NEWS FLASH: The Commission report is now online

In recent years, droughts have caused damaging and costly economic and environmental impacts. Past discussion on drought management with the Western Governors' Association included recommendations to "develop a national framework that integrates actions and responsibilities among all levels of government (Federal, State, regional, local, and tribal)." On July 16, 1998, Congress passed the National Drought Policy Act of 1998, Public Law 105-199, which established the National Drought Policy Commission. The Commission is composed of fifteen members, representative of all levels of government and other drought impacted groups, and is charged by Congress to provide advice and recommendations on the creation of an integrated, coordinated Federal policy designed to prepare for and respond to serious drought emergencies.
# National Drought Policy Commission
## List of Public Commenters

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<td>WDCC Vision, Experiences, and Recommendations</td>
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National Drought Policy Commission
List of Public Commenters

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<td>Climatic Impacts on Agriculture and Natural Resources</td>
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<td>Preparedness the cornerstone of national drought policy</td>
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<td>Planning</td>
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<td>Ag &amp; life sciences and the Texas Agricultural Experiment Station.</td>
<td>Drought information system</td>
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<td>Boise</td>
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# National Drought Policy Commission

## List of Public Commenters

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<th>Meeting Location/Report Comments</th>
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<td>NDMC; NDPC Organization; 1996 WGA Report</td>
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<td>WV</td>
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<td>Lame Deer MT</td>
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<td>Regional water resources management</td>
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<td>Research and Public Law 2-102-250</td>
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<td>Monitor Droughts on a Regional Basis</td>
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<td>New Mexico Wool Growers, Inc.</td>
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<td>New Mexico Public Lands Council</td>
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<td>Roswell</td>
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<td>NM Energy, Minerals &amp; Natural Resources Department</td>
<td>Chair by State Governor and Secy of Agriculture</td>
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<td>Bismarck</td>
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<td>Truckers survival</td>
<td>Dos Palos</td>
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<td>Technology and Water Conservation</td>
<td>Santa Rosa</td>
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<td>Dept. of Economic and Community Development in Mississippi</td>
<td>Planning and Preparedness</td>
<td>Jackson</td>
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<td>American Indians</td>
<td>Kayenta</td>
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<td>Oklahoma Water Resources</td>
<td>Crop Insurance</td>
<td>OK</td>
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<td>CA Governor’s Office of Emergency Services</td>
<td>State and Federal coordination</td>
<td>Rancho Cordova</td>
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<td>Cost benefit; Crop Insurance</td>
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<td>Monitoring</td>
<td>Helena</td>
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<td>SNOTEL; Secy of Agriculture Chair NDPC; Soil Survey</td>
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Background

Public Law 105-99, 112 Stat. 641, provides, “Sec. 4 DUTIES OF THE COMMISSION.
(b)(4) determine what differences exist between the needs of those affected by drought
and the Federal laws and programs designed to mitigate the impacts of and respond to
drought.”

Methodology

The National Drought Policy Commission invited the public to attend seven public
hearings that were held throughout the Nation between July 1999 and February 2000.
Following is a list of the meeting places, dates, and number of respondents at each
hearing. A total of 140 respondents testified at public hearings. There were 40
additional written or telephone comments provided for consideration.

<table>
<thead>
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<td>El Paso, Texas</td>
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<td>Los Angeles, California</td>
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<td>Austin, Texas</td>
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<td>Atlanta, Georgia</td>
<td>2/3/00</td>
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<td>Billings, Montana</td>
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Written comments and transcripts of oral testimony from the hearings are on file with the
Commission Office at the U.S. Department of Agriculture in Washington, D. C.

The Commission’s draft report, “Preparing for Drought in the New Millennium” was
published on March 8, 2000, with a public comment period through March 31. Seventy
comments were received in response to the draft report. In total, 250 comments were
reviewed by the Commission. The draft report was modified, taking into careful
consideration all the comments received before and after the draft report was published.

Overview

Primary Issues Raised by the Public

1. The need for better coordination among Federal programs and between states was
a recurring comment.
2. Producers with small farms and ranches indicated an increased vulnerability to drought and feel more at risk than larger enterprises. They also felt "left out" of assistance programs.

3. The requirement for continued and better monitoring and predictive capability at the national and regional levels was mentioned frequently.

4. The timeliness of assistance and a review/overhaul of crop insurance were noted.

5. There was considerable discussion on management of the proposed National Drought Council and coordination among Federal, state, regional, Tribal, and local jurisdictions.

Comments Grouped According to the Commission’s Goals

All public comments received have been categorized according to the primary subjects covered in the comment as it is related to the specific goals of the Commission. This table provides a summary of the goals and the number of related comments. The subject of each comment often covered multiple goals; therefore, the numbers in the table are greater than the total number of comments.

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<td>2. Science/Technology</td>
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<td>3. Risk Management</td>
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<td>4. Response</td>
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<td>5. Coordination</td>
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<td>6. Other</td>
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Additional information is available from the National Drought Policy Commission. You can access the information at the Commission’s web site: www.fsa.usda.gov/drought. All files can be ordered in electronic format or hard copy. Write: National Drought Policy Commission, USDA/FSA/AO, 1400 Independence Avenue SW, Mail Stop 0501, Washington, D.C. 20250-0501.

* A list of acronyms used in this file will print at the end of the report or the meanings for individual acronyms will display by clicking on the acronym.
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Department or Agency</th>
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Dear National Drought Policy Commission:

Although the Commission cites a finding of the "Need to Address International Drought-related Issues" on page 30 of its draft report, I fail to find any substantive recommendation on this point. If, in the opinion of the Commission, a separate specific recommendation is not warranted, then perhaps some further emphasis on international cooperation included among the other draft recommendations would suffice to keep this aspect from being overlooked during future planning and implementation.

Respectfully submitted,
Amy Sebring
4121 Claudia Dr.
Corpus Christi, TX 78418
361-937-4177

Distributed to: Goal 2, Ray, Jim, Doug for analysis, DATE: 3-17-00
Flagged for: Roseann, Diana, Goal 5 may have an interest here.

Comments on the draft report of the National Drought Policy Commission

Recommendation Number 1 suggests the President direct federal agencies to take specific actions and that congress should "adequately fund programs to address needs not met by current programs." Recommendation number 5 states that a detailed implementation plan will include "specific steps to maximize customer satisfaction" and that federal agencies and departments be provided with funding needed to carry out the recommendations of this report. Several times in the report, reference was made to USDA constituents not being able to receive the disaster relief dollars until months after the crop disaster. I admit the program regulations is one of the reasons for this delay. However, a major reason for the delay is inadequate staffing of the USDA agencies which is the result of inadequate funding. Therefore, I believe that any funding authorized by Congress should include dollars designated
specifically for administrative and personnel needs.

Recommendation Number 3 suggests that risk management strategies be developed and incorporated in drought preparedness. Further, recommendation number 4 endorsed that "Congress and/or the President acknowledge and encourage natural resource stewardship and self help."

I admit that crop insurance is greatly lacking in the needed coverage for all constituents. However, I strongly encourage, that on the order of self-help, USDA constituents be required to purchase basic crop insurance for USDA program participation. This was required several years ago and the number of those purchasing crop insurance hit all time highs. However, as the years have passed, this requirement has fallen on the way side, with producers being able to sign a waiver for the purchase of crop insurance.

Recommendation Number 5 advises that there should be a "periodic in-depth evaluation of federal drought related programs to determine the degree of customer satisfaction, the extent of the gaps that exist between program goals and service delivery and other circumstances that may hinder effective operation." I believe that if a review of the programs is performed, that State and county level employees should be included in the process as they see first hand the problems and issues restricting program delivery and customer service.

Respectfully submitted by:
Jackie M. Stonfer, Program Chief
Pennsylvania State FSA Office
jackie.stonfer@pa.usda.gov

Distributed to Goal Teams 1,3, 4 and 5 for respective analysis, DATE: 3-17-00
Note: It appears the writer substituted "Recommendation" for "Goal" in the comments.

3. Received 3-17-00 @ 3:45 P.M., EST

Drought Committee

In your drought document, there was only cursory mention of one of the most valuable hydroclimatic monitoring systems currently run by any government agency with no mention of continuing support or expansion of that system. That is the SNOTEL system run by the Natural resources conservation service of the USDA. While streamgaging and BOR/COE got mention for additional support and funding, this system which provides data and products that allow all agencies the potential of predicting drought months in advance was somehow neglected in your recommendations. If you are truly concerned with the impacts of drought
in the western US, this system, above all other operational systems should be expanded. By the time you measure it in the water in the stream (while important), you have no warning, drought has happened. Monitoring snowpack allows for several months of lead time... time for preparation, mitigation, etc. I strongly encourage you to include wording in your document specifically regarding this most valuable program - that it should be expanded and enhanced.

Sincerely,

Randall P. Julander
rjulande@utdmp.utsnow.nrcs.usda.gov

Distributed to Goal 2 team, Ray Motha, Jim Laver, Doug Le Comte for analysis, DATE: 3-21-00.
Flagged for Warren Lee

4. Received 3-17-00 @ 11:33 P.M., EST

You put forth a lot of studies but put real people on you panels who have actually lived and farmed through a drought and when you offer the low interest loans to farmers have people in your offices that can do the paperwork. We had to take a loan at higher interest because the local person couldn't do the job and meet the deadline.

Clanahan Beth ,bic@hiplains.net

Distributed to Goal 4 team, Warren Lee, Curtis Carlton, Lorine Boardwine for analysis, DATE: 3-21-00.

5. Received 3-18-00 @ 5:30 P.M., EST

Hi, We have a beef cow calf operation that has suffered the last few years from drought and from the commodity market. We have lost about $140,000.00 in the past 5 years and each year hope that it will turn around and get better. It is to the point that we would be much better off to abandon farming and move on. It is not in our blood to quit. We are afraid to stop producing as what will the people here do if a natural disaster strikes and shuts down the food transportation line. On top of it all, the last thing we need to do to be ready for a natural disaster is to fix the windmill, a $2,000.00 project. Is there any help out there for us.
Soon to collapse

Robert George Dunn
6693 Mapleridge Rd.
Alger, Mi  48610-9735
dunnfarm@ejourney.com
517-836-2285

Distributed to: Warren Lee, Ray Motha, Leona Dittus for analysis, DATE: 3-21-00.
Flagged for ALL: Anybody have any suggestions for this person? (Note: this does not
appear to be a comment specifically related to the 3-8-00 draft report)

6. Received 3-18-00 @ 11:14 P.M., EST

The Commission recommendations appear valid. For those ag areas that already rely on
irrigation for crop production, do these goals still apply? Suggest they also be used in the fight
against Exotic Pest, such as the Mexican-Fruit Fly.
Bob Leonard, Executive Director, Fallbrook Chamber of Commerce

“Chamber Welcome Desk”, fallbrook@primemail.com

Distributed to Goal 2 Team, Ray Moth, Jim Laver, Doug Le Comte for analysis, DATE: 3-21-00.
Flagged for John Flowers, EPA

7. Received 3-21-00, 10 AM

Attached are the comments by Commissioner Susan Combs, Texas Department of Agriculture.
Her signed letter is being mailed to you today.

llemmon@agr.state.tx.us
Lola Lemmon, Safety Coordinator
Producer Services Division
475-1611
March 21, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501
Dear Ms. Dittus:

In reviewing the National Drought Policy Commission Report “Preparing for Drought in the New Millennium,” I have the following comments:

One of the most positive aspects of the proposed drought policy is the implementation of preparedness plans and mitigation measures. Funds invested in this manner are of greater long-term benefit and more cost-effective than the expenditure of federal funds for emergency relief.

Increased public awareness is a vital part of any proactive approach to drought response. Information regarding water conservation techniques in urban settings while providing training within the agriculture community for the planting of drought-resistant and/or tolerant crops contribute to this awareness.

The research and analysis of information is of significant value in predicting drought conditions and monitoring the potential impact on governments and individuals alike. Having access to prediction information will enable farmers and ranchers to alter their planting and/or livestock systems to include the more drought-tolerant/resistant plants and species, which, in turn, will lessen the impact on the many entities dependent on the agriculture industry.

I would further recommend expanded research in areas that will create more water for needs during a drought such as brush control, cloud-seeding, desalinization and canal lining.

Risk management, as part of an overall plan of mitigation and planning, could result in a more positive and cooperative working relationship between the agricultural community and the government. As outlined in the Australian Drought Policy Review Task Force report, farmers would assume greater responsibility for managing their particular risks while the government, by funding drought management and risk management training and providing tax incentives, would create an environment more conducive to a planning and mitigation approach. However, the risk-management approach should not disregard the value of properly implemented federal crop insurance and other forms of federal assistance such as emergency haying and grazing of CRP acres. The current crop insurance program should be extended to permanently cover livestock and revised to expedite response to applications for assistance and payment of claims.

It is doubtful that a handbook will move the general public to action with regard to drought response. Such funds would be better spent for implementing emergency drought preparedness measures with cost-share incentives by appropriate agencies and/or groups or much-needed research as mentioned above. This might include hands-on training and assistance in planning and mitigation to help farmers and ranchers decide the best risk-management strategies for their individual operations (i.e., drought-tolerant crops/species, crop insurance, conservation systems, etc.). Similar training can assist communities in determining their own priorities as they relate to drought issues and protection of environmental resources.

Thank you for the opportunity to comment.

Sincerely,

Susan Combs
Commissioner

Distributed to: Goal 2 Team for Paragraphs 3 & 4, Goal 3 Team, Jane Pease, Beth Osborne, Diana Marquez for Paragraph 4 Goal 1 Team for Paragraph 5.

DATE: 3-21-00

8. Received 3-23-00,
Attached are the comments by Commissioner Gus R. Douglass, West Virginia Department of Agriculture. His signed letter is being mailed to you today, March 27, 2000.

March 23, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus:

The following are my comments relative to Preparing for Drought in the New Millennium:

As the Agriculture Commissioner of West Virginia and chair of the State Soil Conservation Committee which develops policy for the Soil Conservation Agency and Soil Conservation Districts, there is a great need for redirection within USDA. West Virginia has had to deal with many natural disasters, including tornadoes, floods and drought.

After the first two disasters, FEMA (Federal Emergency Management Agency) was on the scene immediately to meet the needs of the citizens and the community. But, when it came to the recent drought, USDA was woefully lacking in their reaction time. A good example is the financial assistance appropriated six months ago to assist the farm community is just now reaching them.

Fortunately, here in West Virginia, the Governor and the Legislature met and immediately made available $11 million to provide emergency assistance to the livestock industry. We would have lost the livestock community if we had not been able to encourage and provide these people immediate assistance to enable them to perpetuate their enterprise though to another grazing season. I do compliment, USDA's Farm Service Agency, as they were the catalyst to help us determine the individuals who needed assistance and the amount of assistance necessary.

In summary, my recommendation is that USDA be given the authority and the motivation to react immediately to move monies to the industry in a drought situation, or give FEMA the authority to react not only to floods and natural disasters such as tornadoes, but also
to drought

Thank you for permitting me to comment

Sincerely,
Gus R. Douglass
Commissioner

Distributed to Goal 4 Team, Warren Lee, Curtis Carleton, Lorine Boardwine for analysis,
DATE: 3-27-00.
Flagged for Goal 5 interest

9. Received 3-23-00 @ 12:33 P.M., EST
A telephone call from: Mr. Leonard Logan
Farmer
Fort Plain, N.Y.
(518) 993-2279

Recipient:
Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501

Mr. Logan expressed concern about the fact that a great deal of money is spent by the
Federal government to subsidize Federal crop insurance. He suggested that farmers
be given the option to have the government funds used to either subsidize crop insurance
premiums or to help establish an irrigation system, whichever is more beneficial for
the individual. He felt that with the money the government would spend in four years
to subsidize his crop insurance he could pay for an irrigation system which would greatly
prepare him for any future droughts. In this scenario, if the farmer did not purchase
crop insurance, he/she would not be eligible for a crop disaster payment. Mr. Logan stated he
would provide the Commission with a written statement he prepared regarding crop insurance and
had already submitted to the Farm Service Agency.

Distributed to Goal 3 Team, Jane Pease, Beth Osborne, Diana Marquez for analysis,
DATE: 3-27-00.

10. Received 3-27-00 @ 12:00 P.M., EST
Ms. Leona Dittus and Commissioners;
Below are some of the comments I have on the draft report prepared by the
Commission:

I like the report and believe that it has very valuable information in it. I support the creation of a National Drought Council to oversee drought policy and preparedness issues. The Council could effectively "achieve a coordinated approach to drought mitigation and response" (Page 4, draft report) and assist programs, such as the National Drought Mitigation Center, to improve the overall readiness of the country for drought situations.

Other than for a drought affecting the Marshall Islands in 1998, I am not aware of the Stafford Act ever being used for a drought situation. Yet it is being offered as a possible solution. Is this truly a solution for the future? There might be a need to state the expectations of when the Stafford Act would be used. Also, it is my impression (but I could be mistaken) that 10 or 15% of the money from the Stafford Act must be used for mitigation purposes. This could be an excellent source of valuable funds needed by states and communities to implement drought mitigation measures. Perhaps that should be mentioned...if my understanding is correct.

Technological solutions are not mentioned much in the report. Will there be support for technology? One area that is mentioned, but not given much attention, is graywater. This is a great idea, but will need support in order to be accepted around the country. Another technology is desalinization. Was the Commission aware of the very good report on desalinization in the December 1999 issue of Water International? It highlighted global examples and successes, including the fact that Florida has over 100 desalinization plants in operation now. It also included a list of recommendations to the U.S. government that are very relevant to the Commission. It is these technologies, as well as the individual entrepreneurs like those heard during the testimonies that should be encouraged by the NDPC. For example, after a visit to the Scottsdale, AZ Water Campus, the Commission could have identified specific recommendations to support similar "mitigation" projects around the country.

The mission of the National Drought Mitigation Center solely deals with drought issues. Currently, the NDMC funding is with a special grant through the CSREES in USDA. I feel that the report can be stronger in recommending stable and increased funding for the NDMC. Grouping us into a recommendation (2.8) for increased funding to established agencies that have multiple responsibilities diminishes the crucial role of the NDMC, and the volatility of its funding situation. I believe that an additional recommendation as stated by David Stooksbury, State Climatologist for Georgia, on February 3, 2000, would be more appropriate: “Increased, stable, long-term support for a national drought education and planning assistance program through the National Drought Mitigation Center located at the University of Nebraska-Lincoln.”
Education and improved public awareness are identified as two important components of a national drought policy, yet the specific recommendations made regarding these components are not very strong and success is not assured. Again, a statement of support for the NDMC would be one specific recommendation. However increased and stable funding is important for the NDMC to effectively accomplish these aspects of its mission. The NDMC would work very closely with the National Drought Council and all agencies and local entities to address these components.

Thank you for this opportunity to present my comments to the Commission. I look forward to the final report and to its reception by Congress and the White House.

Michael Hayes.

Michael Hayes  
National Drought Mitigation Center 
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Distributed to Goal Teams 5 (Paragraph 1), Team 4 (P 2), Team 2 (P 3), Team 1 (P 6), for analysis, DATE: 3-27-00.

11. Received March 28, 12 PM


Submitted by Donald A. Wilhite, Director, National Drought Mitigation Center, University of Nebraska, Lincoln, NE 68583.

Comments:

1. Page 1. The first paragraph. I find this paragraph lacks clarity. For example, it is true that it is difficult to identify and quantify drought impacts because it is hard to separate direct from indirect losses and to assign quantitative values to social and environmental impacts. And, there are complex economic factors that confound separating drought losses from other external factors. Regarding the second and third sentences, one doesn’t necessarily follow from the other. I am not sure that hydropower plants are necessarily designed on the basis of capacity to produce power during a severe drought. These facilities are located at reservoirs that are designed on the basis of many factors, but often flood control and irrigation. Of course the inability to produce
power during a drought year is identified as a loss of revenue for that facility. If power must be produced from another facility, whether nuclear or coal, it is likely to be at a higher cost. There are always winners and losers with the occurrence of any natural hazard event.

Inaccurate reporting of studies in paragraphs 2 and 3. Unclear to which report you are attributing drought losses. You cite my study/report of June 1984 to the NSF, which was of the 1974-77 drought period. However, you make reference to losses to the 1953-56 drought. Were those taken from my report? You also mention federal drought response costs of $6.5 billion—these figures could be attributed to my study which cited $7-8 billion. Also, the primary drought years in question were 1974, 1976, and 1977. Most of the federal dollars provided through congressional appropriations occurred in 1977. Your citation mentions 1977-78 drought costs. I would not include any reference to 1978 since the 1977 drought ended in April for much of the country and certainly by the fall months for the remainder. I would also disagree strongly with the “extraordinary federal expenses” over the 1952-88 period of half a billion dollars. Did someone just take the peaks in expenditures from congressional appropriations related to drought and average them? There are significant costs each year through crop insurance, disaster payments, etc. doing this period. If the value isn’t known, I would suggest not trying to include one.

It is also important to draw a distinction between federal expenditures because of drought (whether congressional appropriations or federal expenditures) and losses. FEMA estimates annual losses resulting from drought at between $6-8 billion. I think that it is critical that this figure is mentioned along with the reference for federal government costs.

In paragraph 3, the report cited was titled “Drought and Natural Resources Management in the United States: Impacts and Implications of the 1987-89 Drought.” This report was not prepared for the Natural Hazards Research and Applications Information Center, rather it was prepared by Riebsame, Changnon, and Karl. Riebsame was a member of the staff of this center at the time.

2. Page 2. The first sentence is poorly phrased. It reads as though these studies have been poorly done with the statement “these well-intentioned efforts have produced a patchy approach to reduce the impacts of drought.” These reports were produced to document actions and losses associated with drought, i.e. post drought evaluations. The point is all we have available to us to assess the impacts and responses to historical drought events are a few sporadic reports completed by different researchers following different methodologies. Some have made recommendations on how improvements could be made in improving this nation’s response to drought. This nation has not had a systematic post-drought evaluation process and so those studies that have been done are “event” specific with no common methodology. A critical point that the NDPC should consider including in the report is that a long series of reports and statements beginning in the mid to late 1970s have recommended significant changes in how we approach drought, including the need for a national policy and plan. However, these recommendations have been largely ignored. I have documented these recommendations, if you are interested. These recommendations provide even more fodder to the recommendations that the NDPC is making at this time.
3. Page 4. Drought snapshots. The drought events listed should be expanded and made more regionally inclusive. First, the 1930s drought years affected more than 60% of the nation, yet it is referred to as largely a Great Plains phenomena. Second, the 1950-54 period should be expanded to include 1956 as this drought event moved northward affecting much of the central U.S. The mid 1960s drought event is omitted (it is mentioned later in the report), this is the drought of record for the Northeastern states. I would also like to see a reference here or somewhere that indicates that drought occurs somewhere in the U.S. every year and, on average, about 12% of the nation is in severe to extreme drought each year.

4. Page 5. The bullets following the definition are misleading. First, drought is a temporary aberration, in contrast to aridity that is a permanent feature of climate. The first bullet misrepresents this concept. Droughts are characterize by two factors, the intensity of the moisture deficiency and the duration of the event. The term “persistent” can be misleading because droughts may last for a period of a few months to years. The last bullet is not necessarily true, depending on the type of drought you are referring to. Meteorological drought, depending on how it is defined, may occur even though because of timing or precipitation effectiveness, it may have little or no impact on crops, etc.

Paragraph 5. National drought policy must also be able to distinguish between true droughts and those that are occurring because normal water supply has been overextended because of non-sustainable development.

5. Page 6. Stored Water and Natural Water Droughts. First paragraph, replace “One type” with “Stored water” to improve clarity. The reference to these types of droughts primarily affecting urban areas and agriculture “near rivers” is inaccurate. Much of the nation’s municipal and agricultural water supplies are obtained from ground water.

6. Page 9. Since this section is just reporting on some examples from states, regional entities, localities, and tribes, it seems inappropriate to refer to these as “program assessments,” since no attempt is made to evaluate the effectiveness of these programs. It would also be helpful to congress to provide an overview of the National Drought Mitigation Center’s program in this section since it has been congressionally funded for six years and primarily addresses issues of planning, mitigation, monitoring, research, training, and outreach/public awareness, all important ingredients to the national drought policy that congress directed the NDPC to derive.

7. Page 18. Reference to the inset information about the NDMC. I know that witnesses at public hearings and others have indicated the high value of information received from the NDMC for a variety of purposes, i.e., planning, monitoring. I would like to see the last sentence modified to include reference to a broader range of services and information provided by the NDMC. We are not just a referral service—this is a minor aspect of our overall program, but we are well networked with other specialists and provide referrals when appropriate.

8. Page 23. 2nd paragraph. It is my understanding that the only drought event that has received Presidential declaration was in Guam and/or the Marshall Islands, therefore the Stafford Act is not useful for drought events.
9. The programs of the National Drought Mitigation Center are focused primarily on the following tasks: monitoring/early warning; research; drought planning; training; public education via our information clearinghouse; advising policy makers; and international activities. For example, we have (1) organized and conducted 9 training workshops on drought planning since 1997 (5 in the U.S., 1 joint workshop between U.S. and Mexico, and 3 international workshops) for over 700 persons; (2) received over 250,000 hits during February 2000 on our web site (information clearinghouse); (3) worked with states and other government entities on drought planning activities; (4) served as technical headquarters for the Western Drought Coordination Council; (5) developed the 10-step planning process methodology used by governments at all levels throughout the world for preparing a drought plan; and (6) promoted drought planning and preparedness activities with foreign governments and U.N. and other international organizations. Although this section addresses most of these areas, no mention is made of our very successful program. Why is that?

Comments on Recommendations

I continue to have concerns about the lack of specificity of many of the points associated with the recommendations. I don’t think Congress will know how to implement these recommendations in many cases, what legislation is being suggested, what funding levels in support of existing or new programs is adequate, etc. Lack of specificity will likely lead to inaction.

10. Under 1.1, (first bullet) the components of a drought plan mentioned are directed more at a drought plan directed at water supply planning. What about impacts on agriculture and other sectors? We recommend that drought plans contain 3 components: monitoring/early warning/prediction; risk and impact assessment; and mitigation and response actions. Within these three areas, all of the components mentioned in the report, plus others, would be addressed.

(Second bullet) Risk or vulnerability assessments need to be completed by each sector for all drought prone areas. This bullet implies that the National Drought Council will assess vulnerabilities.

11. Since the NDMC already has a comprehensive information clearinghouse which links to over 250 web sites and with over 1000 linked to it, the Commission should recommend providing additional resources to expand information on our web site. Our web site received over 250,000 hits during February. The recommendation to “establish” a clearinghouse suggests that no information clearinghouse currently exists.


If you have questions regarding any of my comments, please let me know. I would be pleased to elaborate on any of the points that I have made. Best of luck as you near the checkered flag.

Distributed to: Goal Teams 1, 2 for analysis, DATE: 3-29-00
Flagged for: ALL may have an interest here.
Hello Leona,

It was a pleasure meeting you at the Western States Water Council meeting earlier this month.

I have a few minor technical corrections for the Commission's draft report. A formal letter from our Director will follow, essentially thanking the Commission for its work and its recognition that the USGS stream gaging network needs to be expanded.

The corrections:

-- Page 11, 3rd paragraph under "Stored Water"
Most commonly known as 1976-77 and 1987-92 droughts. Alternatively, specify water year or calendar year.

-- Page 14, 4th paragraph
Suggest delete reference to pending legislation to create a state drought management function. The bill in question was a spot bill, in other words, a placeholder introduced with the intent of being amended. The author intended to have a vehicle available for some type of drought relief measure, if water year 1999 continued to be dry. California is now at essentially normal levels of rainfall and snowpack, so the need for the spot bill has evaporated. The bill is not active, and there is no actual movement to create a state drought management function.

You might want to instead mention that California's Urban Water Management Planning Act requires water purveyors serving more than 3,000 AF annually or more than 3,000 connections to prepare plans demonstrating how they would respond to cut-backs of up to 50% in their supplies, in the event of a drought, natural disaster, etc. Plans are required to be updated every 5 years and are to be submitted to us (the California Department of Water Resources).

-- Page 16, 2nd to last paragraph
Strictly speaking, "potable water emergency" with respect to large cities in Southern California is misleading. The only large city on the brink of a potable water emergency was Santa Barbara, although measures such as construction of a temporary pipeline prevented it from becoming a water haulage situation. A better wording would be: With the exception of the City of Santa Barbara and surrounding smaller communities during the 1987-92 drought, droughts have not .....
Good luck on your report.
Jeanine Jones
CDWR Drought Preparedness Manager
(916) 653-5272

Distributed to: Goal 1, for analysis, DATE: 3-29-00

13. Received March 28, 6 PM through Roseann Gonzales, USBOR

From: Woody Widmark <widmarkw@mail.ssd.k12.ak.us>

HI MY NAME IS WOODY WIDMARK (TRIBAL CHAIRMAN OF SITKA TRIBE OF ALASKA). OUR TRIBE IS LOCATED IN SITKA, ALASKA (SOUTHEAST ALASKA OR PANHANDLE).
IF I MAY, I WOULD LIKE TO MAKE A FEW COMMENTS DURING THE PUBLIC REVIEW PERIOD.

ON PAGE 6: (1ST PARAGRAPH)
FOR YEARS, FARMERS AND RANCHERS, NATIVE TRIBES...............AND SO FORTH. I WOULD LIKE TO COMMENT ON "NATIVE TRIBES". IN ALASKA, THE TRIBES ARE CALLED ALASKA NATIVE TRIBES AND THE "LOWER 48" TRIBES ARE CALLED AMERICAN INDIAN. WHAT I'VE HAVE SEEN WHEN CONSULTING WITH TRIBES, THE PHRASE "ALASKA NATIVE/AMERICAN INDIAN" TRIBES. OR "TRIBE(S)" IS SUFFICIENT........ ARE THE TRIBES FEDERALLY RECOGNIZED? WHAT ABOUT "TRADITIONAL COUNCILS?"

ON PAGE 34 (LAST PARAGRAPH)
THE ULTIMATE OBJECTIVE IS THAT ALL WATERS USERS AT ALL LEVELS OF GOVERNMENT.........AND SO FORTH. AT ALL "LEVELS OF GOVERNMENT"......DOES THAT MEAN FEDERAL, STATE AND TRIBAL GOVERNMENTS?

PAGE 37 (2.5) "NATIVE TRIBES"........I DON'T LIKE THE TERM........EITHER ALASKA NATIVE/AMERICAN INDIAN TRIBES OR JUST (FEDERAL RECOGNIZED) TRIBES WILL DO............

PAGE 39 5. COORDINATE DROUGHT PROGRAMS AND RESPONSE. (2ND PARAGRAPH)
DOUGHT AFFECTS A WIDE ARRAY OF CONSTITUENTS, AMONG THEM FARMERS, RANCHERS, NON-FARM BUSINESSES, TRIBES,....................ETC. I DO LIKE THIS LANGUAGE BECAUSE IT JUST STATES "TRIBES"..............GOOD JOB............
EVEN THOUGH, I'M FROM AN AREA WHERE THERE IS A LOT OF RAIN (RAIN FOREST)/TONGASS NATIONAL FOREST.................I FEEL THE TERMS "NATIVE TRIBES" IS INAPPROPRIATE AND WHEN SPEAKING OF TRIBES, ARE THEY FEDERAL RECOGNIZED? OR NOT? OR IN ALASKA WE HAVE TRADITIONAL COUNCILS AS WELL................THANKS FOR YOUR TIME.

Distributed to: Goal 1, for analysis, DATE: 3-29-00
Flagged for : ALL for interest in Alaska Native/American Indian Tribes

FROM: RobertKlink@bia.gov
14. . Received March 28, 5 PM

I've read your subject report and have the following comments:

Page 2- Robert Miller---- "Past" President of IAC.
Page 3- last paragraph- Add "tribal"to read.... in anyway with tribal or states' water rights
Page 15- delete one Becker County, Minneasota  (listed twice)
Page 18- third full paragraph -suggest replacing Oregon with Alaska to read.... Florida to Alaska...

Metlakatla Reservation on Annette Island near Ketchikan needs a soil survey update.

A tabular list of the 86 drought related programs would be helpful. Table should have a column with a short "one phrase" description of program, and a second column with category(ies).
Page 19- add "and FY 2000 funds" to read only one program with specific authority and FY 2000 funds for drought planning...
Page 28- 1st full paragraph-- ad a comma and remove "and' to read New species, welcome and unwelcome, that only exist....
Page 29- rewrite 1st paragraph under Need to Address... to read "changing soil composition and properties".

last paragraph- change wording to read 'no longer a phenomenon dependent on drought and concentrated in large national forests....
Page 39- There is a need to add an explanation concerning FACA, what does it mean and why the exemption is prescribed in Recommendation 5.1 .

Thanks for the chance to respond & comment by March 31st.

Distributed to: Goal 1,4, 5 for analysis, DATE: 3-29-00
Flagged for : ALL for interest in Alaska Native/American Indian Tribes

15. Received 03/28/00 03:42PM
dave_lund@harvard.edu@inter2
Ms. Dittus, for a report of recent research results regarding the
16th century megadrought in the U.S., see the March 21, 2000 issue of
Eos, a weekly publication of the American Geophysical Union.

The article is entitled "Tree-ring data document 16th century
megadrought over North America" (front page article).

- Dave Lund

Distributed to: Goal 2 Team Ray, Jim, Doug for analysis, DATE: 3-29-00

16. Received March 29, 2000,

Dear Ms. Dittus:

Susquehanna River Basin Commission (SRBC) staff has reviewed the Draft
Report entitled "Preparing For Drought in the New Millennium" by the
National Drought Policy Commission. The SRBC's comments on this Report are
attached. Thank you for the opportunity of commenting on this document.
Please keep the SRBC appraised of the availability of any future drafts or
additional opportunities for input into the National Drought policy
formulation process.

Sincerely,
Stephen A. Runkle
Hydraulic Engineer
Susquehanna River Basin Commission

SUSQUEHANNA RIVER BASIN COMMISSION

Comments on Draft Report entitled
“Preparing for Drought in the New Millennium”
by the National Drought Policy Commission

March 27, 2000

Commission staff has reviewed the Draft Report entitled “Preparing for Drought in the
New Millennium. The Commission agrees with the Report’s principle recommendation that
Congress pass a National Drought Preparedness Act that would establish a National Drought
Council. The primary function of the Council would be to ensure that the goals of national
drought policy are achieved.

However, the Commission does not agree with the recommended composition and chair
of the Council. The Council should not be chaired by the Secretary of Agriculture. This gives a
predetermined bias that agricultural droughts are of paramount importance to the Nation and that
the urban-suburban and environmental impacts from drought are subservient to agricultural
interests. Far too many examples and case studies mentioned in the Report outline agricultural impacts and response measures resulting from drought. Additionally, the Report’s examples and case studies emphasize western versus eastern drought impacts and response actions. No case studies or examples are given which discuss drought impacts and response actions from the northeastern and mid-western metropolitan corridors.

This Commission notes that the composition of the National Drought Policy Commission does not include representatives from the U. S. Department of Energy, Environmental Protection Agency, and other environmental interests. While the Report’s recommendations rectify this, the bias is already incorporated into the Report. In addition, with the exception of the Metropolitan Water District of Southern California, urban and suburban representation is lacking and representation from the eastern and mid-western metropolitan corridors is non-existent. If the proposed Council’s structure is skewed in this manner, a major percentage of the Nation’s population will not be represented. As was noted in our previous comments, the former Water Resources Council should be used as a model for the proposed National Drought Council.

In general, we do agree with the responsibilities assigned to the National Drought Council as described in Section 5 of the Recommendations. A primary function would be to coordinate delivery of existing and new drought programs and available assistance programs to the regions and states. This Commission notes that within the last 10 years, drought related federal programs have been fragmented among 88 separately funded programs. Therefore, future coordination at the federal policy level is essential. Certainly, some of these programs can be combined for greater efficiency.

We also sadly note from the draft Report that fewer than five states have an individual designated as drought coordinator, and only about 20 states have a multi-agency drought task force to coordinate drought management activities within the state. The states need to take a more active part in drought management and drought response activities.

Another vital function for a National Drought Council is to assist regional, county and local governments in developing drought contingency plans and drought preparedness, and in implementing critically needed supplemental water supplies to avoid shortfalls. It is understood that River Basin Commissions fall under the regional government designation and play a key role in regional drought coordination and management activities. Funding for planning and implementation of water resource solution alternatives (both supply and demand side) is critically needed. Adequate metropolitan and municipal water supplies must be assured for future generations.

Another essential role for the National Drought Council is to insure that a viable National Drought Monitoring Network of gages is developed and maintained to monitor key hydrometeorological parameters. Adequate funding is imperative to sustain this Network in order to provide the real-time drought monitoring information necessary for accurate and timely drought triggering. These key hydrometerological parameters include precipitation, streamflow, groundwater levels, reservoir levels and soil moisture indexes. In a recently completed Report, the Susquehanna River Basin Commission has documented significant gaps in the existing streamflow and ground water monitoring network of gages within the Susquehanna River basin.
and has recommended improvements to this network to facilitate effective drought monitoring. Increasing the federal cost share in funding the National water resource gaging programs would go a long way toward improving the National drought monitoring capability.

Recommendation 3 of the Report would develop and advocate comprehensive risk-management strategies and incorporate these in drought preparedness plans. This is a worthy goal, but most sub-recommendations and case studies in the Report involve agriculture. One sub-recommendation is included for small business. Why not include recommendations to develop reservoir and ground water aquifer risk management plans to solve regional water resource needs for all types of water users?

This Commission strongly supports the need to address environmental concerns and impacts resulting from drought. Toward that end the Commission has developed reservoir release management plans for use during times of drought. Reservoir releases from Commission owned storage in basin reservoirs are triggered at critical low flow levels to help protect fish and aquatic life and sustain downstream uses. Continued federal funding for these cutting-edge instream flow studies and implementation projects is critically needed. A viable National Drought Council could insure that these research and implementation measures are supported without interruption.

The Report emphasizes the need for public education to enhance drought preparedness and implement water conservation strategies. However, the report candidly notes that there is little federal assistance available for such programs. A National Drought Council should be empowered with the mandate and resources required to correct this deficiency.

On page 18 of the Report it is noted that drought planning and mitigation strategies are a significant part of the Western Drought Coordination Council and Delaware River Basin Commission programs. However, this Commission has, over the past year and a half developed a Drought Coordination Plan for the basin to coordinate drought management activities among the signatory agencies. The next stage of the Plan will develop strategies to mitigate environmental impacts resulting from drought. These strategies employ detailed instream flow need assessments that are cutting edge technologies in environmental drought management. These Susquehanna River Basin Commission accomplishments should be acknowledged in the Report.

Distributed to: Goal 5, P's 1, 2 & 4; Goal 1, P's 7 & 11; Goal 2, P 8; Goal 3, P 9 , for analysis, DATE: 3-29-00
Flagged for : Deanne, P 3, John Flowers, EPA, P 10

17. Received March 29, 2000

Ms. Dittus:

A copy of the comments with the Chairman's signature will follow by fax.
Dear Ms. Dittus:

Thank you for the opportunity to comment on the draft report of the Commission. As drought adversely impacts the economy of a small state such as Hawaii, it is imperative that we move from a crisis management mode to a risk management mode, which this draft report recommends. I would like to offer the following comments:

1. Recommendation No. 5.2, creation of the "National Drought Council" - the chair of this body should be an agency with broader national interests because drought impacts affect not only agriculture but also encompass potable and industrial water supplies, environmental resources, forest fire hazards, and small businesses. The Bureau of Reclamation may possibly be a more suitable agency to chair the Council.

2. Recommendation No. 5.3, funding for the Council - Congress should provide direct funding to the Council for operational costs in addition to the various federal agencies with drought response programs.

Sincerely,

JAMES J. NAKATANI
Chairperson, Board of Agriculture

cc: Shaun McGrath, Western Governors' Association
Governor Benjamin J. Cayetano
Timothy Johns, Commission on Water Resource Management

Distributed to: Goal 5, items 1, 2 for analysis, DATE: 3-29-00

18. Received March 29, 2000

March 24, 2000
Ms. Leona Dittus, Executive Director  
National Drought Policy Commission  
USDA/FSA/AO  
1400 Independence Avenue, SW  
Mail Stop 0501  
Washington, D.C. 20250-0501

Subject: Comments on the Draft Report of the National Drought Policy Commission  
Delaware River Basin Commission

Dear Ms. Dittus:

Thank you for the opportunity to comment on the draft report of the National Drought Policy Commission. In reviewing the March 8, 2000 version of the draft report, we note that most of our previous comments on the December version have been addressed. We support the proposed National Drought Council as a catalyst for improved coordination of drought information and mitigation activities. We also support the recommendation for drought coordination at the regional and river basin levels.

Although we understand that you are assembling a document that addresses issues at a national scale, the following are additional comments for your consideration:

1. On page 9, Drought Snapshots From 20th Century America: The 1961 - 1966 drought in the northeast should be listed. It was the drought-of-record for many parts of the region. The accumulated rainfall deficit during the period was over 40 inches - or a full year's worth of rain!

2. Under Regional Entities on page 15: Drought mitigation programs in the Delaware River Basin have been responsible for preserving billions of gallons of reservoir storage while maintaining stream flows during drought periods. This is an example of interstate cooperation within a river basin which serves the water supply needs of 17.5 million people. The Delaware River Basin Commission, established by a federal/interstate compact, has served the coordinating role in negotiating drought mitigation programs in the basin. Because of what other regions can learn from this experience, this successful example deserves some mention in this section of the report.

3. On the bottom of page 16 and top of page 17: Although federal water agencies may sell space in existing federal reservoirs, this may entail re-allocation of storage for multi-purpose reservoirs. This may be a complex and expensive process where flood control storage is reduced in favor of water supply storage.

4. Under Goal No.1, item 1.1: We believe that improved stormwater management should be mentioned as contributing to drought mitigation. Though it may not appear directly related to drought, it is part of comprehensive water management and helps to retain runoff and promote infiltration.
Please contact Rick Fromuth (extension 232) of our staff if you have any questions. We feel that your report and recommendations will make positive contributions to drought mitigation efforts.

Sincerely,

Carol R. Collier
Executive Director

DRBC Commissioners

Distributed to: Goal 5, Item 2; Goal 1, Items 3 & 4 for analysis, DATE: 3-29-00
Flagged for: Deanne, Item 1, Bill Werick, Item 3

19. received March 29, 2000

Thank you for sending me the Report and I am pleased to have the opportunity of providing a few comments as relate to water-short and drought stricken of several of our Western States. These comments are in the form of an attachment to this e-mail communication.

Sincerely, Joseph A. Warburton, PhD.
Secretary/Treasurer NAIWMC
Also owner of ranch property in Nevada.

COMMENTS: REPORT OF THE NATIONAL DROUGHT POLICY COMMISSION

I am pleased to have the opportunity to make a few comments on the Drought Report recently prepared for presentation to Congress and the President.

Coming from a State of the Union which is constantly forced to address problems of water supplies, the amounts available, its quality and the attendant issues related to wildlife and endangered species, as well as being the State which presently qualifies as the most rapidly growing in population, it is important for us to be concerned greatly about methodologies which can assist in making more fresh clean water available to our communities.

It is noted, in particular, that the Bureau of Reclamation has the 17 western states as its principal region of concern in such matters. As pointed out on Page 14 of Commission’s report, we see that this Agency was authorized under Public Law 102-250 to assist states, tribes, localities and nonprofit entities in developing comprehensive plans for drought mitigation. It is noted in particular that one Section of this Public Law, namely Section 206(b) is not mentioned or addressed by the Commission. This Section of the Law authorizes the Secretary of Interior to conduct Precipitation Management Technology Transfer Programs to help alleviate problems caused by precipitation variability and droughts in the West, as part of a balanced long-term water resources development and management program. This is to be done by consultation with State, Tribal and local water, hydropower, water quality and in stream flow interests on a 50-50 cost shared basis.
Since many areas of the Western States, in particular the States of Nevada, New Mexico and Texas are experiencing water shortages continuously for the reasons mentioned above, it is not at all clear why the Commission has not taken advantage of this Section of Public Law 102-250 in recommending a continuing implementation of such a Congressionally approved program which these States and others in the West, are ready and willing to participate in on a 50-50 cost shared basis.

It is noted on page 14 of the Commission’s report that the Bureau of Reclamation had requested only $500,000 for planning purposes and no funding for solving the water shortage problems in a pragmatic manner. The $3,000,000 earmarked by Congress in FY2000 for “leasing of water for specified drought related purposes…” provides no help, for example in Nevada, where such leasing is not possible because the Bureau of Reclamation possesses no water which could be leased in those areas of the State most affected by drought. In addition, all of the limited stream flows and ground water supplies are fully appropriated in some of the relevant States to local governments, corporations and individuals.

It is also noted on page 14 of the Commission’s Report, that the Bureau of Reclamation has again requested only $500,000 in its FY2001 budget, presumably for planning purposes only.

The US Department of Agriculture Small Watershed Act only allows for help in watersheds of 250,000 acres or less. The Western States needs are for Watersheds of 2500 square miles or more.

Again on page 22 of the Commission’s Report, it is stated that Public Law 102-250 provides emergency response assistance including emergency well drilling in the 17 Western States. This also is of little or no value in those Western States where all of the ground waters are already appropriated, and no such drilling of new wells is permitted by State Engineers. Again there is a failure to recognize Section 206(b) of this Public Law which provides for alternative methods of increasing available water supplies to those regions affected by water shortages.

ENVIRONMENTAL CONCERNS:

Water shortages caused by droughts have devastating impacts on aquatic and terrestrial environmental resources. This is certainly true in those watersheds alluded to above where wildlife species and endangered species, such as the cutthroat trout in Nevada lakes, are being heavily impacted.

As noted by the Report, these sensitive and endangered species of fish and wildlife are characteristically found in low population densities as found in west Texas, east New Mexico and in Nevada.

Drought also has repercussions on the morphology and hydrologic function of stream channel networks and this is particularly true for example, on the lower reaches of Walker River in western Nevada where the river has deteriorated to become meandering small streams producing water which is too warm for cold water fish species to survive or to spawn. Again, recognition of Public
Law 102-250, Section 206(b), followed by adequate appropriations by Congress will, in cooperation with the States affected, have the capability of reducing these problems to manageable levels.

The creation of a “super-agency” to solve the drought problems of the United States is certainly not a viable approach as noted by the Commission in its recommendations on page 38 of the Report. However, a recommendation to all of the pertinent Agencies to pro-actively determine where, in the nation, drought problems exist which relate to their authorized programs, would go a long way to solving water shortage problems in a pragmatic manner rather than creating more and more multi-agency planning groups. Individual States already know where their drought related water problems are located and, in many cases are only too willing to participate in relief measures such as those spelled out in Section 206(b) of Public Law 102-250.

Distributed to: Goal Teams 1 P's 3,4,9  Goal 2, P's 11,12; Goal 5 , P 13 for analysis,
DATE: 3-30-00

Flagged for : USBOR, P's 3-9, USDA, P 8; EPA, P’s 10-12

20. received March 29, 2000

To: National Drought Policy Commission (NDPC)
From: Leonard Boulas and Jack Truby, Colorado
Date: 05/09/00
Re: Comments on the Commission's Draft Report "Preparing for Drought in the New Millennium"

BACKGROUND
As background, both of the authors of these comments have been involved with Drought in Colorado for over twenty years both as members of the State's Emergency Management Agency, and as members of the State's Drought Response Organization. Both were co-authors of the State's original Drought Response Plan, and even after retirement from state service have continued to be involved on a routine basis. Both were instrumental in the development and implementation of the Western Drought Coordination Council, as well as, in the development of several of the Council's work products. They have a wealth of experience in dealing with all facets of Comprehensive Emergency Management (Mitigation, Preparedness, Response, and Recovery) across a wide range of natural and man made disasters. Both have worked closely with FEMA and predecessor agencies.

REPORT COMMENTS
1. GENERAL COMMENTS
We applaud the efforts of the Commission and its staff in developing the report, and feel that the report findings provide an accurate picture of the current drought management environment and the issues involved in producing a National Drought Policy. We agree with many of the report's
recommendations, although we have significant concerns with some aspects of the report as we indicated in our specific comments.

2. SPECIFIC COMMENTS
A. Page i. We agree with recommendation concerning consolidation of Drought Programs, and the formation of a National Drought Council, but feel the justification for the recommendation provided is flawed. FEMA currently for Federal Emergency Management Programs reports to many different congressional oversight committees. The fact is it could be done, but in doing so, you would lose the expertise of the other federal agencies that currently have programs. The issue is more the need for a lead federal coordinating agency, than for all the existing programs to be consolidated under one agency (note comment on page 2 of the report).

B. Page 20. We feel the Commission should have made recommendations (endorsements) concerning the several risk management strategies that were identified and considered, rather than postponing this for future study.

C. Page 23. The report description of the Stafford Act and FEMA does not give due credit to the uniqueness of this legislation, and FEMA's disaster consequence management expertise and coordination capabilities both of which could be significant management tools in a National Drought Policy. This may be due to FEMA and its predecessor agency, FDAA, reluctance to address drought, which they have considered more of an economic downturn than a physical disaster. It is also noted that there is an Emergency Declaration provision in Stafford in addition to the Disaster Declaration provision. The Act also has a Fire Suppression Declaration provision, and authority for FEMA to task federal agencies to carry out the purposes of the Act. Criteria would have to be developed for use of this Act in a Drought Emergency/Disaster and perhaps the Act would need to be fined tuned to deal with a drought, but its use should be considered. After all, it already exists.

D. Page 31. The statement on this page provides the basic premise the recommendations are based on in bold print. We would argue that "Mitigation" not preparedness should be the cornerstone of a national drought policy as it is for FEMA's Comprehensive Emergency Management Program, which addresses all other natural disasters. We feel the emergency management community has moved beyond preparedness (which is an on going activity) to consideration of mitigation as being the most important building block to reduce long term losses. It may be that the Drought hazard preparedness has not moved as far as preparedness for other natural hazards and therefore needs to be emphasized at this time. If so we would suggest the that the wording be changed to "Mitigation and Preparedness", giving mitigation its rightful emphasis.

E. Page 31. We would note it is hard to hold a Council responsible for its actions or its inaction unless it is statutorily created and funded. If not, there really does need to be a lead-coordinating agency (an Executive Agency) which is held responsible and which can use the council as a vehicle to insure closure to essential needs.

F. Page 32. We agree there is much more that can and should be done in the area of Water Resources Management and Policy preparedness activities as they pertained to drought, and that these efforts should be integrated with current drought response activities. The fact is it is not one or the other, but both that are needed. We have held for a long time that long-term drought mitigation is a Water Resources Management and Policy issue.

G. Page 38. We consider this to be our most important comment and therefore have highlighted it in bold print. We applaud the actions of USDA to step into the breech as the lead-coordinating agency for drought when no other federal agency wanted this role. In addition, for the work it has done on drought as a whole, and to staff the commission. We however strongly disagree with the recommendation that the Secretary of
Agriculture chair the National Drought Policy Council. We feel the track record of USDA in rapid response to its current drought programs as noted in the report have been less than satisfactory.

The issue is that the lead federal coordinating agency for drought should be an agency that has considerable experience in integrating the efforts of the federal family of agencies and brokering their services to achieve program goals. This agency should be proactive, action oriented and responsive to the needs of local and state governments as well as the public. Based on our experience over the years we consider the federal agency best suited to fill this role with a proven record of accomplishment is FEMA. We therefore recommend that FEMA be designated the lead federal coordinating agency for drought and the FEMA Director chair the Council. Someone has to hold the various federal agencies "feet to the fire" to insure that things are done and actions are taken. We feel FEMA is better suited to do this than USDA. This would not detract from USDA's significant ongoing role in drought monitoring, and assessment, as well as agricultural drought response. The potential success or failure to move forward on a National Drought Policy will depend highly on the agency designated to carry forward this important work.

We thank the Commission for the opportunity to comment on the draft report and have provided our input in the spirit of what we believe are constructive comments for the Commission's consideration.

Distributed to: Goal Team 5, Items 2A, C, E, G. Goal 3, Item B. Goal 1, Items D, F. Goal 4, Item C. for analysis, DATE: 3-30-00

Flagged for: USDA, FEMA

21. received March 30, 2000

Here is the testimony I prepared to deliver at the Billings Drought Hearings. Please let me know if you have any trouble reading it, and make sure it is distributed to Commission members. This testimony is the heartfelt view of many of us in the climatological community that have worked for many years to improve drought monitoring and response in our country.

I will also send a printed copy on official letterhead for you to have in your files.

Please confirm the successful receipt of this testimony.

Best wishes to you and the members of the National Drought Policy Commission.

Sincerely,

Nolan Doesken
Colorado Climate Center
February 17, 2000

Dear National Drought Policy Commissioners:

I deeply regret that the high cost of travel to Billings, Montana makes it impossible for me to present my concerns to you in person. I hope that you will hear in my written words the deep conviction that I hold regarding drought monitoring, research and response.

First, here is some background information. I am the Assistant State Climatologist for the State of Colorado and have served in that capacity since 1977. I have been an active participant in Colorado’s Water Availability Task Force since it convened in 1981 when the Colorado Drought Response Plan was first implemented. While Colorado and most of our neighboring states have enjoyed a relative abundance of water since 1982, the topic of drought and what we can do about it remains one of endless concern.

In what I am about to say, please know that my words are not just my own. They represent the attitudes of many of us here at the Colorado Climate Center, the members of the Colorado Water Availability Task Force, the members of the Western Regional Coordinating Committee 102 (Climate Data and Analysis for Application to Agriculture and Natural Resources) and the members of the American Association of State Climatologists which I represent. The basis for my comments is the 23 years of drought monitoring and research with which I have been personally and directly involved and the greater experience and wisdom of the members of the organizations listed above.

Drought – A Hard Thing To Get A Grip On

Among the various natural disasters, drought is perhaps the most difficult to deal with. Rather than being an event – a disaster that strikes quickly, leaves its mark, and moves on – drought is a non-event. It is the cumulative effect of snows that don’t fall, or spring or summer storms that strike elsewhere. Historically, drought tends to sneak up on us, disguised as sunny, dry weather. As such, it does not lend itself to typical emergency response strategies. While being a non-event, it is indeed costly. Drought reaches into the very fiber of community life.

As you know, there are various levels of drought preparedness and response. Through wise adaptation to climate and its variability, the worst impacts from drought can be lessened. However, the natural variations in climate; some potentially predictable and others not; will always affect local and regional water supplies and ecosystems to the extent that “normal activities” will be disrupted, modified or even halted.
The Role of Drought Monitoring

Drought monitoring is the process by which we gather current information locally, regionally, or nationally on the various components of the hydrologic cycle. We compare the current conditions with the full range of conditions that have occurred in the past. Then, using any of a number of analytic tools, we assess the areas, durations and severity of drought and relate this to current or imminent impacts. Drought monitoring has been going on in our country in some shape or form from the very beginning of organized weather observing networks in the 1800s. Drought monitoring is an essential ingredient of any comprehensive response plan or mitigation strategy. Historic studies provide information on how often to expect drought of any specified area, duration and severity, while ongoing monitoring activities describe current patterns of drought.

Precipitation – The Key to Drought Monitoring

The water content of accumulated snowpack, streamflow, reservoir levels, soil moisture, evaporation and vegetation greenness are all a part of the natural water balance and can be measured and assessed to provide important information on drought conditions. However, the single most important observation that relates to all of these others is the measurement of precipitation. If patterns of precipitation, both rain and snow, are accurately measured over time and space, reasonable estimates of the other variables can be made. As such, the basic measurement of precipitation is the simplest and the single most useful measurement for drought monitoring.

The National Weather Service Cooperative Observer Program – The Best National Data Source For Drought Monitoring

Unknown to many in our country is a long-standing network composed primarily of volunteer citizens who day in and day out measure precipitation and temperature for the National Weather Service in urban and rural areas all across our country. This network of observers is known as the Cooperative Observer Program. It is managed by the National Weather Service (http://www.coop.nws.noaa.gov) and consists of one or more reporting sites in practically every county of every state. With sound measurement procedures, durable instrumentation, carefully indexed station information, and archived data available anywhere in the country, this data source has proven itself time after time as absolutely invaluable in the monitoring of drought conditions and other climate anomalies. For decades, data from this program have been used in the computation of the Palmer Drought Severity Index. More recently, local, regional and national computations of the Standardized Precipitation Index are also being generated from data provided to the National Weather Service by the Cooperative Observer Program.

The total number of locations monitoring precipitation on a daily basis is close to 10,000 which allows assessments of drought conditions on the county scale. A sizeable fraction of these stations date back 30 to 100+ years, providing remarkably consistent information over time and
an essential historical perspective from which to assess areas, durations, intensities and return frequencies of drought. No other source of nationwide data exist that can even come close to providing both a localized and historical perspective – essential information for well-planned drought response.

The entire program from data collection down to archival and dissemination is carried out nationally for just a few million dollars each year – a remarkably small amount considering the national scale of this program. In addition to supporting drought monitoring, the data are also used for many other valuable applications ranging from crop yield projections to flood predictions and water quality assessments. Countless businesses and government agencies rely on data from the Cooperative Observer Program. Much of our nation’s infrastructure in terms of roads, bridges, foundations and roofs have been designed and built based on information determined from the many years of climate data collected and saved from the Cooperative Observer Program. This Program is essential not only for drought monitoring but also for the workings of our country.

Despite its obvious importance and its low cost, the National Weather Service’s Cooperative Observer Program remains largely unknown or taken for granted. Even within its host agency, the National Oceanic and Atmospheric Administration (NOAA), the program has gradually slipped in priority over many years. THIS IS A CRYING SHAME!! The NWS Cooperative Observer Program, because it has been around for so many decades and because it seems so low-tech in an age where technology drives so much of our daily lives, has nearly dropped out of view. Yet, because of its low-tech, historically consistent long-term nature, it now emerges as the single most important data source for national drought monitoring and a very important component in global change studies.

The Cooperative Observer Program – A Time for Revival

I appeal to all of you on the Commission to learn more about the Cooperative Observer Program and then speak out boldly on its behalf. A recent report by the National Research Council Committee on National Weather Service Modernization (“Future of the National Weather Service Cooperative Observer Network”, 1998, National Research Council, National Academy Press, Washington D.C.) reviewed this remarkable nationwide volunteer program and provided specific recommendations for sustaining and improving it. With careful planning, and with only modest efforts to modernize data collection, communications, data analysis, archival and dissemination, much more timely and spatially detailed information on U.S. drought will be available now and for decades to come. This network, now 110 years young, deserves a revival! It has earned it. It deserves the renewed support of its own agency, NOAA, and it merits the enthusiastic support of the many other agencies and departments, such as the U.S. Department of Agriculture, the U.S. Department of the Interior, the Federal Emergency Management Administration and all the other groups, who continue to rely on this wonderful source of data.

- This is the right time to improve the level of funding for this program so that dilapidated equipment can be replaced, so that data communications can be improved, and so that data dissemination and archival can be accomplished more efficiently.
This is the right time to raise the priority of this low-cost program within the Department of Commerce, NOAA and the National Weather Service.

This is the right time to improve the recognition of its participants so that they (both volunteers and National Weather Service personnel associated with the program) can see and understand the importance of what they are doing and the many applications of the data they are helping collect.

This is the right time to enlist the support and cooperation of federal agencies like the USDA, USDI, FEMA and other agencies and businesses across the country who utilize this great national resource to again

This is the right time to make the Cooperative Observer Program strong and alive again.

Thank you for your time and your attention. If you would like more information about the NWS Cooperative Observer Program and how its data are used in drought monitoring and research, I would be happy to provide you with more information. I wish you the best in your efforts to carry this message forward to Congress and the citizens of this country. If there is anything that I, and the organizations that I represent, can do to help you in your efforts, please let me know.

Sincerely,
Nolan J. Doesken
Assistant State Climatologist
Colorado Climate Center

cc: G. Taylor, President, American Association of State Climatologists
    R. Motha, USDA-WAOB
    R. Leffler, NWS Cooperative Program Leader
    D. Jensen, Chairman, WCC-102
    J. Brislawn, Chairman, Colorado Water Availability Taskforce

Distributed to: Goal Team 2 from ""The Role of Drought Monitoring"" to the end for analysis, DATE: 3-30-00

22. received March 30, 2000

Leona,
These comments were sent to me, so I'm forwarding them for inclusion in the comment process. Marsha is a California Division of Water Resources planner serving on an IPA with the Bureau of Reclamation.
Leon

Prillwitz, 3/27/2000
Comments on draft Preparing for Drought in the New Millennium

The Commission was asked to advise Congress on how best to:

- integrate federal drought laws with state, local and tribal programs;
- improve public awareness; and
- coordinate drought mitigation measures.

I did not find much guidance or new information along these lines in the review draft. My reading of the draft document indicated that the primary emphasis is on reducing agricultural losses related to drought.

Also, the orientation did not include most of the circumstances we face here in the West, since by definition "dryness during a normal dry season or in an arid climate is not "drought."

In California, a semi-arid state, the successful interaction between agricultural interest and urban and environmental stakeholders during water short times is critical to surviving during both wet and dry years. By definition and orientation, California seems to be excluded from any drought program consideration.

Since we have a well developed process here for general water management planning (through Reclamation’s Central Valley Improvement Act and the State of California Urban Water Management Planning Act), a key link for water shortage planning and coordination is through these mechanisms. These linkages could be highlighted in the document as a positive connection for planning and implementation of drought programs.

Furthermore, the water purveyors that deal with water management and drought contingency planning here in California are “districts” or “agencies” independent of counties, in most cases.

I don't know if the matrix of the 47 federal programs dedicated to drought will be included in the final report, but I hope it will be.

As I read the recommendations, I wondered upon which findings they were based. For example, the commission decided that consolidation of all federal drought programs under one federal agency should not be done. Upon what did they base this decision?

Based upon the difficulties of this Commission, I question whether the recommendation for the formation of a National Drought Council is a wise way to go. I think an alternative would be to further empower the National Drought Mitigation Center to continue and expand their work with perhaps the formation of an advisory committee to that institution (if they don't have one already.)

The recently published publication of the NDMC: A Methodology for Drought Planning, provides a simple step-by-step approach that can be adopted quite easily by water providers throughout the country. We will be providing a copy to all of our contractors this year as part of
their information package for making revisions to their water management plans. Work like this should be supported and distributed generously to the public.

**Distributed to: Goal Teams 1, P's 5 & 10. Goals 4 and 5, P's 8, 9. for analysis, DATE: 3-30-00**

23. received March 30, 2000

March 30, 2000

Ms Dittus:

These comments are from Tony Haffer, Meteorologist in Charge, NWS Forecast Office Phoenix, AZ. I attended, and briefly participated in, the NDPC meeting held in Scottsdale, AZ, on March 1st.

At the March 1st meeting I suggested the Commission consider modifying the wording in recommendation 2.2 to explicitly endorse the importance of having regional- and/or state-level information delivery systems. My primary point was to avoid establishing just one national level delivery system (a single point of failure) in favor of a number of smaller delivery systems.

I'm flattered my suggestion was acted on. However, I feel the resulting wording currently contained in the Report for recommendation 2.2(b) could be modified further to more clearly state the concept of regional- and/or state-level delivery systems.

It is felt that a number of regional information networks are best suited to reflect differences in drought conditions and impacts at the state and local levels. In addition, it would be easier for regional interests to keep their system current than it would be for many entities to manipulate one very large and complex system. In addition, one could argue that it is more likely that state and local entities will use, and update, an information network in which they have a vested interest.

Please consider the following rewording of recommendation 2.2(b):

"(b) We recommend the Congress authorize, and the Administration implement, a means to effectively communicate drought conditions and impacts to decision makers at the federal, state, and local levels"
across the Nation. An information delivery system should be implemented and be comprised of a number of regional, near real-time product and data networks, integrated in an appropriate fashion to accurately reflect regional and state differences in drought conditions. Such a configuration will provide the most efficient access to, and increase the availability of, weather, water, soil and climate data and information to key decision makers.

Thanks to the partnership among federal, state, county, and private sector interests in water management, Arizona has recently implemented such a communication system. While born out of a desire to more efficiently communicate weather and water information during critical flood episodes, the Arizona system will also be used to provide critical drought information to decision makers at all levels within the State.

The system, tagged the Arizona Flood Warning System, is operational, but in its infancy. Never-the-less, it would be our pleasure to demonstrate the utility of this system to Supervisor Morriss, Mayor Campana, or any of the other Commissioners at their leisure.

Thank you for the opportunity to provide input to such a significant effort.

Tony Haffer
602-379-4607 ext. 222
602-267-8051 (fax)

**Distributed to: Goal Team 2 for analysis, DATE: 3-30-00**

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24. received March 30, 2000

Attached are comments concerning the draft National Drought Policy Commission Report. The comments were sent to Michael Neyer, Director of Indiana's Division of Water and a member of the Ohio River Basin Commission, for review.

Judith Beaty
Head Basin Studies Section
Department of Natural Resources, Division of Water

Comments on the National Drought Policy Commission Draft Report
The draft report entitled “Preparing for Drought in the New Millennium” prepared by the National Drought Policy Commission does an excellent job of explaining and addressing the various issues related to drought. We agree, in general, with the report’s assessment of the situation of drought planning in this county; and we agree with many of the proactive planning concepts and subsequent recommendations in the report. We support a shift in policy from emergency response to planning and mitigation measures.

We accept the premise that we can reduce this nation’s vulnerability to the impacts of drought, and thus reduce the need for emergency relief, by making preparedness the cornerstone of national drought policy. We especially believe that good science, public education, and resource stewardship are the most important factors in reducing and/or mitigating impacts of drought.

We strongly support the following specific goals and recommendations contained in the report:

• Improve accuracy and frequency of drought predictions that are disseminated in a timely fashion for decision makers.

• Promote planning activities that lead to preparedness by: 1) defining pre-determined, objective triggers for specific actions; and 2) anticipating conflicts between different water users and establishing a decision-making mechanism for how shortages will be met.

• Increase efficiency in coordination and communication of drought programs and responses. This is particularly important when the people who are responsible for responding to drought may not be the same from drought to drought.

Accordingly, we recommend:

• That a drought impact assessment team of federal, state, and other experts be established who are responsible for analyzing the causes and aggravating factors contributing to drought and its impacts after drought events occur.

• That a comprehensive information clearinghouse be established (such as the National Drought Mitigation Center) to provide users with complete access to drought monitoring, prediction, impact assessment, preparedness, and mitigation measures and to link information from federal and nonfederal sources.

• That the National Drought Mitigation Center be provided with an adequate annual budget to support continuation and improvement of their drought-related work.

Distributed to: Goal Teams 1 and 5 for analysis, DATE: 3-30-00

25. Irrigation Association letter of March 15, 00

Distributed to: Goal Teams 1 and 2 for analysis, DATE: 3-30-00
March 15, 2000

Ms. Leona Dittus
Executive Director
National Drought Policy Commission
United States Department of Agriculture
1400 Independence Avenue, SW
Washington, DC 20250-0501

Dear Ms. Dittus:

In my capacity as Executive Director of the Irrigation Association (IA), I am writing to provide comments and suggestions on the draft report of the National Drought Policy Commission. As you may know, officials of the IA, which represents over 1500 manufacturers, distributors, and designers of irrigation equipment throughout the United States recently discussed our views at length with Pearlie Reed, Ron Marlow, Warren Lee, and Gary Margheim. I am pleased to report that our views were very well received.

First, as you are probably aware, agriculture is the greatest user of our nation's water supplies. Indeed, according to the Census Bureau, of the 25% of the country's renewable water supplies withdrawn each year from aquifers, streams, and lakes, agriculture uses over 80%. Accordingly, identifying and deploying better water management practices by agricultural users will not only help preserve today's water supplies, it will help conserve substantial amounts of water in the future, thereby directly attacking possible drought shortages. We suggest that efficient irrigation technologies should be featured as a prime and immediately available technique for avoiding or at least minimizing drought problems, particularly in light of efficient irrigation's demonstrated contribution as a sound water management practice.

Put another way, the utilization of more efficient irrigation technologies will substantially enhance water quantity as well as quality through both water conservation and reductions in nonpoint source pollution. For example, between 1988 and 1994, the number of farm acres irrigated increased 2.9%, yet the amount of water applied dropped 5.4%. This is due in large measure to the fact that agriculture invested in more efficient irrigation technologies. Our research reveals that the reduction in the amount of water applied each year by agriculture adopting more efficient irrigation practices equals the water needed for the personal use of every man, woman, and child in the nation's 29 largest cities. More water conserved obviously equals more water available.
We agree completely with the basic premise of the Commission’s recommendations that asserts that the nation’s vulnerability to the impacts of drought can be reduced by making preparedness the cornerstone of national drought policy. The logical extension of that premise is that it is critical to look at the problem both in the short-term – what can and should be done today – and in the big picture – what types of long-term solutions can and should be undertaken. Clearly, prevention of the problem can ensure that sufficient water is available in the future, while at the same time slashing the need for disaster aid after the fact; the draft affirms this stance clearly by stating as a preeminent goal the importance of moving away from the need for emergency relief. Again, efficient irrigation practices represent a reasonable mitigation tool prior to both “stored water” and “natural water” droughts.

Unfortunately, it did not appear that the draft sufficiently identified means such as efficient irrigation that can help in the campaign to prepare for serious drought emergencies despite proven successes in conserving substantial amounts of water and the potential for drought prevention.

Modern irrigation technology allows the agriculture industry as well as landscape and golf course interests to apply water more efficiently, taking into consideration time of day, local topography and soil conditions, the size and configuration of the area requiring irrigation, and weather.

Where the draft continues that “investments on the front end in preparedness will save money over the long run,” we heartily concur. Funding to provide farmers a way to purchase irrigation equipment prior to a drought, or tax incentives designed to encourage the purchase and installation of more efficient means of irrigation either through modifications to existing equipment or through deployment of new, modern, and more efficient technology, is consistent with the draft’s proactive recommendations.

In addition, we suggest that ameliorating possible wastes of water by poor irrigation performance can be accomplished by assessing the efficiency of existing systems and recommending corrections through water audits.

Although inefficient irrigation can cause water loss, more water is wasted currently by overwatering than by any other cause. Accordingly, education of farmers on water scheduling and budgeting would go a long way in preserving limited supplies. We believe that an organization like the National Resources Conservation Service is well positioned to assume a leadership role on the education issue.
Finally, I strongly encourage you to revise the conclusions to identify efficient irrigation as one of the mitigation activities specifically cited that “can reduce vulnerability to drought events.”

Thank you for your consideration of these important issues.

Sincerely,

[Signature]

Thomas H. Kimmell
Executive Director
March 10, 2000

Leona Dittus
Executive Director
National Policy Drought Commission
United States Department of Agriculture
1400 Independence Avenue, SW
Room 6701-S, STOP 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus:

The Georgia Department of Natural Resources invited me to provide comments to the National Policy Drought Commission on how drought policy and issues relate to Massachusetts. I would like to share some thoughts and comments on how federal agencies can help mitigate drought response and ensure drought preparedness in the Commonwealth of Massachusetts. I would also like to take the opportunity to commend your Commission’s efforts on reaching out to other federal and state officials to discuss drought policies and issues.

The Commonwealth of Massachusetts is considered a “water-rich” state. Under normal conditions, regions across the state annually receive between 40-50 inches of precipitation. However, Massachusetts can experience extended periods of dry weather, from single season events to multi-year events.

In the 1990’s, Massachusetts has seen inconsistent patterns of precipitation levels and increasing demand for water, which has motivated state agencies to concentrate on developing measures for managing drought preparedness and response. It is in this context that I make several recommendations, on how federal government can help states with drought preparedness and drought response, to the National Drought Policy Commission:

1. We recommend that a single point of contact be identified on the federal level to coordinate more efficiently between state and federal governments. That contact would be able to supply the following information:
Available federal funding and information about how to access their funds;

A contact list of relevant federal agencies and personnel associated with those agencies;

Basic public information or education material on drought would be helpful. Public educational materials that explain the “science” of drought prediction, geographic extent, duration and predicted ending and to explain it in terms the affected public can understand;

The coordinator will also serve as a distributor of resources from outside the stricken region.

2. We recommend the federal government to serve as a regional coordinator on multi-state interactions. This is especially significant in New England where many watersheds are in multiple states.

3. We recommend federal funding to support thorough drought preparedness and programs to handle emergency drought situations. Funding would support contingencies for emergency transport of water, public health issues and threats from fire.

4. We recommend that an active program of federal subsidies and incentives is needed for those who choose to mitigate or avoid drought losses through pro-active water management measures. Federal drought management programs are currently focused on reacting to disasters. Farmers, industry, citizens and other groups cannot afford pro-active drought mitigation measures and state agencies do not have adequate programs and funding to help them.

Thank you for your attention to these issues. By working together we can plan for and mitigate the extended periods of dry weather, which will inevitably occur.

Very truly yours,

Bob Durand

26. Massachusetts letter of March 10,00
Distributed to: Goal Team 1, Item 4. Team 5, Items 1-3 for analysis, DATE: 3-30-00
Dear National Drought Policy Commission,

Thank you for the opportunity to review and comment on the draft National Drought Policy. In November 1998, I attended one of the National Drought Center's conferences and was surprised that only two environmental representatives had been invited. This year, I was surprised that environmental organizations such as mine were unaware that a draft National Drought Policy was available for public comment. A friend happened to pass on the Drought Commission's website and that is how I came to learn of this draft policy.

While the draft document mentions the environmental consequences of drought, I strongly urge the Commission to investigate at a much deeper level the impacts droughts have on ecosystems and wildlife throughout the United States. For instance, in California, the Sierra Nevada Ecosystem Project, authorized by Congress in 1993 and comprised of scientists from a number of disciplines, concluded that the Sierra Nevada aquatic and riparian ecosystems are the most altered and impaired habitats in the Sierra -- due to dams, diversions, flumes, grazing, timber, and residential development.

California has already lost 80% of its salmon and steelhead populations since the 1950s, 96% of its Pacific Flyway wetlands, 99% of its native grasses, 89% of its riparian woodlands, 94% of its interior wetlands, 95% of the spawning habitat for spring run salmon, and 98% of its valley oaks. A sustained drought would have a devastating effect on ecosystems that have been denied their historic water supplies due to the 1,400 federal, state, and private dams that have been erected in the state [1993 Public Trust Report by California State Lands Commission].

In developing sustainable water supplies throughout the country, Friends of the River strongly urges the National Drought Commission to emphasize water conservation and recycling as the most economical and environmentally sound water supply options. The United States Geological Survey reports that Americans are using 20% less water per capita than they did in 1980. Despite such positive numbers, this nation can do much, much more to tap the potential that conservation and recycling holds for reliable, sustainable water supplies.

Finally, Friends of the River requests that the National Drought Commission seriously consider the report issued by the World Commission on Water in the 21st Century. * The Commission, supported by the World Bank, revealed that more than half the world's major rivers are going dry or are terribly polluted, contributing to 25 million environmental refugees a year -- for the first time exceeding the world's number of war-related refugees (21
The report goes on to state that the main reason is lack of coordinated management of watersheds and specifically pinpoints the worsening problems on the Colorado River. The Commission recommends comprehensive regional planning (including across national borders) as a way to provide sufficient water for growing populations while saving the environment.

Thank you for the opportunity to comment. I regret that more environmental voices will not be heard as you finalize your report. Friends of the River strongly urges the National Drought Commission to expand its outreach efforts to include environmental groups as well as low-income populations.

Sincerely,

Betsy Reifsnider
Executive Director
Friends of the River
915 20th Street
Sacramento, CA 95814
(916)442-3155, extension 212

Report is available (80 + pages, executive summary) at:
http://watervision.cdinet.com/visionreport.htm (full report)
http://watervision.cdinet.com/execsumm.htm (Ex. Summary)

Distributed to: Goal Team 1, P 4. Team 5, P 6 for analysis, DATE: 3-31-00
Flagged for EPA, John Flowers

28. received from the Southern Governor’s Association March 31, 2000

March 31, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus:

We are writing to comment on the National Drought Policy Commission’s draft report entitled "Preparing for Drought in the New Millennium.”

We support the draft report’s overall emphasis of moving drought policy towards planning, preparedness and research to reduce the impacts of drought while maintaining a safety net for emergency relief.
However, there are three changes that we believe are important to make to the report in order to best prepare for drought in the new millennium. Specifically, we believe: (1) that it is critical to include nonfederal participation and full representation of all regions of the country on both the National Drought Council as well as the "interim group" that will coordinate drought programs before Congress acts on the commission’s final report; (2) that the National Drought Council be charged with identifying and closing gaps in the availability of federal programs to the various regions of the country; and (3) that the report should call for a crop insurance program that is reasonably available to all farmers in all areas of the country if it is to be used effectively as the primary risk-management tool for farmers. Below please find a brief discussion of these important issues.

Regionally-Balanced Nonfederal Participation

The commission’s draft report suggests that Congress create a National Drought Council with both federal and nonfederal representation to improve coordination of drought programs at all levels. The commission should take this one step further by specifying that the nonfederal members (meaning both state and local governmental entity representatives) be chosen using a method that ensures balanced regional representation. The composition of the National Drought Policy Commission is a good starting point since it appointed nonfederal representatives from various levels of government and gubernatorial commissioners from both the East and West. This model should be duplicated and expanded.

The draft report also suggests that the President establish an interim group composed of representatives from appropriate federal agencies. While we appreciate the need for immediate action, we strongly urge the commission to make room in this interim group for nonfederal interests. Since Congress may not be able to act on the commission’s report this session, the interim group could be the coordinating authority on federal drought policy for at least a year. Without the input of nonfederal interests, the interim group’s actions would be much less effective and very likely to be changed once the more representative final council is created.

In addition to offering meaningful roles for nonfederal, state participation, both the National Drought Council and the "interim group" will be significantly more effective if they evenly represent the interests of all distinct regions of the country - not just East and West. To accomplish this goal, we recommend that nonfederal members be chosen by a group representing their interests. For example, state members would be chosen with the input of the National Governors’ Association, the Southern Governors’ Association and other regional governors’ associations. SGA Comments on Drought Report

March 31, 2000
Page 2

Lastly, it is important that the final report articulate that the National Drought Council’s role is to encourage federal-state cooperation but not to exercise authority over the states’ programs. Through cooperation and coordination, with financial incentives, the goal of planning and preparedness to reduce the impact of drought can be achieved.

Closing Program Gaps

We commend the commission for its thorough review of federal drought programs and support the efforts to close the gaps identified, some of which create unequal access to federal tools to address drought. We urge the commission to recommend that, along with the effort to close gaps between program goals and service delivery, the National Drought Council be charged with the responsibility of identifying and closing those gaps that result in certain regions having less access than others to federal assistance in preparing for drought and report annually to Congress on their progress. For example, the Corps of Engineers, which is very familiar with water resource issues in the East, should have a program specifically targeted and funded to address drought needs in the East much the same way as the Bureau of Reclamation’s drought programs have dealt with drought needs in the West.

Crop Insurance Reform
We recognize that crop insurance reform is a complicated issue and agree that it should be left to a body with more direct expertise than this commission. However, the commission can and should state that if the primary risk-management tool for farmers is going to be crop insurance, then Congress must devise an insurance program that would make it practicable and prudent for all types of farmers in all areas of the country to obtain coverage.

In conclusion, we strongly urge the commission to incorporate into its final report these recommendations for stronger nonfederal, regionally well-balanced participation in drought coordination, to continue to identify and close gaps in the availability of federal programs in different regions, and to provide universal access to crop insurance. Thank you for your attention to these issues.

Sincerely,

Mike Huckabee
Governor of Arkansas

Roy Barnes
Governor of Georgia

Distributed to: Goal Team 5, Item 1 & 2. Team 3, Item 3 for analysis, DATE: 3-31-00

Missouri Dept. of Natural Resources Comments on the 8 March 2000 draft NDPC report to Congress and the President:
“PREPARING FOR DROUGHT IN THE NEW MILLENNIUM”

Comment 1 - Missouri DNR recommends that the proposed national drought policy, programs and initiatives not be regulatory in nature but rather supportive of existing and future state efforts, as well as federal/state cooperative efforts. Missouri DNR requests that the NDPC document be modified to clearly indicate that the NDPC is not recommending federal mandates which supplant existing state water laws or supersede state water rights.

Throughout the report, the phrase “national drought policy” is used. As it is used within this report, this phrase is ambiguous and is left open for interpretation. This phrase should be defined more clearly so that Congress can clearly understand the recommendation as to what is and is not meant. MDNR recommends that this national drought policy and the NDC emphasize cooperation and coordination, and not new regulatory responsibility. As a general observation, the report does not go far enough in explaining how the National Drought Council will operate. The NDPC report should recommend that the federal laws and programs be reviewed and modified so that they are more complementary with existing and future state efforts.
Comment 2 - Missouri DNR recommends that the National Drought Council and Interim Council be composed of only sovereigns: federal, state, local and tribal government representatives. Representation should include all regions of the country and types of government organizations that deal with drought issues.

Comment 3 - Missouri DNR recommends that language be added to the report that each state shall be the primary point-of-contact for the federal agencies/ NDC unless the state has designated another entity. The report should identify the protocol for communication between federal agencies and local governmental entities in order to ensure proper communications at all levels and prevent the NDC from inadvertently circumventing state authority, which can result in local governments receiving conflicting information.

Comment 4 - Missouri DNR recommends that language be added to the report that clearly indicates support for state funding to carry out the drought initiatives identified in the report (planning, data gathering, information dissemination, mitigation, technical and financial assistance). DNR also recommends that the report state that unfunded or underfunded federal mandates not be a part of the NDC policy. Planning, data gathering, information dissemination, mitigation, technical and financial assistance, and public education are all necessary activities.

Comment 5 - Missouri DNR supports and commends the NDPC’s recommendations on technical and financial assistance and technology transfer, public information dissemination, creation of a comprehensive information clearinghouse, and research, monitoring and prediction efforts. Each of these is a vital component in successfully addressing drought planning, mitigation and management. Missouri DNR recommends that language be added to the report that supports and encourages state to state cooperative efforts.

Distributed to: Goal Team 1, Comments 3 & 5. Team 5, Comments 1, 2 & 3, Team 4, Comment 3 for analysis, DATE: 3-31-00
Flagged for Chris Kadas, Beth Osborne, Sarah Carlson P 1

30. Received March 31, 2000

I have reviewed the document PREPARING FOR DROUGHT IN THE NEW MILLENNIUM and respectfully submit the following comments.

My name is Larry Farwell and I have worked for local, state, Federal water agencies since 1986. I have extensive experience with water shortages on the local, state, national and international
levels. In 1989 I designed and implemented a rationing program for the 75,000 people served by the Goleta Water District (Santa Barbara, County, CA). From 1991 until 1993 I was co-leader of the Water Shortage Planning Team, California Department of Water Resources. We wrote legislation requiring water agencies to prepare shortage plans, developed model plans and guidebooks, conducted training workshops for the 300 largest CA water agencies, and evaluated the submitted Shortage Plans. Between 1993 and 1996 I was part of the Water Management Team at the USBR. We wrote criteria for Water Management Plans, developed tools to assist with plan preparation and evaluated submitted Plans. I have also assisted cities in Kansas, Arizona, Nevada, British Columbia and Spain to prepare for and respond to water shortage emergencies.

I believe that the document PREPARING FOR DROUGHT IN THE NEW MILLENNIUM needs to be re-focused. First, a clear discussion of the differences between weather variability and extraordinary drought needs to be included. Second, water agencies need to quantify current reliable supply and peak demand so that the impact of diminishing supply (reservoir siltation, groundwater contamination, etc.) and increasing demand due to increasing population can be modeled.

The Australian approach offered a new perspective but was not mentioned in the final recommendations. In fact, although the reader is left with the concept that conservation and reclamation are good the real issue of matching demand with supply is almost completely missing.

The document is so lacking in specifics that no real guidance or substance is developed. I find it surprising that the similarities between droughts and floods, hurricanes, and earthquakes and never explored. Numerous reports have recommended that we stop building in flood plains, adopt building codes that reduce earthquake damage and adopt zoning that restricts activities in high-risk areas - are these not worth mentioning and applying to water shortages. Not once were such basic concepts as climate-appropriate landscape, locating high-water use business in water-rich areas, or maintaining a reliable supply by limiting new demand discussed.

However there were pages of discussion about the need for more Federal economic assistance - especially for agriculture. What has happened to the biblical concept of storing the bounty during times of plenty in order to survive lean times. There was no mention of the vast areas that are not appropriate for the types of agriculture they now (attempt to) support. The 90 day growing season found in many of the USBR projects in the northern States makes the farms unable to cope with weather variability. And, agriculture is a risky business (regard Hopi corn) and should perhaps be limited in areas with high weather variability. That might even reduce our over production to the point we could stop paying farmers not to farm.

The document includes many special interest opinions but avoid many of the real issues.

The report needs to develop some clear guidelines and responsibilities. The following comments are over-stated for brevity.

2. Weather variability is not drought.
3. Each water provider and business owner should be prepared for 'at least' the drought of record.
4. Droughts of record should not be considered emergencies and the government should not bail out the ill-prepared.
5. Disasters (dam failures, severe earthquakes, etc.) should involve the Federal Emergency Management Agency and Federal financial assistance.

Water providers and businesses (which includes agriculture) should each have a water shortage plan and update it regularly.

An agency or business that does not prepare a detailed plan, and does not implement the plan when appropriate, should not receive technical or financial assistance.

As has been clearly demonstrated in California, plans must be done from the bottom up - from the local water agency all the way up to the State level. This is the only way that environmental needs, water-use priorities and transfers can be determined.

The document PREPARING FOR DROUGHT IN THE NEW MILLENNIUM should call for specific actions. These actions can be implemented immediately by utilizing the diverse water shortage planning information and model plans that are available. This information can be quickly consolidated and made available to water agencies throughout the United States. Technical assistance can be provided at workshops and over the internet. Agencies unable or unwilling to make water shortage planning a priority should be publicly warned - resulting in unpleasant impacts on their bond ratings and insurance rates.

Please notify me of future meetings and documents. This is a vital economic and health issue in which I wish to continue my involvement.

Distributed to: Goal Team 1, P’s 4, 9 & 10. Team 2, P 8, Team 4, P 8 for analysis, DATE: 3-31-00

31. Received March 31, 2000

Dear Mr. Brown:

Thank you for the opportunity to review the NDPC Report. It is an excellent summary of national needs in this important area.

I would like to make you aware of a program recently initiated by the Texas A&M Agriculture Program involving the Texas Agricultural Experiment Station, Texas Agricultural Extension Service, and Texas Forest Service. We are in the process of developing an internet-accessible drought information system that will provide near real time information on: - precipitation, minimum and maximum temperatures, and other relevant weather parameters needed to calculate the potential evapotranspiration of major crops and vegetation types in Texas.,
- simulated growth and development of the major crops in all the relevant crop production regions of the state. Like the weather data, this information will be available at a sub-county level using weather inputs from both weather radar/National Weather Service sources and regional agricultural weather station networks,
- fire danger maps for forests and rangelands,
- software and data needed to make site-specific estimates of irrigation demands by crops and urban landscapes,
- software and data needed for site-specific estimation of drought/weather impacts on crop and grazing land yields, including use of both historical and predicted weather information,
- Extension Service and USDA recommendations for drought mitigation, and
- Links to both short- and long-term weather forecasts.

Based on our research in preparation for this effort, I would suggest that few states and no federal agencies are currently capable of providing the information of the type we soon hope to make available to the public in Texas.

You may wish to add the following recommendation to the report.

2.2c We recommend that Congress authorize and the Administration implement cooperative state-federal drought/weather information systems through Land Grant universities, State Cooperative Extension Services, the U. S. Department of Agriculture, and the National Weather Service. These systems would be designed to provide land managers with the information and training they need to predict and mitigate the agricultural effects of drought at the farm and ranch level.

I would be glad to provide additional information about the newly initiated Texas program if you would like to contact me at 979-862-7139 or cajones@tamu.edu.

C. Allan Jones
Assistant Vice Chancellor,
   Agriculture and Life Sciences
Associate Director,
   Texas Agricultural Experiment Station
Texas A&M University
113 Administration Building
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cajones@tamu.edu

Distributed to: Goal Team 2 for analysis, DATE: 3-31-00
Dear Mrs. Dittus:

Thank you for the opportunity to comment on the March 8, 2000 draft report of the National Drought Policy Commission. The context of my comments is that of managing a large urban water utility in a semi-arid region where we experience cyclical droughts. Denver Water is the wholesale and retail water provider to over 1,000,000 people within a 324 square mile service area. Since the founding of our public agency in 1918, we have coped with serious droughts as well as serious floods. The droughts seem to occur in 20–22 year cycles, so preparing for them is not new to us.

Overall, there are some ideas in the draft report that we liked very much, and some we find troubling. Our comments will be listed by page order.

First, I commend the statement in the Foreword that the Commission’s recommendations are not intended to interfere in any way with state’s water rights, and that the comments should be considered in light of the need to protect the environment. This is extremely important and it is good to include that statement at the outset.

I also applaud your efforts to recommend preparedness as the cornerstone of national policy instead of reaction and response. At Denver Water, we believe that part of responsible water management is preparedness for drought.

On page 7, second bullet, there is a comment that many agriculture producers do not have the knowledge or resources to develop and implement a water conservation/drought plan. We believe that anyone doing business in a semi-arid area ought to make drought preparedness as much a part of the business plan as purchasing new seeds or tractors. Ignorance or refusal to get business savvy should not be criteria for qualifying for government assistance.

We applaud your statement on page 15 that developing a plan for responding to drought is of little value unless the plan is implemented. The concept of having drought drills, somewhat like fire drills, to train new staff is a really fine idea.

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Page 2
On page 20, second bullet, there was a suggestion from someone in the hearings that the federal government should subsidize premiums for crop insurance, although at different rates than under the current program. We disagree with any more federal subsidies in semi-arid areas where crops are being grown without respect for the water resources available. Any subsidies should be extended only to crops that are generally compatible with the amount of rainfall expected in an average year given the climate of the section of the country in which they are planted.

On page 27, under “Need for Training and Technical Assistance,” there is a phrase about adopting water conservation measures year-round. We have found in Denver that our year-round water conservation program has reduced water demand over the last 20 years. Even though the population of our service area has increased from about 840,000 in 1980 to 970,000 in 1998, the total water we deliver has stayed relatively flat at around 77 billion gallons per year. We attribute much of this to our water conservation efforts. This is especially important because natural rainfall here is only about 13-15 inches annually.

Further, we would strongly encourage any federal program of training and technical assistance to set criteria for qualifying for federal dollars. The criteria should include local or regional standards at least equal to the water efficiency requirements in the National Energy Policy Act of 1992. There are current efforts in Congress to repeal these standards. Since newer highly-efficient plumbing products use much less water than old less-efficient ones, it is logical that these highly-efficient products should be required in all new construction, and certainly in all new and renovated properties in drought-prone areas.

In the Conclusions segment, starting on page 29, there is an apparent strong bias toward agriculture, which is understandable in light of the fact that much of agriculture grows food. However, we are also somewhat concerned that the general focus of the entire report is on agriculture instead of equally focused on urban, agriculture and environmental needs.

The remaining bullets on pages 29-30 are very good conclusions and we support them.

We support the recommendation on page 31 urging Congress to pass a National Drought Preparedness Act which would establish the National Drought Council. Even though this federal and non-federal partnership will have some obstacles to overcome, it seems to be the best way to make our nation better prepared for drought. We urge Congress to require both federal and non-federal members on the Council.

We favor Recommendation 1.1 on page 32, particularly the objective of having a drought preparedness and public education plan in place for water users at all levels of government, as well as in the private sector.

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Page 3

We are also in favor of Recommendation 2.2, that a national clearinghouse such as the National
Drought Mitigation Center be established and funded to link information from various sources and provide it to those who need it.

We have concerns, however, with Recommendation 3. The concept that proper risk management means crop insurance is wrong. Insurance does not manage or reduce the risk—it just spreads it more widely. Even though many Americans are growing food, we are concerned that many agriculturists are growing the wrong food for the water resources available in their respective regions, and no amount of technical assistance or crop insurance in preparing for drought will solve this problem. This is especially true as water supplies decrease in quantity (for the population served) and deteriorate in quality. A different kind of technical assistance is needed. We suggest that the concept of risk management require that only certain kinds of businesses in various regions can qualify for crop/livestock insurance.

Recommendation 4.4 seems to be the only reference to drought relief for cities. This is particularly troublesome for the smaller cities and towns. We suggest adding more substance to the recommendations for cities, and not referring to them in the broad general category of “non-agricultural.” This term is not descriptive of all the issues to be faced by communities, business, tribes and Mother Nature herself. Also, this term gives us the impression that the document is mainly an agriculture-oriented document, with the concerns of cities and business as an afterthought.

Recommendation 5 again shows a bias toward agriculture and away from cities. Having the interim coordinating group chaired by the Secretary of Agriculture sets a preference for agriculture over the needs of cities (Recommendation 5.1 on page 38). Instead, we suggest that the Commission recommend that the head of the Federal Emergency Management Agency chair both the interim group as well as the Proposed National Drought Council (Recommendation 5.2 on page 39).

Overall, we applaud the research, public involvement and reporting work done by the National Drought Policy Commission. You, your staff, and your volunteers have done a monumental job. With a few changes, you will have a broader base of support for your recommendation to Congress. Thank you for your attention to our suggestions.

Sincerely,

H. J. Barry, III, Manager

cc: Honorable Dan Glickman, Secretary of Agriculture

/Drought Policy

Distributed to: Goal Team 1, Page 2, P's 2& 6 . Team 2, Page 3 P, Team 3, Page 2 P 1 & Page 3, P 2. Team 4, Page 3, P 3, Team 5, Page 2, P 5 & Page 3, P 4 for analysis,
In reviewing your drought report, the USDA Natural Resources Conservation Service SNOTEL Data Collection Network in only briefly mentioned, and is not mentioned under the recommendations to "provide an adequate annual budget to support continuation and improvement of their drought related work". Many of the agencies mentioned use SNOTEL data and our water supply forecasts and products for their weather forecasting, reservoir operations, etc.

Snowpack is the primary element for predicting droughts in the West. The NRCS SNOTEL Network and Water Supply Forecasting Program allows us to accurately predict summer streamflows (water supplies) 4-6 months in advance. We are in the process of installing 5 new SNOTEL this summer for early flood warning and forecasting water supply conditions (droughts). The 20+ years of experience in collecting SNOTEL data has allowed us the capability to do this efficiently. The knowledge and experience gained by this program could also be expanded elsewhere in the country, as you mention under the SCAN Network.

We continue to develop new products to mitigate drought effects here in Idaho:
- During the El Nino year of 1998, because of the strong correlation with the Southern Oscillation Index (ENSO), we published streamflow forecasts for certain rivers in November for the following summer runoff season.

- The report mentions the Palmer Drought Index, however, due to the importance of snowpack and reservoirs in the irrigated West, we developed a better measure, the Surface Water Supply Index (SWSI), which combines reservoir storage and streamflow runoff. Here in Idaho, we have met with our local users (irrigation districts, USBR, etc.) and determined the threshold level when shortages for irrigated agricultural water supplies will occur. This index is also used as drought trigger mechanism in some states. Here is a link on our Web page for more information about this index:
  http://idsnow.id.nrcs.usda.gov/snow/water.htm

Bank loan officers are requesting this SWSI information prior to approval of loans to farmers when water supplies are marginal or shortages may occur. Similar type of index and supply/demand scale could possibly be expanded to non-irrigated lands elsewhere in the country using soil moisture as a variable.
Your report also discusses public education and information and the need for readily and easily available information for users. We have struggled with this in the past as well. Some success stories follows:

- Near real time SNOTEL data is available in easily understood format with comparisons to 30 year averages. Link to today's SNOTEL Update report: http://idsnow.id.nrcs.usda.gov/snow/snotel/update.htm

- News media interviews - since Jan. 1, 2000, I have provided about 30 TV, radio and newspaper interviews about drought, lack of snowpack and water supply information in Idaho. SNOTEL data and water supply is carried daily or weekly in newspapers throughout Idaho to keep our users aware of current and changing snowpack/water supply conditions (drought). We are careful how we mention the word "Drought" because of the major effects it can have on farmers, ranchers, rafting, hydropower, forest fires, etc.

The information provided by the NRCS SNOTEL and Water Supply Forecasting program is used to reduce the vulnerability to droughts and for better management of our water resource. If this information were not available, the effects of droughts in the West would be much more severe. These data and products provides farmers, recreationists, and other water users throughout the state with accurate water supply information and lead-time to plan accordingly: planting fewer acres, planting crops that require less water, forest fire potential, length of river rafting season, etc. This type of analysis and correlations should be expanded here in the West as well as elsewhere in the country.

Also, have you considered a national committee/policy of such to look at both sides of the coin, floods and droughts? Some of the analysis and programs as mentioned in the report could be used to mitigate effects from both events.

Ron

Ron Abramovich
Water Supply Specialist
Phone: (208)378-5741, ext. 2 Fax: (208)378-5735
http://idsnow.id.nrcs.usda.gov

Distributed to: Goal Team 2 for analysis, DATE: 3-31-00

34. Received March 30,00
March 30, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO - Mail Stop 0501
1400 Independence Ave., SW
Washington, DC 20250-0501

Dear Ms. Dittus,

I am pleased to provide the following material in response to the National Drought Policy Commission (NDPC) report - "Preparing for Drought in the New Millennium." The National Water and Climate Center feels that the NDPC report provides an excellent assessment of the pervasive effects of drought on the United States. Drought, and the importance of water, have been an integral part the economic viability of this country since the turn of the 20th century. For over 65 years, the USDA's Natural Resources Conservation Service, Snow Survey and Water Supply Forecast (SS/WSF) Program has played a key role in assessing water supply and drought throughout the West. We hope the comments provided strengthen your report and provide the citizens of the U.S. with information needed to mitigate the effects of drought. Suggested wording is shown in bold italics.

Specific Comments By Section:

Localities - Page 16, Paragraphs 1 and 2
As noted in the report, the current weather and climate networks do not systematically collect and distribute the data necessary to assess drought for specific areas nationwide. It is suggested that additional emphasis be placed on establishing and maintaining a data collection and distribution network which provides local users access to weather and climate information required to assess the many facets of drought.

Tribes - Page 18, Paragraphs 1, 2 and 3
It should be noted that the NRCS has established a long-term presence on Tribal lands to address a wide variety of natural resource management issues. Each NRCS office has SS/WSF personnel who work closely with Tribal representatives to establish data collection sites, data collection procedures and methods to interpret NRCS Water Supply Forecasts. Training of Tribal personnel is a critical component of this process. In recent years, reduced funding has limited the effectiveness of this program. No specific wording is provided here, however this may be useful as this activity evolves.

Federal Programs - Page 19, Paragraph 3
It is suggested that a portion of the following information be integrated with the third paragraph on page 19 of the NDPC Report. In 1935 Congress authorized the USDA’s Snow Survey and Water Supply Forecast Program (SS/WSF) through Public Law 46. The program provides agricultural water users and other water management groups in the western states area with water supply forecasts to enable them to plan for efficient water management. The program also
provides the public and the scientific community with a database that can be used to accurately determine the extent of the snow resource for 12 western states and Alaska. The SS/WSF program collects and interprets data as a service and an aid to agricultural interests, particularly those served by, or affiliated with, soil, water, and other conservation districts. Information collected by the NRCS for these agricultural users is also made available to other Federal, State, and private agencies and to the general public without charge.

Mitigation - Page 20, Paragraph 5
The following sentence is suggested at the end of paragraph 5:
. . . The annual appropriation is $100 million. The Snow Survey and Water Supply Forecasting Program of the USDA has provided key snowpack data for the arid Western U.S. where snowpack scarcity translates directly into low streamflows, dry soils and drought. Approximately $6,000,000 of federal funding supports this private, state and federal cooperative effort which has been operational since 1935.

Monitoring/prediction and operational products, Page 36, Section 2.1
Based upon the high quality information provided by the NRCS SNOTEL network during the past 20 years, it is suggested that the SNOTEL network be included in the following recommendation.

"We recommend that Congress authorize and the Administration develop and implement a plan to coordinate in cooperation with states and expand, modernize, and maintain a system of coordinated observation (U.S. Geological Survey streamgaging, SNOTEL, SCAN, COOP) networks (based on the National Drought Council's study described above) that meets the needs of all stakeholders, with priority given to filling the gaps on tribal lands and in rural America."

Monitoring/prediction and operational products, Page 36, Section 2.2(b)
We endorse the concept of a Unified Climate Access Network (UCAN) to serve the drought user community. The NRCS National Water and Climate Center has had measurable success working with the NOAA National Climate Data Center and six Regional Climate Centers in developing the Internet infrastructure necessary to deliver climate data and information to any user with an Internet connection. Once implemented, the UCAN concepts have application in delivery of streamflow information through a Unified Water Access Network (UWAN).

Research, Page 37, Section 2.8
Based on the SS/WSF 65 year history in the area of data collection and water supply forecast innovation and product development, it is suggested that the USDA/NRCS be included in the recommendation for an adequate annual budget to support continuation and improvement in drought related activities.

"In recognition of the products and resources of the National Drought Mitigation Center, National Science Foundation, U.S. Geological Survey, National Oceanic and Atmospheric Administration, Natural Resources Conservation Service, Agricultural Research Service, U.S. Forest Service, Bureau of Reclamation, and Department of Energy, we recommend that Congress provide an adequate annual budget to support continuation and improvement of their drought related work."
Summary:

We appreciate this opportunity to comment on the NDPC draft report. The NWCC staff is available to answer any questions you may have by calling 503-414-3107 or visiting our Center's homepage located at http://www.wcc.nrcs.usda.gov.

Sincerely,

JON G. WERNER
Director, National Water and Climate Center

cc:
Richard Van Klaveren, Director, Conservation Engineering Division, NRCS, Washington, DC
Don Woodward, National Hydrologist, CED, NRCS, Washington, DC
Warren Lee, Acting Director, Resources Inventory Division, NRCS Beltsville, MD
Dan Conrad, Team Leader, Operations Management & Oversight Div., NRCS, Washington, DC

Distributed to: Goal Team 2 for analysis, DATE: 3-31-00

35. Received 3-31-00

Subject: LTP – Special Program, Draft Drought Policy Date: March 29, 2000

To: Leona Dittus, Executive Director
    National Drought Policy Commission
    USDA
    1400 Independence Avenue S.W.
    Washington, DC 20250-0501

File Code: 300-15

We have reviewed the Draft Report from the National Drought Policy Commission. The report is comprehensive and addresses many aspects of drought including awareness, planning, and response.

We offer the following comments in the development of National Policy:

General – Available Assistance

The draft report presents a rather hard-to-follow format listing numerous laws, legislation, programs, etc. A change in format or organization should help in this area. The various agencies
need to be separated in order to better define specific areas of responsibility. A chart or table might help in this regard.

Specific – NRCS Program Assistance

NRCS utilizes the 1996 Farm Bill Programs for drought relief assistance where possible. Some examples of the program assistance are:

- **Environmental Quality Incentive Program (EQIP)** – NRCS technical staff work with producers to modify contracts where necessary to reschedule practices.

- **Conservation Reserve Program (CRP)** – When emergency haying or grazing is approved for CRP land, NRCS technical staff can work with producers to develop haying or grazing plans in approved counties.

- **Food Security Act** – NRCS State Conservationist can grant variances to conservation compliance plans or can revise plans with producers to include cover crops to reduce the effects of wind and water erosion.

- **Emergency Conservation Program (ECP)** – NRCS provides technical assistance to producers for practice implementation including emergency livestock pipeline, watering facilities, and silt removal from existing ponds.

- **Emergency Forestry Incentive Program (FIP)** – From drought of prior years, NRCS made available funds in emergency cost share for replanting trees lost due to dry conditions.

General – Technical Assistance

The draft identifies that preparedness is the key element to reduce the impact of drought. In agriculture this relates to the need for technical, educational, and financial assistance. Most USDA conservation programs are designed to protect natural resources. Planning and installation of conservation measures are needed to have the tools and infrastructure o-farm needed to address those times when drought occurs.

Equally important is the operation maintenance and implementation of management measures. This can only occur when individual landusers are well informed and can take actions in response to drought conditions. Technical assistance programs need to be the cornerstone of any drought program.

Specific – Ongoing Technical Assistance

The primary NRCS role during droughts is technical assistance and information to landowners and managers. NRCS also provides various scenarios to better manage for risk during periods of adversity. Most of the NRCS assistance falls in the following categories:
• Working with farmers on improving irrigation systems to conserve and better manage the available irrigation water. Some farmers have a need for retrofitting their irrigation systems.

• Encouraging farmers to practice crop residue management to reduce soil temperature, increase water infiltration, and help reduce the potential for wind erosion.

• Working with ranchers to assess and manage grazing and water resources. A common assistance is designing water lines for better water distribution to more completely utilize available forage or replace water sources that have been depleted.

• Encouraging ranchers to practice risk management and reduce herd size before the drought forces a mass sell off.

• Cautioning absentee owners to check water supplies to ensure adequate drinking water for herds.

• Distributing information on drought management alternatives.

• Monitoring dry hydrants in rural areas and, where necessary, locate other sources of water for fire control. In addition, landowners should give fire and police access to land in case of emergencies. Landowners should be encouraged to install adequate fireguards and fire breaks, especially along public roads.

General – Research and Modeling

The draft also recommends an increase in research efforts to more adequately predict drought. Along with this is the need for additional tools in modeling which, when drought is predicted, can provide those alternatives that would have the least economic and social impacts. Users could then make decisions that would provide for the continued protection of natural resources.

Specific – Better Predictive Tool

Everyone – farmers/ranchers, agency staff, local water supply managers and others – need some type of early warning predictive tool that will give some indication of the future drought potential and impacts on resources under different scenarios. The predictive tool would need to use local rainfall and resource characteristics such as soils, vegetation. This predictive tool should be available to farmers and ranchers to provide additional information in their farm and ranch management decisions.

For example, consider a rancher with rangeland in poor condition. If the predictive tool could predict future forage production with normal rain or various levels of drought, this would give the rancher better insight on herd management. The rancher may further reduce the herd if cattle prices are favorable and predictions of poor future forage production.
NRCS is partnering with Texas A&M Experiment Station and others to develop a computer simulation model to make predictions of future drought conditions from local resource conditions and weather station data. The results would be on a web site and provide real time predictions.

NRCS is in the position to provide various scenarios to better natural resources in respect to forecasting risk. Producers will need to evaluate their water needs based on current rainfall and predicted needs. Prudent judgment is necessary to access markets and remain flexible.

**General – Emergency Relief**

The draft recognizes that even with drought planning, emergency relief will still be needed. This needed to be well coordinated and timely to be effective.

**Specific – Emergency Relief and Drought Management Philosophy**

Drought is a natural phenomenon, which can have disastrous result affecting natural resources, economics, animal well being, crop production, and the human condition. The results of which require both time and careful management to recover.

Droughts and dry times are a factor in most farming and ranching operations. Other than fire, a long-term drought is probably the most damaging element faced by producers. Drought not only affects the fundamental resources, but it has a demoralizing effect on those who work in agriculture. Further, the adversity is multiplied throughout the economic sector as the agricultural base continues to be impacted.

Landowners and operators need better tools in order to predict future management options in assessing drought impacts. Forecast models need to be developed which will allow producers to more accurately simulate various drought scenarios. This could be developed as an early warning system to aid in impact assessment. Producers could use this model to predict crop water needs, forage inventories, crop and animal prices, and other criteria. The overall goal would be to promote better management or resources while reducing economic adversity.

**Long and Near Term Environmental Impacts**

There is deep concern about the impact of another drought in 2000 and subsequent years. If drought conditions continue, dust storms from wind erosion will be a reality, affecting both rural and urban life. The conservation systems currently installed have been severely tested from the past droughts and another drought will make the land more susceptible to wind erosion. Many areas are already experiencing some dust in the air from wind erosion and dust storms in west Texas.

Additionally, poor cover on the land will ultimately affect the quality of runoff entering the receiving streams and drinking water supplies even in areas not directly affected by drought. Certain parts of the nation could face a siltation and sedimentation crisis in some reservoirs. It is
vitally important the vegetative cover be maintained on all watersheds, but imperative on those impacting drinking water.

Farmers and ranchers should be encouraged to keep as much cover on the land as possible at all time and seasons of the year.

One final point to consider. Both research and experience has demonstrated that manipulation or management of certain species of noxious brush and weeds can free up significant amounts of water for other uses. In addition, reestablishment of native grasses will increase water yield. This concept has broad offsite benefits to water supplies and watershed yields.

Thank you for the opportunity to comment on the Draft Policy.

/s/

JOHN P. BURT
State Conservationist

cc: Pearlie Reed, Chief, NRCS, Washington, DC
    Warren Lee, Director, RID, NRCS, Washington, DC
    Charles Adams, Acting Regional Conservationist, South Central Region, Fort Worth, TX

Distributed to: Goal Teams 1, 2, 4 for analysis, DATE: 4-3-00

36. Received 3-31-00

To: Leona Dittus

From: Kimberly Miller

Date: March 31, 2000

Re: OMB comments on NDPC report

P.5, fourth bullet
Adverse impacts from drought also occur in natural, undeveloped or unimproved areas and should be included.
“....harm to livestock, or wildlife, or natural habitats....”
P. 7, first paragraph, first sentence
The report advocates a “broader application of new techniques” but doesn’t give any examples of what these new techniques might be.

P. 7, second bullet in second set
The report states that less than 10 percent of farmers and ranchers receive technical assistance related to water conservation or drought. This sounds unrealistically low, given that a significant percentage of farmers irrigate and likely receive some technical assistance from USDA in implementing their irrigation plan and system. We hope that USDA provides water conservation assistance in conjunction with any irrigation assistance.

P. 11, first paragraph, second sentence
“....the Department of Agriculture and farmers through Cooperative Extension offices, Farm USDA Service Centers, and....”

P. 12, fourth paragraph, first sentence
It seems it would be quite useful to describe some of the basic, inexpensive elements of drought planning the researcher discussed.

P. 13, second paragraph
The report says that there are 560 federally recognized tribes and then references 306 in the conterminous 48 states

P. 13, sixth paragraph
On page 13, paragraph 6, delete "and described the bureaucratic quagmire associated with the Bureau of Indian Affairs". This view may be held only by seven referenced tribes in one region. BIA has ongoing programs that assist tribes with Integrated Resource Management Planning and with Water Management, Planning and Pre-development that support analyses of water quantity, water quality, and resource conditions. Also, BIA's Irrigation operations and maintenance program supports 16 Indian irrigation systems, including water storage and delivery.

P. 13, last paragraph, second sentence
The report falsely states that information such as soils surveys and stream gaging is needed to gain access to Federal assistance.

OMB sent a FAX this morning with another comment that Kimberly Miller forgot to include in her Mar 31 e-mail. It is summarized below in the same format she used before. Please include with the rest of OMB's comments.

P. 15, third paragraph, first sentence.
Add an "er" to hind to make it "hinder"

P. 15, third paragraph, second sentence.

60
The major gap already identified in the Bureau of Reclamation's Drought Program is that the requests for planning assistance far outweigh available funds and that the law does not allow the Bureau to provide financial assistance to the requesting entities. Change the sentence to read: "For the Bureau of Reclamation's Drought Program, requests for planning assistance far outweigh available funds and the program provides technical assistance only, not direct grants.

P. 15, third paragraph, fourth sentence
Delete the first part of the sentence which states that USDA’s “local and tribal offices reach just a small number of the people needing and requesting assistance because of limited resources....” There are over 5600 USDA county offices with over 35,000 employees, who provide assistance to over a million people annually.

P. 17, first paragraph
CRP should not be included as a drought-related program. Emergency haying and grazing (assuming that’s why CRP was included) is not the primary purpose of the program.

P. 18, first paragraph, second sentence
It would be helpful to mention the agencies involved in the Federal interagency drought effort.

P. 20, first paragraph, last sentence.
Delete. This is unjustified and unbalanced. If it’s “too little” the farmer should have bought higher coverage. Crop insurance payments are not tardy and are normally distributed within 30 days of the farmer filing a notice of loss.

P. 20, second bullet
Delete. This offers no valuable guidance and is nothing but a request for higher premium subsidies.

P. 20, third bullet
Delete. This offers no understanding of insurance unless the “payments” refer to premiums paid by the farmer, reduced for greater use of risk management tools.

P. 21, first paragraph, sixth sentence
Describe the undesirable effects associated with reservoir expansion.

P. 22, first sentence
Funding for the Emergency Conservation Program and the Emergency Watershed Protection Program are dependent upon emergency supplemental appropriations. Change the sentence to read: “Additional emergency relief is often provided through emergency supplemental appropriations.”

P. 23, second paragraph
The Stafford Act and its implementation by the Federal Emergency Management Agency (FEMA) is an effective, proven model for organizing and providing emergency assistance during most catastrophic natural disasters. One of the factors that makes this program successful is that FEMA can draw monies from a standing fund to pay for disaster assistance. [I'm not sure what is meant by "standing fund." FEMA does not draw funds from a standing fund. Rather, FEMA must estimate in advance its disaster needs and seek an annual discretionary appropriation from the Congress.] FEMA can provide disaster unemployment assistance, truck in water, and ......

P. 25, first paragraph, fifth sentence
After “prosper” add “further altering the natural balance of the ecosystem.”

P. 26, Wildfire Section
The report doesn’t distinguish between normal wildfires, which are a natural part of many ecosystems, and so-called drought-related wildfires. Unless that is possible to do, this section shouldn’t be included in the report.

P. 27, second paragraph, first sentence.
Resource Conservation and Development Councils are independent, nonprofit organizations and not part of USDA.

P. 33
Insert: 1.6 Federal land management agencies should include drought contingency elements in their land management plans.

P. 34, 2.2
Instead of setting up new clearinghouses and information systems, the government should use already-established organizations such as the National Drought Mitigation Center and the United Climate Access Network.

pg. 37, 3.4
Congress should authorize a standing fund similar to that available under the Stafford Act to consider providing resources for non-farm drought emergencies that affect tribes, communities, businesses, and the environment, but that does not duplicate Stafford Act authority. [I am concerned that this concept of a "standing fund" is not entirely understood by the report drafters. And if it is, then they may be misunderstanding the basis for FEMA's disaster funding. The Stafford Act authorities require appropriations to fund disaster relief. There is no "standing fund" of resources that can be drawn on to fund disaster relief except monies that are made available by appropriation.]

P. 37, 4.1
Delete. No offsets are mentioned for this proposal. Also, the integrity of the programs would be compromised by an indefinite authorization for funding, as opposed to the current situation where funding is appropriated only when emergencies are identified.

P. 38, 5.1, fourth sentence
Why should the Council be exempt from FACA? The reasoning should be included.
Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus:

On behalf of the Western Governors’ Association, I would like to commend the National Drought Policy Commission for its draft report, *Preparing for Drought in the New Millennium.* I am a Commissioner on the Texas Natural Resource Conservation Commission, and was designated by Governor Cayetano, the WGA Chairman, to represent the Association on matters before the National Drought Policy Commission.

Through this report and its recommendations, we believe the Commission would successfully fulfill its mission of presenting Congress with an effective new vision for a national drought policy. If enacted, it would go a long way toward improving drought management in the United States.

The report includes a number of important recommendations, including funding for streamgaging and other monitoring programs, an appropriately strong focus on preparedness and mitigation, and many significant proposed changes to response programs including a dedicated emergency fund for drought. Additionally, we agree with the collaborative approach envisioned with the proposed National Drought Council, and believe it could be an appropriate entity to take on the complex public policy challenges associated with drought.

We believe the report might be improved in a few areas, and offer the following specific comments for your consideration:

On pages 6-7 under the heading “Stored Water” and ‘Natural Water’ Droughts,” the report discusses differences between stored water systems and natural water systems. The discussion
neglects to take into account that the allocation of water lies within the jurisdiction of the states. Further, given state water law, the bullets are misleading or erroneous. We recommend:

a. In the third paragraph, amending the first sentence to read, “Those who share stored water are rarely not affected as greatly by less than normal precipitation...”
b. Delete the five bullets.
c. Add new language at the end of the first paragraph on page 7 after the sentence, “In addition, concern for protection of environmental resources must be considered.” The new language would read: “The allocation of water is the primary responsibility of states, and the Commission does not intend for any of its recommendations to diminish the right of states to control water through state law.” This language is consistent with the directive to the NDPC on this matter contained in the National Drought Policy Act.

1. On page 10 under the heading “Regional Entities,” the report briefly mentions the work of the Western Drought Coordination Council (WDCC). The report refers to the WDCC in a few other areas, and justifies some of its recommendations based on the WDCC’s report, The Western Drought Experience. The National Drought Policy Act specifically directed the Commission to collaborate with the WDCC in order to consider regional drought initiatives and the application of such initiatives at the national level. We believe it would be relevant and appropriate to provide further discussion of the WDCC in the NDPC report, including the WDCC’s goals and objectives, the membership of the Council, and mention of The Western Drought Experience–the report drafted and approved specifically for the NDPC. Additionally, we would like to see the Commission encourage Congress to consider the WDCC’s report and the consensus recommendations for future actions it contains.

1. Additionally, we recommend that the ‘Regional Entities’ section of the report mention the 1996 WGA report, Drought Response Action Plan, which includes a number of recommendations on national drought policy (including one that led to the creation of the National Drought Policy Commission).

1. On page 21, under the heading “Response,” the second paragraph states, “Approximately 47 federal programs have an element of drought-related response, primarily for agricultural droughts.” We recommend adding language following that sentence as follows: “This number, however, is deceiving as many programs are authorized but not funded. Other programs are not easily accessible due to overly-burdensome and bureaucratic eligibility criteria.” We further believe that the Commission should include a specific recommendation (probably under recommendation 4 on page 37) for Congress to review each authorized federal program, including their eligibility criteria and regulations, and make a determination to either continue or eliminate the program. For programs continued, funding should be made available, and the eligibility criteria made fair and easily understood.

1. At the bottom of page 25 and the top of page 26, the report refers to the Western Water Policy Review Advisory Commission. This report was very controversial, and was
strongly opposed by many organizations and entities including a number of western states. We agree with the point of the discussion in the Commission report, namely to support collaborative processes with broad stakeholder group involvement. To add balance and diminish the controversial nature of the WWPRAC, we suggest specifically referencing the ‘Enlibra Principles’ as a model which has been advanced by the western governors to encourage and facilitate broad collaboration on natural resource matters.

On page 30 under “Findings,” the last finding should be amended to read, “Some federal drought-related programs are neither authorized nor funded at the level needed to deliver effective services. Furthermore, their eligibility criteria and cost-sharing requirements may unduly restrict participation, by tribes, farmers and ranchers, and others with limited resources.” This change clarifies that the eligibility criteria are not only restrictive to those ‘with limited resources,’ but are in some cases restrictive to state and local governments as well.

Recommendation 2.2 on page 34 calls on Congress to establish a clearinghouse, “such as the National Drought Mitigation Center...” and under recommendation 2.8 on page 35 asks for an adequate annual budget for the NDMC (along with funding for federal programs). The governors recognize the important work of the NDMC and support their continued funding. Additionally, the governors strongly believe that the NDMC is a model that should be replicated in other universities and research institutions across the country to build more local and regional understanding and capacity with regard to drought. The Commission should therefore recommend that Congress build that regional capacity and drought expertise through funding multiple research institutions and universities in various areas of the country. (This change of focus is supported in the body of the Commission report in the third paragraph on page 18.)

Recommendation 4 on page 37 is entitled, “Maintain a safety net of emergency relief that rewards stewardship of natural resources and self help.” This wording has two potential interpretations that could be problematic: 1) it could imply that the current safety net of emergency relief already rewards stewardship and that should be maintained; and 2) that the Commission is recommending that emergency relief only reward stewardship. To clarify the meaning and to bring in the concept of transitioning to incentive-based response, we suggest the following: “Maintain a safety net of emergency relief, but provide a transition to programs that provide incentives for that reward stewardship of natural resources and self help.”

Recommendation 5 proposes creation of the ‘National Drought Council.’ We support this concept, with a few modifications, and would suggest that the Commission report mention the WDCC as a model. The WDCC report’s first two recommendations support this concept.

We object to the language on page 38 under 5.1, “In the interim, we recommend that the President immediately establish a federal agency coordinating group, chaired by the Secretary of Agriculture, to begin appropriate implementation of the recommendations of this report.” An interim group should not exclude non-federal representatives. If FACA
is the concern, non-federal governmental organizations should be included. The Memorandum of Understanding that led to creation of the WDCC is the model of how this can be accomplished. Since that MOU is still active, perhaps all that is needed is to expand the signatories on that MOU. Additionally, the interim group should have co-chairs, one representing federal agencies and the other representing non-federal entities. Again, we would point out the successful experience with the WDCC using this structure.

1. Recommendation 5.2 on page 39 should be amended to read: “We recommend that the Council be co-chaired by the Secretary of Agriculture representing federal agencies, and by a non-federal member elected by the non-federal members on the Council to represent the non-federal interests. The Co-Chairs will report to Congress and the President annually on the activities and recommendations of the National Drought Council.”

If you have any questions regarding these comments, please contact me at 512-239-5500 or Shaun McGrath of the Western Governors’ Association at 303-623-9378. Again, we commend the Commission for your effort in producing a report that we believe will go a long way in serving as both impetus and guide toward development of an improved national drought policy.

Thank you for this opportunity to provide you comments on the National Drought Policy Commission’s draft report.

Sincerely,

John M. Baker, Jr.
Texas Natural Resource Conservation Commission
Lead WGA Representative to the NDPC

cc: Governor Ben Cayetano, WGA Chairman
    WGA Governors
    Governor Roy Barnes
    Senator Pete Domenici
    Representative Joe Skeen

Distributed to: Goal Teams 4, 5 for analysis, DATE: 3-31-00
Flagged for: All, Deanne

38. Received March 31,00

Ms. Dittus:

My name is Russell Vose, and I am the Arizona State Climatologist. I am writing to echo the Tony Haffer's comments on Recommendation 2.2 in the
Tony makes the point -- and I believe rightfully so -- that it is imperative to recognize the importance of regional climate information networks in the assessment of drought impacts. It's not that I disagree with the notion of monitoring these problems from a national scale and using a nationally managed network. Rather, I believe it's important to also incorporate information from the numerous weather networks that are well managed and maintained, but not necessarily by the federal government. These networks can provide considerably greater detail in a spatial and temporal sense, and thereby give decisionmakers even more accurate information. For example, the state of Arizona has approximately 400 observing stations operated by federal agencies. But there are probably at least another 800 in the state that are maintained by state, county, and local agencies. In a state such as Arizona, where both temperature and rainfall can vary dramatically over short distances, these additional stations really clarify the picture.

Thanks for the opportunity to provide input on the report.

Russell S. Vose
Office of Climatology
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Box 871508
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Distributed to: Goal Team 2 for analysis, DATE: 4-3-00

39. Received March 31, 00

San Diego County Water Authority Comments on Draft Report of the National Drought Policy Commission
March 30, 2000

Thank you for the opportunity to comment on the Draft Report of the National Drought Policy Commission (Commission). At the December 1, 1999 public hearing in Los Angeles, the San Diego County Water Authority (Authority) submitted a written statement to the Commission containing recommendations as to the Federal role with respect to drought preparedness and response. After review of the March 8, 2000 draft report of the Commission, the Authority provides the following additional comment related to a section in the report on international drought-related issues and specifically the description of the emergency connection between the United States and Mexico:
Comment: Revise section “Need to Address International Drought-Related Issues” to more accurately describe the emergency connection between the United States and Mexico located in the San Diego-Tijuana region.

In the discussion on international drought-related issues, it is important to mention the emergency connection between the United States and Mexico, but we suggest that the description be revised due to inaccuracies.

It is mentioned that the Cities of San Diego and Tijuana developed the connection – it was the Mexican and US Sections of the IBWC, as the lead binational agency, who developed the emergency connection. USIBWC worked closely with the Authority, as facilitator of the effort for the US agencies involved (US Bureau of Reclamation, Metropolitan Water District, Authority, City of San Diego and Otay Water District). It is actually the water systems of the Otay Water District and Tijuana that are connected. In addition, emergency water can only be delivered from the US to Mexico. The following is a brief description/history regarding development of the connection:

**Emergency Deliveries of Colorado River Waters for Use in Tijuana**

The emergency water supply connection between the United States and Mexico was built in 1972 to allow Mexico to “wheel” their Colorado River treaty water through the United States to Tijuana in an emergency situation. Tijuana was facing drought conditions in the Tijuana River watershed and required emergency deliveries to avoid a serious shortage of water. The connection was utilized for 11 years, prior to completion of the Acueducto Río Colorado–Tijuana in 1983. IBWC Minute Number 240 established the original conditions upon which the deliveries could be made and identifies the annual volumes of emergency deliveries to be approximately 14,500 acre-feet. Deliveries through the connection also occurred for short durations in the early 1990’s. The water is transported from the Colorado River to Tijuana through the Metropolitan Water District Aqueduct and then the distribution systems’ of the San Diego County Water Authority and Otay Water District. The connection at the border was built by the United States and paid for by the Mexican government. The San Diego County Water Authority facilitated the effort for the United States agencies.

Representatives from both countries are now working together to make necessary modifications at the connection to maximize deliveries to Tijuana in a drought or other water emergency. Modifications have been identified on both sides of the border and the Mexican government is now working to identify the funding source for these improvements. This is an excellent example of the two countries working together in a pro-active manner to ensure water supply reliability.
It should also be noted that, the State of Baja California, not the City of Tijuana, is currently responsible for maintaining the distribution and treatment system for the City of Tijuana. The Comisión Nacional del Agua controls all water resources for the Republic of Mexico.

Thank you again for the opportunity to comment on the draft report. Please contact Dana L. Friehauf, Senior Water Resources Specialist, at 619-682-4172 if you have any questions regarding the Authority’s comments.

Distributed to: Goal Team 2 & 5 for analysis, DATE: 4-3-00
Flagged for Deanne, Diana M., & Roseann

40. Received March 31, 00

Comments from Jerry Alanko FSA 202-690-1003

General Comment:

As part of a larger natural disaster outlay report, the Draft Report should address the need to monitor and annually compile drought related expenditures; by program, region, and crop. Historic information would be useful in projecting costs and budgeting for future disaster assistance.

Comments by program area, page and paragraph reference. (Revise as indicated by red-line and strike-out)

Noninsured Crop Disaster Program

Page 12 Bullet 3

“Federal Crop insurance covers only the “primary” crops grown and does not. The Noninsured Crop Disaster Assistance Program extends to other crops and crop policy exclusions although no standing programs provide assistance to livestock producers.”

Page 23 Risk Management. Second paragraph

“Federal crop insurance covers all major crops in nearly all locations. but does not The Noninsured Crop Disaster Assistance Program extends to all vegetable and other crops n all locations not does it but does not cover livestock.”

Page 37 “Develop and advocate comprehensive risk-management strategies into drought preparedness”
“There is no similar program for others who are at particular risk from drought.”

State and county emergency boards and ECP

“Risk Management” “Response”

P 25
“A similar structure exists…” “When a state governor or tribe gets a request…” “The Secretary sends the request…” “From there, it goes back to the State Emergency Board…”

During the 1999 drought in the mid-Atlantic and southeaster states, the Department of Agriculture under the secretarial disaster designation could only provide assistance through the Emergency Conservation Program and under the secretarial disaster designation process loan applications pending congressional appropriations. (NOTE: ECP not triggered by Secretarial designation)

Page 26

“The 1996 Flood Control Act…” “The preferred approach in providing such surplus water is for a state or subdivision of a state to enter into a contract.”

QUESTION: Can tribes enter into a contract?

Recommendations

2. “Forge closer ties among scientists, economists and managers so that historic drought costs can be utilized in future budget projections and scientists…”

Page 38 Non-agricultural emergency response, 4.4

COMMENT
Consideration should be given to amending the Stafford Act to:
1. allow assistance to agricultural enterprises basis for agricultural response in Federal Response Plan

Distributed to: Goal Team 2,3 and 4 for analysis, DATE: 4-3-00

41. Received March 31, 00

The following comment regarding the National Drought Policy Commission's draft report was received, by telephone, by Leona Dittus, on Friday, March 31, 2000, at 3:00 p.m.

Lawrence J. Charanza
Comments focused on drought programs administered by the Farm Service Agency. Publicity makes it appear, to the general public, like farmers are getting all kinds of help when in fact they aren't. Farmers really do not want a hand out and he would prefer that farmers get help to prepare for disasters and are then required to stand on their own when a disaster occurs.

He is a farmer/rancher in two counties in Texas. Current disaster assistance programs such as the Livestock Assistance Program (LAP) and the Non-insured Crop Disaster Assistance Program (NAP) take way to long to get the money out to producers and then it is not anywhere near what the farmer lost. For example, on his two farms, he received only $698 under LAP but felt he should have received about $6,000. For hay loss on one of this farms in 1999, he just recently received $2028 but felt he should have received about $12,000. The yield used to compute the payment was only 1 ton per acre which he felt was way to low. He has not received his 1999 NAP payment for the other farm yet. Farmers need money quicker so they can pay for seeding costs.

Mr. Charanza feels Congress should provide more dollars for these assistance programs as it appears they have plenty of money for everything else.

**Distributed to: Goal Team 3 & 4 for analysis, DATE: 4-3-00**

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42. Received 3-31-00

"LYLE BENNETT" <LBENNETT@mail.dep.state.wv.us>

I would like to make the following observations and suggestions:

1. Stream flow and groundwater level data is essential in tracking the onset of drought conditions. The USGS operates and maintains a nationwide system of flow gaging stations. Funding at the 100% level should be provided to USGS to keep their gaging stations in operation.

2. In West Virginia, the state National Guard provides a great service to drought stricken communities. They should be included in drought management policy decisions.

3. As the United States population continues to expand so do the demands on the limited water resources available. We should recognize that future droughts of short duration may create a greater strain on water supplies than longer droughts did of the past. With the ever increasing consumption of water supplies, the use of predictive modeling within river basins might provide better drought preparedness.
4. I noticed that little attention was given to water quality issues. The impacts from industrial and municipal discharges during flows below the 7Q10 can have a devastating impact on the environment. Aquatic impacts, affects on water quality regulation and protection, and riparian rights all become issues that need coverage in a drought policy. I would encourage a stronger role for the Environmental Protection Agency and possibly the U. S. Fish and Wildlife Service on the National Drought Council, so that these concerns will be addressed.

5. If a National Drought Council becomes a reality, it should be given the authority necessary to carry out the requirements established through the National Drought Policy Act.

"LYLE BENNETT" LBENNETT@mail.dep.state.wv.us

Distributed to: Goal Team 2, 4 & 5 for analysis, DATE: 4-3-00

Flagged for EPA

43. Received March 31,00

NORTHERN CHEYENNE TRIBE
P.O. BOX 128
Lame Deer, Montana 59043

March 31, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave. SW, Stop 0501
Washington, DC 20250-0501

Dear Ms. Dittus:
The Northern Cheyenne Tribe is submitting the following comments and recommendations concerning the national drought policy.

1. Tribal governments need the authority to declare an emergency themselves. Example one part of the reservation may experience drought while the other part may be alright but because a reservation has multiple counties it will qualify because of 300,000 acre rule.

2. Reservations are sovereign nations and therefore need to have a government to government relationship with all federal agencies.

3. The Northern Cheyenne Tribe is requesting funding for training and technical assistance program funding to gather drought related information, devising strategies and developing local tribal solutions.

4. The Tribe needs soil data, range inventory data and stream-gaging for basic planning as well as drought planning.

5. Montana tribes contribute to Montana's economy. Twenty five percent (25%) of the cattle in Montana is owned by Indians yet the State does not consult with tribes on agricultural issues.

Sincerely,

Signed

Norma Gourneau, Vice-President
Northern Cheyenne Tribe

Distributed to: Goal Team 1, 2 & 4 for analysis, DATE: 4-3-00

44. Received 3-31-00

Good morning. My name is Thomas Gackstetter and I am employed by the Los Angeles Department of Water and Power (LADWP), the largest municipally-owned utility in the nation. In my capacity as the Water Conservation Coordinator, I was asked to provide testimony to the National Drought Policy Commission during the public hearing held last December in Los Angeles. It is in the context of that testimony that I offer the following comments on the Commission's draft report. The National Drought Policy Commission’s draft report, Preparing For Drought In The New Millennium, is very thorough and certainly reflects all of the hard work of the Commission’s members.
From the Los Angeles perspective, my comments center on conservation as a drought mitigation factor. As one of its conclusions, the draft report states "Mitigation activities such as water conservation, reuse of wastewater, pricing strategies, and the identification of back-up water supplies – can reduce vulnerability to drought events." This has certainly been the experience of the LADWP and I feel is an important point to make in a national drought policy. Sustained conservation in preparation for a drought rather than in response to the effects of one. This tenet is a main driver in LADWP’s conservation programs, and I believe in many other conservation programs in California as well.

However, that point is not well-reflected in the report’s first recommendation. Though it includes planning and implementation of mitigation measures (including the provision of incentives), the recommended planning concerns only how to respond to a drought rather than to include how to prepare for one. LADWP’s decade of conservation programs have helped to "drought proof" Los Angeles and comprise an important element of drought planning. Drought mitigation should include a recommendation of sustained conservation efforts. Federal financial incentives should be made available for not only drought planning but ongoing mitigation efforts as well.

Thank you for the opportunity to provide these comments. Please feel free to contact me directly if you have any questions.

Thomas Gackstetter
Water Conservation Coordinator
Los Angeles Department of Water and Power
Voice: 213 367-0936 Fax: 213 367-1055
Thomas.Gackstetter@water.ladwp.com

Distributed to: Goal Team 1 for analysis, DATE: 4-3-00
Flagged for Ane, Peter

45. received March 31, 00

<fmay@dps.state.ut.us>
(Fred May)

Leona,

Please include me in future e-mails <fmay@dps.state.ut.us>. I attended the WGA drought meetings in Albuquerque last week. I prepared a State Drought Mitigation Plan and a County Drought Mitigation Plan, which I presented at that meeting. Dr. Fred May, Utah Hazard Mitigation Planner, Utah Division of Comprehensive Emergency Management.

I have reviewed the Draft Report of the National Drought Policy Commission, on behalf of our agency, and feel quite comfortable with it. A few recommendations are:

p. 14, paragraph 1, line 2.

.....response rather than preparedness AND MITIGATION.
p. 14, paragraph 5 - Utah Discussion

Add - The Utah Division of Comprehensive Emergency Management emphasizes State and local drought mitigation planning and has completed a State Drought Mitigation Plan and, also, a county drought mitigation plan for its most drought-susceptible county, San Juan County, involving county-wide interviews, including Native American communities, resulting in about 70 recommendations that would result in drought resistance.

p. 18, paragraph 2.

Add - In Utah, the Navajo Nation has participated in the San Juan County Drought Mitigation Planning effort, including each Navajo Chapter.

P. 19, paragraph 2, line 6.

comprehensive plans. UTAH RECENTLY COMPLETED A STATE AND A COUNTY DROUGHT MITIGATION PLAN MADE POSSIBLE THROUGH PL102-250 FUNDING.

P. 21 - paragraph 5; end of paragraph.

technical publications." WE ALSO HEARD THAT THERE MAY BE UNCERTAINTY IN THE APPLICATION OF DROUGHT INDICES, SUCH AS THE PALMER DROUGHT SEVERITY INDEX, IN ROCKY MOUNTAIN AREAS. THERE NEEDS TO BE IMPROVED TECHNICAL GUIDANCE IN THE APPLICATION OF DROUGHT INDICES FOR PURPOSES OF DETERMINING DROUGHT HISTORIES, CYCLES, MONITORING, AND FORECASTING.

p. 23, paragraph, end of paragraph 6.

available to them. THERE IS A NEED TO EVALUATE CHANGING DROUGHT RISK, AS MORE AND MORE AGRICULTURAL LAND IS CONVERTED TO URBAN RESIDENTIAL USE. SOME COMMUNITIES THAT HAD MUCH AGRICULTURAL RISK IN RECENT YEARS, NOW HAS LESS AND WILL HAVE YET LESS AS TIME PASSES. YET, THIS CHANGE BRINGS ABOUT AN INCREASE IN RISK TO URBAN AND RESIDENTIAL AREAS.

p. 27 - Add a new title.

MEDIA AWARENESS

THERE IS A NEED TO EDUCATE THE MEDIA IN THE EARLIEST STAGES OF DROUGHT, AND AS TIME PASSES, SO THAT LOCAL ECONOMIES ARE NOT IMPACTED UNNECESSARILY DUE TO INACCURATE OR SENSATIONALIZED REPORTING THAT CAUSES POTENTIAL VISITORS TO THE AREA TO AVOID DROUGHT IMPACTED AREAS. FOR THE MOST PART, DROUGHT INITIALLY IMPACTS AGRICULTURAL ASSETS AND NOT THE STANDARD OF LIVING IN
COMMUNITIES. TOURISTS CAN BE INFLUENCED TO TRAVEL TO OTHER LOCATIONS, FURTHER IMPACTING THE ECONOMIES OF COMMUNITIES. THE MEDIA CAN BE PARTNERS IN OVERCOMING DROUGHT IMPACTS THROUGH PROPER EDUCATION AND AWARENESS. LOCAL GOVERNMENTS SHOULD HAVE ON HAND MEDIA AWARENESS PACKETS TO BE DISTRIBUTED FROM THE EARLIEST STAGES TO PRECLUDE SUCH UNNECESSARY PROBLEMS.

CONCLUSIONS:

- There is a need to identify changes in drought vulnerability as more agricultural land is converted to urban residential use. Some future drought vulnerabilities are being altered from agricultural to urban/residential.

- The media must be included as drought mitigation and response partners, using accurate reporting of drought vulnerability to reduce economic impacts on local governments.

- Native Americans should be included in State and local drought mitigation planning initiatives so that they can benefit from emphases developing within local governments and within their tribal governments.

Distributed to: Goal Teams 1, 2 & 3 for analysis, DATE: 4-3-00
National Drought Policy Commission
Section Two of Two

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March 31, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW., STOP 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus:

Attached are the American Water Works Association's formal comments on Preparing For Drought In The New Millennium. The broad scope of the National Drought Management Commission's composition, particularly the inclusion of individuals familiar with drinking water utilities, and the impacts of drought on the provision of potable water was critical to the development of sound recommendations by the Commission.

AWWA looks forward to continuing to work with the USDA and other federal programs in the near future as the Commission's recommendations are implemented, especially the timely initiation of the National Drought Council. It is very important to continue to build on the National Drought Management Commission's success and maintain a federal – non-federal stakeholder dialogue in the drought preparedness arena.

If you have any questions regarding AWWA's comments, please contact me or Steve Via at 202-628-8303.

Best regards,

[Signature]

Tom Curtis
Deputy Executive Director

TC/sv

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Headquarters Office:
6666 W. Quincy Avenue, Denver, CO 80235
(303) 794-7711 Fax (303) 795-1440
Formal Comments on
America’s Approach to Drought in the New Millennium
National Drought Policy Commission (NDPC)
February 3, 2000 Federal Register Page 5306

The American Water Works Association (AWWA) is an international, nonprofit, scientific and educational society dedicated to the improvement of drinking water quality and supply. Founded in 1881, the Association is the largest organization of water supply professionals in the world. Our 36,000 plus members represent the full spectrum of the drinking water community: treatment plant operators and managers, environmentalists, scientists, academicians, and others who hold an interest in water supply and public health. Our membership includes approximately 4,000 water systems that supply water to roughly 80 percent of the people in the nation.

AWWA is currently in the midst of formalizing the association’s policy on water resource management. A central tenant of that policy is that sound water resource planning and management must provide an adequate supply of high-quality water for people, while giving careful consideration to regional water resource conditions, environmental impacts, and project costs. Conservation of water by practicable means, reduction of pollution, effective water treatment including reuse are all viewed as key components of this policy position.

AWWA is vitally interested in sound water management at the local, state, and national level and strongly supported the National Drought Policy Act of 1998 establishing the National Drought Policy Commission (Commission) to develop a report on how to better coordinate Federal and State drought response. AWWA was gratified to see that once the Commission was formed, the process has been timely and that the Commission Report will go forward to Congress while management of the east coast drought of 1999 is still fresh in everyone’s collective consciousness.

The east coast drought of 1999 was a clear example that drought management is not just an issue in arid regions of America, but a resource management issue that can impact virtually every community in the nation. In its statement to this Commission on September 23, 1999, the American Water Works Association highlighted a number of the themes raised in the recommendations developed for the Commission’s review by the Commission’s Working Groups which are key to sound water management; AWWA would like to re-emphasize these themes:

- Priority focus on availability of adequate quantities of safe drinking water.
- Planning and preparation; sound proactive resource management for water quantity and quality.
- Sound emergency response systems to address the physical, social, and economic impacts of drought when available water supplies are inadequate.
- Inclusion of efficient water use as a key component of water resource management.
Water use education.

Optimizing existing management tools and programs at all levels of government.

Information exchange, so that communities, states and agencies just entering the water resource management arena can learn from the experiences of others.

These themes appear to be consistent with the NDPC draft vision statement and its underlying principles.

What type of information do you need for responding to the drought?
Accurate and reliable prediction of drought conditions, and dissemination of that information, has been sorely lacking over the years. Individual entities such as water utilities have generally been at the mercy of the State regulatory agencies, or left to their own devices to assimilate indicator information, analyze it, and predict the future. Historically, river flows have been the best source of information for predicting impending water shortages at the local level, but the U. S. Geologic Survey has apparently been forced to systematically reduce its network of river gaging stations for economic reasons, thus further impeding the ability of local water utilities to manage water resources proactively during drought conditions.

There has been no central source of reliable prediction of impending (short-term or long-term) drought conditions to our knowledge; if such information has existed, it has not been communicated to the impacted users on a reliable basis.

What needs do you or your organization presently have with respect to addressing drought conditions?
There seem to be large gaps at the federal level in the areas of drought prediction and notification. We would urge that expanded emphasis be placed at the federal level on drought preparedness and planning rather than, or perhaps in addition to, emergency response and disaster relief. This would require improved drought prediction capabilities and communication strategies.

What do you see as the Federal role with respect to drought preparedness? Should Federal emergency assistance be contingent on advance preparedness?
The Federal government has extensive information collection, aggregation, and dissemination capability. It should be an active leader in supporting drought research and technology transfer and informing and facilitating local, State and regional drought preparedness. Federal incentives to implement drought preparedness planning and impact-reduction activities offer a significant opportunity for long-term reductions in demand for drought emergency assistance. The NDMC's draft report offers some useful suggestions, including:

1. Enhance training, financial incentives, and technical assistance for incorporating drought considerations into farm and ranch, business, water supply and land-use plans and risk management.
2. Participation in cooperative partnerships with stakeholders to develop tools and strategies for more effective planning as well as for implementation of plans and impact-reduction measures.
3. Greater collaboration and coordination among federal agencies, universities, and private institutions that gather and analyze drought-related data.
4. Establish a point-of-contact for easier access to drought information and integrating drought monitoring, assessment, and prediction from a variety of sources.
5. Maintain, modernize, and expand climatological observation networks.

Are there any ways you feel that the Federal Government should better coordinate with State, regional, tribal, and local governments in mitigating or responding to droughts?
The NDMC draft report recognizes that while there is a wide array of federal programs focused on drought mitigation and response, identification of applicable programs and identifying the appropriate channels to reach federal resources is difficult. Integration of service would benefit State, regional, tribal, and local governments preparing and responding to droughts.

What lessons have you or your organization learned from past drought experiences that would be beneficial in the creation of a national drought policy?
As with most water quality and water quantity related issues, the initial focus of drought management efforts, and water use restrictions, often seems to be on public water systems. It should be understood that these systems often are not the largest consumer of water in a given watershed, and the Commission should ensure that all demands are considered in formulating policy or guidance for minimizing the effects of drought.

It should also be recognized that conservation practices in all sectors of the economy better prepare both urban and rural communities manage water more effectively and avoid the severity of some drought impacts. Drought response management should also balance the relative impacts of water use control strategies on communities / economic sectors that practice conservation and those that do not.

Summary
The NDPC has made excellent progress on a very complex issue in a very short timeframe. The NDPC wrestled with and identified a solid list of next step activities that will begin the process of building an effective, integrated federal presence in drought management. Inclusion of a diverse spectrum of stakeholders including, municipalities and drinking water suppliers, was an important component of the Commission's success, and should be a component of subsequent follow-through on the NDPC recommendations. While it is important that coordination continue to advance through improved federal coordination, it is equally if not more important that the National Drought Council be established as quickly as possible and represent the diverse range of stakeholders that were included in the National Drought Policy Commission process.
Ms. Leona Dittus, Executive Director  
National Drought Policy Commission  
USDA/FSA/AO  
1400 Independence Ave., SW  
Mail Stop 0501  
Washington, DC 20250-0501

Dear Ms. Dittus,

RE: “Preparing for Drought in the New Millennium”  
DRAFT Report of the National Drought Policy Commission

Thank you for the opportunity to comment on the DRAFT Report of the National Drought Policy Commission entitled “Preparing for Drought in the New Millennium.” The Hopi Tribe has been engaged in the preparation of a Drought Contingency Plan for the past two years. We believe that our experience provides us a strong foundation from which to make comments about this report.

Firstly, the Hopi Tribe commends the National Drought Policy Commission in emphasizing preparedness for drought, rather than focusing on drought recovery and compensation. As is rightly pointed out in this report, the costs of focusing on drought recovery and compensation are enormous, and do nothing to inoculate the affected entities against future losses. Preparedness for drought, while costly in the short run, should reduce losses from drought, thereby saving tax dollars.

The Hopi Tribe also commends you on having a Tribal representative participating in the development of this report. While we have never discussed these issues with Robert Miller, I am sure that given his position with the Intertribal Agriculture Council, he will have brought the Commission’s attention to the diversity of viewpoints amongst Tribes about drought, and Tribal needs related to drought preparedness. Certainly, the document reflects the cross-section of needs, beliefs, and effects of drought on Tribes. It is our hope that the National Drought Policy Commission will continue to actively seek Tribal input, and maintain Tribal representation on the Commission.
The Hopi Tribe also agrees with the Commission's recommendation to not consolidate all federal drought preparation and response programs into one federal agency. It has been our experience that the three agencies most concerned with drought: FEMA, Reclamation and Agriculture, have very different strategies and abilities with regard to this subject. (NOTE: The Hopi Tribe has Memorandums of Understanding with the Bureau of Reclamation, Natural Resources Conservation Service, and Federal Emergency Management Agency (FEMA).)

The Bureau of Reclamation, for example, has been an excellent partner on a government-to-government basis in the development of the Hopi Drought Contingency Plan.

The Department of Agriculture, through the Natural Resources Conservation Service, has been an excellent partner in working with individual producers, whether farmers or ranchers, in drought mitigation activities. Specifically, we are referring to the successful implementation of the Emergency Watershed Protection initiative in mid-1999 in two range units on the Hopi Reservation.

FEMA, on the other hand, appears to be better positioned to respond to emergency situations which are more sudden, i.e. flooding, tornadoes. Its ability to respond to a creeping disaster like drought is not as strong. We have observed that FEMA's regulations specify that their responsibility is to the States, and that Tribes are not directly specified. Other agencies have started interpreting the term "States" to mean "States and Tribes", in response to Executive Orders directing them to work more closely in a government-to-government relationship with Tribes. It does not appear that FEMA has taken this step, nor have we been notified of an Executive Order directing them to work more closely with Tribes. Therefore, the Hopi Tribe would suggest that either through a change in the authorizing regulations, or through Executive Order, FEMA be encouraged to work more closely with Tribes.

With regard to the specific goals to be accomplished by the recommended National Drought Council:

1. Incorporate planning, implementation of plans and mitigation measures, resource stewardship, environmental considerations, and public education as the key elements of effective national drought policy.

The Hopi Tribe fully supports this goal. It has been our experience in developing a Drought Contingency Plan for the Hopi Reservation, that in many cases, good resources management/stewardship is the key to effective drought preparedness. For example, if livestock are rotated on a regular basis, the vegetation will be better able to sustain itself, and withstand a period of intense drought. However, good livestock rotation depends on a variety of water sources to encourage the livestock to move away from watering holes. Having strong grass coverage and a good distribution of water provides a better environment for livestock and for wildlife, while reducing environmental degradation.
There are elements within the current drought legislative structure, however, that prevent good resources management/stewardship. For example, providing a better water distribution system can be funded under the Bureau of Reclamation's drought authority, as long as it is a temporary measure. Permanent infrastructure installations are not fundable under this mechanism. Frequently it is as expensive to put in place a temporary measure as a permanent measure. So to accomplish goal #1 of the National Drought Council, a change in the Reclamation Drought Authority, and perhaps other authorities, will be necessary.

2. **Forge closer ties among scientists and managers so that scientists understand which monitoring, research, data collection, modeling, and other scientific efforts are needed to reduce drought impacts and improve public understanding of those impacts.**

The Hopi Tribe would like to make two comments with regard to this goal:

a) Many Tribes do not have access to scientific data, and/or cannot afford the monitoring costs, to be able to monitor for drought on their lands. For example, during the course of the development of the Hopi Drought Contingency Plan, various data sources available on the internet were discovered and integrated into the plan. Recently, while testing the internet monitoring components of the plan, we discovered that the most useful data now costs money. One site was requiring $75/wk to access the data, and another site was requiring $40/wk. This means that to access the most necessary data, the Hopi Tribe is looking at an expenditure of $115/wk, or $5,980 annually. This is an enormous cost for a small Tribe, like the Hopi Tribe, to absorb.

Additionally, another site does not produce data from November–March each year. This means that the Hopi Tribe, which depends on winter precipitation for the soil moisture to germinate the corn each year, does not have data about soil moisture until we are almost into planting season.

b) Scientists tend to have a "rational" way of viewing drought, which is effectively a form of ideology. The Hopi people have a very different view of drought, based on cultural experience developed through millennia. It is important that the National Drought Council be prepared to take into account a variety of points of view about drought when consulting their various constituencies, and when implementing drought programming, whether planning, mitigation, or emergency relief.

3. **Develop and advocate comprehensive risk-management strategies into drought preparedness.**

None of the strategies advocated in this document are applicable to the situation of Hopi people. Crop insurance is simply not an appropriate strategy for subsistence agriculture. We did try to discuss with the Farm Service Agency about whether, if through
anthropological or other data, the Hopi Tribe could demonstrate the dollar value of the subsistence crop, the farmers could qualify for drought relief. However, we were unable to get a definitive answer to that question.

4. **Maintain a safety net of emergency relief that rewards good stewardship of natural resources and self-help.**

This is an excellent idea, providing incentive to land managers to be good land managers, although it may be difficult to operationalize. One can ask the question, particularly in light of the Risk Management discussion in the document, about how cities like Phoenix or Los Angeles can be demonstrated to be good stewards of their natural resources. It is an easy enough question to answer when evaluating ranchers, for example, but far less easy in an urban environment.

5. **Coordinate drought programs and response.**

The Hopi Tribe supports the concept of program coordination between federal agencies. It is possible, however, that the implementation of this policy may cause an increase of bureaucratization, at least in the short term. Already, the processes in place to access drought relief are too bureaucratic and cumbersome to actually provide relief. During the severe 1996 drought event, the Hopi Tribe applied for drought relief through the Bureau of Reclamation. By the time the paperwork was processed, the Palmer Drought Index said that the Hopi Reservation was out of drought, so the Tribe was immediately made ineligible for relief funding. This decision by the Bureau of Reclamation did not take into account the long-term effects of such a severe drought event, or the impact of its own processes on the ability of the Hopi Tribe to obtain relief.

It is my hope that the National Drought Policy Commission finds these comments useful. I look forward to a productive working relationship. Please keep the Hopi Tribe informed as to developments.

Sincerely,

Wayne Taylor, Jr.
Chairman
The Hopi Tribe

cc: Ms. Roseann Gonzales, Bureau of Reclamation Service Center
PO Box 25007, Denver Federal Center, Bldg. 67, 14th Floor
Denver, CO 80225-0007

Arnold Taylor, Sr., Manager, Dept. of Natural Resources
Bev Suderman, Natural Resources Planner

The Hopi Tribe’s Comments on “Preparing for Drought in the New Millennium”

47. Distributed to Goal Teams 1, 2, 3, 4 & 5 ALL have a comment
Ms. Leona Dittus  
Executive Director  
National Drought Policy Commission  
USDA/FSA/AO  
1400 Independence Ave., SW, Stop 0501  
Washington, DC 20250-0501

Dear Ms. Dittus:

Thank you for providing us the opportunity to review the Draft Report of the National Drought Policy Commission entitled "Preparing for Drought in the New Millennium".

The report as prepared contains information which addresses the various complex elements and issues involved in drought forecasting preparedness and mitigation. As Mr. Carlos Marin presented at your Austin, TX meeting in January the Commission is involved in various drought issues which fit your Commission’s plan.

Again thank you for considering our agency in this process and if you need any further assistance in the future please do not hesitate to call me at 915-832-4104 or contact Mr. Carlos Marin at 915-832-4157.

Sincerely,

John Bernal  
Commissioner

---

48. Distributed to All (short and general)
March 31, 2000

Patricia A. Lowe
Program Assistant National Drought Policy Commission

Via FAX: 202-720-9688

Dear Ms. Lowe:

Thank you for the opportunity of offering comments on the 3/8/00 draft of "Preparing for Drought in the New Millennium."

We would like to offer the sentence below to follow the citation of the Interstate Commission on the Potomac River Basin under Regional Entities on page 10 of the draft document.

The coordination involves the development and maintenance of a drought preparedness plan and the annual exercise of that plan in order to refine its relevance and bring newly hired and replacement personnel from the several jurisdictions and water suppliers up-to-date on this critical issue of regional water resources management.

The importance of this issue is the subject of the last paragraph on page 15 of the draft document.

Sincerely,

Roland C. Steiner, Ph.D., P.E.
Associate Director for Water Resources

for Erik Hagen (who testified at the Washington, D.C. hearing)
March 31, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Avenue, SW
Mail Stop 0501
Washington, DC 20250-0501

Dear Ms. Dittus:

On behalf of the North American Interstate Weather Modification Council, I would like to comment on the draft report of the National Drought Policy Commission. I urge the final report to include a recommendation in the research section to fund research on weather modification technologies.

Weather modification projects can help minimize the severity of droughts when they occur in two ways. First, weather modification technologies can help produce rain or snow during times of drought. Second, they can be used during normal climatic seasons to build up water supplies that can be used when droughts occur. The technologies are environmentally safe and cost effective. In one watershed in Nevada, water can be produced for as little as $4 an acre-foot.

In Public Law 102-250 (which the draft report mentions in several places), Congress authorized the Bureau of Reclamation to conduct a precipitation management technology transfer program. Section 206 (b) of that act authorizes the Bureau to conduct cost-shared field studies to validate and quantify the potential for appropriate precipitation management technology to augment stream flows. In addition, both the Bureau and the National Oceanic and Atmospheric Administration (NOAA) have authority to conduct weather modification research. Both agencies funded such research for years, but ended the effort in the 1990s.

We believe the weather modification research programs at the Bureau and NOAA should be reinstated and funded. In the last few years there have been important developments in the fields of computer modeling, cloud physics, remote sensing and chemistry. These improvements promise to make weather modification technologies more effective. In turn, they can help limit the impacts of droughts.
We propose adding the following subsection to the research recommendations in the draft report:

2.9 We recommend that the appropriate federal agencies fund competitive research grant programs to develop weather modification techniques and technologies, designed to mitigate the impacts of droughts. Furthermore, we recommend that the Bureau of Reclamation utilize section 206 (b) of Public Law 102-250 to create a Precipitation Management Technology Transfer Program. This will enable states, local governments and Indian tribes to study technologies to augment stream flows.

If you have any questions, or need more information, please do not hesitate to contact me. Thank you for your consideration.

Sincerely,

[Signature]

Richard L. Spees

50. Distributed to Goal Team 2
March 31, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Avenue, SW
Mail Stop 0501
Washington, DC 20250-0501

Dear Ms. Dittus:

On behalf of the Consortium of Regional Climate Centers, please find our comments and proposed additions to the National Drought Policy Commission Draft Report.

As you can see, our suggested changes focus on the importance of monitoring droughts on a regional basis. They also highlight the role of the Regional Climate Centers to handle that task.

If you have any questions, please feel free to contact me.

Sincerely,

[Signature]

Richard L. Spees

Attachments
Proposed Changes to the Recommendations of the NDPC Report

1. Spelling change on page 34 section 2.2(b). United Climate Access Network should read Unified Climate Access Network.

2. On page 32, section 1.1, first bullet, there is a sentence which begins “Each drought plan should include:” followed by a list of 5 items. We believe there should be a sixth item, (6) a drought monitoring and warning system, organized on a regional basis through the existing Regional Climate Centers and integrated nationally with NCDC and USDA through UCCAN. This would integrate a near real-time climatic/hydrologic data acquisition, transmission, storage, retrieval, and analysis system with high quality climatic/hydrologic databases.

Rationale for this Requested Addition

1. Decision-makers must have access to adequate data, which is converted to useful information in near real-time.

   Adequate data may or may not be available. If it is not available, then new sites must be established and integrated with the existing data sources. If adequate data do exist, they are often from a variety of networks, and these data need to be integrated into a single, reliable source.

   These data must also be quality controlled before they are made accessible. To be made useful, the data must also be placed in a wide variety of user selectable historical contexts. A few examples are: comparing today’s data with historical means and extremes; comparing the current trend with similar trends in previous years (how does this drought compare with previous droughts?); and, looking at the rate of change of conditions leading up to the present situation. Both of these requirements are dependent upon immediate access to the complete historical databases.

2. Presentations of climatic/hydrologic data and information in print, on television, and via the Web are fundamental to educating and involving the public. They must be timely, accurate and understandable.

   In addition to being placed in a proper historical perspective, the current climatic/hydrologic conditions must also be connected to the impacts on human endeavors under these conditions.

3. Such a monitoring system can be readily modified to provide warnings as well.

   Study of the historical records can yield a range of “trigger points” that are specific to different endeavors. Thus, as conditions approach these historically based thresholds,
a warning can be given to decision-makers to intensify their awareness of impending adverse consequences.

4. Here are some excerpts from the NDPC Report which further validate this request.

"Accordingly, the Commission's vision is of a well-informed, involved U.S. citizenry and its governments prepared for and capable of lessening the impacts of drought—consistently and timely." Page 3

"It must be flexible enough to include a variety of drought situations, but specific enough to distinguish between those situations which are true drought emergencies and those that are normal cyclical conditions." Page 5

"In addition, many people testified to the significant lack of weather and streamflow gages and data in general that are needed to substantiate, review, and make decisions about their applications for agricultural assistance." Page 11

"Some tribes indicated that they lack access to snow amount, soil moisture, and stream flow information needed in planning and for triggering emergency response efforts." Page 13

"Such programs should help address the needs of farmers who told us that they rely on irrigation systems and need detailed, localized information (soil moisture, temperature, wind, humidity, evapotranspiration rates) for irrigation scheduling." Page 17

"And we heard that drought information and data are often complex and, for the most part, are not currently presented in a standardized format. Such data can also be difficult to find and interpret." Page 18

"Many witnesses at our hearings and written comments submitted independently to the Commission indicated a need for an accessible "gateway" (point of contact) where high-quality, standardized, comprehensible current information and historical data are managed." Page 18

"We heard often during our deliberations that a key element in successful drought preparedness is public education." Page 24

"Effective plans should also be designed based on cost and performance and incorporate staged responses to incipient droughts at pre-defined trigger points." Page 29

"Drought-related data can be better marshaled, interpreted, and disseminated to all parties with an interest in drought, including the media and public at large, so that citizens and experts in drought management alike can gain the knowledge they need to help lessen the impacts of drought." Page 30
"Easy access is needed to information on nonfederal and federal programs related to drought monitoring, assessment, and prediction. Effective drought monitoring requires information on climate and water supply conditions, including information on precipitation and temperature, soil moisture, stream flow, reservoir and groundwater levels, and snow pack." Page 30

Provision of these Capabilities

There is an existing resource that brings specific expertise to meet the above needs. It is the three-partner system comprising the National Climatic Data Center, the six Regional Climate Centers, and the Nationally Recognized State Climate Offices. The focus of activity for the drought monitoring and warning system will be on the RCCs. Each of them have experience in near real-time data acquisition from the Cooperative Observer Network, and many have experience with other federal and local networks. Some also have experience with determining sites for new data acquisition platforms, specifying platform components, setting up the platforms, acquiring data from the platforms, and quality controlling the incoming data before they are stored in an online database. The RCCs also work cooperatively with the NRSCOs who operate state networks. All RCCs actively integrate and quality control climatic data from a variety of data sources (networks) and produce textual, graphical, and mapped products, which are available on the Web.

This three-partner system also has strong ties to USDA’s National Water and Climate Center, which operates the SNOTEL and SCAN systems. NWCC also helped fund and create the Unified Climate Access Network with the RCCs. NWCC is working with the USGS to link the hydrological and climatological databases through UCAN.
The following are suggested additions to the Conclusions section.

- The experiences of the Western Drought Coordination Council provided significant insight into the level of detail and types of information needed to support drought mitigation. The recommendations of the WDCC (attached) provide an excellent prototype of the envisioned regional and state emphasis.
- The impacts of drought are manifested most clearly and forcefully at the state and regional levels. What is needed most is a coordinated national system of regionally specific activities, and a similar regional coordination of state and locally specific activities. Experience shows that this approach most effectively addresses the real needs expressed by the user community.

The italicized section (b) is recommended for insertion into Recommendations section 2.2. The previous section (b) is relabeled section (c). An alternative wording is provided below.

2.2 (a) We recommend that Congress authorize and the Administration establish a comprehensive information clearinghouse such as the National Drought Mitigation Center to provide users with complete access to drought monitoring, prediction, impact assessment, preparedness, and mitigation measures and to link information from federal and nonfederal sources.
(b) We recommend that Congress authorize and the Administration provide resources to utilize the existing Regional Climate Centers Program, and affiliated State Climate Offices, to serve as the regional locus of activities for climate and drought monitoring, and coordinate internal regional cooperation.
(c) We recommend that Congress authorize and the Administration implement a nationwide information delivery system—such as the Unified Climate Access Network (UCAN)—reflecting regional and state differences to increase access to and availability of weather, water, soil, and climate data and information.

*Alternative language*

(b) We recommend that Congress authorize and the Administration augment the Regional Climate Centers Program to serve as the regional locus of activities for climate and drought monitoring, in close cooperation with State Climate Programs, and to provide internal regional coordination.
March 31, 2000

Leona Dittus
Executive Director
National Drought Policy Commission
USDA/FSA/AR
1400 Independence Avenue, S.W. Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus:

I testified at your Los Angeles hearing on December 1, 1999, along with numerous other water agencies and environmental representatives. The messages that we were collectively trying to give you that day appear to have been ignored or dismissed by the Commission and have not been incorporated into your draft report.

I am writing today to ask that the Commission reconsider adding these important principles. They are summarized briefly as follows:

1. The Commission should specifically reference the federal water efficiency standards in the Energy Policy Act and stress the national benefit of maintaining those standards.

   A federal standard is important not only to water conservation goals environmentally but is important also to keeping the costs down of needed new public infrastructure systems for water and wastewater. A full third of indoor water use is in the bathroom; it only makes sense to drought-proof the country by eliminating wasteful fixtures, particularly in drought-prone areas. If the Commission is reluctant to support maintaining the federal standards, it should at least recommend at a minimum that no drought disaster relief funding be provided to states which do not have these efficiency standards enforceable on the state level.

2. Where federal dollars are expended for water supply and treatment projects, water efficiency must be practiced as a condition of federal funding.

   Water conservation strategies must be long-term programs and not just short-term drought-related actions. The report recognizes the need for drought preparedness BEFORE the drought. However, the report stops short of recommending that federal funding be provided only if conservation and drought planning takes place. Much like the
implementation of the National Flood Insurance Program, the Drought Management program should not "bail out" districts and localities without the quid pro quo of proper conservation plans and programs being put in place afterward. Certainly, long-term conservation planning helps soften the impact of droughts when they occur and provide the supply buffer needed for consumers. California's conservation programs were conceived in drought but have become a stable part of the water supply mix even in wet years.

3. A uniform set of measures helps coalesce and standardize conservation activity.

The Drought Commission's report should give some specific examples of urban and agricultural water "drought-proofing" and not leave the issue of appropriate actions or programs to a future federal entity or Council. An important principle for the Commission to articulate is their view of a minimum, threshold level of conservation program activity. In addition to a minimum definition, creative, sustainable opportunities for "drought-proofing" should be encouraged and explored by the Commission.

4. The consensus-driven, collaborative approach has been successful.

This is a critical issue in the creation of any national drought coordinating council. Environmental participation was missing from your commission, and this omission needs to be rectified specifically in your recommendations. Without the collaboration of stakeholders, true success cannot be achieved. And without a complete set of stakeholders at the table, true success is virtually doomed.

Thank you for considering my comments. If I can provide any further information, please let me know.

Sincerely yours,

Mary Ann Dickinson
Executive Director

52. Distributed to Goal Teams 1 & 5
Ms. Leona Dittus, Executive Director  
National Drought Policy Commission  
USDA / FSA / AO  
Room 6701 South - Mail Stop 0501  
1400 Independence Avenue, SW  
Washington, D.C. 20250-0501

Dear Ms. Dittus:

On behalf of the Western Urban Water Coalition I am commenting on the draft report of the National Drought Policy Commission, dated March 8, 2000. The Western Urban Water Coalition is an organization of the largest western urban water utilities serving water to over 30 million people in cities including Denver, Las Vegas, Los Angeles, Oakland, Phoenix, Reno, Salt Lake City, San Diego, San Francisco, Seattle, Tucson and others.

We strongly support the overarching message of the report, focusing on front-end planning and preparedness. We agree that federal dollars for response can be trimmed down if appropriate planning is conducted before a drought occurs. We also support expanded communication and simplified dialog among weather forecasters, policy makers and the general public.

There are a few recommendations that we want to underscore and offer some additional comments. With respect to the need for coordination among federal agencies to facilitate improved service delivery for states, regions, counties and cities, our coalition considers this issue to be among the most important. Federal technical and financial assistance to help communities develop drought contingency plans, prepare drought communications and train staff in ways to involve the public in resource allocation decisions is at the crux of this whole effort. One of the mechanisms obviously would be through the proposed National Drought Council and the interim federal agency coordinating group. We would strongly encourage timely appointment of the Council, and that it includes non-federal participants. Both urban water utilities and state water resources agencies can provide state-of-the-art assistance, share what works and doesn’t work, and can be a productive partner in service delivery. One of the key issues from the states perspective, however, is that the National Council does not in any way create a conflict with existing water rights. Coordination and assistance are needed and appropriate, but federal involvement should not preclude states and other water rights holders from implementing their own water allocation priorities and contingencies.

Funding is another important issue, as it would appear greater emphasis on drought planning programs (such as with the Bureau of Reclamation and the Army Corps of Engineers).
Engineers), and data collection activities (i.e. USGS stream gages), would necessitate some reduction in other program costs in these agencies. We would caution the commission to involve those stakeholders who may have anticipated specific budget levels in the upcoming federal budget, of any potential changes that may result from some of these recommendations. I believe we are all working toward mutually beneficial goals, and we should try to avoid any potential budgetary conflicts if possible.

Regarding the need for closer networking among scientists and managers on monitoring, research, data collection, and modeling, we would suggest this recommendation be expanded to recognize the value of states and large utilities in this effort. While much of the effort and focus of the report is on agricultural issues, the WUWC has many members who have state-of-the-art technical and assessment capabilities that would be helpful to your stated goal. Overall, we believe there is a missed opportunity to link the resources of the urban water sector with the agricultural water sector. While the end water use may be different, the techniques necessary to plan for, conduct, assess, monitor, and implement conservation practices to alleviate drought impacts covers all sectors. There are many case studies of successful approaches tested in urban settings that may be transferable to agricultural sites, and we would strongly encourage including this in one of the recommendations.

We appreciate the magnitude of the commission’s effort and welcome the opportunity to be helpful and to participate in the future.

Sincerely,

Guy R. Martin

53. Distributed to Goal Teams 1, 2, 4 & 5
March 31, 2000

Ms. Leona Ditto, Executive Director
National Drought Policy Commission
USDA/FSA/AAO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Ditto:

On behalf of the New Mexico Cattle Growers Association (NMCGA) and its membership, I am writing to express my support of the draft report of the National Drought Policy Commission. The NMCGA represents livestock producers in New Mexico and other Western states, and we recognize the need for a way to prepare for droughts, rather than just moving from crisis situation to crisis situation.

The NMCGA supports the idea that all federal drought coordination should remain dispersed through several agencies, so the largest number of people can benefit. Moving all drought preparation and response to one federal agency would be impractical because of all the different parties affected by a drought.

We also support the coordination of federal actions and assistance be coordinated with ongoing state, local and tribal programs. Decisions made and programs administered at the local level are the most successful because people at the local level know best what their area needs.

Decisions that are handed down from Washington are typically hard to implement because they are not specific to different areas. There is a lot of variation between the and climate of New Mexico and Arizona and the humid South Carolina coast, and one program cannot be applied to both areas and succeed.

By addressing the problems that are caused by a drought now, solutions and actions can be developed. Education on daily water conservation should be a main focus of drought policy. By conserving water, people can help avoid water shortages in the first place.

Thank you in advance for your consideration, and I look forward to seeing the final document.

Sincerely,

Caren Cowan
Executive Secretary

JIMMY R. BASON, PRESIDENT, Hillboro, NM  *  PHIL H. BIDEGAIN, FIRST VICE PRESIDENT, Tucumcari, NM
BRUCE DAVIS, VICE PRESIDENT AT LARGE, Eagle Nest, NM  *  DON CULLUM, SW VICE PRESIDENT, Lordsburg, NM
DON L. (REBO) LEE, SE VICE PRESIDENT, Alamogordo, NM  *  DAVID SANCHEZ, NW VICE PRESIDENT, Española, NM
BILL SAUBLE, NE VICE PRESIDENT, Maxwell, NM  *  R.B. WHITE, SECRETARY/TREASURER, Albuquerque, NM
CAREN COWAN, EXECUTIVE SECRETARY, Albuquerque, NM

54. Distributed to Goal Teams 1 & 5
March 31, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/F SA/O
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus,

On behalf of the New Mexico Wool Growers, Inc. (NMWGI) and its membership, I am writing to express my support of the draft report of the National Drought Policy Commission. The NMWGI represents livestock producers in New Mexico and other Western states, and we recognize the need for a way to prepare for droughts, rather than just moving from crisis situation to crisis situation.

The NMWGI supports the idea that all federal drought coordination should remain dispersed through several agencies, so the largest number of people can benefit. Moving all drought preparation and response to one federal agency would be impractical because of all the different parties affected by a drought.

We also support the coordination of federal actions and assistance be coordinated with ongoing state, local and tribal programs. Decisions made and programs administered at the local level are the most successful, because people at the local level know best what their area needs. Decisions that are handed down from Washington are typically hard to implement because they are not specific to different areas. There is a lot of variation between the arid climate of New Mexico and Arizona and the humid South Carolina coast, and one program cannot be applied to both areas and succeed.

By addressing the problems that are caused by a drought now, solutions and actions can be developed. Education on daily water conservation should be a main focus of drought policy. By conserving water, people can help avoid water shortages in the first place.

Thank you in advance for your consideration, and I look forward to seeing the final document.

Sincerely,

Ron L. Merritt, Jr.
President

55. Distributed to Goal Teams 1& 5
March 31, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/PSA/AO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus,

On behalf of the New Mexico Public Lands Council (NMPLC) and its membership, I am writing to express my support of the draft report of the National Drought Policy Commission. The NMPLC represents livestock producers in New Mexico and other Western states, and we recognize the need for a way to prepare for droughts, rather than just moving from crisis situation to crisis situation.

The NMPLC supports the idea that all federal drought coordination should remain dispersed through several agencies, so the largest number of people can benefit. Moving all drought preparation and response to one federal agency would be impractical because of all the different parties affected by a drought.

We also support the coordination of federal actions and assistance be coordinated with ongoing state, local and tribal programs. Decisions made and programs administered at the local level are the most successful, because people at the local level know best what their area needs. Decisions that are handed down from Washington are typically hard to implement because they are not specific to different areas. There is a lot of variation between the arid climate of New Mexico and Arizona and the humid South Carolina coast, and one program cannot be applied to both areas and succeed.

By addressing the problems that are caused by a drought now, solutions and actions can be developed. Education on daily water conservation should be a main focus of drought policy. By conserving water, people can help avoid water shortages in the first place.

Thank you in advance for your consideration, and I look forward to seeing the final document.

Sincerely,

Bud Eppers
President

56. Distributed to Goal Teams 1 & 5
March 30, 2000

Ms. Leona Dittus  
Executive Director  
National Drought Policy Commission  
USDA/FSA/AO  
1400 Independence Ave., SW., STOP 0501  
Washington, D.C. 20250-0501

Dear Ms. Dittus:

Thank you for the opportunity to comment on the National Drought Policy Commission draft report. Our comments are as follows:

Note: These comments are cross-referenced to the draft report, *Preparing for Drought in the New Millennium*.

1. Ref. p. 39: We recommend Congress act to establish a National Drought Council for the coordination of drought programs and responses. For the interim, we recommend the president name the Secretary of Agriculture and pick one state governor to serve as co-chair over a federal agency coordinating group that will begin the process of implementing the recommendations in the report.

2. Ref. p. 8, 35, 36: We recommend the funding for drought research not be limited to the National Drought Mitigation Center in Lincoln, Nebraska. Rather, we believe additional funding should be developed to support technical decisions (such as water supply, climatology, and biotic stress) being contemplated by state and local drought planners.

3. Ref. p.4, 27, 29, 34: We recommend forest resource stewardship programs be recognized and considered as drought mitigation and preparedness programs. Well managed forest lands are less prone to catastrophic fires. When wildfires occur in healthy forest stands, suppression options are broader. These programs are truly proactive and have long-term benefits. In some instances, wildfire can cause significant residual environmental damage to watercourses. This recommendation is tied to a request for increased funding and a strong public information campaign espousing the benefits of forest lands being managed in a diverse, ecologically sustainable fashion.
4. Ref. p. 10 (fourth bullet): We recommend amending the fourth bullet to read as follows:
   Drought does not occur until there are adverse impacts, and these impacts can be reflected in various ways such as harm to crops, pastures, forests and woodlands; harm to livestock or wildlife; impacts on the water supplies upon which people depend; or economic impacts on the water supplies upon which people depend; or economic impacts to drought-stricken businesses or communities.

Drought has adverse impacts to forest health far beyond wildfire. Even native trees are susceptible to drought induced mortality and are weakened by drought to the point that insect epidemics occur.

5. Ref. p. 22, 29: We recommend a portion of the applied research and technological outreach funding include the development of peer reviewed criteria that will help resource managers select the proper drought monitoring model(s) for the wide ranging decisions they face. For example, the Palmer Drought Index has value for a number of areas and activities but does not work well after partial relief has occurred but the soil remains dry. The Wildland Fire Assessment System provides reliable information but may not provide all the answers needed to explain drought phenomena. Published criteria would help provide drought managers defensible answers and go a long way toward explaining which factors are most important for their location.

If you have questions regarding the following comments, please do not hesitate to contact me at (505) 827-5950.

Sincerely,

Jennifer A. Salisbury

57. Distributed to Goal Teams 1, 2 & 5
March 29, 2000

Leona Dittus, Executive Director
National Drought Policy Commission
U.S. Department of Agriculture
1400 Independence Avenue, SW
Room 6701 & STOP 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus,

After a careful review of the draft document dated 3/8/00, Preparing for Drought in the New Millennium, NUAC is pleased with the thoroughness and overall content. There are a couple of areas, however, that appear to be lacking and deserve consideration, especially in these planning stages.

It is NUAC’s opinion that preparedness consists of far more than awareness and education. Training is perhaps the most essential aspect of drought preparedness. This lies at the heart of NUAC’s message. Knowing what to do is one thing, but implementing it is quite another. If the Federal government is serious about drought preparedness, then they should be willing to put a considerable amount of effort and money toward training programs. Furthermore, future programs for all Federal agencies should include funding in their out-year budgets (line item) for training and implementation.

In like manner, it only makes sense that the Commission encourage all of the agencies that have participated in the formation of this document, governmental and non-governmental, to create implementation methodologies and training programs. There is a need to build up what may be called “institutional memory” within all levels of governmental and non-governmental agencies. Training and implementation should be kept current regardless of who is filling what position. Drought preparedness must become part of the everyday vernacular and our water use habits must follow the lead.

In regards to water reclamation and conservation, it is NUAC’s opinion that these programs are nothing more than stopgap measures unless the water usage they offset is somehow kept in reserve. A water conservation program alone can be a huge deterrent to drought if managed properly, but it takes vision, it takes insight, and it takes discipline on the part of water
managers to stop the overselling of water. Water managers need training and education as much or more than the general public. Their "bad" habits can be more detrimental than the public's when it comes to the reliability of the water supply in a drought situation.

The report talks about the establishment of a National Drought Council to coordinate federal and nonfederal interests, needs, programs, and stakeholders. This Council should be comprised of a strong balance of non-governmental entities such as NUAC, AWWA, USGA, ASIC, ASI, and some of the leading research institutions. Mention is also made of a research "summit" of multi-disciplinary, geographically diverse representatives. Considering our unique perspective on the issue, NUAC would like to be invited to participate in such a summit.

Again, NUAC is encouraged by the present draft document and hopes that the above comments will further solidify the planning efforts. We have great interest in the issue of drought preparedness and look forward to providing more assistance in the future.

Yours very truly,

Roger Waters
President

58. Distributed to Goal Teams 1& 5
March 28, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave. SW
Mail Stop 0501
Washington, D.C. 20250-0501

Dear Ms. Dittus,

We have reviewed the draft report "Preparing for Drought in the New Millennium," and offer the following comments:

First, we fully support the idea that all drought preparedness planning efforts and decisions be left to the states and local interests. This is very important, as the State of North Dakota will not concede or compromise its right to manage and protect its own land and water resources as it sees fit. In addition, this is the best approach to take in developing effective drought preparedness strategies, because state and local entities undoubtedly understand their vulnerabilities, resources, and local priorities better than anyone else.

We also support the coordination efforts by the proposed National Drought Council, as this appears to be a positive step toward making the federal drought assistance programs more efficient and accessible. If the National Drought Council is able to effectively coordinate between federal agencies offering drought assistance with state and local entities seeking assistance, the time of recovery in the event of a drought would be greatly reduced. This would be a valuable extra level of support for states and local governments in situations where their drought preparedness strategies were not entirely effective. However, coordinating efforts by the National Drought Council would only be supported if they were not intrusive or counterproductive to state or local planning strategies.

An area of concern identified by State Water Commission staff included the language on page 39, under 5.1, which reads "In the interim, we recommend that the President immediately establish a federal agency coordinating group, chaired by the Secretary of Agriculture, to begin appropriate implementation of this report." We recommend that the proposed interim group include non-federal representatives, which would make it a more acceptable approach to state and local entities.

[Signature]
Governor Edward T. Schafer
Chairman

[Signature]
David A. Sprynczynatyk, P.E.
Secretary & State Engineer
Also related to the Council, on page 40, under 5.2, we recommend that the Council be directed by Co-Chairs. One of the Co-Chairs being the Secretary of Agriculture, and the other, a non-federal Co-Chair elected by non-federal interests.

Finally, clarification is needed in the second paragraph of the "Response" section on page 25 where it reads "Approximately 47 federal programs have an element of drought-related response, primarily for agricultural droughts." It should be added that not all of these 47 federal programs are funded, and therefore, all 47 programs cannot provide assistance to state and local interests if needed.

We appreciate your consideration of our comments regarding the National Drought Policy Commission's draft report "Preparing for Drought in the New Millennium."

Sincerely,

David A. Sprynczynatyk
State Engineer

DAS:PF/322

59. Distributed to Goal Teams 1, 4, 5
February 20, 2000

President Bill Clinton
1600 Pennsylvania Ave. NW
Washington, D.C. 20500

President Bill Clinton

We are just a small family owned and operated trucking company. Our business is solely supported by the farmer’s and when they can’t survive because of the water distribution cuts then we can’t survive either.

Yes, the farmers get government subsidy loans, but we don’t. We are asking that you give the farmers the water they need to farm the land, that feed our country.

THE LORD WILL PROVIDE THE WATER WE NEED FOR IRRIGATION TO FEED THIS COUNTRY, REMEMBER THE FISH AND ANIMALS ARE NOT HUMAN LIVES.

I have always said that if all of you in Washington meaning Congress persons and Senators (not your aides) would come to the Westside of the San Joaquin Valley and irrigate a crop for about three days in the month of August and see where this food comes from, and the process it goes through from seed to market, you would look at farming from a different light.

Sincerely,

Phillip & Jacque Kasey
Valley Carrier

60. Distributed to Goal Team 4
Wednesday, March 29, 2000

Leona Dittus
National Drought Policy Commission
1400 Independence Ave., SW., STOP 0501
Washington D.C., 20250-0501

Dear Ms. Dittus,

I was glad to receive the draft report from the NDPC. Preparing for Drought in the New Millennium. Our company was honored to speak to the Commission last September and share some of the new technologies available to government agencies, farmers, and homeowners. As I read the draft, I see the word "mitigation" show up throughout the report. This is a good thing because it implies taking action before problems arise. Unfortunately, I do not see the words "technology" or "water conservation" very often.

As the NDPC moves forward in addressing the serious impact that drought conditions have on this country, I hope that it will also be a major force in disseminating critical information regarding new water and water conservation technologies. As our wells go deeper and the major aquifers dry up across the country, I hope the pace of the NDPC can keep-up with the problem. Based on the progress made during this past year, with this recent draft as the indicator, I would have to say some acceleration is warranted.

If you have recommendations for us as far as meetings, events, papers, or other means of disseminating information please make us aware of them.

Best wishes for continued progress at the NDPC.

Regards,

[Signature]

Kent Corley
Communications Director
March 30, 2000

Ms. Leona Dittus  
Executive Director  
National Drought Policy Commission  
USDA/FSA/AO  
1400 Independence Avenue, Southwest  
Mail Stop 0501  
Washington, D. C. 20250-0501

Dear Ms. Dittus:

Thank you for the opportunity to respond to the draft report of The National Drought Policy Commission, *Preparing for Drought in the New Millennium*. I commend you for welcoming input from the Mississippi Department of Economic and Community Development. The Department is the state's lead agency for economic development.

After careful review of the report, I offer the following comments:

1. The acknowledgement that the country has no consistent, comprehensive drought policy is the first step in rectifying the situation.
2. A long-term National Drought Council established by Congress is an appropriate vehicle to bring continuity to the development of a national drought policy.
3. A shift in policy from emergency response to planning and mitigation measures will lessen the impact of drought on individuals, communities and the environment.
4. Partnerships among nonfederal governments, the federal government and private interests will be necessary to develop the tools and strategies for

APR 5\(^{\circ}\) 2000
formulating and carrying out appropriate drought preparedness and mitigation plans.

5. Effective plans should build in flexibility to allow for the diversity of conditions across the country to avoid a "one size fits all" approach.

6. Drought preparedness and mitigation plans should have clearly identified objectives and be monitored to ensure those objectives are being met.

7. Drought planning should be an on-going process.

8. The United States Department of Agriculture and other federal agencies involved in assisting people with drought activities need to provide their services effectively and expeditiously.

Should you have questions, please call me at (601) 359-6622.

Sincerely,

James C. Burns, Jr.
Executive Director

JCB:DB:ao

cc: Donna Simmons

62. Received April 5, 00. Distributed to Goal 5, #5, Goal 1, #'s 5-7, Goal 4, #8
March 29, 2000

Ms. Leona Dittus, Executive Director
The National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW
Mail Stop 0501
Washington, D.C. 20250-0501


To Members of the National Drought Policy Commission:

The members of Texas Sheep and Goat Raisers, located primarily in western Texas, an arid region frequented by drought, are well acquainted with the problems associated with drought, both from an economic and a natural resource standpoint. We stand in favor of drought management and planning. We also stand in favor of protecting states water rights, as long upheld by the courts and in protecting individual property rights. We also support less government and would prefer a program that is less "top down" in its approach.

We believe there are significant programs within the federal agencies and a significant cost savings can be offered by coordinating, streamlining, and perhaps even the elimination of minor or duplicated programs. A National Drought Council may be the mechanism, provided the council does not become just another level of bureaucracy and provided that its charter or mission statement recognizes states water rights and individual property rights. These programs and agencies may already have adequate funding, if it is used more efficiently, and would caution against funding without effective cost/benefit analysis. We would ask Congress to reexamine some of the public laws and programs, in order to determine the need for expansion or reduction of the applicability of those laws or programs.

We do not believe it is feasible or practical for all water users to have a drought management plan and water users as referred to in the Recommendations, Section 1.1 and that all users should be better defined. All Federal agencies and facilities should participate and Congress should make that part of their authorization. A Presidential directive should not be required nor a request needed. Public education is vital to any drought planning, but should be funded to the states to manage on a local level. Drought States like the western part of Texas and the southwestern United States need to take the lead in educating the more rainfall prone parts of the country.

The monitoring/prediction and operational products called for in Recommendations, Section 2, we feel could be handled by the existing NOAA, National Weather Service, US Geological Survey, and perhaps others and delivery by one of these without creating another
agency, like United Climate Access Network, for delivery. In fact, recently, the NWS eliminated information from its agricultural forecast. Information that should be included or reformatted into a more user friendly form. We support research, but suggest that it not provide an avenue for ever expanding the size and budget of agencies as less is more efficient and cost effective.

We support an improvement in the crop insurance program. One that includes livestock, exotic animals and pasture land and the use of other risk management tools. As referred to in Section 3 of the Recommendations.

We would support a fund similar to the Stafford Act for non-farm drought emergencies. However, we would not favor borrowing from the Commodity Credit Corporation, as mentioned in Recommendations, Section 4 and would hope for a faster response time while still maintaining the "bottoms up" approach provided by current USDA programs. A single, simple trigger is needed; after all, there is no question in the event of a hurricane, tornado, flood, or earthquake, but drought is no less burdensome financially, it only takes longer to occur.

We support good stewardship, and incentives for such, but rewards for good stewardship as mentioned in Recommendations, Section 4, are complicated, hard to define and often, in the eye of the beholder, different, depending on the education, experience, and special interests of the beholder.

We would support better coordination and integration of programs and response as mentioned in Recommendations, Section 5. This would make the programs and response more effective and more cost efficient. We support the creation of a Drought Council, chaired by the Secretary of Agriculture, to coordinate interests, needs programs and stakeholders. We would mention that federal interests should be non federal interests, first and foremost. We do not believe the Council or an interim coordinating group should be exempt from FACAs but would agree that the requirements of sections 8 and 10 of FACAs, regarding attendance, chairing, called meetings, and control, would render the Council cumbersome if not impossible. We would support open meetings, free testimony and annual reports to the President and to Congress. We would hope that the Council would focus first on existing drought programs and try to make them more efficient, before looking to create new ones.

Lastly, we would comment that approximately two weeks to comment on the report is inadequate.

Respectfully submitted,

Stephen J. Salmon, Chairman
Natural Resources Committee, TSGRA

Cc. Members of the Texas Delegation

63. Received March 30,00. Distributed to : Goal 5, P's 2, 7; Goal 1, P 1; Goal 2, P 4; Goal 3 P 5; Goal 4, P 6
April 4, 2000

Ms. Leona Dittus, Executive Director
National Drought Policy Commission
USDA/FSA/AO
1400 Independence Ave., SW
Mail Stop 6501
Washington, DC 20250

Dear Ms. Dittus,

I would like to suggest two additions to the National Drought Policy Commission (NDPC) Draft Report. Both of these recommendations build on successful drought related programs currently in operation in Nevada.

First, I believe the NDPC should highlight activities of the Regional Climate Centers in monitoring droughts and other climatic conditions. Droughts are regional in nature and therefore it is important that drought conditions be tracked, processed and assessed regionally by local observers. The six regional climate centers, gather data from a wide range of sources—a more extensive network than utilized by the National Oceanic and Atmospheric Administration. At the same time, they have the historical database and knowledge of their region to assess the data. This critical role in drought monitoring should be recognized and supported in the commission's report.

Additionally, many states have weather modification programs to enhance water production and mitigate the impact of droughts. For years the federal government supported these programs with research and operating funds, but the federal support ended last decade. To take advantage of new developments in computer modeling, cloud physics and chemistry, the federal research and operations programs should be reinvigorated. In Nevada, the winter cloud seeding project produces water at a cost of $4 an acre foot. Our nation cannot afford to ignore technologies that could reduce the severity of droughts.
Attached for your review are two paragraphs that I would like to suggest be added to the NDPC report in the recommendations section. Thank you for your consideration.

Sincerely,

[Signature]

Sunny Green
Governor
Add the following subsection to the Recommendation Section 2.2

(C) We recommend that Congress authorize and the Administration provide resources to utilize the existing Regional Climate Centers Program, and affiliated State Climate Offices, to serve as the regional locus of activities for climate and drought monitoring, and coordinate internal regional cooperation.

Add the following new section to the "Research" Recommendations:

2.9 We recommend that the appropriate federal agencies fund competitive research grant programs to develop weather modification techniques and technologies, designed to mitigate the impacts of droughts. Furthermore, we recommend that the Bureau of Reclamation utilize section 206 (b) of Public Law 102-250 to create a Precipitation Management Technology Transfer Program. This will enable states, local governments and Indian tribes to study technologies to augment stream flows.

64. Received April 4, 00, Distributed to Goal 2 Team
March 20, 2000

Mr. Warren Lee
Resource Inventory Division NRCS
5601 Sunnyside Ave.
Beltsville, MD  20205-5475

Dear Mr. Lee,

At our March Board Meeting we reviewed the Draft of the "Preparing for Drought in the New Millennium" report being developed by the National Drought Policy Commission. Page 9 narrates provisions for American Indians. We are appreciative of having the American Indian considered. However, we feel that the narrative is very vague. We would like to have the commission consider developing language in each of the Assessments and Needs listed on the Contents for American Indians. Some of the Assessments and Needs may be merely having language that will simply have tribal nations included immediately after states, county, cities, etc. Since this is such a short turn around time, are comments are very limited. We would like to have the opportunity to spend the necessary time to carefully review the Assessments and Needs so that American Indians will have the National Drought Policy work for them.

Should you have any questions please contact me at (520) 697-8482.

Respectfully,

Keith Bennett
President

65. Received April 3, 00. Distributed to Deanne, Flagged for Roseann, Warren
I want to commend the National Drought Policy Commission for an extremely well-researched, intelligent report on the nation's drought policy and associated improvements required to improve response to future drought episodes in the U.S. I especially concur with the need for better coordinated drought information aimed at those most vulnerable to drought (i.e., farmers/ranchers, etc.) and tearing down barriers that prevent the awarding of timely technical/financial drought assistance to those who need it most.

I have only one noteworthy comment:

* Page 38, Recommendation 3.1:

I believe that the Commission's recommendation "that Congress authorize a study to evaluate different approaches to crop insurance,..." does not go far enough in addressing this problem. As the report states, the Commission heard numerous testimonies concerning the stated need for extending crop insurance coverage to include crops and livestock. I think this recommendation would have a stronger impact and actually better reflect the sentiment of the Commission if it directly recommended Congress to authorize a study to "evaluate the extension of crop insurance coverage to include all crops and livestock,..."

Thanks for this opportunity to comment.

Regards,

Brian R. Vance
Oklahoma Water Resources Board
405/530-8866

66. Received 4-6-00, Distributed to Goal 3 Team
March 31, 2000

Mr. Shaun McGrath
Western Governors' Association
600 17th Street
Suite 1705 South Tower
Denver, CO 80202-5452

Dear Mr. McGrath:

Enclosed is our review and comments regarding the submitted draft document “Preparing for Drought in the New Millennium, Draft Report of the National Drought Policy Commission, March 8, 2000.” We found the document informative and welcomed the opportunity to comment.

In California we place great emphasis on coordination among state agencies committed to emergency and disaster responsibilities including day-to-day activities. If emergency conditions reach the level at which the Governor declares a State of Emergency, the state emergency organization’s response is directed through the Office of Emergency Services. In order to ensure State and Federal coordination during any future drought situation, we would like to see the Federal Emergency Management Agency serve as a major participant in drought preparedness activities.

Thank you for the opportunity to comment on the report.

Sincerely,

[Signature]

DALLAS JONES
Director

Enclosure
c: Department of Water Resources
Emergency Planning Document Review


Reviewer: Donald Pinegar, OES Plans Unit

General Observations
The paper discusses a full range of drought situations from farm losses to loss of drinking water to major metropolitan areas. The major emphasis is on developing a new or revised National Drought Preparedness Act (page 37), establishing a National Drought Council with the Secretary of Agriculture as the lead for agricultural emergency response (page 38).

The Chair of the commission preparing the report was the Secretary of the U.S. Department of Agriculture (USDA). The FEMA Human Services Division Director represented the federal disaster and emergency community while the New Mexico Director of Emergency Management represented state emergency services interests.

The report criticizes the existing system, stating in part “From a national perspective, these well-intended efforts have produced a patchy approach to reduce the impacts to drought. And despite the major role that the federal government plays – no single federal agency is in a lead or coordinating position regarding drought” (page 7). This statement is made, despite FEMA’s clear coordinating role in disaster response and mitigation. Little discussion of the shared responsibility exists between FEMA and USDA regarding mitigating droughts and emergency response and the actual federal programs. Drought prone states have aggressively developed specific programs as needed to address a variety of drought caused disasters.

The report focuses on drought action planning in a general way but has no detailed structure to ensure that all individuals participate in an effective way. Reference is made to the CALFED program in California but there is no description of its operating practices that might be useful for comparison.

Also, the report could identify who the different levels of “drought contingency planners” are. It is clearly a ramp-up group whose numbers climb as the situation grows more dire. The Emergency Management community needs to exercise its legal responsibility to prepare for, respond to, recover from, and mitigate the effects of drought disasters.

Specific Comments
Reference to the “dry hydrant” (page 30) should be changed to distinguish between “dry barrel fire hydrants”, which are sometimes referred to as dry hydrants, and the described uncharged pipe. Technically, hydrants have multiple outlets so the “dry hydrant” might better be described as a “dry water valve” which is connected to a water source.

The authors should consider changing references from “drought planning” or “drought planners” to “drought contingency planning” or “drought contingency planner.” This is important unless we are planning to create a drought.
To: Leona Dittus

From: Victoria Greenfield

Subject: CEA Comments on “Preparing for Drought in the New Millennium”

Date: April 3, 2000

Thank you for the opportunity to read and comment on the Report of the National Drought Policy Commission (NDPC), we received a copy late last week and apologize for the delay in responding. CEA has two very general comments.

• We commend the NDPC for taking a long-term view, but find that the report provides insufficient basis for comparing and prioritizing the various recommendations. In particular, there is no systematic cost-benefit analysis. Without this framework, it is difficult, if not impossible, to determine how to allocate resources efficiently across options. The list is helpful, but not as helpful as it could be. Some mention of expected costs, expected benefits, and priorities would add considerable value. (If this is not possible, we suggest explicitly noting that this kind of analysis is beyond the scope of the report.)

In the insurance discussion, we suggest adding something on incentives—some farm producers may not purchase insurance because they recognize that the government typically provides some form of ex-post disaster assistance. Knowing that this assistance is likely, they lack adequate incentives

68. Received April 3, 00, Distributed to all, Goal 3, P 3
Jesse Aber  
Montana DNRC  
Leona -  

our comments from Billings were not specific enough. The comments are in BOLD & ITALICS following the respective pertinent passage from the draft.

Thanks, once again for coming to Billings with the NDPC hearings. It was nice to meet you also. I know I would have got an earful if I had stayed, with. I did have some good conversations with people at the Ft. Belknap Reservation last fall regarding stock water and pasture conditions. But BIA quit coming in 1994 or so. I need to reach out to them again. Anyway, here are some more comments. I hope that they are not too late - my boss wanted I had a good conversation. She agreed with me that the federal agencies need drought response / planning entity. Other than a mandate from the administration and USDA to encourage and reward proactive drought long-term an extensive policy implementation oversight bureaucracy. It is healthy to review response post-drought to determine effectiveness of response, etc.

Comments from State of Montana – 3/30/2000

Maintain a safety net of emergency relief that rewards good stewardship of natural resources and self help.

CONCLUSIONS

From its findings, the Commission drew the following conclusions.

- The United States would benefit from development of national drought policy with preparedness as its core.
- Comprehensive, proactive drought planning and mitigation measures that incorporate long-term strategies can lessen the impact of drought on individuals, communities, and the environment. They can also reduce the need for future emergency financial and other relief. 

Operative word here is can, the safety net should, in one form or another, remain in place.
through period of transition.

- The people and entities that are likely to receive the greatest share of federal emergency assistance because of drought—that is, farmers, livestock producers, and other rural entities—often have the fewest personnel, information, and financial resources to prepare for and mitigate the potential impacts of drought. True, however the USDA FSA does have adequate personnel to assist farmers – their arms are tied by USDA policy – EPIC, SCAN, UCAN could help these people.

- Individuals, businesses, local/county/state governments, tribes, and nongovernmental organizations with an interest in or responsibilities for drought management—as well as the general public—would benefit from training and technical assistance to plan for and reduce the impacts of drought. In Montana, having the FSA, tribes, Army Corps, and BIA attending meetings would be a good start.

- There are a number of "success" stories in drought preparedness at the individual, local, state, regional, and federal levels that would make excellent models for use in training and technical assistance. True, but the successful efforts in Montana were locally-driven with the federal, state, and county governments partners in support.

- A pooling of federal, state, and local experience, possibly in the form of a handbook on emergency planning, would be a useful tool in helping determine which measures and resources need to be in place to respond to emergencies whose particular causes are unforeseeable. Perhaps at a statewide level, or for a sector such as dryland farming, or municipal water, but not a comprehensive handbook.

- Effective plans should also be designed based on cost and performance and incorporate staged responses to incipient droughts at pre-defined trigger points. Drought-related data can be better marshaled, interpreted, and disseminated to all parties with an interest in drought, including the media and public at large, so that citizens and experts in drought management alike can gain the knowledge they need to help lessen the impacts of drought. We support these criteria.

- Easy access is needed to information on nonfederal and federal programs related to drought monitoring, assessment, and prediction. Effective drought monitoring requires information on climate and water supply conditions, including information on precipitation and temperature, soil moisture, stream flow, reservoir and groundwater levels, and snow pack. Too vague – We need funding for and to expand our NRCS Snotel real-time gauging, USGS minimum streamflow monitoring network that has full, not coop, funding for the best long-term gauges used to monitor drought, and a real-time soil moisture measurement network – all of which are posted on the Internet pages of the respective agencies. For example, Bu Rec’s Agri-Met stations could be linked to USDA or Ag Stats for actual soil moisture and remote precip. Data collection.

- Drought-related research is the foundation of many drought programs and is critical in the production of high-quality innovations that lead to improved drought preparedness and mitigation measures. Yes! Continue to build the database of climatology for reference and use for risk management during climate anomalies.

**RECOMMENDATIONS**

The basic premise of the Commission's recommendations is straightforward: We can reduce this nation's vulnerability to the impacts of drought, and thus reduce the need for
emergency relief, by making preparedness the cornerstone of national drought policy. Investments on the front end in preparedness will save money over the long run.

The goals are:

Incorporate planning, implementation of plans and mitigation measures, resource stewardship, environmental considerations, and public education as the key elements of effective national drought policy.

Forge closer ties among scientists and managers so that scientists understand which monitoring, research, data collection, modeling, and other scientific efforts are needed to reduce drought impacts and improve public understanding of those impacts. Scientists already know what data is needed to reduce impacts – they either have no state forum at which to present the interpretation of data to managers and the media; meet among themselves but do not disseminate the data to the public where mitigation needs to take place, or; lack appropriate means such as watershed groups to which info. And expertise can be channeled.

Develop and advocate comprehensive risk-management strategies into drought preparedness. Maintain a safety net of emergency relief that rewards stewardship of natural resources and self help. See our previous comments; Current FSA programs ironically often punish producers for using self-help, and make payments to those who plant the same crops and let damage accrue each year.

Coordinate drought programs and response.

We recommend that Congress pass a National Drought Preparedness Act, which would establish a nonfederal/federal partnership through a National Drought Council as described in Recommendation 5.1. The primary function of the Council is to ensure that the goals of national drought policy are achieved. We like the follow-through accountability such a body could provide, but they need to check-in at the grass-roots level to determine if policy objectives are being achieved. Without more details, it sounds like another layer of bureaucracy to us.

2. Forge closer ties among scientists and managers so that scientists understand which monitoring, research, data collection, modeling, and other scientific efforts are needed to reduce drought impacts and improve public understanding of those impacts.

Once again, scientists already know what kinds of help or information is needed – but their programs are being cut back at a time when they are needed most, too few of the drought-affected parties know what scientists are doing and where to find their info.; or states located in semi-arid regions, are remiss in not having a clearinghouse for data or a forum, like a drought advisory committee, at which a comprehensive picture of conditions can be presented to resource managers and the media, who are waiting for direction, a story or news. Scientists are waiting to share their knowledge and findings – all that they need is an invitation and a forum for presentation, such as a state drought advisory committee.

The Commission supports drought monitoring/prediction, operational products, and research efforts that make the greatest contribution to improved preparedness and risk management, and, ultimately, to reduced relief payments. Specifically, the NRCS Snotel real-
time network, BuRec real-time reservoir data, USGS real-time streamflow data on a fully-funded drought network for each state, not the coop format which is not a firm enough commitment to long-term drought data on surface water.

5. Coordinate drought programs and response.

The federal drought program is a collection of initiatives run by different departments and agencies. Every analysis of past responses to major droughts notes that these programs need to be better coordinated and integrated. The legislation enabling the National Drought Policy Commission cited this problem and asked the Commission to recommend whether all federal drought preparation and response programs should be consolidated under one existing federal agency and, if so, to identify such agency.

We believe that such consolidation would be impractical and ineffective. Drought affects a wide array of constituents, among them farmers, ranchers, non-farm businesses, tribes, water districts, municipalities, and industry. The federal expertise required to address the needs of these constituents and the impacts of drought on the environment resides in many agencies. The federal agencies currently involved in drought programs report to multiple congressional authorizing and appropriating committees, making it difficult to restructure these authorities appropriately in a timely manner.

In arriving at its recommendations, the Commission considered the consolidation option and three others. The first was a "National Drought Council" similar in composition to the National Drought Policy Commission, but that also includes a representative from the U.S. Department of Energy, a representative from the Environmental Protection Agency, and a nonfederal, nongovernmental environmental representative. This option is too far removed to discuss or address any more than the NDPC already has. The second option was a presidentially created federal drought coordinating body comprised of only federal representatives from the appropriate federal agencies. Like the option #2, this proposal would likely do little to improve drought response. Ask each state how it would like to see federal assistance and respond accordingly. This entity would be directed to coordinate with state and local governments, tribes, regional drought-related entities, and the private sector in carrying out its duties. The third option was to build on existing, less formal models such as the Department of Agriculture's Resource Conservation and Development Councils or the Association of State Dam Safety Officials. Create no more federal councils or committees, just listen to the states and be at the table. This is a state-lead / federal agency follow issue.

We recommend the following:

5.1 Congress should establish a long-term, continuing National Drought Council to coordinate federal and nonfederal interests, needs, programs, and stakeholders. In the interim, we recommend that the President immediately establish a federal agency coordinating group, chaired by the Secretary of Agriculture, to begin appropriate implementation of the recommendations of this report. Once the National Drought Council is created, the federal agency coordinating group should become part of the Council. The Council should either be exempt from FACA or constituted in a way that does not trigger FACA. Primary responsibilities of the Council include:

• Coordinate delivery of existing and new federal drought programs and facilitate appropriate outreach to assure coordination of federal programs with other governmental and non-
governmental entities and all other interested parties.

- Encourage states, localities, and sovereign tribes to coordinate with current regional and state drought planning entities, perhaps within watersheds YES! or river basins, or to establish new regional entities. Members of these planning entities would define their goals and methods of operation. For example, they may decide to establish sub-regions in recognition of specific conditions that may lead to drought in one area of the region, while another area may not experience drought. The Council's role would be to coordinate available assistance to the regions. The Council would collaborate with the governors of all states in each region, appropriate agencies, and interested parties and seek the counsel of university researchers with drought-related expertise.

- Coordinate a periodic in-depth evaluation of federal drought-related programs to determine the degree of customer satisfaction, the extent of gaps that exist between program goals and service delivery, and other circumstances that may hinder effective operation. Sounds appropriate.

- Coordinate development of a detailed implementation plan as soon as practicable. The plan will include specific actions in each of the four program areas (preparedness, information and research, risk management, and emergency relief) and specific steps to maximize customer satisfaction.

5.2 We recommend that the Secretary of Agriculture chair the Council. The Secretary of Agriculture will report to Congress and the President annually on the activities and recommendations of the National Drought Council.

5.3 We recommend that Congress provide federal departments and agencies with appropriate authority and funding needed to support the activities of the National Drought Council and to carry out the recommendations in

69. Received April 8, 00 (a missing attachment from the April 4 e-mail). Distributed to Goal 4, Bullets 2, 3 Page 46-7, 3 P, Page 48; Goal 2, Bullets 8 & 9, Pages 47-8, P 2, Page 48 under Recommendations, No 2 page 48, Goal 5, P 3, Page 48, Bold in No. 5, Page 49. Goal 3,
Ms. Leona Dittus, Executive Director  
National Drought Policy Commission  
USDA/FSA/AO  
1400 Independence Ave. SW., STOP 0501  
Washington, D.C. 20250-0501  

3/29/00

Dear Ms. Dittus:

Thank you for the 3/8/00 Draft: Preparing for Drought in the New Millennium. The FedEx contents, sent by Janice Watkins to my home in Maryland, was a very quick response to my request for a copy suggested by your letter of March 14, 2000.

The 39 page document represents an accurate description in their findings of the present drought situation, concluding that this country can and must do better to prepare for drought in the future. The basic premise: We can reduce this nation’s vulnerability to the impacts of drought, and thus reduce the need for emergency relief, by making preparations the cornerstone of national drought policy, is an excellent recommendation. Also, we strongly support the view that consolidation of current activities would be impractical and ineffective. Also, we support the alternative of creating a National Drought Council, to be chaired by the Secretary of Agriculture.

All other recommendations and goals are also supported, as realistic and needed at very level of drought related responsibilities. We are encouraged that drought has been elevated by this work to an issue requiring more attention. The Soil Conservation Service, exists today partially because of the “Dust Bowl” of the 1930’s. I was honored to serve as their sixth Chief, and at one time in my career had the Great Plains Conservation Program (GPCP) under my jurisdiction. That Program, now merged into the Environmental Quality Incentives Program (EQIP), along with the Agricultural Conservation Program (ACP), by the 1996 Farm Bill, needs more financial and technical assistance funding to meet its demand by landowners with soil and water conservation problems. One activity that should be mentioned in the report is the Snow Survey and Water Forecasting Program. This field work provides estimates of annual water availability from high mountain snow packs and relates to summer steam flow in the Western States and Alaska. Information is used by agriculture,
industry, and cities in estimating future water supplies. This action, each winter by the Natural Resources Conservation Service (NRCS), is strongly endorsed. We commend the mention of the need to complete the Nation’s Soil Surveys as soon as possible. There are other features of the Draft that deserve attention and comments. However, because of the public comment deadline of March 31, 2000, we want to be on record as being responsive to this critical issue.

We appreciated the chance to comment on the Draft.

Best wishes,

Norman A. Berg
Washington Representative, Soil and Water Conservation Society
1200 18th Street NW Suite 800
Washington, D.C. 20036
Ph:202/659-5668
E-mail:nberg@farmland.org

70. Received March 29, 00 Assigned to: Goals 1 & 5, P 2; Goal 2, P 3
DRAFT

REPORT OF THE AGRICULTURE WORKING GROUP

to the

NATIONAL DROUGHT POLICY COMMISSION

11 June, 1999

Washington, DC
To the Members of the National Drought Policy Commission:

This is the draft Report of the Agriculture Working Group. We have attempted, in the short time available to us, to gather as much information as possible on existing laws, programs, etc., primarily at the Federal level. This report also focuses on needs and gaps, but it is by no means an exhaustive list.

We know there is much more information to be added -- from the State, local, and tribal levels -- and that the Commission will uncover much of this in the next few months. However, we hope that this will provide a sound basis for the additional work that will be done by all of us to complete the charge that Congress has given the Commission.

WARREN LEE  PATRICIA GARAMENDI
Co-Chair  Co-Chair
Agriculture Working group  Agriculture Working Group
II. Executive Summary

Concerns about drought underlie the creation of the National Drought Policy Commission (NPDC) by the US Congress. The sections of this report are a first compilation of mainly Federal efforts to deal with drought emergencies for members of the National Drought Policy Commission, newly-constituted under the National Drought Policy Act of 1998 (PL 105-199). It is hoped that this report will form part of the basis of the Commission’s final report to Congress.

Much of this draft report has been structured around the eight critical questions asked by the legislation. A summary of initial needs identified follows.

**Preparedness**

- Improve the accuracy of short and long range weather forecasting.
- Monitor plant stress and soil moisture status more completely.
- Develop a national framework that integrates actions and responsibilities among all levels of government that clearly spells out preparedness, mitigation and response measures to be provided by each entity.
- Develop drought contingency plans at each level of government that includes early detection, monitoring, decision-making criteria, short and long range planning, and mitigation.
- Develop public awareness and education campaigns on drought and water conservation measures.
- Consolidate meteorological, agronomic, and hydrological data to produce an index(s) than can be used in decision making and allocation of available funds.

**Mitigation**

- Programs and policies that provide greater opportunity and incentives to proactively integrate drought planning into day-to-day business decisions thereby reducing the effects of drought and reducing the overall response and recovery costs.
- Incentives for drought mitigation and planning at the local, state and regional levels including educational resources that promote the concepts of drought planning.
- Expanded drought insurance coverage for additional crops
- Train farmers to be more active risk managers.
- Assess if drought mitigation criteria can be incorporated into existing disaster assistance programs.
- Additional research on:
  - Developing new germplasm resistant or tolerant to drought
  - Developing management strategies that effectively exploit available water, increase available water and match new germplasm.

**Response and Recovery**

- Establish a more permanent funding source for response and recovery programs.
Establish a common "trigger" for activating the Emergency Loans, Noninsured Crop Disaster Assistance Program, livestock assistance, tree assistance and dairy assistance programs.

- Change statutory language that requires the producer to choose between benefits available under multiple disaster programs.
- Expand authorities for the Emergency Watershed Program (EWP), Emergency Conservation Program (ECP) and the Tree Assistance Program (TAP).
- Develop a data base of program costs associated with drought and other weather related disasters.

III. Background Information and Current Federal Drought-Related Information

Concerns about drought underlie the creation of the National Drought Policy Commission (NPDC) by the US Congress. The following sections of this report are a first compilation of mainly Federal efforts to deal with drought emergencies for members of the National Drought Policy Commission, newly-constituted under the National Drought Policy Act of 1998 (PL 105-199). It is hoped that this report will form part of the basis of the Commissions final report to Congress. Much of this draft report has been structured around eight critical questions asked by the legislation.

In general, the NPDC's five working groups have been assigned the task of compiling and reviewing laws and programs at all levels of government so that recommendations can be made to plan mitigation as well as improvements in response. The eight issues being addressed by the working are typical of risk management issues for which risk assessment can form a framework for organizing complex information.

**Drought in the United States**

Drought is a reoccurring feature of the American landscape. Although the United States (US) is considered a water-rich county by the international community, about 40% of the US is considered arid, semi-arid, or dry sub-humid. These lands comprise almost half of the continental US west of the 100th meridian, encompassing 17 western states. Drought can occur almost anywhere in the US, and the agriculture and forestry sector is particularly vulnerable to the effects of drought and other weather-related phenomena. There is significant variation in water availability from one place to another and from one year to the next.

Today, government relief for farmers, ranchers, and other landowners affected by drought takes many forms. However, drought relief was not seen as a Federal responsibility until early in the 20th century. The Federal government made its first drought disaster loans to farmers during the wartime emergency in 1918. The first extensive programs for drought relief came during the "Dust Bowl" days of the early 1930s. The Federal government also conducted research and transferred soil and water conservation technologies to landowners to stabilize the soils of the semi-arid Great Plains.

Laws, programs, and agencies have been created by Federal, State, local, and tribal governments in response to droughts that have cyclically occurred throughout the 20th century. The actions supported by these laws and agencies are predicated on concerns that droughts cause unwanted impacts, that they are highly likely to recur,
and that their effects on American society can be severe.

III.1

Section 4(b)(1). "determine, in consultation with the National Drought Mitigation Center in Lincoln, Nebraska, and other appropriate entities, what needs exist on the Federal, State, local, and tribal levels to prepare for and respond to drought emergencies."

A summary of initial needs identified follows.

Preparedness

- Improve the accuracy of short and long range weather forecasting.
- Monitor plant stress and soil moisture status more completely.
- Develop a national framework that integrates actions and responsibilities among all levels of government that clearly spells out preparedness, mitigation and response measures to be provided by each entity.
- Develop drought contingency plans at each level of government that includes early detection, monitoring, decision-making criteria, short and long range planning, and mitigation.
- Develop public awareness and education campaigns on drought and water conservation measures.
- Consolidate meteorological, agronomic, and hydrological data to produce an index(s) that can be used in decision making and allocation of available funds.

Mitigation

- Programs and policies that provide greater opportunity and incentives to proactively integrate drought planning into day-to-day business decisions thereby reducing the effects of drought and reducing the overall response and recovery costs.
- Incentives for drought mitigation and planning at the local, state and regional levels including educational resources that promote the concepts of drought planning.
- Expanded drought insurance coverage for additional crops
- Train farmers to be more active risk managers.
- Assess if drought mitigation criteria can be incorporated into existing disaster assistance programs.
- Additional research on:
  - Developing new germplasm resistant or tolerant to drought
  - Developing management strategies that effectively exploit available water, increase available water and match new germplasm.

Response and Recovery

- Establish a more permanent funding source for response and recovery programs.
- Establish a common "trigger" for activating the Emergency Loans, Noninsured Crop Disaster Assistance Program, livestock assistance, tree assistance and dairy assistance programs.
• Change statutory language that requires the producer to choose between benefits available under multiple disaster programs.
• Expand authorities for the Emergency Watershed Program (EWP), Emergency Conservation Program (ECP) and the Tree Assistance Program (TAP).
• Develop a data base of program costs associated with drought and other weather related disasters.

**Federal level Needs:**

**Department of Agriculture:**

Recently, USDA's Economic Research Service (ERS) published a report, "Managing Risk in Agriculture." To find this report, search on the Internet under http://www.econ.ag.gov. The main conclusions from the USDA-ERS recent risk report, which focuses on the farm-level income risks associated with natural disasters (such as drought), include:

The economic impacts of droughts and other natural disasters can be quite different depending on the supply and demand characteristics for different commodities. For major field crops grown in a wide variety of geographic areas, (for instance wheat), severe drought in specific locations (and hence, low supplies) on increasing prices (as well as price variability) tends to be less than for crops that are produced in narrower geographic areas and that have fewer substitutes (such as lettuce or apples).

In addition to government programs, farmers have many alternative strategies that they can use to manage the risks associated with droughts and other natural disasters. These include diversification, both across different geographic areas and across different types of commodities. A farmer who has both livestock and several crops is less likely to be severely affected by drought, for example, than a farmer who works with a single crop. Also, farmers can use various types of contracting, can hedge in futures markets, etc., to reduce the price risks associated with natural disasters. Cultural practices (such as irrigation and planting varieties with different maturity dates), can help mitigate the income risks associated with drought, and Federal-level programs--such as crop insurance and NAP--are also important.

USDA's Agricultural Resource Management Study (ARMS) is a comprehensive annual survey that recently asked questions regarding risk management. The highest percentage of farms indicated that they would draw upon cash on hand to help mitigate the risks associated with droughts and other natural disasters. Producers in the smallest sales classes (<$50,000) are much less likely to use different tools and strategies (contracting, hedging, diversification) than are larger-scale farmers. This situation has implications for educating producers as to ways to mitigate the income-risk effects of drought--especially smaller-scale farmers. (It's also important to keep in mind that these small-scale farmers are also more likely to rely on off-farm income to a much larger extent than larger farms--which can also help reduce income risk in the face of disasters.)

The income risks associated with droughts and other natural disasters tend to be less in the major growing areas than in peripheral areas of production. In major
growing areas (such as the Corn Belt for corn), low yields tend to be highly correlated with high prices, and vice versa. This relationship works as a *natural hedge* that helps stabilize income (calculated as price * yield) risk. In addition, major producing areas inherently tend to have lower yield risk. Thus, the *peripheral* producing areas tend to have higher inherent income risk, compounded by both higher yield variability and a weaker *natural hedge.* These areas are more likely to be adversely affected by drought, and to realize the greatest impact on farm-level income risk.

Bankers and other lenders are well aware of the risks of drought and the impacts on farm incomes. In risky situations, lenders use various strategies to protect their interests. Lenders in higher-risk areas may charge higher interest rates, be quicker to limit loan amounts, charge special fees, etc. Situations in which government programs are known in advance regarding payouts in drought situations (e.g., crop insurance) are more likely to be more favorably viewed by lenders (and result in more favorable terms to farmers) than those that are ex post and are uncertain as to their implementation.

Research indicates that younger producers are more likely to participate in risk mgt. programs than are older farmers. In addition, participation tends to be positively associated with education, the percent of crop acres on the farm, total farm acres, and the degree of farm leverage.

Needless to say, extended droughts can have a major impact on rural communities. When producers have less money to spend in heavily agricultural-dependent areas, local businesses realize severe impacts in addition to the farmers themselves. This can have implications for not only businesses, but schools and other rural institutions.

**Other Needs Identified by Federal-level Contributors:**

- A federal interagency commission or council should be established for drought coordination with states and regional agencies. This group should determine the federal government's role in drought response and mitigation. They should also seek to focus federal response and information so that states and local governments have access to "one-stop shopping."

- Of family farmers suffering from the effects of drought, only those who are raising traditional row crops meet all eligibility requirements for the existing FSA EM Farm Loan Program. The current FSA EM Farm Loan Program excludes livestock ranchers from qualifying for loans under drought conditions. These ranchers experience pasture grazing and hay production losses during dry conditions. Prudent ranchers increase culling of their basic herd to compensate for decreasing forage availability which results in less calves carried to market and a loss on the sales from culled cows due to over supply. Most area ranchers will not have sufficient grazing and are forced to increase culling thereby flooding the local markets.

- "Future policies should provide greater opportunity and incentives to proactively integrate drought planning into day-to-day business decisions thereby reducing the effects of drought and reducing the overall response
needs to all sectors including: agriculture, water allocation and planning, wildlife and environment".

- "Water conservation measures should not be mandated or applied universally in the absence of specific goals. Rather, water conservation is best viewed as a complement to, not as a substitute for, more traditional water supply development. The objective is the same--to satisfy the needs of water users in the most cost-effective and efficient manner without adversely impacting public health, safety, or the quality of life and the environment".

- "The NDPC should provide specific ideas which Congress could consider in national legislation to encourage the incorporation of incentives for drought mitigation and preparedness at the local, state and regional levels including educational resources that promote the concepts of drought planning". 1

- Drought coverage could be expanded or modified under the existing statutory authorization as long as the risks associated with the modifications were adequately rated for the purpose of maintaining actuarial soundness.

Research issues related to drought mitigation can be broken into two broad questions:

1. How can we efficiently and cost-effectively maintain water input to the production system?

2. How can crops and cropping systems be tailored for efficient and productive use of available water?

Three broad areas of research focus are needed:

1) Development of new germplasm resistant or tolerant of drought conditions.
   a. incorporate traits from existing germplasm into appropriate germplasm
   b. incorporate genes from non-crop plants (naturally drought tolerant) into crop lines
   c. develop novel genes and gene systems that enhance drought resistance or tolerance

2) Management strategies that effectively exploit available water, increase available water, and match new germplasm.
   a. develop management systems that overcome limitations to root growth (e.g., increase soil temperature in cool climates, or decrease soil temperature in warm climates, decreased pathogen infection)
   b. develop systems for enhanced VAM associations with crop plants at low soil water content and high temperature
   c. develop water harvesting strategies to enhance storage of
natural precipitation
d. develop strategies to increase infiltration rates, particularly in soils with low organic matter content

3) Long range (6 to 12 month) warning of below normal precipitation.
   a. develop long range predictions of precipitation and temperature based on cyclic atmospheric events that persist beyond individual seasons (e.g. ENSO, North Atlantic Oscillation, Bermuda high)
   b. collaborate with ongoing global circulation modeling efforts to insure agriculturally relevant parameters are predicted
   c. develop strategies for the use of inter-decadal precipitation cycles in agricultural management

**State Level Needs:**

- Each state needs to develop a drought contingency plan that includes early detection, monitoring, decision-making criteria, short- and long-range planning, and mitigation. Programs addressing public awareness and education on drought and water conservation should also be included.

- "The experience in Texas suggests that additional state and federal resources are needed for drought preparedness, response, and mitigation for small water systems. For example, most small water systems do not understand their vulnerability to drought and most do not have drought management plans. As a consequence, many small systems can find themselves in an emergency situation with little or no advance warning and then respond in an ad hoc manner".2

- The NDMC has determined in talks with all kinds of stakeholders is that a very general definition (such as "a lack of expected water supply") can be appropriate, but that specific definitions need to be applied that are unique to each stakeholder (sector, location, program, etc...). For example, what is "drought" to the governor of South Carolina is going to be different than "drought" to the governor of Nevada. Because of lack of uniformity in definitions, it is critical, then, to have the appropriate triggers established in order to make the necessary decisions. Thus, with triggers, "droughts" can be occurring in both South Carolina and Nevada.

- In Australia, the trigger that is used is that government relief is provided for the "exceptional drought" defined as a 1 in 20 year event (with some additional criteria). There is a need to establish triggers that apply equitably to the agricultural sector of the nation. Should the triggers be regional in focus, or could a program such as FSA have triggers that apply to the entire country? Will the triggers for FSA be the same as the Risk Management Agency (or any other), or is it appropriate to have different triggers. Or should triggers be handled by the states?
Comprehensive mitigation plans should be prepared at all appropriate levels that includes all affected stakeholders and identifies needs. There is a need to determine who the key players are who will develop the plans, their capabilities and needs for technical and financial assistance based on this assessment. Assistance will be dependent on state and local conditions, and expertise; there is no one step fits all approach. It is important to have educational and motivational components of the program to "sell" the need for a strong mitigation effort.

**Local Level Needs:**

- With continued growth of communities, long range planning for water supply needs to be built into day-to-day operation that includes consideration of potential drought issues.

During the National Drought Study, US Army Corps of Engineers (USACE) worked with public and private sectors to garner lessons learned from the California drought. One thing that came through strongly is that if an authority announces "we are in a drought" the public hears that (1)something unusual and important is going on and (2) a public response is needed (or else why would they be saying this on TV?). USACE found over 100 definitions of drought and categorized them during the Drought Study. In the end, one could argue that when the word is used in public or in policy discussions, it should mean there is a problem and the public should be prepared to act. Those definitions can only be made regionally after thorough systems analysis.

- Agricultural water suppliers and users need to have an integrated water management plan that incorporates a drought mitigation plan and conservation programs. They also need an effective State/regional drought mitigation plan and supporting programs which are coordinated, in turn, with a coordinated Federal policy and programs.

**Tribal Level Needs**

Input needed from working groups members of the Intertribal Agriculture Council, DOI-Bureau of Indian Affairs and individual tribes.

**Section 4(b)(2). "review all existing Federal laws and programs relating to drought;"**

A summary of existing Federal-level programs related to drought is presented as part of Table 1.

Additional Information on Laws or Programs Identified by Federal Members include:

Programs with potential use for drought response in USDA's Farm Services Agency (FSA):
Environmental Quality Incentive Program (EQIP)

Emergency Conservation Program (ECP)

Agricultural Conservation Program (ACP)

Conservation Reserve Program (CRP)

Conservation Reserve Enhancement Program (CREP)

Wetlands Reserve Program (WRP)

Noninsured Crop Disaster Assistance Program (NAP)

American Indian Livestock Feed Program (AILFP)

Livestock Feed Programs

- Emergency Feed Assistance Program (EFAP)

Livestock Preservation Donation Program (LPDP)

Cash Feed Grain Donation Program (CFGDP)

Prickly Pear Cactus Burning Program (PPCBP)

Livestock Assistance Program (LAP)

Livestock Indemnity Program (LIP)

Tree Assistance Program (TAP)

Crop Loss Disaster Assistance Program (CLDAP)

Tobacco and Peanuts Program

- The FSA Emergency Loan (EM) Program is available to assist any family farmer who has suffered from any natural disaster. The family farmer must meet all eligibility requirements and have physical and production losses in areas declared by the President, designated by the Secretary, or named for physical loss loans by the FSA Administrator. These eligibility requirements are statutory and contained in the Consolidated Farm and Rural Development Act (ConAct).

The FSA EM Loan Program Regulations, as currently written, are designed to help farmers suffering from any natural disaster. FSA does not have any Farm Loan Program specifically targeted to those farmers suffering from drought. Farmers that raise row crops; are experiencing drought conditions; meet all of the eligibility requirements; and have suffered at least a thirty percent production loss, are eligible for a low interest FSA EM production loss loan of 80% of their actual loss (less any insurance benefits). Farmers whose production comes from trees or other fixture type plants, who suffer from a drought may be eligible for an FSA EM low interest physical loss loan of up to 100% of the physical loss (less any insurance payments).
The interest rate for both of these loans is currently 3.75 percent. The terms for the loans range from 1 to 40 years determined by the security offered.

The USDA Risk Management Agency (RMA) administers the programs of the Federal Crop Insurance Corporation (FCIC) which was established in 1938 as an agency within the U.S. Department of Agriculture. The Federal Agriculture Improvement and Reform Act of 1996 placed personnel and the administration of crop insurance programs under RMA. FCIC’s Board of Directors and the responsibility for establishing crop insurance programs remain under FCIC which is a wholly owned government corporation.

RMA serves the national interest by improving the economic stability of agriculture through a sound system of crop and revenue insurance products. These insurance products are delivered through private crop insurance agents nationwide. Drought is a covered cause of loss on all policies issued under the authority of the FCIC except those established for irrigated practices. For irrigated acreage, the policies cover failure of the water supply (with restrictions) which is often the result of extended drought.

RMA currently insures more than 70 crops in over 3,000 counties across the United States. Coverage is available on about 75 percent of the annual U.S. farm production value. RMA has targeted further program expansion to make coverage available on 95 percent of the value of annual farm production.

In 1998, RMA provided nearly $28 billion of liability coverage on over 181 million acres through approximately 1.24 million policies accounting for about $1.87 billion in premiums. Farmers choose a level of crop insurance. For 1999, a basic 50 percent level of coverage of expected crop yield at 55 percent of the established price is available for an administrative fee of $60 for each crop. This is known as catastrophic risk coverage (50/55) and the premium is subsidized completely by the Federal government. Limited and additional coverage is also available at 5 percent increments up to a maximum of 75 percent of the expected crop yield and 100 percent of the established commodity price based on the amount of risk producers plan to absorb and their own actual production history. This coverage is rated and the producer pays a portion of the premium in addition to the government subsidy. The most widely purchased coverage level is 65/100. In order to encourage participation in the program, all crop insurance premiums are subsidized. Also, agency administrative costs are paid by the Federal government and are not calculated into the premium rate structure.

In the event of crop damage or failure from drought or other covered perils, farmers receive payment equal to the dollar difference between the assessed value of their crop and the dollar value of the amount of insurance coverage selected.

As part of its goal to meet the risk management needs of farmers, RMA has developed and worked with private insurance companies to make several revenue insurance plans available to producers. The Income Protection, Crop Revenue Coverage and Revenue Assurance insurance plans, while differing in their approach, provide a price component to the coverage in addition to the underlying yield coverage.
• The Federal Crop Insurance Act (Act) does not need to be modified to cover drought. Crop insurance is a unique product in relation to most other disaster assistance programs. Unlike other disaster assistance programs, the producer must subscribe to crop insurance in advance of the cause of loss. RMA is carrying out an extensive risk management education program to assist farmers in recognizing their potential for loss, which in drought prone areas would include purchasing adequate insurance to cover potential losses. The Act is currently under review and one of the Administrations proposals deals with multi-year loss occurrences (including drought). Modifications to the Act are expected to provide some relief in this area, which would likely be implemented for the 2000 crop year.

(Bureau of) Reclamation States Emergency Drought Relief Act of 1991

Title I Assistance During Drought

For the 17 USDI-Bureau of Reclamation (USBR) States, only during times of drought by request of Governor or governing body of tribe, the USBR may:

• Undertake on 50/50 cost share basis construction, management, and conservation activities that will minimize losses and damages resulting from drought conditions.

• Provide non-financial assistance to willing buyers in their purchase of available water supplies from willing sellers.

• Purchase water from willing sellers who through conservation or other means have reduced their consumptive demand for water. The water can be used for Federal or state wildlife habitat or sold to recover costs incurred by USBR.

• Make water available and may make USBR facilitates available to store or convey project or non-project water for use within and outside authorized project service areas.

• Make water from USBR projects and USBR facilities available on a non-reimbursed basis for the purpose of protecting or restoring fish and wildlife resources impacted by drought.

• Provide loans up to 15 years to water users for the purposes of undertaking construction, management or conservation activities, or the acquisition and transportation of water.

Title II Drought Contingency Planning

• For the 17 USBR States, for identification of opportunities for water supply conservation, augmentation, and use USBR may:

• Conduct studies to identify opportunities to conserve, augment, and make more efficient use of water supplies available to USBR projects and Indian water resource development in order to be prepared for and better respond to drought conditions.
• Provide technical assistance to States and to local Tribal governments in the
development, construction and operation of water desalinization projects
including technical assistance for assessing technical and economic feasibility.

• Prepare or participate in the preparation of cooperative drought contingency
plans for the prevention or mitigation of adverse drought effects.

• Plans can identify elements appropriate for USBR facilities and non-USBR
facilities.

• In September, 1992, EPA and the U.S. Agency for International Development
(USAID) issued a manual, "Guidelines for Water Reuse." At this time, there are
no uniform national guidelines or standards for water reuse. The 1992
EPA/USAID document reviewed technical issues in planning water reuse
systems, types of reuse applications, water reuse regulations and guidelines in
the U.S., legal and institutional issues, funding alternatives for water reuse
systems, public information programs, and water reuse outside of the U.S.
Included in the document is discussion of agricultural water recycling and
reuse.

Federal Research on Drought and Drought Related Issues

The USDA Agricultural Research Service (ARS) conducts research to develop and
transfer solutions to agricultural problems of high national priority and provides
information access and dissemination to:

  • ensure high-quality, safe food and other agricultural products,
  • assess the nutritional needs of Americans,
  • sustain a competitive agricultural economy,
  • enhance the natural resource base and the environment, and
  • provide economic opportunities for rural citizens, communities, and
    society as a whole.

The Agricultural Research Service is the principal research agency of the U.S.
Department of Agriculture (USDA). ARS is charged with extending the nation's
scientific knowledge across a broad range of program areas that affect the American
people on a daily basis. The agency's work falls into three main categories: Animal
Production, Product Value and Safety, Natural Resources and Sustainable
Agricultural Systems, Crop Production, Product Value and Safety. These are further
divided into 23 broad national programs. All research projects within the agency are
associated with one or more of these national programs. A complete listing of the
national programs is provided on the ARS web site at

TABLE 00. EPA STATEMENT OF PRINCIPLES ON EFFICIENT WATER USE

• In order to meet the needs of existing and future populations and ensure that
habitat and ecosystems are protected, the nation's water must be
sustainable and renewable. Sound water resource management, which
emphasizes careful, efficient use of water, is essential in order to achieve these
objectives.
Efficient water use can have major environmental, public health, and economic benefits by helping to improve water quality, maintain aquatic ecosystems, and protect drinking water resources. As we face increasing risks to ecosystems and their biological integrity, the inextricable link between water quality and water quantity becomes more important. Water efficiency is one way of addressing water quality and quantity goals. The efficient use of water can also prevent pollution by reducing wastewater flows, recycling industrial process water, reclaiming wastewater, and using less energy.

The U.S. Environmental Protection Agency’s (EPA) Office of Water strongly encourages all sectors, including municipal, industrial, and agricultural, to achieve efficient water use.

EPA recognizes that regional, state, and local differences exist regarding water quality, quantity, and usage. Differences in climate, geography, state institutions, and laws favor a prudent approach in which water efficiency programs are tailored for specific locales.

To promote efficient water use, EPA’s primary role is to provide technical assistance and information concentrating on 1) improved management practices, 2) better science, 3) effective planning and coordination, 4) market incentives, and 5) public education.

Section 4(b)(3). "review State, local, and tribal laws and programs relating to drought that the commission finds pertinent;"

Written contributions from Agr. Working Group Federal members include:

- In the U.S., the States have taken various approaches to water reuse regulations; Arizona, California, Florida and Texas have regulations that strongly encourage water reuse as a water resources conservation strategy. Based upon available information (that is current as of March 1992), 19 States have regulations or guidelines for water reuse for food crops and 35 States have regulations or guidelines for water reuse for non-food crops.

- The Federal crop insurance program preempts non-Federal laws and regulations. Through the Risk Management Education program RMA is actively working with Native Americans and other groups to address under served areas.

- Specifically for California- Municipal and Industrial water districts must prepare water shortage contingency plans. Guidebook has been prepared but little technical assistance is available from the state. Agricultural water districts have no similar requirement. Water shortage contingency plans are required of all Federal water contractors in the Central Valley Project but mitigation is not emphasized.

- Specifically for Hawaii- the USDI Bureau of Reclamation can provide planning assistance to the state of Hawaii under the current authorization, but can not provide funding since Title I specifically applies to the 17 Western states on which Hawaii is not included.
Section 4(b)(4). "determine what differences exist between the needs of those affected by drought and the Federal laws and programs designed to mitigate the impacts of and respond to drought;"

Written contributions from Agr. Working Group Federal members include:

- The Farm Service Agency Emergency Loan Program as written and implemented is not adequate to assist most family farmers and ranchers in America who are currently or have recently suffered from the devastating results of drought. Farm Service Agency does not include provisions for a low-interest Farm Loan Program, designed to assist those family farmers and ranchers suffering from a drought, particularly livestock ranchers. Often during a drought emergency ranchers are forced into increased culling. One alternative for the rancher is the purchasing of feed for the cattle. This is very expensive and causes a loss in profits. Another alternative is to keep the same herd size on decreased forage, which will result in much lower calf market weights and percentage of cows settling during the calving heat. This will also result in fewer calves produced in the following year. Unfortunately, all of these alternatives are considered management decisions and therefore the rancher is not eligible for FSA EM loans for drought designated disasters.

- A fundamental issue is drought response time and strategic preparation. Federal and State agencies do not have a plan of coordination developed prior to a drought. Each drought program has different eligibility criteria. Response times vary from one program to the next. Program triggering mechanisms should be standardized.

- Policy needs to be developed to promote drought contingency planning, emphasizing a more proactive, anticipatory approach to drought management.

- There is no standard definition of drought, among all levels of government (federal, state, regional, and local). On the other hand, it would be difficult to identify independent or objective physical criteria that specify when drought conditions exist.

- Drought funds should be shifted from drought relief to drought preparedness and mitigation. We do not have an effective drought risk management program. Farmers and ranchers need to adopt a more self-reliant approach to managing climatic variability. We need to ensure risk management tools are available to all farmers and ranchers to make them more self-reliant.

- A change in policy requires time for communication and change. Farmers and ranchers need to be engaged in the policy process.

There is no national drought plan. The states must develop their own plans for collecting, analyzing and disseminating information on drought conditions. State plans should be linked to the national plan through interagency committee(s) with drought designation responsibility and program administration.

As producers diversify into nontraditional crops and livestock in response to market changes, program flexibility, risk reduction, etc., USDA must assure that non-
traditional commodities, when raised for commercial production, are provided with an adequate safety net.

Provide outreach to small, limited resource and undeserved farmers, who often raise non-traditional crops, to assure all producers have equal access to USDA programs.

A fundamental issue is drought response time and strategic preparation. Federal and State agencies do not have a plan of coordination developed prior to a drought. Each drought program has different eligibility criteria. Response times vary from one program to the next. Program triggering mechanisms should be standardized.

Policy needs to be developed to promote drought contingency planning, emphasizing a more proactive, anticipatory approach to drought management.

Develop a standard definition of drought, among all levels of government (federal, state, regional, and local).

Drought funds could be shifted from drought relief to drought preparedness and mitigation.

Develop an effective drought risk management program. Farmers and ranchers need to adopt a more self-reliant approach to managing climatic variability. We need to ensure risk management tools are available to all farmers and ranchers to make them more self-reliant.

Develop a national drought plan. The states must develop their own plans for collecting, analyzing and disseminating information on drought conditions. State plans should be linked to the national plan through interagency committee(s) with drought designation responsibility and program administration.

- FSA programs dealing with crop losses associated with drought primarily relate to replacing lost income. Funding of such programs are often ad hoc. A more permanent funding source would enable farmers, ranchers, and bankers more financial certainty.

- Enhance programs that the Secretary can authorize when making a Secretarial Declaration by developing an expedited emergency response procedure impacting Emergency Loans, Noninsured Crop Disaster Assistance Program, livestock assistance, tree assistance, and dairy assistance programs. Establish a common trigger that activates all programs. This would require statutory and regulatory change.

- Change statutory language that requires the producer to choose between benefits available under multiple disaster programs.
- Allow producers to collect multiple benefits from multiple programs, and cap the payments at the value of the producer's economic loss.

- Expand authorities under the Emergency Conservation Program (ECP) and the Tree Assistance Program (TAP). Consider such changes as using CCC funds in lieu of an appropriation, provide for permanent authorization of TAP, increase the cost-share under TAP, and authorize tree planting under ECP.
• Train farmers to be more active risk managers.

• Develop a data base of program costs associated with drought and other weather-related disasters. Project program costs associated with drought and reflect in the budgeting process.

• Encourage statutory authority for programs which have been suspended or sunset e.g. livestock feed assistance programs, Indian Acute Disaster Distress Program.

• Encourage Federal, Tribal and State partnerships, including shared program funding, to the maximum extent possible.

• Assess if drought mitigation criteria can be incorporated into existing disaster assistance programs.

• Assure that adequate resources are available to fund and administer programs.

• Using existing technologies to track, verify, model and predict drought, its expansion, contraction and impact on various commodities, agribusiness, families and communities.

• Develop a framework that integrates actions and responsibilities among all levels of government (federal, state, regional, and local). This policy should plainly spell out preparedness, response, and mitigation measures to be provided by each entity.

• Develop a State drought contingency plan that includes early detection, monitoring, decision-making criteria, short- and long-range planning, and mitigation. Programs addressing public awareness and education on drought and water conservation should also be included.

• The drought response authority is very limited for the NRCS Emergency Watershed Protection Program (EWP). A legal analysis is needed of the EWP authority for drought and options considered for its implementation. For example, NRCS may be able to request supplemental community assistance funds when a drought is declared for rural water supply.

• Drought mitigation or response is not emphasized purposes of the new NRCS conservation programs such as EQIP, WHIP, WRP, and Farmland Conservation. Drought needs to be re-emphasized as a potential activity in locally led conservation or on farm planning as alternative practices such as cultivation methods and crops are considered for farm management systems. Conservation practice standards also need to be updated for drought preparation, mitigation, and response concerns.

• The International Drought Information Center conducted a survey in 1992 on how NRCS (formerly the Soil Conservation Service) is "fostering the adoption of drought mitigation measures by farmers, ranchers, rural community residents, and others". Attachment 1 lists the recommendations of forty-four states on what changes in NRCS programs and policies would be most useful.
for improving NRCS ability to help farmers reduce their risk of exposure to drought hazards. The responses range from changes in what NRCS promotes for irrigation management practices to changes in what they recommend for water management for rural communities.

(NRCS2, J.Frost, 5/99)

Attachment 2 lists recommendations of the forty-four states on how NRCS should help farmers and ranchers respond to droughts while preserving environmental quality. These recommendations range from which farm practices help the most to legal/institutional changes that are needed.

(NRCS2, J.Frost, 5/99)

Attachment 3 lists recommendations of the forty-four states on how NRCS could improve and promote its practice standards and assistance activities for drought mitigation. These recommendations range from changes in the emphasis of drought consideration in the planning process to better training of NRCS personnel.

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(EPA, G.Hudiburgh, 5/14/99)

The EPA recommends that there needs to be some discussion of quality of water for various agricultural uses/needs, as well as public perceptions of use of recycled/reused water for agricultural uses/needs.

The Federal government could play an increased role in recycle/reuse of water in agriculture by public education and outreach, and leadership role by use of recycle/reuse water itself in its ag areas. [This last concept is likely something that the US federal government already does.] DOI Bureau of Reclamation has done considerable work in California.

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(RMA1, 5/99)

Producers are adversely affected and currently under protected from multi-year reductions in insurance guarantees due to repeated losses and erosion of producers' historical yields as a result of this decline. As discussed above, this issue will be debated in the current session of Congress.

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(Department of the Interior, USDI Bureau of Reclamation, T. Slavin 5/99)

Stakeholders should be provided with a clear understanding of what federal agency assistance is available. It is important to identify what federal programs exist and how state and local agencies can utilize the assistance while minimizing duplication.

Section 4(b)(5). "collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the
Written contributions from Agr. Working Group Federal members include:

- Develop a national drought policy or framework that integrates actions and responsibilities among all levels of government (federal, state, regional, and local). The policy should plainly spell out preparedness, response, and mitigation measures to be provided by each entity.

- "The activities initiated by the WDCC could be emulated in the remainder of the country as part of a coordinated national effort. With much of the infrastructure already begun through the WDCC's efforts, a national oversight group could provide a clear mandate, management, and resources which would ensure success for a variety of drought related activities on a national level." ¹

- (Coordination, rather than oversight, may be what is needed so that the existing Federal and state agencies and private sector organizations may be able to function more efficiently.)

- "The WDCC recommends that the National Drought Policy Commission (NDPC) consider linking the national oversight group to regional groups for program delivery. Drought and other water issues have greatly different physical characteristics, impacts, political response mechanisms, and thus informational needs, from region to region. These regional perspectives should utilize existing institutions such as the Regional Climate Centers." ¹

- "NDPC should support the establishment of a statutorily designated lead federal agency, adequately funded, that would coordinate communication and cooperation among the various regional groups, to ensure an absence of duplication and the encouragement of complimentary actions including establishment of a clearing house, with possible regional sub-sections". ¹

- The Commission should give consideration to implementation of recycle/reuse guidelines for ag on a river basin or watershed basis; the needs for and eventual end uses of the water can and does vary in different river basins and watersheds.

- The Commission should assess the need to become more active in promoting risk management and the crop insurance program as a means of mitigating the economic impact of drought.

- Different entities including water user authorities, tribes, resource conservation districts etc. can be effective players in developing and implementing drought preparedness, response and mitigation efforts.

Other written contributions from Working Group Federal members on those
questions which must be answered by the Commission included:

**SECTION 4 (B) 6 Options to Recommend how Federal drought laws and programs can be better integrated with ongoing State, local, and tribal programs into a comprehensive national policy to mitigate the impacts of and respond to drought emergencies without diminishing the rights of States to control water through State law and considering the need for protection of the environment.**

(USDA_FSA/DAPHE B. Karmen 6/99)

USDA is building the capability to warehouse geospatial information on the nation's farm and ranch land. The data will include land use information, such as soils, crops, wetlands, easements, conservation practices, watershed boundaries, and many others. Once collected, this information could be a valuable tool to support analyses of the economic impact that droughts could have in defined areas. Real time weather data could also be overlayed on the geospatial data to serve as an early warning diagnostic tool and to identify mitigation opportunities. This capability will become available in increments over the next seven years and will likely evolve into a critical information sharing opportunity for the public and private sector.

Organizations such as the Western Governors Association Task Force on Drought and the NDPC are vital organizations which can drive change to assure common responses and policy before the impacts of the drought become critical.

An organizational structure similar to the NDPC could be established within the varied Departmental organizations to assure USDA speaks with a common voice in response to all disaster events.

As applicable, provide Federal assistance in conjunction with and through State, local, and tribal programs on a grant or cost share basis.

(NRCS2, J.Frost, 5/99)

Incentives should be established for some types of Federal drought preparation and mitigation programs. Federal drought assistance could be larger or have more favorable cost shares for states, conservation and water districts, private land owners, and other entities that have adopted drought plans or included drought as a primary resource concern to consider during planning.

NRCS needs to include drought preparation, mitigation and response on an equal basis with other resource concerns or purposes in its area wide conservation and watershed planning and on farm planning. NRCS needs increased funding for conservation technical assistance for droughts during these planning activities. This assistance should include updating practice standards for drought, increasing the use of water resource analysis tools, and obtaining better crop management tools for droughts.

(EPA, G.Hudiburgh, 5/14/99)

Drought policy should be implemented on a watershed basis because of the innate advantages of this approach and because of the growing trend toward watershed management in the U.S. The policy should integrate research, planning,
management, and sustainable development. Principles of social equity, environmental protection, and participatory decision-making should be stressed in drought mitigation and response programs. More emphasis placed on mitigation programs than is currently the case.

(Department of the Interior, USDI Bureau of Reclamation, T. Slavin 5/99)

The following are desired outcomes:

1. Insure preparation of Drought Mitigation Plans at all pertinent levels including state, public agency and on-farm.

2. Insure that planning entities and end users have access to state of the art drought forecasts in order to optimize drought response efforts.

3. Insure that drought response is consistent with overall state, tribal and local land use policy and should be careful not to reward individuals who do not conform to those land use policy.

SECTION 4(B) 7 Options to recommend improving public awareness of the need for drought mitigation and prevention; and response on developing a coordinated approach to drought mitigation, prevention, and response by governmental and non-governmental entities, including academic, private, and nonprofit interests; and,

(USDA_FSA/DAPHE B. Karmen 6/99)

Provide coordinated (Federal, State, local, and tribal) public service programs regarding the availability of water (surface and ground), the effects of heat on all aspects of the environment, and the availability of government programs to mitigate the effects of drought. Train farmers to be more active risk managers.

Provide federal funding for the National Drought Mitigation Center to assist states with drought preparedness, planning, and mitigation. This center should serve as a clearinghouse for information on mitigation, planning, and preparedness activities; provide a regional/national climate monitoring system; and develop a national/regional database of state drought response resources.

(NRCS2, J.Frost, 5/99)

Increase drought educational material available to conservation partners such as conservation districts, Resource Conservation and Development Councils and state organizations. NRCS state offices need to establish communication plans to encourage voluntary planning for droughts by private land owners.

(EPA, G.Hudiburgh, 5/14/99)

Public awareness and support is critical for agricultural water suppliers and users to successfully implement recycle/reuse. Included in this effort is the need for education of the safety of agricultural products through use of water that meets minimum standards. [This is in no way an attempt by EPA to impose upon any Indian Tribe recycle/reuse requirements inconsistent with any Tribal cultural and/or religious beliefs.] The Federal government, States, and Tribes can assist by coordinating their
information dissemination efforts.

Well-recognized national clearinghouse is important. The National Drought Mitigation Center is well suited to this role and should be duly supported. It will also be of value to maintain and establish strong state lead information sites as part of this program.

**SECTION 4(B)8 Options to Recommend whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency.**

USDA FSA believes that it would be advantageous to have one Federal agency coordinate implementation of Federal drought mitigation and response activities. The possibility of establishing a superfund for drought related assistance should be explored.

Establish a multi departmental group similar to the Federal Emergency Management Agency (FEMA) long term recover task force, for drought coordination with states and regional agencies. This group should determine the federal government’s role in drought response and mitigation. They should also seek to focus federal response and information so that states and local governments have access to "one-stop shopping".

Identify the available family of Federal programs which can be activated as the severity as a drought deepens.

Assure programs are offered in a coordinated, non duplicating manner.

Establish a central USDA point of contact where producers and other Federal and State agencies can obtain accurate and timely information on available assistance. (Drought assistance is offered under several USDA programs.)

Issue status and action reports as a drought deepens and expands.

It would be very difficult to consolidate all Federal drought preparation and response programs under a single Federal agency. Many programs are integral components of larger programs that have other purposes, sponsors, participation rules, and methods of delivery. Two examples are the many purposes besides drought that are served by water management practices on farms and operating rules of dams. Droughts are identified and responded to in different ways for various water users such as communities, industry, navigation, agriculture, recreation, and environment. The methods for monitoring and determining when there is a drought differs for each of these water users. Agriculture drought occurs when crops cannot utilize the soil moisture or farmers can no longer make a profit.

It would be useful to have a Federal agency as a single point of contact or coordinator for Federal agencies with drought responsibilities. Agency
representatives could serve for two years on a core drought response staff at the single Federal agency. Special drought teams could be assembled for responding to major droughts once they are declared or a separate team could be on call for each region of the country. The type of impacts of each drought—municipal and industrial, agriculture, environment, and transportation—would determine which agencies/programs would send its people to each team.

It would be very useful to collect a core group of response programs under a single agency. These programs would be aimed at similar types of water users and droughts such as agriculture and rural water supply. This would allow more efficient and effective coordination among these programs 1) drought declaration formulas, 2) data collection and interpretation, 3) response teams, and 4) cost sharing formulas.

(EPA, G.Hudiburgh, 5/14/99)

The Federal drought program in the 17 Western States should be consolidated under the Department of Interior. The drought program for the remaining States should be consolidated under the Department of Agriculture. All programs should be reoriented on a watershed basis.

(Department of the Interior, USDI Bureau of Reclamation, T. Slavin 5/99)

The federal agencies are structured and staffed to interact with different constituencies. For instance the U.S. Bureau of Reclamation works primarily with water districts and tribes and has programs and authorities to assist those entities. The USDA's National Resource Conservation Service has historically targeted on-farm concerns with programs and authorities to meet the individual farmers needs. To house all programs under one agency umbrella would not be effective in delivery all federal assistance because the specific agencies have unique expertise and relationships with specific stakeholders which allows them to best implement the drought programs they have been authorized to carry out.

However, many of these programs have areas of duplications and do require coordination. This could best be handled by naming a lead agency to coordinate efforts and determine where deficiencies exist and additional programs should be developed.

**SELECTED REFERENCES**


APPENDIX A. List of Acronyms Used in This Report

ARS Agricultural Research Service, USDA
BOR USDI Bureau of Reclamation (see also USBR)
EPA US Environmental Protection Agency
FSA Farm Services Agency, USDA
FS Forest Service, USDA
NRCS Natural Resources Conservation Service, USDA
USBR Bureau of Reclamation, USDI (see also BOR)
USDA US Department of Agriculture
USDI US Department of the Interior

APPENDIX B. List of Federal Members of the Agriculture Working Group

(See list preceding the report)

APPENDIX C. List of Federal Research on Drought-Related Problems

US DEPARTMENT OF AGRICULTURE

Agricultural Research Service. Included below is a less than exhaustive list of ARS research projects relating to drought. (A more complete list is being developed.):

Project Name: DEVELOPMENT OF SOYBEAN GERMPLASM AND PRODUCTION SYSTEMS FOR HIGH YIELD & DROUGHT PRONE ENVIRONMENTS

Project # 3607-21000-004-00D; Mode Code 3607-15-00

Midwest Area - Corn & Soybean Research

Principal Investigator: RICHARD COOPER

Williams Hall, OARDC, Room 218

1680 Madison Avenue

Wooster, OH 44691-4096
OBJECTIVES: Identify physiological/genetic constraints to higher soybean yields and develop germplasm and production systems that will maximize the biological efficiency of soybeans when grown in highly productive, irrigated environments, and in low-yielding, drought-prone environments, within the constraints of maintaining the quality of the environment.

APPROACH: In addition to normal agronomic traits, important physiological traits such as photosynthesis, plant water status, nitrogen status and cold tolerance will be measured to identify genetic, environment and management effects. This knowledge will be used to develop soybean germplasm with specific adaptation to high yielding and drought prone environments, and in the evaluation of management systems to increase soybean yields. Disease, insect and nematode resistance will be incorporated into elite germplasm lines. Water quality will be monitored in the high yield, high input system to ensure water quality is being maintained.

Project Name: PHYTOCHEMICAL RESPONSES TO ENVIRONMENTAL STRESS: IMPLICATIONS FOR GLOBAL CHANGE AND NUTRITION

Project # 1270-11210-006-00D; Mode Code 1270-25-00

Beltsville Area - Natural Resources Institute - Climate Stress Laboratory

Principal Investigator: BRITZ, Steven J

BLDG 046A BARC-WEST

10300 Baltimore Blvd.

Beltsville, MD 20705-2350

Voice: 301-504-5607; Fax: 301 504-6626; E-Mail: sbritz@asrr.ars.usda.gov

OBJECTIVES: Identify the effects, separately and in combination, of atmospheric CO2, solar radiation, air quality, temperature, soil moisture and mineral content on a suite of phytochemical compounds. Evaluate the role of these compounds in the tolerance/resistance of crops to chronic and acute environmental stress under ambient and expected future levels of atmospheric CO2. Evaluate the implications of environmental stress and global change on the phytonutrient content of crops.

APPROACH: Interactions between atmospheric CO2 levels and multiple environmental stresses (both chronic and acute) will be investigated in controlled environments or open-top chambers in the field, adjusting or monitoring atmospheric CO2, soil moisture and pH, mineral nutrition, actual or simulated solar radiation, temperature, and air pollutant levels. A range of crops will be studied, including soybeans, wheat, forages, green leafy vegetables, cucumbers, tomatoes, and small fruits. Important phytochemical constituents including ascorbic acid, dehydroascorbic acid, carotenoids, flavonoids, sterols, and fatty acids, will be extracted from seeds, fruits or leaves, analyzed enzymatically or by HPLC, and inventoried for a range of environments. Antioxidant properties of specific compounds will be assayed to
assess qualitative and quantitative changes in composition. Stress-tolerant/resistant lines of crops will be compared to sensitive ones to evaluate the significance of differences in phytochemical composition. Effects of environment on biosynthetic pathways will be evaluated.

Project Name: **AGROFORESTRY SYSTEMS FOR THE APPALACHIAN REGION**

Project # 1932-21610-001-00D; Mode Code 1932-05-00

North Atlantic Area - Appalachian Farming Systems Research Center

Principal Investigator: Carol Schumann

1224 Airport Road

Beaver, WV 25813-9423

Voice: 304-256-2832; Fax: 304-256-2921; E-Mail: cschumann@afsrc.ars.usda.gov

**OBJECTIVES**: To evaluate the coupled production of trees and understory species to optimize the economic and environmental integrity of Appalachian farms. Specifically: 1) Develop tree/forage/specialty crop systems with emphasis on filling high value niche markets and providing raw materials for associated value added enterprises, and 2) Determine competitive and synergistic mechanism by which agroforestry systems partition sunlight, nutrients, and water for developing improved management strategies.

**APPROACH**: Various tree species of interest will be planted on appropriate pasture sites that vary in soil type, soil depth, landscape position and elevation. Forested sites will be thinned or cleared in narrow east-west strips and managed for high value understory specialty crops. Growth by tree species and understory species will be evaluated to determine optimal tree density for various soil and microclimate site characteristics. Water, solar radiation and nutrient budgets will be analyzed on a temporal and spatial basis to identify opportunities to increase the productivity of these species diverse agroforestry systems. Particular attention will be given to the impact of tree utilization of water and cycling of nutrients from depths below the availability range for understory species. In addition to studying the dynamics of resource competition, allelopathic and synergistic effects will be analyzed to develop a species compatibility rating system. Attention will also be paid to species combinations that facilitate natural biological suppression of pests and diseases.

Project Name: **IDENTIFYING AND MANIPULATING DETERMINANTS OF PHOTOSYNTHATE PRODUCTION AND PARTITIONING**

Project # 3611-21000-010-00D; Mode Code 3611-30-00

Midwest Area - Photosynthesis Research

Principal Investigator: Donald Ort

1201 W Gregory Dr. Rm. 148
OBJECTIVES: The research effort will be focused in three major areas. I. Regulation of partitioning and determinants of sink strength; II. Environmental limitations on photosynthetic performance/productivity; III. Limitations in resource acquisition and allocation in transgenic plants engineered to produce novel products or overproduce natural products.

APPROACH: The scope of this Research Project is broad, containing several distinct projects, requiring application of diverse theories and the use of a wide range of techniques and methodologies. Required techniques, procedures and methodologies include: a wide range of biochemical isolations of cellular components, conventional and kinetic absorption and fluorescence spectroscopy, procedures for measuring photosynthesis in intact leaves, in isolated chloroplasts and in an array of subchloroplast membrane preparations, ion specific and polarographic electrodes, computer analysis of kinetic data, nucleic acid and protein blotting, in vitro mRNA translation, nuclear run off transcription, antibody production, enzyme kinetics, plant genetics, yeast genetics, plant transformation, and organic synthesis. Certified by U of I IBC for Biosafety Level 1 on May 12, 1998 for work in rooms 196 and 77 ERML. CRIS project covering all work in Research Unit was determined to be 10 percent of effort in biotechnology after consolidation of 3 CRIS(s) into 1.

Project Name: INTEGRATED CONTROL OF ASPERGILLUS FLAVUS AND AFLATOXIN IN THE MIDWEST CORN BELT

Project # 3620-42000-015-00D; Mode Code 3620-35-00

Midwest Area - National Center for Agricultural Utilization Research - Bioactive Agents Research

Principal Investigator: Donald Wicklow

NCAUR-ARS-USDA

1815 N. University St. Room 3204

Peoria, IL 61604-3999

Voice: 309-681-6243; Fax: 309-681-6686; E-Mail: wicklodt@mail.ncaur.usda.gov

OBJECTIVES: Control Aspergillus flavus infection and aflatoxin contamination of preharvest corn in the midwest through an integrated approach to disease management.

APPROACH: Identify structural, chemical and biochemical resistance factors in corn; develop diagnostic methods enabling breeders to monitor the transfer of resistance factors; determine if resistance factors are altered by drought/temperature stress; investigate naturally occurring, non-aflatoxin producing A. flavus populations and
necrotrophic yeasts in preventing aflatoxin contamination; develop control strategies for sap beetle vectoring of A. flavus; incorporate data on weather, corn insects, A. flavus populations and corn hybrid susceptibility to produce a predictive model. NCAUR, Peoria, IL, BAR Labs, Rms 2302, 2304, 2312, 2318; BL-1; IBC Recertified, 3/11/98.

Project Name: **GERMPLASM IMPROVEMENT AND AGRONOMIC DEVELOPMENT**

**OF NEW ALTERNATIVE INDUSTRIAL CROPS**

Project # 5344-21410-002-00D; Mode Code 5344-20-10

Pacific West Area - U.S. Water Conservation Laboratory - Environmental and Plant Dynamics Research

Principal Investigator: Francis Nakayama

4331 E Broadway Rd

Phoenix, AZ 85040-8832

Voice: 602-379-4356; Fax: 602-379-4355; E-Mail: fnakayam@uswcl.ars.ag.gov

**OBJECTIVES:** Acquire and characterize germplasm of guayule, lesquerella, vernonia, and other promising new, alternative crops. Evaluate and enhance germplasm of new crops for industrial raw materials. Develop knowledge of floral biology and seed production and plant responses to stresses. Develop economical cultural and production systems for new crops under various conditions. Develop methods for efficient guayule latex extraction and seed oil analyses for characterizing latex, resin, and oil properties.

**APPROACH:** The evaluation and improvement of new-crop germplasms will be conducted concurrently with the development of appropriate crop production practices. Since timetables are difficult to conduct for new crops, frequent reviews for achieving the objective will be conducted and appropriate changes made to maximize efficient use of personnel and resources. Replaced 5344-21410-001-00D (10/95).

Project Name: **MOLECULAR AND PHYSIOLOGICAL TECHNIQUES FOR IMPROVING SEMIARID RANGELAND AND PASTURE PLANTS**

Project # 5428-21000-006-00D; Mode Code 5428-10-00

Northern Plains Area - Forage and Range Research

Principal Investigator: N.J. Chatterton
**OBJECTIVES**: Develop knowledge of C and N metabolism; using molecular techniques identify genetic markers and define processes limiting photosynthesis, carbohydrate partitioning, nitrogen assimilation, seedling vigor, persistence and production in forage plants exposed to environmental stresses; determine relationships between plants and parasitic nematodes; translate new knowledge into efficient screening procedures. Develop improved plants for enhanced conservation, water quality, and forage production.

**APPROACH**: Key traits and metabolic processes of range and pasture plants, including carbon isotope discrimination, drought tolerance, salt tolerance, assimilate partitioning, plant competition, grazing tolerance, cool temperature growth, seedling establishment, plant persistence, rooting characteristics, nutrient uptake and assimilation, and resistance to nematodes will be measured, studied (including molecular approaches), and used to evaluate and select improved plant materials. Research will be effected in a cooperative germplasm enhancement effort with plant geneticists and breeders. Knowledge of biochemical and physiological mechanisms will be used to develop new and more efficient selection criteria for effective germplasm improvement. Plant responses to environmental stresses and resistance to nematodes will be modified through breeding and selection to provide plants better adapted on the millions of acres of parklands/recreational areas and semiarid rangelands in the western U.S. Logan, UT, FRRL Lab, Rms 110, 117&23. Code: BL-19/7/97

Project Name: **GERmplasm Collection, Evaluation, Enhancement and Breeding of Plants Adapted to Semiarid Regions**

Project # 5428-21000-007-00D; Mode Code 5428-10-00

Northern Plains Area - Forage and Range Research

Principal Investigator: Kay Asay

696 N 1100 E

Logan, UT 84322-0000

Voice: 435-797-3069; Fax: 435-797-3075; E-Mail: KHASAY@cc.usu.edu

**OBJECTIVES**: Evaluate genetically diverse germplasm. Apply breeding and molecular procedures to develop improved grasses and legumes for resource conservation, low-maintenance turf and grazing by wildlife and livestock on semiarid rangelands and irrigated pastures. Utilize cytological and molecular technology to
develop genetic markers and gene maps for range and pasture species, and to effect intergeneric genetic exchange and fix gene combinations to maximize heterosis in grass/cereal species.

**APPROACH:** Collect germplasm throughout temperate rangelands of North and South America, Europe, and Asia to establish a biologically diverse germplasm base. Important germplasm will be evaluated and characterized. Hybridization, induced polyploidy and unique laboratory and field screening procedures will be used to develop germplasm and cultivars for temperate semiarid rangelands and irrigated pastures with improved nutritional qualities, water-use efficiency, productivity of forage and seed, seedling vigor, drought stress, grazing potential during the late fall and winter, resistance to biotic and abiotic stresses, and reduced anti-quality potential. Drought-resistant grasses will be developed for low-maintenance turf and conservation in water-limited environments. Molecular techniques will be used for cultivar identification and to mark and map genes conditioning important traits. Genetic introgression with perennial Triticeae will be pursued to fix superior gene combinations in cereals and rice. Biotech: Logan, UT; FRRL, RM121&122; Code# BLP-1 9/7/97.

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**Project Name:** LOW RISK MANAGEMENT STRATEGIES FOR SUSTAINING RANGELAND AGRICULTURE IN THE NORTHERN GREAT PLAINS

**Project #** 5434-11210-003-00D; Mode Code 5434-05-00

Northern Plains Area - Range and Livestock Research

Principal Investigator: Marshall Haferkamp

Ft. Keogh LARRL

Rt. 2 Box 2021

Miles City, MT 59301-9202

Voice: 406-232-8211; Fax: 406-232-8209; E-Mail: marshall@larrl.ars.usda.gov

**OBJECTIVES:** For the mixed grass prairie in the Northern Great Plains quantify role of rangelands & management in regulating atmospheric carbon dioxide flux; identify ecological mechanisms and quantify impact of livestock grazing on long-term sustainability; quantify role of planted forages on ecological & economic sustainability of beef cattle industry; & elucidate interaction effects of soil water & nitrogen on herbage production & plant species composition between indigenous perennial & alien annual grass species.

**APPROACH:** Field-laboratory studies will evaluate how plants respond to grazing and environmental stress. Role of rangelands and management tactics in regulating atmospheric carbon dioxide flux will be assessed by measuring temporal changes in plant biomass, soil organic matter and water, and carbon dioxide fluxes with both a Bowen-Ratio Unit and 1m**3 chambers. Long-term impacts of environment on
ecological condition will be assessed by evaluating changes in plant species composition inside and outside livestock exclosures and evaluating changes in herbage production and rooting dynamics with short-term droughts applied with a rain-out shelter. The potential role of planted forages will be studied by monitoring herbage growth dynamics, cattle diets, & weight gains. Plant and community responses to interactions of varying levels of soil water and nitrogen will be assessed in field and greenhouse studies by measuring plant water relations, phenological development, and above- and below- ground biomass production at selected time intervals.

Project Name: **GENOMIC RELATIONSHIPS AND GERMPLASM ENHANCEMENT OF WHEAT BY CLASSICAL AND MOLECULAR TECHNIQUES.**

Project # 5442-21000-017-00D; Mode Code 5442-05-25

Northern Plains Area - Red River Valley Agricultural Research Center - Cereal Crops Research

Principal Investigator: Prem Jauhar

Northern Crop Science Lab

1307 N 18th ST

Fargo, ND 58105-5677

Voice: 701-239-1309; Fax: 701-239-1369; E-Mail: jauharp@fargo.ars.usda.gov

**OBJECTIVES:** Improve wheat germplasm through the transfer of desirable traits, including disease resistance, salinity resistance or tolerance, drought tolerance, and improved quality, to wheat from the Triticeae grasses; improve techniques for making wide crosses within Triticeae; and provide a better understanding of genome relationships, gene introgression, and fertility restoration in wide crosses; wheat germplasm enhancement by direct introduction of alien genes by biolistics.

**APPROACH:** Conventional and improved procedures will be used to produce interspecific and intergeneric hybrids of wheat and related Triticeae species. Growth regulators, embryo rescue, appropriate culture methods, chromosome doubling techniques, and appropriate crossing, backcrossing, and selection procedures will be used to facilitate production of wheat plants with desirable alien genes. Cytogenetic procedures will be used to verify production of hybrids and study chromosome pairing, and provide information on genome relationships. Derived amphiploids will be evaluated for meiotic regularity and reproductive stability and used for further breeding and selection experiments. Diploid and tetraploid species of Triticeae will be intercrossed to produce hybrids and amphiploids for use as bridges in crosses with wheat. Wheat germplasm enhancement will also be effected by direct introduction of alien genes into regenerable scutellum callus using microprojectile bombardment.

Project Name: **DEVELOPMENT OF INTEGRATED AND SUSTAINABLE FORAGE-**
OBJECTIVES: Quantify plant and soil processes that affect forage establishment, nutritive quality, and productivity, and plant responses to temperatures, drought, global climate change, soil nutrients, diseases, and other stresses that determine the sustainability of forages. Develop management practices that incorporate improved forage germplasm and reduce competition from weeds into dryland forage-crop-livestock systems that will provide high quality forage over an extended grazing period.

APPROACH: Study response of improved grass cultivars to soil water and N in a rain shelter by evaluating water use-efficiency, nutritive value, plant development using growth stage scales and agronomic and physiological attributes. Evaluate the effect of management practices imposed on grasslands on the global carbon balance using the carbon dioxide Bowen ratio energy balance technique to measure carbon dioxide fluxes over time. Study leafy spurge control through multispecies (cattle and sheep) grazing. Evaluate the dynamics of the soil seedbank of weedy species in development of weed management strategies for crop and forage systems. Graze improved and native pastures with yearling steers in a free choice design to evaluate animal selection preference, forage utilization, animal performance, stand persistence, and seasonality differences. Evaluate the use of improved pastures, native rangeland and annual crops for use in managing for an integrated and sustainable forage-crop-livestock approach.

Project Name: IMPROVEMENT OF FORAGE GERMLASM FOR CONSERVATION & FORAGE-LIVESTOCK SYSTEMS IN THE NO. GREAT PLAINS
OBJECTIVES: Develop forage germplasm with improved establishment capability, nutritive quality, drought resistance, and disease resistance for use in crop-forage-livestock systems in the Northern Great Plains. Develop methods to incorporate improved forages into management systems that will supply high quality forage over an extended grazing season, increase profitability, and protect the natural resource base.

APPROACH: Select among and within half-sib families of important cool-season grasses and dryland alfalfa for seedling vigor, nutritive quality, drought resistance, and disease resistance. Develop and test methods for incorporating improved grass and alfalfa germplasm into dryland crop-forage-livestock systems. Monitor the effects of temperature, soil water, and soil mineral levels on extent and rate of digestion and on fiber and mineral concentrations of improved forage germplasm throughout the grazing season. Evaluate effects of soil water and N on growth and development, nutritive quality, rooting depth, plant gas exchange, water relations, and C-13 carbon isotope discrimination on tetraploid Russian wildrye and other elite forage germplasm using a field rain shelter. Describe seedling morphology and crown placement for different forage species and cultivars. Continue development of effective screening techniques for resistance to plant pathogens causing major disease damage to forages, particularly pathogens causing root rot diseases.

Project Name: DEVELOPMENT OF COTTON GERMPLASM WITH IMPROVED TOLERANCE TO ABIOTIC STRESSES

OBJECTIVES: To conduct fundamental and applied research to develop cotton germplasm, through traditional, novel molecular and biotechnological approaches, that can maintain productivity under stressful abiotic environments and the biotic stresses associated with them.

APPROACH: 1) To access procedures to improve the transformation of cotton for germplasm expansion and to reduce the varietal specificity of the current protocols; 2) to evaluate the role of glycine, betaine and other metabolites in osmoprotection
and nitrogen status of cotton and biotechnologically assess alterations in such compounds; 3) to produce gene constructs to determine the efficacy of rehydrins in extending drought tolerance limits for cotton; 4) to alter the lipid composition of cotton root plasmamembranes to improve chilling tolerance and resistance to seedling diseases. IBC recertification 02-19-98 by Jeff Velten.

Project Name: FORAGE GERMPLASM DEVELOPMENT FOR INCREASED SUSTAINABILITY OF AGRICULTURAL AND RANGELAND ECOSYSTEMS

Project #: 6216-11210-004-00D; Mode Code 6216-05-00

Southern Plains Area - Rangeland and Pasture Research

Principal Investigator: Chester Dewald

2000 18th St
Woodward, OK 73801-0000

Voice: 580-256-7449; Fax: 580-256-1322; E-Mail: cdewald@ag.gov

OBJECTIVES: Develop enhanced forage and grain producing eastern gamagrass and big and sand bluestem cultivars for improved pastures and to complement native rangeland. Develop Texas bluegrass lines and interspecific hybrids with Argentine and Kentucky bluegrass for improved mode of reproduction and quantity and quality of cool-season forage. Select, characterize, and map genes controlling apomixis in Eastern gamagrass and develop methods for their transfer to other grasses and crops.

APPROACH: The overall approach is to identify germplasm with desirable traits, to expand the limits of germplasm variation by wide hybridization utilizing interspecific and intergeneric introgression and genetic manipulation, to evaluate and select superior genotypes, and then release superior germplasm and improved cultivars. A broad-base germplasm collection of eastern gamagrass, big and sand bluestem, and Texas bluegrass are maintained at the Southern Plains Range Research Station at Woodward, OK. Facilities include a 35 x 40’ breeding chamber, 5000 sq. feet of glass house space, a cytological-molecular laboratory equipped with light and fluorescent microscopes, karyotyping work station - densitometer imaging system and RFLP, RAPD-PCR accessories, sterile laminar flow hood, four growth chambers, a -80 C freezer, and ample acreage for field trials and nurseries. This research will involve basic agronomic, physiology, genetics, cytogenetics and molecular biology studies.

Project Name: BIOCHEMICAL, PHYSICAL, MICROBIOLOGICAL MANAGEMENT
FOR PREVENTION OF MYCOTOXINS IN PEANUTS

Project # 6604-42000-005-00D; Mode Code 6604-05-00

South Atlantic Area - Peanut Research

Principal Investigator: Joe Dorner

1011 Forrester Drive, S.E.
Dawson, GA 31742-0000

Voice: 912- 995-7408; Fax: E-mail:

OBJECTIVES: Develop technology to prevent/control mycotoxin (especially aflatoxins) contamination of peanuts by further evaluation of the nature of natural resistance and the role of peanut phytoalexins in natural resistance; development/refinement of biological control agents such as non-aflatoxigenic strains of A. flavus and A. parasiticus as biocompetitive agents for preharvest control; development/evaluation of other management strategies; further refinement of postharvest removal/cleanup systems.

APPROACH: Previous studies in our environmental control plot facility using individual plant aflatoxin analysis have shown differences in resistance/susceptibility between certain peanut germplasm. Additional studies to further identify drought resistant germplasm will be conducted. Collaborative studies with peanut breeders to utilize these resistant lines in the development of commercially acceptable aflatoxin resistant genotypes will be continued. Studies using biocompetitive agents have shown a high degree of promise. Additional biocompetitive agent studies will be conducted to refine this technology for commercialization. An existing expert system (aflatoxin early warning system) for predicting the occurrence of preharvest aflatoxin contamination is in the final stages of refinement; another system is under development. Other appropriate preharvest/postharvest prevention strategies will be developed and tested as these become apparent.

Project Name: ENVIRONMENTAL STRESSES, PHYSIOLOGICAL RESPONSES AND PRODUCTIVITY

Project # 6615-12210-001-00D; Mode Code 6615-20-00

South Atlantic Area - Crop Genetic and Environmental Research

Principal Investigator: Thomas Sinclair

1700 S.W. 23rd Dr
Gainesville, FL 32608-0000

Voice: 352-392-6180; Fax: 352-374-5896; E-Mail: aksch@gnv.ifas.ufl.edu

OBJECTIVES: To understand and thereby to provide means to modify the
detrimental crop responses to environmental stresses, particularly water deficits.

**APPROACH:** Four approaches to researching environmental stresses will be pursued. (A) Investigate a drought avoidance trait in maize. (B) Explore opportunities to incorporate aerenchyma into the anatomy of maize roots. (C) Develop tolerance to water deficits in the symbiotic nitrogen fixation activity of soybean. (D) Facilitate the application of simple crop growth models by various users.

Project Name: **INCREASING THE COMPETITIVE POSITION OF US SOYBEANS IN GLOBAL MARKETS THROUGH PLANT BREEDING**

Project # 6645-21220-005-00D; Mode Code 6645-35-00

South Atlantic Area - Soybean and Nitrogen Fixation Research

Principal Investigator: Paul Bishop

Gardner Hall, Room 4526

Box 7615, NCSU

Raleigh, NC 27695-7615

Voice: 919-515-3770; Fax:

**OBJECTIVES:** To develop diverse genetic resources exhibiting traits that enhance quality and productivity of soybean, and biocontrol strategies for resistance to fungal toxins and removal of excess N from soil applied animal wastes.

**APPROACH:** Improve soybean quality and productivity through development of genetically diverse germplasm exhibiting traits for altered seed composition, morphological traits, drought tolerance and soyfood characteristics. Characterize genes that govern nitrogenase and MO uptake systems in bacteria. Evaluate utility of soybeans in animal waste management systems. Characterize genes that govern toxin synthesis and transport in microorganisms. Raleigh, NC. Gardner Hall, Room 2417, BL-1, 07/01/96; and Room 4267, BL-1, 07/01/96. Scientists and technicians associated with project: R.G. Upchurch, P.E. Bishop, T. Loveless.

**US DEPARTMENT OF AGRICULTURE**

The following is a list of a few ongoing research projects with a component aimed at drought mitigation:

(With relevant CRIS project numbers)

Lubbock, Texas

1. **Wind erosion processes, fugitive dust emissions, and mitigation strategies.**
   (6208-11120-004-00D)
Long-term continuous monitoring of dust concentration and climatic parameters allow a correlation between ambient dust levels and drought for current land use patterns. Dust monitoring in different agricultural regions allows the determination of which management systems are most sensitive to drought conditions. Thus, such studies can be used to quantify the effects of drought and current agricultural practices on dust levels and a long term dust record could potentially provide a measure of how changing agricultural practices provide regional mitigation of drought induced dust.

2. Sustainable agricultural systems that reduce wind erosion and dust emissions. (6208-12000-006-00D)

The ARS strategy in drought mitigation relates to methods of relieving the effects of drought and not weather modification *per se*. The effects of drought often include wind-induced soil erosion which impacts plant production, profitability, and air quality. ARS develops economically and environmentally viable agricultural systems that conserve water and control wind erosion.

3. Strategies for irrigated and dryland crop production in semi-arid climates. (6208-13000-004-00D)

Semi-arid crop production occurs under either rainfed or a combination of rainfall supplemented by irrigation. Expert management is needed to maximize the efficiency of water use and the best technologies from physical and biological sciences must be employed. The project objectives are: 1) Develop quantitative information on energy and water transport in stressed crops, defining plant archetypes and management strategies that impact water-use efficiency; 2) Develop strategies for using current climate conditions and long range weather variability predictions as a management tool for the agricultural industry; 3) Develop strategies to improve the capture and use of rainfall by crops; 4) Devise new irrigation and dryland management strategies for existing germplasm and crops genetically modified for water and thermal stress tolerance; and 5) Using remote sensing and precision agriculture technologies, define management strategies to alleviate the impact of water deficits on crop production. A major contribution from this research project and others listed below is BIOTIC, a patented irrigation management device, that controls irrigation based on continuously measured canopy temperature, a location specific time factor and a species specific temperature threshold.

4. Improving plant performance in adverse environments. (6208-21000-008-00D)

The fundamental impact of drought, a combination of heat and water stress, on the ability of a crop to reach its potential yield capability and quality levels is directly correlated to the ability of the cells of plant tissues to protect themselves from damage or to quickly repair what damage occurs. This project is directly aimed at understanding how plant cells achieve these goals by the production and control of heat shock protein biosynthesis and the development of thermotolerance and the production and control of proteins that confer vegetative desiccation (the severest form of water stress) tolerance. The results from this research are being used to evaluate breeding and biotechnological strategies for drought tolerance in major US crops.

A key element in the ability of a crop plant to mitigate the effect of drought is the establishment and maintenance of an efficient root system that can extract available moisture from the surrounding soil. This project is aimed at identifying cotton germplasm that has the capability of producing root systems that work effectively in soils that are deficient in water or can maximize the use of water when it becomes available such that the effect of drought on crop productivity is minimized. This project is also investigating the role that symbiotic fungi (mycorrhizae) play in channeling water and nutrients to cotton root systems in order to develop management strategies that would maximize the benefits of such an association under drought conditions.

7. Development of cotton germplasm with improved tolerance to abiotic stresses. (6208-21000-010-00D)

A major component of any strategy to improve the ability of a crop to mitigate the effects of drought is the use of a biotechnology. This project is aimed at using genes that have been identified as being associated with drought tolerance in other plant species or other organisms to improve the stress tolerance capabilities of cotton (in the long term other crops will be targeted). The project is presently aimed at using genes from a desiccation tolerant moss (a non-flowering plant that can tolerate the loss of all its internal free water) to improve the water stress resistance of cotton. The project is also concerned with developing better techniques for introducing genes into cotton and other crop plants.

Woodward, Oklahoma

Issues:

Drought is a most common characteristic of Southern Plains climate and new cultivars to reclaim marginal crop land in a permanent cover to control soil erosion requires availability of improved native or exotic grasses that will withstand precipitation shortfalls. Drought tolerant grasses released from Woodward since 1982, in cooperation with the NRCS, Texas Tech University, Texas A&M, are now planted on more that 3 million acres in the Southern Plains. There remains a continuing need for additional cultivars that have tolerance to drought and other factors that limit their use. CRIS Projects: 1) 6216-12110-001-00D: Forage germplasm development for increased sustainability of agricultural and rangeland ecosystems; 2) 6216-21630-005-00D: Rangeland and pasture ecosystem management in the Southern Plains.

Tucson, Arizona

1. Radar-Rainfall Related Research for "Drought Mitigation"

A critical factor for both planning for drought mitigation and assessing the impacts of drought is having accurate knowledge of rainfall in space and time. However, it is not economically feasible to provide raingage networks at sufficient spatial densities over the vast public and private land areas in the West. Installation of ground-based
radars throughout the West and Southwest offer a potential tool to provide rainfall characteristics over large land areas. Unfortunately, radar-based rainfall estimates have not been adequately researched or verified in many of these environments. Detailed raingages observations from ARS Walnut Gulch Experimental Watershed (85 raingages in the 148 sq. km) will be used to quantify the capabilities of "standard" radar-rainfall reflectivity relationships used by the National Weather Service in this region and potentially to developed improved relationships.

2. Linkage of ENSO and Other Large-scale Forcing to Precipitation

Droughts in the southern and southwest portions of the United States are known to be highly correlated to La Nino episodes. Research is being carried out to improve the forecast capability of daily precipitation by incorporation of the El Nino/La Nino-Southern Oscillation (ENSO) signal using the Southern Oscillation Index (SOI) into daily precipitation models. Using historical rainfall data the method can determine if daily rainfall is significantly influenced by ENSO/LNSO, which months are significantly influenced, and provide a early warning forecast from the SOI when daily and seasonal precipitation may be reduced (indication of a drought beginning) or when precipitation may be increased (ending of a drought). CRIS projects: 5342-13610-005-00D: Hydrologic processes, scale, water resources, and potential global change impacts in semi-arid areas.

Florence, South Carolina

**Hydrologic Processes, Scale, Water Resources, and Potential Global Change Impacts in Semi-arid Areas**

Problem: In humid and sub-humid areas, crops can suffer from both water excess and drought, often within the same growing season. Annual rainfall usually exceeds evaporation, but rainfall is poorly distributed within the growing season. The sandy soils of the SE Coastal Plain store relatively little water and are quite variable even in small fields. Consequently, crops in some areas of most fields suffer from drought multiple times in most years and even on the best soils, may suffer drought in one year of two. For agriculture to be consistently profitable, improved methods of water management must be developed. These methods must protect the environment, conserve the water supply, and for maximum efficiency be adaptable to variable-rate technologies.

* Developing site-specific center pivot irrigation systems for water, nutrient, and pesticide management.

* Developing irrigation scheduling decision aid for personal computer that accommodates rainfall probability, leaving storage capacity for rainfall after irrigation.

* Developing subsurface drip irrigation systems and water and nutrient management techniques for agronomic and horticultural crops of the region.

* Developing color plastic mulches to combine irrigation and water conservation measures with photobiological management of plant growth.

* Investigating season water use patterns and their effect on transient water stress using both field measurements and computer simulation models.
CRIS projects: 6657-13000-005-00D: Managing southeastern coastal plains natural resources for profitable agriculture and environmental quality.

El Reno, Oklahoma

Issues- Most of the agricultural enterprise in the Southern Great Plains (SGP) are based on dryland farming. Grazing systems and livestock production are integrated with crop production systems to provide diversity and are for the most part dependent upon non-irrigated acres as a source of feed. Both cropping and grazing systems are vulnerable to droughts that disrupt efforts to achieve a stable, sustainable, diverse and economically viable agricultural production enterprise. Economic losses due to droughts are not limited to the farmers and ranchers, but also impact local and regional economics and consumers world wide through volatile prices, inconsistent farm product quality and irregular supplies. Research is underway to develop technology and methodologies for rapid assessment of regional soil moisture reserves, to incorporate new long-lead climate outlook projects into risk based decision making processes, and to find alternative forage production systems that are flexible and adaptable to drought situations. CRIS projects: 6218-11130-001-00D; 6218-13000-008-00D; 6218-21000-004-00D.

Las Cruces, New Mexico

Issues:

1. What are the persisting effects of severe drought in this environment?

We do this through maintenance of long term (since 1915) studies on desert vegetation dynamics that can be tracked during drought years. We have learned that effects are certainly site specific, but they are also related to the state that the site is in. If the site is in a transitional state, then drought can be a factor that causes that state to change, and change rapidly. We have observed huge changes in a few years.

2. How can we distinguish the effects of drought from the effects of other typical stressors (the main ones are grazing and fire) to desert rangelands?

We have done this through manipulative studies where we control certain stressors, including drought (by using rain out shelters) and observing cascading effects on vegetation, soil and animal populations. Obviously, we have learned that drought overwhelms all other stressors, and its effects are seriously magnified if other stressors occur in common. This is especially true of overgrazing.

3. What indicators can we use to monitor the conditions of these lands so we can adjust our management in order to mitigate the effects of stress, especially drought?

This is one of our main research objectives, and is a key issue. It is not directly a drought mitigation question, but the development of tools for managing lands that experience severe drought in at least 1 year out of 5. We do this by trying to identify properties of systems that reflect key processes and then identify indicators of those properties which can be measured in some reliable fashion. Thus, soil surface organic matter is a property of nutrient cycling and a slake test seems to be an indicator of SOM.
4. What technologies can be used that are low input, inexpensive, ecologically-based, and effective which will re-mediate lands degraded by the effects of drought?

We have learned that our agronomic tools, like use of a rangeland drill or broad scale chemical programs are extremely inefficient in arid environments. We devote an increasing amount of our research to new approaches. These are VERY small scale, very passive, but very cheap.

APPENDIX D. Summary of Recommended Federal Actions from Earlier Drought Episode Reports

Table 13. Recommended changes in NRCS programs and policies to improve agency ability to reduce drought to farmers, ranchers, and rural communities.

Irrigated Farms

Irrigation Management Practices
- Promote irrigation scheduling and system evaluation
- Increase cost-sharing for sprinkler and/or surge systems
- Promote supplemental irrigation
- Increase irrigation efficiencies
- Increase use of drip/trickle systems on vegetables and orchards
- Provide incentives and cost-share programs for irrigation system modifications

Water/Crop/Land Management Practices
- Provide incentive programs for ground water recharge
- Develop farm management plans for below-normal, normal, and above-normal water supplies
- Promote recycling of municipal and industrial water
- Inventory water supply options (e.g., surface impoundment sites, ground water reserves, streams) available for a variety of user needs
- Promote selection of drought resistant, low water use crops/varieties

Human and Financial Resources
- Devote more human resources to total resource management planning
Legal/Institutional
- Increase interagency cooperation on irrigation water management
- Implement total resource management system planning within SCS
- Relax rules on irrigation-induced wetlands during drought conditions
- Encourage partnerships between rural and urban communities through incentive programs

Education
- Improve educational and technical assistance programs on water management and conservation
- Improve education on irrigation techniques, including equipment
- Provide additional technical assistance to farmers on appropriate drought mitigation actions
- Provide better educational programs on the effect of improper irrigation practices
- Increase field demonstrations on irrigation water management
- Provide more training on efficient use of water
- Provide greater information on the effects of improper irrigation practices

Data/Information Products/Delivery Systems
- Provide better information on best management practices during drought
- Expand SNOTEL data collection network, improve forecasts
- Develop and implement surface water supply indexes
- Implement process simulation hydrologic models
- Improve monitoring and management of ground water withdrawals
- Provide additional information about soil water potential requirements
- Develop more specific water use data needed for crops
- Improve surface and ground water supply monitoring systems
- Promote more extensive soil moisture monitoring
- Upgrade information delivery systems to farms on available water supplies
- Improve dissemination of water supply forecasts
- Develop more efficient delivery systems

Table 13. Recommended changes in NRCS programs and policies to improve agency ability to reduce drought to farmers, ranchers, and rural communities. (Continued)

**Nonirrigated farms**

**Water/Crop/Land Management**

- Increase emphasis on water quality
- Increase technical and financial assistance to promote snow management practices (e.g., windbreaks, grass strips, stripcropping)
- Develop more farm ponds
- Assist in selecting drought resistant crops/varieties
- Promote conservation practices (e.g., conservation tillage, residue management, and drought resistant crop varieties)
- Increase emphasis on strip-cropping, contour farming, and wind barriers
- Adopt more crop rotations to better use available moisture
- Develop early maturing crops
- Promote flexible cropping systems

**Legal/Institutional**

- Establish the use of PL-566 cost-sharing for water conservation in humid areas as a higher priority

**Education**

- Continue emphasis on CRM educational programs
- Provide training for farm-level drought plan development
- Increase field demonstrations of residue management techniques

**Data/Information Products/Delivery Systems**

- Improve soil moisture monitoring programs
- Expand SNOTEL system, improve water supply forecasts
Develop and implement surface water supply indexes

Develop better drought indicators and forecasts

Improve dissemination of water supply forecasts

(NRCS2, J.Frost, 5/99)

Table 13. Recommended changes in NRCS programs and policies to improve agency ability to reduce drought to farmers, ranchers, and rural communities. (Continued)

**Ranches with Irrigation**

**Irrigation Management**

- Integrate irrigation practices with other water needs (e.g., livestock)
- Develop irrigation water management plans

**Water Management**

- Develop dependable livestock water systems through pipelines and rural water systems

**Rangeland Management**

- Inventory and manage forage produced on grazing lands

**Education**

- Develop programs to train persons on drought preparedness techniques
- Develop programs to encourage the maintenance of adequate feed reserves
- Develop incentives to encourage proper stocking rates

**Rural Communities**

**Water Management**

- Provide technical assistance through RC&D for water supply systems and monitoring
- Modify PL-566 to make rural water supplies eligible for cost-sharing
- Provide technical and financial assistance to rural communities for water supply development
- Emphasize total watershed protection to increase surface and subsurface storage
- Expand rural water systems to serve both towns and farms
- Emphasize watershed planning
Legal/Institutional
- Assist rural communities in the development of a drought plan

Education
- Develop programs on drought preparedness
- Promote water conservation
- Encourage use of drought-tolerant plants in landscapes
- Encourage xeriscaping
- Develop programs to improve lawn and shrub irrigation efficiencies
- Develop lawn watering programs

Data/Information Products/Delivery Systems
- Improve drought indicators

Table 14. Recommendations for NRCS on helping farmers and ranchers respond to increasing demands for water to preserve environmental quality during droughts.

Irrigation Management
- Improve marketing of drip irrigation systems
- Promote irrigation efficiency
- Provide greater technical assistance for water storage for use during irrigation season or for re-lease to augment stream flow
- Promote ground water recharge
- Promote drip irrigation
- Encourage use of sprinkler systems

Water/Land/Crop Management
- Promote crop rotations that enhance infiltration
- Develop ditch storage system
- Increase technical assistance to landowners to assist them in better land management
- Develop water storage structures on streams
- Better management of systems and structures
- Use water from deep aquifers rather than surface water
- Promote adoption of total resource management system plans
- Maintain and establish stream buffers for all land uses
- Develop detention measures in projects that augment stream flows
- Provide assistance to water users to install water measurement devices to ensure diversion of allocated amounts
- Build more structures with gated outlets from bottoms of ponds
- Plan and apply RMS's on watersheds that will have the greatest impacts on water quality and quantity
- Emphasize on-site practices (e.g., residue management, irrigation water management, proper grazing techniques, terraces) that have a direct/indirect benefit in enhancing in-stream flows
- Promote sound land use and conservation measures
- Encourage use of drought-tolerate crops

Legal/Institutional
- Work with state and local government on drought response plans
- Assist in changing water laws to allow farmers to "market" excess water (i.e., transfer of water between users)
- Promote NRCS as leader in water conservation techniques
- Change attitude with in NRCS of addressing one resource concern (e.g., soil erosion) to one of addressing the entire ecosystem

Education and Training
- Disseminate information that promotes shifts from more to less water-dependent
systems

- Provide education and technical assistance on crop irrigation requirements

**Environmental Quality**

- Promote water quality enhancement and protection
- Balance efficient use of agricultural water with environmental needs
- Promote alternate crops that are in harmony with local environment, reducing the need for irrigation

**Data/Information Products/Delivery Systems**

- Develop soil moisture monitoring programs
- Assist USGS with low flow monitoring
- Develop and use process simulation models for stream flow forecasting

Table 15. Recommendations for NRCS on improving technical standards and assistance activities to foster use of drought mitigation practices by landowners and rural communities.

**Water/Crop/Land Management**

- Target funds and personnel to assist with drought mitigation practices
- Create more flexibility for USDA commodity programs
- Provide cost-share assistance for residue management and mulching practices during drought
- Alter NRCS priorities to allow more time for drought mitigation activities
- Improve policies on pond construction, using a team approach for site assessment, etc.
- Make water quantity issues a higher priority within NRCS
- Improve water conservation research and partnerships with research agencies
- Develop a coalition of agencies to cooperatively develop technical methods and approaches for irrigators and farm managers

**Education and Training**
- Provide better information on irrigation management systems

- Make working with individual landowners on drought mitigation practices a priority; techniques are known, education is the key

- Handle drought mitigation practices through the Field Office Technical Guide

- Develop irrigation handbook for use by personnel and consultants

- Communicate, coordinate, and be involved in identifying and solving problems related to soil, air, plant, and animal resources

- Provide more technical assistance on resource planning rather than administering farm bills

- Prepare fact sheets of recommended drought mitigation practices for farmer and rural communities, including emergency crop and land management responses

- Provide better training of landowners and rural communities on drought mitigation measures

- Provide information on the economic benefits of drought mitigation practices

Data/Informational Products/Delivery Systems

- Expand collection of data on climatic and soil moisture conditions

- Use remotely sensed data to assist with drought assessment

- Improve soil moisture monitoring

- Improve program delivery

- Improve methods of disseminating research findings to field personnel in a user-friendly format

Table 00.

EPA STATEMENT OF PRINCIPLES ON EFFICIENT WATER USE

(epaag2, G.Hudiburgh, 5/14/99)

In 199?, the US Environmental Protection Agency (EPA) issued a statement of principles on efficient water use. The statement follows.
In order to meet the needs of existing and future populations and ensure that habitats and ecosystems are protected, the nation's water must be sustainable and renewable. Sound water resource management, which emphasizes careful, efficient use of water, is essential in order to achieve these objectives.

Efficient water use can have major environmental, public health, and economic benefits by helping to improve water quality, maintain aquatic ecosystems, and protect drinking water resources. As we face increasing risks to ecosystems and their biological integrity, the inextricable link between water quality and water quantity becomes more important. Water efficiency is one way of addressing water quality and quantity goals. The efficient use of water can also prevent pollution by reducing wastewater flows, recycling industrial process water, reclaiming wastewater, and using less energy.

The U.S. Environmental Protection Agency's (EPA) Office of Water strongly encourages all sectors, including municipal, industrial, and agricultural, to achieve efficient water use.

EPA recognizes that regional, state, and local differences exist regarding water quality, quantity, and usage. Differences in climate, geography, state institutions, and laws favor a prudent approach in which water efficiency programs are tailored for specific locales.

To promote efficient water use, EPA's primary role is to provide technical assistance and information concentrating on 1) improved management practices, 2) better science, 3) effective planning and coordination, 4) market incentives, and 5) public education.

Agricultural water suppliers and users need to have an integrated water management plan that incorporates a drought mitigation plan and conservation programs. They also need an effective State/regional drought mitigation plan and supporting programs which are coordinated, in turn, with a coordinated Federal policy and programs.

Sec.4(b)(8) "include a recommendation on whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency;"

Dan R. Upchurch (ARS, Lubbock, Texas)

I agree with the recommendation made by Merle A. Venezio that "all Federal drought preparation and response programs should be consolidated and assigned to the Secretary of Agriculture, given appropriate staff and funding. USDA as the agency-in-charge, given its variety of programs and the fact that the first effects of drought often appear in the agricultural sector and in firefighting efforts."
Executive Summary

This report summarizes the findings and recommendations of the Environmental Issues (EI) Working Group (WG) as input to the work of the National Drought Policy Commission (NDPC) in response to the requirements of Public Law 105-199. It was synthesized based on input from 18 individual members of the EI WG, including the National Drought Mitigation Center, four states (Missouri, New Mexico, Texas, Washington), and 12 federal agencies: U.S. Environmental Protection Agency, Federal Emergency Management Agency, U.S. Army Corps of Engineers, Department of Commerce (DOC) National Oceanic and Atmospheric Administration, Department of Interior (DOI) Fish and Wildlife Service, DOI National Park Service, DOI U.S. Geological Survey, U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service, USDA Agricultural Research Service, USDA Farm Service Agency, USDA Forest Service, and USDA Natural Resources Conservation Service. This draft does not presently contain input from other state members of the EI WG, from any tribal members, or from the following federal agencies: DOC National Marine Fisheries Service, DOI Bureau of Indian Affairs, DOI Bureau of Land Management, or DOI Bureau of Reclamation.

The Environmental Issues Working Group was asked to consider and provide pertinent findings and recommendations on issues related to wildfires and water body dependent issues, including ecosystems and fish and wildlife. However, in its discussions, the WG agreed its mandate was broader than this initial charge, and included consideration of any significant environmental issue, not specifically the subject of another WG, that might be triggered by drought occurrence.

Thus, a wide array of issues fall under the purview of this Working Group - arguably a greater diversity of issues than considered by any other Working Group. Because of the large diversity of issues considered here, and also because the environmental responsibilities of WG members are so diverse, this report retains the identity of the member submissions and presents the NDPC with the various perspectives of the EI WG members in relation to the environmental issues requiring careful consideration during drought.

As a consequence, it is not possible to summarize the findings and recommendations of the Environmental Issues Working Group in a few succinct bullets. A wide variety of issues, concerns, and suggestions are presented here for careful consideration by the NDPC. Nonetheless, several broad themes or overarching points do emerge from the work of this group, including the following ten key points:
A broad array of environmental impacts and concerns must be carefully considered in respect to preparing for and responding to drought emergencies. Careful consideration of all anticipated categories of environmental impacts will allow decisions to be made as to which impacts can be tolerated, versus those that cannot and which thus must be mitigated.

In preparing for and responding to drought emergencies, all levels of government (Federal, State, local, tribal) must do a better job of balancing hydrologic and human use issues and needs with a concern for environmental impacts and concerns. Governments must consider impacts to both aquatic and terrestrial ecosystems. Instream flow issues, and impacts to fish and wildlife populations, threatened and endangered species, and ecosystem health and integrity, represent especially critical issues requiring careful analysis in relation to drought. This essentially requires development of ecosystem management guidelines pertinent to drought planning, response, and mitigation.

Priority must be placed on enhancing the scientific and technical basis for drought planning, response, and mitigation activities. This will involve both increased support for research on an array of relevant topics at appropriate scales of space and time, and development of prediction and planning tools, models, and other research products. Research must be linked to monitoring and observation programs, and to acquisition of improved data on climatic and weather phenomena and on ecosystem processes and biota.

At present, Federal drought programs lack consistency, and are fragmented and poorly coordinated across the multiple Federal agencies that deal with drought. These programs are also poorly coordinated with State, local, and tribal governments. It is critical that efforts be made to develop a national drought policy, strategy, or framework that specifies responsibilities, capabilities, actions, and coordination across all levels of government, and that also spells out preparedness, response, and mitigation measures to be provided by each government entity. States should develop drought contingency plans to match Federal coordination efforts. This national policy or strategy should be implemented on a watershed basis. A single Federal agency should be identified to coordinate drought preparedness, response, and mitigation activities, without eliminating the unique statutory responsibilities of each agency in relation to drought.

Drought planning should be conducted within the broader context of watershed-based water resource planning, with strategic, operational, and contingency components. This approach is based on the clear recognition that drought is not a climatic anomaly, but rather part of the overall climatic system that is highly variable in space and time.

Better forecasting tools and capabilities are required to prepare government entities at all levels to deal with drought emergencies, and to enhance public awareness of the importance of dealing with drought in an effective and coordinated manner. Development of improved forecasting tools and capabilities should be linked with carefully designed observation and monitoring networks.

Programs and plans for dealing with drought should include both short- and long-term mitigation measures, actions that can reduce system (ecological, hydrologic) vulnerability to drought, and create robust ecological and hydrologic systems capable of withstanding disruption, and on response
measures that kick in once a specific drought is deemed to be underway.

- Preparation and planning to deal with the effects of drought are directly related to watershed protection and restoration - healthy watersheds or ecosystems are more able to withstand, and are less severely impacted by, drought conditions as compared to degraded systems.
- We need a consistent and improved definition of drought, one that includes environmental concerns and criteria along with criteria based on human use and needs and on purely hydrologic perspectives.
- Existing drought-related programs at all levels of government should be carefully evaluated, in order to determine whether all important environmental impacts of drought have been identified; if current programs adequately address these priority environmental impacts; whether the measures promoted by existing programs address both short- and long-term mitigation and response measures adequately; whether the right customers are being served by current programs; and whether or not the programs are working and why or why not.

Introduction

This report summarizes the findings and recommendations of the Environmental Issues (EI) Working Group (WG) as input to the work of the National Drought Policy Commission (NDPC) in response to the requirements of Public Law 105-199. This report was synthesized based on input received from 18 individual members of the EI WG, including the National Drought Mitigation Center, four states (Missouri, New Mexico, Texas, Washington), and 12 federal agencies: U.S. Environmental Protection Agency, Federal Emergency Management Agency, U.S. Army Corps of Engineers, Department of Commerce (DOC) National Oceanic and Atmospheric Administration, Department of Interior (DOI) Fish and Wildlife Service, DOI National Park Service, DOI U.S. Geological Survey, U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service, USDA Agricultural Research Service, USDA Farm Service Agency, USDA Forest Service, and USDA Natural Resources Conservation Service. This draft does not contain input from other state members of the EI WG, from any tribal members, or from the following federal agencies: DOC National Marine Fisheries Service, DOI Bureau of Indian Affairs, DOI Bureau of Land Management, or DOI Bureau of Reclamation.

The Environmental Issues Working Group was asked to consider and provide pertinent findings and recommendations on issues related to wildfires and water body dependent issues, including ecosystems and fish and wildlife. However, in its discussions, the WG agreed its mandate was broader than this initial charge, and included consideration of any significant environmental issue, not specifically the subject of another WG, that might be triggered by drought occurrence. While most of the issues discussed here relate to wildfires or water bodies, others extend, for example, to drought impacts on terrestrial vegetation and wildlife, and to issues such as modification of grazing management regimes under drought conditions. Critical environmental issues that require consideration and careful analysis in relation to the occurrence of droughts of various magnitudes include requirements for minimum instream flows to protect aquatic biota and channel morphology in streams and rivers; requirements for minimum water levels to protect organisms and ecological processes in ponds, lakes, and wetlands; and drought impacts, in both terrestrial and aquatic ecosystems, to fish and wildlife populations, threatened,
endangered and sensitive species, ecosystem health and integrity, and wildfire occurrence.

Thus, a wide array of issues fall under the purview of this Working Group - arguably a greater diversity of issues than considered by any other Working Group. Moreover, several new members were added to the WG in the final week before this initial draft report was due, and input from a number of members was not received until just prior to the initial due date. For all these reasons, it was decided that this report should not synthesize across or suppress the identity of the individual member contributions. Also, because the environmental responsibilities of WG members are so diverse, it seemed appropriate to retain the identity of the member submissions and to present the NDPC with the various perspectives of the EI WG members in relation to the environmental issues requiring careful consideration during drought.

As requested, the report is organized according to the eight ADuties of the Commission as listed under Section 4(b) of P.L. 105-199. Where a given duty is not pertinent to the interests or statutory responsibilities of a member, no response is given from that member. If a member's response is pertinent to several sections or duties, this fact is so noted below.

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**Section 4(b)(1) "determine, in consultation with the National Drought Mitigation Center in Lincoln, Nebraska, and other appropriate entities, what needs exist on the Federal, State, local, and tribal levels to prepare for and respond to drought emergencies"**

**Comments from National Drought Mitigation Center (NDMC)**

Drought effects on the environment can be unrecoverable as in the case of drought impacts on endangered plants and animals. In other cases, such as tree mortality and loss, long recovery times may be necessary. Therefore, mitigation is essential in environmental planning. Response measures may be too late in some cases.

Generally, comprehensive environmental data are essential for appropriate planning. One must know the environment in order to modify or protect it. This may mean increased research funding; increased cooperation among agencies; and sharing and organization of adequate environmental databases. Environmental data must also be available at a scale relevant to drought planning efforts. As
pointed out in the Navajo Drought Vulnerability Study, environmental and climatic data are especially inadequate on some tribal lands. Tribes also consistently note that funds are usually lacking for research studies and drought planning.

Environmental data must also be readily available to public and governmental planners. Technical expertise may also be necessary to interpret the information.

Federal, State, Tribal, and local drought planning will reveal specific relevant needs. In terms of time and resources required for planning, especially if drought is not a pressing issue in a particular area, it might make sense to include drought planning with water supply planning or community hazard planning processes.

From a broader perspective, drought will occur whether or not humans are present. Streams will dry up, fish will die, plants will wither, wildfires will occur, terrestrial animals will starve - ecosystems will be disrupted and persist, sometimes with new adaptations. Then people enter the picture. We modify our environments, expect different things from them, and place new limitations on them. For example, we change our environments for our wants/needs often at the expense of the relationships that plants and animals have established. Some species can adapt, others do not. Also, we no longer tolerate widespread wildfires or episodes of mass wildlife deaths. We often can't/won't let nature take its natural course of action.

Drought is a normal part of climate that causes local and regional environmental disruptions. People's actions can modify these disruptions, create new ones, or exacerbate existing effects. People decide what disruptions can/must be tolerated and which cannot. A review of environmental impacts will determine which disruptions are tolerable and which should be addressed. This should be done by a combination of public consensus and science. The NDMC has compiled a list of typical environmental impacts on its website at http://enso.unl.edu/ndmc/impacts/impacts.htm#enviro The following is a listing of the types of impacts that may occur:

**Damage to animal species**

- Reduction and degradation of fish and wildlife habitat
- Lack of feed and drinking water
- Greater mortality due to increased contact with agricultural producers, as animals seek food from farms and producers are less tolerant
- Increased incidence of or susceptibility to disease
- Increased vulnerability to predation (from species concentrated near water)
- Migration and concentration (loss of wildlife in some areas and too many in others)
- Increased stress to endangered species
- Loss of biological diversity

**Hydrologic effects**

- Lower water levels in reservoirs, lakes, and ponds
- Reduced flow from springs
- Reduced streamflow
- Loss of wetlands
Estuarine impacts (e.g., changes in salinity levels)  
- Increased ground water depletion, land subsidence, and reduced recharge  
- Water quality effects (e.g., salt concentration, increased water temperature, pH, dissolved oxygen, turbidity)

**Damage to plant communities**

- Loss of biological diversity  
- Loss of trees from urban landscapes, shelterbelts, and wooded conservation areas  
- Increased number and severity of fires  
- Wind and water erosion of soils, and reduced soil quality  
- Air quality effects (e.g., dust, pollutants)  
- Visual and landscape quality (e.g., dust, vegetative cover, etc.)

The Preparedness and Mitigation Working Group of the Western Drought Coordination Council also briefly discusses environmental drought impacts in Appendix A of its "How to Reduce Drought Risk" guidebook (http://enso.unl.edu/wdcc/products/risk.pdf). They discuss a range of impacts including: soils and sediment, surface and ground water levels, air quality, wildlife and plants, and wildfire. A review of drought-related programs will help to ensure that priority environmental impacts are being addressed.

**Comments from State of Missouri (Department of Conservation)**

Current water management by the U.S. Army Corps of Engineers during drought conditions for the Missouri River system mandates releasing water to maintain identified system uses while adversely affecting river fish and wildlife resources. A water release plan addressing fish and wildlife interests during drought conditions within the Missouri River Basin is needed.

What federal regulations/laws are authorized to protect federally endangered species during drought conditions? Loss of instream flows sufficient to maintain federally endangered fish/mussels and other species is an issue that should be addressed at the federal level.

Identify the existence, or lack of, federal regulation(s) addressing the use of fire on federal lands during drought conditions. What are the effects of drought conditions, both positive and negative, on species existing on federal lands?

**Comments from State of New Mexico (Forestry Division)**

From a state perspective, the following additional skills or needs in predicting weather that creates severe fire behavior would be desirable:

- Fire managers need to know before thunderstorms occur that create 'dry lightning' which is caused when lower level air moisture is not sufficient to produce rain but thunderstorms develop that create fire-igniting lightning. That information would allow prepositioning of fire suppression resources.  
- Fire managers need support from the National Weather Service for prescribed fire weather forecasts. In some fuel types, near-drought conditions during cooler periods can offer important opportunities to burn vegetation to improve
forest health. Weather forecasts are important to prescribed fire managers for safety reasons.

- Fire managers need to know when high pressure events are unusually high. Erratic fire behavior can occur when this occurs.

Similarly, the following additional skills or needs in recognizing drought effects would be desirable:

- There are drought conditions that indirectly cause insect mortality in live trees. There are probably more acres of trees killed by insects annually in New Mexico than wildfire. When forests are drought stressed, they lack the vigor to repel natural insect attacks. As a result, epidemics occur. By the time aerial detection surveys are conducted, the effects are often in full swing and there is little that can be feasibly done. Improved skill in recognizing drought-stressed forests may offer support for fire and forest managers in developing appropriate responses.

**Comments from State of Texas (Texas Natural Resource Conservation Commission)**

It would be helpful if state drought response capabilities and needs are presented in the report as well as recognition provided of the primary role of the States in water resource management and allocation decision-making. This would provide a more complete context in which the Commission could make recommendations as to the appropriate role for federal agencies in responding to drought. Given the extent of the existing environmental and drought response programs of States, the most appropriate role for federal agencies to play in responding to drought is to assist state and local water planners and managers with increased funding, technical assistance, and regulatory flexibility. Applicable federal agencies could also assist the border States in achieving greater cooperation with Mexico in stream monitoring and the enforcement of water rights in the Rio Grande and joint efforts to respond to drought, including a system for the international marketing of water and the protection and mitigation of environmental flows.

States such as Texas that have extensive programs to respond to drought and to assess and mitigate related environmental impacts do not need federal templates on what should be required to respond to drought. Rather, they need federal financial assistance to carry out state and locally devised drought response measures. Such assistance is increasingly needed to offset increasing federal demands on other state programs to meet recent and sometimes questionable federal water quality initiatives. With so much that federal agencies could do to constructively assist states, particularly those in the more drought prone areas of the country, it is discouraging when federal agencies such as the U.S. Bureau of Reclamation spends its time and resources asserting title to the water in the Rio Grande that has been allocated under compact to Texas, Colorado, and New Mexico.

It would also be helpful from a state perspective if the Commission recommended that federal agencies be tasked by Congress to examine ways to provide more regulatory flexibility during times of drought. For example, the U.S. Environmental Protection Agency should consider relaxing temperature and dissolved oxygen
criteria when there are low or no flows in streams due to drought or arid conditions. Similarly, public drinking water standards for total dissolved solids could also be relaxed under such conditions. Such regulatory flexibility would not degrade the existing environmental conditions or affect public health and could result in significant resource savings that could be redirected to more pressing environmental needs. I believe the current Clean Water Act and Safe Drinking Water Act can accommodate such flexibility, but it may require specific Congressional direction to achieve it.

In addition the cost-effectiveness of the artificial maintenance of stream or springflow to protect federal listed species needs to be examined. The apparent absence of this ability under the current Endangered Species Act has resulted in the absurdity that the City of San Antonio must develop or otherwise acquire, at the cost of millions of dollars, alternative surface water supplies so that adequate springflows that rely on the Edwards Aquifer can be maintained in the unlikely repeat of the worst drought of record. The development of these alternative supplies will likely have their own environmental impacts that must be mitigated.

Other federal laws such as the National Environmental Policy Act should also be examined in a similar fashion to see whether flexibility could be provided during drought. For example, an exemption could be provided for the funding of projects meant to alleviate drought conditions.

Comments from State of Washington (Department of Ecology)

The impacts of droughts can vary widely in the state of Washington due to the diverse nature of the state and the variability of the circumstances under which droughts might occur. While the state consists of many relatively small watersheds, many of which are quite similar in nature, the effects of drought can differ greatly among them. What is a common characteristic, however, is that all watersheds include fish and wildlife species that are to some degree sensitive to drought.

The key environmental need during drought for Washington at present is the need to protect fish species, primarily salmonid species, that have been listed as threatened or endangered under the Endangered Species Act. Absent some form of water storage that can be manipulated to the benefit of the affected species, the options for providing additional water for fish are limited. Still, there are activities, for example berming or trenching to protect spawning gravels, that can help sustain those fish populations. To the extent that federal programs can assist with those types of protection activities, they would be invaluable. The downside to some efforts to protect fish, and one that could be controversial, is that they could act to the detriment of existing state (and other) water rights.

The other significant drought-related need in Washington is that of forest health. While wildfire is commonly considered to be a major concern during drought episodes, forest resource officials in Washington tend to view the situation somewhat differently. Wildfire is a concern, but a concern triggered by availability of fuels and meteorological conditions, such as temperature and humidity, rather than simply a lack of precipitation for a sustained period of time. The greater concern arising from drought is pest and disease infestations and other conditions that, over the long term, could adversely affect forest health and increase the likelihood of
future wildfires. Because many of the northwest forest ecosystems extend beyond state boundaries, and many of the forests are under federal ownership, the involvement of the federal government in protecting and preserving forest health is invaluable.

Comments from U.S. Environmental Protection Agency (EPA) (OW/OWOW/WD)

A strategy or framework should be developed that integrates responsibilities, capabilities, and action among all levels of government and appropriate watershed groups. This plan should address the preparedness, triggering mechanism, geographic scope, response, and mitigation measures to be provided by each entity, if any, in preparation for and in response to drought conditions. The strategy/framework should be developed broadly, across multi-levels of government, but should focus on implementation on a watershed basis. The drought strategy/framework should be implemented on a watershed basis due to the intuitive (i.e., conceptual) and physical advantages of this approach and because of the national trend toward watershed management.

Comments from Federal Emergency Management Agency (FEMA)

In the Federal government there is a need to develop a National Drought Policy which would eliminate the situational drought disaster response. Currently, available programs are widely scattered among several Federal agencies making application and qualification by States difficult and unduly burdensome. In many instances, potential applicants must endure the bureaucratic process of being passed around from one agency to the next until they reach the agency with the appropriate statutory authority to provide Federal assistance to meet their needs. Even within the Federal government there is confusion on the authorities and programs of various agencies: overlapping program authorities, unfunded or suspended programs, and differing program mandates with respect to the same issue.

To eliminate this confusion, States and multi-task force findings have suggested that the National Drought Policy designate one Federal agency to coordinate a unified Federal approach to disasters. Other approaches towards streamlining the Federal government's approach include refining certain program authorities to make funding more readily available to those impacted by drought, and by developing and maintaining a compendium of drought assistance programs for reference by Federal, State, and local officials.

Comments from US Army Corps of Engineers (USACE) (Policy & Special Studies Division)

Preparatory planning for droughts is a complex enterprise, consisting of three basic phases or time horizons: strategic planning (10-50 years); tactical or operational planning and management (seasonal and interannual); and contingency planning (real-time operation and decisions under various scenarios and constraints).

Each level of preparation/planning focuses on different management measures. The strategic emphasis should deal with issues such as priorities for water withdrawals and uses; implementation of a long-term water conservation strategy;
development of ecosystem management guidelines for alleviating the impacts of drought and low flow conditions; the specification of instream flow requirements for various threatened and endangered species and habitats; and other relevant targets for environmental protection during these critical periods. A key aspect here is to get agreement, in advance, as to which existing regulatory constraints, laws, procedures, etc., could or should be relaxed and under what circumstances they may be breached as part of emergency or contingency operations. This may be developed as part of municipal or regional Drought Preparedness plans and exercises conducted to test the responsiveness and shortcomings of current water management systems. The Interstate Commission on the Potomac River Basin (ICPRB) regularly conducts such scenario-driven emergency drought management exercises for the basin and the Metropolitan Washington, DC area.

*Operational* planning essentially deals with an assessment of the flexibility, reliability, resilience, and robustness of various water management systems to provide for the demands and constraints of the individual needs of the water sector during critical shortage periods. Basically, the questions are about how much water is there; what is the likelihood of continued shortages; what are the demands; which demands are essential; where are the critical demand centers; what are the possibilities for reallocating existing stored water; and what are the means for redistributing and transporting water from areas of availability to areas of need? Operational planning and management requires that emergency drought preparedness exercises be conducted regularly during the normal dry parts of the season and at the onset of droughts.

*Contingency* planning is essentially the real-time decision making component and adaptation to the evolving drought situation. It deals with the uncertain and unanticipated components of drought management, while adhering to the accepted predetermined decision rules and constraints. Declarations of various drought stages and associated restrictions are closely monitored, as are declarations of drought emergencies which set in motion various new emergency authorities of federal agencies, as well as triggering disaster assistance programs.

Environmental needs are but one component of water demands. During each stage of planning (strategic, operational, contingency), there are different aspects of environmental issues that need to be emphasized. Clearly this is a complex and intertwined problem which cannot be easily segmented. Authorities during emergency situations are quite flexible, but they can be circumscribed as part of a long term strategic plan for drought management. Essentially, the crux of the matter are the conflicts between environmental uses of instream water and both the instream and off stream demands and withdrawals for municipal and industrial water supply, agriculture, power cooling water, hydroelectric power, and navigation. And the key issue during a drought is the priority of needs and withdrawals - i.e., who gets what, and when. The strategic planning component can address the issues of how much each water using sector is entitled to, and how we can rearrange future water use and allocation to serve society's priorities. During the drought itself is not the time to argue those points.

*Comments from DOC National Oceanic and Atmospheric Administration (NOAA) (NWS)*
There is a need to consolidate various meteorological and hydrologic products currently produced by a number of federal agencies into a single product to increase public and private awareness of developing drought situations. This would provide more timely advance notice of drought problems, enabling more timely preparation for drought responses.

Wildland agencies would benefit from a drought monitoring and prediction program that brings those agencies into a state of readiness for prescribed fire activities and wildfire incident response. The USDA Forest Service Fire Sciences Laboratory in Missoula has developed the Weather Forecast and Analysis System (WFAS) that uses Internet web capabilities to display drought indices such as Haines and Keech Byrum that include fuel moisture and/or stability parameters critical to fire spread. An interagency project to develop a continuum of forecast tools and products that compares antecedent conditions to climatology, including past fire regimes, and extends from outset conditions to long-term seasonal outlooks tied to fire activities, could help mitigate effects and (de)mobilize firefighting resources.

**Comments from DOI Fish and Wildlife Service (FWS)**

The Fish and Wildlife Service, to fulfill its statutory requirements to conserve fish, wildlife, and plants, needs to inform other agencies during drought emergencies of critical wildlife habitat needs, and water requirements that trust resource populations will require to survive the drought emergency.

At times, effects may be severe enough to prepare contingency plans and coordination of federal contingency plans with local and state plans to ensure optimum survival for wildlife and humans that are affected. The Service will work with other agencies to ensure that existing policies, restrictions, and assistance are provided in ways that ensure survival of trust resources. This would include but may not be limited to: delaying emergency haying on federal lands to ensure nesting success and brood survival, participating with area landowners in pro-rata share reductions in water deliveries from irrigation sources, cooperation with State and Federal partners on wildfire suppression where resources are available, and enacting measures to control drought opportunistic invasive/nuisance species.

**Comments from DOI National Park Service (NPS)**

See NPS comments under Section 4(b)(2).

**Comments from DOI U.S. Geological Survey (Biological Resources Division) (USGS/BRD)**

The USGS/BRD recognizes two major needs in relation to planning for and responding to droughts. First, we need to determine the minimum in-stream flow requirements in streams and rivers and minimum water levels in wetlands, ponds, and lakes that are critical for the continued functioning of aquatic biological communities, especially for species of high state and federal concern (e.g., threatened and/or endangered species, anadromous fish stocks, and those upland species relying on these species for food). This needs to be accomplished at a watershed level to ensure water withdrawals for human consumption are commensurate with minimum flows required for aquatic community sustainability.
Extreme drought conditions have the potential to exacerbate habitat loss and subsequent population losses of these important resources.

Second, we need to ensure groundwater recharge and sufficient fresh water entering estuaries and bays to preclude salt water moving further up rivers into otherwise brackish and fresh water environments. The increase in salinity has the potential to force aquatic populations to move away from food sources and to cause a change in vegetative communities over time, potentially affecting the survival of aquatic animal and plant species, including threatened and endangered species; organisms which terrestrial wildlife and humans harvest for food; and species of commercial importance.

Comments from USDA Animal and Plant Health Inspection Service (APHIS)

The need exists to coordinate the planning for, and response to, drought emergencies of Federal, State, local, and tribal groups. To handle a drought situation, it seems prudent to have a National Drought Emergency Management System in place that is similar to the National Animal Health Emergency Management System of the Animal and Plant Health Inspection Service (APHIS). APHIS is the lead federal agency for the animal health emergency management action areas of prevention, preparedness, response, recovery, and mitigation. APHIS partners at the national and local levels with State animal agriculture agencies, animal production industry groups, animal health professional organizations, other Federal agencies, and State and Federal emergency management agencies. The partnership looks at six action areas in developing the emergency management system: (1) Cooperation; (2) Research; (3) Monitoring and Surveillance; (4) Education and Public Awareness; (5) Infrastructure and Training; and (6) Response Plans.

In keeping with the need for coordination, USDA is working as a full partner with the Departments of Commerce and Interior to develop national initiatives that address problems associated with invasive species (insects, weeds, aquatic organisms, etc.). The National Invasive Species Council has been established, as mandated by Executive Order 13112, and has been charged with developing a National Invasive Species Management Plan which will detail and recommend performance-oriented goals and objectives that would enhance local infrastructure with regard to control and/or eradication of invasive species. The Plan will be developed through a public process and in consultation with stakeholders and other Federal agencies.

Specifically, existing USDA programs will be reviewed to develop specific initiatives for noxious weeds and aquatic organisms, and budget initiatives will be developed to enhance and expand USDA invasive species exclusion and detection capabilities. Invasive species programs will strengthen their ability to coordinate regulatory actions with regard to biocontrol initiatives. Special emphasis will be placed on the development of a National Invasive Species Database, and USDA will help organize Regional Pest Management Centers and oversee a research and education plan for growers.

Comments from USDA Agricultural Research Service (ARS) (Northwest Watershed Research Center)
'Preparation' for drought emergency presupposes understanding and agreement on definition of 'drought' at the appropriate spatial and temporal scales. One low-precipitation summer or low-snowpack winter may result in local water supply deficiencies without regional or national impacts, while long-duration, widespread lack of normal water input (rain and snow) can have obvious regional and national consequences. Science-based definition of drought requires validated, quality-controlled basic climatic and hydrologic data, including that gathered by USDA efforts such as the NRCS SNOTEL system, the NRCS/ARS Soil Moisture/Soil Temperature Network (SCAN), and long-term ARS experimental watershed and hydrologic research programs. Similarly, responses to "drought emergencies" should be developed with full understanding of the immediate and cumulative consequences of specific response strategies for environmental issues at local and regional scales. The information required is developed through a broad spectrum of scientific research from physiology of individual plants and species, to soil/water relationships at the field or catchment scale, to hydrologic regime of watersheds, to basin-wide and regional climate dynamics (watershed, river basin, region, sub-continent).

Environmental sensitivity to inputs and processes -- e.g., climatology, precipitation, snow amount, timing, duration, melt season, evapotranspiration, soil moisture, surface runoff, groundwater recharge -- varies locally, regionally, and by individual crop or environmental component. Better understanding of these forcing factors, and of short- and long-term environmental impacts of drought, as well as identification and discrimination of both short- and long-term environmental consequences of individual and cumulative mitigation practices, will require intensification and coordination of federal/state/academic drought research.

Extensive listings of "environmental issues" associated with drought and with drought mitigation actions are available from many sources including the National Drought Mitigation Center, Western Water Policy Review Advisory Commission, the Western Governors' Association, and the open literature. Drought policy should take full account of the inherent variability of "normal" climate, particularly in the semi-arid and high-elevation sectors of the nation. Drought policy should capitalize on the existing body of scientific knowledge of climate, natural resources, and environmental systems. Drought policy should support an enhanced, cooperative network of long-term research, observation, and monitoring programs led by USDA and coordinated with other Federal, State, river basin, and academic entities. The following additional points are pertinent to the perspective developed here:

- Drought policy should explicitly recognize the dominant role of high-elevation snow in supplying water for all uses throughout the American West.
- Drought policy should explicitly recognize the keystone role of stream corridors and riparian zones, including those of high-elevation headwaters streams, in providing critical habitat and refugee during times of water crisis, and the vulnerability of these environments to improper management during non-drought and drought episodes alike.
- Drought policy should explicitly recognize the linkages among water stress, drought, and other 'environmental perturbations' including wildfire and invasive plant and animal species (exotic or indigenous).
- Drought policy should explicitly recognize social forces and phenomena such as increased human populations in formerly rural or Awild@ settings,
increasing public and citizen use of and involvement with land and resource management policy for public lands, and rapidly increasing urban/suburban/wildland fringe contact zones and consequent problems incurred in water allocation, fire control, and noxious species control.

- Drought policy should acknowledge the need for improved science-based understanding of the complex web of landscape, biota, climate, and social structure within which drought manifests itself and within which drought mitigation practices are designed and implemented.

Comments from USDA Farm Service Agency (FSA) (CEPD/CPB)

A framework needs to be developed that integrates actions and responsibilities among all levels of government (federal, state, regional, and local). This policy should plainly spell out preparedness, response, and mitigation measures to be provided by each entity.

Each state needs to develop a drought contingency plan that includes early detection, monitoring, decision-making criteria, short- and long-range planning, and mitigation. Programs addressing public awareness and education on drought and water conservation should also be included.

A federal interagency group should be established for drought coordination with states and regional agencies. This group should determine the federal government's role in drought response and mitigation. They should also seek to focus federal response and information so that states and local governments have access to 'one-stop shopping.'

Comments from USDA Forest Service (FS) (NFS/WSA, S&PF/FAM, R&D/IFW)

Along with other extreme events (e.g., floods, severe storms), drought is a major factor that shapes the structure, composition, and function of ecological systems, both terrestrial and aquatic. Drought-induced extreme low flow events have major impacts on the morphology and hydrologic function of stream channel networks; on the composition, function, and integrity of aquatic ecosystems and biotic communities; and on the chemistry and water quality of streams and lakes. Drought also has major impacts on ecological processes and species populations in riparian zones within forested watersheds, zones which function as major loci of biotic activity and movement, particularly in the arid West. Drought similarly impacts terrestrial systems and processes, leading to major episodes of tree mortality and succession, initiating outbreaks of insects and disease, impairing forest health, causing catastrophic wildfires, and significantly impacting ecosystem productivity and cycling of essential elements. Biotic impacts of drought are particularly acute for threatened, endangered, and sensitive species of fish and wildlife present at low population densities, especially those species that require water or moist habitats to complete critical life history processes. In spite of the importance of these drought-induced ecological impacts, the scientific knowledge base for understanding drought impacts on ecosystem structure, processes, and biota is remarkably incomplete and spotty. Increased research is required not only on the direct and indirect impacts of drought on aquatic and terrestrial ecosystems and biota, but also on ecological responses to and recovery from drought. Research should also focus
on better understanding the magnitude of drought that triggers various levels and types of ecological response (useful in terms of defining drought from an environmental as well as from strictly hydrologic and human use perspectives). Such research should span the range of spatial scales from the local forest stand and headwater catchment to the forested landscape. Basic research must be closely linked to monitoring programs designed to evaluate the current condition of ecosystems and resources, and their responses to a variety of human and natural disturbances including drought.

Results of research should be transferred to managers and policy makers charged with planning for, responding to, and mitigating the effects of drought. Drought policy, management, and planning should be firmly grounded in scientific knowledge regarding drought impacts and response, and should take full advantage of available tools and models resulting from scientific research. One particularly critical need in this regard is to better integrate environmental issues, especially instream flow issues but also the array of additional ecological impacts and concerns enumerated in the previous paragraph, into drought planning and decision making. Most drought policy presently relies heavily on issues relating to impacts to human uses and needs. Such impacts are, of course, critical. But, greater attention must be paid to environmental issues and impacts, with drought planning, mitigation, and response better integrating both human and environmental issues into improved decision making.

With respect to the specific issue of wildfire, preparation for wildland fire emergencies includes planning for, preparing, training, and equipping for normal and above normal circumstances. Federal, State, local, and tribal agencies have the ability to monitor and evaluate weather and vegetative conditions to determine fire danger levels and wildfire potential. Existing mechanisms at the Federal level are available to respond to high wildfire danger conditions, as well as to provide equipment and training to State, local, and tribal agencies. Additionally, FEMA is investigating adoption of a more aggressive role in wildfire preparedness.

**Comments from USDA Natural Resources Conservation Service (NRCS)**

"Future policies should provide greater opportunity and incentives to proactively integrate drought planning into day-to-day business decisions thereby reducing the effects of drought and reducing the overall response needs to all sectors including: agriculture, water allocation and planning, wildlife and environment" (Western Drought Coordination Council's Report to the National Drought Policy Commission).

"Water conservation measures should not be mandated or applied universally in the absence of specific goals. Rather, water conservation is best viewed as a complement to, not as a substitute for, more traditional water supply development. The objective is the same -- to satisfy the needs of water users in the most cost-effective and efficient manner without adversely impacting public health, safety, or the quality of life and the environment" (Western Governors' Association Drought Task Force Report).

"The NDPC should provide specific ideas which Congress could consider in national legislation to encourage the incorporation of incentives for drought mitigation and preparedness at the local, state and regional levels including
educational resources that promote the concepts of drought planning" (Western Drought Coordination Council's Report to the National Drought Policy Commission).

Drought planning and preparation efforts, whether Federal, State, local, or tribal, must consider the needs of the environment as well as agricultural or human considerations. Fish and wildlife resources can be very vulnerable to drought as streams, springs, and ponds dry up due to the weather or de-watering for human use and all available forage or wildlife cover is hayed or consumed by livestock.

Section 4(b)(2) "review all existing Federal laws and programs relating to drought"

The spreadsheet, "Report on Drought Related Programs", which is attached to the reports of the Working Groups, provides a comprehensive summary of existing Federal programs related to droughts. Only comments that go beyond or further elaborate on material contained in this spreadsheet are presented in this section.

Comments from National Drought Mitigation Center (NDMC)

The focus of the NDMC is to reduce vulnerability to drought by promoting mitigation. That is, the NDMC promotes the use of preventative actions and planning to lessen the impacts of drought when it occurs. NDMC does not necessarily focus on the details of specific environmentally related drought programs. It looks at the concept of drought as a whole and works on issues regarding the reduction of drought impacts and vulnerability. Therefore, the identification and effectiveness of specific drought-related programs are best left to those agencies that deal with them on an ongoing basis. The NDMC works to:

- Help people conceptualize drought;
- Provide information on drought: what it is, what it does, and how to handle it;
- Provide pros and cons to themes and debates in drought management; and
- Help identify gaps in the types of drought management programs.

As for developing programs to handle environmental impacts of drought, the perspective of the National Drought Mitigation Center is that actions should be taken in advance of drought to lessen the potential for environmental impacts. There are short-term and long-term actions that can reduce overall vulnerability to drought. Then there are actions that are implemented when an actual drought is underway. The first actions help create robust systems capable of withstanding disruptions. The second actions help minimize damages from unforeseen or unmitigated impacts. These categories, short- and long-term mitigation and response measures should all be addressed in current program policy. A review of drought-related programs will help to ensure that all three types of measure are covered.

As pointed out in the "Report on Drought-Related Programs" attached to these Working Group reports, who/what is going to utilize and benefit from drought programs and the practical limitations of drought programs (i.e., funding) are also important considerations. An assessment of "Customers Served" would determine whether or not programs are focusing on a wide enough audience. There are many things that a wide variety of groups and individuals could be doing to mitigate
environmental drought impacts. Finally, an assessment of efficiency, feasibility, and cost/benefit aspects of drought- and environment-related programs would help ensure that programs will work.

Comments from State of Washington (Department of Ecology)

Most of the federal drought response programs that have been employed in Washington have been targeted to human, rather than environmental, needs. While they have been effective in achieving their desired objectives, they were generally undertaken without thought being given to any secondary environmental effects.

One of the problems that Washington has encountered in recent drought events is the lack of consistency in approaching drought from different federal agencies. To begin with, different types of federal drought assistance have different triggers. Secondly, many programs are designed to address the effects of a drought after the fact rather than seeking to minimize those effects from the outset. Many drought effects may, in fact, be unavoidable, but many could potentially be reduced with early action. While these variabilities have probably not caused too much hardship, the main reason is that recent drought episodes have not been too severe. Were those circumstances different, greater hardships might have resulted.

One area where federal-state cooperation has been very successful in Washington is drought forecasting. The increased availability of information on potential water shortages and indications of the possibility of drought have greatly enhanced the state's ability to prepare for an appropriate level of response should an actual drought event materialize. Because the most recent drought events in Washington have been single year events, the limits of that forecasting ability have not been greatly tested. A multi-year drought event, one that would have longer-term and farther-reaching consequences, might be less easy to predict. However, the improved understanding of long-term climatic trends, such as the El Niño-Southern Oscillation (ENSO) and Pacific Decadal Oscillation (PDO), may provide valuable information about the possibilities for future long-term droughts in the state.

Comments from U.S. Environmental Protection Agency (EPA)
(OW/OWOW/WD)

There are few grant and loan programs that may be used to improve water quality and/or fish and wildlife habitats. In instances where increasing preparedness for drought or reducing the impact of drought also improve water quality and/or habitats, they may be eligible for funding by these programs. These grant and loan programs often provide technical assistance and funding to create healthier watersheds (e.g., wetlands, watershed restoration), and healthy watersheds are usually better able to withstand drought.

Comments from Federal Emergency Management Agency (FEMA)

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, P. L. 93-288 (the Stafford Act), was designed by Congress to address the loss of life, human suffering, loss of income, and damage or destruction of property that occur during disasters. To assist communities in recovering from these events, the Stafford Act enables FEMA to provide supplementary Federal assistance to individuals, State
Section 102(2) of the Stafford Act defines the term major disaster to mean:

Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under this Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering thereby.

(emphasis added)

For each State request for a major disaster, FEMA must provide a recommendation to the President. FEMA's recommendation is based on several factors (44 CFR '206.37), including whether or not assistance is available from other Federal programs and other sources. In the majority of instances during drought, other Federal agency programs have been more appropriate to address State and local concerns.

The programs activated under a Presidentially declared major disaster are primarily recovery oriented. For instance, individuals may be eligible for temporary housing and home repair assistance (to name just a few areas of assistance). State and local governments, as well as certain private nonprofit organizations, may be eligible for public assistance funding to clear debris; to implement emergency protective measures for the preservation of life and property; to repair or replace public infrastructure, such as streets, bridges, or water control facilities; to repair or replace public buildings and related equipment; to repair or restore public utilities; and to repair or restore public recreational facilities and parks.

In approving funding for these projects after a major disaster declaration, FEMA is required to comply with all other Federally mandated laws including, but not limited to, the National Environmental Policy Act of 1969, the National Historic Preservation Act of 1966, the Endangered Species Act of 1973, the Clean Air Act of 1990, and the Clean Water Act of 1987. In accordance with the Council on Environmental Quality regulations and 44 CFR Part 10, FEMA prepares environmental impact statements or environmental assessments on proposed permanent repair work projects that may have a significant and potentially detrimental impact on the environment. However, most FEMA permanent repair work is categorically excluded from FEMA's environmental requirements, as is the work performed under Emergency Declarations and Fire Suppression Assistance Declarations.

The Fire Suppression Assistance Program, authorized by Section 420 of the Stafford Act, is perhaps the FEMA program of most benefit in dealing with the environmental effects of drought, namely wildfire. Under Section 420 of the Stafford Act, the President is authorized to provide assistance, including grants, equipment, supplies, and personnel, to any State for the suppression of any fire on publicly or privately owned forest or grassland which threatens such destruction as would constitute a major disaster. Under Executive Order 12148, this authority has been
Fire suppression assistance declarations are authorized when an event threatens such destruction as would constitute a major disaster. The threat of a major disaster involves a natural or human-caused event as defined in Section 102(2) of the Stafford Act, which immediately threatens lives and improved property, such as primary residences, businesses, or critical infrastructure. Fire suppression assistance declarations cannot be approved for the protection of agricultural, cultural, and environmental resources.

Comments from US Army Corps of Engineers (USACE) (Policy & Special Studies Division)

There are many laws related to environmental aspects of instream flows, and minimum flows for fish and wildlife needs and aquatic environment in fact too numerous even to begin to enumerate, because most are site (reservoir) and stream specific. There are many court-ordered constraints (e.g., Delaware River minimum flow) as well as interstate compacts for minimum flows between state boundaries. Most, however, are agreed-to targets, without specific legal standing. That is, during normal conditions, states and agencies agree to provide for instream flow targets to the extent that they do not interfere with the basic legislated purposes of a given reservoir or project.

The key issue is how much flexibility we can build into the basic regulatory decisions involving emergency instream water withdrawals during droughts, especially EPA Section 404 regulations.

Comments from DOC National Oceanic and Atmospheric Administration (NOAA) (NWS)

Existing DOC programs and laws that relate to drought are included in the summary spreadsheet prepared by the NDPC staff. It is noted that there is one DOC program designed to provide benefits to drought victims, and this is administered by the Economic Development Agency. This program has been used infrequently in recent years. In contrast, NOAA has many products that relate to drought, though no single program that deals exclusively with drought on a national scale. Programs that relate to drought within NOAA could be classified as falling into three categories: observations, monitoring, and forecasting.

Observation networks that take and transmit measurements of temperature, precipitation, and other meteorological variables enable the detection of anomalies that lead to drought. Routine and reliable observations are also required to initialize the forecast computer models at the National Centers for Environmental Prediction (NCEP) and other forecast centers around the world. There are a number of networks operating on federal, regional, and state levels, many automated and some manual. Of special note are the several hundred first-order stations operated by the FAA and the NWS, the several thousand cooperative network stations, and a number of automated networks operating regionally or statewide. While most stations take surface weather observations, a recent network established by USDA Natural Resources Conservation Service (NRCS) takes explicit measurements of various parameters, including soil moisture, from around 30 sites across the
Monitoring efforts include compiling surface or soil measurements into maps or tables that summarize weather conditions. This information can then be used to assess the extent of significant anomalies. Currently, there are a number of drought indices that are disseminated in tabular and map form via the Internet, NWS Family of Services, DIFAX, and/or publications. These indices generally use temperature and precipitation data to estimate soil moisture anomalies at various depths. Among those indices used, the longest are the Palmer Drought Index (PDI) and the Crop Moisture Index (CMI), both of which are disseminated via publications such as the *Weekly Weather and Crop Bulletin* and over the Internet and DIFAX. There are various forms of Palmer Drought Index (PDI), but most yield fairly uniform results. The PDI has been calculated for all U.S. climate divisions extending back more than 100 years, making this index especially useful for historical analyses and comparisons. Historical data on precipitation, temperatures, and drought are maintained principally by the NOAA/NESDIS National Climatic Data Center (NCDC) and the Regional Climate Centers (RCCs). Both the RCCs and NCDC disseminate recent and historical data and information via hard copy, magnetic media, and the Internet. Also, a number of federal agencies produce publications or Internet reports analyzing current or recent climatic variations or extremes, including drought. NCDC, the RCCs, and the NOAA/NWS Climate Prediction Center, for example, issue periodic reports that can be used to monitor dryness, as well as special reports on extreme weather events on an ad hoc basis. The NOAA/USDA Joint Agricultural Weather Facility's *Weekly Weather and Crop Bulletin* is especially useful for monitoring U.S. weather conditions, as it includes considerable weather data and information on weekly, monthly, and seasonal time scales. The Web sites operated by CPC, NCDC, the NWS Hydrologic Information Center, and NOAA's Climate Diagnostics Center offer considerable information on current anomalies, including drought.

Though the National Weather Service does not have a drought-specific regional program, two of the NWS regional offices (western and eastern) have drought programs that detail specific actions to be taken when drought develops. Other NWS regions are active during drought, though they do not have formal drought programs. In all cases, NWS personnel work with appropriate state and regional entities, as well as the media and public, in providing information on drought status.

NCEP issues forecasts of precipitation, temperature, and other variables that have an impact on drought, but there currently is no specific forecast aimed explicitly at drought. Especially important for monitoring drought, however, are the various Quantitative Precipitation Forecasts (QPFs). These include forecast precipitation amounts for the next 24 hours, the following 24 hours, and the next 5 days. The principal U.S. medium range model, the Medium-Range Forecast (MRF) model, produces forecast rainfall totals out to 2 weeks with varying degrees of accuracy depending on location, time of year, and the various synoptic patterns. The 6-10 day forecast, issued three times per week, offers temperature and precipitation forecasts in categories (e.g., above normal, much above normal, etc.). The recent week-2 forecasts are experimental and are issued as probabilities once a week. The experimental U.S. Threats Assessment provides 3- to 10-day forecasts of significant weather events of interest mostly to emergency managers. These do include areas of significant dryness. CPC also disseminates probabilistic outlooks
for monthly temperature and precipitation with a 2-week lead as well as 13 overlapping 3-month forecasts. There are also products that use MRF output to forecast soil moisture, including CPC’s experimental soil moisture maps. This recent effort forecasts soil moisture anomalies 1 and 2 weeks in advance. It also monitors daily moisture using the precipitation network from the River Forecast Centers, which includes over 6,000 stations.

**Comments from DOI Fish and Wildlife Service (FWS)**

Requirement for Emergency Consultation Under the Endangered Species Act (ESA) - A Federal response to emergency drought conditions requires emergency consultation under Section 7 of the Endangered Species Act when listed species and/or their critical habitat may be affected. Guidance on emergency consultations is provided in Chapter 8 of the Endangered Species Consultation Handbook.

Most Federal agencies are now promoting a watershed approach in assessing environmental conditions and conducting habitat restoration. Healthy watersheds and/or ecosystems are more able to withstand, or not be as severely impacted by, drought conditions than are degraded ones. Federal habitat restoration programs can help ameliorate or buffer the effects of drought conditions.

These programs include the FWS Partners for Fish and Wildlife Program and North American Waterfowl Management Plan; USDA Conservation Reserve Program, Wetlands Reserve Program, and Wildlife Habitat Incentives Program; and EPA Small Grants. All these programs result in on-the-ground habitat restoration of wetlands, grasslands, and riparian areas, often done in a watershed restoration context. Habitat restoration can help increase groundwater recharge, surface water retention, and the health of riparian zones, all of which can help buffer the impacts of drought.

**Comments from DOI National Park Service (NPS)**

The National Park Service (NPS) Organic Act (16 USC 1) directs NPS to "conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." NPS Management Policies go on to direct NPS to manage natural resources consistent with fundamental ecological processes and allow interference with natural processes in park natural zones only (1) when directed by Congress; (2) in emergencies when human life and property are at stake; and (3) to restore native ecosystem functioning that has been disrupted by past or on-going human activities. As such, to the extent that drought is a natural process, the NPS Organic Act and Management Policies direct NPS not to interfere with this process or its effects (except as noted above). However, that being said, two areas where drought has an impact on NPS management actions include (1) the use of water by visitors and for park administrative purposes, and (2) management of fire. In regard to water use, NPS Management Policies direct NPS to use water efficiently and, in water-scarce areas, use water frugally. When drought conditions exist, NPS units have developed and implemented water conservation and alternative water supply plans. In regard to fire management, during times of severe drought, NPS fire management is modified. Under such conditions, additional fire management staff and equipment...
are typically requested and fire management becomes strictly "fire suppression" until drought conditions improve and routine fire management, as defined in each park's Fire Management Plan (e.g., prescribed fire or wildland fire for natural resource benefits), is carried out. Further, when parks are expecting to experience long-term extreme fire danger due to drought that may not adequately be met by existing staffing and equipment, a severity assessment and special funding request are prepared and submitted.

It should also be noted that NPS's watershed restoration activities (e.g., restoration of wetlands, floodplains, abandoned mine lands, and other disturbed lands) result in more natural watershed conditions that are better able to cope with or mitigate the impacts of drought.

Comments from USDA Animal and Plant Health Inspection Service (APHIS)

Current authorities enable APHIS to promulgate regulations that protect the health and well-being of U.S. plants, animals, and natural resources. These authorities also enable the Agency to initiate programs that are designed to eliminate or control invasive insects, weeds, pathogens, and other organisms. Specific legislative authorities include: Federal Plant Pest Act; Plant Quarantine Act; Section 102 of Organic Act of 1944; Federal Noxious Weed Act; Golden Nematode Act; Honeybee Act; Title III, Federal Seed Act; Alien Species Prevention and Enforcement Act of 1992; Endangered Species Act; Swine Health Protection Act; Section 306 of the Tariff Act of 1930; Animal Quarantine Laws; Virus-Serum-Toxin Act; Animal Damage Control Act; Lacey Act; and Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988.

Comments from USDA Agricultural Research Service (ARS) (Northwest Watershed Research Center)

USDA Agricultural Research Service (ARS) is the primary agricultural research arm of USDA. ARS drought research is conducted under the broad mandate of the ARS mission, "... to develop and transfer solutions to agricultural problems of high national priority and provide information access and dissemination" in order to:

- ensure high-quality, safe food and other agricultural products;
- assess the nutritional needs of Americans;
- sustain a competitive agricultural economy;
- enhance the natural resource base and the environment; and
- provide economic opportunities for rural citizens, communities, and society as a whole.


ARS research is accomplished through 23 National Programs (see
Research in each of these sectors contributes to certain aspects of drought assessment and mitigation. National Programs which are directly relevant to the NDPC Environmental Issues WG include: Animal Germplasm Resources, Conservation, and Development (101); Aquaculture (106); Water Quality and Management (201); Soil Quality and Management (202); Air Quality (203); Global Change (204); Grazinglands Management (205); Integrated Farming Systems (207); Integrated Crop Production and Protection Systems (305); and Animal Production Systems (102).

In the context provided by the above authorities, research sectors, and National Programs, ARS research is organized by individual research programs. Approximately 23 discrete research programs conducted at 20 different locations are conducting research relevant to this NDPC Environmental Issues Working Group.

Comments from USDA Forest Service (FS) (NFS/WSA, S&PF/FAM, R&D/WWAR)

Two existing Federal laws address, and Federal Property Management Regulations provide (41 CFR 101), Federal assistance to State, local, and tribal agencies for wildland firefighting assistance. Additionally, the Forest Service has internal mechanisms in place that can authorize severity funds and equipment to National Forests that demonstrate abnormally high fire danger.

The Cooperative Forestry Assistance Act of 1978 authorizes the USDA Forest Service [Section 10(b)(1)] to cooperate with State foresters or equivalent State officials in developing systems and methods for prevention, control, suppression, and prescribed use of fires on rural lands and in rural communities that will protect human lives, agricultural crops and livestock, property and other improvements, and natural resources. Additional provisions of this act specify the following:

- Section 10(b)(2) authorizes the FS to provide financial, technical, and related assistance to State Foresters or equivalent State officials, and through them to other agencies and individuals for the prevention, control, suppression, and prescribed use of fires on non-Federal forest lands and other non-Federal lands.
- Section 10(b)(3) authorizes the FS to provide financial, technical, and related assistance to State Foresters or equivalent State officials in cooperative efforts to organize, train, and equip local firefighting forces, including those of Indian tribes or other native groups, in order to prevent, control, and suppress fires threatening human lives, crops, livestock, farmsteads or other improvements, pastures, orchards, wildlife, rangeland, woodland, and other resources in rural areas. As used herein, the term "rural areas" shall have the meaning set out in the first clause of section 306(a)(7) of the Consolidated Farm and Rural Development Act.
- Section 10(b)(4) authorizes the FS to provide financial, technical, and related assistance to State Foresters or equivalent State officials, and through them...
to other agencies and individuals, including rural volunteer fire departments, to conduct preparedness and mobilization activities, including training, equipping, and otherwise enabling State and local firefighting agencies to respond to requests for fire suppression assistance.

- Section 10(c) specifies that the Secretary of Agriculture, with the cooperation and assistance of the Administrator of General Services, shall encourage the use of excess personal property (within the meaning of the Federal Property and Administrative Services Act of 1949) by State and local fire forces receiving assistance under this section.

- Under Section 10(e)(2)(A), $70,000,000 is authorized to be appropriated annually to carry out subsection 10(b)(4). Of the total amount appropriated to carry out this subsection,

  (i) one-half shall be available only to State Foresters or equivalent State officials, and through them to other agencies and individuals, of which not less than $100,000 shall be made available to each State; and

  (ii) one-half shall be available only for rural volunteer fire departments.

- Under Section 10(e)(2)(B), the Federal share of the cost of any activity carried out with funds made available pursuant to this paragraph may not exceed 50 percent of the cost of that activity. The non-Federal share for such activity may be in the form of cash, services, or in-kind contributions.

- Under Section 10(f), there shall be established in the Treasury a special rural fire disaster fund that shall be immediately available to and used by the Secretary to supplement any other money available to carry out this section with respect to rural fire emergencies, as determined by the Secretary. The Secretary shall determine that State and local resources are fully used or will be in the disaster fund to assist a State in which one or more rural fire emergencies exist. There are hereby authorized to be appropriated such sums as may be needed to establish and replenish the disaster fund established by this subsection.

The Federal Property and Administrative Services Act of 1949 authorizes the Forest Service to [Section 202(b)(4)] transfer or dispose of such excess property as promptly as possible in accordance with the authority delegated and regulations prescribed by the Administrator. Moreover [Section 202(d)(2)], under such regulations and restrictions as the Administrator may prescribe, the provisions of this subsection shall not apply to the following: property furnished under section 580a of Title 16, in connection with the cooperative Forest Fire control program, where title is retained in the United States.

Under the Federal Property Management Regulations (41 CFR 101), FEPP must be used for wildland and rural fire, and the Forest Service must maintain ownership of the property.

The Research and Development Deputy area of the Forest Service maintains active research programs focused on better understanding impacts of a number of human and natural disturbances, including drought, on forest and aquatic ecosystems.
nationwide. This research is conducted through six regional Research Stations, the Forest Products Laboratory, and the International Institute of Tropical Forestry, with research organized in over 160 individual research units conducted at over 65 research locations. Much of the agency's drought-related research has been conducted at a network of over 80 experimental forests and watersheds, some of which have continuous research as well as long-term databases on hydrometeorological conditions, streamflow, and a broad array of ecological processes extending over 60 years. Major components of the research effort pertinent to drought occurrence and impacts are conducted in the areas of Fundamental Plant Science; Quantitative Analysis; Forest and Rangeland Management; Insects, Diseases, and Exotic Weeds; Fire Science; Terrestrial Wildlife Habitat; Aquatic Habitat; Watershed Processes; and Atmospheric Sciences.

Section 4(b)(3) "review State, local, and tribal laws and programs relating to drought that the Commission finds pertinent"

Comments from National Drought Mitigation Center (NDMC)

See NDMC comments under Section 4(b)(2).

Comments for State of Missouri (Department of Conservation)

The Missouri Department of Conservation has a policy addressing municipal use of water taken from Department lakes during drought periods. The policy is stated as follows:

"The Department will cooperate with communities and individuals in times of extreme drought emergencies by allowing use of water from Department lakes, as evaluated on a case-by-case basis. Department lakes are not to be viewed as standby sources of public drinking water."

Environmental issues associated with this policy involve the effects on lake-associated aquatic biota from extended periods of water withdrawal. The policy was established April 1990.

Maintaining sufficient instream flows during periods of drought to sustain stream biota is an important issue and one the Missouri Department of Conservation is addressing. This issue should be recognized as extremely important during drought conditions and should be addressed through a well coordinated effort involving appropriate State and Federal agencies.

The Missouri Department of Conservation maintains daily flights over the State's Ozark Region during dry spring conditions, usually the month of March, to observe and report forest fires. Forest fires are extremely prevalent during drought conditions and can have significant harmful effects on the region's forest, fish, and wildlife interests (e.g., loss of vegetation cover resulting in increased watershed erosion).

Missouri Drought Response Plan, 1995 - Water Resources Report No. 44, addresses the response component of drought planning within Missouri. It defines
basic linkages among local, State, and Federal jurisdictions for coordinated planning and response efforts. The plan identifies the effects of drought-produced ground water loss to State streams and stream biota.

Comments from State of New Mexico (Forestry Division)

The State of New Mexico has recently passed legislation that permits municipalities and counties to restrict or ban the sale of fireworks. The law requires use of the Palmer Drought Index (PDI) to meet severe or extreme status. While the PDI is a well recognized index, it appears to say more about soil moisture than fuel moisture which is of greater interest to fire managers. Also, PDI is too slow to react when fire danger is on a steep increase due to extreme temperatures and winds. On the other side, at the end of a drought, there may be significant surface moisture but PDI may continue to show drought due to the departure from normal. We are interested in a better drought index that combines attributes more responsive to wildfire management needs.

Comments from State of Texas (Texas Natural resource Conservation Commission)

Texas, as do most other states, has extensive drought response and environmental programs. The Dust Bowl era of the 1930s and the subsequent worst drought of record which occurred in Texas during the 1950s led the state to begin strengthening its water planning and management programs. In addition, increased public awareness and appreciation of environmental values that began over two decades ago has now resulted in the routine consideration of environmental impacts when water resource management and allocation decisions are made.

The Texas Natural Resource Conservation Commission (TNRCC) administers the state's water rights and water quality permitting programs. The TNRCC is specifically required by state law to consider impacts to instream uses, water quality, aquatic and wildlife habitat and freshwater inflow needs of bays and estuaries when reviewing and taking action on a water right application. In performing this assessment, the TNRCC consults with the Texas Parks and Wildlife Department. In its action on the application, the TNRCC may place conditions on the water right to avoid or mitigate environmental impacts. Texas law also provides that, upon request of an affected water right holder, these conditions may be temporarily suspended if the petitioner demonstrates that an emergency condition exists and there are no practicable alternatives to the suspension.

The TNRCC also conditions the approval of a water right application with the development and implementation of water conservation and drought contingency plans. All holders of irrigation rights of 1,000 acre-feet per year or more and municipal, industrial and other uses of 10,000 acre-feet per year or more are required by law to develop and implement water conservation plans. All wholesale and retail public water suppliers and irrigation districts are also required by state law to develop and implement drought response plans. The TNRCC, in conjunction with the Texas Water Development Board (TWDB), provides technical assistance to these entities for this purpose. The state has also allocated funds for related educational programs as well as weather modification and brush control projects.
Texas has also integrated environmental protection and drought response in its state and regional water planning efforts. State water planning begins at the regional level. In developing regional options to meet future water needs, regional planning groups develop options to meet environmental flow needs as well as respond to drought. These regional plans are reviewed and approved by the TWDB before they are incorporated into the state water plan. In turn, the TNRCC is required to consider the state water plan when reviewing an application for a water right.

Additionally, an interagency Drought Preparedness Council has been established in Texas to: assess and report on drought conditions in the state; recommend specific provisions for a defined state response to drought-related disasters; advise regional water planning groups on drought-related issues; ensure effective coordination among state, local and federal agencies in drought response planning; and report to the Texas Legislature every two years on significant drought conditions in the state.

Generally, drought response measures fall into two broad categories: water supply and demand management. Both options are properly subject to state and local control. Water supply development is a matter subject to state water rights administration. Drought response includes the curtailment of discretionary, beneficial uses of water in order to protect public health and safety. What constitutes discretionary uses and the timing and extent of their curtailment is a matter for local decision-makers. How to balance public health and safety with instream flow needs during drought should also be matter for state and local water managers and planners.

Comments from State of Washington (Department of Ecology)

The state of Washington has its own set of drought-related laws and regulations that include a statutory definition of drought. The primary objectives of the statute are to "ensure the survival of irrigated crops and the state's fisheries" (Revised Code of Washington [RCW] 43.83B.415).

Drought conditions are defined as occurring when "water supply for a geographical area or for a significant portion of a geographical area is below seventy-five percent of normal and the water shortage is likely to create undue hardships for various water uses and users" (RCW 43.83B.400). Since the state drought statutes are largely focused on irrigated agriculture, Washington's statutory drought definition constitutes something of a hybrid of the meteorological, hydrological, and socioeconomic definitions of drought developed by the National Drought Mitigation Center.

Droughts can be declared in Washington for any "geographical area or part of a geographical area" that is experiencing the water supply conditions specified above. The administrative rules implementing the drought statutes (the Washington Administrative Code, or WACs) provide that the issuance of administrative orders declaring the existence of drought conditions can be for the entire state, individual counties, specific watersheds, or other geographic (or geological or hydrogeological) units than make hydrologic sense.

Most of the activities authorized under Washington's drought statutes have to do...
with variations on the state's normal water right permitting activities, such as issuing temporary water right permits for the duration of a drought event or permitting the temporary transfer of water rights. The program also includes, however, a grant and loan program that can be used for a number of purposes to minimize the effects of drought. Recently, thought has been given to using the funds from that program in a more preventive fashion to return waters to enhance flows necessary to support viable fish populations.

Comments from DOI Fish and Wildlife Service

See FWS comments under Section 4(b)(2).

Comments from USDA Agricultural Research Service (ARS) (Northwest Watershed Research Center)

Environmental issues related to drought, and environmental consequences of drought and drought mitigation strategies, transcend political layers and jurisdictions. Research is needed to provide a scientific basis for determination of drought occurrence, severity, and environmental consequences across the suite of biological, physical, and social parameters that comprise integrated ecosystems, at local, tribal, state, and regional levels in diverse biogeographical regions of the nation. Research is necessary to develop and substantiate verifiable drought indices and the rationale for determining appropriate drought mitigation actions at varying political levels (local, Tribal, State, regional) and across varying spatial (watershed, river basin, region, sub-continent) and temporal (annual, multi-year, decadal) scales. Research and model development and application of resource management simulation models suitable for parameterization and validation at varying scales in diverse biogeographic settings (specific examples are available), provide one promising approach for assessing drought programs and consequences at local, tribal, State, and regional levels.

Comments from USDA Forest Service (FS) (NFS/WSA, S&PF/FAM, R&D/WFWAR)

State water rights statutes in the 17 western states where the appropriation doctrine applies are definitely neither 'drought responsive' nor 'drought friendly.' The 'first in time, first in right' principle is a deterrent to a system of ranking beneficial uses in some logical manner, such as domestic water as highest and best use, followed by other uses (e.g., instream flows for channel maintenance and fish habitat protection) in some kind of descending order as defined in State law or regulation. Historically, on several occasions a State governor has suspended State water rights and ordered drinking water be provided citizens before any other use. That can be disruptive if unplanned. States, counties, and tribes should do more and better contingency planning for drought management. The consequences of such plans for fish and wildlife populations and other environmental attributes should receive greater attention than is now the case.

Section 4(b)(4) "determine what differences exist between the needs of those affected by drought and the Federal laws and programs designed to mitigate the impacts of and respond to drought"
Comments from National Drought Mitigation Center (NDMC)

Basically, a comprehensive evaluation of existing programs by the NDMC should include a review to ensure that priority environmental drought impacts are identified and addressed in programs and policies that place an emphasis on short- and long-term mitigation, while still recognizing the need for response measures during times of drought. These actions should be feasible and efficient, and undertaken by those individuals and programs that can make a difference in reducing environmental vulnerability to drought. Specifically:

- A review of environmental impacts will determine which impacts are tolerable and which should be addressed in relevant programs;
- A program assessment will help to ensure that priority environmental impacts are being accounted for in current programs;
- A program assessment will help to ensure that short- and long-term mitigation measures and response measures are all included in recommended programs and policies;
- An assessment of "Customers Served" would determine whether or not programs are focusing on a wide enough audience; and
- An assessment of efficiency, feasibility, and cost/benefit aspects of programs related to drought and the environment would help ensure that programs will work.

In the case of the Environmental Issues Working Group, we must decide: whether all important environmental impacts have been identified; if current programs adequately address these priority impacts; whether the measures promoted by the programs address both short- and long-term mitigation and response measures adequately; whether the right "customers" are being served; and whether or not the programs are working and why or why not.

Comments from State of Washington (Department of Ecology)

Fish and wildlife populations are almost always stressed by drought events. While those effects have not gone totally unnoticed, they have generally taken a back seat to human needs arising during times of drought. Certainly human needs are an important consideration during drought, but programs designed to provide for human needs need to be evaluated to identify and minimize any secondary environmental impacts. In the northwest, that need has been emphasized even more by the listing of many salmonid species as threatened or endangered. The concern now is that those species not be unduly affected by actions taken to diminish other drought impacts.

In Washington, drought effects occur most often on a watershed or multi-watershed basis depending upon actual hydrologic conditions in specific basins. One of the difficulties the state has encountered during past drought episodes is that the focal point for the delivery of federal assistance has been county governments. That may be unavoidable to some extent, but federal programs should be modified to better acknowledge the essentially hydrological nature of drought. Services may need to be provided through county governments, but they should be made available on a watershed basis as much as possible.
A strategy or framework needs to be developed to promote drought contingency planning and organization. The strategy or framework should emphasize an anticipatory environmental risk management approach to drought management.

Comments from Federal Emergency Management Agency (FEMA)

In the case of FEMA, the differences between the needs of those affected by drought and existing law and disaster assistance programs are considerable. The Stafford Act circumscribes FEMA's authority to assisting State and local governments in lessening the loss of life, human suffering, loss of income, and damage to improved property. The Stafford Act is not designed to address agricultural, cultural, or environmental losses.

It could be argued that the effects of drought impact wildlands and rural communities first, areas where USACE, DOI, and USDA programs have statutory authority to provide assistance. As a result, FEMA's role in drought is limited. Even once drought spreads into urban centers, many other programs are authorized by SBA or covered by States (such as unemployment insurance programs).

Only when there is an unmet need, such as a food and water shortage for communities/individuals and families, has FEMA been able to provided assistance. In 1998, extreme food and water shortages in the Federated States of Micronesia and Republic of the Marshall Islands resulted in a Presidential disaster declaration. FEMA coordinated relief efforts with several other Federal agencies.

Comments from US Army Corps of Engineers (USACE) (Policy & Special Studies Division)

Currently there are few, if any, laws designed specifically to mitigate the effects of drought on aquatic habitats or ecosystems. There are many existing environmental constraints that serve to provide a minimal degree of protection and needs for aquatic ecosystem maintenance. However, the needs of the environment are usually judged to be of a lesser priority than the needs of society during a drought. There are both explicit and implicit priorities expressed and implemented, usually as a consequence of the most intense stages of a drought, when emergency powers and authorities are triggered.

Comments from DOC National Oceanic and Atmospheric Administration (NOAA) (NWS)

NWS has discussed drought issues with meteorologists and hydrologists in the DOI Bureau of Reclamation and U.S. Geological Survey as well as hydrologists in the NWS regions. Some tentative findings follow: a) there is a need for more accurate and more quantitative forecasts of precipitation in order to better forecast runoff and stream flow; b) longer range forecasts should be issued more frequently; c) better information on national drought (location, intensity, etc.) would be helpful; d) verification scores for all forecasts should be made readily available; e) a forecast of the number of hours temperatures will remain above or below freezing would
help forecast snow pack and runoff; f) forecasts giving the probabilities of recording various precipitation totals would be useful.

For the wildland fire community, information on long-term patterns and abrupt changes in those patterns are critical for drought preparation, mitigation, and response efforts. There have been limited efforts made to teleconnect rainfall anomalies to fire occurrences. A probabilistic approach to ascertain risk at various time intervals would be beneficial.

Comments from DOI Fish and Wildlife Service (FWS)

See FWS comments under Section 4(b)(2).

Comments from DOI National Park Service (NPS)

The NPS is currently advancing and Environmental Leadership Initiative that, among other things, includes the development and implementation of park water conservation and alternative water supply plans. In addition, NPS is advancing a Natural Resource Initiative that proposes stepped-up natural resource inventory and monitoring and disturbed lands restoration activities in units of the National Park system.

Comments from USDA Animal and Plant Health Inspection Service (APHIS)

By partnering with stakeholders in both the case of the APHIS National Animal Health Emergency Management System and the National Invasive Species Council, with State Invasive Species Councils eventually established, the needs of those affected by animal health emergencies and invasive species introductions can be addressed. The same could hold true for a National Drought Emergency Management System.

Comments from USDA Agricultural Research Service (ARS) (Northwest Watershed Research Center)

Drought anticipation by persons and institutions potentially affected will be supported by new prediction and planning tools. Anticipation of environmental issues require adequate understanding of the physical and biological processes operative in agricultural ecosystems, of the linkages among water-dependant processes and organisms, and of the consequences of water shortage or deprivation on each component and the holistic ecosystem. Federal, ARS, and collaborating private, Federal, and academic research programs develop the basic knowledge requisite to that understanding, and further provide the basis for developing practices and programs to mitigate and respond to drought. These drought mitigation programs must anticipate downstream (time and place) consequences on the social, biological, and physical components and attributes of the affected system(s).

Comments from USDA Farm Services Agency (FSA) (CEPD/CPB)

A fundamental issue is drought response time and strategic preparation. Federal and State agencies do not have a plan of coordination developed prior to initiation of drought. Each drought program has different eligibility criteria. Response times
vary from one program to the next. Program triggering mechanisms should be standardized.

Policy needs to be developed to promote drought contingency planning, emphasizing a more proactive, anticipatory approach to drought management.

We do not have a standard definition of drought, among all levels of government (Federal, State, regional, and local). It would be difficult to identify independent or objective physical criteria that specify when drought conditions exist.

Drought funds should be shifted from drought relief to drought preparedness and mitigation.

We do not have an effective drought risk management program. Farmers and ranchers need to adopt more self-reliant approach to managing climatic variability. We need to ensure risk management tools are available to all farmers and ranchers to make them more self reliant.

A change in policy requires time for communication and change. Farmers and ranchers need to be engaged in the policy process.

There is no national drought plan. The states must develop their own plans for collecting, analyzing, and disseminating information on drought conditions. State plans should linked to the national plan through interagency committee(s) with drought designation responsibility and program administration.

**Comments from USDA Forest Service (FS) (NFS/WSA, S&PF/FAM, R&D/WFWAR)**

Presently Federal programs targeted at drought response are woefully disjointed, uncoordinated, and perhaps even counterproductive. Federal agencies are able to deal with droughts no more effectively than are States, tribes, cities, or counties. We need some kind of clearinghouse or other mechanism to ensure effective coordination and improved response capabilities. Perhaps a Federal statute targeted solely at drought management would help. While the Congress has frequently funded major water projects in the country and left the details of their operations to BOR or the Corps in many cases, or turned projects over to the States, the fact remains that even these projects are not being well managed to mitigate droughts. None are tightly coordinated with State-owned projects on the same river system. It may be infeasible to expect either State legislatures or the Congress to modify existing State or Federal laws to add drought planning and mitigation provisions to them until a genuine crisis develops that demands their attention.

Federal financial, technical, and physical equipment support to States related to wildland firefighting is provided annually. State Foresters have the discretion to manage State and local priorities for receipt of Federal wildland firefighting assistance provided by FS programs.

Relative to the needs identified in Section 4(b)(1), one significant need is to increase funding for research on the impacts of drought on terrestrial and aquatic ecosystems, processes, and biota; on ecological responses to and recovery from drought; and to land and water management strategies for improving drought resilience in the nation’s ecosystems.
drought; and on the magnitude of drought events that trigger various levels and types of ecological response. A second critical need is to better incorporate the results of this research into drought planning and decision making. In particular, environmental issues and concerns need to receive equal consideration with hydrologic and human use concerns in relation to drought planning, response, and mitigation activities [see FS comments under Section 4(b)(1)].

**Comments from USDA Natural Resources Conservation Service (NRCS)**

The drought response authority is very limited for the NRCS Emergency Watershed Protection Program (EWP). A legal analysis is needed of the EWP authority for drought and options considered for its implementation. For example, NRCS may be able to request supplemental community assistance funds when a drought is declared for rural water supply.

Drought mitigation or response are not emphasized purposes of the new NRCS conservation programs such as EQIP, WHIP, WRP, and Farmland Protection Program. Drought needs to be re-emphasized as a potential activity in locally led conservation or on-farm planning as alternative practices which can benefit human uses as well as fish and wildlife resources. Practices include pond or spring development, wetland restoration, riparian restoration, and stream habitat restoration. Conservation practice standards also need to be updated for drought preparation, mitigation, and response concerns for environmental issues such as fish and wildlife resources.

On a larger scale NRCS or multi-agency planning at the watershed level allows planners to provide better and longer lasting drought mitigation practices for fish and wildlife resources than can be done at the farm or ranch level. Stream and riparian restoration throughout the watershed can provide excellent mitigation against the ravages of drought in western states by targeting critical stream or riparian habitats with restoration efforts. Restoring these degraded critical stream segments will not only increase habitat and in many cases water quantity and quality for fish but will provide deep holes in the stream channel to provide water for numerous aquatic species in times of drought and allow species to quickly recover as stream flows recover. The restored riparian cover will also provide shade for the stream and food, cover, and water for the endemic wildlife species. Away from the streams ponds can be built and springs developed to provide water for wildlife benefiting them in times of drought as well as in times of normal weather. Food and cover plots can be planted for numerous wildlife species.

The International Drought Information Center conducted a survey in 1992 on how NRCS (formerly the Soil Conservation Service) is "fostering the adoption of drought mitigation measures by farmers, ranchers, rural community residents, and others".

The following list summarizes recommendations of the forty-four states on how NRCS should help farmers and ranchers respond to droughts while preserving environmental quality. These recommendations range from which farm practices help the most to legal/institutional changes that are needed.

*Irrigation Management*
- Improve marketing of drip irrigation systems
- Promote irrigation efficiency
- Provide greater technical assistance for water storage for use during irrigation season or for release to augment stream flow
- Promote ground water recharge
- Promote drip irrigation
- Encourage use of sprinkler systems

**Water/Land/Crop Management**

- Promote crop rotations that enhance infiltration
- Develop ditch storage system
- Increase technical assistance to landowners to assist them in better land management
- Develop water storage structures on streams
- Better management of systems and structures
- Use water from deep aquifers rather than surface water
- Promote adoption of total resource management system plans
- Maintain and establish stream buffers for all land uses
- Develop detention measures in projects that augment stream flows
- Provide assistance to water users to install water measurement devices to ensure diversion of allocated amounts
- Build more structures with gated outlets from bottoms of ponds
- Plan and apply RMS's on watersheds that will have the greatest impacts on water quality and quantity
- Emphasize on-site practices (e.g., residue management, irrigation water management, proper grazing techniques, terraces) that have a direct/indirect benefit in enhancing in-stream flows
- Promote sound land use and conservation measures
- Encourage use of drought-tolerate crops

**Legal/Institutional**

- Work with state and local government on drought response plans
- Assist in changing water laws to allow farmers to 'market' excess water (i.e., transfer of water between users)
- Promote NRCS as leader in water conservation techniques
- Change attitude with in NRCS of addressing one resource concern (e.g., soil erosion) to one of addressing the entire ecosystem

**Education and Training**

- Disseminate information that promotes shifts from more to less water-dependent cropping systems
- Provide education and technical assistance on crop irrigation requirements

**Environmental Quality**

- Promote water quality enhancement and protection
- Balance efficient use of agricultural water with environmental needs
- Promote alternate crops that are in harmony with local environment, reducing
the need for irrigation

Data/Information Products/Delivery Systems

- Develop soil moisture monitoring programs
- Assist USGS with low flow monitoring
- Develop and use process simulation models for stream flow forecasting

Section 4(b)(5) "collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the national level"

Comments from National Drought Mitigation Center (NDMC)

Drought does not recognize political boundaries. The federal government and some states have cooperated on watershed management efforts. This may be especially relevant for environmental issues such as interstate water rights for instream flows. Two examples are the Delaware River Basin Commission (http://www.state.nj.us/drbc/drbc.ht) and the Susquehanna River Basin Commission (http://www.srbc.net/). Although there is currently some redundancy in their drought declaration efforts, as the commissions and the state departments both develop their own drought classifications, more such regional approaches could be explored.

Comments from State of Washington (Department of Ecology)

Washington is already involved in many regional efforts dealing with environmental issues such as the recovery of threatened or endangered species. Any response to drought, including a federal response, that would affect these listed species would need to be regional in nature. Several entities, such as the Northwest Power Planning Council and the Pacific Northwest Wildfire Coordination Group, already exist to coordinate planning for a number of activities among the northwestern states on an ongoing basis. Drought and its effects on fish and wildlife should be part of that planning.

What is lacking at the present is the recognition that droughts are not climatic anomalies, but rather part of an overall climate system that is highly variable. That recognition would make planning for drought an integral part of overall water planning and management rather than an emergency action invoked only when an area is in the throes of a drought. Greater emphasis needs to be placed on initial preparedness for drought, making use of the best possible forecasting technologies, and less on response. Those that might be affected by drought need to make informed choices and be accepting of the consequences of those choices.

Comments from U.S. Environmental Protection Agency (EPA) (OW/OWOW/WD)

Consideration should be given to planning for and implementing drought initiatives on a watershed-by-watershed basis.
Comments from Federal Emergency Management Agency (FEMA)

One aspect of drought impacts which FEMA has worked with States to address is the increased potential for wildfire. In the past, wildfire activity was seen predominately in the western United States. In more recent years, however, fire activity has gradually spread eastward. The significance of this trend is that fire has moved from large national forests and agricultural lands into the wildland/urban interface, where lives and improved property are increasingly at risk.

In the past decade, FEMA has seen an increase in the number of State requests for Fire Suppression Assistance. In the 1980's FEMA would typically receive from 5 to 7 requests per year. In 1998 alone, FEMA processed such 122 requests.

FEMA's role in combating wildland/urban interface fires is to encourage comprehensive disaster plans and programs, to increase the capability of State and local governments in suppressing wildfires, and to provide a greater understanding of FEMA's programs at all governmental levels.

To help prepare for upcoming fire seasons, at the beginning of each year, staff from FEMA's ten regional offices work with State emergency management agencies and/or State divisions of forestry to update all necessary agreements and contact lists, and to provide brief training or a refresher on the program. Pre-season fire preparedness is critical to expedite the fire suppression assistance application process. During fire season, FEMA regional offices maintain contact with the State officials to monitor any situations that develop.

Comments from DOC National Oceanic and Atmospheric Administration (NOAA) (NWS)

Collaboration with the WDCC increased markedly during 1999 as meteorologists at CPC worked with the WDCC Monitoring, Assessment, and Prediction working group and a number of individuals from the WDCC began participating in a new national drought monitoring initiative. Meteorologists from numerous Federal agencies are now maintaining much closer contact on drought issues.

Comments from USDA Animal and Plant Health Inspection Service (APHIS)

This type of cooperation and partnering is inherent to the APHIS National Animal Health Emergency Management System and the intent of a soon-to-be developed National Invasive Species Management Plan.

Comments from USDA Agricultural Research Service (ARS) (Northwest Watershed Research Center)

The causative factors in drought and the deleterious consequences for ecosystems and people cut across man-made jurisdictions. Drought mitigation measures applied at the national or regional level may have unintended adverse consequences at a smaller scale or in a longer time perspective. Collaboration among all entities in analyzing environmental issues is imperative. This coordinated analysis must be comprehensive and systems-based. Organization by hierarchical "watershed" or hydrologically defined landscape units provides an appropriate conceptual framework which is based on physical and biological reality and allows
consideration of the flow of mass and energy in drought-affected systems. Voluntary cooperatives such as the Watershed Management Council, local and regional watershed or basin advisory groups, soil and water conservation districts, and multi-state basin commissions can contribute to this collaboration. Information and data gathered under planning initiatives like the Interior Columbia Basin Ecosystem Management Plan (USDA Forest Service and USDI Bureau of Land Management) should be fully utilized in both development and application of drought mitigation measures for environmental issues.

Comments from USDA Farm Service Agency (FSA) (CEPD/CPB)

Develop a national drought policy or framework that integrates actions and responsibilities among all levels of government (Federal, State, regional, and local). The policy should plainly spell out preparedness, response, and mitigation measures to be provided by each entity.

Comments from USDA Natural Resources Conservation Service (NRCS)

"The activities initiated by the WDCC could be emulated in the remainder of the country as part of a coordinated national effort. With much of the infrastructure already begun through the WDCC's efforts, a national oversight group could provide a clear mandate, management, and resources which would ensure success for a variety of drought related activities on a national level" (Western Drought Coordination Council's Report to the National Drought Policy Commission).

Environmental issues and their needs must be considered at the National as well as State, local, and tribal levels as fish and wildlife resources and critical habitats cross all of these boundaries. All too often fish and wildlife resources receive very little consideration during the time of an emergency as human needs always surpass them in terms of priority. The time to consider our very important fish and wildlife resources is during the planning or preparation phase when resources and time can be dedicated to mitigation efforts and the many agencies and groups have the time to coordinate their efforts with each other and implement needed practices.

"The WDCC recommends that the National Drought Policy Commission (NDPC) consider linking the national oversight group to regional groups for program delivery. Drought and other water issues have greatly different physical characteristics, impacts, political response mechanisms, and thus informational needs, from region to region. These regional perspectives should utilize existing institutions such as the Regional Climate Centers" (Western Drought Coordination Council's Report to the National Drought Policy Commission).

"The NDPC should support the establishment of a statutorily designated lead federal agency, adequately funded, that would coordinate communication and cooperation among the various regional groups, to ensure an absence of duplication and the encouragement of complimentary actions including establishment of a clearing house, with possible regional subsections" (Western Drought Coordination Council's Report to the National Drought Policy Commission).

Section 4(b)(6) Amake recommendations on how Federal drought laws and programs can be better integrated with ongoing State, local, and tribal
programs into a comprehensive national policy to mitigate the impacts of and respond to drought emergencies without diminishing the rights of States to control water through State law and considering the need for protection of the environment.

Comments from U.S. Environmental Protection Agency (EPA) (OW/OWOW/WD)

Drought policy should be implemented on a watershed basis because of the innate advantages of this approach and because of the growing trend toward watershed management in the U.S. The policy should integrate research, planning, management, and sustainable development. Principles of social equity, environmental protection, and participatory decision-making should be stressed in drought mitigation and response programs.

Comments from Federal Emergency Management Agency (FEMA)

FEMA itself has no specific law or program to address drought, particularly drought impacts to the natural environment. However, from this Agency's experience in helping State and local communities recover from major disasters, a recommendation for altering national policy might be to encourage State, local, and tribal organizations to develop comprehensive all-hazard mitigation plans. FEMA encourages mitigation whenever possible. After a major disaster declaration, funding is often made available to States for hazard mitigation projects. States may submit applications to FEMA for wildfire mitigation projects, even if the disaster was not caused by a wildfire. Projects must be in the declared disaster area and must meet HMGP eligibility requirements, but can be utilized for the mitigation of any hazard.

Past mitigation efforts have included the following:

- building and vegetation management code development/enforcement;
- vegetation management program development projects; and
- public education programs (fire danger signs, pens and magnets, educational materials for children, etc.).

In order to be eligible, projects must provide a long-term mitigation solution and must be cost-effective. Building code development, nonflammable structure enhancement placement, and the establishment of community rules for vegetation placement are all eligible mitigation projects. Preparedness and equipment do not constitute eligible mitigation projects.

Comments from USDA Animal and Plant Health Inspection Service (APHIS)

Develop a National Drought Management Council, comprised of Federal, State, local, and tribal entities, that is charged with developing a National Drought Management Plan. The Plan would include the design for a National Drought Emergency Management System.

Comments from USDA Agricultural Research Service (ARS) (Northwest Watershed Research Center)
Integration of laws and programs across local, tribal, State, and Federal levels must be founded on science-based understanding of driving forces and consequences of drought and drought mitigation actions. A national policy must acknowledge regional and local conditions and site-specific circumstances.

Comments from USDA Farm Service Agency (FSA) (CEPD/CPB)

Ensure that drought is an essential element in any national discussion of water policy. This is particularly true for western water policy, where water is critical to the region's sustainability. Drought must be addressed as an integral part of the Western Water Policy Review.

Comments from USDA Forest Service (FS) (NFS/WSA, S&PF/FAM, R&D/WWAR)

It will be difficult to integrate Federal drought relief programs with the western water rights doctrine of appropriative water law, in that the latter is specifically designed to allocate water during both droughts and wet years to the first water users on a stream that put the water to beneficial use long ago, without regard to what the water was or is presently used for. States guard these laws and resist modernizing them, or tempering them during extremely dry years. Seldom are sufficient instream flows set aside for the protecting the environment and allowed to remain for that purpose during dry years when ecological needs are most critical. States may be willing to make some changes to their instream flow laws if the Federal government would agree to purchase or lease water from willing private sellers during droughts. However, without some financial leverage being provided by new legislation, there may be very little chance for true integration. One clear need for any such efforts at integration is to give more complete consideration to environmental issues and attributes, both aquatic and terrestrial, as opposed to strictly human water use issues and needs, in relation to drought planning, response, and mitigation.

Comments from USDA Natural Resources Conservation Service (NRCS)

Environmental issues incentives as well as other incentives should be established for some types of Federal drought preparation and mitigation programs. Federal drought assistance could be larger or have more favorable cost shares for States, conservation and water districts, private land owners, and other entities that have adopted drought plans or included drought as a primary resource concern to consider during planning.

NRCS needs to include drought preparation, mitigation, and response on an equal basis with other resource concerns or purposes in its area wide conservation and watershed planning and on farm planning. NRCS needs increased funding for conservation technical assistance for droughts during these planning activities. This assistance should include updating practice standards for drought, increasing the use of water resource analysis tools, obtaining better crop management tools for droughts, and restoring critical segments of stream and riparian habitats as well as other fish and wildlife drought mitigation practices.

Section 4(b)(7) "make recommendations on improving public awareness of the need for drought mitigation, and prevention; and response on developing
a coordinated approach to drought mitigation, and prevention, and response by governmental and non-governmental entities, including academic, private, and non-profit interests"

Comments from U.S. Environmental Protection Agency (EPA) (OW/OWOW/WD)

Public awareness and support are key for water suppliers and water users to successfully implement programs to reduce water consumption and to increase the use of recycled water. The public also needs to be aware of economic, environmental, and/or quality of life costs that are incurred by different options for drought mitigation or preparedness.

Comments from DOC National Oceanic and Atmospheric Administration (NOAA) (NWS)

Disseminating better information on the magnitude of ongoing droughts as well as their outlook will help to improve public awareness of the need for drought mitigation and prevention. The current myriad products that relate to drought should be consolidated into a single national product that contains credible and timely information on all existing dry areas that may evolve into drought or have already become drought. The best observation, monitoring, and forecast information should be incorporated into the new drought product, which should be disseminated as widely as possible, using the Internet and official NWS communications procedures. Such a national product, prepared by experts from various Federal agencies in concert with the National Drought Mitigation Center, would likely be used by various private services, such as The Weather Channel, enhancing the potential for widespread use by the public and appropriate state, local, tribal, and other entities interested in drought. The latest forecast technology, including the use of model ensemble outputs of temperature and precipitation, should be used to project significant changes in drought category. The goal is to significantly increase public awareness of the status of current drought and the likelihood for amelioration or intensification. Toward this end, a new drought classification scheme should be considered. Similar to the schemes used for tornadoes and hurricanes, a 4- or 5-category drought scheme would more easily convey pertinent information on drought to the public and emergency workers. Although a one-size-fits-all approach may be inappropriate, some relationship between this drought index, state of fuels, and fire occurrences should be established.

Comments from USDA Animal and Plant Health Inspection Service (APHIS)

The National Drought Management Council could have a subcommittee work on developing a public awareness and education campaign.

Comments from USDA Agricultural Research Service (ARS) (Northwest Watershed Research Center)

Improved public awareness of the need for drought mitigation should be based on enhanced public understanding of the complex interrelations among climate, landscapes, and ecosystems; on enhanced, scientifically sound understanding of normal variability of climate particularly in semi-arid and arid regions including much
of the American West; and on improved appreciation of the cumulative, complex future consequences of alternative drought mitigation strategies for the nation’s environment.

Comments from USDA Farm Service Agency (FSA) (CEPD/CPB)

Provide federal funding for the National Drought Mitigation Center to assist states with drought preparedness, planning, and mitigation. This center should serve as a clearinghouse for information on mitigation, planning, and preparedness activities. Provide a regional/national climate monitoring system, and develop a national/regional database of state drought response resources.

Comments from USDA Forest Service (FS) (NFS/WSA, S&PF/FAM, R&D/FWWAR)

Opportunities for public education and outreach on droughts vary greatly by locale, but generally need substantially increased support. This is especially true in terms of achieving a better balance or integration in consideration of environmental versus human water use issues during drought planning, response, and mitigation. We all recognize the importance of public awareness because public support is essential to successful response to and mitigation of drought effects - people suffer directly and indirectly every time they experience drought conditions. Every generation seems to need to learn this lesson themselves. All sectors of society need to contribute to the public awareness campaign, but not all do. The Federal government’s role is probably to contribute funds, direct assistance, expertise, and encouragement to State, tribal, and local people involved. Pre-disaster planning has not worked well in the past and needs to be strengthened.

Comments from USDA Natural Resources Conservation Service (NRCS)

Increase drought educational materials available to conservation partners such as conservation districts, Resource Conservation and Development Councils, and state organizations. NRCS state offices need to establish communication plans to encourage voluntary planning for droughts by private land owners. These efforts will include plans for environmental issues as well as human or agricultural needs.

Section 4(b)(8) "include a recommendation on whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency"

Comments from U.S. Environmental Protection Agency (EPA) (OW/OWOW/WD)

All drought prevention and mitigation programs should be reoriented on a watershed-by-watershed basis.

Comments from Federal Emergency Management Agency (FEMA)

During our experience working with States and other Federal Agencies on the Drought of ’96 report, several States expressed concern about not having a single Federal agency to coordinate Federal drought activities. From coordinating disaster assistance for the past 20 years, FEMA supports the idea of uniting drought under
one Federal agency that would coordinate the many aspects of drought preparedness, response, and mitigation.

FEMA believes USDA should be appointed as the lead agency, given its variety of programs and the fact that the first effects of drought often appear in the agricultural sector and firefighting efforts. As the lead Federal agency, USDA would be responsible for assessing drought impact and guiding States to the aid programs that do not require a Presidential declaration to activate. USDA would also need to be knowledgeable of the various interagency drought-related programs and would need to provide technical assistance to States in coordination with the other agencies involved. Interagency compacts could be entered into to reflect the triggering authorities and responsibilities of USDA and other involved Federal agencies.

**Comments from DOC National Oceanic and Atmospheric Administration (NOAA) (NWS)**

In terms of monitoring and predicting drought, the Climate Prediction Center should work closely with USDA and the National Drought Mitigation Center in developing and disseminating a consolidated national drought product. Other agencies will contribute information used in the product, and the final product will in turn go to and benefit these and other agencies involved in drought issues. The national drought status and forecast product will be concise and timely, issued at least every 2 weeks during the warm half of the year and monthly during the cold half.

**Comments from USDA Animal and Plant Health Inspection Service (APHIS)**

This would not be necessary if a National Drought Management Council is developed, with membership including representatives from relevant Federal, State, local, and tribal groups.

**Comments from USDA Farm Service Agency (FSA) (CEPD/CPB)**

All Federal drought preparation and response programs should be consolidated and assigned to the Secretary of Agriculture, given appropriate staff and funding. USDA should serve as the agency-in-charge, given its variety of programs and the fact that the first effects of drought often appear in the agricultural sector and in firefighting efforts.

**Comments from USDA Forest Service (FS) (NFS/WSA, S&PF/FAM, R&D/WFWAR)**

From a strictly environmental perspective, the Forest Service does not think that drought planning and response programs of the Federal government should be consolidated under a single Federal agency or office. Environmental responsibilities related to drought are highly diverse, and are the appropriate statutory responsibilities of many different agencies. However, developing a more effective coordination role, perhaps assigned to a single Federal agency, which would then be responsible for ensuring effective coordination in delivery of Federal drought programs, does have merit.

**Comments from USDA Natural Resources Conservation Service (NRCS)**
It would be very difficult to consolidate all Federal drought preparation and response programs under a single Federal agency. Many programs are integral components of larger programs that have other purposes, sponsors, participation rules, and methods of delivery. Two examples are the many purposes besides drought that are served by water management practices on farms and operating rules of dams. Droughts are identified and responded to in different ways for various water users such as communities, industry, navigation, agriculture, recreation, and environment. The methods for monitoring and determining when there is a drought differs for each of these water users. Agricultural drought occurs when crops cannot utilize the soil moisture or farmers can no longer make a profit.

It would be useful to have a specific Federal agency as a single point of contact or coordinator for Federal agencies with drought responsibilities. Agency representatives could serve for two years on a core drought response staff at the single Federal agency. Special drought teams could be assembled for responding to major droughts once they are declared or a separate team could be on call for each region of the country. The type of impacts of each drought -- municipal and industrial, agriculture, environment, and transportation -- would determine which agencies and programs would send its people to each team.

It would be very useful to collect a core group of response programs under a single agency. These programs would be aimed at similar types of water users and droughts such as agriculture and rural water supply. This would allow more efficient and effective coordination among these programs in terms of 1) drought declaration formulas, 2) data collection and interpretation, 3) response teams, and 4) cost sharing formulas.
The main conclusions from most recent ERS-USDA "Managing Risk in Agriculture" report (http://www.econ.ag.gov/), which focuses on the farm-level income risks associated with natural disasters (such as drought), as well as some other thoughts, include:

The economic impacts of droughts and other natural disasters can be quite different depending on the supply and demand characteristics for different commodities. For major field crops grown in a wide variety of geographic areas (such as wheat), the impact of severe drought in specific locations (and hence, low supplies) on increasing prices (as well as price variability) tends to be less than for crops that are produced in narrower geographic areas and that have fewer substitutes (such as lettuce or apples).

In addition to government programs, farmers have many alternative strategies that they can use to manage the risks associated with droughts and other natural disasters. These include diversification, both across different geographic areas and across different types of commodities. A farmer who has both livestock and several crops is less likely to be severely affected by drought, for example, than a farmer who has a monoculture. Also, farmers can use various types of contracting, can hedge in futures markets, etc., to reduce the price risks associated with natural disasters. Cultural practices (such as irrigation and planting varieties with different maturity dates), can help mitigate the income risks associated with drought, and Government programs--such as crop insurance and NAP--are also important.

USDA's Agricultural Resource Management Study (ARMS) is a comprehensive annual survey that recently asked questions regarding risk management. The highest percentage of farms indicated that they would draw upon cash on hand to help mitigate the risks associated with droughts and other natural disasters. Producers in the smallest sales classes (<$50,000) are much less likely to use different tools and strategies (contracting, hedging, diversification) than are larger-scale farmers. This situation has implications for educating producers as to ways to mitigate the income-risk effects of drought--especially smaller-scale farmers. (It's also important to keep in mind that these small-scale farmers are also more likely to
rely on off-farm income to a much larger extent than larger farms--which can also help reduce income risk in the face of disasters.)

The income risks associated with droughts and other natural disasters tend to be less in the major growing areas than in peripheral areas of production. In major growing areas (such as the Corn Belt for corn), low yields tend to be highly correlated with high prices, and vice versa. This relationship works as a *natural hedge* that helps stabilize income (calculated as price * yield) risk. In addition, major producing areas inherently tend to have lower yield risk. Thus, the *peripheral* producing areas tend to have higher inherent income risk, compounded by both higher yield variability and a weaker *natural hedge.* These areas are more likely to be adversely affected by drought, and to realize the greatest impact on farm-level income risk.

Bankers and other lenders are well aware of the risks of drought and the impacts on farm incomes. In risky situations, lenders use various strategies to protect their interests. Lenders in higher-risk areas may charge higher interest rates, be quicker to limit loan amounts, charge special fees, etc. Situations in which government programs are known in advance regarding payouts in drought situations (e.g., crop insurance) are more likely to be more favorably viewed by lenders (and result in more favorable terms to farmers) than those that are ex post and are uncertain as to their implementation.

Research indicates that younger producers are more likely to participate in risk mgt. programs than are older farmers. In addition, participation tends to be positively associated with education, the percent of crop acres on the farm, total farm acres, and the degree of farm leverage.

Needless to say, extended droughts can have a major impact on rural communities. When producers have less money to spend in heavily agricultural-dependent areas, local businesses realize severe impacts in addition to the farmers themselves. This can have implications for not only businesses, but schools and other rural institutions.

4 (B) (1) RESPONSE: (DRAFT 6/23/99)

There is a universal need for a National Drought Policy, implemented on a Federal level, which seeks to eliminate the situational response to drought disaster, to define the Federal response, and to coordinate the available drought resources. It may also refine the Federal approach by addressing some of the problems that impede disaster response such as overlapping program authorities, unfunded or suspended programs, and differing program mandates.

There are many federal, state, and local programs that respond to drought problems. The greatest need is for a coordinated response mechanism that will implement a systematic and organized response. Such a formal mechanism (FEMA) is in place for other national disaster events such as floods or hurricanes, which are clearly defined and visible. However, no such response mechanism exists for drought
emergencies, which unfold gradually and take place in a larger, more complex environment. Although drought response programs may exist in permanent form, their activation tends to be ad hoc, triggering events differ, and information is scattered. There is no single point of contact. Communities must discover assistance programs and navigate the various program requirements and constraints as best they can. The result is confusion and frustration in accessing the relevant programs.

In order to meet the needs of local communities, individual, and businesses, a unified approach is needed among federal, state, and local governments. The impact of drought on a community is often directly correlated to its impact on the community’s economic base. While the greatest impact tends to be on the agricultural or recreation sectors, the impact of the drought creates a ripple effect throughout the local community. Certain needs that tend to be universally apparent in drought-affected communities include;

**Social**

- Public health problems, related to more concentrated airborne pollutants, cross-connection contamination, diminished sewage flow, and reduced fire-fighting capacity, must be addressed.
- Economic disruption caused by drought often results in a reduction of tax revenues to localities, often at a time when drought-response claims on local resources increase.
- Conflicts may arise among end-users of water resources, such as agricultural, business, environmental, and residential users. Communities need to have a strategy to resolve such conflicts.
- Increased transportation costs related to loss of river navigability may lead to increased costs for communities and residents.
- Communities that are heavily dependent on drought-stricken industries, such as agriculture and tourism, often suffer from population migration to urban areas or other agricultural regions. This causes both increased costs of dealing with the dislocation, as well as a decrease in the economic tax base.
- The impact of drought is often unequally distributed, falling most heavily on groups of people dependent on drought-stricken industries. The impact often falls heavily on individuals least able to deal with it, such as casual workers and their families. Communities need to develop methods of identifying and responding to the needs of these groups.
- Increased energy demand, often concurrent with increased costs of using more expensive energy sources in the absence of hydropower, result in distribution problems and higher costs to end-users.

**Individuals and Families**

- Unemployment often increases as a result of drought-related production declines and a resultant decrease in commercial activity.
- Consumers often must deal with higher food prices, shortages of certain food items, and higher utility costs.
- In addition to the health problems noted above, individuals must also deal with stress-related problems, such as anxiety, depression, and domestic violence, resulting from economic disruption.
Economic and Business Concerns

- In largely agricultural economies, the loss of income by farmers/ranchers affects the cash flow of both agriculture-dependent businesses such as implement or seed dealers, and "main street" businesses which are dependent on the buying power of the agricultural community.
- In non-agricultural economies, businesses which depend on water flow, such as marinas or water recreation businesses, may suffer adverse impact, as will businesses in the "green industries"—nurseries, landscapers, etc.
- With every drought-affected business, no matter the industry, the loss of revenues leads to working capital shortages, erosion of capital, and inability to meet normal operating expenses. Perhaps the greatest short-term need of such businesses is access to credit in the form of credit lines, working capital loans, or debt restructure.
- At the same time lenders, faced with increased non-performance rates in their lending portfolio, may be unable or unwilling to lend to businesses that are at increased risk due to drought-related economic conditions.
- Over the long-term perspective, the effect of prolonged drought on small business may be more serious. In areas in which reduced moisture may be a long-term reality, it may not be economically feasible for some businesses to remain in operation in their current form. These businesses may need technical assistance and access to capital to assist them to adapt to a business activity less reliant on water or a water-dependent economy.

Development of a National Drought Policy needs to be pursued in the context of a national water resources policy. It should encourage states, regions, and communities to depend on planning and mitigation rather than response, and should encourage communities to plan and act wisely in resource allocation and contingency planning.

In the context of a national drought policy, communities need assistance in developing a drought contingency plan in advance of the occurrence of a drought disaster. Community planning processes need to deal with all phases of a drought disaster, including preparedness, response, recovery, and mitigation. The plan should address both long- and short-range issues, and should establish the criteria for decision-making and prioritization. It should also include a public awareness and education component. In order to optimize resources, the community may find it useful to bundle drought planning into the process of water supply planning or community hazard planning. Some critical components of such a plan are:

- An emphasis on planning and mitigation rather than response
- An assessment of vulnerability to drought on a local and regional basis, including the economic and social impact of drought.
- An assessment of water availability, sources, distribution systems, demand, and use on a local and regional basis.
- An assessment of governmental and community resources available to assist in providing assistance and disseminating information.
- An evaluation of community development plans and the amount of new development sustainable given the available water supply.
- Coordination with other communities in developing preparedness, mitigation, and response plans.
In order to accomplish these tasks, communities need resources and support in developing such a plan. They need a coordinated source of information on what governmental programs are available, what triggers various programs, and how to access them. They also need assistance in coordinating state, regional, and local planning efforts.

Additionally, such program information must have a source of continuity and updating, so that current information is available when it is needed and knowledgeable personnel is available to implement the programs.

**SECTION 4 (B) (4)**

**Determine what differences exist between the needs of local communities, governments, and businesses affected by drought and the Federal laws and programs designed to mitigate the impacts of and respond to drought.**

Summary. There are emergency, tactical and strategic drought response programs. Emergency measures are used in unexpected situation, and as a safety net when all other options have failed. Tactical responses are planned before droughts, within the context of existing laws and infrastructure, and are designed to meet anticipated problems. Tactical plans are tailored to specific regional drought problems and must be tested and updated regularly. Strategic responses such as new water supply projects, new water allocation laws or rulings, and landmark legislation set the context within which communities and businesses plan for drought.

Strategic programs often address more than just drought issues. Changes in strategic programs are difficult and rare, by design. For the most part, existing tactical drought response mechanisms, including Federal laws and programs, do a good job of minimizing drought impacts to communities and businesses (see exception in discussion of SBA program).

But these programs do not satisfactorily relieve the anxiety that droughts engender in communities. There are two primary reasons for this disparity. First, if bureaucracies take too long to "get up to speed" on their drought response, communities and businesses lose confidence that government can deal with the drought. It is not unusual for the startup of a drought response to be badly choreographed, since enough time passes between droughts that we are not practiced in the application of our own programs; drought plans become outdated and experienced staff move to new positions.

Moreover, each agency's tentativeness is magnified because drought mitigation must be coordinated among agencies and communicated with stakeholders. Federal and State agencies often do not have a plan of coordination developed and tested prior to a drought. Each drought program has different eligibility criteria. Response times vary from one program to the next. Program triggering mechanisms may not be coordinated.

The second reason that concern outstrips impacts is that droughts stimulate public discussion of changes in strategic measures, such as subsidies and water rights. Taken together, these factors create conflict and headlines even if existing programs ultimately prevent economic trauma.
Thus, the primary shortcoming of existing Federal programs for tactical drought response is that they are not practiced, tested, and coordinated with non-Federal drought responses between droughts. Drought exercises or "virtual droughts", if properly designed can also reduce or manage fears about strategic institutional changes because they create a forum where "worst case" conditions can be explored and new policy options tested in a non-crisis atmosphere. In fact, the strategic changes that are feared by some may be beneficial to society as a whole. The primary examples of these long term policy changes are (1) the shift from government drought relief to drought preparedness and individual risk planning, and (2) change in water allocation, including water rights, to higher and better uses, meaning uses that provide greater economic or financial returns or greater environmental benefits.

Concern often outweighs drought impacts. Impacts of the drought on California stakeholders during the 1987-1992 drought were catalogued by the Corps as part of its National Drought Study. Economic impacts were surprisingly small. One study of residential economic impacts in the Los Angeles and San Francisco Bay areas indicated that per household economic costs were less than five dollars per week in the San Francisco Bay area and less than two-and-a-half dollars per week in the Los Angeles region. About 90% of the estimated costs result from replacing dead landscaping, purchasing irrigation water for landscape conservation, and xeriscaping. There are significant qualifications on these household economic impact estimates.

Like most phenomena that occur during multi-year droughts, it is impossible to determine the impact of the drought alone - what would the investment in conservation would have been during normal weather? Thus, these estimates are probably excessive. Second, there are errors inherent in the sampling. Third, adjustments to water scarcity, such as xeriscaping, may reduce future costs, and thus are really investments. These costs were small and must be compared to the prime alternatives, which are additional water supply (opposed in most cases because of the environmental costs) or more economically efficient water allocation. But efforts at reallocating California water supply set off legislative and court battles that continue to this day, so it cannot be considered an obviously superior solution.

Direct agricultural impacts included significant amounts of land left idle and increased water costs. Agriculture did not suffer substantial impacts until 1991, the fifth year of the drought. While California registered a record agricultural revenue of $18.3 billion in 1990, revenue declined in 1991. However, irrigated agriculture adapted to the drought and direct economic losses were limited to about $250 million in California in 1991, about 1-1/2 percent of the agricultural revenue for the state that year.

Much of the reduction in California agricultural output caused by the drought was offset by increases in other regions of the country. A study that modeled the economic impacts (as signified by the sum of producer and consumer surplus) of drought on California and the nation in 1991 indicated that the total national impacts were less than 30 percent of the impacts in California ($80 million versus $276 million, respectively), for the crops modeled. The reluctance of farmers to buy all the water available in the California Water Bank indicates that the reduction in crops
produced was a reasonable economic outcome, although it may have had dire financial consequences to individual farmers. The Corps did not track financial indicators, such as the number of bankruptcies.

Another industry affected by the drought was the "Green Industry" including landscaping and gardening. Drought-induced economic losses in 1991 were estimated to include the loss of about 5,630 full-time jobs, and a reduction of about $460 million in gross revenue from the 1990 total of $7 billion.

The lack of impacts in other industrial and commercial industries has been attributed to a number of factors, including exemptions for some industries from mandatory water allocation rules, implementation of new water conservation practices, and in a few cases, substitution of groundwater for surface water.

Although the environmental, agricultural, and urban sectors account for much of the adverse impacts of the drought, the drought also affected water quality and recreation. Total recreation days (a recreation day is the visit of one person to a recreation area for any part of one day) declined by 20 percent between 1987 to 1991. The drought also had major impacts on tourist activities such as skiing in the Sierra Nevada, houseboating on reservoirs, and fishing for salmon and striped bass.

The impact to electric utilities is hard to define; they produced the same amount of power, replacing lost hydroelectricity with more expensive natural gas and out-of-state power purchases. The replacement costs were mostly passed down to consumers. These costs increased marginal electricity costs to consumers by approximately three cents per kilowatt-hour. Based on this estimated marginal cost increase, the drought cost state ratepayers an estimated $3.8 billion from 1987 to 1992 (calculated by multiplying estimated lost hydropower production by 3 cents per kilowatt-hour). This amounted to roughly $21 per person per year. The total revenue from all electricity sold to ultimate consumers exceeded $107 billion during this period. Hydropower production is bound to go down in severe droughts; the only issue is whether the losses can be efficiently reduced. Hydropower plant operators use sophisticated financial analyses that incorporate drought time operations, so cost effective internal modifications to improve production during drought will be made. Further gains generally require tradeoffs with other water uses.

While estimated economic losses in California were significant, they pale in comparison to the Gross State Product reported at $619.4 and $631 billion for the years 1990 and 1991 respectively (Economic Report of the Governor 1992).

Far beyond the impacts on the environment, agriculture, urban economies, and other sectors and activities, the drought also had a significant impact on the public's perception of water use, and the institutions that manage water in California. The human significance of the 1987-92 drought was highlighted by news coverage and political turmoil that persisted for years.

Anxiety derived from these impacts was magnified by a number of issues, including: uncertainty about the duration and the anticipated quantum leap in impacts beyond the sixth year; clashes of social traditions and values associated with advocates of growth, environment, and agriculture; and connection with national debates on issues such as the Endangered Species Act and "jobs versus environment."
"Three-Way Process," discussions between representatives from agricultural, urban, and environmental groups on water sharing - were going well before the drought, but collapsed during the drought. Examples of proscribed Federal programs. Most people associate FEMA with disaster assistance, but FEMA actually plays a small role in drought response. The Stafford Act circumscribes FEMA's authority to assisting State and local governments in lessening the loss of life, human suffering, loss of income, and damage to improved property. The Stafford Act is not designed to address agricultural, cultural, or environmental losses. USDA, DOI, and USACE programs have the statutory authority to provide assistance for drought impacts on wildlands and rural communities. Even once drought spreads into urban centers, many other programs are authorized by SBA or covered by the State (such as unemployment insurance programs). Only when there is an unmet need - such as a food and water shortage for communities, individuals and families, has FEMA been able to provide assistance. For example, in 1998, extreme food and water shortages in the Federated States of Micronesia and Republic of the Marshall Islands resulted in a Presidential major disaster declaration. FEMA coordinated relief efforts with several other Federal agencies. Similarly, under a disaster declaration by the Secretary of Agriculture, Small Business Administration (SBA) assistance is limited to those businesses which have suffered economic injury as a direct result of the declared agricultural disaster. For example, an implement dealer who suffered economic injury because of farmers' inability to purchase implements due to the impact of drought damage to their agricultural operations would be eligible. Other needs may be addressed through the regular Business Loan programs. SBA Disaster Assistance Program is excluded by statute from assisting agricultural enterprises, under a broad definition that excludes all farming and agriculture-related enterprises. The USDA inclusion is more narrowly defined. As a result, certain agriculture-related businesses, such as tree farms, maple syrup producers, stables, and aquaculturists, are not eligible under either program. We believe that the solution is to broaden the USDA inclusion to include such agriculture related businesses. While non-disaster SBA programs may offer assistance to small business concerns including agricultural enterprises, the statutory definition of a small business concern for an agricultural enterprise could be considered restrictive.

Possible shortcomings in strategic programs. Some have suggested that farmers and ranchers need to adopt a more self-reliant approach. Farmers are in a precarious position, with the viability of their way of life closely linked to government policies. The "Freedom to Farm" Act in 1995 increased farmers' vulnerability to fluctuations in the global marketplace - thereby decreasing the overall resilience of their operations to other hardships such as drought. If the past is an indicator of the future, when these farmers consequently face financial disasters because of drought, Congress will vote for relief funds. One strategic option is to create an agricultural policy that adequately buffers small farming operations from the worst weather and market fluctuations. Another approach would be for the government to acknowledge the risk inherent in farming, and to support a risk-management approach to farming, focusing on providing good information to agricultural decision-makers, with criteria for "bailouts" clearly defined in advance. Australia is an example of a country that has taken this approach.

Federal agencies can act as technology transfer centers during drought exercises to ensure risk management tools are available to all farmers and ranchers to make them more self reliant. Drought exercises can also assure that farmers and ranchers...
Farmers already have many alternative strategies that they can use to manage the risks associated with droughts and other natural disasters. These include diversification, both across different geographic areas and across different types of commodities. A farmer who has both livestock and several crops is less likely to be severely affected by drought, for example, than a farmer who has a monoculture. Also, farmers can use various types of contracting, can hedge in futures markets to reduce the price risks associated with natural disasters. Cultural practices (such as irrigation and planting varieties with different maturity dates), can help mitigate the income risks associated with drought, in tandem with Government programs--such as crop insurance and NAP (spelling out?).

USDA's Agricultural Resource Management Study (ARMS) is a comprehensive annual survey that recently asked questions regarding risk management. The highest percentage of farms indicated that they would draw upon cash on hand to help mitigate the risks associated with droughts and other natural disasters. Producers in the smallest sales classes (annual revenues less than $50,000) are much less likely to use different tools and strategies (contracting, hedging, diversification) than are larger-scale farmers. This situation has implications for educating producers as to ways to mitigate the income-risk effects of drought--especially smaller-scale farmers. (It's also important to keep in mind that these small-scale farmers are also more likely to rely on off-farm income to a much larger extent than larger farms--which can also help reduce income risk in the face of disasters.)

The income risks associated with droughts and other natural disasters tend to be less in the major growing areas than in peripheral areas of production. In major growing areas (such as the Corn Belt for corn), low yields tend to be highly correlated with high prices, and vice versa. This relationship works as a "natural hedge" that helps stabilize income (calculated as price \( \times \) yield) risk. In addition, major producing areas inherently tend to have lower yield risk. Thus, the "peripheral" producing areas tend to have higher inherent income risk, compounded by both higher yield variability and a weaker "natural hedge." These areas are more likely to be adversely affected by drought, and to realize the greatest impact on farm-level income risk.

Bankers and other lenders are well aware of the risks of drought and the impacts on farm incomes. In risky situations, lenders use various strategies to protect their interests. Lenders in higher-risk areas may charge higher interest rates, be quicker to limit loan amounts, charge special fees, etc. Situations in which government programs are known in advance regarding payouts in drought situations (e.g., crop insurance) are more likely to be more favorably viewed by lenders (and result in more favorable terms to farmers) than those that are ex post and are uncertain as to their implementation.

Research indicates that younger producers are more likely to participate in risk management programs than are older farmers. In addition, participation tends to be positively associated with education, the percent of crop acres on the farm, total farm acres, and the degree of farm leverage.
Sec 4 (b)(5) "collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the national level."

Report from the United States Army Corps of Engineers will be submitted as will the report from the Western Drought Coordination Council for this question. Other material that may be submitted:

Introduction

Collaboration within regional drought planning strategies, response, and mitigation activities require a comprehensive understanding of the various factors that define drought and resources and services that may be employed. Understanding the complexity of resources that can be used to develop and support a national and state drought policy must consider the interaction of environmental, economic and social impact. Policy that defines, prepares, and can respond with the appropriate level of service and support in meeting the comprehensive local needs at any given point in time.

The National Drought Mitigation Center provides invaluable monitoring and scientific research to help local, state and national proactive planning and response strategies to drought. They continue to monitor state and international efforts of governments to clarify the role of policy and actions in drought prediction, planning and mitigation.

An Internet search regarding policy and programs in use area of drought reveals numerous efforts in state and local government in taking on the challenge of planning and preparing for the agricultural and economic losses due to drought. The was acknowledgment by many groups of the need for integrating the three elements of environmental, economic and social aspects caused by drought but very few of the sites presented policy positions that provided for this integration, especially social needs. Thus, national policy that defines drought conditions relative to the level of impact in these three are as is needed. Definitions of drought conditions relative to a policy positions when certain threshold are met in economic, environmental and social would help the overall coordination of national, state and local level program and resources.

Agency Response

Comments centered around the following three key issues regarding regional drought initiatives and the role national policy might play in improving the coordination of local, state and federal governments in preparedness and response.

Preparedness/Planning

- Area-wide or regional planning organization can play a strong role in planning, interpreting data and information, and providing education and coordinate resources during but advance time is needed.
- Federal and State agencies need to work with local communities to design and provide incentives to plan and install water recycling/reuse practices.
- A regional drought information, monitoring and technology sharing program are needed.
Policy should plainly spell out preparedness, response, and mitigation measures to be provided by each entity at a given point in time, for specific purposes.

Response

- Individual businesses and communities should play work towards recycling of gray water and other water conservation efforts before and during drought periods to conserve water supply.
- Develop a national drought policy or framework that integrates actions and responsibilities among all levels of government (federal, state, regional, and local).
- Understand the role and resources of various service providers in meeting the environmental, economic and social impacts of drought.

Mitigation/Direct aid (could use more information here)

- FEMA offers two types of non-disaster specific preparedness grants: Disaster Preparedness Improvement Grants and Emergency Management State and Local Assistance Grants. A similar initiative, designed specifically for drought activities and implemented at a national level, might be very helpful to States in mitigating the effects of drought. In the future, these two grants may be consolidated into one Emergency Management Performance Grant.

Brief examples of drought exercises currently underway as presented by the Federal Agencies.

- The Interstate Commission on the Potomac River Basin Commission holds an annual drought exercise to assure drought plans are up to date, and to train new staff to deal with events that may not occur for a decade.
- The Seattle district of the Corps of Engineers uses a "shared vision model" to help resolve potential dispute in the management of releases from Howard Hansen reservoir. The model was built with stakeholder participation, so there is a high degree of trust in its simulations.
- The Tarrant Regional Water District, Ft. Worth-Arlington, TX conducted a virtual drought two years ago. This was a collaborative effort using the Corps Section 22 Planning Assistance to States authority referenced in our "drought authorities".
- The national Drought Mitigation Center web site indicates that as of February 1999, 30 state ad drought plans, two delegated planning to local authorities instead of having a single state-level plan and two states plans were in development. Map below taken from the web illustrates the innovative states.
Drought Assessment

A critical area of national support is in the financial support of local, state and federal agency's in assessing their planning, response and mitigation action after a drought event. Some examples that have added much to the shared knowledge of government and communities is the following:

- Huntington District of the Corps of Engineers led a successful drought study response to the 1988 drought in the Kanawha River Basin which will, it is believed, reduce impacts to the whitewater rafting industry by millions of dollars in future droughts, while also improving water quality. Additional details can be provided.
- "Drought Response Action Plan" by the Western Governors Association, November 1996.
- "Drought of 96", Multi-State Drought Task Force Findings, FEMA, August, 1996

It is important for the Commission to appreciate the number of findings in drought management's limitation and strength over the past few years. Federal and State agencies have documented many of these areas. The National Drought Mitigation Center has captured this information and designed solutions into communication and education material used at the local and state level.

National Policy
An important role for the National Drought Policy Commission is to work with the States and Tribes to define the various levels of drought conditions. The three areas of environmental, economic and social should be designed as a matter of policy. Local, state and national programs can respond to a clear set of standard or conditions that define and predicate when their interest and resources can be applied to local problems. Australia's Drought Plan is worth review in this regard. In summary the three key objectives of their National Drought Policy are repeated here for consideration.

- Encourage primary producers and other sections of rural Australia to adopt self-reliant approaches to managing the risks stemming from climatic variability.
- Maintain and protect Australia's agricultural and environmental resource base during periods of extreme climate stress.
- Insure early recovery of agricultural and rural industries constant with long-term sustainable levels.

National policy of the US should be designed like a coiled spring that under ever-increasing load (drought conditions) the various levels of program resources, technical expertise and direct aid are systematically employed to provide an equivalent increase in resistance to negative aspects of drought. National policy could play an important role in recognizing and supporting the various levels of interest in responding to drought conditions. The point to the illustration below is that when economic and social impacts become stronger the demand of society on governments to respond becomes stronger also. Policy could recognize the role of existing programs and resources when mild environmental conditions exist. When negative economic and social impacts increase the response must change to a target approach and in worst cases directs aid or support.

Attachment Material maybe added to text as part of supporting documentation or as findings to support a need for a national drought policy. This maybe covered in other ways already.

WGA comments

The recent population growth in several of the drought stricken states and associated increases in water demands coupled with many states' lack of experience in handling drought for the last 10 years-have exacerbated the crisis.

The last western regional response drought coordinated by WGA was the 1976-77 drought period, when WGA did an admirable job of representing the collective concerns of western states with the Congress and the Administration. Unfortunately, a structure and process to deal with future prolonged droughts and issue resolution were not put in place at that time. Therefore, it has taken several months for WGA to fully recognize the extent and impact of the Southwest's current drought on its member states, and begin addressing these states' collective concerns. WGA's actions were activated once the Federal Drought Task Force scheduled a meeting of impacted states, and the State of New Mexico focused Congressional and Executive Branch attention to the issue.

In most all cases, government agencies at all levels lack a standard policy for
The absence of management structures has also eroded the sustainability of policy development.

The lack of state-wide preplanning for some states, plus the absence of organizational structures and processes to identify and resolve issues, facilitate networking, and identify and promote partnerships also hinder reaction time and effectiveness.

At the federal level, droughts have historically been treated, as unique, separate events even though there have been frequent, significant droughts of national consequences over the years. Actions are taken mainly through special legislation and ad hoc action measures rather than through a systematic and permanent process, as occurs with other natural disasters. Frequently, adequate funding to assist states with related impacts is also unavailable.

To complicate matters, several federal agencies have a role in providing drought assistance, ranging from predicting, forecasting, and monitoring of conditions; providing planning and technical assistance; and dispensing financial aid and resource assistance. The absence of a lead agency to handle drought—in addition to the lack of federal interagency coordination—has significantly reduced the federal government's ability to provide adequate support over the long term.

Perhaps the most untenable shortcoming at the federal level has been the lack of assistance for states to build capacity and emphasize long-term drought mitigation measures. Compounding this issue are modernization, downsizing, budget restrictions, and changing programs and authorities, making the process extremely frustrating for states, affected citizens, and businesses.

**Recommendations**

Develop a national drought policy or framework that integrates actions and responsibilities among all levels of government (federal, state, regional, and local). This policy should plainly spell out preparedness, response, and mitigation measures to be provided by each entity.

Ensure that each state develops a drought contingency plan that includes early detection, monitoring, decision-making criteria, short- and long-range planning, and mitigation. Programs addressing public awareness and education on drought and water conservation should also be included.

Establish a regional drought policy and coordinating council to develop sustainable policy, monitor drought conditions and state responses, identify impacts and issues for resolution, facilitate interstate activities, and work in partnership with the federal government to address needs brought on by the drought. The council—consisting of policy makers and drought managers—would assist states in developing drought preparedness, response, and mitigation action plans. Finally, it could heighten awareness of drought and its impacts at both the Administration and congressional levels of government.

Establish a federal interagency coordinating group with a designated lead agency for
drought coordination with states and regional agencies. This group should determine the federal government's role in drought response and mitigation. They should also seek to focus federal response and information so that states and local governments have access to "one-stop shopping."

Provide federal funding for the National Drought Mitigation Center to assist states with drought preparedness, planning, and mitigation. This center should serve as a clearinghouse for information on mitigation, planning, and preparedness activities; provide a regional/national climate monitoring system; and develop a national/regional database of state drought response resources.

Ensure that drought is an essential element in any national discussion of water policy. This is particularly true for western water policy, where water is critical to the region's sustainability. Drought must also be addressed as an integral part of the Western Water Policy Review Commission's assessment currently in progress.

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Understanding and Defining Drought

The Concept of Drought

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all-climatic zones, although its characteristics vary significantly from one region to another. Drought is a temporary aberration and differs from aridity since the latter is restricted to low rainfall regions and is a permanent feature of climate.

Drought is an insidious hazard of nature. Although it has scores of definitions, it originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area, a condition often perceived as "normal." It is also related to the timing (i.e., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness of the rains (i.e., rainfall intensity, number of rainfall events). Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity.

Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Human beings often exacerbate the impact of drought. Recent droughts in both developing and developed countries and the resulting economic and environmental impacts and personal hardships have underscored the vulnerability of all societies to this "natural" hazard.

There are two main kinds of drought definitions: conceptual and operational.
Conceptual Definitions of Drought

Conceptual definitions, formulated in general terms, help people understand the concept of drought. For example:

Drought is a protracted period of deficient precipitation resulting in extensive damage to crops, resulting in loss of yield.

Conceptual definitions may also be philosophically important in establishing drought policy. For example, Australian drought policy incorporates an understanding of normal climate variability into its definition of drought. The country provides financial assistance to farmers only under "exceptional drought circumstances," when drought conditions are beyond those that could be considered as part of normal risk management. Declarations of exceptional drought are based on science-driven assessments. Previously, when drought was less well defined from a policy standpoint and less well understood by farmers, some farmers in the semiarid Australian climate claimed drought assistance every few years.

Operational Definitions of Drought

Operational definitions help people identify the beginning, end, and degree of severity of a drought. (A "lite" description of operational definitions is also available.)

To determine the beginning of drought, operational definitions specify the degree of departure from the average of precipitation or some other climatic variable over some time period. This is usually done by comparing the current situation to the historical average, often based on a 30-year period of record. The threshold identified as the beginning of a drought (e.g., 75% of average precipitation over a specified time period) is usually established somewhat arbitrarily, rather than on the basis of its precise relationship to specific impacts.

An operational definition for agriculture could compare daily precipitation values to evapotranspiration rates to determine the rate of soil moisture depletion, and express these relationships in terms of drought effects on plant behavior (i.e., growth and yield) at various stages of crop development. A definition such as this one could be used in an operational assessment of drought severity and impacts by tracking meteorological variables, soil moisture, and crop conditions during the growing season, continually reevaluating the potential impact of these conditions on final yield. Operational definitions can also be used to analyze drought frequency, severity, and duration for a given historical period. Such definitions, however, require weather data on hourly, daily, monthly, or other time scales and, possibly, impact data (e.g., crop yield), depending on the nature of the definition being applied. Developing a climatology of drought for a region provides a greater understanding of its characteristics and the probability of recurrence at various levels of severity. Information of this type is extremely beneficial in the development of response and mitigation strategies and preparedness plans.

Disciplinary Perspectives on Drought:

Meteorological, Hydrological, Agricultural and Socioeconomic

Meteorological Drought
Meteorological drought is defined usually on the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. Definitions of meteorological drought must be considered as region specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region. For example, some definitions of meteorological drought identify periods of drought on the basis of the number of days with precipitation less than some specified threshold. This measure is only appropriate for regions characterized by a year-round precipitation regime such as a tropical rainforest, humid subtropical climate, or humid mid-latitude climate. Locations such as Manaus, Brazil; New Orleans, Louisiana (U.S.A.); and London, England, are examples. Other climatic regimes are characterized by a seasonal rainfall pattern, such as the central United States, northeast Brazil, West Africa, and northern Australia. Extended periods without rainfall are common in Omaha, Nebraska (U.S.A.), Fortaleza, Ceará (Brazil), and Darwin, Northwest Territory (Australia); a definition based on the number of days with precipitation less than some specified threshold is unrealistic in these cases. Other definitions may relate actual precipitation departures to average amounts on monthly, seasonal, or annual time scales.

**Agricultural Drought**

Agricultural drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced ground water or reservoir levels, and so forth. Plant water demand depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil. A good definition of agricultural drought should be able to account for the variable susceptibility of crops during different stages of crop development, from emergence to maturity. Deficient topsoil moisture at planting may hinder germination, leading to low plant populations per hectare and a reduction of final yield. However, if topsoil moisture is sufficient for early growth requirements, deficiencies in subsoil moisture at this early stage may not affect final yield if subsoil moisture is replenished as the growing season progresses or if rainfall meets plant water needs.

**Hydrological Drought**

Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (i.e., stream flow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, stream flow, and ground water and reservoir levels. As a result, impacts are out of phase with those in other economic sectors because different water use sectors depend on these sources for their water supply. For example, a precipitation deficiency may result in a rapid depletion of soil moisture that is almost immediately discernible to agriculturalists, but the impact of this deficiency on reservoir levels may not affect
hydroelectric power production or recreational uses for many months. Also, water in hydrologic storage systems (e.g., reservoirs, rivers) is often used for multiple and competing purposes (e.g., flood control, irrigation, recreation, navigation, hydropower, wildlife habitat), further complicating the sequence and quantification of impacts. Competition for water in these storage systems escalates during drought and conflicts between water users increase significantly.

Hydrological Drought and Land Use

Although climate is a primary contributor to hydrological drought, other factors such as changes in land use (e.g., deforestation), land degradation, and the construction of dams all affect the hydrological characteristics of the basin. Because regions are interconnected by hydrologic systems, the impact of meteorological drought may extend well beyond the borders of the precipitation deficient area. For example, meteorological drought may severely affect portions of the northern Rocky Mountains and northern Great Plains region of the United States. However, since the Missouri River and its tributaries drain this region to the south, there may be significant hydrologic impacts downstream. Similarly, changes in land use upstream may alter hydrologic characteristics such as infiltration and runoff rates, resulting in more variable stream flow and a higher incidence of hydrologic drought downstream. Bangladesh, for example, has shown an increased frequency of water shortages in recent years because land use changes have occurred within the country and in neighboring countries. Land use change is one of the ways human actions alter the frequency of water shortage even when no change in the frequency of meteorological drought has been observed.

Sequence of Drought Impacts

The sequence of impacts associated with meteorological, agricultural, and hydrological drought further emphasizes their differences. When drought begins, the agricultural sector is usually the first to be affected because of its heavy dependence on stored soil water. Soil water can be rapidly depleted during extended dry periods. If precipitation deficiencies continue, then people dependent on other sources of water will begin to feel the effects of the shortage. Those who rely on surface water (i.e., reservoirs and lakes) and subsurface water (i.e., ground water), for example, are usually the last to be affected. A short-term drought that persists for 3 to 6 months may have little impact on these sectors, depending on the characteristics of the hydrologic system and water use requirements.

When precipitation returns to normal and meteorological drought conditions have abated, the sequence is repeated for the recovery of surface and subsurface water supplies. Soil water reserves are replenished first, followed by stream flow, reservoirs and lakes, and ground water. Drought impacts may diminish rapidly in the agricultural sector because of its reliance on soil water, but linger for months or even years in other sectors dependent on stored surface or subsurface supplies. Ground water users, often the last to be affected by drought during its onset, may be last to experience a return to normal water levels. The length of the recovery period is a function of the intensity of the drought, its duration, and the quantity of precipitation received as the episode terminates.

Socioeconomic Drought
Socioeconomic definitions of drought associate the supply and demand of some economic good with elements of meteorological, hydrological, and agricultural drought. It differs from the aforementioned types of drought because its occurrence depends on the time and space processes of supply and demand to identify or classify droughts. The supply of many economic goods, such as water, forage, food grains, fish, and hydroelectric power, depends on weather. Because of the natural variability of climate, water supply is ample in some years but unable to meet human and environmental needs in other years. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply. For example, in Uruguay in 1988-89, drought resulted in significantly reduced hydroelectric power production because power plants were dependent on stream flow rather than storage for power generation. Reducing hydroelectric power production required the government to convert to more expensive (imported) petroleum and stringent energy conservation measures to meet the nation's power needs.

In most instances, the demand for economic goods is increasing as a result of increasing population and per capita consumption. Supply may also increase because of improved production efficiency, technology, or the construction of reservoirs that increase surface water storage capacity. If both supply and demand are increasing, the critical factor is the relative rate of change. Is demand increasing more rapidly than supply? If so, vulnerability and the incidence of drought may increase in the future as supply and demand trends converge.
U.S. States as Policy Innovators

Because water shortfalls are first local and regional issues, and because of the lack of a cohesive U.S. water policy, states have emerged as important innovators in devising ways to reduce long-term vulnerability to drought. During the widespread U.S. drought of 1976-77, no state had a formal drought plan, and in 1982, only three states had drought plans. But as of February 1999, 30 states had drought plans (states in gray and blue on the map), two delegated planning to local authorities instead of having a single state-level plan, 16 did not have formal drought plans, and two states' plans were in development.

Research has shown that the frequency of drought in a state does not fully explain how committed a state is to drought planning. Most but not all of the more drought-prone western states are committed to drought planning, as are many states in the east, where drought is a less obvious feature of the climate. Trends in federal-state relations in the 1980s, as well as the drought of 1987-88, may be responsible for the surge in drought planning. During the 1980s, states' capabilities increased in conjunction with the Reagan administration's New Federalism and concurrent mandates to state and local governments; states were concerned about federal intrusion into state-level water resource planning and water rights; and there was friction between states and the Federal Emergency Management Agency (FEMA) in FEMA's early days. Innovations in water management, such as ground water management policies and water use permits in riparian states, may also have spurred drought planning. (For more on why states do and don't plan for drought, please refer to "State-level Drought Planning in the United States: Factors Influencing Plan Development," by Donald A. Wilhite and Steven L. Rhodes, in Water International, Vol. 19, No. 1.)

An NDMC survey of U.S. states' drought mitigation activities yielded a variety of ideas, demonstrating that drought mitigation can be addressed in many ways.

The Drought Planning Process

Developing a drought plan is a critical part of drought mitigation. The complexity of drought impacts requires a preventive, anticipatory approach to vulnerability reduction. How can governments reduce vulnerability to drought? The first steps involve the formulation of a drought policy with clearly stated objectives and the development of a preparedness plan that lays out a strategy to achieve these objectives.

Drought preparedness plans promote a more preventive, risk management approach to drought management. They reduce vulnerability to drought and dependence on emergency assistance from governments and international organizations. The process of developing a plan will identify vulnerable areas,
The process also seeks to identify data and informational gaps and research and institutional needs. Ultimately, preparedness plans will improve coordination within and between levels of government, procedures for monitoring, assessing, and responding to water shortages; information flow to primary users; and efficiency of resource allocation. The goals of these plans are to reduce the impacts of water shortages, personal hardships, and conflicts between water and other natural resource users. These plans should promote self-reliance by systematically addressing issues of principal concern to the region or nation in question. To be successful, drought preparedness plans must be integrated between levels of government and with other national plans or strategies, such as those to ensure food security and combat desertification.

Australia's drought policy reflects a risk-management approach rather than a crisis-management approach.

Drought preparedness plans contain three critical components: (1) a comprehensive early warning system; (2) vulnerability and impact assessment procedures; and (3) response and mitigation strategies. These components complement one another and represent an integrated institutional approach that addresses both short- and long-term management and mitigation issues.

The 10-step process described in the Drought Planner's Handbook for developing a national or provincial drought preparedness plan has been used by many governments, with appropriate modifications. The process emphasizes strengthening existing institutions rather than developing new ones.

Drought Mitigation Tools for States

The following grab-bag of drought mitigation tools for state governments is based on two surveys of states, one published in 1993 and one that is ongoing. Tools (that is, initiatives) are listed two ways: by category, and then by state or river basin commission. In other words, the list of "legislation and public policy" drought mitigation tools includes suggestions from several different states, but the "California" list is made up of many different steps taken by California's Department of Water Resources. Many ideas naturally fit into more than one category, but are only listed once, so it probably wouldn't hurt to look over the whole list to find ideas that would work in your area.

The 1993 survey was undertaken as part of a cooperative agreement with the U.S. Soil Conservation Service (now the Natural Resource Conservation Service). Its objectives were to identify primary state, federal and regional players in U.S. drought planning, to identify and describe the drought prediction, assessment and mitigation strategies in use, to analyze the role of the SCS in drought planning, and to identify top priorities for federal drought planners.

The current survey is part of the NDMC's ongoing communication with drought planners around the country. We recently asked state governors to identify the primary drought planner in their state, and then contacted the planners to ask how the NDMC could be of most assistance, what drought-related concerns states face, and what they are doing in response to those concerns.
Caution: The following ideas are the results of a survey of what states have done. They are not necessarily recommendations. Not all ideas are appropriate in all cases. Many of the ideas are more in the realm of short-term emergency response, or crisis management, rather than long-term mitigation, or risk management. Emergency response is an important component of drought planning, but it should not be the end of drought planning. We'll soon be adding a Lessons Learned section that will include more information about what has and hasn't worked well in drought mitigation.

State Drought Mitigation Tools

- Assessment
- Legislation and Public Policy
- Increasing Water Supply
- Public Awareness and Education Programs
- Technical Assistance
- Conservation
- Emergency Response
- Conflict Resolution
- Drought Contingency Plans

Selected Overviews

- California
- Illinois
- Delaware River Basin Commission

Assessment

- Developed criteria -- "triggers" -- for drought-related actions
- Developed early warning system
- Inventoried data
- Inventoried water bank contracts to find new water supplies for drought-stricken areas
- Evaluated use of ground water
- Established new data collection networks
- Studied public willingness to pay more for more reliable water supplies
- Studied effectiveness of conservation measures
- Monitored vulnerable public water suppliers

**Legislation and Public Policy**
- Prepared position papers for legislature on public policy issues
- Examined statutes governing water rights for possible modification during water shortages
- Established a state water bank
- Passed legislation to protect instream flows
- Passed legislation to protect and manage groundwater
- Passed legislation providing guaranteed low-interest loans to farmers
- Imposed limits on urban development
- Developed a state water plan
- Passed legislation requiring water agencies to develop contingency plans
- Enacted legislation to facilitate water recycling

**Increasing Water Supply/Supply Augmentation**
- Issued emergency permits for water use
- Provided pumps and pipes for distribution
- Proposed and implemented program to rehabilitate reservoirs to operate at design capacity
- Undertook water supply vulnerability assessments
  - Inventoried self-supplied industrial water users for possible use of their supplies for emergency public water supplies
- Inventoried and reviewed reservoir operation plans
- Provided funds for water recycling projects

**Public Education**
- Organized drought information meetings for the public and the media
- Implemented water conservation awareness programs
  - Published and distributed pamphlets on water conservation techniques and drought management strategies
- Organized workshops on special drought-related topics
- Prepared sample ordinances on water conservation
- Established a drought information center
- Set up a demonstration of on-site treatment technology at visitor center
- Included media in state drought plan

**Technical Assistance**

- Advised people on potential sources of water
- Evaluated water quantity and quality from new sources
- Advised water suppliers on assessing vulnerability of existing supply systems
- Recommended adopting water conservation measures
- Helped water agencies develop contingency plans
- Formed a drought information center and distributed real-time weather data
- Conducted workshops on crop survival during drought
- Developed training materials in Spanish for agricultural and landscape irrigators
- Conducted workshops on design and implementation of water rationing programs
  - Developed and marketed innovative technologies such as irrigation system improvements, waterless urinals, and monitoring technologies
- Developed and distributed software for irrigators and urban water suppliers

**Conservation/Demand Reduction**

- Established stronger economic incentives for private investment in water conservation
- Encouraged voluntary water conservation
  - Required water users to decrease reliance on ground water and implement conservation measures
- Improved water use and conveyance efficiencies
- Implemented water metering and leak detection programs
- Supported local development of conservation programs
• Established standards for safe residential use of gray water

Emergency Response

• Established alert procedures for water quality problems
• Stockpiled pumps, pipes, water filters, and other equipment
• Established water hauling programs for livestock
• Listed livestock watering spots
• Established hay hotline and provided emergency shipments
• Funded water system improvements, new systems, and new wells
• Funded drought recovery program
• Lowered well intakes on reservoirs for rural water supplies
• Extended boat ramps and docks for recreation
• Issued emergency irrigation permits for using state waters for irrigation
• Created low-interest loan and aid programs for agriculture
• Created drought property tax credit program for farmers
• Established tuition assistance so farmers could enroll in farm management classes
• Told farmers about sources of federal assistance

Conflict Resolution

• Resolved emerging water use conflicts
• Investigated complaints of irrigation wells interfering with domestic wells
  • Negotiated with irrigators to gain voluntary restrictions on irrigation in areas where domestic wells were likely to be affected
• Clarified state law regarding sale of water
• Clarified state law on changes in water rights
• Suspended water use permits in watersheds with low water levels
  • Worked with community-based organizations to promote public participation in conservation programs

Drought Contingency Plans
- Adopted an emergency water allocation strategy to be implemented during severe drought
- Recommended water suppliers develop drought plans
- Evaluated worst-case drought scenarios for possible further actions
- Established natural hazard mitigation council

SECTION 4 (B) (6)

Make recommendations on how Federal drought laws and programs can be better integrated with ongoing State, local, and tribal programs into a comprehensive national policy to mitigate the impacts of and respond to drought emergencies without diminishing the rights of States to control water through State law and considering the need for protection of the environment."

Drought must be an essential element of any national discussion of water policy. This is true not only for western water policy where water is critical to the region's sustainability, but also to other parts of the country that are accustomed to an abundant supply of water where a drought can mean utter disaster and risk to life.

Experience of federal agencies in helping State and local units of government recover from major disasters indicates that State, local, and tribal organizations fare better when they have developed a comprehensive all-hazard mitigation plan. This helps agencies to provide and target funding to states after major disaster declarations. The same can be done for pre-disaster situations to develop hazard mitigation projects.

The Commission may want to consider a federal policy initiative that encourages local, state, federal and tribal governments to focus on watersheds as a unit of resource management. Matching institutional authority and political will to physical reality helps eliminate institutional gaps and builds community. (Water in the West, the report of the Western Water Policy Review Advisory Commission http://www.den.doi.gov/wwprac/reports/west.htm; and "Watershed Management: It's Not Just a Job, It's a Way of Life," by Janet L. Bowers, Water Resources Impact, Volume 1, Number 1). Building community -- increasing social capital, connections between people - increases resilience during drought and other catastrophes.

Integration is best achieved through testing in drought exercises or virtual droughts, that allow stakeholders and agencies to understand what a drought will be like before it happens. Mismatches in authorities or services and increased or diversified water needs can be identified and mitigation steps taken before the drought occurs.

Drought mitigation policies can be designed to support state and local units of government, community and business groups. Factors to be considered in designing drought mitigation plans that have been successfully proven include the following:

Designate one federal agency to take the leadership role for the federal agencies and collaborate with the local community. The lead agency should establish regional response teams by working with other partners including federal, state and local
governments and the private sector.

Include ground water recharge as a purpose for purchasing conservation easements for the Farmland Protection Program and other land conservation easements programs in ground water recharge areas.

Work with communities to assist community residents and businesses to "re-landscape" yards, open spaces, parking lots and roof tops to use native species that conserve water, resist evaporation, are drought resistant. Assist communities develop specifications for building and vegetation management codes and enforce vegetation management programs.

Use constructed/natural wetlands to have an additional purpose of drought mitigation as well as wildlife preservation.

Strengthen community programs so that community, local government, and business abilities to plan for drought mitigation and their ability to react and address drought situations are recognized or given preference when applying for grants, loans and general assistance to enhance their community.

Develop, and in some places, mandate the use of a physical or chemically altered soil surface to reduce evapo-transpiration.

Develop public education programs that stress drought management and mitigation. (fire danger signs; pens and magnets; educational materials for children, etc.)

Drought mitigation projects should provide a long-term solutions and be cost-effective. Building code development, nonflammable structure enhancement placement, and the establishment of community rules for vegetation placement are examples of mitigation projects.

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1. Favorable tax treatment on drought-mitigation investments--Provide tax relief for:
   a) investments in structural improvements for the storage of grain or hay, and/or b) expenditures on structural improvements for the purposes of conserving or conveying water.

2. Integrated approach to education--Encouraging state extension and advisory services to develop whole-farm based financial decision support packages that
would provide useful planning information in situations of drought, as well as other natural disasters.

3. Rural counseling--Providing appropriate support for rural counselling where there is a demonstrated need for this service at the community level (remember recent NYTimes article.)

4. Scientific research on drought-resistant crops--Increased research into the use of perennial crops and drought resistant species, including grasses, etc.

5. Favorable tax treatment on income--Consider the feasibility of extended income smoothing provisions to farmers, ranchers, and non-farm businesses.

I thought it was also interesting that the Australian report differentiated between policies providing incentives to effective farm management, and those providing industry relief. We might want to delineate the types of options that we discuss within some such type of framework.

SECTION 4(B) (7)

"Make recommendations on improving public awareness of the need for drought mitigation, and prevention, and response; and on developing a coordinated approach to mitigation, and prevention, and response by governmental and non-governmental entities, including academic, private, and non-profit interests."

* Please note: I "fixed" the above-quoted portion of the National Drought Policy Act. I think the punctuation in the Act got messed up it has the first semicolon after prevention, and since mitigation, prevention and response go together, and since the second half makes no sense if it starts "and response on developing ..." I'm taking the liberty of addressing what it means instead of what it says. Please clue me in ASAP if I've misconstrued the meaning.

Public Awareness of the Need for Drought Mitigation, Prevention & Response

Public awareness of drought mitigation, prevention and response could be part of a broad, strategic effort to bring about long-term changes in how we conceive of our ability to manipulate natural resources. Many of drought's effects on local government, communities and businesses are the result of large-scale systematic factors that create vulnerability.

Where to connect with current public discourse:

"Drought mitigation" is a fairly abstract concept, and realistically, would probably have to be part of at least two separate education and awareness programs, one stressing an understanding of humans in ecosystems, particularly as related to water, and another stressing risk management versus crisis management, helping people mentally reclassify drought from "a random act of God that you can't do anything about" to "something you can't control but should prepare for."
Fortunately, these themes are current in mainstream media. For example:

- It's likely that land use will be an issue in the 2000 presidential campaign, as politicians capitalize on people's growing discontent with suburban sprawl.

- The National Science Foundation on May 19 released the results of a five-year study on natural hazards, saying that short-sighted development policies have increased vulnerability to natural hazards. People have too much faith in technological fixes and overestimate community resilience, the study found.

- Many communities are adopting the principles of sustainable development, which stresses a balance of economic well-being, social justice and environmental conservation. Although the physical effects of drought happen in the environment -- including the managed environment, such as farm fields -- its indirect effects are social and economic, so building resilience in all three of those areas will reduce vulnerability to drought.

**Key Concepts**

1. The hydrological cycle is nature's water delivery system, and how much water gets delivered varies considerably from one year to the next. History shows us that droughts and floods happen over and over again. (This may sound obvious, but a lot of people still think of droughts and floods as random, once-in-a-lifetime acts of God.)

2. Natural systems have limits. When we push the limits and rely on techno-fixes and emergency bailouts, we increase vulnerability to drought.

3. Know your watershed.

   For children: Activities such as River of Words, a program by the International Rivers Network that gets children to write about their place in a watershed, and outdoor activities that increase awareness and knowledge of natural systems.

   For adults: GIS maps, tours, and activities that increase awareness and knowledge of natural systems.

**Coordinated Approach to Mitigation, Prevention & Response, by Government, Research and Education, Private, Non-Profit and Other Interests**

Many agencies and organizations are doing a good job of creating and disseminating information that can be used to mitigation drought. However, there could be more coordination, including at the community and regional level. For instance:

- The NRCS' regional guidelines on soil management for ag producers and ranchers are a key component of drought mitigation. Taking good care of the soil all the time increases resilience when drought happens. The NRCS could also develop and disseminate guidelines for soil and resource management during drought.

- The Cooperative Extension Service, in some states, has put together excellent
fact sheets for agricultural producers on special concerns and issues that surface during drought. States could share this information more systematically.

- The Council on Environmental Education has produced Project Wet, a curriculum and activity guide for educators, which includes some excellent lessons on water and natural disasters, including drought. A K-12 curriculum panel could survey what is being taught in schools and attempt to find ways to work greater drought awareness into available curricula.

- Drought planning should be part of community and regional natural resources and natural hazards planning. Wherever federal programs intersect with planning processes are potential opportunities to provide assistance and incentives for drought planning. FEMA’s Project Impact, which provides a template for community hazard planning, is an excellent example. If a community incorporated drought planning into Project Impact or a similar process, it might choose to build "farm ponds" and detention basins as emergency storage measures that could be tied in to the drought emergency plan and used for ground water recharge. These could have multiple functions including serving as neighborhood wetland educational areas or parks.

- The U.S. Army Corps of Engineers research on the 1987-1992 drought in California showed that the general public generally responded well to calls for short term water use curtailment. It may be government agencies themselves that need greater awareness. Because droughts may not occur for years, even decades, agency staff may have little experience with droughts and may not be aware of the vast amount of research and practical experience available. "Dry runs" of drought plans, or virtual droughts, like fire drills, let everyone practice their roles in preparation for the real thing.

**A Non-Governmental Coordinating/Awareness Clearinghouse:** In tandem with the greater federal coordination of drought response that the NDPC is considering, the FSA has recommended that federal funding be provided to the National Drought Mitigation Center to assist states with drought preparedness, planning, and mitigation. This center should serve as a clearinghouse for information on mitigation, planning, and preparedness activities; provide a regional/national climate monitoring system; and develop a national/regional database of state drought response resources. Permanent federal funding for the NDMC has also been recommended by the Western Governors Association and by FEMA in their reports on the Drought of 1996.

**Institutional gap:** An institutional gap exists in preparing for drought, in that drought mitigation is truly an interdisciplinary field. Research has been concentrated in the physical sciences, such as climatology. But social science has much to offer in detecting opportunities to reduce vulnerability to drought. For example, it would be useful to have a matching set of socio-economic or environmental data when using climatological data to establish triggers for various degrees of drought response. As of now, there is quite a bit of guesswork in determining, for example, how governments and people should react to a -2 SPI value.

In fact, beyond drought, there is a strong need for interdisciplinary research that
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SECTION 4 (B) (8) include a recommendation on whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency.

The Local Government Community Business Working Group developed three possible options in answer to this question.

**Option #1: Single Federal Agency**
It is practical to designate one Federal agency with the coordination of drought preparation and response similar to FEMA's role in coordinating Federal disaster relief.

- The lead Federal agency would be responsible for assessing drought impact and guiding States to the appropriate aid programs available.
- In order to function as the lead Federal agency, an agency would need to be knowledgeable of the various interagency drought-related programs, however; interagency compacts could be entered into to reflect the triggering authorities and responsibilities of the lead Federal agency and other involved Federal agencies.

USDA has been suggested to serve as the lead Federal agency responsible for the coordination of drought preparation and response given its variety of programs and the fact that the first effects of drought often appear in the agricultural sector and firefighting efforts. USDA also has an extensive local presence nationwide making it an appropriate vehicle for the facilitation of drought assistance.

**Option #2: Interagency Task Force/Virtual Team**

- An interagency task force or virtual team composed of interagency representatives could be established to focus on drought-related problems and solutions and to strengthen the role of local leadership in drought.
- The interagency task force or virtual team would work more efficiently to handle drought than having all drought preparation and response programs consolidated under a single Federal agency since:
  - Drought preparation and response activities must draw upon a broad range of skills and knowledge including, but not limited to: weather, agriculture, hydrology, water management, economics, public affairs, and water treatment.
  - The Federal programs that address these issues are frequently subsets of other established programs rather than independently functioning programs and would be difficult to extricate from their respective legislative, regulatory, and funding authorities for consolidation.
  - By taking the drought-related components of these programs out of their intended context, the consolidated components may not function as effectively as before, diminishing overall preparation and response activities.
- A virtual team may be more effective than an interagency task force since virtual teams are designed for problem solving and interagency task forces are more informational.

**Option #3: Clearinghouse**

- A central clearinghouse for the Federal government could be established to gather and maintain information related to Federal drought assistance programs.
- The clearinghouse would reside with a single Federal agency, but would be an interagency initiative.
- The single Federal agency designated with the responsibility of maintaining the clearinghouse would be required to continuously update its information and would serve as the point of contact to other Federal agencies and State and
local governments seeking information on the Federal government's drought programs.

The assessments, comments and recommendations given below are specifically aimed at addressing the monitoring and prediction component within each of the duties or objectives of the National Drought Policy Commission and its working groups. Some of the options given are specific to the Commission's study while others are directed at actions or activities that could or should be implemented following the development of a national drought policy.

For further information please contact the Monitoring and Prediction working group co-chairs:

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Summary: A comprehensive integrated drought monitoring and data acquisition system needs to be established in order to provide early warning of impending drought and other climate related events so that local, state, tribal and federal officials can implement appropriate mitigation and response measures in a timely manner. A national drought assessment product and report should be prepared on a bi-weekly (or weekly during the growing season) basis for use by decision makers at all levels. The foundation for all monitoring and prediction activities is predicated on the continued or enhanced support of our nation’s data collection networks. The most fundamental need is for better geographic coverage and timely access to spatially detailed observational data, especially from sites with a long, well-documented history. Easier access to data will allow for quicker assessments and decision-making at all levels.

Sec. 4(b)(1) "determine, in consultation with the National Drought Mitigation Center in Lincoln, Nebraska, and other appropriate entities, what needs exist on the Federal, State, local, and tribal levels to prepare for and respond to drought emergencies; "

NEEDS:
1) Data collection systems need to be modernized to allow for both timely aggregation and dissemination of products and assessments.

2) Sufficient support, expansion and maintenance of various data gathering networks located across the country.

3) Data need to be in a standardized format to allow for easy assimilation among all users.

4) Centralized access paths to existing drought products, and to create new derived products which specifically address and portray the most important components of drought.

5) Research, develop and improve current monitoring and prediction abilities.

1) Data collection systems need to be modernized to allow for both timely aggregation and dissemination of products and assessments.

The most fundamental need is simply for easier access to spatially detailed observational data from long-term sites which can furnish the needed historical perspective. Many of these data sources exist already, and others need to be initiated. Access to timely data will allow for quicker assessments and decision making at all levels.

2) Sufficient support, expansion and maintenance of various data gathering networks located across the country.

There is a critical need for nation-wide integration of the numerous unique existing climate, hydrologic and soil moisture/temperature monitoring networks, as well as integration of data from new sites, to provide a comprehensive coverage nationwide. These networks in turn will feed essential data into a coordinated national drought monitoring system and will be used to make timely assessments of both current and expected conditions.

3) Data need to be in a standardized format to allow for easy assimilation among all users.

Data and metadata (information about the data) standards need to be established, and older sites and systems modified, to meet requirements allowing for consistent current and historical data sets which in turn drive analyses, assessments and model predictions. The utility of these sources for effective drought analysis is severely limited by non-universal data standards, unreliable and inconsistent data availability and no integrating source for the information.

4) Centralized access paths to existing drought products, and to create new derived products which specifically address and portray the most important components of drought.

Currently, drought monitoring, assessment and prediction products are spread out over several Federal agencies. A centralized web location for the posting and dissemination of this information would strongly benefit the monitoring and
The various and often conflicting federal information sources dealing with drought must be eliminated. A centralized coordinating entity would provide "one official voice" derived from a consensus of all federal information sources and serve as an efficient source of critical information and analyses related to drought. A web based interface needs to be employed to allow for easy access by users. The users can then also provide useful and essential input back through the interface.

A basic need exists to supply the media and all concerned parties with a suite of drought information products, projections and assessments of current conditions. Consolidated climatological, meteorological and hydrological product(s) generated by a number of Federal and State agencies would increase public and private awareness on drought as a disaster while also informing them of current or emerging drought conditions across the nation. Establishing generalized definitions of terms used in the monitoring, assessment and prediction of droughts would be most useful.

5) research, develop and improve on current monitoring and prediction technology

Deficiencies in drought monitoring and prediction products can be improved with more research and technology development into new types of data, new and improved instrumentation, and new methods of analysis and modeling using the latest in state-of-the-art technology. Users with specific needs, from agricultural producers to navigation interests, would be included as partners in researching and developing products so that they are truly useful to the sectors affected by drought.

OPTION:

Support a national entity to acquire, assess, inform and educate the citizenry of the status of drought, its risks, and how they can prepare to mitigate economic, natural resources, and impacts. The desired outcome is an entity to coordinate a nationwide effort that would integrate various partners and resources to provide data and drought education in an easily accessible way that is of consistent and certified quality. This entity must have firm recurring funding and a defined role in the nation's infrastructure of drought monitoring and assessment activities.

Sec. 4(b)(2) "review all existing Federal laws and programs relating to drought;"

A thorough review and inventory of existing Federal laws and programs pertaining to monitoring and prediction of drought was undertaken by this group and others. These are identified in the list of programs maintained by the NDPC staff.

Most drought programs provide good emergency response and relief with economic stability as the desired end result. In many cases, such programs are activated by law when certain data and/or derived parameters pass a threshold level. Ironically, the accuracy and existence of the data collected and used to trigger these actions is seldom addressed by the various laws and federal programs currently in place. The data often lack common units, standard formats, metadata, ready access, quality
control, historical records, consistent resolutions, and the consistency of record that should be used to place a current drought within the context of historic droughts.

These shortcomings are evident in nearly all of the current programs reviewed and described in the Inventory of Federal Drought Programs compiled for the National Drought Policy Commission by the Western Drought Coordination Council and the National Drought Mitigation Center. The resultant incomplete, inconsistent, and disparate data sets need improvement to support routine and special assessments of drought risk or effective information efforts for users. Correction of this data deficiency is basic to any improvement in federal assistance to the public.

Sec. 4 (b)(3) "review State, local, and tribal laws and programs relating to drought that the Commission finds pertinent; "

Until very recently, many States as a matter of policy placed primary responsibility for drought action (including monitoring and assessment) with the Federal and local governments. (Walker, W.R. and others, 1991)

In those states that have drought plans (approximately 30), there are typically a series of trigger mechanisms which initiate different degrees of response as drought worsens or ameliorates. Without exception, an implicit assumption, seldom stated, is that the necessary physical data will (somehow) be available to make the determination as to whether circumstances are declining, maintaining, or improving.

In practice, nearly all climate records of the necessary length have been gathered under the auspices of the federal government, primarily the Department of Commerce for the past half century, and the Department of Agriculture prior to that. A few state and local records span the necessary length of time, but these are not usually stored with, and accessible by means of the same vehicles as, the federal data.

It is thus a dangerous assumption that these same federal records will be available when needed. In addition to generally being shorter, state and local records are often under heavy pressure when budget shortfalls appear. At the local level, monitoring is often viewed as something of a luxury, an expendable activity when budgets tighten, and harder to justify when competing against potholes and schools for dollars.

In addition, the resources needed to analyze and interpret state and local climatological and hydrological observations or predictions, and place them in context, are scarce, and often not present.

A second type of monitoring is often lacking as well, the monitoring of impacts ("assessment"). It is crucial for the credibility of drought monitoring efforts that hydro-climatological evidence be corroborated by impact evidence from the field, of those systems--human and natural--that are being affected. Understandably, there is extreme nervousness about recommending emergency actions on the basis of climate and water information alone. Confirmatory testimonials from those impacted are needed. In many cases, this local information, even if it exists, does not readily and
automatically make its way into the regional and national impact assessment process.

The proposed three-tiered National Climate Services infrastructure (state/regional/national) should be promoted and utilized to connect the data and information needs and flows between these different scales.

The lack of a coherent system for feeding accurate and timely impact information up through the local/state/regional/federal hierarchy, as the consequences of drought unfold, acts as a deterrent for effective reaction and results in an early warning system which is tilted toward climatic evidence rather than practical impacts.

Because similar national pressures occasionally lead to federal monitoring cutbacks (witness recent closures of many excellent long-term USGS streamflow gages), we often encounter federal and state/local entities trying to leverage the efforts of each other, a sort of shell game that leads to no real improvement in the quantity, quality, or timeliness of the information needed by both, but looks good on paper.

Local and state responses to drought need locally detailed climate information from dense networks, placed in historical perspective, to be of any value to local decision-makers. In recent years there have been several instances in western states of national-level products based on limited data and spotty observations (or even no data, relying on interpolations from neighboring regions) being preferred as decision aids, in the face of contradictory field evidence from impacts, or of climatic information (both as raw data, and as indices) from different sources indicating both wet and dry conditions for the same area at the same time. In these cases, the climatic information was thrown out altogether.

This is indeed unfortunate, as regulations, laws, past practices, and common sense require substantiating evidence in order to justify drought assistance. Since the basic unit of drought relief is often the county, a basic commitment should be made that every county has at least one active climate station (more for larger, or more populated, or climatically diverse counties), and that their observations be transmitted to the regional and national data repositories at least once each day.

Though not specifically mentioned so far, the same problems affect the tribal regions. The biggest void found on a map of western climate stations is always the Navajo Reservation. Very few reservations have adequate long-term climate monitoring sites. Many (most) have had a difficult time committing to long-term, high-quality monitoring programs, a reflection of a number of historical factors tracing back a couple centuries or more. At the same time, the tribes are a, and perhaps the, key player in the resolution of a number of fundamentally important water issues; in spite of this, desired information pertinent to their water supply and demand is sorely lacking.

Sec. 4 (b)(4) "determine what differences exist between the needs of those affected by drought and the Federal laws and programs designed to mitigate the impacts of and respond to drought;"

**NEEDS:**
1) better dissemination of assessments and products that meet users needs

2) continual need for improved prediction (forecasting) capabilities

3) better ways of incorporating feedback from users into products

4) thorough assessment to determine future monitoring and prediction needs

1) better dissemination of assessments and products that meet users needs

Better interpretative and impact assessment products are needed to evaluate droughts (location, intensity, etc.) occurring across the United States. Basic soil moisture, soil temperature, crop stress, hydrologic and climatic information is sorely inadequate. Information systems are not available to process the available data into readily available and useful products and the data collected is not in a standard format that can be shared easily.

Improvement in real-time data collection and dissemination is essential so that there can be reliable input into drought monitoring and assessment as well as in decision making.

2) continual need for improved prediction (forecasting) capabilities

Improved, timely forecasts are needed in order to give users the best available information at the earliest possible time so that mitigative decision making and policy implementation can take place.

Some progress has been made on the prediction of rainfall on a daily time scale using numerical weather prediction methods, and also on multi-seasonal time scales related to the impact of El Niño. However, research efforts are needed to yield a meaningful suite of monitoring products, instruments, or predictions that are relevant to the needs of agricultural producers and water suppliers and others. These needs span the time continuum from days to decades.

Verification of drought forecasts should be made readily available. Some educational capacity needs to be built in to these predictions so that the meaning and limitations of the forecasts are clearly understood by users. At this time, current products are not flexible enough to be adjusted for specific user needs.

This is coupled by a need for more accurate and more quantitative forecasts of precipitation as well as better forecasts of runoff and streamflow. Forecasts giving the probabilities of recording various precipitation totals would also be useful. A forecast of the number of hours temperatures will remain above or below freezing would help in forecasting snow pack and runoff.

3) better ways of incorporating feedback from users into products

Reforming products to meet the needs of users, expressed through their feedback, is a major missing component in both monitoring and prediction products. A needs assessment study would help to determine what products are used most or need improvement and to help recognize a need for additional products that may fill a void.
Improved relevant assessment and prediction tools need to be developed and implemented. Information dissemination is not consistent but becomes an event related matter, thus, it is generally delivered too late for most affected users or producers to utilize.

Present laws and programs do not provide for the infrastructure, or essential agency integration systems, to develop and efficiently deliver the right information, in the proper medium and format, that is both useful and available to those affected most by drought. Many so-called formalized ADrought Programs@ provide only for reactive emergency relief, not pro-active mitigation actions.

Current formalized research is insufficient to address needs or opportunities for optimizing preparedness efforts. Research and technology development are needed to help the various sectors affected by drought maximize water-use efficiency before the onset of drought. This in turn can affect what is monitored and how predictions will be made.

A need exists for continual monitoring of hydrological, climatic and other parameters such as soil moisture and soil temperature. This provides for a consistent base level of historical information from which to assess droughts.

4) **thorough assessment to determine future monitoring and prediction needs**

Information contained in any monitoring and prediction product, report or assessment to a user needs to allow for user feedback. Information from the managers should flow back to a central, official drought monitoring and assessment entity in an organized fashion, providing information such as reservoir stores (if possible with some degree of historical perspective) and the details of implemented drought management measures when they occur. This entity would also serve to both monitor and record impacts in order to better understand why and when they occurred during the evolution of the drought.

Current drought education is not effective enough in changing agricultural practices, water conservation technology or techniques, or in changing user perceptions of drought and its role in the overall use and sustainability of our natural resources.

**OPTION:**

Implement as described in **Sec. 4 (b)(1)**

**Sec. 4 (b)(5) "collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the national level; "**

**NEEDS:**

1) To develop a drought information system that integrates climatic, hydrologic and soil moisture information from various sources for local, regional or national use. Assessments of current conditions and better forecasts of drought as well as risk assessment are also needed locally and regionally.
The Western Governors Association sponsored Western Drought Coordination Council (WDCC) brought together the primary agencies or groups involved in monitoring, assessing and predicting demonstrating the effectiveness of an integrated approach, but also defining clearly, the serious requirement for soil climate monitoring and assessment to support effective predictions.

The WDCC drought monitoring, assessment and prediction group activities were well coordinated among many Federal, State and local agencies. A method of data acquisition, assessment and risk analysis was followed that could serve as a blueprint for a coordinated national effort. The WDCC=s monitoring effort clearly showed a necessity to have a regional focus in order to provide interpretations that were accurate and meaningful at all levels and by all users.

OPTIONS:

Support implementation of a national monitoring effort that utilizes the existing state climatologists, Regional Climate Centers, various federal agencies involved in monitoring and the National Drought Mitigation Center in order to assess and monitor regional drought differences. The network should produce regional assessments that can be integrated into a national product.

Initiate a drought user/research/operations web site to determine needs of various users.

Sec. 4 (b)(6) "make recommendations on how Federal drought laws and programs can be better integrated with ongoing State, local, and tribal programs into a comprehensive national policy to mitigate the impacts of and respond to drought emergencies without diminishing the rights of States to control water through State law and considering the need for protection of the environment; "

NEEDS:

1) An entity should be authorized to fully integrate the various drought monitoring and prediction technologies and information resources, to provide quality, unbiased, standardized, consistent and easily accessible current information and historical data.

2) States, tribal governments and others need to be taught how to interpret and use data and analyses to meet their decision-making needs. New products may also need to be developed in response to their needs. Establishing the drought information entity described above will provide the methodology foundation necessary to carry out local, state and tribal laws and environmental programs.

OPTIONS:

An intergovernmental forum could cooperatively integrate drought laws, programs and policy. Such an entity could also serve to help establish better data standards and the sharing of such data. This could become a basic part of the national infrastructure of resource information that would be available to all.
For a federal entity to integrate the technologies, resources, and needs to provide quality, standardized, consistent, and easily available historical and current data along with analysis.

Provide assistance to states, tribal governments and others on the interpretation and use of the data and analyses to meet their needs as decision-makers.

Conduct research to help agricultural producers and municipalities prepare for drought

Sec. 4 (b)(7) "make recommendations on improving public awareness of the need for drought mitigation and prevention; and response on developing a coordinated approach to drought mitigation, prevention, and response by governmental and non-governmental entities, including academic, private, and nonprofit interests; "

NEEDS:

1) education of the public and decision makers about the nature of drought and its continual monitoring needs as well as better understanding prediction and risk assessment tools

2) to significantly increase the public's awareness on the status of identified drought(s) and the likelihood for amelioration or intensification

3) to efficiently organize and disseminate monitoring, assessment and prediction information dealing with drought

4) direct research to provide better tools to understand, monitor and predict drought

Unfortunately, drought is an ill-defined concept that is based on the impacts of water shortages. Education and preparedness are the keys. Coordinated efforts among public, private and educational institutions are needed in several areas:

- Development of short and long range, local, state, regional and tribal drought monitoring, mitigation and response plans that are in place and tested before a drought occurs
- Better awareness of the services of the National Drought Mitigation Center whose mission it is to make the public aware of the need for drought mitigation and preparedness

2) to significantly increase the public's awareness on the status of identified drought(s) and the likelihood for amelioration or intensification
There is a significant need to educate the public on the subtle nature of a drought's onset, its devastating impacts, and probabilities for recovery.

The best observation, monitoring and forecast information should be incorporated into a new drought product. The national drought status and forecast product should be concise and timely, issued at intervals that meet the users needs. It should be distributed as widely as possible, using the Internet and official government communications procedures.

Toward this end, a new drought classification product or index scheme should be seriously considered. Similar to the schemes or index values used (by decision makers and recognized by the public) for tornadoes and hurricanes, a 4 or 5-category drought classification scheme would more easily convey pertinent information on drought to the public, decision makers and emergency workers.

A national drought classification product, prepared by experts from various Federal agencies in concert with the National Drought Mitigation Center, would likely be used by governmental and various private services, such as The Weather Channel, enhancing the potential for widespread use by the public and appropriate state, local, tribal, and other entities interested in drought. Better access to observational data coupled with the latest forecast technology, including the use of model ensemble output of temperature, precipitation, and soil moisture, should be used to project significant changes in a drought's severity level, potential duration and spatial extent.

3) to efficiently disseminate comprehensive information, or products, on drought from a coordinated site

Tribal, county, municipal and state governments need access to timely information and forecasts about drought, as well as a system through which inter-governmental coordination for drought monitoring and/or response can take place.

As to better coordinated approaches in information dissemination, efforts have been underway in the form of the National Drought Mitigation Center, USDA Water Supply Forecasts (NRCS), UCAN/UWAN, NOAA WX radio, and development of web clearing houses in order to get out timely data and products.

4) direct research to provide better tools to understand, monitor and predict drought

Efforts and resources must always be dedicated to improving our existing knowledge and capabilities in monitoring and predicting droughts. Different tools and methods are needed in different regions across the country.

Historical Aproxy@ data sets are a valuable tool in helping us understand past droughts. Research in this area helps us to characterize and define our experience with the drought phenomena as it occurred in pre-instrumental times.

OPTIONS:

Implementation of proposals in Sec 4 (b)(1) would provide an entity responsible to achieve
the concerns raised in Sec 4 (b)(7). The desired outcomes include:

- Consistent data sources and appropriate monitoring, assessment and prediction tools provide a platform upon which to build the education and awareness tools that are necessary
- Change public awareness to show that drought is a normal part of climatic and can have lasting impacts well after the event has ended
- Make all information and education awareness information available through webservices and other appropriate dissemination vehicles

Sec. 4 (b)(8) "include a recommendation on whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency."

NEEDS:

1) coordination of monitoring and prediction efforts of all agencies under the leadership of one entity with a comprehensive policy and a framework process that will allow for flexibility and timeliness in responding to changing drought conditions

"Consolidated" as used in Section 4 (b)(8) is interpreted to mean the bringing together of the significant, complementary, and effective monitoring, assessment, and prediction activities, tools and functions of the various programs, and entities currently involved under one entity with federal identity, official status, reoccurring fiscal resources, and adequate staff and technology available.

APPENDIX

Preface

To define for the purposes of PL 105-199 the meaning of Monitoring@ and Prediction@ as related to drought:

- Monitoring includes all activities related to collecting, acquiring, managing, archiving and assessing moisture conditions as reflected by the data parameters collected
- Prediction is the outlook, or forecast, of future climatic or soil moisture conditions that could cause a drought to emerge or enhance or decrease the severity or extent of an existing one

Introduction:

Drought to a climatologist or meteorologist is generally associated with lower than normal precipitation followed by a decrease in available soil moisture. To the groundwater hydrologist it is declining water tables and aquifers. For other users, it is a negative impact on his or her ability to: operate an economic agricultural operation, manage and assess the risk of wildfires, generate power, provide recreation, manage wildlife resources, sustain a viable resource without damaging its sustainability, maintain adequate water supplies, or satisfy a lifestyle.
Using an index to gauge the severity of drought and to initiate and terminate responses is a well established practice. When the index value is used solely to discuss droughts, it is usually called an index; when used as an administrative action indicator, the term Atrigger@ is used.

There are several considerations in determining whether to apply a specific index or trigger in a particular situation: Is the index available? Can it be calculated quickly, or is it reported two weeks or a month after all data are gathered? Is it reliable? Can it be meaningfully correlated with actual conditions?

For large geographic areas (ranging from continental, to multi-state and to sub-state levels) there are at least eight recognized indices. Indices provide a way to quantitatively compare present conditions with the historic record and present a relative magnitude of the drought condition. The indices each use a limited number of basic raw data: precipitation, snowpack, temperature, soil moisture and/or reservoir storage. The most common of these indices are: Percent of Normal Precipitation, Palmer Drought Index, Standardized Precipitation Index, Deciles, Surface Water Supply Index, Crop Moisture, Rainfall Index and Dependable Rain. Advances in technology have also led to a number of indices that can be derived from remotely sensed data collected from satellite sensors.

For local water utilities, these indices are supplemented or replaced with more localized information. The local indices may be as simple as a flow measurement at the point of diversion on a river, the depth to water in an aquifer, the projected reservoir storage at some point in the future, a notification from a water supplier of the potential, or actual decreases in, delivery, or the ratio of potential demand to potential supplies.

Some response programs, particularly at the Federal level, rely on triggers that relate to actual impacts from the drought event, such as crop losses or reductions in income.

In several cases, response programs at the Federal and State levels require a very specific trigger, a declaration of Drought Emergency, by the Governor and/or President. The basis for the declaration varies across government units.

1. What is drought?

Drought is broadly defined as a condition of water shortage. This succinct definition is good for its simplicity and generality in that any user can relate to the concept of supply and demand. However, the mission of monitoring and prediction entails much more than just the problem of "water shortages", but the water supply in general. In the West especially, water is akin to a commodity for many users, trading the rights to use or consume set quantities today or at a future date. Such decisions require knowing both the risks for water shortages and water surpluses, both locally and regionally.
Drought to a climatologist or meteorologist is generally associated with lower than normal precipitation followed by a decrease in available soil moisture. To the groundwater hydrologist it is declining water tables and aquifers. For the citizen, municipal manager, and land operator (users) it is a negative impact on his/her ability to: manage and assess the risk of wildfires, operate an economic agricultural operation, generate power, provide recreation, manage wildlife resources, sustain a viable resource, maintain adequate water supplies, or satisfy a lifestyle.

Any purely mathematical and/or meteorological definition of drought will be unsatisfactory because drought is defined first and foremost by the amplitude of its impacts. The degree to which such impacts respond to the meteorology and hydrology differs markedly from place to place, and indeed even from season to season in the same place.

The notion of a single drought classification scheme has been proposed with the justification that it would offer a unified assessment of national water shortages for media, public, and institutional consumption. The scientific merits of such an approach are less clear, however, and for several reasons a single drought classification is arguably incomplete due to the diversity of users. Therefore, a combination of measures that apply to specific drought interests such as planning, mitigation, response and prediction over varying time and spatial scales is the only way to satisfy all interests. Once people have all of the available information, interested parties can discuss and assess the drought situation by considering all the meteorological and hydrologic parameters, indices, and impacts, and then make human decisions.

2. Monitoring

From a political point of view, the need for a simple single metric of drought is clear in light of the Federal commitment to underwrite State, Local or Tribal losses related to State declared drought emergencies. For example, Texas Governor Bush had declared a state of emergency related to drought in 170 of the state=s 254 counties as of Mid-April 1999. An objective measure of drought would certainly be valuable in such situations in order to substantiate the State's claim.

But for other purposes, the notion of a local index of drought seems too simple. On the one hand it takes no account of the water supply available to a region. The semi-arid West again serves as a good example. Here, a local water shortage is less relevant for agricultural, municipal, and industrial concerns than is the remotely stored water that resides in adjacent high terrains of river head waters.

On the other hand, fire weather services and open range management would be more sensitive to local water supply through its affect on timber and grasslands, and a local index of that supply would again be valuable. There are many examples on both sides of the ledger, and the point being made here is that there needs to be a diversity of products that address the informational needs of users with regard to water supply.

3. Monitoring Needs

A. Observations
Observation networks that take and transmit measurements of temperature, precipitation, and other meteorological and hydrological variables enable the detection of anomalies that lead to drought. Routine and reliable observations are also required to initialize the forecast computer models at the National Centers for Environmental Prediction (NCEP) and other forecast centers around the world. There are a number of networks operating on federal, regional, and state levels, many automated and some manual. Of special note are the several hundred first order stations operated by the FAA and the NWS, the several thousand cooperative network stations, and a number of automated networks operating regionally or statewide. While most stations take surface weather observations, a recent network established by USDA's Natural Resource Conservation Service (NRCS) takes explicit measurements of various parameters, including soil moisture, from around 30 sites across the country. In addition, there are many regional, state, and locally sponsored networks. The data collected are needed in a real-time from an easily accessible centralized data base to allow for up-to-date monitoring of current conditions.

The U.S. Geological Survey (USGS) operates nearly 7,000 streamgages nationwide, more than 4,500 of which use satellite telemetry to provide river stage and discharge information in real-time. It also monitors groundwater conditions at several thousand wells. Although not all groundwater data is directly relevant to management activities during drought, there are several hundred wells that do provide information of potential value. The usefulness of these groundwater data is constrained, however, because they are not yet being provided in real time.

A USDA, NRCS, National Water and Climate Center (NWCC) 1992 inventory of existing Soil Moisture-Soil Temperature data sites and systems is attached. It lists over 1600 separate activities. The utility of these sources for effective drought analysis is severely limited by non-existent data standards, unreliable and inconsistent data availability and no integrating source for the information.

Limited soil-climate information can be obtained from the various disparate sources across the nation. It is also true that even after exhaustive efforts to gather this information from numerous uncoordinated sources have been conducted, applying various processes to "normalize" it for analysis over large areas and regions, it is still inadequate to support the growing demands of drought /resource assessment and management and risk assessment models. The existing data sets tend to be application specific, short-term in scope, incomplete, and limited in their coverage area. Many include nonstandard sensors with varying degrees of quality control applied.

There is a critical need for nation-wide integration of the numerous unique existing climate and soil moisture/temperature monitoring networks, as well as utilizing data from new sites to provide for a comprehensive coverage of the nation while also providing data pertinent to individual farmers and other small entities using smaller areas on the landscape. Data standards need to be established, and older sites and systems modified, to meet requirements allowing for consistent, current and historical data sets to drive analysis and risk assessments.

B. Assessment
Water users, institutional authorities, and the media will not be uniformly familiar with drought indices to use them to develop useful information on drought. Different stakeholders (e.g., the agricultural community, government agencies at different levels, industries, environmental managers, etc.) will require different types of indices and context information to be able to make rational decisions regarding mitigation or response. Thus, simple communication of indices to different stakeholders will not be enough information to constitute assessments of drought. Putting the index value of a current or projected drought into historical context enables a user to interpret the severity and likelihood of the event. For example, water suppliers or crop insurers probably would find recent precipitation records, soil moisture measurements, or other quantitative but simple indices alone inadequate as assessments on which to base decisions. Although the quantitative indices are a starting point for communications dealing with drought, their use as triggers in planning or decision making is minimal without historical and geographical context.

Monitoring efforts should be extended to assessments to include compiling surface or soil measurements into maps or tables that summarize weather conditions over time or space. This information can then be used to develop context statements as assessments of the extent of significant anomalies. Currently, there are a number of drought indices that are disseminated in tabular and map form via the Internet, DIFAX, and/or publications. The indices generally use temperature and precipitation data to estimate soil moisture anomalies at various depths. Among those indices used the longest are the Palmer Drought Index (PDI) and the Crop Moisture Index (CMI), both of which are disseminated via publications such as the Weekly Weather and Crop Bulletin and over the Internet and DIFAX. A newer index is the Standardized Precipitation Index. Both the PDI and the SPI have been calculated for all the U.S. climate divisions back more than 100 years, making these indices especially useful for historical analyses and comparisons. Historical data on precipitation, temperatures, and drought are maintained principally by the NOAA/NESDIS National Climatic Data Center (NCDC) and their Regional Climate Centers (RCCs). Both the RCCs and NCDC disseminate recent and historical data and information via hard copy, magnetic media, and the Internet.

A number of federal agencies produce publications or Internet reports analyzing current or recent climatic variations or extremes, including drought. NCDC, the RCCs, and the NOAA/NWS Climate Prediction Center, for example, issue periodical reports that can be used to monitor dryness, as well as special reports on extreme weather events on an ad hoc basis. The NOAA/USDA Joint Agricultural Weather Facility's (JAWF) Weekly Weather and Crop Bulletin is especially useful for monitoring U.S. weather conditions, as it includes considerable weather data and information on weekly, monthly, and seasonal time scales. The Web sites operated by CPC, NCDC, the NWS Hydrologic Information Center, and NOAA’s Climate Diagnostics Center offer considerable information on current anomalies, including drought. This is also true of the USGS web sites that provide both current and historical streamflow data on a state-by-state basis. USGS is also adding a new national daily streamflow index map to its web site to complement its monthly National Water Conditions report, as well as the hydro-climatic index products of other agencies.

Although many of these drought indices can be used as triggers, values to be used
as triggers by different stakeholders for different purposes must be identified by placing them in spatial or historical context. Thus, efforts must be made not only to develop improved indices or use existing ones more efficiently, but also to improve ways of relating the values to the decision process. Improved drought mitigation will depend as much on easily communicated assessments as on the techniques of actual quantification of drought conditions.

C. Dissemination

Disseminating better information on the magnitude of ongoing droughts as well as their outlook will help to improve public awareness of the need for drought mitigation and prevention. The current myriad of products that relate to drought should be consolidated into a single national suite of products that contain credible and timely information on all existing dry areas that may evolve into drought or have already become drought. The best observation, monitoring, and forecast information should be incorporated into the drought product, which should be disseminated as widely as possible, using the Internet and official NWS communications procedures. Such a national product, prepared by experts from various agencies in concert with the National Drought Mitigation Center, would likely be used by various private services, such as The Weather Channel, enhancing the potential for widespread use by the public and appropriate state, local, tribal, and other entities interested in drought. The latest forecast technology, including the use of model ensemble output of temperature and precipitation, should be used to project significant changes in a drought's classification. The goal is to significantly increase the public's awareness of the status of a current drought along with the prospects for amelioration or

Information to the end users needs to be a two-way street. Information from the managers should flow back to a central, official drought monitoring and assessment entity in an organized fashion, providing information such as reservoir stores (if possible with some degree of historical perspective) and the details of implemented drought management measures when they occur. This would also serve as a medium to monitor and record impacts, along with when and why they occurred. A centralized coordinating entity is needed to provide "one official source" of the critical information and analyses. The various and sometimes conflicting information sources on drought must be eliminated. Web based technology needs to be employed to allow easy access by users who can also provide efficient feedback to the centralized coordinating entity.

There is a significant need to educate the public and decision makers on the nature of drought, the subtlety of the onset of drought, the devastating impacts, and probabilities for recovery of economic opportunity and environmental security. Emphasis on a more pro-active approach such as public information, public involvement, and drought prediction may be three good tools to improve public awareness. Drought prediction alerts the public and the decision makers of impending drought, drought severity, or the termination of drought. Public information such as school programs could familiarize the public with mitigation techniques. Public involvement in the mitigation and response activities incorporates all the stakeholders.

D. Prediction
Some progress has been made on the prediction of rainfall on daily time scales using numerical weather prediction methods, and also on multi-seasonal time scales related to the impact of El Niño. However, research efforts are needed to understand the basic drought meteorology. A better understanding of drought will yield a meaningful suite of prediction products pertaining to water supply that span the time continuum from days to decades.

Specifically, there is a need for more accurate quantitative forecasts of precipitation to better forecast runoff and stream flow, for longer range forecasts to be issued more frequently, for verification scores for all forecasts to be made readily available, for a forecast of the number of hours temperatures will remain above or below freezing (to help in forecasting snow pack and runoff), and for forecasts giving the probabilities of recording various precipitation totals would be useful.

\textit{Other thoughts and responses relative to sections 1-8:}

Sec. 4(b)(1) "determine, in consultation with the National Drought Mitigation Center in Lincoln, Nebraska, and other appropriate entities, what needs exist on the Federal, State, local, and tribal levels to prepare for and respond to drought emergencies;"

Three policy shifts need to be made: (1) anticipate and assess risk, not simply react to disasters; (2) focus on mitigation that builds resilience at the earliest planning stages, not as an afterthought, and deal with mitigation comprehensively rather than piecemeal; and (3) implement warning and dissemination systems that allow society to bring its resilience in to play. (Razzaghi, A.)

Whether the drought is real or perceived, putting a current event into historical context enables a user to interpret the likelihood and severity of the event. Perhaps a more important individual need is to provide water supply interests and crop insurers (government and private) with the current status of a drought. Quantitative measures are needed, such as precipitation, soil moisture and drought indices, because these thresholds are often used to trigger drought mitigation action, or responses, for entities having contingency plans or programs.

\textit{DATA ACQUISITION:}

Expand support of the Soil Climate Analysis Network (SCAN) effort proposed by the USDA, Natural Resources Conservation Service (NRCS). In the area of drought monitoring this is one of the parameters that lacks the most observed data for. SCAN would integrate information from existing soil-climate date networks and establish new data collection points through partnerships with other federal, state, local, and tribal entities. SCAN will focus on the agricultural areas of the U.S. and is completely compatible with other major federal data collection efforts such as the modernization of the NOAA Cooperative Observer Climate Network. NOAA is initiating a process to modernize data collection from long-standing climate stations by establishing a Climate Reference Network (CRN). It is expected that SCAN will complement NOAA's effort by providing soil moisture/temperature data on a scale of coverage never before possible. This soil climate data would also be of great benefit as an input to help improve forecast models at all spatial scales. Other significant USDA partners include the WAOB, NRCS, FS, ARS, ERS and NASS.
The Forest Service (FS), Bureau of Land Management (BLM), National Park Service (NPS), and Fish and Wildlife Service (FWS) all collect data for fire/drought management using Remote Automatic Weather Stations (RAWS). These stations could possibly be up-graded or modernized allowing for an expansion of monitoring sites fitted to the NRCS SCAN or SNOTEL networks in order to assess conditions in forested and upper elevation locales. Information from this network is relied upon heavily by foresters and range managers. Coordination also needs to occur between the FS and NRCS in looking at the development of the Forest Service National Forest Systems monitoring system called the National Resource Information Network (NRIS). Coordination would allow for systems to share data between them in times of drought.

**DATA ANALYSIS/DELIVERY OF INFORMATION AND PUBLIC EDUCATION ON DROUGHT:**

Support the Unified Climate and Water Access Network (UCAN-UWAN) under development by USDA (NRCS) to ensure Internet delivery of drought, climate and water resource information to all interested parties nationwide. Data deliverables include near real-time observed climate, soil moisture, soil temperature, and other hydrologic data for assessing drought potential, monitoring drought development, mitigation, response and recovery, as well as appeals and legislative briefings, climate and water data products to meet real-time natural resource management, and all necessary spatial climate data sets, as well as climate generation data sets and technology for climate change and variability scenario development.

UWAN is a newly conceived USDA, NRCS, NWCC initiative proposes that partnering with the USGS to standardize the format of their water resource data records using a modified time series structure used by climate. USGS would partner with UCAN members in providing Internet access to this data. Due to the similarity in streamflow and climate information, it is proposed that the climate software developed for UCAN be made available to the USGS in a collaborative effort to improve streamflow interpretations. The NRCS also proposes that the USGS allow the UCAN members to quality control and database the climate information collected at streamflow sites.

**RESEARCH:**

Better prediction skill provided as early as possible is considered an essential need. Information needs to be given early enough in order to plan for or mitigate the impacts of drought. Forest and rangeland managers would benefit greatly from long-term drought predictions, and thus, research on drought prediction modeling would be useful to the federal land management agencies. A better understanding of soil water and forage production potential in rangeland ecosystems would also be useful, especially if it can be linked with models to predict soil moisture weeks to months or seasons in advance.

Improved easy to use science-based indices need to be developed to aid the average decision maker in planning.

There needs to be more research on remote sensing and drought monitoring. Resources and equipment only stretch so far. Remote sensing technology allows us
to efficiently and economically monitor large areas on a relatively frequent basis.

Instrumentation and data acquisition technology advancements are needed to provide more accurate, less costly, and more dependable data.

Assessment and drought risk models need to be perfected and transferred to the decision makers as a ready to implement tool for local assessment and interpretation.

Sec. 4(b)(2) "review all existing Federal laws and programs relating to drought;"

In the area of drought monitoring, current programs are limited to data acquisition functions of the NOAA Cooperative Observer Network, NRCS's Soil Climate Analysis Network (SCAN), Soil Moisture- Soil Temperature (SM-ST) Pilot Project, Snow Telemetry (SNOTEL) systems, the Forest Service=s Remote Automatic Weather Stations (RAWS), and several scattered state climatologist and regional networks, such as the High Plains regional network in the Midwest and the Oklahoma Mesonet state network to name only a few, plus many disparate climate and soil moisture sites and systems serving local needs. These monitoring and assessment activities can be authorized (but are not limited to) under various state and multi-stage agreements with supporting state legislative authorities.

DATA COLLECTION: Drought monitoring functions of the USDA, NRCS, supporting the Soil Climate Analysis Network (SCAN), Soil Moisture- Soil Temperature (SM-ST) Pilot Project, Soil Climate Analysis Network (SCAN), and snow telemetry (SNOTEL) systems, and Climate Services (including Surface Water Supply Indices, drought assessments, and Streamflow Water Supply Forecasts) are authorized by:

[Code of Federal Regulations]
[Title 7, Volume 6, Parts 400 to 699]
[Revised as of January 1, 1998]
From the U.S. Government Printing Office via GPO Access
[CITE: 7CFR612]

[Page 564-566]

TITLE 7--AGRICULTURE

CHAPTER VI--NATURAL RESOURCES CONSERVATION SERVICE,
DEPARTMENT OF AGRICULTURE

PART 612--SNOW SURVEYS AND WATER SUPPLY FORECASTS

Sec.
612.1 Purpose and scope.
612.2 Snow survey and water supply forecast activities.
612.3 Data collected and forecasts.
612.4 Eligible individuals or groups.
612.5 Dissemination of water supply forecasts and basic data.
612.6 Application for water supply forecast service.
612.7 Forecast user responsibility.
The data collection activities of the National Weather Service networks including the Cooperative Observer Climate Network, are authorized by the National Organic Act of October 1, 1890:

"The Secretary of Commerce shall have charge of the forecasting of weather, the issue of storm warnings, the display of weather and flood signals for the benefit of agriculture, commerce, and navigation, the gauging and reporting of rivers, the maintenance and operation of seacoast telegraph lines and the collection and transmission of marine intelligence for the benefit of commerce and navigation, the reporting of temperature and rain-fall conditions for the cotton interests, the display of frost and cold wave signals, the distribution of meteorological information in the interest of agriculture and commerce, and the taking of such meteorological observations as many be necessary to establish and record the climatic conditions of the United States, or as are essential for the proper execution of the foregoing duties."


Some of the hydrologic data collected by the U.S. Geological Survey is mandated by interstate compacts, treaties, Supreme Court and other court decrees. These instruments call for the Federal government, often the Secretary of the Interior or the Director of the USGS in particular, to provide impartial hydrologic data to meet the needs of the affected parties. Issues and concerns associated with drought are at least implicit in most, if not all, of these documents. The instruments include: the Colorado River Compact, Upper Colorado River Basin Compact, Lower Colorado River Supreme Court Decree (1964, Arizona vs. California), Arkansas River Compact, Belle Fourche River Compact, Republican River Compact, Pecos River Compact, Rio Grande Compact, Delaware River Supreme Court Decree (1954, New Jersey vs. New York), and the Columbia River Treaty.

Prediction activities are found within NOAA=s various centers and/or forecasts offices. USDA- NRCS also issues streamflow forecasts for the western states.

Sec. 4 (b)(3) "review State, local, and tribal laws and programs relating to drought that the Commission finds pertinent;"

No additional comments at this time

Sec. 4 (b)(4) "determine what differences exist between the needs of those affected by drought and the Federal laws and programs designed to mitigate the impacts of and respond to drought;"

Drought is too often mistakenly treated like the very short-term traumatic natural disasters, such as floods or earthquakes, with both programs and resources
focusing on emergency response rather than on assessment, preparation, and mitigation. The public is poorly served when we are not able as scientists to adequately convey to them the impending disastrous consequences. Technology is available to do the appropriate monitoring across the nation and proposals have been presented as new budget initiatives over the past ten years without authorization or funding being secured. Emergency programs offer relief in the aftermath, usually providing little in the way of mitigation, however, to the real losses such as the enormous cost to agricultural production, the soil resource, sustainable soil productivity, environmental damage, and socio-economic distress that dwarf the fiscal payments extended.

In response to comments heard from participants at over six drought workshops conducted by the National Drought Mitigation Center and the Bureau of Reclamation across the United States, Mexico and Brazil in the last two years, a common question asked has been one calling for advance warning in order to make decisions and plans when there is still time to do something about it. Suggested optimal time needed to incorporate the forecasts into planning or decision making was on the order of three to six months. They also wanted to know how confident in and how well the forecasters are doing with these predictions. Anything better than 50-50 chance can be enough reason for a decision maker to hedge their bets or plan accordingly. An assessment should be made to determine if there is a need to have seasonal (long-lead) forecasts issued on a bi-weekly basis.

Many citizens affected by drought are also limited in resources, particularly on several of the Native American holdings. This can eliminate them from cooperating in new data acquisition or risk assessment. In spite of growing needs by this sector, downsizing of federal programs has made it impossible for many government agencies to serve their needs (and others as well) because that requires a contribution of funding to leverage limited federal resources. Their only aid is usually found in the aftermath in the form of emergency relief. Many of the impacts could possibly have been lessened or prevented entirely if provided with advance information and proper mitigative actions.

The Bureau of Reclamation's drought Law (P.L. 102-250) and programs are excellent in coordinating the needs with emergency assistance. The needs are determined from those affected and then mitigation is provided as available. This is a very good example of an effective Law.

Sec. 4 (b)(5) "collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the national level;"

No additional comments at this time

Sec. 4 (b)(6) "make recommendations on how Federal drought laws and programs can be better integrated with ongoing State, local, and tribal programs into a comprehensive national policy to mitigate the impacts of and respond to drought emergencies without diminishing the rights of States to control water through State law and considering the need for protection of the environment;"
The State, in most situations, represents the unit of government that has the authority to allocate water, to set policy objectives that are concerned with water-use efficiency and equality, to consider inter-boundary and external issues associated with matters such as minimum in-stream flows, and to coordinate the activities of local governments in meeting water-supply needs during times of severe water shortages (Walker, W.R. and others, 1991). States also have defined resource and economic thresholds that define a drought and a trigger preventative, mitigation and response efforts.

Following the drought of 1976-77, the Comptroller General of the United States recommended that a national plan be developed for providing assistance in a more timely, consistent, and equitable manner. Issues to be considered in the development of such a plan are: (1) identification of respective roles of agencies involved to avoid overlap and duplication of activities, (2) Need for legislation to more clearly define agency roles and activities, and (3) need for standby legislation to permit more timely response to drought-related problems (Comptroller General of the United States, p. 21). To date, none of these recommendations have been acted upon.

Sec. 4 (b)(7) "make recommendations on improving public awareness of the need for drought mitigation and prevention; and response on developing a coordinated approach to drought mitigation, prevention, and response by governmental and non-governmental entities, including academic, private, and nonprofit interests;"

No additional comments at this time.

Sec. 4 (b)(8) "include a recommendation on whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency."

One coordinating entity responsible for drought monitoring and prediction would make the system efficient. This entity will be dealing with understanding and predicting drought, agricultural impacts, local and regional water supply impacts, energy impacts (hydroelectric), economic interests (commodity markets), and sustainability of economic and environmentally safe agriculture, which transcend the focus of any one department or agency. From a program viewpoint, we are dealing with education, drought assessment, drought mitigation (pre-drought planning), drought response, disaster relief, research (scientific and social), etc. Therefore the entity must be chartered with a scope and capability for operations and interactions equal to this complex departmental crosscutting challenge.
KEY POINTS

- A workable plan for handling drought emergencies is essential, whether it is stand-alone or part of an overall disaster preparedness and response plan. Plans should be a product of the logical areas they cover, such as watersheds, groups of States, regions within a State, and/or the individual entities responsible for water management. The Federal role should be primarily coordination and technical assistance.
- Due to the sporadic nature of droughts, new Federal programs specifically oriented toward mitigation of and recovery from drought impacts would not be desirable. However, without such programs, it must be recognized that requests for assistance for drought purposes under existing programs will often have to compete with non-drought related requests, which may already exceed available funds.
- Plans should recognize and accommodate the needs of small water systems and small businesses, in addition to families and individuals, which may all be disproportionately affected by drought impacts because their resources are limited.
- Ensuring the availability of safe drinking water, which is essential to human survival, must be the top priority, even if stringent conservation measures are required in other use categories. Allocation of water among other use categories should be as balanced as possible based on the particular circumstances involved.

RESPONSE TO THE 8 ITEMS

1. Determine, in consultation with the National Drought Mitigation Center in Lincoln, Nebraska, and other appropriate entities, what needs exist on the Federal, State, local, and tribal levels to prepare for and respond to drought emergencies.

The most critical need is to ensure the availability of adequate quantities of safe drinking water. The needs of other water using sectors often conflict during water shortages. Severe droughts exacerbate tensions between the municipal and industrial, wastewater, hydropower and waterborne transportation sectors, between these and other consumptive uses, such as agriculture, and between these sectors and environmental water requirements. Small businesses may experience loss of vital cash flow as a result of drought, due to a loss of customers directly due to drought conditions, such as a water recreation business dependent on water flow.
Likewise, they may experience economic losses indirectly because customers lose buying power, such as a non-agricultural business (grocery stores, gas stations, etc.) in a heavily agricultural community. In both cases, the business may experience a lack of working capital to meet business or personal expenses. However, the California droughts from 1987-1992 exemplified what is often true, which is that measurable drought impacts in the M & I sectors are often small in comparison to the social and political friction created by the anticipation of more severe impacts. The anticipation may be of impacts directly from the drought or indirectly from legal remedies applied during the "crisis".

Stakeholders in these sectors require thorough planning to identify the parties involved, possible impacts of water shortages, a thorough inventory of water supply and demand, statutory and other requirements, and any limiting factors. As of June 1999, more than a third of the 48 States did not have a formal drought plan according to the National Drought Mitigation Center. The best time to prepare for drought emergencies and how to respond to them is during non-drought periods. Unfortunately, when there is no drought, water users place a low priority on drought preparation; when a drought does occur, increased competition for water within and between sectors and regions often inhibits collaborative solutions.

A final note, what some call a need, others might call an unreasonable expectation. In some cases drought conditions may become the norm for a fairly long period of time. From a societal perspective, it may not be realistic or desirable for some businesses to survive in their current form over the long term as a result of long-term drought conditions. Business owners may need assistance in planning, financing, and executing the transition to a more viable activity.

2. Review all existing Federal laws and programs relating to drought.

Based on information assembled by the working groups, there are over 70 Federal programs which could conceivably be utilized in preparing for or responding to a drought situation. These programs are identified and briefly described in Appendix nnn.

As the descriptions show, however, most of these relate to very specific areas or activities, particularly agricultural production, or to only a small proportion of the groups which are, or can be, affected by a drought. Most also are oriented toward responding to the impacts of a drought or other disaster such as a flood or hurricane; in many cases, a disaster must actually be declared to create eligibility for the program. Only a very small number of the programs have preparation for a disaster as a primary or even major purpose. Those include the Resource Conservation and Development Program provided by USDA, the Planning Assistance to States program provided by the U.S. Army Corps of Engineers, and the Mitigation Assistance Program provided by the Federal Emergency Management Agency.

3. Review State, local, tribal laws and programs relating to drought that the
Commission finds pertinent.

State, local, and tribal laws and programs relating to drought should be further evaluated once a more complete evaluation has been made of Federal laws and programs. Some information on state laws is presented below.

**State:**

Each State has a Drinking Water State Revolving Fund Program that loans money to municipalities to build drinking water infrastructure to meet the requirements of the Safe Drinking Water Act. Most States have included in their Intended Use Plan a provision for funding projects on an emergency basis if the project is on the priority list. The emergency conditions are determined by each State and may include drought.

Similarly, each State has a Clean Water State Revolving Fund Program from which qualifying applicants (states, communities, citizen groups, individuals, non-profits) can borrow to fund various structural and non-structural wastewater projects. These include reclamation/reuse facilities, agricultural runoff control, estuary restoration, and limited water conservation measures. Project eligibility is at the discretion of the State.

At least 15 States and one regional authority (Delaware River Basin Commission) have a water conservation planning requirement for water systems in conjunction with a funding or permit program. A recent survey showed that only 17 of the 42 responding States required water systems to prepare a drought contingency plan.

State water law generally governs the allocation and permitting of water supply. States have modified their laws to better prepare for and respond to drought. During the National Drought Study, the Corps identified the following six key insights into the way state water law is being adapted to help manage drought:

a. Site specific programs are more practical than generic sweeping changes in the law. The trend of water law both in the East and the West is to apply new, improved approaches to specific geographic areas, where problems are sufficiently obvious to warrant political action. In Virginia, recent statutes allow the State Water Control Board to designate management areas within which restrictions may be imposed to meet emergency conditions. Indiana, North Carolina, South Carolina and New Jersey allow restrictions on groundwater use in specific areas. In the west, the Arizona Groundwater Management Act establishes special use restrictions in certain areas.

b. Unquantified water rights can be a problem or an opportunity. Some western states are taking steps to adjudicate existing water rights in order to determine how much water is really needed. A large source of uncertainty regarding water use comes from unquantified claims of the Indian tribes and certain Federal reservations. Water managers should push for flexibility of water use where needed during drought, without waiting for complete adjudication. In some cases, the threat of a court fight to quantify water rights can be used constructively to encourage negotiated water allocations during droughts.
c. Public Trust Doctrine and Instream Flows. The full extent of the public interest in water is not always recognized by water allocation decisions. The public trust doctrine holds that the sovereign retains control of the water resource to serve public trust purposes, which may include recreation and ecological values. As of 1994, the public trust doctrine was explicitly recognized in some form in nine eastern and western states. In California, a court decision requires California water managers to take the public trust into account in planning and managing water resources. As a practical matter, any drought management plan must include consideration of the instream values of water, in order to avoid a challenge based upon the public trust doctrine. In most states, instream flows are, to some extent, explicitly protected. A 1989 survey listed eight western states with instream flow laws, and four that protect instream flows by means other than allocation. In the East, many states have authorized agencies to establish minimum stream flows or water levels. Instream flows are often an important factor in drought management planning, particularly as the drought intensifies.

d. Legal disincentives to water conservation and water transfers are being addressed, but there are still problems. The "pure" prior appropriations doctrine requires that water be diverted for beneficial use. "Beneficial" is defined a little differently in different states, but it always refers to categories of use; for example, irrigation is a beneficial use, no matter how inefficiently the water is applied or how low the value of the crop. Beneficial in this context does not mean that the use has great economic value or high social importance. Water conservation can reduce the amount of water used beneficially, and thus can reduce the right. Recognizing this can be a disincentive to the best use of a limited resource, a few western states have passed laws that favor water conservation by use of water salvage, water marketing or water banking. But these efforts are not settled. For example, the Supreme Court of Arizona recently ruled that most of a 1995 law that made it easier for landowners to preserve their right even as they reduced use through conservation was unconstitutional. One practical consequence is that the city of Scottsdale, which bought a ranch to get the water rights, reportedly will now have to continue to irrigate alfalfa fields on the ranch to preserve the right to use the water for M&I water supply.

e. Legal prohibitions against trans-basin diversions may or may not be in the regional or national interest. We raise this issue for the Commission's awareness although we know of no case where the transfer would occur if only a legal restriction were relaxed. We believe most transfers would be controversial because the impacts and benefits can both be substantial. There can be formidable environmental arguments against transfers, such as the potential harm from the introduction of non-native species to the recipient basin, but the ability to make inter-basin transfers during drought can increase water supply reliability without having to build additional reservoir storage. Nevertheless, diversions have been allowed in the East and some western states have created restrictions to protect the interests of the basin of origin despite the fact that fundamental appropriation doctrine allows such diversions and fundamental riparian law does not. A legal restriction against transfers stifles attempts to design a transfer that addresses the concerns of lawmakers.

f. Changes in groundwater law and conjunctive use management offer a long range promise for reducing drought impacts. In most states, allocation of ground water is
handled differently from that of surface water. In some states there is no provision at all for state allocation of ground water. This situation complicates the preparation of drought contingency plans, which, in principle, should provide for most effective use of ground and surface water combined. Only two states in the East have expressly provided for surface and ground water resources to be managed as a single system. Arizona has a broad-based centralized program of ground water management which was devised to meet a chronic and continuing ground water shortage. New Mexico has a system of prior appropriation for ground water resources. The main development of conjunctive use management in the west has been on an incremental, site-specific basis, rather than a statewide program.

4. Determine what differences exist between the needs of those affected by drought and the Federal laws and programs designed to mitigate the impacts of and respond to drought.

The impacts of drought are often far-reaching, going well beyond the immediate impact on those directly affected by a shortage of water. Crop yield reduction or failure directly affects farmers, but may also affect livestock producers, equipment suppliers, and others. Federal laws and programs designed to mitigate the impacts of and respond to drought, however, are often oriented toward those who are directly affected. In addition, the laws and programs also tend to be oriented more toward responding to droughts than to preparing for them.

Those affected by drought impacts tend to consider their needs to be a very high priority. Those needs are often met, however, through programs that address ongoing needs that are not emergency in nature. Thus, at the Federal level, drought-related needs must be balanced with other needs that may affect far more of the population or country.

Federal laws and programs that mitigate drought impacts can be organized by temporal perspective into three categories: strategic, tactical and emergency.

**Strategic preparedness** includes construction of supply systems, navigation improvements, legislation to protect groundwater, or laws affecting long term water conservation. These measures take years to enact and can reduce the frequency and severity of future water shortages during drought for the next several decades.

Many existing Federal, State, local and Tribal laws are deficient in terms of substance or coverage in many areas, including the protection/management of groundwater, facilitation of water recycling/reuse, requirement for water supplier drought contingency plans. The Federal government could play an increased role in the research and development of water reclamation/reuse and desalination to make "drought-proof" supply sources more available.

Municipal and industrial water supply is primarily a local responsibility, but the Federal government can play a significant supporting role in strategic preparations for drought. The Corps of Engineers must approve the construction of all new surface water reservoirs. The Corps and the Bureau of Reclamation may use their own reservoirs to store water for municipal use. These programs can be
frustratingly slow to accommodate to new water use patterns, partly because affected parties contest the changes, but partly because state of the art planning methods are not used to find the best plan and resolve disputes.

Wastewater treatment plants typically discharge organic material into rivers which consumes oxygen as it degrades. This waste must be diluted with sufficient quantities of river water to maintain dissolved oxygen concentrations capable of supporting fish. During droughts, this use of fresh water competes with some other uses, including municipal water supply, boating and swimming in reservoirs, hydropower, and irrigation. The reduction in Federal subsidies has slowed construction of wastewater treatment plants, which increases the biological oxygen demand and the requirements for dilution water.

Inland navigation through free flowing channels (that is, not controlled by locks and dams) can easily be affected by droughts because fairly high flows are required to maintain adequate depths. The consequence of shallower water is that navigation becomes more expensive as less and less cargo can be loaded into barges.

Strategic planning can identify structural solutions (such as weirs which produce required depths with less flow) and non-structural solutions (such as changes in reservoir operations). However, the use of water from Corps reservoirs to maintain navigation flows at the expense of reservoir recreation is highly controversial in the Mississippi-Missouri and Apalachicola-Chattahoochee-Flint river basins. In the ACF, the states of Alabama, Florida and Georgia are using state of the practice planning methods and have formed an interstate compact to deal with these issues. But even in the ACF resolution is slow, not because of a lack in Federal programs or laws but because the demand for competing water uses changes over time. The new demands and new stakeholders take root and prosper during wetter years, but the old and the new demands cannot be met during a drought. Because drought plans are not periodically tested and exercised, it usually takes a drought for people to notice that they have overused their water supply.

Strategic planning for hydropower development is based on the "dependable" output available even during droughts, when hydropower production is generally at its lowest.

Tactical preparedness refers to drought response plans prepared well in advance of any specific drought. These plans can be developed in a few months to a few years, and should be exercised, tested, and updated periodically. In terms of the needs of drinking water suppliers, some states may lack one or more of the following: an established emergency funding mechanism; a mitigation program that could include a requirement for a drought emergency plan, a water conservation requirement, the provision of technical assistance, and a State drought contingency plan. The National Drought Mitigation Center identifies some 27 States with a drought response plan. Only four States have or are developing a drought mitigation plan.

The Federal government has some expertise but limited funding to help municipalities develop tactical drought response plans. The Bureau of Reclamation received limited funding to establish drought mitigation centers throughout the U.S., and has led drought workshops throughout the U.S. in the last few years. The Bureau has not developed a drought plan with a municipality.
Although the reduction in power production during droughts is considered in the investment analysis before hydropower facilities are installed, in some cases it might make economic sense to revisit these assumptions and to change reservoir operating rules to increase hydropower production or reduce it even further during drought. This has to be considered on a case by case basis during the development of drought mitigation plans, but a national policy that encouraged better drought planning would help discover those cases.

**Emergency response** measures are constrained by the strategic and tactical planning that has taken place, but they also include *ad hoc* and time specific decisions made in response to the particular circumstances of an ongoing drought. Under a disaster declaration by the Secretary of Agriculture, SBA assistance is limited to those businesses, which have suffered economic injury as a direct result of the declared agricultural disaster. For example, an implement dealer who suffered economic injury because of farmers' inability to purchase implements due to the impact of drought damage to their agricultural operations could be eligible. Other needs may be addressed through the regular Business Loan programs.

5. Collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the national level.

Drought conditions and impacts vary considerably in different sections of the country. Knowledge developed in one area, whether a single state or a multi-state area, should be evaluated when dealing with droughts in other states or areas of the country. However, mitigation and response measures from one area may not be appropriate in another. Drought planning and responses should be monitored on a nationwide basis to determine when implementation on a national basis is appropriate. However, a national approach should not be considered if it would hinder or restrict programs or initiatives that have already been developed and are functioning effectively.

The Commission should give consideration to implementation of drought policy on a river basin or watershed basis. A partial framework is in place with the River Basin Commissions. A good example of this approach in action is that of the Delaware River Basin Commission.

At least three regions have used the sort of drought exercises recommended by the National Drought Study team. They are:

a. The Interstate Commission on the Potomac River Basin Commission holds an annual drought exercise to assure drought plans are up to date, and to train new staff to deal with events that may not occur for a decade. A meeting last month allowed new staff in several state and local agencies to learn about drought planning in the basin. As required by the regional water supply agreements signed in 1981, the agency heads commissioned an update of water use forecasts for Washington, D.C.

b. The Seattle district of the Corps of Engineers uses a "shared vision model" to help resolve potential dispute in the management of releases from Howard Hansen Reservoir. The model was built with stakeholder participation, so there is a high
degree of trust in its simulations.

c. The Tarrant Regional Water District, Ft. Worth-Arlington, TX conducted a virtual drought two years ago. This was a collaborative effort using the Corps Section 22 Planning Assistance to States authority referenced in our "drought authorities".

In addition, the Huntington District of the Corps of Engineers led a successful drought study response to the 1988 drought in the Kanawha River Basin which will, it is believed, reduce impacts to the whitewater rafting industry by millions of dollars in future droughts, while also improving water quality. Additional details can be provided.

6. Make recommendations on how Federal drought laws and programs can be better integrated with ongoing State, local, and tribal programs into a comprehensive national policy to mitigate the impacts of and respond to drought emergencies without diminishing the rights of States to control water through State law and considering the need for protection of the environment.

Water is a resource that requires holistic or integrated management approaches to achieve optimum use. Such holistic approaches require that all aspects of water management be considered, including supply as well as demand management, conjunctive use of surface water and groundwater, water conservation, recycling and reuse, water quality, economics, environmental/ recreational aspects, public health, socio-cultural aspects, storage (surface and underground), pollution control, water marketing and transfers, public involvement, conflict resolution, sustainability, etc.

Transfers of water from willing sellers to willing buyers while protecting third party interests should be facilitated. In general, drought problems are site specific requiring specific local/regional solutions. Municipal and industrial water suppliers need to have an integrated water management plan that incorporates a drought mitigation plan, demand management programs, and a supply management program. They also need an effective state/regional drought mitigation plan and supporting programs that are coordinated, in turn, with a coordinated federal policies and programs.

The Corps has demonstrated effective drought preparation techniques collectively referred to as "shared vision planning" in cases where M&I, navigation, hydropower, environmental uses, recreation, and wastewater dilution were factors. These methods stress collaborative planning, with plans tested in stakeholder-built computer simulations of future droughts. The methods are effective and relatively inexpensive, and provide a comprehensive remedy for the shortcomings of traditional drought mitigation efforts.

Drought response planning should be a component of an overall effort involving contingency planning for other potential emergencies as well, since there will likely be overlap. There should be increased emphasis on identifying resources which are available to State, local, and tribal governments to prepare for and respond to drought and other emergency situations and ensuring that those governments are aware of the resources. Federal laws and programs should be evaluated based on knowledge of programs at the State level or below, but should primarily reflect
national priorities rather than accommodating those programs. For example, Federal programs should be based on consideration of conditions and needs on a broader scale. This may mean a national, multi-state, or watershed approach.

Drought policy should be implemented on a watershed basis because of the innate advantages of this approach and because of the growing trend toward watershed management in the U.S. The policy should integrate research, planning, management, and sustainable development. Principles of social equity, environmental protection, and participatory decision-making should be stressed in drought mitigation and response programs.

Integration is best achieved through testing in drought exercises or virtual droughts that allow stakeholders and agencies to understand what a drought will be like before it happens. If there are mismatches in authorities or services, or if water needs have increased or diversified, these problems can be identified and corrected before the drought occurs. This simple idea, taken for granted in fire drills and dress rehearsals, is still rare in drought preparedness, although each new drought brings new demands for legislation to mandate coordination.

7. Make recommendations on improving public awareness of the need for drought mitigation, and prevention; and response on developing a coordinated approach to drought mitigation, prevention, and response by governmental and nongovernmental entities, including academic, private, and nonprofit interests.

Public awareness is very important. It seems that when drought conditions are present, the public gets concerned and may even panic, but when water supplies are adequate, apathy sets in. The public sector interested in drought issues needs sufficient resources to inform the public about drought prevention. Federal efforts should be coordinated by a single agency - not necessarily all done by a single agency, but coordinated.

Public awareness and support is critical for water suppliers to successfully implement drought mitigation, water conservation and supply management programs. Suppliers will have a major role in disseminating information through a variety of forums. The Federal government and States can assist by coordinating their information dissemination efforts or by making information available to suppliers.

Including the public in the decision-making process for drought planning is crucial to gaining public support. The public must have a voice in decisions impact them, such as water conservation or curtailment, balancing competing water needs, and economic development.

Our research on lessons learned from the California droughts from 1987-1992 showed that the general public generally responded well to calls for short term water use curtailment. Information on the drought was abundantly available. It may be the agencies themselves that need greater awareness, since they need to know much more about what to do, and need to know in advance of the drought.
Because droughts may not occur for years, even decades, agency staff may have little experience with droughts and may not be aware of the vast amount of research and practical experience available. Again, drought exercises, like fire drills, let everyone practice their roles in preparation for the real thing.

8. Include a recommendation on whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency.

Five options are offered for discussion:

a. **Central clearinghouse.** Because programs that address drought issues tend to be subsets of other established programs rather than freestanding drought programs, and because these programs are subject to different legislative, regulatory, and funding constraints, consolidation would not be practicable. A central clearinghouse with access to all disaster-related programs may be advisable.

b. **No change is needed.** Consolidation is really not essential as long as the various agencies work closely together to achieve optimum solutions. Municipal, industrial, and agricultural water users and environmental interests are all in the same (water) boat and must work together and compromise so that optimum solutions are achieved where probably nobody is happy but where at least dissatisfaction is uniformly distributed.

c. **Federal coordinator.** Many drought related programs are actually part of mainstream programs - particularly the Federal and State programs that finance facilities and structures. Expertise is located in a myriad of agencies. Many experts in drought-related issues work on other issues as well. Therefore, we do not believe that all drought preparation and response programs should be consolidated under one agency. It would be advisable for one Federal agency to coordinate drought policy and preparation and response programs. Since agriculture is the largest water user, it would make sense for USDA to be the coordinator.

d. **Department of the Interior.** The Federal drought program in the 17 Western States should be consolidated under the Department of Interior. The drought program for the remaining States should be consolidated under the Department of Agriculture. All programs should be reoriented on a watershed basis.

e. **Virtual Teams.** The idea is appealing because of the hope that information and direction would be seamlessly integrated within one agency, but the arguments against forming a single agency are more convincing. First, attempts at agency reorganizations have often failed. Second, it has been our experience that it is easier and more effective to form virtual teams made up of representatives from the agencies in a region with power to help during droughts. Drought preparation and response efforts may draw upon a broad range of skills and knowledge - weather, agriculture, hydrology, water management, economics, public affairs, water treatment - that are unlikely to be found in one agency but can be borrowed from several. Virtual teams also have an easier time focusing on problems and solutions...
rather than process, since the teams are formed for an explicit purpose and are not subject to any one agency's protocol. Finally, the reality is that miscommunication and lack of coordination occur within agencies as well as between them. There are two caveats for the use of virtual teams. First, it is still useful to have a central point of contact for information. This may be nothing more than a website, or it may be a designated coordinating person or agency. Second, to assure accountability, virtual teams need a leader who will be held responsible for the success or failure of the team.

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National Drought Policy Commission

Summary of State Drought Programs

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ANALYSIS OF REGIONAL DROUGHT PROGRAMS

Background

Public Law 105-99, 112 Stat. 641, provides, "Sec 4. DUTIES OF THE COMMISSION. (b)(5) Collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the national level."

Methodology

The Western Drought Coordination Council submitted a detailed report to the Commission containing several recommendations. Other data was gathered from known regional bodies and by follow up telephone contacts. The National Drought Policy Commission (NDPC) staff compiled the results.

Overview

The NDPC reviewed eight river basin or interstate regional structures ranging from the Upper Mississippi River Basin encompassing Minnesota, Wisconsin, Iowa, Illinois, to the Interstate Council on Water Policy which encompasses 18 states, six river commissions, five water districts, and nine affiliates.

River basins (and watersheds) are useful, natural drought planning "regions" below the national level, but greater than the state level. Throughout the country there are existing regional (and river basin) organizations with drought responsibilities.

Some commissions have proven that coordination and management of water resources assets on a multijurisdictional, regional basis during drought periods can allow a major metropolitan area to sustain itself. This coordination can be accomplished by annual review of the plan and plan implementation training. Other commissions encourage conservation and end-use efficiency; use alternative methods for resolving inter/intrabasin conflicts; and encourage joint studies to collect data and promote dialog between different sets of water users. They often incorporate interdisciplinary teams, interagency cooperation and public participation in water management planning; and use incentives to conserve water such as pricing water to reflect the costs of its use to society and the environment. Others suggest that a national drought policy must emphasize mitigation and risk management and promote self-reliance. They also emphasize local implementation, innovation, and responsibility.

The Commission staff also reviewed a 1995 report prepared by the U.S. Senate Task Force on Funding Disaster Relief, and a 1995 Corps of Engineers report entitled "National Study of Water Management During Drought." Inefficiencies in existing approaches and lack of holistic management were cited as flaws by both, as well as the failure to involve stakeholders in water management.
Strengths of the regional concept: Since drought recognizes no human-imposed boundaries, a regional body brings a coordinated perspective to the issues. Additionally, the regional concept allows greater focus than one size fits all philosophy and accounts for geographical uniqueness and anomalies. The sharing of information fosters a best practices concept among the members.

Weaknesses of the Regional Concept: Historical disputes among jurisdictions may prevent open and full participation. The entity requires a central point of contact and consistent administrative staffing.

Western Drought Coordination Council (WDCC)

The WDCC recommended the following:

1. The activities initiated by the WDCC could be emulated in the remainder of the country as part of a coordinated national effort. With much of the infrastructure already begun through the WDCC’s efforts, a national oversight group could provide a clear vision, management, and resources which would ensure success for a variety of drought-related activities on a national level.

2. The WDCC recommends that the NDPC consider linking the national oversight group to regional groups for program delivery. Drought and other water issues have greatly different physical characteristics, impacts, political response mechanisms, and thus informational needs, from region to region. These regional perspectives should utilize existing institutions such as the Regional Climate Centers.

3. It is critical to provide resources and designate a responsible agency or group to produce national drought assessment reports. The "Western Climate and Water Status, Quarterly Report," with its uniquely strong dependence on snowpack and topography, should be maintained--in service of both regional and national needs, and the ability to obtain the requisite basic input data should be strengthened.

4. Basic weather, water, and climate observations are the foundation of the monitoring and assessment activity which alerts the nation to impending drought. It is recommended that the NDPC support funding for maintenance and modernization of the observational networks to ensure that the data will continue to be available into the future. Additionally, it is particularly important that the local, state, and tribal interests are brought into the process to provide input on both climate/water conditions, especially on impacts, and ensure local acceptance of the resulting assessments.

5. Snowpack information is extremely important in assessing drought conditions in the West. Similarly, better and more extensive information on snow extent and water content is needed, including via the web, for the northern portions of the Midwestern and Eastern states.

6. Development of long-term soil moisture and groundwater reference networks is recommended. Reservoir storage, streamflow, groundwater, and soil moisture information, both current and historical, must become more accessible, especially via the web.

7. The NDPC should provide specific ideas that Congress could consider in Federal legislation to encourage the incorporation of incentives for drought mitigation and preparedness at the local, state and regional levels, including educational resources that promote the concepts of drought planning. The
NDPC should also provide suggestions for funding of the activities associated with mitigation and preparedness.

8. The NDPC should support the establishment of a statutorily designated lead federal agency, adequately funded, that would coordinate communication and cooperation among the various regional groups, to ensure an absence of duplication and the encouragement of complimentary actions including establishment of a clearinghouse, with possible regional subsections.

9. The NDPC may consider developing a drought situation report to determine whether the assistance programs adequately meet the needs of those adversely impacted by droughts. By creatively using the Internet to compile capabilities, policy makers and others would be able to quickly assess historical information and in which areas additional assistance is needed.

10. The Historical Drought Impact Survey data developed by the WDCC should be maintained and expanded to include drought experiences from other regions of the country. Reports should be utilized to take advantage of prior efforts and to help identify primary drought concerns.

11. The Catalog of Federal Assistance Programs applies to all states nationwide and the NDPC should make specific recommendations noting its value and ways to ensure that the catalog be kept current as program information changes.

12. The WDCC was interested in utilizing media to raise awareness of drought issues, but without a national direction, the Council was not able to tap into national and regional media including television, large newspapers and professional association communication vehicles. The NDPC should utilize this opportunity to raise drought issues on a national level.

Additional information is available from the National Drought Policy Commission. You can access the information at the Commission's web site: www.fsa.usda.gov/drought. All files can be ordered in electronic format or hard copy. Write: National Drought Policy Commission, USDA/FSA/AO, 1400 Independence Avenue SW, Mail Stop 0501, Washington, D.C. 20250-0501.
SUMMARY OF REGIONAL DROUGHT PROGRAMS

Name of Commission, Council or Initiative: Western Drought Coordination Council (WDCC)

Regional Jurisdiction (States): AZ, CA, CO, ID, KS, ND, NE, NM, OK, OR, UT, TX, WA, WY; USDA, DOI, FEMA, SBA

Years in Service: February 1997 to present

1. Description of Regional Mission or Objectives: Develops and implements model drought policies & management/mitigation measures that reduce impacts associated with droughts. Promotes economic and environmental sustainability in the West.

Function: Response, Monitoring and Prediction, Mitigation, Communication

Recommendations of Regional Group to NDPC Commission based on experience: Activities initiated by the WDCC could be emulated as a coordinated national effort. A national oversight group could link with regional groups for program delivery. See "Western Drought Experience," The Western Drought Coordination Council’s Report to the NDPC, May 1999.

2. Description of Regional Mission or Objectives: Develops a monitoring system that can provide timely recognition of drought for response measures. Prepares guidelines pertinent to triggers and thresholds. Provides alerts of drought and its severity.

Function: Monitoring and Prediction

Recommendations of Regional Group to NDPC Commission based on experience: Diagnostic information from both climate and water sources, including snowpack data from Eastern and Midwestern states. Search for ways to integrate current water information into long-term historical perspective. Incorporate state, local and tribal climatic conditions into a national assessment of conditions that is linked to emergency assistance programs. Develop new and better tools to interpret and use long-lead outlooks with soil moisture and groundwater reference networks.

3. Description of Regional Mission or Objectives: Concentrates on long-term and short-term national management issues. Identifies preparedness actions and mitigation options, and promotes drought contingency planning.

Function: Mitigation, Planning

Recommendations of Regional Group to NDPC Commission based on
experience: Provide specific ideas to encourage incorporation of incentives for drought mitigation and preparedness at the local, state and regional levels.


Function: Response

Recommendations of Regional Group to NDPC Commission based on experience: Establish a lead federal agency, designated by law and adequately funded, to coordinate communication and cooperation among regional groups. Develop a drought situation report to determine whether assistance programs adequately respond to adverse impacts of a drought.

5. Description of Regional Mission or Objectives: Coordinates communication functions within WDCC.

Function: Communication

Recommendations of Regional Group to NDPC Commission based on experience: Expand the WDCC's Historical Drought Impact Survey data nationally. Ensure that the Catalog of Federal Assistance programs is maintained. Use media to raise awareness of drought issues on a national level.

Name of Commission, Council or Initiative: Upper Mississippi River Basin Charter

Regional Jurisdiction (States): MN, WI, IA, IL, MO

Years in Service: October 2, 1989, to present

Description of Regional Mission or Objectives: Notifies and consults on proposals to divert interstate waters.

Function: Communication

Recommendations of Regional Group to NDPC Commission based on experience: Any state having knowledge of a proposal for a new or increased diversion of water that will exceed 5 million gallons per day average in any 30-day period from the Upper Mississippi River Basin to another basin shall notify and consult all other basin states.

Name of Commission, Council or Initiative: Southeast Water Resources Dialog

Regional Jurisdiction (States): AL, AR, FL, GA, KY, MD, MS, NC, SC, TN, VA

Years in Service: August 1998 to present

Description of Regional Mission or Objectives: Builds a foundation for an
Recommendations of Regional Group to NDPC Commission based on experience: Water management policies should encourage conservation and end-use efficiency; use alternative methods for resolving inter/intrabasin conflicts; encourage joint studies to collect data and promote dialog between different sets of water users; incorporate interdisciplinary teams, interagency cooperation and public participation in water management planning; use incentives to conserve water such as pricing charged for water reflecting the costs its use to society and the environment.

Name of Commission, Council or Initiative: Interstate Commission on the Potomac River Basin

Regional Jurisdiction (States): MD, PA, VA, WV, DC, and Federal Government


Description of Regional Mission or Objectives: Created by an act of Congress as an interstate compact among the jurisdictions with a mission to enhance, protect and conserve the water and associated land resources of the Potomac River and its tributaries through regional and interstate cooperation.

Function: Response, Monitoring and Prediction, Mitigation, Communication

Recommendations of Regional Group to NDPC Commission based on experience: River basins (and watersheds) are useful, natural drought planning "regions" below the national level, but greater than the state level. Throughout the country there are existing regional (and river basin) organizations with drought responsibilities.

Name of Commission, Council or Initiative: Interstate Commission on the Potomac River Basin Commission (subcommittee)

Regional Jurisdiction (States): DC, MD, VA

Years in Service: 1981 to present

Description of Regional Mission or Objectives: Conducts an annual drought exercise to assure drought plans are up-to-date and trains new staff in drought planning.

Function: Mitigation, Communication

Recommendations of Regional Group to NDPC Commission based on experience: Annual training in drought planning to staff and update drought plans regionally; consider implementation of drought policy on a river basin or watershed
**Name of Commission, Council or Initiative:** Section for Cooperative Water Supply Operations on the Potomac (COOP), Interstate Commission on the Potomac River Basin

**Regional Jurisdiction (States):** MD, VA, WV, DC, and Federal government

**Years in Service:** P.L.91-407 (Sept. 25, 1970) and ICPRB Resolution dated Nov. 1, 1979

**Description of Regional Mission or Objectives:** Authorized by the interstate compact creating the Interstate Commission on the Potomac River Basin, the COOP Section was established to have one central cooperative technical center to manage the water supply for the Metropolitan Washington Area.

**Function:** Response, Monitoring and Prediction, Mitigation, Communication

**Recommendations of Regional Group to NDPC Commission based on experience:** In the Potomac River Basin, it has been demonstrated that coordination and management of water resources assets on a multi-jurisdictional, regional basis during drought periods can allow a major metropolitan area to sustain itself without excessive regulation.

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**Name of Commission, Council or Initiative:** Tarrant Regional Water District

**Regional Jurisdiction (States):** TX

**Years in Service:** 1997

**Description of Regional Mission or Objectives:** Conducted a virtual drought exercise in 1997, utilizing Corps of Engineers Sec. 22 planning assistance.

**Function:** Mitigation

**Recommendations of Regional Group to NDPC Commission based on experience:** Use virtual drought exercises as a training tool.

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**Name of Commission, Council or Initiative:** Western States Water Council

**Regional Jurisdiction (States):** AK, AZ, CA, CO, ID, MT, NE, NV, NM, OK, OR, UT, TX, WA, WY

**Years in Service:** 1965 to present

**Description of Regional Mission or Objectives:** Purposes are to accomplish effective cooperation among western states in conservation, development and management of water resources; to maintain state prerogatives; to provide a forum for the exchange of views, perspectives, and experiences among the states; and to
provide an analysis of federal and state developments.

**Function:** Response, Communication

**Recommendations of Regional Group to NDPC Commission based on experience:** The Water Resources Committee has prepared reports on 1) improving implementation of the Endangered Species Act, 2) water conservation, 3) water and growth management, 4) drought response, and 5) groundwater recharge. In 1987, the committee prepared and distributed a model response plan that many states have since utilized.

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**Name of Commission, Council or Initiative:** Western Water Policy Review Advisory Commission

**Regional Jurisdiction (States):** AZ, CA, CO, ID, MT, NE, NV, NM, OK, OR, UT, TX, WA, WY

**Years in Service:** 1996–98

**Description of Regional Mission or Objectives:** Makes recommendations for the proper role of the federal government in Western water management for the next 20 years.

**Function:** Mitigation

**Recommendations of Regional Group to NDPC Commission based on experience:** Establish an interagency task force to develop an integrated national drought policy that emphasizes mitigation and risk management and promotes self-reliance. Policy should ensure sustainable use of resources; maintain national goals and standards; emphasize local implementation, innovation, and responsibility; provide incentives; respect existing rights; promote social equity; organize around watersheds and river basins; employ participatory decision-making; and provide innovative funding, including public and private partnerships.

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**Name of Commission, Council or Initiative:** Multi-State Drought Task Force (FEMA--Drought of 1996)

**Regional Jurisdiction (States):** AK, AZ, CO, KS, NM, OK, TX, UT

**Years in Service:** 1996 to present

1. **Description of Regional Mission or Objectives:** Coordinate the federal response to drought-related problems and develop long-term suggestions for national actions to provide drought relief

**Function:** Communication

**Recommendations of Regional Group to NDPC Commission based on experience:** Create resource databases and Information Bulletin Board clearinghouse. Support regional forums for drought discussion. Support national
2. Description of Regional Mission or Objectives: Coordinate the federal response to drought-related problems and develop long-term suggestions for national actions to provide drought relief

**Function:** Mitigation

**Recommendations of Regional Group to NDPC Commission based on experience:** Remove existing requirement of crop planting for federal crop insurance eligibility. Improve zoning regulation at county/local level for making new developments "fire-safe." Fund vegetative management programs on federal lands to lower fuel loads. Provide fish hatchery/refuge support for sport fish production and endangered species protection. Enhance water conservation technology and incentives at the local level. Support development of National Drought Policy or Response Plan. Expand SBA program to include drought-affected businesses that are not associated with agricultural production. Issue block grants to state departments of agriculture or state-level FSA offices for declared emergencies. Include drought in FEMA's national mitigation strategy.

3. Description of Regional Mission or Objectives: Coordinate the federal response to drought-related problems and develop short-term suggestions for national actions to provide drought relief.

**Function:** Response

**Recommendations of Regional Group to NDPC Commission based on experience:** Extend authority for Livestock Feed Programs, Reclamation State Emergency Drought Relief Act, Economic Injury Disaster Loans (SBA), Emergency Water Supply (USACE). Release haying and grazing during droughts in Conservation Reserve Program. Extend authority to USACE for water hauling for livestock. Implement National Wildlife Refuge emergency provisions in drought. The President should name a federal agency in charge of drought planning and response (states suggest FEMA; FEMA suggests DOI, USDA, or USACE); agency in charge would maintain compendium of federal programs for assistance, planning sessions with states, trigger mechanism communication, and recommendations for further legislative authority.

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**Name of Commission, Council or Initiative:** Interstate Council on Water Policy

**Regional Jurisdiction (States):** 18 States, 6 river commissions, 5 water districts, 9 affiliates

**Years in Service:** 1959 to present

**Description of Regional Mission or Objectives:** Organization of state and regional government water managers that helps define the roles of federal, state, regional, and local governments in water management.

**Function:** Response, Communication
Recommendations of Regional Group to NDPC Commission based on experience: Advocates groundwater and surface water management as an integrated system. Drought management will be focus of September 18-19, 2000, meeting in Chicago.

Name of Commission, Council or Initiative: Great Lakes Commission
Regional Jurisdiction (States): IL, IN, MI, MN, NY, OH, PA, WI
Years in Service: 1955 to present
Description of Regional Mission or Objectives: Ecosystem-based coordination and policy development
Function: Mitigation, Communication
Recommendations of Regional Group to NDPC Commission based on experience: Promote the orderly, integrated and comprehensive development, use and conservation of the water resources of the bi-national Great Lakes Basin.

Name of Commission, Council or Initiative: Senate Task Force on Funding Disaster Relief
Regional Jurisdiction (States): All States
Years in Service: 1995 to present
Description of Regional Mission or Objectives: By Public Law 103-211, the task force was commissioned to look at federal disaster assistance programs with regard to their funding and effectiveness, possible program and policy modifications, budgetary and funding options, and the roles of state, local, and other service providers.
Function: Mitigation, Response
Recommendations of Regional Group to NDPC Commission based on experience: Set a threshold on what is categorized as true emergency spending; fund disaster programs at historic average levels. Establish rainy-day fund to cover disaster expenses for future federal relief. Eliminate emergency safety valve of the Budget Emergency Act. Allow funding only for emergencies in any supplemental appropriation bill. Improve federal-state coordination by adopting performance standards. Provide incentives for planning & mitigation, cost-sharing reductions for those not up to par, frequent training, and post-disaster analyses.

Name of Commission, Council or Initiative: National Study of Water Management During Drought
Regional Jurisdiction (States): CA, USACE
Years in Service: 1992--94

Description of Regional Mission or Objectives: Extract lessons learned from California Drought of 1987--92 (Institute of Water Resources Report 94-NDS-6)

Function: Mitigation, Response

Recommendations of Regional Group to NDPC Commission based on experience: Groundwater use is most effective single response to drought. Ensure that water is available through a variety of management measures: early drought warning and response actions are essential in short-term management of drought; local and regional interconnections of water-supply systems are effective and flexible options against severe water shortage; irrigation may provide complementary environmental benefits; increase in water rates should accompany or precede rationing plans.

Name of Commission, Council or Initiative: Delaware River Basin Commission (DRBC)

Regional Jurisdiction (States): DE, NJ, NY, PA

Years in Service: October 1961 to present

Description of Regional Mission or Objectives: Manages the water resources in the 13,000-square-mile area drained by the Delaware River and Delaware Bay.

Function: Response, Monitoring and Prediction, Mitigation, Communication, Planning

Recommendations of Regional Group to NDPC Commission based on experience: Existing interstate organizations such as the DRBC successfully address drought management issues for interstate river basins. The NDPC should support existing interstate organizations and also the creation of new ones.

Name of Commission, Council or Initiative: Susquehanna River Basin Commission (SRBC)

Regional Jurisdiction (States): NY, PA, MD

Years in Service: January 1971 to present

Description of Regional Mission or Objectives: Manages the water resources of the Susquehanna River Basin under comprehensive, multiple-purpose planning principles. Exercises planning, regulatory and coordination powers.

1. Function: Response, Monitoring and Prediction, Mitigation, Communication, Planning

Recommendations of Regional Group to NDPC Commission based on experience: The Commission has set forth its recommendations for drought
2. Function: Response, Monitoring and Prediction, Mitigation, Communication

Recommendations of Regional Group to NDPC Commission based on experience: Resolution 99-15 (1)(a): Promote communication between jurisdiction members and the Commission in development and revision of all drought-related policies, plans, restriction or regulations; (b): NY, PA, and MD implement SRBC recommendations regarding groundwater and streamflow monitoring; (c): NY, PA and MD use the interstate forum to rectify inconsistencies in their respective bans of nonessential water uses and water variances during drought.

3. Function: Monitoring and Prediction

Recommendations of Regional Group to NDPC Commission based on experience: Resolution 99-15 (2): Use the interstate commission to assess the extent to which drought emergency requirements result in reduction in water use throughout the basin; (3): use the interstate commission to review low-flow trigger criteria currently contained in Consumptive Use Regulation 803.42 to determine if the said trigger flow is adequate to protect the water resource and water users.

4. Function: Mitigation, Communication

Recommendations of Regional Group to NDPC Commission based on experience: Resolution 99-15 (4): Use the interstate commission to assess long-term availability of water supply for citizens and businesses of the basin, including but not limited to an assessment of the potential for regionalizing small water systems.

5. Function: Mitigation, Communication

Recommendations of Regional Group to NDPC Commission based on experience: Resolution 99-15 (5): Convene through the interstate commission a meeting of agencies of member jurisdictions, major water users and other interested parties to assess the effectiveness of drought management measures, list the lessons learned in managing drought, compile the findings in a special report for future reference and distribute to key decision makers within the interstate jurisdiction.

Name of Commission, Council or Initiative: Ohio River Basin Commission (ORBC)

Regional Jurisdiction (States): IL, IN, KY, MD, NC, OH, PA, VA, WV

Years in Service: 1971 to present

Description of Regional Mission or Objectives: Improves water and related land resource programs of member states and promotes the primary role of the states in water resources planning and management.

Function: Mitigation, Communication, Planning
Recommendations of Regional Group to NDPC Commission based on experience: Prepares comprehensive, coordinated plans for development of water resources and related land resources of the basin, and recommends long-range priorities.

Name of Commission, Council or Initiative: International Boundary and Water Commission

Regional Jurisdiction (States): United States and Mexico

Years in Service: 1906 to present

Description of Regional Mission or Objectives: Coordinates water quality- and quantity-related issues for the Rio Grande and Colorado Rivers.

Function: Response, Mitigation, Communication

Recommendations of Regional Group to NDPC Commission based on experience: Recommendations from two bi-national conferences held in 1998 included: establish a drought fund to assist with international, state, and local emergency responses; establish joint projects that will foster and establish trust; establish mutually defined definition of drought triggers and indices; develop regional trans-boundary drought planning processes, mitigation tools, and criteria for applying resources, plus some site-specific recommendations.
# ACRONYMS OF REGIONAL DROUGHT PROGRAMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>State/Region</th>
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<tr>
<td>AK</td>
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<td>Delaware</td>
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<td>Department of Interior</td>
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<td>DRBC</td>
<td>Delaware River Basin Commission</td>
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<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
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<td>Interstate Commission on the Potomac River Basin</td>
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<td>Abbreviation</td>
<td>Description</td>
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<td>WDCC</td>
<td>Western Drought Coordination Council</td>
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<td>WV</td>
<td>West Virginia</td>
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<td>WY</td>
<td>Wyoming</td>
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ANALYSIS OF EXISTING LOCAL PROGRAMS

Background

Public Law 105-99, 112 Stat. 641, provides, "Sec. 4 DUTIES OF THE COMMISSION. (b)(3) review State, local, and tribal laws and programs relating to drought that the Commission finds pertinent;"

Methodology

The National Association of Counties conducted a sample survey of member counties around the country.

Overview

A small percentage of counties reported substantial forms of local drought specific plans or programs in place. More than seventy-five percent of the 177 respondents indicated that they use Federal programs to respond during drought emergencies. Many reported their role in assessing and declaring the existence of a disaster as one of their functions.

Twenty percent of the 177 respondents have county or city drought assistance programs or regulations that include drought emergency response as well as water conservation plans incorporating drought contingency procedures. Most counties have emergency procedures for disasters, including drought, and communication channels to get information to their populations.

For wildland and urban wildland interface firefighting, local fire authorities usually work closely with the State Forest Service, Fire Marshals and Federal fire agencies where they have mutual interests. Local fire districts often have mutual aid agreements in place.

Larger municipal water providers do tend to have contingency plans and public education systems in place. These providers are usually owned by a county, municipality or as a special district. Smaller, rural systems often are run on historic precedent.

"Because water shortfalls are first local and regional issues, developing a drought plan is a critical part of drought mitigation.... The goals of these plans are to reduce the impacts of water shortages, personal hardships, and conflicts between water and other natural resource users. These plans should promote self-reliance by systematically addressing issues of principal concern to the region ... " (National Drought Mitigation Center website)

Communication. Practically all jurisdictions have the ability to communicate programmatic information to their population on a routine basis and when in an emergency response mode. In disaster circumstances, County Commissioners,
County Managers, Mayors and their press offices can be very effective. For routine communication, newsletters, pamphlets and the Internet are heavily utilized.

**Mitigation.** Contingency plans are a form of mitigation and most local jurisdictions have some coverage in this area through their local emergency operating plan, water and wastewater procedures or other related plans. Those that do not have specific drought plans tend to have a process for dealing with the hazard.

**Monitoring and Prediction.** The local jurisdictions generally rely on the state and Federal scientific and other communities for their monitoring and long lead predictive information. For example, the Natural Resources Conservation Service’s Snow Survey Telemetry Network System for snowpacks and the six National Oceanic and Atmospheric Administration Climate Regional Centers for weather and climate are widely utilized. The State climatologists can be extremely valuable in providing, interpreting, and massaging the volumes of scientific information. States often have their own systems for monitoring streamflows and groundwater. We need to keep in mind that predicting drought remains a complex task on any level; but, increasing technologies provide positive improvement in this area.

**Response.** Most counties do not have their own drought- specific response mechanisms, but have the ability to request state and Federal assistance through the various avenues. The process, however, can be daunting due to the volume (over 88) of Federal programs and the number of agencies involved. Based on the extent of the impacts, states may use their emergency powers to declare a state drought disaster without or before asking for Federal assistance.

<table>
<thead>
<tr>
<th>State/County</th>
<th>Experience Drought</th>
<th>1999 Drought</th>
<th>Source(s) of Drought Assistance</th>
<th>County Drought Programs * may include plans and regulations</th>
<th>Description (if available)</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>Local* State Federal</td>
<td>Emergency Response Program Other Program Emergency Response Policy Other Policy Code and/or Ordinance</td>
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<td>Apache</td>
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<td>Declaration of Emergency.</td>
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<td>Fire restrictions, etc.</td>
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<td>California</td>
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<tr>
<td>Humboldt</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Have never needed to provide assistance.</td>
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<tr>
<td>Plumas</td>
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<td>Drought assistance coordinated through Ag Comm and Ag Extension.</td>
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<td>Yuba</td>
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<td>Educational information on water conservation distributed.</td>
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*May include plans and regulations

**Description (if available)**

- Can impose water restrictions and establish priority users and uses.
- Mutual aid agreement area counties and Georgia Emergency Management Agency.
- Supply emergency potable water to Augusta-Richmond counties.
- Water restrictions.

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## Local Drought Information

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<td></td>
<td>Public water system and emergency water policy.</td>
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<td>Rio Arriba</td>
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<td>Planning fire control, water shortage, and Emergency Management Service plans.</td>
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## Local Drought Information

<table>
<thead>
<tr>
<th>State/County Experience Drought</th>
<th>1999 Drought</th>
<th>Source(s) of Drought Assistance</th>
<th>County Drought Programs</th>
<th>Description (if available)</th>
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<td>Declaration resolutions are passed when appropriate.</td>
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Total Numbers=177 37 66 138
ANALYSIS OF TRIBAL PROGRAMS

Background

Public Law 105-99, 112 Stat. 641, provides, "Sec. 4 DUTIES OF THE COMMISSION. (a)(2) review State, local, and tribal laws and programs related to drought that the Commission finds pertinent."

Methodology

The Intertribal Agriculture Council surveyed their membership. The Natural Resources Conservation Service of USDA, the U.S. Bureau of Reclamation and the Commission performed outreach activities in attempts to develop information. Supplemental data was gathered from public testimony and comments.

Overview

There are approximately 560 federally recognized Indian tribes located within the United States - 306 in the conterminous 48 states. Two hundred eighty nine are west of the Mississippi River, where 95 percent of all Indian trust land is located. Most tribes rely on their own disaster systems and processes which often count heavily on the existing Federal programs (Federal Emergency Management Agency Stafford Act, Agriculture, etc.).

Many tribal lands lack current soil survey, streamgaging, and range condition information. Some tribes indicated that they lack access to snow amount, soil moisture, and stream flow information needed in planning and for triggering emergency response efforts. Many tribes noted the need for technical and financial assistance to effectively plan and implement conservation measures and other practices to enhance wildlife and protect against wildfire. They emphasized that this assistance must be easily and locally accessible to tribal members. Most tribal representatives explained that current programs require modifications in eligibility criteria and cost-share rates to address specific tribal situations and that programs must be adequately funded.

Some tribes are using planning as a viable means of lessening the impacts of drought on tribal lands and populations. Others expressed their concerns that criteria for national drought policy might compromise their cultural or religious beliefs and specifically asked that this not occur. They asked the Commission to support the special relationship that tribes have with the Federal Government.

As a result of the outreach effort, we found that six (6) tribes the Hopi Tribe, Hualapai Nation, Kaibab-Paiute Tribe, Navajo Nation, San Carlos Apache Tribe, and Zuni Pueblo are in the process of developing drought contingency plans through cooperative agreements with the Bureau of Reclamation. It remains unknown how many others may be developing plans on their own initiative.
Based on the information received, the current state of tribal drought activity appears to be shifting toward an emphasis on preparedness and mitigation. Previously, tribal drought activities focused on response. Recently, tribes have begun to develop comprehensive drought contingency plans; however, our survey found that only six had initiated these planning efforts.

Additional information is available from the National Drought Policy Commission. You can access the information at the Commission’s web site: www.fsa.usda.gov/drought. All files can be ordered in electronic format or hard copy. Write: National Drought Policy Commission, USDA/FSA/AO, 1400 Independence Avenue SW, Mail Stop 0501, Washington, D.C. 20250-0501.
TRIBAL DROUGHT ACTIVITIES

**Tribe:** Hopi Tribe

**Location:** Located in northeastern Arizona, approximately 185 miles north of Phoenix, and about 230 miles west of Albuquerque.

**Planning Process:** The Hopi Tribe is developing a drought contingency plan. They are in the process of writing the draft final plan. The draft monitoring plan is on the internet at [http://192.101.10.68](http://192.101.10.68) for review and comment by agencies previously contacted. Also completed is a draft "Preliminary Assessment of Water Availability on Hopi Lands" which includes an appendix on water development needs and costs on Hopi range lands. The Tribe expects to complete the plan, in draft format, in May 2000.

**Contact:** Beverly Suderman  
Natural Resources Planner  
PO Box 123  
Kykotsmovi, AZ 86039  
Phone: 520-734-3626 FAX: 520-734-3819  
Email: bsuderman@hopi.nsn.us

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**Tribe:** Pueblo of Zuni

**Location:** Located in southwestern New Mexico, approximately 140 miles west of Albuquerque, and about 40 miles south of Gallup, near the Arizona border.

**Planning Process:** The Pueblo of Zuni is developing a drought contingency plan. They have hired a contractor who is tasked with the development of a draft monitoring plan and water availability assessment which should be completed in May 2000. The Pueblo will then begin public meetings using those documents as the basis for discussion. From the public meetings, they expect to get input for the development of triggers, responses, and mitigation alternatives. The Pueblo has put together a hydrology library and is reviewing those documents for demand estimates, history of droughts, etc. They expect to have a draft plan in October 2000.

**Contact:** Kirk Bemis  
Zuni Conservation Project  
PO Box 339  
Zuni, NM 87327-0339  
Phone: 505-782-5852  
FAX: 505-782-2726  
Email: none
Tribe: Kaibab Band of Paiute Indians

Location: Located in northwestern Arizona, approximately 60 miles east of St. George, Utah and 20 miles west of Freedonia, Arizona, within the Arizona Strip.

Planning Process: The Kaibab are developing a drought contingency plan. They have almost completed an assessment of water resources which consists of documentation of all of the springs on the reservation. The assessment includes the condition of the spring as to its potential for development and what could be done in terms of development or maintenance to increase the water supply of the Band. They attempted to form a drought planning task force. This was not successful so they decided to use the same approach as the Zuni: Write a draft and then take it out for public participation. They expect to complete the draft final plan in September 2000 and begin a round of public meetings.

Contact: Roger Holland
Tribal Planner
HC 65 Box 2
Pipe Spring, AZ 86022
Phone: 520-643-7245
FAX: 520-643-7260
Email: none

Tribe: Hualapai Nation

Location: Located on the south rim of the Grand Canyon in Coconino and Mohave Counties of northwestern Arizona approximately 45 miles north of Kingman, Arizona.

Planning Process: The agreement with the Hualapai was just approved by the contracting officer in April of 2000. Once the Hualapai have signed the agreement and Reclamation executes the agreement, work will begin. This is estimated to be around the middle of May.

Contact: Kerry Christenson
Senior Wildlife Biologist
PO Box 300
Peach Springs, AZ 86434
Phone: 520-769-2254
FAX: 520-769-2309
Email: none

Tribe: San Carlos

Location: Located in east-central Arizona, approximately 135 miles east of Phoenix.

Planning Process: The San Carlos Apache Tribe has completed a report on drought impacts associated with the San Carlos Lake. The plan has been used to understand the necessary lake levels required to support the lake’s trophy fishery
During periods of drought. The plan process resulted in a Congressional "write-in" to purchase Central Arizona Project exchange water during the summer of 1999. This action saved the fishery and protected the local economy.

**Contact:** Ned Anderson  
CAP Project Coordinator  
San Carlos Apache Tribe  
P.O. Box 0  
San Carlos, Arizona 85550  
Phone: 520-475-3832

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Tribe: Navajo Nation

**Location:** Located in northeastern Arizona, approximately 30 miles east of Flagstaff covering the four corners area.

**Planning Process:** The Nation has completed an assessment of its water resources and plans to complete its nationwide drought contingency plan for submission to Congress by October 1, 2000.

**Contact:** Dr. John Leeper  
Manager  
Water Management Branch  
Navajo Department of Water Resources  
PO Box 678  
Ft. Defiance, Arizona 87504  
Phone: 520-729-4004  
FAX: 520-729-4126  
Email: john_leeper@kestral.bia.gov

[Download PDF Version - Text] [Download PDF Version - Excel]
ANALYSIS OF EXISTING FEDERAL PROGRAMS

Background

Public Law 105-99, 112 Stat. 641, provides, "Sec. 4 DUTIES OF THE COMMISSION (b)(2) review all existing Federal laws and programs relating to drought; ."

Methodology

Federal participants in the Commission's Interagency Contact Group surveyed the agencies regarding drought-related Federal programs and compiled the results. The responsible Federal agencies provided the original data and Commission staff later assisted in formatting the information.

Overview

A total of 88 directly and indirectly related to existing Federal programs and were funded within the past ten years. Programs were classified into four broad program categories: (1) preparedness, including planning and mitigation; (2) information, including monitoring/prediction and research; (3) risk management; and (4) emergency response. Seven of these programs provide assistance for drought planning, 42 for drought mitigation, 22 for drought-related monitoring/prediction and research, and 47 for response. These numbers total more than 88 because some programs cover more than one facet of drought.

Preparedness, Planning, and Mitigation. Limited authorities and funds, as well as lack of coordination among and within federal agencies, hinder the planning efforts. In general, requests for planning assistance far outweigh available funds. Authorities often do not allow the agencies to provide financial assistance to requesting entities.

Successful implementation of plans requires practice, particularly when the people who are responsible for dealing with drought may not be the same from drought to drought. Enough time passes between droughts that issues change, water use changes, and professional staff members retire or move to new jobs.

Within Federal government programs, it is often the case that water supply and droughts are considered together. As a result, proactive drought mitigation comprises a broad range of measures from the installation of livestock watering ponds on ranches to state-of-the-art wastewater treatment that allows reuse of water.

Information, Monitoring and Prediction. Exchanges of information among planners and decision-makers have helped determine the direction of drought-related research. Sharing findings among research entities has helped promote many of the advances in drought-related research. In relation to monitoring and
prediction, these programs focus on weather patterns, climate, soil conditions, and streamflow measurements. Unfortunately, such programs are not always available in some areas, such as on tribal lands and in remote rural areas.

The wealth of monitoring and prediction information produced by federal programs and others can create a problem for some users because drought information and data are often complex and, for the most part, not presented in a standardized format. Such data can also be difficult to find and interpret. This is especially true for individuals, small businesses, and some communities and Tribes that do not have ongoing relationships with drought management agencies. There appears to be a need for an accessible "gateway" (point of contact) where high-quality, standardized, comprehensible current information and historical data are managed.

Keep in mind that predicting drought remains a complex task on any level, but upgrading technologies and increased coordination can provide improvement in this area.

**Risk Management.** The best preparedness and proactive mitigation measures will not adequately address all drought-related risks. The Small Business Administration notes that business interruption insurance is available in private insurance markets. However, it is generally not tailored to the needs of small businesses in drought situations. Small businesses may also lack access to information about financial and business risk-management strategies available to them.

For several decades, the U.S. Department of Agriculture has offered crop insurance to farmers as one of the government’s major risk-management strategies. Federal crop insurance covers all major field crops in nearly all locations, but it does not currently extend to all vegetable and other crops in all locations nor does it cover livestock. There are several efforts underway to improve this tool administratively and in the legislative area.

**Response.** A safety net is needed to help overcome the impacts of extreme occurrences of drought or the impacts of multi-faceted disasters (for example, flood/drought or hail/drought). Federal drought assistance is often described as "too little and too late". Documentation acceptable to trigger federal response for one Department of Agriculture emergency program is not sufficient to trigger other Departmental emergency programs. Constituents reported that they often fail to get a clear understanding of what additional information is needed to meet program criteria and this causes confusion for everyone. The Stafford Act and its implementation by the Federal Emergency Management Agency is an effective, proven model for organizing and providing emergency assistance during most catastrophic natural disasters, but has been rarely used for drought. One of the factors that make this program successful is that the Agency can draw monies from a standing fund to pay for disaster assistance. However, a Stafford Act declaration for drought does not enumerate any assistance for agriculture and livestock producers.

Additional information is available from the National Drought Policy Commission. You can access the information at the Commission’s web site: [www.fsa.usda.gov/drought](http://www.fsa.usda.gov/drought). All files can be ordered in electronic format or hard copy. Write: National Drought Policy Commission, USDA/FSA/AO, 1400
Program Title: Federal Crop Insurance Corporation (FCIC) administered by the Risk Management Agency (RMA)


Direct or Indirect Linkage to Drought: Direct

Functions: Mitigation, Risk Management

Agencies (primary agency listed first): USDA--RMA, FCIC

Who's Eligible? Customers include all farmers. RMA has increased its outreach and educational efforts to reach beginning, minority, limited-resource and small farmers.

Eligibility Criteria: RMA provides a risk management program that protects against production losses due to unavoidable causes such as drought, excessive moisture, hail, wind, hurricane, volcano, tornado, lightning, etc.

Funding History (1985 to the present): In 1998, nearly $28 billion in protection was provided on over 181 million acres through more than 1.2 million insurance policies.

Type of Assistance / Examples: Financial assistance to manage risk for agricultural producers in order to improve the economic stability of agriculture. Crop insurance helps farmers to recover from crop losses, secure operating loans, and aggressively market a portion of their crop. Recent changes in farm policy have increased the risk borne by individual producers; to help them acquire the risk management skills needed to compete and win in the global marketplace, RMA has been providing education and educational grants in production risk, legal risk, marketing risk, financial risk and human resources risk.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Losses from drought are calculated on a share, or producer/farm basis. To be eligible for payments, a farmer must have purchased crop insurance before the sales closing date established for the 70+ crop insurance programs covered.
Program Title: National Fire-Danger Rating System

Statute: Not applicable

Direct or Indirect Linkage to Drought: Indirect

Functions: Monitoring and Prediction

Agencies (primary agency listed first): USDA--FS; DOI--BLM, NPS, BIA, FWS, & OAS; DOC--NWS

Who's Eligible? Federal, state, county, and local government agencies engaged in wildland fire control and planning

Eligibility Criteria: Not applicable


Type of Assistance / Examples: Technical assistance as a means of monitoring and predicting conditions for wildland fires throughout the fire season. The data on 1000-hour fuel (i.e. large, dead fuel), moisture, and energy release component are most closely related to drought. National Fire-Danger Rating System uses daily input from some 1,500 weather stations that comprise the Fire Weather Network to run various models and algorithms to create maps, graphs, and tabular products, which yield predictions of fire danger.

Integration with State, Tribal, or Local Government: Information is provided to state, county, tribal, and local government entities.

Effectiveness: No data

Program Limitations/ Recommendations: Interpretation requires knowledge of spatial and temporal context of normal and drought conditions.

Contact Name and Phone Number: Patti Hirami (202) 205-1498

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Program Title: Keetch-Byram Drought Index

Statute: Not applicable

Direct or Indirect Linkage to Drought: Direct

Functions: Monitoring and Prediction

Agencies (primary agency listed first): USDA--FS; DOI--BLM, NPS, BIA, FWS, &
Who's Eligible? Federal, state, county, and local government agencies engaged in wildland fire control and planning

Eligibility Criteria: Maps are used throughout the fire season as a means of monitoring soil moisture conditions as a measure of drought; also used in wildland fire control and planning.

Funding History (1985 to the present): No data

Type of Assistance / Examples: Technical assistance to produce maps of the conterminous U.S. and Alaska which display the Keetch-Byram (soil moisture) Drought Index. This soil/duff drought index ranges from 0 (no drought) to 800 (extreme drought), is based on a soil capacity of 8 inches of water, and includes factors such as maximum daily temperature and daily, antecedent, and annual precipitation.

Integration with State, Tribal, or Local Government: Information is provided to state, county, tribal, and local government entities.

Effectiveness: No data

Program Limitations/ Recommendations: 1. Designed for use in forested conditions. 2. Interpretation requires knowledge of spatial and temporal context of normal and drought conditions.

Contact Name and Phone Number: Patti Hirami (202) 205-1498
www.fs.fed.us/land/wfas

Program Title: Vegetation Greenness Maps

Statute: Not applicable

Direct or Indirect Linkage to Drought: Indirect

Functions: Monitoring and Prediction

Agencies (primary agency listed first): USDA--FS; DOI--BLM, NPS, BIA, FWS, and OAS; DOC--NWS

Who's Eligible? Federal, state, county, and local government agencies engaged in wildland fire control and planning

Eligibility Criteria: Maps are used throughout the fire season as a means of monitoring conditions for wildland fires. Drought places stress on live vegetation that can be monitored using these maps. FAO uses data in maps for early warning of food shortages (see www.fao.org/giews/english/windisp/windisp.htm).

Funding History (1985 to the present): Funded since about 1992 at $30K/yr
**Type of Assistance / Examples:** Technical assistance to produce Greenness maps to assess the condition of live vegetation over time. Actively photosynthesizing biomass, or vegetation "greenness," is used to assess relative fire danger in forests and grasslands.

**Integration with State, Tribal, or Local Government:** Information is provided to state, county, tribal, and local government entities.

**Effectiveness:** Can be an effective predictive tool; however, 1) uses AVHRR satellite imagery that provides only coarse (1 km) resolution; 2) best viewed as time series to detect and monitor change; 3) clouds may totally or partially obscure certain portions of the images (need to calculate replacement values for pixels); 4) need to develop procedures to quantify change over large areas rather than pixel by pixel.

**Program Limitations/ Recommendations:** 1. Uses AVHRR satellite imagery. Provides only coarse (1 km) resolution. 2. Best viewed as time series to detect and monitor change. 3. Clouds may totally or partially obscure certain portions of the images.

**Contact Name and Phone Number:** Roberta Bartlette (406) 329-4828
www.fs.fed.us/land/wfas

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**Program Title:** Wetlands Reserve Program (WRP)

**Statute:** 16 U.S.C. 3837

**Direct or Indirect Linkage to Drought:** Indirect

**Functions:** Mitigation

**Agencies (primary agency listed first):** USDA--NRCS; DOI--FWS. Other agencies, such as USDA's USFS and FSA and state wildlife agencies, participate as partners.

**Who's Eligible?** Landowners

**Eligibility Criteria:** Program is more geared toward alleviating flood rather than drought conditions. Not an emergency or disaster assistance program, although 70 percent of all lands in the program are subject to frequent flooding. With limitations, certain acreage may be utilized for haying or grazing providing it is authorized as a compatible use.

**Funding History (1985 to the present):** No data

**Type of Assistance / Examples:** Financial and technical assistance to restore and protect wetlands. Financial assistance is in the form of cost-share payments to establish wetland and wildlife practices, easement acquisition payments, and costs associated with filing the easement. **Examples:** Gives landowners options for managing their lands. They can voluntarily sell an easement to the property and restores wetland conditions. Provides the landowner with a fair price of the
restrictions conveyed, creates enhances or restores the wetland and provides excellent wildlife habitat.

Integration with State, Tribal, or Local Government: Voluntary assistance for any private landowner with eligible land based on competitive selection.

Effectiveness: Funds are spent only on wetland restoration and protection.

Program Limitations/ Recommendations: The authorizing language provides that the purpose of the program is to restore and protect wetlands while placing priority on habitat for migratory birds and other wildlife. Compatible uses may only be authorized if such uses are consistent with the long-term protection and enhancement of the wetland and other natural values of the easement area. National policy prohibits the wetlands from being used as a water supply, such as for irrigation withdrawal. Total acreage enrollment limitation is 975,000 acres. Acreage cap is expected to be met in FY2000.

Contact Name and Phone Number: Leslie Deavers (202) 720-1067

Program Title: Snow Survey and Water Supply Forecasting (SS/WSF) Program


Direct or Indirect Linkage to Drought: Direct

Functions: Communication, Monitoring and Prediction, Planning, Mitigation, Risk Management, Response

Agencies (primary agency listed first): USDA--NRCS, FS; DOC--NWS, NCDC, RCCs; DOI--NPS, BLM

Who's Eligible? a) Any individual or group who is a significant water user. b) Agricultural interests, particularly those served by or affiliated with soil, water, and other conservation districts. Information is also available to other federal, state and private agencies and to the public without charge. Cooperator's financial contribution is usually required for special measurements or interpretations beyond the scope of the regular program.

Eligibility Criteria: None

Funding History (1985 to the present): 1999: $5,990,000. From 1990 to 1998 funding ranged from $5.4 mil. to 5.8 mil., increasing incrementally each year.

Type of Assistance / Examples: Technical assistance to monitor the climate and hydrologic elements necessary to produce water supply forecasts for the West.

1. Elements monitored include snowpacks, soil moisture and temperature,
2. These data are combined with other water resource information, such as streamflows and reservoir storage, to forecast the seasonally variable water supplies (amounts and timing) and to make drought risk assessments. **Examples:** Near real time information is collected from remote mountain sites. The information is electronically transferred to a master station. The information provides scientists with information on the moisture contained in the snow on the mountain as well as precip and temperature information.

**Integration with State, Tribal, or Local Government:** The SS/WSF program activities are fully integrated with state, tribal and local governments. The program has funded specific enhancements to data collection efforts on tribal lands in AZ and NM to enhance water management activities.

**Effectiveness:** Recent GPRA results indicate 98% satisfaction with Snow Survey and Water Supply Forecasts. Water supply forecasts are produced annually (January to June) in partnership with the National Weather Service. During the 1999 forecast season, NRCS issued 6,835 seasonal water supply forecasts for 747 locations in 12 Western states. Snow Survey and Water Supply Forecasts are an integral part of the Weekly U.S. Drought Monitor, published by the USDA, DOC and National Drought Mitigation Center.

**Program Limitations/ Recommendations:** Limitations: 1. Limited scope of application (Parent agency priority and resource assignments (human and fiscal) are insufficient to effectively implement existing data acquisition technology and data analyses / management on a national basis to meet known needs and opportunities). 2. Resources are limited in the general downsizing of USDA / agencies. 3. Program is unable to utilize opportunities to leverage considerable available partnered inkind and fiscal support without parent agency endorsement and robust infrastructure. 4. Disparate, non single-point national leadership prevents comprehensive and widely cost effective mitigation and response.

Recommendations: Establish a new USDA Budget Line item specifically for drought monitoring and risk assessment. Identify funds to complete the SNOTEL network in the West to meet requests for new water supply forecast points and products. Expand the SCAN network to the entire United States for drought assessment. Augment NRCS state staffs to provide local interpretations and direct assistance with local drought and water supply issues.

**Contact Name and Phone Number:** Jon Werner, Director, National Water & Climate Center, (503) 414-3107, email jwerner@wcc.nrcs.usda.gov

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**Program Title:** Livestock Indemnity Program (LIP)


**Direct or Indirect Linkage to Drought:** Direct

**Functions:** Mitigation, Response
Program Title: Livestock Assistance Program (LAP)


Direct or Indirect Linkage to Drought: Direct

Functions: Mitigation, Response

Agencies (primary agency listed first): USDA--CCC, FSA

Who's Eligible? Livestock producers who suffered grazing losses

Eligibility Criteria: Natural disaster, including drought, that has resulted in a 40 percent or greater grazing loss for 3 consecutive months

Funding History (1985 to the present): No data

Type of Assistance / Examples: Financial assistance for grazing losses suffered by livestock producers in calendar year 1998 in counties that have suffered a 40 percent or greater loss of normal grazing as a result of a natural disaster.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Livestock producers in an approved county must have suffered at least a 40 percent loss of normal grazing for a minimum of 3 consecutive months for the producer's eligible livestock. Livestock producers must have possessed a beneficial interest in eligible livestock which were lost as a result of the disaster condition in the Presidential or Secretarial disaster declaration.

Contact Name and Phone Number: Rebecca Davis (202) 720-9882
must have been owned or leased for at least 3 months.

Contact Name and Phone Number: Lynn Tjeerdsma (202) 720-6602

Program Title: Noninsured Crop Disaster Assistance Program (NAP)

Statute: 7 U.S.C. 7333

Direct or Indirect Linkage to Drought: Direct and Indirect

Functions: Mitigation, Response

Agencies (primary agency listed first): USDA--CCC, FSA

Who's Eligible? Farming and ranching enterprises

Eligibility Criteria: Natural disaster, including drought, that has resulted in crop loss (due to prevented planting) on greater than 35 percent of the crop's intended area, or low yield (lost yield in excess of 60%) of production of one or more crops.

Funding History (1985 to the present): Information on drought-related funding not available

Type of Assistance / Examples: Assistance is equivalent to the catastrophic risk protection otherwise available under Section 508 (b) of the Federal Crop Insurance Act (7 U.S.C. 508 (b)). Natural disasters, including drought, may result in payments to producers of eligible crops in an area suffering from prevented planting in excess of 35% or loss of yield in excess of 60%.

Integration with State, Tribal, or Local Government: Close linkage to the catastrophic level of crop insurance

Effectiveness: Effective program but underutilized. Following a natural disaster event or when the impact of an event is known, e.g. drought and excessive heat, a determination is made as to the geographic size and extent of the impacted area. If the impacted area comprises a minimum of 320,000 acres, produces annually $80 million worth of agricultural commodities, and contains at least five producers of crops which have suffered loss, a NAP "area" is recognized. Any crop in the recognized area which has at least a 35% loss is eligible for NAP payments. Any producer of the approved crop that has a 50% or greater loss can apply for NAP payments. Payments are calculated for losses in excess of 50% of an approved yield at 55% of approved market price.

Program Limitations/ Recommendations: Eligible crops include each commercial crop or other agricultural commodity, except for livestock, for which catastrophic risk protection under section 7 U.S.C. 1508(b) is unavailable and which is produced for food or fiber. Other eligible crops are specifically included. Payment limitation is $100,000 per person per crop year. Persons with qualifying gross revenues in excess of $2 million in most recent tax year prior to year of disaster are ineligible. Multiple benefit exclusion precludes assistance under NAP and other USDA benefits with some exceptions.
Program Title: Tree Assistance Program (TAP)


Direct or Indirect Linkage to Drought:

Functions: Mitigation, Response

Agencies (primary agency listed first): USDA--CCC, FSA

Who's Eligible? Owners of eligible trees or vines

Eligibility Criteria: Natural disaster, including drought, that has resulted in a loss of eligible trees or vines

Funding History (1985 to the present): No data

Type of Assistance / Examples: Financial assistance for eligible owners who replant or rehabilitate eligible trees or vines lost or damaged by natural disasters during the qualifying period.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Owners of eligible trees or vines must have suffered qualifying tree or vine losses of 20 percent or greater due to an eligible natural disaster.

Contact Name and Phone Number: Rebecca Davis (202) 720-9882

Program Title: Crop Loss Disaster Assistance Program (CLDAP)


Direct or Indirect Linkage to Drought: Direct

Functions: Mitigation, Response

Agencies (primary agency listed first): USDA--CCC, FSA

Who's Eligible? Crop producers

Eligibility Criteria: Natural disaster, including drought, that has resulted in crop loss

Funding History (1985 to the present): No data
Type of Assistance / Examples: Financial assistance is available for single-year 1998 crop losses or multiple-year crop losses which resulted in crop insurance indemnity payments or payments under the Noninsured Crop Loss Disaster Assistance Program or ad hoc disaster program payment in at least 3 of the years from 1994 to 1998.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Producers must have suffered a qualifying 1998 crop loss due to a natural disaster or have received qualifying payments for crop losses in at least 3 of the years 1994 to 1998.

Contact Name and Phone Number: Rebecca Davis (202) 720-9882

Program Title: Fire Severity Authorization

Statute: Internal policy

Direct or Indirect Linkage to Drought: Direct

Functions: Mitigation, Response

Agencies (primary agency listed first): USDA--FS

Who's Eligible? National Forests with interagency coordination

Eligibility Criteria: Requests from National Forests for funds

Funding History (1985 to the present): Information on drought-related funding not available

Type of Assistance / Examples: Provides authority to spend funds for fire pre-suppression and preparedness.

Integration with State, Tribal, or Local Government: Funds are distributed regionally to National Forests.

Effectiveness: Effective in mitigating drought conditions long before they occur.

Program Limitations/ Recommendations: Limited to appropriated funds

Contact Name and Phone Number: Jose Cruz (202) 204-1483

Program Title: Federal Excess Property Program

Statute: Federal Property Administration Act of 1948

Direct or Indirect Linkage to Drought: Indirect
Functions: Mitigation

Agencies (primary agency listed first): USDA--FS

Who's Eligible? State and local governments

Eligibility Criteria: Existence of excess property for fire preparedness

Funding History (1985 to the present): Information on drought-related funding not available

Type of Assistance / Examples: Excess fire-fighting equipment is available to states to fight fires. The federal government retains title to the equipment.

Integration with State, Tribal, or Local Government: Program distributes equipment to state governments.

Effectiveness: Effective in mitigating drought conditions long before they occur.

Program Limitations/ Recommendations: No data

Contact Name and Phone Number: Jose Cruz (202) 204-1483

Program Title: Cooperative Forestry Assistance


Direct or Indirect Linkage to Drought: Indirect

Functions: Mitigation

Agencies (primary agency listed first): USDA--FS

Who's Eligible? State Forestry Fire programs

Eligibility Criteria: States receive assistance for preparedness.

Funding History (1985 to the present): Information on drought-related funding not available

Type of Assistance / Examples: Financial and technical assistance to State Foresters

Integration with State, Tribal, or Local Government: Includes a new program to address wildland/urban interface areas. Fire prevention teams may be requested by states to the regional offices. States must compete and demonstrate capability to deliver services associated with the additional funding.

Effectiveness: Effective in mitigating drought conditions long before they occur.

Program Limitations/ Recommendations: Limited to resources/funds
Program Title: Watershed Management Program

(PL-566 & PL- 534)


Direct or Indirect Linkage to Drought: Indirect

Functions: Mitigation

Agencies (primary agency listed first): USDA--FS, NRCS

Who's Eligible? All sectors and customers that depend upon water supplied from the 192 million acres of national forests and grasslands, without restriction or discrimination

Eligibility Criteria: 1. Data on below-normal precipitation, low soil moisture, and fine fuels buildup are collected at hydroclimatic stations by any agency. 2. Increasing risk of wildfire triggers restrictions on outdoor burning and outdoor recreational and access activities (road and trail closures) which can affect people's use of the national forests and grasslands and, for a few, affect their ability to access their buildings, water facilities, microwave towers, etc. located on these lands and waters.

Funding History (1985 to the present): NRCS funding in 1985-94 ranged from $161-$199 mil/yr; in 1995-99, ranged from $70-99 mil/yr; for 2000, $92 mil/yr. Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Technical assistance includes: 1. Water use conservation and restrictions at government-owned offices, garages, employee housing, fire retardant bases, livestock watering tanks and irrigation of pasture. 2. Construction and operation of water storage ponds for wildfire suppression. 3. Measurements of snowpack, rainfall, streamflow, groundwater levels, air temperature and other meteorological parameters at hydroclimatic stations on national FS lands in over 500 locations, often in support of NRCS and NOAA programs.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: No special funds, staffs, or agency priority are normally assigned to drought mitigation or response until drought becomes very severe.
Program Title: Disaster Transfers -- Peanuts

Statute: The Agricultural Adjustment Act of 1938, as amended by the Federal Agriculture Improvement and Reform Act of 1996

Direct or Indirect Linkage to Drought: Direct

Functions: Response

Agencies (primary agency listed first): USDA--FSA

Who's Eligible? Peanut producers

Eligibility Criteria: Underproduction of quota due to drought, flood, or any other natural disaster, or any other condition beyond the control of the producer

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Financial assistance is available to producers who produce Segregation 2 or Segregation 3 peanuts marketed as additional loan peanuts, to upgrade the production from additional loan to quota loan through a Disaster Transfer, on a farm on which the poundage quota was not harvested because of drought, flood, or other natural disaster conditions beyond a producers control. Peanuts transferred under this provision will be supported at 70 percent of the quota support rate on 25 percent of the effective quota.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Peanuts transferred under this provision are supported at 70 percent of the quota support rate in lieu of 100 percent in previous legislation and transfers cannot exceed 25 percent of the farms effective quota.

Contact Name and Phone Number: Tonye Gross, Branch Chief, Peanuts Branch, (202) 720-4319 e-mail Tonye_Gross@wdc.fsa.usda.gov

Program Title: Fall Lease and Transfers -- Peanuts

Statute: The Agricultural Adjustment Act of 1938, as amended by the Federal Agriculture Improvement and Reform Act of 1996

Direct or Indirect Linkage to Drought: Direct

Functions: Response
Agencies (primary agency listed first): USDA--FSA

Who's Eligible? Peanut producers

Eligibility Criteria: Underproduction of quota due to drought, flood, or any other natural disaster, or any other condition beyond the control of the producer

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Financial assistance is available to producers in the fall of the year to transfer the balance of the quota remaining on the marketing card, if the producer made a good-faith effort to produce a normal crop on the acreage devoted to peanuts and the poundage was not produced due to conditions beyond the producer's control such as drought, flood, or other natural disaster, to any other farm in the State where the quota was established to market the production on the receiving farm.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Must meet 90 percent planting requirement to be eligible.

Contact Name and Phone Number: Tonye Gross, Branch Chief, Peanuts Branch (202) 720-4319 e-mail Tonye_Gross@wdc.fsa.usda.gov

Program Title: Transfer of tobacco allotment/ quota that cannot be planted or replanted due to a natural disaster

Statute: Agricultural Adjustment Act of 1938, as amended

Direct or Indirect Linkage to Drought: Direct

Functions: Response

Agencies (primary agency listed first): USDA--FSA

Who's Eligible? Tobacco producers

Eligibility Criteria: Counties affected by natural disaster (including but not limited to hurricane, rain, flooding, hail, drought and any other severe weather) which prevents the timely planting or replanting of any kind of tobacco.

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Tobacco acreage/quotas may be transferred to another farm(s) in the same or any other nearby county/state if such acreage cannot be planted or replanted due to a natural disaster.
Program Title: Disaster transfer of tobacco acreage allotment/quota: flue-cured and burley tobaccos

Statute: Agricultural Adjustment Act of 1938, as amended

Direct or Indirect Linkage to Drought: Direct

Functions: Response

Agencies (primary agency listed first): USDA--FSA

Who's Eligible? Tobacco producers

Eligibility Criteria: Disaster-related underproduction on the transferring farm

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: The allotment/quota established for a farm may be transferred to another farm by lease under natural disaster conditions.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Farm's expected production of burley and flue-cured tobacco is less than 80 percent of the farm's effective quota. Acreage planted on the transferring farm was sufficient to produce the farm's effective quota.

Contact Name and Phone Number: Tom Burgess, Branch Chief, Tobacco Branch (202) 720-4318 e-mail Tom_Burgess@wdc.fsa.usda.gov.

Program Title: Emergency Conservation Program (ECP)

Statute: Section 401 of the Agricultural Credit Act of 1978 (92 STAT. 420-434), as amended by the Disaster Assistance Act of 1989, Section 502

Direct or Indirect Linkage to Drought: Direct

Functions: Mitigation
Agencies (primary agency listed first): USDA--FSA, NRCS

Who's Eligible? Farmers and ranchers

Eligibility Criteria: In the event of a natural disaster, ECP may be implemented to rehabilitate farmlands and conservation facilities. ECP provides cost-share assistance to eligible producers.

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Financial assistance to make cost-share payments to agricultural producers who carry out emergency measures to control wind erosion on farmlands or to rehabilitate farmlands damaged by wind erosion, floods, hurricanes or other natural disasters when, as a result of the foregoing, new conservation problems have been created that (1) if not treated, will impair or endanger the land; (2) materially affect the productive capacity of the land; (3) represent damage that is unusual in character and, except for wind erosion, is not the type that would recur frequently in the same area; and (4) will be so costly to rehabilitate that federal assistance is or will be required to return the land to productive agricultural use.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: ECP is limited to funds which are generally made available by emergency supplemental appropriation, and staff available to handle requests. There is no annual appropriation.

Contact Name and Phone Number: Robert Stephenson, Director, Conservation and Environmental Protection Division (202) 720-6221

Program Title: Conservation Reserve Program (CRP)

Statute: Title XII of the Food Security Act of 1985 as amended (16 USC 3831)

Direct or Indirect Linkage to Drought: Direct

Functions: Mitigation

Agencies (primary agency listed first): USDA--FSA, NRCS, FS, ERS; EPA; DOI-FWS

Who's Eligible? Farmers and ranchers

Eligibility Criteria: The Food Security Act of 1985, as amended, authorizes the Secretary in the case of drought and other similar emergency to permit haying and grazing of CRP acreage.

Funding History (1985 to the present): Specific drought funds have not been
Type of Assistance / Examples: Financial and technical assistance to cost-effectively reduce water and wind erosion, protect the nation’s long-term capability to produce food and fiber, reduce sedimentation, improve water quality, create and enhance wildlife habitat, and other objectives including encouraging more permanent conservation practices and tree planting. Under the CRP, Commodity Credit Corporation (CCC) will enter into contracts with eligible participants to convert eligible lands to a conserving use for a period of not less that 10 years and not more than 15 years in return for financial and technical assistance.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Limited to CRP participants. Emergency haying and grazing must be conducted in a manner protective of all CRP stakeholders and purposes, including soil erosion control, water quality, and wildlife.

Contact Name and Phone Number: Robert Stephenson, Director, Conservation and Environmental Protection Division (202) 720-6221

Program Title: Farmland Protection Program (FPP)

Statute: Section 388 of the Federal Agriculture Improvement and Reform Act of 1996

Direct or Indirect Linkage to Drought: Indirect

Functions: Monitoring and Prediction

Agencies (primary agency listed first): USDA--NRCS, CCC

Who’s Eligible? State, local and tribal agricultural protection entities that in turn purchase easements from farmers.

Eligibility Criteria: Farm is accepted into a state, local, or tribal farmland protection program and conservation easements are recorded.

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Technical assistance: Each farm under a purchased agricultural conservation easement (PACE) is required to have a conservation plan. Part of that conservation plan should contain a drought section that includes mitigation actions, should a drought occur.

Examples: Landowners may be able to sell development rights on their property in areas eligible for this program.
Program Title: Small Watershed Program (PL-566)

Statute: Watershed Protection and Flood Protection Act (Public Law 83-566)

Direct or Indirect Linkage to Drought: Indirect

Functions: Mitigation

Agencies (primary agency listed first): USDA--NRCS

Who's Eligible? States and subunits of state government (called local sponsors) are the primary customers. However, projects are often sponsored on behalf of residents in a given watershed.

Eligibility Criteria: The Small Watershed Program contains several eligible purposes authorized by the Act that would mitigate the effects of drought. They include agricultural water management, municipal and industrial water supply, groundwater recharge, & watershed protection.

Funding History (1985 to the present): No data

Type of Assistance / Examples: Technical and financial assistance in dealing with watershed protection and flood prevention; the Flood Control Act of 1944 authorizes USDA to undertake emergency measures for runoff retardation and soil erosion protection as needed to safeguard lives and property from floods and the products of erosion on any watershed where fire or other natural element or force had caused a sudden impairment of the watershed.

Examples: A local town can request assistance from USDA under this program to address flooding, watershed management, municipal and industrial water needs, etc. Technical and financial assistance may be available to help the community address their needs.

Integration with State, Tribal, or Local Government: Requires sponsors that have legal authority to obtain property rights, water rights and permits, and provide operation and maintenance.

Effectiveness: Project purposes only include agricultural water management, groundwater recharge, and municipal and industrial water supply.

Program Limitations/ Recommendations: Projects must contain benefits to agriculture, including rural communities, that account for at least 20% of total
benefits. Cost-share rates vary, depending on the purpose. Some rates are set at the discretion of the Secretary of Agriculture. Recent declines in Congressional appropriations for the Small Watershed Program have led to a significant backlog of unfunded, authorized projects. As of the beginning of FY 1999, the backlog is in excess of $1.5 billion.

Contact Name and Phone Number: Director, Watersheds and Wetlands Division, (202)-720-3534

Program Title: Conservation Technical Assistance (CTA)

Statute: NRCS and CTA established by Department of Agriculture Reorganization Act of 1994 (7 U.S.C. 6962) which combined the authorities of the former Soil Conservation Service (Soil Conservation Act of 1935) with seven cost-share programs for natural resource conservation.

Direct or Indirect Linkage to Drought: Indirect

Functions: Mitigation, Response

Agencies (primary agency listed first): USDA--NRCS

Who’s Eligible? Private land users, communities, units of state and local government, and other federal agencies

Eligibility Criteria: Customers request assistance. Assistance provided is for planning and implementing natural resource solutions to natural resource concerns that could include drought.

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Technical assistance to implement the following: state and local financial assistance programs; other state, local and federal conservation initiatives; technology development; disaster preparedness; technical assistance training for NRCS, state and local personnel, and administration. Technical assistance provided is in the form of soil erosion control, grazing entities, water conservation quantity and quality, wildlife habitat development, soil survey interpretations and data collection and interpretation.

Examples: Private landowners and or operators can apply for technical assistance to help the individual develop and implement a drought plan as well as address other resource concerns.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Only technical assistance is available and no financial assistance is included for landowners to implement conservation measures.
Program Title: Plant Materials Program


Direct or Indirect Linkage to Drought: Indirect

Functions: Mitigation

Agricultures (primary agency listed first): USDA--NRCS

Who's Eligible? NRCS field offices receive technical information and transfer it to end users (e.g., farmers and ranchers).

Eligibility Criteria: The program is limited to conservation cooperators' properties in conjunction with Soil Conservation Districts, State Agricultural Experiment Stations, and State Cooperative Improvement Associations.

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Technical assistance through plant science technology to NRCS field offices for transfer to end users (e.g., landowners and land managers). The program functions in this capacity by providing vegetative solutions for natural resource problems. It develops plant releases (i.e., materials) and information technology on how to establish and manage plant species.

Examples: Landowners, working with their local conservation districts, can test drought tolerant species of grasses to see if they are well suited for their particular farm.

Integration with State, Tribal, or Local Government: Technology is provided to NRCS field offices for transfer to end users (e.g., landowners & land managers).

Effectiveness: Drought conditions are ameliorated but not eliminated. Suitable planning and management must be implemented before drought occurs.

Program Limitations/ Recommendations: The program emphasizes field testing to determine a plant's value and restoration techniques. It is limited to conservation cooperators' properties in conjunction with conservation districts, State Agricultural Experiment Stations, State Crop Improvement Associations and other federal and state agencies. Plants or seed are not provided to the general public, and the public is not eligible to participate in the program.

Contact Name and Phone Number: Rick White (202) 720-2587
Program Title: Forestry Incentives Program (FIP)


Direct or Indirect Linkage to Drought: Indirect

Functions: Response

Agencies (primary agency listed first): USDA--NRCS

Who's Eligible? Eligible private landowners

Eligibility Criteria: Program can be augmented with emergency funds to assist in tree planting and timber stand improvements needed due to eligible natural disaster situations.

Funding History (1985 to the present): Specific drought funds have not been provided to the program.

Type of Assistance / Examples: Technical and financial assistance available nationwide in counties designated as potentially suitable for production of timber products. The program pays up to 65 percent of the costs of tree planting, timber stand improvements, and related practices on nonindustrial private forest lands.

Integration with State, Tribal, or Local Government: No data

Effectiveness: No data

Program Limitations/ Recommendations: Maximum payment limitation for FIP is $10,000 per individual per fiscal year

Contact Name and Phone Number: Robert Molleur (202) 720-6521
ANALYSIS OF FEDERAL LAWS

Background:

Public Law 105-199, 112 Stat. 641, provides, "Sec. 4. DUTIES OF THE COMMISSION. (b)(2) review all existing Federal laws and programs relating to drought."

Methodology:

Research of the United States Code found 74 sections of drought-related legislation. Listed below is the title number, name, and number of sections in each title with drought-related language in the legislation.

Title Number, Name, and Number of Sections of US Code Related to "Drought"

<table>
<thead>
<tr>
<th>Title</th>
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Total Number = 74

Overview:

The majority of drought-related legislation is in response to agricultural events and their impacts. As noted in the National Drought Policy Commission report, the
Commission favors a shift from an emphasis on response and relief to preparedness through planning and proactive mitigation.

Additional information is available from the National Drought Policy Commission. You can access the information at the Commission's web site: www.fsa.usda.gov/drought. All files can be ordered in electronic format or hard copy. Write: National Drought Policy Commission, USDA/FSA/AO, 1400 Independence Avenue SW, Mail Stop 0501, Washington, D.C. 20250-0501.

[Download PDF Version]
U.S. Code Number: 7USC178c

Chapter: Department of Agriculture

Law Title/Statute: 7 USC 178c.

Function: Mitigation

Law Description: This allows the Secretary of Agriculture to encourage research relative to the culture and extraction of latex from Parthenium or other hydrocarbon-containing plants. This research would be to, among other things, increase the drought tolerance of these plants. This appears to have last been amended by PL 102-237, Title X, sec. 1005(1), Dec 13, 1991, 105 Stat. 1894.

Agencies (Primary agency listed first): USDA-(ARS, NRCS)

Customers Served: Producers of plants that produce latex.

How is this law related to drought? The research will, at some point in time, result in latex producing plants that will better withstand drought.

Law Limitations: This is authorizing legislation. There is a need for appropriations to accomplish the legislative purpose.

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1301

Chapter: Department of Agriculture


Function: Mitigation

Law Description: In (b)(8)(A) the term "adjusted for abnormal weather conditions" is used for the trends in yields for wheat production. It is specifically not allowed for cotton.

Agencies (Primary agency listed first): USDA
Customers Served: Wheat farmers

How is this law related to drought? The yield figures used for the calculation of long term yields are to be adjusted for any year and area that the Secretary of Agriculture determines that drought has impacted.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: The case of cotton and the calculation of yield trend as a result of "abnormal weather conditions" may be interpreted that drought yield reductions can't be exempted from the 5 years of data needed to formulate the Cotton "National average yield."

U.S. Code Number: 7USC1301

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part A; Sec 1301

Function: Response

Law Description: In applying the "Agricultural Adjustment Act of 1938" the Secretary of Agriculture may, if drought or other "uncontrollable natural cause occurs, recalculate the "normal yield." If the drought year yield is less than 75% of the "normal yield" the Secretary can just drop that year's yield out of the five to ten year yields used. This applies to Section 1301.(b)(13)(A)or (B) for peanuts, and the construction for Section 1301.(b)(13)(D) or (E) was that if the yield is less than 75% of "normal" for rice or wheat, then substitute 75% "normal" into the calculations for the "normal" yield.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Cash grain farmers

How is this law related to drought? The calculation of the "normal" yield establishes what the farmers will be paid by the Federal Government if a drought occurs.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

Federal Drought Laws

U.S. Code Number: 7UCS1306

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part A; Sec 1306
Function: Response

Law Description: This section allows using projected yields rather than actual yields for years when drought caused crop failure. It only applied to the years 1974 to 1977.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Wheat farmers

How is this law related to drought? Projected yields if drought didn't occur will be more than the actual yields during a drought year.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1313

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part B; SubPart I; Sec. 1313.

Function: Response

Law Description: The Secretary of Agriculture is directed to consider the effects of drought in previous year(s) when establishing the current year's tobacco market quota for a farm.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Tobacco Farmers

How is this law related to drought? If the quota is increased as a result of lowered yields caused by drought, then the farmer can sell more tobacco in a later year.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1314i

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part B; SubPart I; Sec. 1314i

Function: Response
Law Description: If drought causes pool inventories of Burley or Flue-cured tobacco to be depleted, the Secretary of Agriculture may reduce the minimum amount of domestic tobacco that cigarette manufacturers are required to utilize below 75%.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Cigarette manufacturers.

How is this law related to drought? Because domestic cigarette companies are required to utilize at least 75% Burley or Flue-cured tobacco in their product, when drought curtails supply, price rises and this act allows the companies to purchase foreign tobacco and thus not be subject to extremely high prices.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1331

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part B; SubPart iii; Sec. 1331.

Function: Response

Law Description: While this section talks about the need to avoid either undersupply or oversupply of wheat because of the effect on interstate commerce, etc., there are a series of amendments that stretch back into the 1970's saying it doesn't apply to the current five years that the farm bill encompasses.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Wheat & other grain farmers.

How is this law related to drought? Doesn't really apply, even though the word drought is H11in the code. It is a "sense of the Congress" piece of code that currently doesn't apply, and hasn't applied for quite a few years because every farm bill writes it out for the five years that the farm bill applies for.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1341

Chapter: Department of Agriculture
Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part B; SubPart iv; Sec. 1341.

Function: Response

Law Description: While this section discusses the need to avoid either undersupply or oversupply of cotton because of the effect on interstate commerce, etc., there is a note that says it doesn't apply to the current five years (1996-2002) for "crops of loan commodities, peanuts, and sugar."

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Cotton farmers

How is this law related to drought? Doesn't really apply, even though the word drought is in the code. It is a "sense of the Congress" piece of code that currently doesn't apply, and hasn't applied for quite a few years because every farm bill writes it out for the five years that the farm bill applies for.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): No data

U.S. Code Number: 7USC1350

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part B; SubPart iv; Sec. 1350.

Function: Response

Law Description: In the event of drought, section 1350(e)(2) allows the Secretary of Agriculture to consider acres not planted to cotton because of the drought to have been planted to cotton. In 1350.(h) the Secretary of Agriculture may find that if a portion of the farm base acreage that is affected by drought can be utilized by other farms in the county, then those acres may be transferred to those farms.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Cotton farmers

How is this law related to drought? In the event of drought, this code prevents the acreage of cotton from shrinking because of the acres that aren't in the base acreage of the county, etc.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): No data
U.S. Code Number: 7USC1358-1

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part B; SubPart vi; Sec. 1358-1.

Function: Response

Law Description: In the event of drought, section 1358-1(b)(4)(A) allows the Secretary of Agriculture to consider the farm's poundage quota of peanuts not produced because of drought, then the farm poundage quota shall be considered to have been produced. In 1358-1.(b)(8)(A) the Secretary of Agriculture also may find that the farm quota poundage not harvested and marketed because of drought, ... beyond the control of the producer, may be transferred to the quota loan pool ...

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Peanut farmers

How is this law related to drought? In the event of drought, this code prevents the acreage of peanuts from shrinking because of the acres that aren't in the base acreage of the county, etc.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): No data

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U.S. Code Number: 7USC1359ff

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part B; SubPart vii; Sec. 1359-ff.

Function: Response

Law Description: In the event of drought, section 1359-ff(b)(4)(B) directs the Secretary of Agriculture to add the farm's sugarcane acreage not able to be harvested because of drought when determining the farm's acreage base.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Sugarcane producers

How is this law related to drought? In the event of drought, this code prevents the acreage of sugarcane from shrinking because of the acres that aren't in the base acreage of the county, etc.
Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): No data

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U.S. Code Number: 7USC1379c

Chapter: Department of Agriculture

Law Title/Statute: Agricultural Adjustment Act of 1938-Loans, Parity Payments, Consumer Safeguards, Marketing Quotas, and Marketing Certificates--Wheat Marketing Allocation 7 USC Sec. 1379c. Marketing Certificates

Function: Mitigation

Law Description: The Secretary (of Agriculture) shall provide for the issuance of wheat marketing certificates for each marketing year for which a wheat marketing allocation program is in effect for the purpose of enabling producers on any farm with respect to which certificates are issued to receive, in addition to the other proceeds from the sale of wheat, an amount equal to the value of such certificates.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Wheat farmers

How is this law related to drought? No data

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): No data

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U.S. Code Number: 7USC1379-c

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35; SubChap II; Part D Sec. 1379-c.

Function: Response

Law Description: In the event of drought, section 1379c.(a) directs the Secretary of Agriculture to consider an acreage of wheat not planted because of drought, ... shall be deemed to be an actual acreage of wheat planted for harvest for purposes of this subsection provided such acreage is not subsequently planted to any crop for which there are marketing quotas or voluntary adjustment programs in effect.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Wheat farmers

How is this law related to drought? In the event of drought, this code prevents
the acreage of wheat from shrinking because of the acres that aren't in the base acreage of the county, etc.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

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U.S. Code Number: 7USC1427

Chapter: Department of Agriculture

Law Title/Statute: USC Title 7; Chap 35A; SubChap I; Sec. 1427.

Function: Response

Law Description: Sec. 1427 (e)(1) provides, Notwithstanding the foregoing provisions of this section, the Corporation [Commodity Credit Corporation], on such terms and conditions as the Secretary may consider in the public interest, may -- (A) make available any farm commodity or product thereof owned or controlled by the Corporation for use in relieving distress -- (i) ... (ii) in connection with any major disaster determined by the President to warrant assistance by the Federal Government under the Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.); and (B) donate or sell commodities in accordance with subchapter V (7 USC 1471a.) of this chapter. Public Law 98-180, 97 Stat. 1151, authorized the Secretary to provide damaged corn to livestock producers beginning in late 1983. Public Law 100-387,Title I, Sec. 101(b)(4), Aug. 11, 1998, 102 Stat. 932 repealed the section allowing the use of damaged corn to feed livestock and poultry if the shortage was caused by drought. There is a note that this section is inapplicable to 1996 through 2002 crops of loan commodities, peanuts, and sugar and inapplicable to milk during period beginning Apr. 4, 1996 and ending Dec. 31, 2002.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Livestock and poultry farmers

How is this law related to drought? If desired, the Congress could pass legislation to empower this piece of code, so that during a drought, the Secretary of Agriculture could move commodities that are in storage out to either provide for free, or could sell at a reduced price to people who are suffering from severe drought.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: This section of code, when active, allowed farmers to utilize a source of feed which normally was unavailable, and which reduced the animal feeders' costs of operation when feed would have been expensive.
Law Description: If an emergency is created by drought, the Secretary of Agriculture, using Sec. 1441-2(e)(7)(B), may modify or terminate any participation agreements with rice farmers.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Rice farmers

How is this law related to drought? Rice farmers suffering from a severe drought can be released from their participation agreements by the Secretary of Agriculture. This will give them more freedom to acquire income to make it through the drought.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

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Law Description: Sec. 1444 (d)(3) provides, the Secretary of Agriculture can find that 1966–1970 acreage is not planted to upland cotton because of drought. As long as the acreage isn't planted to some other crop that has a market quota or agriculture program, then the cotton acreage is treated as if it were planted. Sec. 1444 (e) is the program for the [1971–1977] cotton crop. In (2) the Secretary may find that if drought, or other disaster prevents planting any portion of the allotment, the rate of payment for such portion shall be the larger of (A) the foregoing rate, or (B) one-third of the established price. If the Secretary determines that, because of such a disaster or condition, the total quantity of cotton which the producers are able to harvest on any farm is less than 66\(\frac{2}{3}\) percent of the farm base acreage allotment times the average yield established for the farm, the rate of payment for the deficiency in production below 100 percent shall be the larger of (A) the preceding rate, or (B) one-third of the established price. Paragraph (e)(2) provides special conditions for small farms. The payment rate with respect to any producer who (i) is on a small farm (that is, a farm on which the base acreage allotment is ten acres or less, or on which the yield used in making payments times the farm base acreage allotment is five thousand pounds or less, and for which the base acreage allotment has not been reduced under section 1350(f) of this title, (ii) resides on
such farm, and (iii) derives his principal income from cotton produced on such farm, shall be increased by 30 per centum; but, notwithstanding paragraph (3), such increase shall be made only with respect to his share of cotton actually harvested on such farm within the quantity specified in paragraph (3). Paragraph (e)(3) provides, if the acreage not planted is determined by the Secretary, to be due to drought, then it shall be considered to be planted. The second reference to drought provides that the actual yields shall be adjusted by the Secretary for abnormal yields in any year caused by drought, flood, or other natural disaster. Paragraph (h)(4, 5, & 6) establishes a program for extra long staple cotton beginning with the 1984 crop. Paragraph (4) provides, the farm program payment yield for each crop of extra long staple cotton shall be determined on the basis of the actual yields per harvested acre on the farm for the preceding three years, except that the actual yields shall be adjusted by the Secretary for abnormal yields in any year caused by drought, flood, or other natural disaster, or any other condition beyond the control of the producers. If the Secretary finds that there is an imbalance of supply and demand for the long staple cotton, he can impose restrictions on the program. The following applies to how the Secretary may determine acreage, etc for the restriction. "The acreage base for any farm for the purpose of determining any reduction required to be made for any year as a result of a limitation under this subparagraph shall be the average acreage planted on which the determination is made. Paragraph (h)(4, 5, & 6) provides, for the purpose of the preceding sentence, acreage planted to extra long staple cotton for harvest shall include any acreage which the producers were prevented from planting to extra long staple cotton or other nonconserving crops in lieu of extra long staple cotton because of drought, flood, or other natural disaster or other condition beyond the control of the producers. Paragraph (h)(6), provides that if a farmer desires to participate in a program for extra long staple cotton will execute an agreement with the Secretary of Agriculture. The Secretary may, by mutual agreement with the producers on the farm, terminate, or modify any such agreement if the Secretary determines such action necessary because of an emergency created by drought, or other disaster ...

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Cotton farmers, Long staple cotton producers

How is this law related to drought? Treating drought acreage as planted will reduce farmers' costs and won't cut their long-term program acres. A small cotton farmer, suffering from drought, will be paid 130% of what his actual cotton harvest would have brought. Acreage not planted because of drought, will be treated as if it had been planted and thus will not reduce the farmer's program acreage. Drought is a condition that allows the Secretary of Agriculture to either reduce the terms that farmers have to meet or even can forgo the terms and thus reduce the farmer's production costs. Depending upon the market forces acting upon the supply of long staple cotton, the Secretary of Agriculture can adjust the yield used in the program if drought has caused a reduction in the yield. In the event of severe drought, the Secretary of Agriculture can modify or drop the terms of the program agreement with the long staple cotton producer.

Law Limitations: No data
U.S. Code Number: 7USC1463

Chapter: Department of Agriculture

Law Title/Statute: 7 USC Sec. 1463.

Function: Response

Law Description: Sec. 1463 defines crop acreage bases and (c)(2) describes that the crop acreage base is considered to have been planted when producers can't plant because of drought.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Farmers, who are able to grow agricultural program crops.

How is this law related to drought? This code also allows the agriculture programs to assume that acreage not planted because of drought, is planted. This will mean that the rolling average acres for the program will not decline.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

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U.S. Code Number: 7USC1471a

Chapter: Department of Agriculture

Law Title/Statute: 7 USC Sec. 1471a.

Function: Response

Law Description: 7 USC 1471a provides, (a) the Secretary of Agriculture can determine that a livestock emergency exists in the state or county because of drought, or other cause, and can then provide emergency livestock feed assistance.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Livestock farmers

How is this law related to drought? The Secretary can provide emergency feed when a drought emergency occurs.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data
U.S. Code Number: 7USC1471b

Chapter: Department of Agriculture

Law Title/Statute: 7 USC Sec. 1471b.

Function: Response

Law Description: Either the Governor or the county committee (established under 16 USC 590h., where it provides that the Secretary will establish a committee of no less than 3 and no more than 5 producers who receive benefits from the program) may determine that a livestock emergency exists in the State or county and they may submit a request to the Secretary of Agriculture for emergency livestock feed assistance. If the Secretary agrees with their finding, then he can proceed as is detailed in 7 USC 1471a. In 7 USC 1471b(b) the Secretary may make his own determination and proceed as in 7 USC 1471a.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Livestock farmers

How is this law related to drought? This is an alternate way for livestock farmers to receive benefits when a drought emergency exists.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

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U.S. Code Number: 7USC1471c

Chapter: Department of Agriculture

Law Title/Statute: 7 USC Sec. 1471c.

Function: Response

Law Description: 7 USC 1471c provides, (a) Qualifying livestock producers (1) If the Secretary [of Agriculture] determines that a livestock emergency exists in a State, county, or area, qualifying livestock producers located in such State, county, or area, or in a contiguous county as provided for in [7 USC 1471a(b)] of this title, shall be eligible (under application procedures established by the Secretary [of Agriculture] for emergency feed assistance under this subchapter in accordance with this subsection. (2) For the purposes of this subsection, a "qualifying livestock producer" is a livestock producer who has suffered a substantial loss in feed normally produced on the farm for such producer's livestock as a result of the livestock emergency and, as a result, does not have sufficient feed that has adequate nutritive value and is suitable for each of such producer's particular types of livestock (as of the date of the request, or initiation of consideration, for a determination of a livestock emergency under section 1471b of this title) for the
estimated duration of the emergency. 7 USC 1471c provides, (3) Each qualifying livestock producer shall be eligible for emergency feed assistance under the programs specified in section 1471d(a) of this title that is made available where the producer is located in quantities sufficient to meet such feed deficiency with respect to the producer’s livestock normally fed with feed produced by the producer. 7 USC 1471c. (b) availability of additional assistance Each livestock producer in such State, county, or area, or in a contiguous county as provided for in section 1471a(b) of this title, regardless of whether the producer qualifies for assistance under subsection (a) of this section, shall be eligible for emergency assistance under the programs specified in section 1471e of this title that are made available where the producer is located.

**Agencies (Primary agency listed first):** USDA-FSA

**Customers Served:** Livestock producers in counties that have drought or that are in counties bordering on the drought counties.

**How is this law related to drought?** This allows the secretary to extend the livestock benefits of agriculture programs into counties that are not totally within a drought area. If some farms are over the line, in another county, they too can be pulled into the programs by this section.

**Law Limitations:** No data

**Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective):** No data

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**U.S. Code Number:** 7USC1471d

**Chapter:** Department of Agriculture

**Law Title/Statute:** Price Support of Agricultural Commodities -- Emergency Livestock Feed Assistance Act of 1988 7 USC Sec. 1471d. Assistance programs.

**Function:** Response

**Law Description:** Available Programs --In accordance with section 1471c(a) of this title, the Secretary shall make one or more of the following assistance programs available to qualifying livestock producers in a State, county or area, if the Secretary determines that the livestock emergency in such State, county or area requires the implementation of such program: (1) The donation of feed grain owned by the Commodity Credit Corporation to producers who are financially unable to purchase feed under paragraph (2) or to participate in any other program authorized under this subsection.

**Agencies (Primary agency listed first):** USDA-FSA

**Customers Served:** Livestock producers

**How is this law related to drought?** Allows Secretary (of Agriculture) to create assistance programs for qualifying livestock producers.
Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1471e

Chapter: Department of Agriculture

Law Title/Statute: Price Support of Agricultural Commodities -- Emergency Livestock Feed Assistance Act of 1988 7 USC Sec. 1471e. Assistance programs

Function: Response

Law Description: Determination by Secretary (of Agriculture)--In addition to the assistance provided under section 1471d of this title, if the Secretary determines that the livestock emergency also requires the implementation of one or more of the assistance programs described in subsection (b) of this section, the Secretary shall implement such programs.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Livestock producers

How is this law related to drought? Allows Secretary (of Agriculture) to create assistance programs for qualifying livestock producers.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1508

Chapter: Department of Agriculture

Law Title/Statute: Crop Insurance

Function: Response

Law Description: 7 USC 1508 (a) provides, crop Insurance may operate if the losses are caused by drought. The insurance may not cover losses other than "in the field." (appears to mean that the insurance can not be used to cover losses that might occur while in storage.) Several exclusions are listed in (a)(3). They are logical for an insurance program, i.e. won't cover losses through neglect or malfeasance, won't cover losses from poor farming practices, and if it is customary to reseed and this is not done, the Secretary of Agriculture won't cover the loss.

Agencies (Primary agency listed first): USDA
Customers Served: Crop producers

How is this law related to drought? This appears to give the Secretary of Agriculture the authority to utilize crop insurance on eligible crops if they are damaged by drought. There may be other sections of code that need to be examined relative to crop insurance.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): The code doesn't provide funding nor even authorization to obtain funding through a funding measure.

---

U.S. Code Number: 7 USC 1519

Chapter: Department of Agriculture

Law Title/Statute: Crop Insurance

Function: Response

Law Description: Section 1519.(a) provides, the Secretary of Agriculture is able to "establish a noninsured crop disaster assistance program" equivalent to that available in sec. 1508 of Chap 36. In Sec. 1519(h)(3) the producer who is able to receive drought loss payments from two or more different programs is required to choose and only take from one.

Agencies (Primary agency listed first): USDA

Customers Served: Crop producers

How is this law related to drought? This gives the Secretary of Agriculture the authority to establish a noninsured crop insurance program. One of the obvious problems is, this doesn't authorize or provide funding for such a program. There may be other sections of code that need to be examined relative to crop insurance.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): The code doesn't provide funding nor even authorization to obtain funding through a funding measure.

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U.S. Code Number: 7USC1838

Chapter: Department of Agriculture

Law Title/Statute: Soil Bank Program

Function: Response, Mitigation
Law Description: Appears to be only for years 1965 - 1970.

Agencies (Primary agency listed first): USDA-FSA

Customers Served: Land owners

How is this law related to drought? No data

Law Limitations: This program doesn't exist anymore.

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1929a

Chapter: Department of Agriculture

Law Title/Statute: Rural Development Insurance Fund

Function: Response

Law Description: This section allows loan guarantees for rural entities, cooperatives, or Indian tribes in order to alleviate distress caused by the drought of 1988 or 89.

Agencies (Primary agency listed first): USDA-RMA

Customers Served: Rural people

How is this law related to drought? This program guaranteed loans to relieve distress caused by drought in '88 & '89.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective: No data

U.S. Code Number: 7USC1964

Chapter: Department of Agriculture

Law Title/Statute: Ag Credit Emergency Loans

Function: Response

Law Description: This subchapter is for emergency loans. The Community Emergency Drought Relief Act of 1977 (CEDRA77) is PL 95-31, dated May 23, 1977, 91 Stat. 169. In 1964, (e) the Secretary of Agriculture may use this if a political subdivision has a population of fewer than 10,000, but if the population is over 10,000, they would be eligible for a grant under the CEDRA77 as long as CEDRA77 is or has been in effect.
Agencies (Primary agency listed first): USDA-RDA

Customers Served: Rural communities

How is this law related to drought? A drought may qualify the local community for an emergency loan.

Law Limitations: No data

Unmet needs at federal, state, local, and tribal levels (includes changes from customer or "provider" perspective): No data
### Acronyms Used in the Summary of Regional Programs

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### Acronyms Used in the Summary of Regional Programs

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Fact Sheet

Background

The National Drought Policy Act of 1998 (the Act), Public Law 105-199, was signed by the President on July 16, 1998. The Act establishes the National Drought Policy Commission (NDPC) to provide advice and recommendations on the creation of an integrated, coordinated Federal policy designed to prepare for and respond to serious drought emergencies.

Purpose

The NDPC is charged with making recommendations on:

- How to better integrate Federal drought laws and programs with ongoing State, local, and tribal programs;
- How to improve public awareness of the need for drought mitigation, prevention, and response;
- Whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency, and if so, identify the agency.

The NDPC is to conduct a thorough study and, no later than eighteen months after the date of the enactment of the Act, submit a report to the President and Congress which contains a detailed statement of the findings and conclusions of the NDPC, together with its recommendations for such legislation and administrative actions as it considers appropriate.

Members

In addition to the Secretary of Agriculture, who will chair the committee, other members include:

- The Secretary of the Interior or a designee;
- The Secretary of the Army or a designee;
- The Secretary of Commerce or a designee;
- The Director of the Federal Emergency Management Agency or a designee;
- Two persons nominated by the National Governors' Association and appointed by the President -- one governor of a State east of the Mississippi River and one governor of a State west of the Mississippi River;
- A person nominated by the National Association of Counties and appointed by the President;
- A person nominated by the United States Conference of Mayors and appointed by the President; and
- Six persons, appointed by the Secretary of Agriculture in coordination with the Secretary of the Interior and the Secretary of the Army, representing groups acutely affected by drought emergencies. Such groups include the agricultural production community, credit community, rural and urban water associations, Native Americans, and fishing and environmental interests.

The public may send comments to:

USDA/FSA/AO
National Drought Policy Commission
STOP 0501
1400 Independence Ave., SW
Washington, DC 20250-0501

or e-mail: leona.dittus@usda.gov

A copy of the National Drought Policy Act and other related information is available on the NDPC website at www.fsa.usda.gov/drought

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Public Law 105-199

An Act

To establish an advisory commission to provide advice and recommendations on the creation of an integrated, coordinated Federal policy designed to prepare for and respond to serious drought emergencies.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Drought Policy Act of 1998".

SEC. 2. FINDINGS.

Congress finds that--

(1) the United States often suffers serious economic and environmental losses from severe regional droughts and there is no coordinated Federal strategy to respond to such emergencies;

(2) at the Federal level, even though historically there have been frequent, significant droughts of national consequences, drought is addressed mainly through special legislation and ad hoc action rather than through a systematic and permanent process as occurs with other natural disasters;

(3) there is an increasing need, particularly at the Federal level, to emphasize preparedness, mitigation, and risk management (rather than simply crisis management) when addressing drought and other natural disasters or emergencies;

(4) several Federal agencies have a role in drought from predicting, forecasting, and monitoring of drought conditions to the provision of planning, technical, and financial assistance;

(5) there is no single Federal agency in a lead or coordinating role with regard to drought;

(6) State, local, and tribal governments have had to deal individually and separately with each Federal agency involved in drought assistance; and

(7) the President should appoint an advisory commission to provide advice and recommendations on the creation of an integrated, coordinated Federal policy designed to prepare for, mitigate the impacts of, respond to, and recover from serious drought emergencies.

SEC. 3. ESTABLISHMENT OF COMMISSION.

(a) Establishment.--There is established a commission to be known as the National Drought Policy Commission (hereafter in this Act referred to as the "Commission").
(b) Membership.--

(1) Composition.--The Commission shall be composed of 16 members. The members of the Commission shall include--

(A) the Secretary of Agriculture, or the designee of the Secretary, who shall chair the Commission;

(B) the Secretary of the Interior, or the designee of the Secretary;

(C) the Secretary of the Army, or the designee of the Secretary;

(D) the Secretary of Commerce, or the designee of the Secretary;

(E) the Director of the Federal Emergency Management Agency, or the designee of the Director;

(F) the Administrator of the Small Business Administration, or the designee of the Administrator;

(G) two persons nominated by the National Governors' Association and appointed by the President, of whom--

(i) one shall be the governor of a State east of the Mississippi River; and

(ii) one shall be a governor of a State west of the Mississippi River;

(H) a person nominated by the National Association of Counties and appointed by the President; and

(I) a person nominated by the United States Conference of Mayors and appointed by the President;

(J) six persons, appointed by the Secretary of Agriculture in coordination with the Secretary of the Interior and the Secretary of the Army, who shall be representative of groups acutely affected by drought emergencies, such as the agricultural production community, the credit community, rural and urban water associations, Native Americans, and fishing and environmental interests.

(2) Date.--The appointments of the members of the Commission shall be made no later than 60 days after the date of the enactment of this Act.

c) Period of Appointment; Vacancies.--Members shall be appointed for the life of the Commission. Any vacancy in the Commission shall not affect its powers, but shall be filled in the same manner as the original appointment.

d) Initial Meeting.--No later than 30 days after the date on which all members of the Commission have been appointed, the Commission shall hold its first meeting.

e) Meetings.--The Commission shall meet at the call of the chair.

f) Quorum.--A majority of the members of the Commission shall constitute a quorum, but a lesser number of members may hold hearings.

g) Vice Chair.--The Commission shall select a vice chair from among the members who are not Federal officers or employees.

SEC. 4. DUTIES OF THE COMMISSION.

(a) Study and Report.--The Commission shall conduct a thorough study and submit a report on national drought policy in accordance with this section.

(b) Content of Study and Report.--In conducting the study and report, the Commission...
(1) determine, in consultation with the National Drought Mitigation Center in Lincoln, Nebraska, and other appropriate entities, what needs exist on the Federal, State, local, and tribal levels to prepare for and respond to drought emergencies;

(2) review all existing Federal laws and programs relating to drought;

(3) review State, local, and tribal laws and programs relating to drought that the Commission finds pertinent;

(4) determine what differences exist between the needs of those affected by drought and the Federal laws and programs designed to mitigate the impacts of and respond to drought;

(5) collaborate with the Western Drought Coordination Council and other appropriate entities in order to consider regional drought initiatives and the application of such initiatives at the national level;

(6) make recommendations on how Federal drought laws and programs can be better integrated with ongoing State, local, and tribal programs into a comprehensive national policy to mitigate the impacts of and respond to drought emergencies without diminishing the rights of States to control water through State law and considering the need for protection of the environment;

(7) make recommendations on improving public awareness of the need for drought mitigation, and prevention; and response on developing a coordinated approach to drought mitigation, prevention, and response by governmental and nongovernmental entities, including academic, private, and nonprofit interests;

and

(8) include a recommendation on whether all Federal drought preparation and response programs should be consolidated under one existing Federal agency and, if so, identify such agency.

(c) Submission of Report.--

(1) In general.--No later than 18 months after the date of the enactment of this Act, the Commission shall submit a report to the President and Congress which shall contain a detailed statement of the findings and conclusions of the Commission, together with its recommendations for such legislation and administrative actions as it considers appropriate. 

(2) Approval of report.--Before submission of the report, the contents of the report shall be approved by unanimous consent or majority vote. If the report is approved by majority vote, members voting not to approve the contents shall be given the opportunity to submit dissenting views with the report.

SEC. 5. POWERS OF THE COMMISSION.

(a) Hearings.--The Commission may hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence as the Commission considers necessary to carry out the purposes of this Act.

(b) Information From Federal Agencies.--The Commission may secure directly from any Federal department or agency such information as the Commission considers necessary to carry out the provisions of this Act.

Upon request of the chair of the Commission, the head of such department or agency shall furnish such information to the Commission.

(c) Postal Services.--The Commission may use the United States mails in the same
manner and under the same conditions as other departments and agencies of the Federal Government.

(d) Gifts.--The Commission may accept, use, and dispose of gifts or donations of services or property.

SEC. 6. COMMISSION PERSONNEL MATTERS. 42 USC 5121 note.

(a) Compensation of Members.--Each member of the Commission who is not an officer or employee of the Federal Government shall not be compensated for service on the Commission, except as provided under subsection (b). All members of the Commission who are officers or employees of the United States shall serve without compensation in addition to that received for their services as officers or employees of the United States.

(b) Travel Expenses.--The members of the Commission shall be allowed travel expenses, including per diem in lieu of subsistence, at rates authorized for employees of agencies under subchapter I of chapter 57 of title 5, United States Code, while away from their homes or regular places of business in the performance of services for the Commission.

(c) Detail of Government Employees.--Any Federal Government employee may be detailed to the Commission without reimbursement, and such detail shall be without interruption or loss of civil service status or privilege.

(d) Administrative Support.--The Secretary of Agriculture shall provide all financial, administrative, and staff support services for the Commission.

SEC. 7. TERMINATION OF THE COMMISSION. 42 USC 5121 note.

The Commission shall terminate 90 days after the date on which the Commission submits its report under section 4.


LEGISLATIVE HISTORY--H.R. 3035 (S. 222):

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HOUSE REPORTS: No. 105-554, Pt. 1 (Comm. on Transportation and Infrastructure).
SENATE REPORTS: No. 105-144 accompanying S. 222 (Comm. on Governmental Affairs).
June 16, considered and passed House.
June 24, considered and passed Senate.
<all>
LINKS

- National Drought Mitigation Center
- Drought Monitor
- American Water Works Association
- Water Wiser
- National League of Cities
- U. S. Conference of Mayors
- Western Governors' Association
- National Governors' Association
- Texas Natural Resources Conservation Commission
- Kentucky Water Supply Planning Drought Status Home Page
- Agricultural Weather Center
- Kentucky Connect
- Pennsylvania Drought Information Center
- South Carolina Drought Information Center
- West Virginia Drought Emergency Information

Check back periodically for updated links.