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LR Testimony 01/01/06

## **144 NGOs Support The One-Dam Solution**

November 30, 2005

Mr. Bob Johnson

Regional Director

Bureau of Reclamation, Lower Colorado Region

Attention: BCOO-1000

P.O. Box 61470

Boulder City, NV 89006-1470

Mr. Rick Gold

Regional Director

Bureau of Reclamation, Upper Colorado Region

Attention: UC-402

125 South State Street

Salt Lake City, Utah 84318-1147

Dear Mr. Johnson & Mr. Gold,

Living Rivers, Colorado Riverkeeper, and the 144 undersigned organizations submit the following report, The One-Dam Solution, as scoping comments for the development of management strategies for operations at Lake Powell and Lake Mead, on the Colorado River, under low reservoir conditions.

With current demand for Colorado River water nearly at the river's historical annual flow of 13.5 million-acre feet (MAF) and rising, and government-sponsored scientists anticipating average annual flows to decline 18 percent by 2040, the prospect of ongoing low water conditions for Colorado River reservoirs is a near certainty. The average flow of 60 percent into the system for the past six years is firm evidence of this.

For more than 25-years, government scientists and administrators have warned that shortages would be occurring now. This action is the first to reexamine the flawed operational strategies that have been in place as far back as 1922 when the Colorado River Compact allocated 11 percent more water than the Colorado River has to give.

Reexamining these two reservoirs is critical, as they constitute more than two-thirds of the system's storage capacity, which with declining inflows and increased demand are proving excessive.

Meanwhile, these two reservoirs can cause the loss of upwards of ten percent of the river's average annual flow due to evaporation—valuable water for critical habitats and water users downstream.

Furthermore, the challenges facing the future operations of these reservoirs go beyond water allocation and storage inefficiencies. Sediment entering Lake Powell will eventually compromise Glen Canyon Dam's safety. Despite recent warnings that this could happen sooner than the 40-year-old estimate of 2060, there has been no comprehensive monitoring or analysis conducted to address this inevitable problem.

Lastly, despite more than \$200 million already spent, no gains have been made to restore the critical habitat for endangered species in Grand Canyon National Park impacted by Glen Canyon Dam's operations. The mandates of the Grand Canyon Protection Act and the Endangered Species Act in particular are being ignored to maintain Lake Powell even though it is proving to be both wasteful and unnecessary for water storage.

It is therefore critical that the Bureau of Reclamation broadly reexamine the operations of these facilities in accordance with preparing an Environmental Impact Statement to address the following:

- 1) Pursue transfers of Lake Powell and Lake Mead storage to groundwater aquifers.
- 2) Develop a sustainable sediment management program for Lake Powell and Lake Mead.
- 3) Determine the costs and benefits of decommissioning Glen Canyon Dam to restore natural flows through Glen and Grand Canyons.
- 4) Identify new water allocation guidelines to reflect the amount of water the Colorado River actually provides, how it should be distributed and what amounts are needed to protect critical habitats in Grand Canyon and elsewhere.

A water management crisis is looming on the Colorado River. The federal government, as Water Master, has the responsibility to help avert this. Most of the issues addressed in the attached report are not new, but continuing to ignore them will only worsen the impacts once the crisis arrives.

Thank you for the opportunity to submit these comments. We look forward to assisting the Bureau of Reclamation in developing this Environmental Impact Statement concerning the protection of water resources from the Colorado River in times of shortage.

Sincerely yours,

John Weisheit Conservation Director, Living Rivers Colorado Riverkeeper

Attachment: [The One-Dam Solution](#)

Submitted July 26, 2005 at Henderson, Nevada

On behalf of the following groups:

A Critical Decision

Alabama Environmental Council

Alaska Coalition  
American Wildlands  
Animas Riverkeeper  
Appalachian Forest Coalition  
Audubon Society of Greater Denver  
Ballona Institute  
Black Warrior Riverkeeper  
Blackwater/Nottoway Riverkeeper  
Bluewater Network  
Boulder Regional Group  
Buckeye Forest Council  
Californians for Western Wilderness  
California Save Our Streams Council  
Casco Baykeeper  
Castle-Crown Wilderness Coalition  
Center for Biological Diversity  
Choqueyapu Riverkeeper  
Citizens of Lee Environmental Action Network  
Citizens Progressive Alliance  
Coalition for Jobs and the Environment  
Coastal Law Enforcement Action Network  
Cold Mountain, Cold Rivers  
Coloradans for Utah Wilderness  
Colorado Plateau River Guides  
Colorado White Water Association  
Columbia Riverkeeper  
Conservation Northwest  
Coosa River Basin Initiative  
Devil's Fork Trail Club  
Dogwood Alliance  
Earth Action Network  
Ecology Center  
Electors Concerned about Animas Water  
Endangered Habitats League  
Erie Canalkeeper  
Flagstaff Activist Network  
Forest Guardians  
Forest Watch  
Forests Forever  
Foundation for Global Sustainability  
Four Corners School of Outdoor Education  
Free the Planet  
Friends of Living Oregon Waters  
Friends of the Animas River  
Friends of Blackwater Canyon  
Friends of the Earth

Friends of the Eel River  
Friends of the Estuary at Morro Bay  
Friends of Hurricane Creek  
Friends of the Milwaukee River  
Friends of the Nanticoke River  
Friends of Yosemite Valley  
Gifford Pinchot Task Force  
Glen Canyon Institute  
Goods From The Woods  
Grand Canyon Private Boaters Association  
Grand Riverkeeper  
Great Egg Harbor Watershed Association  
Great Old Broads for Wilderness  
Greenaction for Health and Environmental Justice  
Green Delaware  
Green Party of Utah  
Green Party of York County  
Hells Canyon Preservation Council  
Hudson Riverkeeper  
Hurricane Creekkeeper  
Indiana Forest Alliance  
Inland Empire Waterkeeper  
International Rivers Network  
International Society for Preservations of the Tropical Rainforest  
Johnson County Green Party  
Jumping Frog Research Institute  
Kern Valley River Council  
Kettle Range Conservation Group  
Land Institute  
London Canalkeeper  
Lone Tree Council  
Los Alamos Study Group  
Louisiana Bayoukeeper  
Lower Neuse Riverkeeper  
Maricopa Audubon  
Milwaukee Riverkeeper  
Montana River Action  
Morava Riverkeeper  
National Organization for Rivers  
National Water Center  
New Riverkeeper  
New River Foundation  
Northwest Rafters Association  
Northwoods Wilderness Recovery  
Neuse River Foundation  
Ogeechee-Canoochee Riverkeeper

Orange County Coastkeeper  
Oregon Natural Desert Association  
Outdoor Adventure River Specialists  
Outward Bound West  
Patapsco Coastkeeper  
Patrick Environmental Awareness Group  
Puerto Rico Coastkeeper  
Raritan Riverkeeper  
Red Rock Forests  
Restore: The North Woods  
Ridgeline & Open Space Coalition  
River Runners for Wilderness  
Riverhawks  
Rocky Mountain Peace and Justice Center  
Russian Riverkeeper  
Sacramento River Preservation Trust  
Salt Creek Watershed Network  
San Diego Coastkeeper  
San Luis Obispo Coastkeeper  
Santa Monica Baykeeper  
Satilla Riverkeeper  
Save the Illinois River  
Siskiyou Project  
Snake River Alliance  
South Riverkeeper  
South Yuba River Citizens League  
Southern Appalachian Forest Coalition  
Southern Utah Wilderness Alliance  
Spirit of Sage Council  
Swan View Coalition  
Taking Responsibility for the Earth and Environment  
Taxpayers for the Animas River  
The Clinch Coalition  
The River Project  
Umpqua Watersheds  
Upper Coosa Riverkeeper  
Upper Neuse Riverkeeper  
Ventura Coastkeeper  
Virginia Forest Watch  
Waterkeepers of Australia  
West/Rhode Riverkeeper  
Western Lake Erie Waterkeeper  
Western Lands Project  
Western Watersheds Project  
Wetlands Action Network  
Wild South

Wild Virginia  
Wild Wilderness  
Wilderness Watch  
Wildlaw

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LR in the News 02/16/06

## **Groups Sue Feds Over Colorado River Fish**

By AMANDA LEE MYERS Associated Press Writer © 2006 The Associated Press

PHOENIX — Five environmental groups filed a lawsuit against the federal government Thursday, saying it has failed to protect endangered fish in the Colorado River.

Because of the failure of the Interior Department and its Bureau of Reclamation to provide a more natural environment in the river, the humpback chub, razorback sucker, Colorado pikeminnow and bonytail chub are in danger of extinction, the suit alleges.

The suit, filed in U.S. District Court in Arizona, contends the government is violating federal law by operating Glen Canyon Dam in a manner that fails to protect the features of Grand Canyon National Park and Glen Canyon National Recreation Area.

The dam straddles the Arizona-Utah border, backing up the Colorado River to form Lake Powell. The suit contends the dam releases water at unnatural temperatures, quantity, quality and frequency, and deprives the Grand Canyon of sediment and needed nutrients.

The lawsuit asks the court to order Interior Secretary Gale Norton and the Reclamation Bureau to consult with the U.S. Fish and Wildlife Service over the effects of dam operations, and ultimately, provide a "more natural flow and water temperature regime" and "adequate downstream nutrients and sediment."

The species in the most danger is the humpback chub, the adult population of which declines between 15 percent and 20 percent each year, according to a 2005 report by the U.S. Geological Survey.

Currently, there are between 3,000 and 5,000 in the Colorado River, but that number could decline sharply to between 1,500 and 2,000 in the next 10 to 15 years if nothing is done.

"Arizona's native fish are overwhelmingly imperiled," said Robin Silver, conservation chair for the Center for Biological Diversity, one of the plaintiffs.

For years, officials have studied how to regulate the temperature of water released from the dam, said Barry Wirth, spokesman for the Bureau of Reclamation's Upper Colorado region. But change takes time, he said.

"There's a lot of things that come into play," he said. "We know the technology works. It's just not an off-the-shelf thing."

Wirth said programs such as reducing predators and water flow strategies help the humpback chub and other species.

Neither Wirth nor agency spokeswoman Trudy Harlow in Washington would comment directly on the lawsuit. The suit was filed by the Center for Biological Diversity, Sierra Club, Glen Canyon Institute, Living Rivers and Arizona Wildlife Federation. It followed another legal battle last month between the federal government and two environmental groups, Grand Canyon Trust and Earthjustice.

In that case, U.S. District Judge Frederick Martone ruled the U.S. Fish and Wildlife Service recovery plan for the endangered fish was ineffective. He ordered a new plan to include more specific goals and a timeline for recovery.

Although the ruling was a victory for the environmental groups, a better recovery plan won't save the fish unless the government acts on it, Silver said.

"A recovery plan does not save species because they're never obeyed," he said. "It won't cause anything to happen." \_\_\_\_\_

[Link to Press Release](#)

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LR Press Release 02/16/06

## **Conservation groups file suit to reverse harm to Grand Canyon's aquatic habitat**

For Immediate Release: February 16, 2006

### Contacts:

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Matt Kenna, Western Environmental Law Center 970-385-6941

John Weisheit, Living Rivers 435-259-1063

David Wegner, Glen Canyon Institute 970-259-2510

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Phoenix, AZ—The Center for Biological Diversity, Arizona Wildlife Federation, Living Rivers, Sierra Club – Grand Canyon Chapter, and Glen Canyon Institute file suit in U.S. District Court in Arizona today against Gale Norton, U.S. Department of the Interior, and the U.S. Bureau of Reclamation on behalf of the humpback chub and the Grand Canyon. For more than a decade the Bureau of Reclamation has been required to modify the operations of Glen Canyon Dam on the Colorado River to reverse the dam's

downstream impacts on Grand Canyon's priceless river ecosystem. These efforts have failed to produce results. The agencies are in violation of the Grand Canyon Protection Act, the Endangered Species Act and the National Environmental Policy Act.

"The agencies have neglected their responsibilities to this incredible place. Arizona's native fish are overwhelmingly imperiled, and only four of eight native fish species continue to exist in the Grand Canyon. The humpback chub's decline is just another example of the federal government's complete disregard for native wildlife and the irreplaceable habitat they represent," said Robin Silver, Board Chair of the Center for Biological Diversity.

In 1992, Congress passed the Grand Canyon Protection Act to reverse the demise of the canyon and the decline of endangered native fish species such as the humpback chub. Following the completion of an Environmental Impact Statement (EIS) three years later, the Glen Canyon Dam Adaptive Management Program was established to guide the Bureau of Reclamation in implementing recovery guidelines set forth by the U.S. Fish and Wildlife Service (USFWS). The unsuccessful "Modified Low Fluctuating Flow Alternative" (MLFF) is the operational scheme enacted in the Adaptive Management Program which called for released flood flow events with the hope of improving habitat and restoring native fish populations.

"To date, the negative impacts of Glen Canyon Dam continue to lead to the continual decline of the humpback chub. Clearly the Adaptive Management program, as being implemented by the federal government, is not working," said David Wegner, Glen Canyon Institute.

"The Grand Canyon Chapter has long worked to protect the Grand Canyon and the Colorado River, plus the species which rely on this important system," said Sandy Bahr, Conservation Outreach Director, Sierra Club – Grand Canyon Chapter. "We have supported efforts to remove non-native fish species and previous efforts to operate the dam in such a manner as to promote recovery of the fishes and to rebuild the beaches which are also being decimated by the operation of the dam. Clearly, the federal government needs to make some changes to protect our native fishes and to protect the recreation that relies on the Canyon's beaches."

In October 2005, the U.S. Geological Survey released its evaluation of this program in a 220-page report, "The State of the Colorado River Ecosystem in Grand Canyon." This report confirmed what many scientists have been saying for years: that recovery of the humpback chub is not being achieved. According to the report, "...it is clear that the restrictions on dam operations since 1991 have not produced the hoped for restoration and maintenance of this endangered species."

"Since the Fish and Wildlife Service issued its Biological Opinion on the dam's operations in 1994, the Bureau of Reclamation's actions have merely made things worse," said Living Rivers Conservation Director John Weisheit. "One more fish species is effectively extinct in the Canyon, and another is on the verge."

Despite the ongoing detrimental effects of Glen Canyon Dam on the humpback chub, razorback sucker, Colorado pikeminnow and bonytail chub, and the failure of the Adaptive Management Program to address those impacts, the agencies have not reinitiated consultation with USFWS and prepared a supplemental EIS as required by law.

The groups' suit aims to protect the native fish and aquatic habitat of the Grand Canyon and Colorado River by stopping the ongoing destruction caused by the current operations of Glen Canyon Dam. The suit does not seek to decommission the dam. Matt Kenna, Western Environmental Law Center in Colorado, represents the organizations.

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For More Information

[Complaint February 2006](http://www.livingrivers.org/pdfs/ComplaintFeb2006.pdf) [57k PDF File]  
<http://www.livingrivers.org/pdfs/ComplaintFeb2006.pdf>

[60-day notice letter](http://www.livingrivers.org/pdfs/CBD_LR_Notice.pdf) [57k PDF File]  
[http://www.livingrivers.org/pdfs/CBD\\_LR\\_Notice.pdf](http://www.livingrivers.org/pdfs/CBD_LR_Notice.pdf)

[Biological Opinion: Glen Canyon Dam](http://www.livingrivers.org/pdfs/BOgcd.pdf) [3700k PDF File]  
<http://www.livingrivers.org/pdfs/BOgcd.pdf>

USGS SCORE Report, released on October 25, 2005  
[The State of Natural and Cultural Resources in the Colorado River Ecosystem](http://www.gcmrc.gov/products/score/2005/score.htm)  
<http://www.gcmrc.gov/products/score/2005/score.htm>

LR Press Release, October 24, 2005  
[Grand Canyon Restoration Program, a Failing Grade](http://www.livingrivers.org/archives/article.cfm?NewsID=690)  
<http://www.livingrivers.org/archives/article.cfm?NewsID=690>

[Letter from Living Rivers and others for Supplemental EIS](http://www.livingrivers.org/archives/article.cfm?NewsID=567)  
<http://www.livingrivers.org/archives/article.cfm?NewsID=567>

[200 groups support the Supplemental EIS](http://www.savegrandcanyon.org)  
<http://www.savegrandcanyon.org>

[Glen Canyon Dam Adaptive Management Program](http://www.usbr.gov/uc/rm/amp/index.html)  
<http://www.usbr.gov/uc/rm/amp/index.html>

[Living Rivers](http://www.livingrivers2.org/)  
<http://www.livingrivers2.org/>  
Living Rivers is a non-profit organization dedicated to the restoration of the natural hydrological and ecological processes within the Colorado watershed to protect native species and their habitats.

[Center for Biological Diversity](http://www.biologicaldiversity.org/swcbd/)  
<http://www.biologicaldiversity.org/swcbd/>

The Center for Biological Diversity is a non-profit conservation organization with over 18,000 members dedicated to the protection of imperiled species and their habitats.

#### [Arizona Wildlife Federation](http://www.azwildlife.org/)

<http://www.azwildlife.org/>

The Arizona Wildlife Federation is Arizona's oldest conservation organization, founded in 1923 by Arizona hunters and anglers to protect and conserve Arizona's wildlife resources.

#### [Sierra Club Grand Canyon Chapter](http://arizona.sierraclub.org/)

<http://arizona.sierraclub.org/>

The Sierra Club is the nation's oldest and largest grassroots conservation organization with more than 13,000 members in Arizona.

#### [Glen Canyon Institute](http://www.glencanyon.org/)

<http://www.glencanyon.org/>

The Glen Canyon Institute is a non-profit conservation organization with over 1,500 members dedicated to restoring Glen Canyon and the protection of the natural and biological living systems of the Colorado River and its tributaries.

#### [Western Environmental Law Center](http://www.westernlaw.org/)

<http://www.westernlaw.org/>

The Western Environmental Law Center is a non-profit public interest environmental law firm that works to protect and restore Western wildlands and advocates for a healthy environment on behalf of communities throughout the West.

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LR in the News 02/17/06

### **Lawsuit targets Arizona dam**

Says native fish near extinction

Shaun McKinnon for The Arizona Republic Feb. 17, 2006 12:00 AM

Five environmental groups on Thursday accused the Interior Department of failing to protect native fish in the Grand Canyon and asked a federal court to order changes in how water flows into the Colorado River from Glen Canyon Dam.

Their lawsuit, filed in U.S. District Court in Phoenix, stopped short of demanding that the government decommission the dam, a drastic solution some activists say is the only way to restore the river's ecosystem.

Instead, the groups want the court to enforce an existing plan that calls for operating the dam in a way that will help the fish and other species downstream. The government has ignored that plan, the lawsuit alleges, and allowed some fish species to slide nearer to extinction. advertisement The suit could disrupt other attempts to control the river's flow

from Glen Canyon Dam, most notably the ongoing drought talks among the seven states that draw water from the Colorado. That plan could clash with some of the measures prescribed to help the native fish, whose populations have declined in the 40 years since the dam was built.

The groups want the courts to declare the Interior Department in violation of the Endangered Species Act and force the agency to conduct new environmental studies that would lead to changes in the dam's operations. The suit specifically says the groups are not seeking an injunction to stop or alter the flow of water from the dam.

In denouncing the government's efforts so far, the groups cite a plan released last year by the U.S. Geological Survey, which found little progress in species recovery or habitat restoration after experiments designed to mimic the river's pre-dam flows. That report noted trouble for at least four native species: the humpback chub, the razorback sucker, the Colorado pikeminnow and the bonytail chub.

"We waited patiently while they did their studies," said Robin Silver, board chairman for the Center for Biological Diversity, one of the groups that signed on to the suit. "It shouldn't be this way. The lawsuit should be unnecessary. But those agencies are not motivated to do what's necessary to make sure we get these species to survive."

Federal officials had not seen the full complaint Thursday, but it is likely to trigger a negative response from water managers in the seven Colorado River states, said Sid Wilson, general manager of the Central Arizona Project, which delivers water from the river to Phoenix and Tucson.

"If the environmental groups continue to push, you're going to have the seven states and the federal agencies and, frankly, the political officials from the seven states pretty united on all this," Wilson said. Because the states are working on their own plan to control flows from Glen Canyon Dam, any competing scheme could complicate work on the drought plan. Wilson said he has heard anecdotal evidence in recent months that some native fish populations are growing again, in part because of government-sponsored programs to remove non-native fish, such as trout, that feed on baby chubs.

"This suit is like anything else," he said. "If you want to discredit things, you can find them."

The complaint asks the court to force the Interior Department to revise an environmental impact statement written more than a decade ago after studies found evidence that the dam was harming the Colorado River ecosystem along the length of the Grand Canyon.

With the dam in place, the water that flowed into the Grand Canyon was cooler and clearer, creating conditions that are not friendly to the native fish. The dam also blocked seasonal floods and other fluctuations in the river's flow, which helped maintain beaches and other natural habitat in the canyon.

In 1992, Congress ordered the Interior Department to regulate the dam's flows in a way that would help restore the habitat and protect the native species. Two years later, the U.S. Fish and Wildlife Service found that the humpback chub and razorback sucker

were in jeopardy of extinction, triggering an adaptive management plan aimed at improving conditions.

One of the plan's most visible elements was a series of artificial floods designed to rebuild beaches. The first try in 1996 produced disappointing results, and later attempts were only slightly more successful. Future floods could be hampered by agreements among the seven states on how and when water is released.

"Their actions have merely made things worse," said John Weisheit, conservation director for the group Living Rivers. "One more fish species is effectively extinct in the Canyon and another is on the verge."

Weisheit's group has helped lead the charge to decommission Glen Canyon Dam and drain Lake Powell, restoring the river's natural flow through the Grand Canyon. That proposal has been widely discredited by water providers and federal agencies.

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[Additional information and press release](#)

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River News 03/14/06

### **Rivers: a drying shame**

We have used our engineering skills to harness the Earth's water systems. Now we are paying the price.

By Geoffrey Lean for The Independent (UK) March 12, 2006

The delta of the great Colorado River - where once it swept into the Gulf of California - used to be the most wonder-filled wetland in the whole North American continent. Some 400 species of plants and animals - including jaguars, beaver and the world's smallest dolphin- thronged its 3,000 square miles of wetlands, lagoons and tidal pools. The local people made a good living fishing its teeming waters. Now it has become a forbidding desert of salt flats and giant heaps of dead clamshells. The fishing boats have been long since beached; the destitute people have to seek what work they can in wheat fields and tortilla factories far away.

The reason for the transformation is not hard to find. Not a drop of the mighty river which once carved the Grand Canyon now flows through the delta to the sea. It has all been used upstream - to slake the thirst of cities such as Tucson, Arizona, feed fountains in Las Vegas, green golf courses and irrigate farmland. Such water as remains in the delta has flowed in from the sea.

It is much the same story in that other great river of the American south-west, the Rio Grande. This does not merely fail to reach the sea: it disappears for much of its length.

The atlases tell us it is one of the 20 longest rivers in the world, but in reality it stops some 800 miles inland at El Paso, Texas, which takes all its water. For the next 200 miles or so there is just a dribble of sewage in its old river bed, and even this often dries up in summer. Local people call it "the forgotten river". The dry channel does not come alive again until a relatively healthy tributary, the River Conchos, joins it from Mexico. For the rest of its length, as it forms the boundary between the two nations, it should, in justice, be called the Conchos, not the Rio Grande. But even this is quickly used up, mainly to irrigate farmland, and often fails to make it through to the Gulf of Mexico.

It is much the same story right across the world. China's Yellow River, the fifth longest in the world is in trouble at both ends. Its source in the Tibetan plateau is drying up - and for most of the past 35 years it has failed to reach the sea all year round.

Similarly, despite the words of the spiritual, the River Jordan is far from "deep and wide". In practice it ends at the Sea of Galilee, where Israeli engineers have blocked the outflow and piped the water to irrigate fields and supply Jerusalem and Tel Aviv.

Such water as flows down the Jordan valley again comes from a tributary, the River Yarmuk. But it cannot really do the job. In biblical times the valley carried a billion cubic metres of water every year; now it has to make do with less than a tenth of that. The ugly truth is that the river - sacred to Christians, Jews and Muslims - is now mainly made up of diluted sewage.

It is the same for river after famous river. The lower reaches of the Nile used to carry 32 billion cubic metres of water a year; now they are down to two billion. The Indus in Pakistan - "Asia's Nile" - similarly has lost 90 per cent of its water in the last 60 years. Australia's Murray River fails to reach the sea every other year.

Even in Europe, Germany's River Elbe has run so dry that it frequently becomes impassable to barge traffic for months at a time - and three years ago river traffic almost completely stopped on the Rhine. In Britain the Environment Agency regularly sounds the alarm about our chalk rivers and streams - which gave birth to the sport of fly-fishing. Dozens of them dry up every summer, and 40 of the 160 in the country are officially under threat.

The writer Fred Pearce, who has published a groundbreaking book on the crisis of the world's rivers, says: "The maps in an atlas no longer accord with reality. The old geography lessons about how rivers emerged from mountains, gathered water from tributaries and finally disgorged their bloated flows into the oceans are now fiction."

The UN-backed World Commission on Water for the 21st Century reported: "More than one half of the world's major rivers are being seriously depleted and polluted".

There are two main culprits; abstraction of water for rivers - usually after damming them - and global warming.

The world has, on average, built two giant dams a day, every day, for the past 50 years. Now 45,000 of them span the world's rivers. Every one of the world's 20 longest rivers is encumbered by them.

In many ways it all began on the Colorado, 70 years ago, with the Hoover Dam, the great symbol of Franklin Roosevelt's New Deal. Today, the dams intercept more than a third of the world's freshwater as it flows towards the sea and at any one time are holding back 15 per cent of it.

The UN's triennial World Water Development Report, published for a international conference in Mexico City this week, cautions that damming has "hugely changed the natural order of rivers worldwide." It goes on: "Humanity has embarked on a huge ecological engineering project with little or no preconception - or indeed full present knowledge - of the consequences. We have sought to redesign and impose a new order on natural planetary systems, built over aeons of time."

Dams waste massive amounts of water. In hot, dry regions, they lose about 10 per cent of their reservoirs to evaporation every year: much more is lost in irrigation. Global warming is making things even worse. The source of the Yellow River is drying out as glaciers retreat. And a great drought in the southwestern United States - so intense that even cacti are wilting - is exacerbating the crisis of the Colorado and the Rio Grande.

It is even endangering relatively healthy rivers. The Amazon, relatively unencumbered by great dams, was hit by the worst drought on record last year: water levels fell by 10 metres and boats were stranded. And salmon are endangered in Alaska's Yukon River because its waters are too warm.

This will only get worse as the world goes on heating up, making the desert delta of the Colorado just a foretaste of the rivers of the future.

## RIVER REPORT

### Amazon

Length: 4,000 miles

Famous as: Source of some of world's richest habitats

Problems: Depleted by a record drought last year. Widespread deforestation

Verdict: Largely undammed and rescuable

### Yellow River

Length: 2,900 miles

Famous as: Carries most silt

Problems: Source is drying out and river now usually fails to reach the sea

Verdict: Attempts at rescue. Task immense

### Jordan

Length: 104 miles

Famous as: Holy river

Problems: Effectively ends below the Sea of Galilee. Site where Jesus was baptised now a pool of sewage

Verdict: Hardly exists, damage seems terminal

### Rio Grande

Length: 1,900 miles

Famous as: Border river  
Problems: Now two rivers, split by 250-mile dry section  
Verdict: Over-exploited

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LR in the News 03/23/06

### **Plan for Grand Canyon use gets final approval**

March 24, 2006 USA Today

PHOENIX (AP) - More people will be able to raft down the Colorado River each year, but visitors will be spread out over a longer period of time and will be forced to travel in smaller groups, according to a new plan the National Park Service formally adopted Thursday.

More rafters will be shifted to fall, winter and spring months while the number of daily summertime launches of both motorized and non-motorized commercial rafts will decrease.

The result will be more tourists overall.

The new plan also eliminates the current waiting list for those who want to raft the river in non-commercial boats, replacing it with a lottery system.

More than 7,000 trip leaders are on the waiting list, said Jeffrey Cross, project manager for the plan. Many people have been waiting to go on trips for more than a decade, he said.

"Their lives often changed," Cross said. "They had babies, they moved, they changed jobs."

The long wait resulted in a cancellation rate between 30 and 50 percent, Cross said.

In the next six weeks, the 600 people who have waited the longest will be assigned dates spread throughout the next five years. After that, those on the waiting list can combine their waits with the waits of friends, allowing the longest 600 of those waits to be assigned dates.

After that, everyone else will be in the computerized lottery. The first drawing will be in August and will take up the rest of the available 2007 dates.

Those who have already been assigned trips for the summers of 2006 and 2007 will not be affected, said Steve Sullivan, who manages the waiting list.

"We heard pretty strongly from members of the public," Sullivan said. "A waiting list was not working for the people."

Additionally, the number of non-commercial trips allowed annually will double by 2007, allowing 500 trips a year, up from 240, Cross said.

The lower Colorado River, from Diamond Creek to Lake Mead, will see pontoon boat tours go up, allowing up to 480 passenger per day, up from between 130 and 188 passengers, depending on the time of year.

Members of the Hualapai American Indian tribe, which runs the lower river tours, had requested allowing nearly 1,000 passengers.

The plan bans jet boat tours entirely, but commercial operators that use the craft to meet rafts above Lake Mead would still be allowed.

Additionally, the maximum number of passengers on commercial boats will be trimmed by 10 to 32.

The approval of the final plan comes after four years of study by a group of scientists, Park Service managers and other professionals, with input from tour operators, Indian tribes and members of the public. It will be in place for the next 10 years, but alterations can be made if necessary.

The plan is being met with wide support, including the Grand Canyon River Outfitters Association and the Grand Canyon Private Boaters Association, two difficult-to-please groups, Sullivan said.

"That's kind of amazing," he said. "Three years ago, I would have said that would be unlikely. It's a pretty major accomplishment."

But not everyone is pleased.

"We're pretty disappointed," said Owen Lammers, director of Living Rivers, a river restoration group. "It's completely shortsighted and completely negligent in terms of the Park Service mission. They're failing. They're completely derelict in their duties."

Lammers said the plan should have addressed the environmental affects of the Glen Canyon Dam on the Colorado River and banned motorized boats altogether because "they're not necessary at all."

"They spent how many millions of dollars on this when the end result is a lottery system instead of a waiting list?" Lammers said. "It would be OK if they labeled it a human resources plan. It's not a river management plan at all. The public is just being completely misled by the Park Service."

Cross said there are non-motorized boats on the river, as well, and that the Park Service is just trying to meet the demands of the public.

ON THE NET: Management plan: [www.nps.gov/grca/crmp/](http://www.nps.gov/grca/crmp/)

Grand Canyon National Park: [www.nps.gov/grca/](http://www.nps.gov/grca/)

Living Rivers: [www.livingrivers2.org/](http://www.livingrivers2.org/)

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LR Press Release 03/28/06

## **Groups Sue to Protect the Grand Canyon**

Coalition effort to improve management of the Colorado River\

For Immediate Release: Tuesday, March 28, 2006

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(Denver) A coalition of groups has announced their lawsuit (not a 60-day notice) challenging last Thursday's National Park Service decision to continue to allow commercial motorized rafting tours and helicopter passenger exchanges through Grand Canyon National Park. Since Grand Canyon's recommendation for formal wilderness designation three decades ago, the Park has neglected to remove motorized tour boats and helicopters, that, by the Park's own admission, do not conform to legal wilderness standards.

The groups, Rock the Earth, River Runners for Wilderness, Living Rivers and Wilderness Watch, are defending this crown jewel of the National Park system and every visitor's right to a pristine wilderness experience in the backcountry and on the river. The coalition is represented by Julia Olson of Wild Earth Advocates and Matthew Bishop of the Western Environmental Law Center.

"After consulting with a number of partners and citizen groups, we feel that the recent park service ruling fails to properly fulfill the National Park Service mandate that the Colorado River through Grand Canyon must be managed as wilderness," states Rock The Earth Executive Director Marc Ross, "We're fighting to make sure the National Park

Service does the duty all Americans entrust them with: protecting this beloved natural treasure.”

In addition to the Park Service’s failure to remove motorized tour boats and helicopters in a qualifying wilderness area, the agency’s decision to perpetuate the inequitable allocation of river running permits is also at issue. Currently, commercial tours receive priority over public opportunities for do-it-yourself rafting and kayaking in the summer.

“The distribution of use is so skewed that public river runners have little or no chance of ever gaining a permit through the proposed lottery. It is scandalous discrimination against those choosing to do their own trips while tourists can buy their way onto a high-priced tour almost immediately,” notes Jo Johnson, Co-director of River Runners for Wilderness.

A third concern of the group is the Park Service’s failure to properly address and mitigate degradation of the Grand Canyon’s ecosystem by human use and the ongoing depredations of Glen Canyon Dam, including the lack of planning for lower river flows caused by the continuing drought.

“Dangerous national precedents for the commercialization and privatization of public lands and wilderness areas are at stake here,” said Julia Olson, lead attorney. “We hope they finally address these vital concerns now that we’ve filed notice.”

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For more information:

[Western Environmental Law Center](#)

[River Runners for Wilderness](#)

[Rock The Earth](#)

[Wilderness Watch](#)

[Living Rivers](#)

[Complaint](#) [164k PDF File]

[Grand Canyon National Park's Colorado River Management Plan](#)

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Regional News 03/29/06

**Arizona goes on 'red' alert over drought**

Shaun McKinnon for The Arizona Republic

Arizona turned red with extreme drought Tuesday after one of the driest winters on record left the state's high country draped with too much brown and not enough white.

The official drought monitor was moved from "severe" to "extreme" based on nearly non-existent snowpack and brittle soil and vegetation conditions. The recent rain and snow had little effect on a drought that is now entering its 11th year.

The new status won't trigger rationing or any other restrictions, but it comes with a lengthening list of things to do for state agencies and local government officials. Unless the governor declares an emergency, only those local officials can limit Arizonans' water use.

A map issued by the state drought-monitoring group Tuesday shows all but three counties colored bright red, indicating extreme drought. Mohave, La Paz and Yuma counties stayed at "severe."

This is the first time the state has used the drought monitor. If conditions worsen, the red could turn even darker, indicating the top category of "exceptional" drought.

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Regional News 03/30/06

### **Groups sue over plan for Grand Canyon's river corridor**

Land Letter on Thursday, March 30, 2006

April Reese for Land Letter Western reporter

Days after the National Park Service issued the final management plan for Grand Canyon National Park's river corridor, two environmental groups have filed suit seeking changes to the controversial plan.

The Colorado River Management Plan, which was codified in a record of decision issued March 23, is aimed at balancing public access to the 227-mile river corridor in the park with the protection of the canyon's natural resources. Thousands of rafters and kayakers ply the river's waters each year.

The 277-mile corridor of the Colorado River in the Grand Canyon is a popular destination for rafting enthusiasts.

But environmental groups and private river runners say the new plan favors commercial outfitters over private boaters.

Even though the new plan gives private boaters more access to the river overall, it relegates them largely to the off-season while allowing commercial, motorized trips in the popular spring and summer months. It also requires private boaters to complete their trips faster, giving them less time on the river, said Tom Martin, co-director of River Runners for Wilderness.

"It is scandalous discrimination against those choosing to do their own trips while tourists can buy their way onto a high-priced tour almost immediately," said Jo Johnson, co-director of River Runners for Wilderness.

"Dangerous national precedents for the commercialization and privatization of public lands and wilderness areas are at stake here," added Julia Olson, an attorney who is representing the groups in the case. "We hope they finally address these vital concerns now that we've filed notice."

Environmental groups also fear that the plan could hurt the river corridor's chances of being designated as wilderness, since it does not ban motorized boats. A long-standing Park Service directive requires the agency to manage the river to preserve its wilderness characteristics.

However, Linda Jalbert, a planner for Grand Canyon National Park, noted that allowing motorized rafting does not preclude the area from qualifying for wilderness designation. A provision in the Wilderness Act makes an exception for existing motorized use. The park recommended the river for wilderness designation in 1980, but Interior officials have not carried that request to Congress, Jalbert said. Under the plan -- itself a result of a lawsuit filed by environmentalists in 2002 over management of the popular canyon -- motorized and non-motorized use would be split into two periods, and river traffic would increase by about 2,200 boaters per year.

Motorized boating would be allowed during the main tourist season, from April 1 through Sept. 15, with non-motorized use primarily between September and March. Currently, the park allows boating nine months out of the year, and about 70 percent of permits go to commercial outfitters, with the rest going to private boaters. Under the park's new plan, the number of commercial trips would stay about the same, while access for private, noncommercial boaters would increase.

Overall, the new system would allow about 24,700 people on the river, up from 22,500 (Land Letter, Nov. 17, 2005).

The document also attempts to address the much-maligned permit system for non-commercial, private boaters, who currently must wait as long as a decade for a permit to float through the canyon. The park will now use a weighted lottery, where winners would be chosen each year for the following year's permits. Those who have waited longer for a river trip would be given more chances in the lottery.

Mike Denoyer, president of Grand Canyon Expeditions, said he believes the plan is fair to all concerned.

"They've made a very cooperative effort to make trips available to both the commercial and non-commercial sector," he said.

While the new plan will increase river traffic overall, it distributes launches more evenly throughout the year, lessening pressure on the river's resources and reducing crowding, Jalbert said.

"We were able to accomplish this balance by spreading the use out on a daily, weekly and even a seasonal basis," she said.

For instance, under the existing plan, up to nine trips could float down the river on a summer day, but the new plan allows only five to six trips per day in summer while increasing the number of allowable trips in the off-season, Jalbert said.

But critics said the plan does little to address beach erosion, degradation of cultural sites and other effects of those trips.

"Basically, instead of treating it as a wilderness resource, they're treating it like a water highway," said Sandy Bahr, conservation director for the Sierra Club's Grand Canyon chapter. "We think there will continue to be more damage to the vegetation, the beaches, and the cultural resources."

The Sierra Club has not yet decided whether to join the lawsuit, she added.

Western reporter April Reese is based in Santa Fe, N.M.

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LR in the News 03/30/06

## **Conservationists sue to keep motors out of Canyon**

By CYNDY COLE Sun Staff Reporter

Four environmental and river rafting groups are suing the National Park Service in an attempt to stop helicopter flights and motorized rafting in the Grand Canyon.

They want the park designated as wilderness and a recent decision that doubled river use for private boaters overhauled. It's the first lawsuit since the early 1980s to attack motorized rafting in the Grand Canyon, something the Park Service itself had recommended ending in the 1970s and '80s.

Motorized rafts and helicopters in the canyon have long been a target for some because of the noise they create. The Park Service itself decided repeatedly that motorized rafting was not in the best interest of the canyon's beaches, fish or visitors, the groups said in their lawsuit.

"We feel like we're going to battle on behalf of all American citizens. They deserve to have the Grand Canyon designated as wilderness," said Jo Johnson, co-director of River Runners for Wilderness.

But maybe extra federal protections for the canyon are a moot point.

Motorized rafting could be allowed even if the Grand Canyon and Colorado River were designated as wilderness, Park Service documents state.

Living Rivers, Rock the Earth and Wilderness Watch are the other plaintiffs. They say the Park Service failed to prove motorized commercial boating is necessary as required by law, failed to fairly distribute boating permits on the river and didn't analyze whether increasing boating by about 2,000 rafters annually will harm the ecosystem.

Of the 24,657 people to be allowed down the Colorado River next year under a new plan to reallocate time on the river, a third will be noncommercial boaters.

That's twice as many as previously allowed but still not enough, the plaintiffs said.

Between 40 percent and 60 percent of all trips on the Grand Canyon are motorized, giving time-starved customers a way to get down the river in a week instead of two, said Mark Grisham, director of the Grand Canyon River Outfitters Association, which represents commercial interests.

"If there weren't motorized trips, the majority of Americans would be deprived of the opportunity to see the Grand Canyon by river," Grisham said.

The groups suing have also argued that helicopter use to transport rafters in and out of the canyon should be illegal.

"The park believes that the final environmental impact statement and the record of decision represent a good balance of the many competing interests and we believe that the court will affirm our decision," Grand Canyon spokeswoman Maureen Oltrogge said.

Sen. Orrin Hatch, R-Utah, attached a rider to a 1981 bill that would block any federal funds from being used to support removal of motorized boats from Grand Canyon, even if they were only used for drawing up planning documents.

The Park Service reversed course on its mission to phase out motorized boating following Hatch's move and hasn't attempted again since.

A proposal to designate most of the Grand Canyon as wilderness was put forth by Grand Canyon managers in 1993 and has never been transmitted to Congress or any president since, as would be required, according to the Colorado River Management Plan.

The lawsuit is not expected to hold up river trips or permit lotteries for upcoming river trips, as the plaintiffs are not seeking an injunction.

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Regional News 04/02/06

**National Geographic: Drought Drains Lake Powell--Uncovering the Glory of Glen Canyon**

National Geographic on April, 2006

By Daniel Glick and photographs by Michael Melford

### Excerpt

"Today, the fall of the lake has driven a rising debate about its future. Many scientists think Western droughts will intensify as the Earth's climate warms. Water will become even more precious-and reservoirs, which lose vast amounts through evaporation, will seem intolerably wasteful. Better, say many environmentalists, to exploit new technologies for storing water underground, decommission the dam, and let Lake Powell once again be Glen Canyon."

#### A DRY RED SEASON

A year ago Lake Powell reached its lowest level since Jimi Hendrix played Woodstock and Neil Armstrong made his giant leap onto the moon. A sustained drought had sucked out two-thirds of its water, exposing 140 vertical feet of once drowned cliffs. The dry spell temporarily turned the great reservoir back into a red-rock maze called Glen Canyon, stirring hopes that terrain whose grandeur rivals any on Earth may one day be revealed for good.



It also resurrected Tom McCourt's childhood.

McCourt holds forth on a newly exposed rock outcrop near the shrunken lake and reminisces about what was here 40 years ago: two small settlements flanking a vast floodplain cleaved by the Colorado River's milk-chocolate waters and guarded by fortress cliffs. His grandparents lived on this east side, in the town of White Canyon, before it was slowly inundated by the reservoir.

As a kid, he'd come regularly to visit, and he recalls the country as harsh and bountiful. "My grandfather told me it got so hot down here that the ravens left contrails because their feathers were smoking," McCourt says, a storyteller's glint in his eye. "The soil was so rich we couldn't grow watermelons, because the vines would grow so fast they'd drag the melons across the garden and wear them out before they could ripen."

On this early spring day, visitors representing three generations of two families with ties to White Canyon gather and bear witness to its unveiling. The water hasn't dropped enough to reveal the old landing strip or the site of McCourt's grandparents' house, but it's fallen more than enough to stir personal and collective memories.

McCourt's entourage includes his cousin Janis York, who lived here with her parents until she was five. York shyly approaches, moved to tears by swirling childhood memories. She used to sit on a hill behind her grandparents' house and pretend she was queen of the land. "There were rocks that sparkled," she recalls bits of glittering fool's gold. I used to call them my little jewels." After her family left and the waters rose, she says, I was brokenhearted."

York gazes out over the canyon and the years. "This is the heart of the whole world," she says. I remember telling my jewels I'd be back some day."

After Glen Canyon Dam closed its gates on the Colorado River near Page, Arizona, in 1963, the river's cargo of snowmelt and spring rain, gathered from much of the mountain West, hit the dam's concrete stopper and began to back up. The rising waters slowly transformed the lower reaches of the intricate, thousand-hued Glen Canyon into a monolithic blue-green reservoir, the country's second largest after Lake Mead, farther down the Colorado.

Aided by Lake Powell's aqueous bounty, Little League fields sprouted in Las Vegas, subdivisions multiplied in Los Angeles, golf courses carpeted Phoenix. As the reservoir waters rose, Glen Canyon drowned. This remote heart of the Colorado Plateau, dubbed "the place no one knew" in photographer Eliot Porter's ode to this lost landscape, gurgled underwater.

In unknown Glen Canyon's stead emerged the enormously popular Glen Canyon National Recreation Area-which quickly became a mecca for millions of houseboaters, water-skiers, and striped bass fishermen taking advantage of this watery miracle in the desert.

Then came the sustained drought that ushered in the 21st century, one of the region's periodic dry spells. For five years clouds yielded little moisture, even as the West continued to drink greedily. The Colorado River, lifeblood for seven states, dwindled. Lake Mead and Lake Powell, the river's massive catch basins, shriveled. No amount of hydro-engineering, cloud seeding, flow regulating, or other manipulation could change a simple fact: Not enough water was falling from the sky to keep the West's reservoirs full. Not with the increasing number of straws sucking upstream water to irrigate alfalfa fields, fill swimming pools, and sprinkle suburban bluegrass expanses.

Lake Powell's loss was and is Glen Canyon's unmistakable gain. People who were lucky enough to get a glimpse of Glen Canyon when they were young flocked to see it again, as if offered the chance to visit, after 40 years, a first love who had abruptly moved away. People who had only known the canyon through photos and descriptions-by John Wesley Powell, Wallace Stegner, Katie Lee, Eliot Porter, David Brower, and Edward Abbey-hurried for a first look.

The ancient Navajo sandstone itself shook off the water as easily as a dog emerging from a swimming pool. At an average rate of an inch a day, a lost sculpture garden of rock resurfaced, miraculously intact.

The uncovered slickrock sandstone told its astounding life story: of Sahara-size sand dunes marching across the landscape 190 million years ago; of three-toed dinosaurs that left tracks in damp spots between the dunes; of deep burial that slowly squeezed sand and mud into rock; of epic uplifts and tectonic shifts; of water and wind that carved slot canyons hundreds of feet deep.

Layers of human history saw the light again too: thousand-year-old petroglyph panels and cave dwellings of the Anasazi; artifacts from Navajo settlements; inscriptions left by 19th-century Mormon pioneers; equipment from uranium miners' camps of the 1950s; sunken boats and even a lost airplane of more recent vintage.

Desert varnishes, mineral-rich dust transformed by microbes and moisture, soon streaked the canyon walls. Vermilion, rust, beige, taupe, slate, maroon, cocoa, coffee, pale orange, and peach, they began painting over the lake-bleached bathtub ring left by high water. Streams rippled anew in the side canyons that branch out like arteries from the main stem of the Colorado to distribute lifemaidenhair ferns and coyote willow, soft-stem bulrushes and golden sedges in this arid land.

There was little soul-searching when Congress voted to euthanize this hidden world back in 1956, when Ike was President, the country poised to pave interstates coast-to-coast, and Sputnik was but a year away. Today, the fall of the lake has driven a rising debate about its future. Many scientists think Western droughts will intensify as the Earth's climate warms. Water will become even more precious and reservoirs, which lose vast amounts through evaporation, will seem intolerably wasteful. Better, say many environmentalists, to exploit new technologies for storing water underground, decommission the dam, and let Lake Powell once again be Glen Canyon.

There's little chance of that for now. Lake Powell, however diminished, plays too important a role in the West's water supply, and its removal would mean rewriting complex water laws at a time of massive population growth. But even though slightly above-average runoff in the spring of 2005 raised the lake 53 feet from that year's historic lows, managers expect it to drop again, to perhaps 108 feet below full pool by this month. Another sustained dry spell would push the lake to new lows. And in the very long run, nature will defeat the dam. Over the centuries, Lake Powell will ultimately fill up with silt.

Let me get a little less disoriented here," says Bill Wolverton as he scrambles up a slickrock tower to gaze into Twilight Canyon. Wolverton, 57, has roamed this Glen Canyon backcountry for a quarter century, first as a furloughed railroad worker with time on his hands and a love of the desert, and for the past 18 years as a seasonal backcountry ranger and an ardent advocate for the canyon. On his days off he walks me up and down a half dozen remote canyons, observing what the reservoir wrought and the drought incrementally reversed.

In the lower reaches of each canyon, by the lake, we sink into giant pillows of sediment, deposited over the decades since high water flooded the canyon and stripped the banks of life. Wolverton calls this vegetation-free carpet of stinking mud the "death zone." At

one point I am in it up to my knees and elbows when solid-looking ground turns out to be quicksand.

Here gnarled gray hundred-year-old cottonwood branches beckon like skeletal hands from the mud. Detritus from boating trips—an anchor, the handle from a water-ski towrope, a swim fin rests forlorn in the sandbars. Fishing line trails from broken rods tangled in driftwood.

The reservoir's drop of 140 feet, stretched over the gentle gradient of a side canyon, can mean that two or three miles of terrain have been slowly unveiled over the past six years. By last spring more than 100 square miles of canyons had seen air for the first time in decades. We slither up one of Twilight Canyon's tributaries, a magnificent narrow slot that requires gymnastic moves to explore. Seeing it for the first time delights Wolverton, and he doesn't hide his desire that the waters keep receding. "It's knowing that places this special are underwater that makes me want the reservoir gone," he says.

The farther we hike from Lake Powell, the more signs of life reappear. Less than half a mile from the water, frontier willow colonies and tiny reeds clothe the banks, along with a host of invasive species. Tamarisk, tumbleweeds, and cheatgrass, all aliens, have seized an unnatural advantage, battling with the natives for the new territory. Farther upstream, spring floods since the lake receded have blasted a channel into the sediment, uncovering the bedrock and exposing swirling patterns on the sandstone canvas.

A mile or so up from the reservoir's edge, the canyon feels like it is breathing again. The descending plaintive warble of canyon wrens, which Wolverton describes as the "call you can hardly forget," echoes off salmon-hued walls. Sixfoot cottonwood saplings with fresh, electric green leaves sprout in the shadow of drowned, hulking snags. Cattails, horsetails, and black willows are revegetating the stream banks. On benches above the streambed, yellow and pink blooms of prickly pear cactus herald the spring. Gardens of monkey flower and cave primrose take tenuous hold in aired-out alcoves wet from seeps. Gambel oaks and box elders cluster above the high-water mark. We are struck by wafts of desert flower perfume, of sage aroma awakened by the sun, of moist sand and earthy oak and fleshy cottonwood bark.

"This dam won't work forever," Wolverton says, and he shows me why. We hike to the confluence of Coyote Creek and the Escalante River, a tributary of the Colorado. Where the clear water washing down Coyote Gulch meets the pea green water of the Escalante, we stare at a steady underwater parade of pebbles, sand, and silt moving downstream. "Budding a dam across sediment-laden rivers is like driving your car without ever changing the oil filter" he says. Sooner or later the marching sediment will have its day. "There's the answer right there," he says, pointing to the gravel on the march. "It's inexorable. This is the land of erosion."

Perhaps it all comes down to this place: a waterfall in a most unlikely location, a hidden cavern of mystical proportions aptly called Cathedral in the Desert. I arrive here alone by boat, following a sinewy side canyon, new desert varnish on its steep walls and the

chalky white bathtub ring nearly gone. The water is green, deep, still. The walls close in, the canyon narrows. Rounding one last turn, I eye a beach, cut the motor, and glide silently to shore.

Ahead, the canyon walls curve, rising hundreds of feet above me, overhanging to form a giant cavern, once drowned by Lake Powell. The waterfall drops 50 feet, bounding, bouncing, pulsing. It has left a splash of dark green on the wall. Water was at work here long before the dam and the reservoir, wearing a notch in the rock that now guides the stream the way a halved section of bamboo pipe funnels water in a Japanese garden. The cascade sounds eerily like the low murmur of a room full of people. Three hundred feet above, an opening frames a boomerang-shaped sliver of sky.

As I write this, the waters have risen again and put the waterfall at least temporarily back in the bottle. Somewhere, though, a canyon wren still warbles its haunting song. The warm desert wind rushes over the slickrock. Pebbles march toward the sea. And Glen Canyon abides.

End

**Red Rock Country:** Download the glories of Glen Canyon to your desktop view a photo gallery with pointers from photographer Michael Melford, and get travel tips [at ngm.com/0604](http://at.ngm.com/0604).

[Download the article with color pictures](#) [1m PDF File]

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LR in the News 04/02/06

### **Lake Powell may never be full again**

New accord means it won't go so low, nor reach full pool in future

By Joe Baird for The Salt Lake Tribune

The white band on the cliffs of Lake Powell shows a drop in the water level in March 2004. (Paul Fraughton/Tribune file photo)



After six years of drought and a drop to water elevation levels not seen in decades, Lake Powell began refilling last year. And it will continue to rise this spring and summer, owing to a second consecutive year of close-to-normal snowmelt in the upper Colorado River Basin.

For those who recreate on the huge reservoir that sprawls across the Utah-Arizona border, this comes as happy news. Powell dropped to a record-low elevation of 3,555 feet just over a year ago - about 33 percent of capacity - and is forecast to reach 3,622 feet this summer when the runoff reaches its peak in July. That's a jump of nearly 70 feet, and to about half of what the reservoir can hold. But for those who long for the day when Lake Powell will be replenished to the brim - about 3,700 feet - the wait could be a long one.

A nearly finalized agreement between the seven Colorado River Basin states regarding future management of the river calls for the joint, coordinated operation of Lake Powell in the upper basin and its sister reservoir, Lake Mead, downstream in the lower basin. The thrust of the idea is to ensure, as much as possible, that neither reservoir suffers at the expense of the other during future dry periods. The upside: Federal and state water officials believe that, barring a hydrological catastrophe, such a coordinated approach will prevent Powell from draining to the depths it reached during the drought. On the other hand, the deal - which probably will be incorporated into an ongoing federal environmental study of drought conditions on the Colorado River - will in most years prevent Powell from refilling to its historical high-water mark.

"This agreement really puts a cap on the reservoir unless we have some gangbuster [water] years," says Jack Schmidt, an aquatic, watershed and earth resources professor at Utah State University who specializes in Colorado River issues.

Water officials don't like the word "cap," but acknowledge that a less-than-full Powell will become the rule and a filled reservoir the exception under the new agreement.

"The first thing you have to remember is that reservoirs aren't meant to be full all the time," says Larry Anderson, the just-retired director of Utah's Division of Water Resources. "The second thing is, the upper basin still hasn't developed all of its water. As it does, there will be a greater drain on the reservoir.

"But now," he adds, "as we jointly manage these reservoirs, we won't run into the problem of one being too high and one being too low. That will protect the water users first and foremost, and recreation and hydropower."

Lake Powell is a hugely popular regional tourist destination, the Glen Canyon National Recreation Area drawing nearly 2 million visitors annually, largely for boating among the parts of the redrock canyons that rise above the water. The drowning of Glen Canyon, however, has been the long lament of American wilderness advocates who say the dam was not needed for water storage and who mourn the loss of one of the most beautiful and spectacular river canyons on Earth.

Under the terms of the recent agreement, when Powell's water level is up and Mead's is low, upper basin officials will have the discretion to release extra water to the lower basin, beyond the annual 8.23 million acre-feet they are committed to provide. Conversely, lower basin users will accept less than that amount if Mead is up and Powell is low.

Anderson says that extensive computer modeling established that 3,570 feet was Powell's baseline elevation for maintaining recreation opportunities - which translates into a huge chunk of the economy for southern Utah and northern Arizona.

Under the new management criteria, Bureau of Reclamation officials expect that Powell's median elevation will hover between 3,630 and 3,640 feet over the next decade. That's still 60 to 70 feet below the reservoir's full line, but still plenty of water for boaters to launch their craft and for marinas to operate.

"In the past few years, during the drought, we made a lot of effort to ensure the public had access to the reservoir," says Kevin Schneider, management assistant for Glen Canyon National Recreation Area. "We extended the launch ramps and made sure the [navigation] buoys were in the right places. The reservoir is designed to go up and down. Our management is also designed to adapt. Regardless of what the elevation is, the public will have the opportunity to enjoy the park."

Not everybody agrees with such optimistic assessments. Environmental groups clamoring for the decommissioning of Glen Canyon Dam and draining of Lake Powell say federal and state officials are ignoring long-term historical trends - at their peril.

"They're concentrating on a historic record based upon the 20th century. But those who study tree rings call it the wettest century in 1,200 years," says Jon Weisheit, conservation director of the Moab-based Living Rivers organization. "What we've lived through has been an anomaly. The whole thing is based on bad science, and this new agreement just basically maintains the status quo. They're ignoring the good work that's being done by climatologists, something they could use and benefit from."

Richard Ingebretsen, founder of the Glen Canyon Institute, a group that advocates draining Lake Powell to uncover the lost Glen Canyon, said that at the Bureau of Reclamation's projected median elevations, many of the side canyons, including much of the Escalante River, will be above water.

"A lot of the side canyons in the upper stretches will be out of water," he said. "Almost all of Cataract Canyon."

Ingebretsen agrees it is inevitable that upper basin states will develop more of their Colorado River allotment - Utah's planned Lake Powell pipeline being a prime example. But in addition, he predicts that lower basin states will want to buy more water and said that projections show as much as a 30 percent reduction in the flow of the river because of global warming.

"Lake Powell is going to go lower and lower," said Ingebretsen.

At the other end of the spectrum are those who believe not only will the new agreement stabilize Lake Powell's water levels, it will eventually top out again - and sooner rather than later.

"The seven basin states have modeled the heck out of this. With good hydrology, with a series of good water years, I think Powell will fill up again in the future," says Don Ostler

of the Upper Colorado River Commission. "But the bottom line is, this deal will allow Powell to fare better during the droughts."

And that, USU professor Schmidt says, is the central point of the proposed joint operations of the two reservoirs.

"The important thing that the public needs to understand is that the elevations of Lake Powell are only partially determined by nature and droughts," he says. "They will be determined most fundamentally by human decisions."

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LR in the News 04/04/06

### **Park plan makes Grand Canyon river tours easier to get**

USA Today

PHOENIX (AP) — More people will be able to raft the Colorado River through the Grand Canyon each year, but they will be spread out over more of the year and will travel in smaller groups, under a new management plan adopted by the National Park Service.

More rafters will be shifted to fall, winter and spring months while the number of daily summertime launches of both motorized and non-motorized commercial rafts will decrease.

The result will be more tourists overall.

The new plan also eliminates the existing waiting list for those who want to raft the river in non-commercial boats, replacing it with a lottery system.

More than 7,000 trip leaders are on the waiting list, said Jeffrey Cross, project manager for the plan. Many people have been waiting for more than a decade, he said, but the cancellation rate when their names finally reached the top was between 30% and 50%.

"Their lives often changed," Cross said. "They had babies, they moved, they changed jobs."

In the next six weeks, the 600 people who have waited the longest will be assigned dates spread over the next five years. After that, another 600 applicants will get assigned dates based primarily on how long they have waited.

But then, everyone else will be in the computerized lottery. The first drawing will be in August of this year and will take up the rest of the available 2007 dates.

Those who have already been assigned trips for the summers of 2006 and 2007 will not be affected, said Steve Sullivan, who manages the waiting list.

Additionally, the number of non-commercial trips allowed annually will double by 2007, allowing 500 trips a year, up from 240, Cross said.

The lower Colorado River, from Diamond Creek to Lake Mead, will see pontoon boat tours go up, allowing up to 480 passenger per day, up from between 130 and 188 passengers, depending on the time of year.

The plan bans jet boat tours entirely, but commercial operators that use the craft to meet rafts above Lake Mead would still be allowed.

The plan is supported by the Grand Canyon River Outfitters Association and the Grand Canyon Private Boaters Association. But the plan is being criticized by Living Rivers, a river restoration group, which feels motorized boats should have been banned entirely.

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Regional News 04/27/06

### **Climate change may shrink supply, hike demand in Denver**

By Jerd Smith, Rocky Mountain News April 27, 2006

Denver Water could see its customers' thirst for water rise dramatically and its supplies shrink if Colorado's temperatures rise an average of 2 degrees, a scenario that is possible as climate change occurs, the agency says.

"The combination of lost supply and higher demand is a worst-case scenario worth worrying about," said Tom Gougeon, a Denver Water Board member.

Gougeon's comments came during a board briefing Wednesday on the agency's long-term water supply plans.

As part of that work, the agency analyzed the effect of various climate-change scenarios, both on its water supply and on how much water customers would need to maintain healthy landscapes in a warmer environment.

According to Denver Water's analysis, its supplies, derived largely from mountain snowmelt, could drop 12 percent or 45,000 acre feet, as customer demand rises 6 percent, or 23,000 acre feet each year.

That would be under a "moderate" climate change scenario in which temperatures rose 2 degrees.

An acre foot equals nearly 326,000 gallons, or about enough water to serve up to two urban households annually.

Denver Water, which serves about 1.2 million metro-area customers, is Colorado's largest municipal water utility.

The agency derives about half of its annual water supply from the headwaters of the Colorado River and the rest from the South Platte River.

A study by the United States Geological Survey published late last year indicates that higher temperatures could reduce the Colorado River's flows 10 percent or more and that could jeopardize Denver's share of the river.

One of the key issues the board is examining is how large a water reserve it should maintain.

The agency's system generates just over 325,000 acre feet of water annually. It maintains a reserve of 30,000 acre feet.

The reserve is designed to help the agency survive a multi-year drought or to cope with a major breakdown in its water supply system.

Now, climate change is being factored into the agency's reserve calculations.

"We don't know what's going to happen," said George Beardsley, another board member.

"But we don't have the luxury of waiting to find out."

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River News 05/16/06

## **Ruling Favors Rivers Over Power Dams**

The Supreme Court says states may protect the waterways by requiring a steady flow at hydroelectric plants, which tend to harness it.

By David G. Savage, Times Staff Writer on May 16, 2006

WASHINGTON — The Supreme Court sided with the environment over electric power Monday, ruling that state regulators may require a steady flow of water over power dams to benefit fish and kayakers.

The unanimous decision holds that states may protect the health of their rivers, even though hydroelectric dams are regulated exclusively by the federal government.

The dispute arose over five small dams on the Presumpscot River in Maine, but the court's decision affects an estimated 1,500 power dams in 45 states. They include scores of dams on the Sacramento, Klamath and San Joaquin rivers in California.

Separately, the court agreed to take up an appeal from environmentalists who are seeking to enforce stricter clean-air rules against aging coal power plants. The justices said they would hear the clean-air case in the fall.

The ruling on rivers and dams resolved a clear conflict in the law. The Federal Power Act says hydro-power dams are to be regulated by federal authorities with the aim of producing electricity. But the Clean Water Act says those who "discharge" anything into a state's navigable waters must obtain a permit from the state.

Until recently, state officials believed they were entitled to protect their rivers by regulating the flow of water over and through dams.

But last year, the privately owned SD Warren Co., which produces hydroelectric power in Maine, won the Supreme Court's review of its argument that water flowing in and out of a dam is not a discharge.

Had the company prevailed, states would have lost their legal authority to protect their rivers and ensure a steady flow of water. Not surprisingly, officials of the power plants said that during dry seasons, they were more interested in holding back water so they could be assured of a steady flow over their generators to maintain power production.

In its opinion, the Supreme Court looked to the dictionary to decide the meaning of the word "discharge."

"When it applies to water, 'discharge' commonly means a 'flowing or issuing out,'" said Justice David H. Souter, citing Webster's New International Dictionary. Other judges and regulators have agreed with "our understanding of the everyday sense of term," he added.

Therefore, since water flowing over a dam is discharged back into the river, a state may regulate the operation of the dam, the court concluded in *SD Warren Co. vs. Maine*.

"This is a victory for rivers, for clean water and most of all for good common sense," said Rebecca Wodder, president of the environmental group American Rivers.

But environmentalists are anxiously watching two other Clean Water Act cases that are pending before the Supreme Court. Both from Michigan, they will determine whether federal regulators can continue to protect inland wetlands and small streams from development or pollution.

Private-property activists say the Clean Water Act protects only rivers and lakes where boats can float, not wetlands that are far inland. Decisions in those cases are due by late June.

Bush administration lawyers joined all three Clean Water Act cases on the side of the environmentalists.

The clean-air case to be heard in the fall, however, concerns a move by the Bush administration to relax a strict anti-pollution rule set by the Clinton administration.

Under that rule, aging power plants that expanded or modified their facilities were required to adopt modern anti-pollution controls in the process. This issue has drawn much attention in the states of the Northeast, including New York, which are downwind of coal-powered plants in Ohio and West Virginia.

The Duke Energy Corp. in North Carolina challenged the Clinton-era rules and won a ruling from the U.S. 4th Circuit Court of Appeals concluding that the Environmental Protection Agency had exceeded its authority in requiring such modifications.

In a separate lawsuit, several Northeastern states are challenging the Bush administration's move to relax the same rules.

Taking up the cause of clean-air advocates, lawyers for the nonprofit group Environmental Defense appealed to the high court. They argued it was the 4th Circuit Court that exceeded its authority.

The ruling will have a broad impact, environmentalists say.

"Over 160 million Americans, more than half of the country, live in communities out of compliance with the nation's health standards, and today the Supreme Court took a big step toward aiding those communities in their efforts to restore healthy air," Vickie Patton, an Environmental Defense lawyer, said on Monday.

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Regional News 05/29/06

## **UA tree-ring study could affect use of Colo. river water**

By Eric Swedlund for Arizona Daily Star, Tucson, Arizona

A new UA study uses tree-ring data to reconstruct Colorado River flows over the past 500 years. The study could have a significant impact on water use in the West and further emphasizes the need for flexibility in managing the resources, according to scientists and policy experts who study the Colorado River basin. The study found several periods of more severe and longer-lasting drought than the region has experienced in the past century. The findings provide further indications that the data used for the 1922 Colorado River Compact overestimated the Colorado's average water flow, with water allocations to the seven Western states that share the river based on one of the wettest periods in the past 500 years.

"The long-term perspective provided by tree-ring reconstructions points to a looming conflict between water demand and supply in the upper Colorado River basin," the study said.

Updating the University of Arizona's groundbreaking 1976 study of tree rings in the Colorado basin, the new work reconstructed the river flows back four centuries before the gauge record and found eight periods of drought of equal or greater severity to the

most recent drought, roughly from 1999 to 2004, said Dave Meko, one of the study's authors.

"The other issue on the droughts is the tree-ring records show periods of dry conditions that lasted longer than the observed record," said Meko, an associate research professor of dendrochronology.

The 1922 Colorado River Compact between Arizona, California, Colorado, Nevada, New Mexico, Wyoming and Utah determined how much of the Colorado River water each state would get, dividing them between upper- and lower-basin states. The Boulder Canyon Project Act of 1928 ratified the compact and apportioned the lower basin's 7.5 million acre-foot annual share of the water. Arizona's share is 2.8 million acre feet, enough to meet the needs of 5.6 million four-person families for a year.

"For a long time, many of the states in the basin have assumed that just the historical gauge record is adequate for modeling purposes," said Brad Udall, managing director of the Western Water Assessment, which partially funded the study. "It's not adequate. We need to consider hydrological stresses on the system commonly like what we have just seen and expect those things are quite frequent."

The study, a collaboration between the University of Arizona's Laboratory of Tree-Ring Research, the National Oceanic and Atmospheric Administration, the U.S. Geological Survey and the University of Colorado, is published in this month's issue of *Water Resources Research*.

While the new reconstructions estimate the average water flow at 14.6 million acre-feet, compared to the 1976 study's estimate of 13.5 million acre-feet, the longer historical average remains below the 15.2 million acre-feet recorded by stream gauges from 1906 to 1995.

The researchers compared tree-ring widths from 1906 to 1995 with the stream flows recorded by gauges along the river as a way to calibrate the tree rings, then applied the statistical comparison to the tree rings dating back to the late 1400s.

The core samples used in the study were taken from about 1,200 trees in 60 areas throughout the Colorado River basin. The update of the 1976 study gives more precise results, filling in gaps to provide a more accurate picture overall of the Colorado region, Meko said.

The new work had 40 more years of tree-ring data to build a more accurate statistical model from comparisons to the gauge records, plus expanded tree-ring site coverage of the basin for a more reliable sample.

The study zeroed in on a drought period of about 20 years in the late 1500s, a much longer drought cycle than contained in the gauge records of last century. "There were much bigger swings in the reconstructed flows at some periods of the record than at others," Meko said. "We don't know if we're going to move into a really long-lasting dry period or if it may go back to more rapid switching back and forth between wet and dry periods."

The researchers are trying to reconstruct the water flows even further back into the past by expanding the tree-ring data to include core samples from dead trees, preserved pieces of trunks and standing snags known as remnant wood, Meko said.

The reconstruction has reached the limit of living trees, but using the evidence from remnant wood, researchers can see growth patterns about 200 years further into the past. The wood, however, is more difficult to find and will yield a spottier record.

"I think this paleo record is a good point to start to talk about stresses on the river greater than we've seen in the past," said Udall of the Western Water Assessment, a joint climate assessment venture between the University of Colorado and the National Oceanic and Atmospheric Administration.

"To date our reservoirs have been big enough to allow us to deal with these periods of time when we haven't had enough," he said. "There will come a time in the future that will not be true."

The West has to be prepared to modify its water use, shorting some things to allow more valuable uses to continue at times of drought, Udall said.

"There's a lot you can do actually," Udall said. "The true gauge of our future success in water management is how flexibly we design our water institutions." Fernando Molina, conservation program manager for Tucson Water, said he hadn't seen the study but that long-range planning is crucial to the agency.

Tucson Water uses about half its allocation from the Central Arizona Project, a 336-mile long system that brings Colorado River water to Pima, Maricopa and Pinal counties.

"On the user end, if we start look at shortages on the Colorado, if there's any cutbacks on there, we need to be prepared to deal with that," he said.

Tucson Water stresses conservation programming, Molina said, as well as looking into long-range supply alternatives including using groundwater from other areas, negotiating deals for a greater share of Colorado water and potentially using effluent as a potable supply.

Contact reporter Eric Swedlund at 573-4115 or at [eswedlund@azstarnet.com](mailto:eswedlund@azstarnet.com).

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LR Press Release 06/02/06

## **60-day notice filed to protect endangered species in Grand Canyon**

Mitigation Mayhem in Grand Canyon's River Corridor  
Stocking Fish Upstream, Shocking Them Downstream

For immediate release on Friday, June 2, 2006

Contact:

Living Rivers, John Weisheit: 435-259-1063

Center for Biological Diversity, Robin Silver: 602-246-4170

In an effort to resuscitate a long-deteriorating, artificial sport fishery below Glen Canyon Dam, Arizona Game and Fish is planning to stock non-native rainbow trout in the Colorado River just above its entrance into Grand Canyon National Park.

Seventy-five miles downstream from Glen Canyon Dam, the US Department of Interior has for three years been removing trout because these introduced fish prey on the larvae and young juveniles of the humpback chub, a native fish species whose numbers have dropped to potentially unrecoverable levels and is protected by the Endangered Species Act.

At a cost of \$800,000 annually, this trout removal process involves using electroshock to stun the fish, netting them by the boatload, then grinding them up for use as fertilizer.

"There are plenty of places where trout exist in their native habitat, and that are far more accessible to the average angler than below Glen Canyon Dam, that's not the case with the humpback chub," says Living Rivers Conservation Director John Weisheit. "If more aggressive action is not taken to protect them, the humpback chub will soon be the fifth of Grand Canyon's original eight native fish species to go extinct since Glen Canyon Dam's operations began in 1963."

Thirty years ago the artificial environment below Glen Canyon Dam supported one of the most famous blue-ribbon sport fisheries in the country. But with changes in dam operations the population shifted from one dominated by a thriving population of very large fish to a population of moderate-sized trout, little difference from what could be caught in thousands of streams around the country. As a result, angler interest declined considerably, especially as access to the fishery requires the use of powerboats.

With the advent of the recent drought the rainbow trout populations has been declining considerably due to rising water temperatures, lower oxygen content and lack of basic nutrients to support their food requirements. Fishing guides are reporting a 50 percent decline in business over the past five years, a further acceleration of the decline in angler activity that had already been underway since the mid 1980s.

"Putting in more fish when there's no food will merely force them to swim downstream to survive, potentially exacerbating the problems for the humpback chub," adds Weisheit. "There are so few fishing guides left anymore, and as they are the only ones who get people to the trout, why not just spread the restocking money among them as a direct subsidy, and focus on protecting the native fish that belong there."

The National Park Service, which itself once stocked trout in Grand Canyon tributary streams, has abandon this practice altogether, and has even erected weirs in an attempt to impede trout populations from spawning in these tributary streams. Additionally, more than \$200 million has been spent over the past 14 years by the Department of Interior to mitigate the impacts of Glen Canyon Dam's operations on

Grand Canyon's river ecosystem following the passage of the 1992 Grand Canyon Protection Act.

"It's unfortunate for the ecology of the Grand Canyon state that Arizona Game and Fish must prioritize efforts to prop-up a declining, artificial fishery over the preservation of endangered native fish," concludes Weisheit. "It's also unfortunate that the federal government, responsible for protecting the humpback chub, appears equally hamstrung in addressing this obvious contradiction in management objectives."

The Center for Biological Diversity and Living Rivers filed a 60-day notice today to stop this contradiction to the federal mandate of conserving the endangered fish species of Grand Canyon National Park.

For more information:

[60-day notice to Arizona Game and Fish: Exotic trout reintroduction jeopardizes endangered fish species of Grand Canyon National Park](http://www.livingrivers2.org/pdfs/agfd60day.pdf)

<http://www.livingrivers2.org/pdfs/agfd60day.pdf>

[Arizona Game and Fish: Lee's Ferry Trout Evaluation](http://www.usbr.gov/uc/rm/amp/twg/mtgs/06jan25/Attach_07b.pdf)

[http://www.usbr.gov/uc/rm/amp/twg/mtgs/06jan25/Attach\\_07b.pdf](http://www.usbr.gov/uc/rm/amp/twg/mtgs/06jan25/Attach_07b.pdf)

[Lee's Ferry Fishing Guides: Letter to Adaptive Management Program](http://www.usbr.gov/uc/rm/amp/twg/mtgs/06jan25/Attach_07a.pdf)

[http://www.usbr.gov/uc/rm/amp/twg/mtgs/06jan25/Attach\\_07a.pdf](http://www.usbr.gov/uc/rm/amp/twg/mtgs/06jan25/Attach_07a.pdf)

[Grand Canyon Monitoring and Research Center: Trout removal overview](http://www.gcmrc.gov/files/pdf/removal_overview.pdf)

[http://www.gcmrc.gov/files/pdf/removal\\_overview.pdf](http://www.gcmrc.gov/files/pdf/removal_overview.pdf)

[Grand Canyon National Park: Management plan to reduce trout population](http://www.nps.gov/grca/compliance/pdf/Scoping-fishltr.pdf)

<http://www.nps.gov/grca/compliance/pdf/Scoping-fishltr.pdf>

[Fly Rod and Reel, April 2003: Role Reversal On The Colorado, a different twist on clearing out aliens to save a native fish](http://www.flyrodreel.com/index.php/page/blog/?p=184)

<http://www.flyrodreel.com/index.php/page/blog/?p=184>

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Regional News 06/03/06

### **Salt in the Colorado River**

Are your dishes spotted? Your toilet choked? Your water heater dying a premature death?

Blame salt: City exploring ways to rid our water of destructive mineral

B. POOLE for The Tucson Citizen

We're getting more than water from the Colorado River.

We're also getting 100,000 tons of salts every year, most of it calcium carbonate - the cause of lime buildup. Like a silent plague, the salt creeps into our homes through faucets, washing machines and dishwashers and comes to rest where you have likely dealt with it.

That white film on your sink? Salt. The white spots on your clean dishes? Salt. The knocking sound in your water heater? The ring in your toilet bowl?

It's all salt, and it's costing us plenty. Salt from the Colorado River - about 9 million tons per year - causes an estimated \$300 million in damage annually in southwestern states, said Kib Jacobson, manager of a Bureau of Reclamation program aimed at keeping salt out of the river.

Most of that damage is in agriculture, but cities face their own problems. Over the past five years, Tucson Water helped fund a central Arizona salt study, because the salt content of our water is rising, said Karen La Martina, a Tucson Water management analyst.

"The things that they are beginning to explore and the things that they are experiencing now could be our future," La Martina said.

The study, due out this summer, recommends strategies Arizona cities can use to rid our water of salt. Salt assault

Maricopa, Pinal and Pima counties accumulate 1.75 million tons of salt per year from the Colorado, Salt and Verde rivers. Southern Arizona's share will rise to about 200,000 tons when the city ramps up to full use of its Central Arizona Project water allocation over the next few years, according to a draft report of the Central Arizona Salinity Study.

The Colorado River gets much of its salt when farmers irrigate crops and the water washes into the river through underground calcium deposits. The Salt River sends sodium salt - the kind in your salt shaker - to Phoenix from springs in the White Mountains, said Thomas Poulson, the Bureau of Reclamation's manager of the study.

"Originally those salts would have been carried out to the ocean," he said.

Tucson and Phoenix also import sodium through tens of thousands of water softeners, which keep calcium salt from clogging appliances but dump sodium salt into sewers. In Phoenix, 26 percent of the salts in wastewater is from home water softeners, the study found.

Sewers get another dose from household cleaners and cooling tower backwash.

Salt, which is in Tucson groundwater, though in much lower levels than Colorado River water, is a familiar nightmare for homeowners.

We spend money avoiding it with bottled water, filters and water softeners. It forces us to buy extra cleaners (which are less effective because of the hard water). Salt buildup from landscape watering can eventually poison soil. Salt cuts the life of coffee makers, dishwashers, showerheads, faucets, sinks and swamp coolers.

Water heaters are especially vulnerable because heat causes calcium to build up faster, said Kevin Cummings, owner of Cummings Plumbing, 1050 S. Park Ave.

When you turn on a water heater, the white, rock-hard calcium carbonate starts collecting on every surface in the tank. After a year, electric heating elements are usually coated, and after two or three they burn out. The buildup eventually cuts capacity, Cummings said.

"We've seen them half full," he said.

After five years, most electric water heaters here have hit retirement age, often because of reduced capacity.

"In other parts of the country they last 10 or 15 years," he said.

Gas water heaters last more than 10 years on average because they have no heating elements. In a gas heater, the calcium can't settle in the bottom, because the water there is boiling. Bouncing chunks of calcium eventually develop, creating a knocking sound that hints it's time for a new heater, Cummings said.

Calcium can also destroy the internal parts of toilets and clog jets around the inside of the bowl. If your toilet flushes slowly, poking a wire coat hanger into each jet can get it flowing properly again, he said.

Tankless water heaters and filters can help, but tankless heaters cost three times the \$500 to \$600 price of a traditional heater, and whole-house filters start at about \$2,800. In addition, tankless heaters generally require new gas or electric lines, which can add another \$500 to \$1,000. The costs outweigh the benefits for most of us, Cummings said.

"I wouldn't recommend those for the average homeowner," he said.

Cummings also doesn't recommend water softeners because of the salt they add to sewers. The answers

The most cost-effective way to deal with salt is to prevent it from getting into water, the salinity study says.

Since 1973, the Colorado River Basin Salinity Control Program, a collaboration among federal agencies, Colorado River states and farming interests, has been keeping salt out of the Colorado through improved irrigation, crop management and diversion of salty groundwater.

Though the program keeps an estimated 1 million tons of salt out of the river annually, it needs more money, the study says.

The program this year got about \$30 million through the Bureaus of Reclamation and Land Management and the Department of Agriculture. The request for next year is to add \$13 million, Jacobson said.

Blocking salt before it gets into the river costs about \$30 per ton of salt blocked. Salt removal can cost more than 20 times that. The salt-prevention program is a bargain, considering the \$112 in damage caused by each ton of salt, Jacobson said.

"This is one of many answers. Right now it's the cheapest answer," he said.

Public awareness campaigns, another suggestion in the study, can reduce salt in sewers by educating the public on water softener settings or offering rebates for high-efficiency softeners. Specifics would have to be created for each community, based on circumstances, the study says.

The study also urges cities and water providers to research reverse osmosis (see related story), or pushing water through membranes to screen out minerals. The current technology is costly and wastes about 20 percent of the water, the report says.

"The water loss is the real key for places like the Southwest, where we just don't have the source water," Poulson said.

Tucson Water recommends that the city not desalinate drinking water. Because we blend groundwater at an average of 280 parts per million dissolved solids with water from the CAP canal, which has 650 ppm dissolved solids, our drinking water will eventually stabilize between those levels without treatment.

But growth is increasing the amount of salt we dump in sewers, and salinity rises again by about half during treatment at wastewater plants. Tucson will eventually have to desalinate wastewater if we intend to turn it into drinking water, which Tucson Water recommends we do in coming decades, La Martina said.

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LR in the News 06/07/06

### **Activists fight trout stocking at Lees Ferry**

By CYNDY COLE, Sun Staff Reporter

Although rainbow trout are down by at least half at Lees Ferry, two environmental groups are planning to sue Arizona Game and Fish to prevent proposed stocking at the world-renowned fishery.

Utah's Living Rivers and the Center for Biological Diversity of Tucson have given notice they will sue on behalf of declining populations of native humpback chub and three other endangered fish under the Endangered Species Act if Game and Fish adds more rainbow trout, believed to prey on native fish downstream.

Game and Fish wants to stock tagged, mostly sterile trout for catching at Lees Ferry and to track them to see whether they make it 60 miles downriver to prey on chub and other native fish. Rainbow trout populations are about 50,000 less than normal.

Experimenting with a population of 4,500 or 5,000 chub by adding predators is too dangerous and shouldn't be considered before studies are conducted in public, Center for Biological Diversity's Robin Silver said.

Three of eight fish species native to the river have already been exterminated, U.S.G.S. studies have found.

But there may be two problems with the environmental groups' arguments.

First, chub populations might not be declining. They might have actually made a turnaround in the last three years because of warmer water or trout-removal operations, according to U.S.G.S. research.

Although the chub population was slated to decrease from a range of 3,000 to 5,000 to around 1,500 or 2,000 in the coming decade, the population is now up around 4,500 or 5,000, more recent research from the Grand Canyon Monitoring and Research Center shows.

"It looks like the humpback chub population is no longer on a straight projection down, but is stabilizing," said Matthew Andersen, biology program manager at the Grand Canyon Monitoring and Research Center.

Second, there is no direct evidence that the rainbow trout eat chub, according to U.S.G.S. and Game and Fish.

But biologists do believe rainbow trout compete with chub in other ways, such as eating their food, according to data from the Fish and Wildlife Service and other scientific papers.

It's the brown trout populating Bright Angel Creek and the Colorado River -- which Game and Fish doesn't stock -- that have certainly been found to eat chub, including some fish caught with chub in their mouths.

Experimenting with a population of 4,500 or 5,000 chub by adding predators is too dangerous and shouldn't be considered before studies are conducted in public, Center for Biological Diversity's Robin Silver said.

Game and Fish last stocked Lees Ferry in 1998. More recently, the same agency has been killing mostly rainbow trout by the thousands 60 miles downstream where the humpback chub live.

"It's a ludicrous program. On one hand you're trying to remove trout in the Grand Canyon and electrofishing them out ... and on the other hand you're adding them near the dam," said Dave Foster of Marble Canyon Outfitters at Lees Ferry.

Some anglers are concerned the trout population won't bounce back without human intervention.

"It's bad. It's really bad. People that I know from Flagstaff, they don't fish up there anymore. They know there's hardly any fish up there," said Mark Steffen, who

represents the Federation of Flyfishers/Northern Arizona Flycasters and makes fishing poles in Flagstaff.

Yet commercial fishing Web sites still sometimes boast that the fishing is legendary these days, Steffen concedes.

That's because commercial fisherman with powerful boats and deep knowledge of the river aren't having as hard a time as the private boaters, he said.

There are supposed to be 100,000 rainbow trout 2 years old or older between Lees Ferry and the Glen Canyon Dam, according to management plans for the river, Game and Fish fisheries branch chief manager Larry Riley said.

The actual population is half of that or less now, he said, and rainbows haven't been reproducing much in the past three years.

Both trends are attributed to a November 2004, flood experiment, higher-than-average water temperatures and low oxygen absorption into the water.

There's also a tiny New Zealand snail that can reproduce quickly without a mate that has made it into the river. The snail competes with the trout for food, Andersen said.

Ultimately, the trout question becomes a divisive issue on the Colorado River, Andersen said.

On one side, anglers say the industry at Lees Ferry is an economic engine for northern Arizona and one of the state's best fishing areas.

But others, including some anglers, seem to support propagating the remaining native fish that live in the Grand Canyon.

It would be possible to put trout into the river on one end and kill any that make it 60 miles downstream, Andersen said.

"At this time, in 2006, it might be possible to strike a balance," he said.

Cyndy Cole can be reached at [ccole@azdailysun.com](mailto:ccole@azdailysun.com) or at 913-8607.

[Link to the Living Rivers press release](#)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=718>

#### LETTER TO THE EDITOR

In regard to article "Activists fight trout stocking at Lees Ferry" by Cyndy Cole:

The reporter is correct that the population of humpback chub seems to have stabilized after a long period of decline. However, it is illogical and incorrect to assume that this means rainbow trout are not a threat, or that the abundance and distribution of humpback meet the agencies objectives for this endangered fish population.

When agencies behave more like bean counters and not as ecologists, it suggests that all they are really interested in is avoiding lawsuits over dubious compliance actions and not about the true measure of actual recovery for our endangered creatures.

The agencies are not correct that there is no evidence that rainbows eat humpback. A 1997 peer-reviewed research paper (Marsh, et al.) describes rainbow predation on humpback chub. Several studies have also documented trout predation on threatened native fish, such as speckled dace and bluehead sucker. In January 2003, the mechanical removal crew caught a rainbow with a flannelmouth sucker in its mouth. [http://www.usgs.gov/newsroom/article\\_pf.asp?ID=200](http://www.usgs.gov/newsroom/article_pf.asp?ID=200)

The agencies assert that the real problem is brown trout predation on humpback chub. Although an individual brown trout is more likely to include fish in its diet than an individual rainbow trout, there are so many more rainbow trout that they exert a higher overall impact on humpback chub. Estimates suggest that prior to recent trout removal near the Little Colorado River confluence, there were about 35 times more rainbow trout than brown trout.

Perpetuating the convenient fiction that rainbows do not emigrate from Glen Canyon and prey on humpback chub is not helpful to the commons. Suggesting the stocking of rainbows at Lee's Ferry and then killing those that emigrate to the mouth of the Little Colorado River, is neither logical nor fiscally responsible. This strategy would undoubtedly cause a negative impact to humpback chub and other native fish. Under National Park Service policy, management for native and endangered species has precedence over recreation. Secondly, the cost of continuous trout removal would be astronomically high.

We strongly suggest an Environmental Impact Statement be conducted to develop and analyze the management alternatives.

John Weisheit  
Living Rivers  
Conservation Director

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Regional News 06/16/06

### **Below-normal flows projected for Colorado River**

June 16, 2006 at 17:51:19 PDT ASSOCIATED PRESS

LAS VEGAS (AP) - Light snow falls and an early, warm spring have federal officials predicting below-normal flows into the Colorado River this year.

"We didn't get quite as much snow as we'd hoped, and it got very warm, very quickly in the upper basin, so snow melted very rapidly," said Terry Fulp of Bureau of

Reclamation, the agency that oversees management of the river. "That means we lost more water to evaporation and seeping into the ground."

Fulp presented the projections Friday at the first of three meetings in which representatives from state water agencies and power, tribal and environmental interests compile an annual Colorado River operating plan to be submitted to the Interior Department in September.

Fulp said the National Weather Service is projecting runoff from the snow melt at 72 percent of normal levels in the April to July period. Forecasts for the "water year" of October to September call for similar levels.

The numbers are down from last year, when water levels rose after five years of record drought and flows came in above normal. Officials caution one good year doesn't end a drought.

"My answer when people ask, 'Is the drought over?' is 'We still don't know,'" Fulp said. "We had a better year last year, but then again we've had a sub par year this year. We don't know where we are in the drought sequence."

Fulp said the projected levels will not likely force changes in the river's management plan because there is still enough water in storage. The system is at 59 percent of capacity, and is expected to fall to 58 percent by the end of September.

Officials predicted a slight increase in the water level at Lake Powell by the end of the water year and slight decreases for the system's other major reservoir, Lake Mead. Lake Powell is projected to be 52 percent full in September, Lake Mead is forecast at 54 percent capacity.

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LR in the News 07/19/06

### **Parties agreed on river plan lawsuit process**

<http://www.grandcanyonnews.com/main.asp?SectionID=7&SubSectionID=7&ArticleID=6170>

By Jackie Brown

Grand Canyon News Editor

Parties in a lawsuit challenging portions of the Colorado River Management Plan came to an agreement last week on how the case will proceed.

In a meeting last week, both sides agreed to conduct the case in two phases – one to determine the merits of allegations that NPS violated the law in its development of the CRMP, and a remedy phase to discuss relief if plaintiffs prevail. The civil suit was filed last March after the CRMP was finalized. In it, the plaintiffs – River Runners for

Wilderness, Rock the Earth, Wilderness Watch and Living Rivers – say that officials violated several laws when developing the plan, including the National Environmental Policy Act, National Park Service Organic Act and the National Park Service Concessions Management Improvement Act.

Defendants named in the suit are Superintendent Joe Alston, NPS Director Fran Mainella, former Secretary of the Interior Gayle Norton and the U.S. Department of the Interior. It is being heard by David G. Campbell, U.S. district court judge for the District of Arizona.

According to attorney Julia Olson, plaintiffs are challenging the CRMP on several grounds. One is that by allowing motor boat and helicopter use in a proposed wilderness area, it violates NPS policy.

"The coalition is seeking to require the National Park Service to fulfill the park's mandate that the Colorado River through Grand Canyon be managed as wilderness," Olson said.

Also, the plaintiffs charge that the Park Service did not comply with the law in how it determined appropriate amounts of commercial use and that it gives concessioners preferential treatment.

"The amounts of use allocated to commercial purposes is not necessary," Olson said. "The wait to go on a Colorado River trip is much longer if you choose to do a non-commercial trip."

They also maintain that the process of determining long-term impacts was flawed and failed to properly address impacts from human use, ongoing drought and from Glen Canyon Dam.

She said the case will likely go forward by early next year. "Things are moving forward," she said. "There won't be a decision until next spring or early summer."

The Grand Canyon River Outfitters Trade Association has requested to legally intervene on the side of the defendants in the litigation. Judge Campbell will review this request. Olson said that the Havasupai tribe was also considering joining as an intervenor on the plaintiff's side, "but their issues are slightly different than ours."

According to Park Public Affairs Officer Maureen Oltrogge, the Park Service will not comment on ongoing litigation.

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LR in the News 08/10/06

## **Grand Canyon humpback chub population 'stabilizing,' USGS says**

April Reese, Land Letter Western reporter

The Grand Canyon's long-suffering population of humpback chub appears to be stabilizing, according to new findings from federal scientists.

According to data released by the U.S. Geological Survey last week, the canyon's adult humpback chub population increased to 5,000 fish between 2001 and 2005, up from about 3,500 in 2002. Scientists also found more juvenile and newly hatched fish in 2005, suggesting that the fish are successfully reproducing, according to the report.

"The possible stabilization of adult fish numbers is exciting news for the recovery effort because it means that conditions exist in Grand Canyon that allow young fish to reach reproductive age," said Matthew Andersen, supervisory biologist with the survey's Southwest Biological Science Center.

"Before the upswing, the Grand Canyon population was steadily declining, with adult fish dying at a rate of 15 to 20 percent a year," Anderson said. Young fish were not surviving in great enough numbers to replace the dying adult fish.

Fish biologists are hoping the new findings suggest the fish, which was listed as endangered in 1967 under a precursor to the Endangered Species Act, can be recovered despite the ecological changes wrought by Glen Canyon Dam upstream.

Sam Spiller, Lower Colorado River coordinator for the Fish and Wildlife Service's Southwest region, called the findings "exciting," adding that he is hopeful the new data will attract greater attention -- and support -- to recovery efforts.

Several factors may have contributed to the population increase, according to USGS. Drought has helped warm the waters of the Colorado, which have been too cold in most parts of the river for the chub to successfully reproduce since the dam was built. In 2005, water temperatures in the Colorado River near the confluence with the Little Colorado River reached almost 61 degrees -- the warmest the river has been since the reservoir filled behind the dam in 1980.

Efforts to remove large numbers of non-native fish, such as rainbow and brown trout, which compete with the chub for food and prey on their young, may also have helped the fish. And a 2000 experiment in which dam operators released steady flows of 8,000 cubic feet per second during the summer, with two high flow releases to enhance habitat, also likely had a beneficial effect on the population, USGS concluded.

The endangered humpback chub, which once numbered in the tens of thousands and thrived throughout the Colorado River Basin, now occupies only the lower basin, primarily in a small area within Grand Canyon National Park near the confluence of the Little Colorado River and the mainstem river.

Nikolai Ramsey of Grand Canyon Trust said that while the new numbers are encouraging, the fish have a long way to go before they can be considered a healthy population.

"We're pleased to see this bump up, but they haven't stabilized," Ramsey said. "Five thousand fish is insufficient for recovery. The best available science suggests that at least 10,000 fish are needed for recovery."

FWS is completing new recovery goals for the chub, the result of a successful court challenge by the Grand Canyon Trust (Land Letter, Feb. 2). Previous recovery goals called for establishing a minimum viable population at 2,100 fish, which Ramsey called "ludicrous."

And it remains to be seen whether the population will continue to grow, particularly when -- and if -- the drought breaks, added John Weisheit, conservation director for Living Rivers.

"You would like to think it's because of our management actions, but it's because of the drought," Weisheit said. "Mother Nature helped save the fish."

Weisheit is hoping the findings will convince the Adaptive Management Working Group, the stakeholder group that helps decide how to operate the dam to meet objectives for both hydropower and park resources, to recommend a flow regime more like the 2000 experiment. A report released in 2004 by the technical arm of the group concluded that the flow plan advocated by the Bureau of Reclamation, which calls for daily fluctuations in flow, has been a "failure" (Greenwire, July 26, 2004).

Western reporter April Reese is based in Santa Fe, N.M.

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Regional News 08/14/06

## **Power generation tied to supplies of water**

By Cyndy Cole

Arizona Daily Sun (Flagstaff); Tucson, Arizona | Published: 08.14.2006

As interstate disputes over the Colorado River and other water fights loom large in future years, power-supply problems promise to be twice the headache.

People are moving into arid Arizona and Nevada quickly enough to make them the fastest-growing states in the nation. The demand for power across the Southwest is expected to roughly double by 2025.

And that power is coming, by and large, from electricity producers across the West that rely on water.

That's 650 million gallons of water per day for power generation, said Gary Deason of Northern Arizona University's Center for Sustainable Environments. NAU, in Flagstaff, hosted a recent summit on sustainability, where the people charged with providing water and power across the nation looked toward the future, trying to solve problems they'll share.

Among them was Mike Hightower of Sandia National Laboratories, a group that studies threats to the nation's water and power supplies for Congress.

While 70 percent of the water in the West goes to irrigation for farming, electricity generation is also still largely water-related, Hightower said.

Add climate change, drought, population booms in arid areas, microclimates that keep cities such as Phoenix hot and more energy spent pumping water from deeper in aquifers, and you have a "potential train wreck," Hightower said.

Speakers at the conference focused on big-picture solutions.

Biofuels can't save the day en masse, Hightower said, because of the amount of water needed to irrigate the vast cropland that would be required.

Hydroelectric power can be a problem during drought.

Hydrogen power requires substantial water availability. And desalination of seawater requires a lot of power.

"The issues of water availability are not just a Western issue," Hightower said. "They're becoming a national issue."

The solutions, in his view, might involve placing power generation next to water-treatment facilities and giving special tax credits or other incentives to water-efficient renewable forms of energy that don't use water, such as wind power.

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LR Press Release 09/01/06

## **Scientists reveal a higher discharge and frequency of extreme floods along the Colorado River**

Utah's uranium waste pile is at risk while funding for removal stalls in Congress

For immediate release on September 1, 2006

Contact: John Weisheit 435-259-1063  
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In an effort to better understand the impacts from extreme floods on the infrastructure and water resources of the Colorado River corridor, Living Rivers, supported by a grant from the Citizens' Monitoring and Technical Assessment Fund, commissioned two flood studies in Utah near the town of Moab.

Two critical issues were examined:

- 1) River migration adjacent to the second largest uranium waste pile in the United States
- 2) The magnitude and frequency of large floods along the Colorado River

These investigations were performed by two professors of geology from the University of Arizona: John C. Dohrenwend and Noam Greenbaum. Victor Baker, a pioneer in the field of flood research, reviewed their findings.

The report on river migration by Dohrenwend emphasized how previously contracted investigations by the Department of Energy (DOE) failed to provide reasonable assurances that this radioactive waste pile in Utah was safe from probable maximum floods within the next 1,000 years, a reclamation standard the DOE is required to fulfill under Environmental Protection Agency regulations.

Dohrenwend also announced to the DOE that a paleoflood study would help to remove the uncertainty, and that a professional investigation would be conducted. Paleoflood studies are detailed examinations of flood sediments and organic deposits--the remnants of huge floods that once tumbled down the Colorado River before modern-day instruments began to measure stream flow. This was to be the first study of its kind for the Colorado River upstream of Arizona.

The results of the paleoflood study were completed in June 2006 by Greenbaum, who provided physical evidence to support a conclusion that floods occurring at 100- and 500-year intervals in the Colorado River Basin are not yet properly understood.

It is generally accepted by resource managers that a 100-year flood on the Colorado River has a peak discharge of about 100,000 cubic feet per second (cfs), and that a 500-year flood has a peak discharge of about 120,000 cfs. The limit of a maximum flood is considered to have a peak discharge of 300,000 cfs and occurs around intervals of 10,000 years.

Greenbaum's preliminary findings indicate that these conventional flood estimates are vastly underestimated by a factor of five times. His data shows that over the past 2000 years, at least 20 floods have matched or exceeded the 500-year estimate, and that five probable maximum floods have also occurred in the same time period. Greenbaum also discovered the possibility that two floods may have exceeded 350,000 cfs.

Says Greenbaum, "This study shows that catastrophic floods can occur with much greater frequency than originally speculated, and such floods could happen, quite frankly, sooner as opposed to later."

"Such floods are induced by springtime storms that drop warm rain on mountainous snow packs," added Victor Baker from Tucson.

The scientists recommend additional investigation be undertaken to better understand the potential for severe flooding along the Colorado River above Glen Canyon Dam.

"These preliminary results of high magnitude floods occurring at greater frequencies spotlight future vulnerabilities for the entire Colorado River watershed," says John Weisheit, conservation director of Living Rivers. "This paleoflood study provides useful information for all resource managers of the Colorado River, so that they can take action to reduce the hazards associated with catastrophic floods."

The findings of Dohrenwend and Greenbaum are contained in the recently published report by Living Rivers, *The Moab Mill Project: A technical report towards reclaiming uranium mill tailings along the Colorado River in Grand County, Utah*.

The 36-page color report (with additional photos and drawings) is available for download at:

[Document: Moab Mill Project](#) [4m PDF File]

[Cover Letter: Moab Mill Project](#) [PDF File]

[Brochure: Moab Mill Project](#) [PDF File]

[Poster \(17 x 22\): Moab Mill Project](#) [1.5m PDF File]

[Times-Independent newspaper clippings: Moab Mill Project](#) [7m PDF File]

Printed copies are also available from:

Living Rivers  
PO Box 466  
Moab, UT 84532

Supplemental information

Two years ago it seemed likely that the uranium waste pile (the former Atlas Corporation uranium processing facility) along the Colorado River near Moab, Utah, would remain in place with nothing to protect it from large flood events other than a veneer of clay and large rocks.

Instead, the Department of Energy (DOE), the agency designated by Congress in 2000 to reclaim the site and remediate the groundwater, issued a Record of Decision in 2005 announcing that the pile would be moved 30 miles to the north and out of harm's way.

The Colorado River supplies water for metropolitan areas such as Phoenix, Las Vegas, Los Angeles, and San Diego, as well as much of the region's agricultural industry. Other river resources at risk of radioactive contamination include the riverine ecosystems of national parks, such as Grand Canyon and Canyonlands.

On July 17, at a public meeting in Moab, it was disclosed that DOE's funding cycle for the next five-years will be insufficient to remove the pile as scheduled. Instead, DOE documents reveal that continuing site remediation and incremental preparatory work is

anticipated, until which time a committed appropriation for removal by Congress is approved.

Since taking over responsibility of the pile in October of 2001, the DOE and the project contractors have expended in excess of \$23.5 million at the end of the first quarter for year 2006. For the next five years, it is projected they will spend about \$136 million, with no financial guarantee that the next five-year cycle will mean the actual removal of the pile.

[Department of Energy: Moab Project](http://gj.em.doe.gov/moab/)

<http://gj.em.doe.gov/moab/>

[City of Moab and Grand County Council](http://www.moabtailings.org)

<http://www.moabtailings.org>

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Regional News 09/04/06

St. George Pipeline OpEds

EDITORIALS BY: LA TIMES, NY TIMES, SALT LAKE TRIBUNE, and BOSTON GLOBE  
LA TIMES

### **How the West Was Sold**

Auctioning off government land and giving the money to communities robs the federal treasury and could waste natural resources.

July 31, 2006

NOT EVERY IOTA OF FEDERALLY owned land is an environmental treasure crying out for protection. Some portions would be better sold for private development. That's especially true within the vast Western holdings of the Bureau of Land Management.

The federal government owns about two-thirds of the land in Utah and more than 80% of Nevada, a product of Western states' history - they were federal territories before they were states. Some isolated communities, surrounded by these protected swaths of unused land, cannot respond to the pressures of growth because they have nowhere left to grow.

Selling off chunks of fenced-off land makes sense. But new proposals to auction BLM property near these towns come with a troubling twist: The money, which could easily run into the billions, wouldn't go to the Treasury to pay down the deficit or otherwise benefit U.S. taxpayers. Instead, a hefty portion would be directed to the communities to build local projects, such as water lines, roads and schools. The rest would be used for federal programs, but only near where the land was sold.

Using federal lands as a piggybank for local projects is a waste of national resources, and as a result might earmark hundreds of millions in federal funds for what won't be the most worthy or urgent public projects. Worse, it gives local communities a strong incentive to pressure the federal government to sell land that might otherwise be preserved for good reason. How about that new highway you've been wanting but haven't been able to afford? Just get the feds to sell off some nearby land and give you the proceeds.

The run on national resources for local profit started with legislation forcing the BLM to sell land around Las Vegas and give the money to Sin City and the state of Nevada. The latest target is Washington County, Utah, near Zion National Park. County officials there just after 25,000 acres of BLM land, in part so that the popular area can expand, but also to help pay for a \$500-million water project they have in mind. They are supported by Utah congressmen from both parties.

President Bush was stymied last year when he rightly tried to direct more of the \$4 billion from the Vegas sale to the Treasury. As The Times' Julie Cart reported last month, Western legislators are now lining up with similar proposals for Idaho and New Mexico.

There's nothing wrong with the federal government helping long-pressed areas build public projects. But converting federal resources into local windfalls, at the expense of taxpayers nationwide, is a way to squander money while carving up protected land.

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NY TIMES

True Wilderness, and False

Published: September 4, 2006

Under the radar, Congress has been quietly adding to the nation's inventory of protected wilderness. In three bills approved by both houses and signed by President Bush, the 109th Congress has awarded wilderness designation to 11,000 acres of canyonland and desert in New Mexico, 10,000 acres of rain forest in Puerto Rico and 100,000 acres in the Cedar Mountains of Utah.

Four more wilderness bills have cleared one house or the other, and when approved will add an additional 750,000 acres of wilderness in California, Idaho, Oregon and Washington. More such bills are waiting in the Congressional wings.

The Wilderness Act of 1964 prohibits all commercial activity — roads, buildings, logging, drilling — in areas designated as wilderness, the highest level of protection given to any public lands, including the national parks. Congress has designated roughly 106 million acres as permanent wilderness, more than half of it in Alaska.

Measured against this number, the latest designations may seem like small change. Yet they reflect rare moments of bipartisan cooperation at a time when Congress seems polarized on just about everything, not least conservation issues. They also reflect well on local groups that have worked long and hard to find common ground between

environmentalists and commercial interests. And while Mr. Bush seems as determined as ever to open up chunks of the public estate to commerce, especially for oil and gas drilling, like other presidents before him he finds it impossible to resist grass-roots ideas that have been so thoroughly debated in advance.

This is not to say that all wilderness bills are free of low motives and commercial intent. One particularly distasteful example is a bill introduced by Senator Robert Bennett and Representative Jim Matheson of Utah. It would sell off 40 square miles of federal land to private developers in Washington County, the fifth-fastest-growing county in the country and already something of a monument to suburban sprawl and strip development. In exchange, it offers wilderness protection to about 220,000 acres.

Wilderness bills often involve land swaps — small amounts of land for commercial purposes in exchange for lots more permanent wilderness — and the Utah deal would seem to fit the pattern. It doesn't. First, about half the proposed wilderness is already protected. Second, some of the proceeds would go not for local conservation projects but for off-road vehicle trails and, most alarming, for a 120-mile pipeline to draw water from Lake Powell, which is already stressed by undisciplined development. Third, there has been little public input. Finally, there appears to be plenty of private land available to satisfy Washington County's insatiable needs.

This is, in short, a raid on national resources aimed at helping private developers. It is the worst sort of Congressional earmarking. And it gives true wilderness bills a reputation they do not deserve.

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#### SALT LAKE TRIBUNE

Bigger pants: Washington County bill is on backwards

You are honest enough with yourself to note that you are gaining weight. You can start to eat more wisely and get some exercise. Or you can buy a bigger pair of pants. The Washington County Growth and Conservation Act is a bigger pair of pants.

The bill introduced by Utah's Sen. Bob Bennett and Rep. Jim Matheson is represented as an overdue way of managing the colossal growth of St. George and the surrounding area. But, despite some reasonable provisions that set up planning and preservation activities affecting both the urbanizing areas and nearby Zion National Park, the guts of the bill are just bad news.

It is simply - no, astoundingly - unwise to begin what will be a complicated and controversial planning process by giving the Bureau of Land Management, which holds title to large swaths of southern Utah, direction to sell as much as 24,300 acres of federal land.

Some 4,300 acres of that land have already been identified, in a process that even some environmentalists accept, as land that isn't worthy of federal protection. But the other 20,000 acres is no more than a figure pulled out of the air and imagined as some

kind of a relief valve for the urbanization that is already swallowing up most of the privately owned land in and around St. George.

There's a grain of sense in that. It is entirely possible that some land now in private hands should and could be preserved, either as park land or for agricultural use, just as some federal land could become homes, shops and golf courses. The net effect could be positive for all concerned.

Or it could be seen as a final word - an act of Congress, by gum - that 24,000 acres is going to be released for development - common sense and environmental responsibility be hanged.

Unless the Vision Dixie smart-development program is allowed to work its difficult magic first, and concludes with binding guidelines, such a land rush would be the logical outcome of this bill's passage.

Bennett and Matheson are hoping the bill can be passed this year, probably as a rider on some bigger piece of legislation. Bennett certainly has the clout and the skill to insinuate it into some other act while no one is looking. He will claim that he is doing his constituents a favor.

He wouldn't be. This bill should wait.

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BOSTON GLOBE  
A ruinous land rush  
August 16, 2006

NEAR THE majestic canyons of Zion National Park in southern Utah is the fifth-fastest-growing county in the United States, a monument to suburban sprawl and strip development. To help Washington County grow even faster, one of Utah's senators, Republican Robert Bennett, is sponsoring a bill that would sell off a parcel of federal land almost as large as the city of Boston to developers. Some of the proceeds would go not for conservation but to such local projects as an off-road-vehicle trail and a water pipeline.

The bill has set off alarm bells all over the West for the worrisome example it sets. Because Utah was originally a territory, the federal government owns about two-thirds of it, and the Bureau of Land Management periodically sells off properties. The money from the sale is supposed to be spent on conservation projects in the affected state. Instead, this bill encourages the wasteful use of land.

It specifically earmarks money for an off-road-vehicle trail, which would destroy fragile desert habitat, and for a portion of the cost of a \$500 million, 120-mile pipeline to draw water from Lake Powell in Arizona. Getting a straw into Lake Powell would spur further growth in Washington County, a center for resorts and retirement homes.

A spokesman for Bennett points to a similar federal land sale in Nevada as a precedent for this kind of allocation of land-sale funds. Conservationists say the Utah proposal is worse than the Nevada one because the proceeds would directly benefit local government, giving local officials a strong incentive to push for the sale of lands that would be better left under the protection of the federal government.

Critics also say there was too little opportunity in Washington County or elsewhere in Utah to debate the legislation. Officials held two open houses with poster boards and draft maps and comment sheets for the public to fill out, but many of those who attended complained they did not have the chance that a genuine public hearing would provide to discuss the bill's pros and cons with its government supporters.

The Bennett bill follows an attempt by the Bush administration to sell off national forest lands to raise money for rural schools and to sell Bureau of Land Management land to reduce the federal deficit. That proposal set off overwhelming bipartisan opposition and was dropped earlier this year. The public properly recoils when it sees its birthright put on the auction block to offset the government's profligate fiscal policies or to advance private development projects. If the Senate does not reject the Bennett bill, it invites a proliferation of proposals in the West to use land sales to finance not conservation but the despoliation of the public's land.

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[More information](#)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=732>

[GROUPS CALL FOR MORATORIUM ON DESTRUCTIVE PUBLIC LAND BILLS \(pdf file\)](#)

<http://www.westernlands.org/assets/9-12-06-Moratorium.pdf>

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LR Press Release 09/05/06

### **New Environmental Study on Grand Canyon's Native Fishes and Habitat — Impacts of Glen Canyon Dam**

Center for Biological Diversity  
Living Rivers/Colorado Riverkeeper  
Arizona Wildlife Federation  
Sierra Club – Grand Canyon Chapter  
Glen Canyon Institute  
Western Environmental Law Center  
For Immediate Release: September 5, 2006

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Phoenix—The U.S. Bureau of Reclamation will conduct further environmental studies on the impacts of Glen Canyon Dam on endangered fish of the Colorado River according to a recent settlement agreement. The agreement specifies that the Bureau, in consultation with the U.S. Fish and Wildlife Service, will prepare a supplemental environmental impact statement by October 15, 2008.

The Center for Biological Diversity, Arizona Wildlife Federation, Living Rivers, Sierra Club – Grand Canyon Chapter, and Glen Canyon Institute filed suit in U.S. District Court in Arizona earlier this year against the Bureau of Reclamation on behalf of the Humpback Chub and the Grand Canyon. The groups charged the Bureau with violations of the Grand Canyon Protection Act, the Endangered Species Act and the National Environmental Policy Act.

In the settlement recorded by the Court on September 1, the Bureau agreed to assess the impacts of current and modified operations of Glen Canyon Dam on the Humpback Chub, Bonytail Chub, Razorback Sucker, and Colorado Pikeminnow—all native fishes to the Colorado River.

“We’re pleased that the agencies will be conducting the studies without a protracted lawsuit. Arizona’s native fish are overwhelmingly imperiled, and only four of eight native fish species continue to exist in the Grand Canyon. The Humpback Chub will fail to recover and likely go extinct if action isn’t taken to reverse the degradation posed by Glen Canyon Dam,” said Robin Silver, Board Chair of the Center for Biological Diversity.

For more than a decade the Bureau of Reclamation has been required to modify the operations of Glen Canyon Dam on the Colorado River to reverse the dam’s downstream impacts on Grand Canyon’s priceless river ecosystem. These efforts have failed to produce results.

In 1992, Congress passed the Grand Canyon Protection Act to reverse the demise of the canyon and the decline of endangered native fish species. Following the completion of an Environmental Impact Statement (EIS) three years later, the Glen Canyon Dam Adaptive Management Program was established to guide the Bureau of Reclamation in implementing recovery guidelines set forth by the U.S. Fish and Wildlife Service (USFWS).

The unsuccessful “Modified Low Fluctuating Flow Alternative” (MLFF) is the operational scheme enacted in the Adaptive Management Program which called for released flood flow events with the hope of improving habitat and restoring native fish populations.

“To date, the negative impacts of Glen Canyon Dam continue to jeopardize the Humpback Chub. Clearly the Adaptive Management program, as being implemented by the federal government, is not working,” said David Wegner, Glen Canyon Institute.

“The Grand Canyon Chapter has long worked to protect the Grand Canyon and the Colorado River, plus the species which rely on this important system,” said Sandy Bahr,

Conservation Outreach Director, Sierra Club – Grand Canyon Chapter. “We have supported efforts to remove non-native fish species and previous efforts to operate the dam in such a manner as to promote recovery of the fishes and to rebuild the beaches which are also being decimated by the operation of the dam. Clearly, the federal government needs to make some changes to protect our native fishes and to protect the recreation that relies on the Canyon’s beaches.”

In October 2005, the U.S. Geological Survey released its evaluation of this program in a 220-page report, “The State of the Colorado River Ecosystem in Grand Canyon.” This report confirmed what many scientists have been saying for years: that recovery of the humpback chub is not being achieved. According to the report, "...it is clear that the restrictions on dam operations since 1991 have not produced the hoped for restoration and maintenance of this endangered species..."

"It is past time for a new assessment on the dam's operations. At least now the issue will be reopened for public review," said Living Rivers Conservation Director John Weisheit. "The hope is that the Humpback Chub can be rescued from imminent extinction and that the ongoing destruction caused by the current operations of Glen Canyon Dam on the Grand Canyon and Colorado River will be stopped."

Matt Kenna, Western Environmental Law Center in Colorado, represents the organizations.

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[Settlement of September 2006](http://www.livingrivers2.org/Legal/CBD/CBDvDOI%20Settlement.pdf)

<http://www.livingrivers2.org/Legal/CBD/CBDvDOI%20Settlement.pdf>

[Complaint of February 2006](http://www.livingrivers2.org/pdfs/ComplaintFeb2006.pdf)

<http://www.livingrivers2.org/pdfs/ComplaintFeb2006.pdf>

[60-day notice of 2005](http://www.livingrivers2.org/pdfs/CBD_LR_Notice.pdf)

[http://www.livingrivers2.org/pdfs/CBD\\_LR\\_Notice.pdf](http://www.livingrivers2.org/pdfs/CBD_LR_Notice.pdf)

[Biological Opinion: Glen Canyon Dam](http://www.livingrivers2.org/pdfs/BOgcd.pdf)

<http://www.livingrivers2.org/pdfs/BOgcd.pdf>

[USGS SCORE Report, released on October 25, 2005](http://www.gcmrc.gov/products/score/2005/score.htm)

The State of Natural and Cultural Resources in the Colorado River Ecosystem <http://www.gcmrc.gov/products/score/2005/score.htm>

[LR Press Release, October 24, 2005](http://www.livingrivers2.org/archives/article.cfm?NewsID=690)

Grand Canyon Restoration Program, a Failing Grade  
<http://www.livingrivers2.org/archives/article.cfm?NewsID=690>

[Glen Canyon Dam Adaptive Management Program](http://www.usbr.gov/uc/rm/amp/index.html)

<http://www.usbr.gov/uc/rm/amp/index.html>

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Regional News 09/19/06

## **Droughts and reservoirs: Finding storage space underground**

Press Release: Geological Society of America  
Longmont, Colorado and Conference of September 19-20, 2006

"Managing Drought and Water Scarcity in Vulnerable Environments: Creating a Roadmap for Change in the United States"

Droughts and reservoirs: Finding storage space underground

Odd as it sounds, in some places the smartest way to safeguard the water supply is to let it drain out of the reservoirs and soak into the ground. That's what been discovered in local water shortages in Kansas, Oklahoma, and New Mexico – all of which could be microcosms of water shortage issues looming throughout the Western U.S.

In these three cases – Cedar Bluff Reservoir (Hays, KS), Optima Lake, (Guymon, OK), and Storrie Lake (Las Vegas, NM) – water losses from evaporation are so high that they can accelerate water supply emergencies for farms and cities, explains Tom Brikowski, a professor of hydrology at the University of Texas at Dallas. Brikowski and Wayland Anderson, a Denver engineer, are presenting their work at the Geological Society of America conference on Managing Drought and Water Scarcity in Vulnerable Environments: Creating a Roadmap for Change. The meeting takes place 18-20 September at the Radisson Hotel and Conference Center in Longmont, Colorado.

In the case of the City of Hays, the trouble starts 20 miles upstream at the Cedar Bluff Reservoir. Because of changes in farming practices, the reservoir gets only half the inflowing water it did when built in 1949. It now loses 75 percent of its inflowing water to evaporation. As a result, water losses most years now equal or exceed inflows. Reservoir releases were cut in 1979.

"You get to the point where you can't afford to lose that much water," said Brikowski, "and your only other alternative is to store it underground."

But how do you do that? In the case of Hays, nature had already provided for underground storage in the form of the Smoky Hill River aquifer. The aquifer has provided half the city's water supply for decades. Since the building of the Cedar Bluff reservoir, however, stream flow on top of it has dropped by 50 percent. That stream water recharged the wells, which, in turn, kept alive the town of Hays, Brikowski explains.

At the behest of the City of Hays, Brikowski and Anderson created a detailed three-dimensional model of the sandy, gravelly ("alluvial") ground beneath the Smokey Hill River. Anderson analyzed the water balance of the reservoir. Next they simulated what had happened to the dropping water table, how much groundwater the aquifer could store, and how long a drought it could endure.

"It's a clear case that the shut off of water (by the reservoir) limited how much water Hays could pump," said Brikowski. It also showed that by releasing water from that same reservoir they could kill two birds with one stone: recharge the aquifer and reduce the evaporation loss rate. According to Brikowski, "It was pretty hard to argue with the conclusion."

They also found that by releasing reservoir water to recharge the Smoky Hill River aquifer, users could survive even the worst recorded drought with full production from municipal wells.

"I think the City as a whole was quite happy," said Brikowski. By getting a better understanding of their water, the city can now avert seasonal water emergencies and no longer have to consider building hundreds of miles of pipeline to get water from other river basins.

This story could replay in other places as well – especially where reservoirs are getting less inflow due to changing water uses or climate change.

There's the city of Las Vegas, NM, only months away from evacuations this year after lack of snow over the winter left streams dry. It was only the annual monsoon season that saved them this year, said Brikowski. The water crisis is becoming an almost annual event as winter snow packs shrink and melt sooner each spring, probably as a consequence of global warming.

"More efficient storage, perhaps in alluvial aquifers, represents the only real hope for a solution," Brikowski said.

The same may eventually be the case for most of California, which relies heavily on the melting of snow pack high in the Sierra Nevada to feed streams and rivers through the summer. Global warming is expected to raise the snowline on those mountains and has already pushed spring earlier in the year. This means there is generally less snowmelt and it may not last the whole summer.

The Optima Reservoir of the Oklahoma Panhandle is an extreme example. A dry lake, it loses 100 percent of its inflowing water to evaporation. Converting to subsurface storage may be the only way to store water.

"It's not that in any of these places they've done anything wrong," Brikowski said. Rather, situations change and water management has to keep up to avoid supply problems. Underground storage, he said, is something to add to the water management toolbox.

[See: Report by Living Rivers called The One Dam Solution](http://www.livingrivers2.org/archives/article.cfm?NewsID=688)  
<http://www.livingrivers2.org/archives/article.cfm?NewsID=688>

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Regional News 09/20/06

## **Scientists have grim drought forecast for West**

Expert says some could be worse than Dust Bowl

By Jim Erickson, Rocky Mountain News on September 20, 2006

LONGMONT - Future Western droughts could last an average of 12 years, spanning half of the region and severely reducing Colorado River flows that supply millions of people, according to climate projections from a Boulder scientist.

Eighteen of the world's most powerful computer climate models were used in the study, presented Tuesday by Martin Hoerling, of the National Oceanic and Atmospheric Administration.

Hoerling said he was startled by his own findings. But he cautioned that his results are preliminary and have not been published in a peer-reviewed scientific journal.

"The numbers are pretty striking," he said Tuesday at a drought conference sponsored by the Geological Society of America. "Climate change is moving us in the direction of a perpetual state that is of the Dust Bowl type."

The models forecast a temperature increase of 5.4 degrees Fahrenheit by 2060 in the interior West, largely because of the buildup of heat-trapping gases emitted by fossil-fuel combustion.

But little or no precipitation increase is foreseen in the West. The result: Increased evaporation and drier soils, leading to more severe and frequent droughts, Hoerling said.

How severe? Some droughts could be 25 percent worse than the 1930s Dust Bowl, Hoerling said.

How frequent? On average, half of the interior West will suffer from severe drought each year, he said.

But several other scientists said that Hoerling's projections should be taken with several grains of salt, even though previous studies have concluded that more frequent and severe droughts are likely in a warming West.

"Past studies have shown smaller changes, not on the order of what Marty is showing," said Brad Udall, director of the Western Water Assessment at the University of Colorado.

"The (climate) models have a lot of problems," Udall said. "They get a lot of things right, and they're really good at the global level. But they're not so good when you try to step them down into the regional level."

Hoerling found that the Upper Colorado River Basin is likely to take the hardest hit from an increase in drought severity and frequency.

Currently, 13.5 million acre feet of Colorado River water are consumed each year. About 9 million acre feet are used by the Lower Colorado River Basin states: Arizona, California and Nevada. About 4.5 million acre feet go to the upper basin states: Colorado, Utah, Wyoming and New Mexico.

The dividing line between the two basins is at Lees Ferry, near the Utah-Arizona border, just below Lake Powell.

Hoerling's computer simulations show that the flow at Lees Ferry could drop to 6 million acre feet by 2050, creating huge problems for water managers trying to meet obligations to the Lower Colorado River Basin.

"The decrease in runoff at Lees Ferry is pretty dramatic," said Connie Woodhouse, NOAA paleoclimatologist. "If he's right, we're going to have to rethink how we use water in this area."

But Woodhouse cautioned that other studies of future Colorado River runoff are in the works, and that preliminary results from one of them show "not as sharp a decrease" in runoff as Hoerling found.

Denver Museum of Nature & Science geologist Bob Reynolds echoed Udall's concerns about the uncertainties of climate models. But he said he was alarmed by Hoerling's findings.

"It's something to be concerned about, but it's not something to be scared of," he said. "We're going to have to adapt our survival strategies to coping with less water."

Last year in the journal *Nature*, a team led by U.S. Geological Survey hydrologist Christopher Milly used 12 state-of-the-art climate models to study global-warming associated reductions in river runoff worldwide.

Milly and his colleagues found that by 2050, drier conditions could lead to a 10 to 20 percent drop in runoff from rivers in the U.S. West.

Milly said Tuesday that his results appear to jibe with Hoerling's findings.

"I think those drought numbers that he's giving you are probably realistic numbers," Milly said in a telephone interview. "What he's saying does not seem far-fetched."

NOAA researcher Jon Eischeid collaborated with Hoerling on the study.

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[See: Report by Christopher Milly](#)

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## **Drought becoming norm, experts say**

Sept. 30, 2006 12:00 AM

By Shaun McKinnon for THE ARIZONA REPUBLIC

Everything you think you know about water in the West is about to change.

Scratch that. It's changing now.

The drought that's squeezing Arizona and the Colorado River? It could be the new normal. The warming temperatures that seem to start earlier and linger later? A shift in climate that already has stolen runoff in some parts of the Northwest. advertisement

Scientists met in Colorado last week for a conference on drought and water scarcity and there was no missing the theme of change in their messages, swathed as they were at times in dense, geologic research papers.

" . . . the natural snow pack reservoir is getting smaller and smaller," said Richard Palmer, who teaches water resource management at the University of Washington.

"In the winter of 2005, we had the smallest snow pack on record. That's a real wake-up call for us that something is changing."

An Australian scientist urged Americans to treat drought as constant rather than an emergency: In her country, "drought is no longer considered a disaster," said Linda Botterill, who teaches at the Australian National University in Canberra. "We have one of the most variable climates on earth. We really don't have a 'normal' climate. Therefore it's absurd to treat every drought as an emergency."

Changing ideas about climate and rain and water are nothing new in the arid West. It hasn't been that long ago - the middle of the 19th century - that respected leaders subscribed to a theory called "rain follows the plow." The theory gained prominence as homesteaders began moving into the Great Plains and the edge of the West and found that they couldn't rely on rain to water their crops.

Leaders of the time, fearful of the economic effects of a stalled expansion, convinced farmers that if they would only plow their fields and plant crops, the rain would follow. They found scientists who swore that plowing field would release moisture into the air and create rain; some even suggested the vibrations from all the building and digging and tromping around would drum up storms.

The whole scheme is widely blamed for early dry farming failures.

As late as the early 1900s, leaders of the seven Colorado River states apportioned water based on what turned out to be some of the wettest years in centuries. The river is now overallocated.

Botterill and others say we should consider drought the baseline condition here and the wet years part of the dramatic variability in climate.

"Drought is always out there," said Donald Wilhite of the National Drought Mitigation Center in Lincoln, Neb. "It's always affecting some part of the country." Reacting to droughts is far more expensive than planning for them, he said. Climate change and growth will only worsen our plight if we don't shift our thinking.

In other words, the drought we're surviving now in Arizona might flatten us in 30 or 40 years, when climate change has cut into runoff and our population has doubled again.

Evidence is accumulating that warming temperatures will affect mountain snows in the West, reducing runoff into reservoirs. Several studies suggest the Colorado River could shrink by 30 percent or more over the next half-century.

Warmer conditions eat away on several fronts: Less snow falls, resulting in less runoff. Rain falls at the wrong times of year, when reservoirs can't contain it. Warmer temperatures increase demand for water sooner in the season, tightening the supply further.

In studies of the Seattle and Portland areas, the UW's Palmer estimated that the amount of water available in the high-demand months will decrease 6 percent a year, 24 percent by 2040. Some of the water that arrives as rain in the winter will seep into the aquifers for pumping later, but it changes the equation in an area so reliant on runoff.

Reach McKinnon at [shaun.mckinnon@arizonarepublic.com](mailto:shaun.mckinnon@arizonarepublic.com); read his water blog Tuesdays and Thursdays at [mckinnonblog.azcentral.com](http://mckinnonblog.azcentral.com)

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Regional News 09/27/06

## **Efforts may help get more water from Colo. River**

Shaun McKinnon for The Arizona Republic

The Colorado River will undergo a series of experiments in the coming year aimed at squeezing from it even more water to meet the growing demands of Arizona and six other Western states.

Among the experiments, most of them intended to reduce wasted water: a three-month test of the Yuma desalination plant, expansion of a pilot program that pays farmers not to plant crops and construction of a small reservoir near the river's end to catch unused water before it reaches Mexico.

The U.S. Bureau of Reclamation, which oversees the lower Colorado, outlined the programs in the river's annual operating plan, a document that includes water-supply estimates along with management strategies. A draft version was presented to representatives from the seven river states last week. It takes effect Sunday.

The experiments won't free up much water right away, nor will they end disputes among the seven states about how to deal with drought. But officials believe the ideas could

help avoid future water shortages and help the states find ways to better manage the overworked river.

For Arizona, which relies on the Colorado for more than one-third of its water supply, any saved water could help protect it from losses if a river shortage is declared. Under the river's governing laws, Arizona must give up as much as half of its allocation before any other state is affected, part of a deal struck to win approval of the Central Arizona Project canal.

Key proposals in the plan:

- Restart the Yuma Desalting Plant. The bureau would run the mothballed plant at 10 percent capacity for about 90 days, then evaluate it as a way to cut losses from agricultural runoff. The test also would examine ways to lessen environmental damage from the plant's operation.
- Build a reservoir. The bureau will work with several water agencies to start construction next year on a small reservoir about 25 miles west of Yuma in California along the All American Canal. The reservoir could prevent the loss of as much as 26 billion gallons of water a year.
- Pay farmers not to farm. The bureau will contribute money to a program started by a California water agency that pays farmers near Blythe, Calif., to leave land fallow. The unused irrigation water remains stored in Lake Mead, available for later use.

"Some of these things will be a big part of the future," said Larry Dozier, deputy general manager of the CAP, which delivers Colorado River water to Phoenix and Tucson.

"What we're seeing this year are just start-up programs, but if you don't start, you won't finish."

The proposals, whose total costs have not yet been released, are mostly aimed at more efficiently operating the river from Lake Mead to the Mexican border. A study several years ago found that the United States was losing 500,000 acre-feet or more in some years to waste and flawed delivery procedures. The water flowed into Mexico, which used it without counting it against its share of the river.

An acre-foot is 325,851 gallons, enough to serve a family of five for a year.

Changes to the system have reduced the losses in recent years, but as much as 100,000 acre-feet still flows into Mexico annually. That translates into a 1-foot drop in water levels at Lake Mead, the giant reservoir that stores water for Arizona, Nevada and California. Lake Mead's level is important because it is used to determine whether there is a shortage on the river.

#### Desalination restart

Arizona views restarting the Yuma desalter as a critical step in averting shortages. The desalter was built in the early 1990s to remove salt from agricultural runoff as it enters

Mexico, but it was operated for only a few months before it was shut down, in part because high flows on the river diluted the salt content naturally.

Restarting it, even just to run tests, marks an important step for Arizona, Dozier said. The test run will fit into plans developed more than a year ago to operate the desalter without damaging the Cienega de Santa Clara, a wetland south of Yuma that survives on farm runoff from Arizona.

"It's not very much, a minimal amount of water, but it's significant in that it will let us test the system," he said. The CAP has agreed to help fund an \$80,000 water-monitoring program during the test run to see how the wetland is affected.

Running the desalter full time would cost tens of millions of dollars, but the bureau agreed to run the test as part of a broader water-savings plan.

"We do think there are some benefits to do a test, to better understand how it might work," said Jayne Harkins, deputy director of the bureau's Lower Colorado Region. "We haven't run it in a long time, so the test will let us study what it's going to take to replace that water that's lost."

#### New reservoir savings

Another significant source of lost water has been the changing needs and conditions among the hundreds of farmers who take water from the river.

When a farmer or irrigation district orders water, it is released from Lake Mead and takes several days to reach diversion points downstream. In the meantime, rainy weather might mean the farmer doesn't need the water after all, but because it has already been released, it flows into Mexico.

To solve that problem, the bureau will back a plan to build a small reservoir west of Yuma along the All American Canal, which moves water from the river to the Imperial and Coachella valleys of California. The reservoir will hold only about 8,000 acre-feet of water - by contrast, Lake Mead can store 28 million acre-feet - but the water won't stay more than a few days. It will be put back in the system when it's needed.

The reservoir, scheduled for completion in 2009, would benefit all the states on the river, said Tom Carr, assistant director of the Arizona Department of Water Resources. The water saved will stay in Lake Mead, raising overall storage.

Under a plan endorsed by the states, Nevada offered to pay for construction of the reservoir, Carr said. If that happens, Nevada will earn access to extra shares of the saved water.

#### Farming for water

Arizona won't participate in the farm-fallowing programs in the coming year, Carr said. The Metropolitan Water District of Southern California, which serves Los Angeles and surrounding cities, will continue paying farmers near Blythe to leave some ground unplanted. The water saved will remain in Lake Mead.

As part of next year's pilot program, the bureau will contribute money to the program and will seek other water users for future following projects. Water stored in federally funded programs will be used on behalf of all users.

The seven basin states also are working with an independent consultant to find other ways of conserving water or adding it to the river. The Southern Nevada Water Authority paid for the \$750,000 study, which is expected to yield a list of ideas soon.

Arizona, California and Nevada will contribute money this winter to boost cloud seeding along the upper Colorado.

The states also are working on a long-term drought plan. Their first set of ideas is under review by the Interior Department, which will issue a draft proposal at the end of the year and choose a plan in 2007. The plan is expected to change the way Lake Mead and Lake Powell, on the Arizona-Utah line, operate and will spell out more specifically how water shortages will affect the river's 25 million users.

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LR Press Release 10/13/06

### **CRSP 50th anniversary: no cause for celebration**

For Immediate Release:

Contact: John Weisheit 435-259-1063

Cell: 435-260-2590

On the occasion of the the 50th anniversary of the Colorado River Storage Project Act (CRSP) next Thursday, the Bureau of Reclamation will host a private celebration at Glen Canyon Dam.

Wrought with technical, economic and environmental controversy from the start, the massive reservoirs authorized by the CRSP have now entered a new era of conflict as increased water demand and climate change induced flow reductions have reinforced 50-year old arguments that these projects are not sustainable.

The scheme's cornerstone and nation's second largest reservoir, Lake Powell behind Glen Canyon Dam, now sits at less than 50 percent full. The Department of Energy forecasts that it and its companion projects upstream will soon not be able to guarantee delivery of the full allocation of water to the states of California, Arizona and Nevada.

"Instead of a celebrating, the Bureau of Reclamation should be performing a wake for the pending funerals of the communities that will run out of water once these reservoirs bottom out and the rivers run dry," said John Weisheit of Living Rivers. "Its time to develop a new project, the Colorado River Survival Project."

Climate specialists warned Reclamation ten years ago (the aftermath of the 1989-92 drought) of the consequences that climate change would have on the supply of the Colorado River, but the message went unheeded. In 2000, as the worst drought to hit

the system began to take hold, they were instead putting the finish touches on a management plan now known as "Surplus Criteria."

It was not until 2002 that Reclamation began to publicly recognize the potential for scarcity, but instead of developing a solid plan to prudently conserve, it's "2025 Plan" focused more on public relations and plans for water desalinization. Not until last year did it take it's first baby steps to actually address reduced water flows though the implementation of what they call "Shortage Criteria."

"But these plans may, at best, only ensure supplies through a small drought. They cannot guarantee survival through the severe and prolonged droughts that all of us are about to face," adds Weisheit, "We are not talking about the daily weather forecast here. This is a situation about a changing climate of warmer temperatures that is going to hang around for a very long time."

The climate professionals have been successfully modeling Colorado River flow based on the warming trends of the atmosphere and the oceans. Their peer-reviewed reports say the consequences of global warming include a lengthening of the growing season, increasing surface water evaporation, drier soils, and, most importantly, it will rain more than it will snow--the snow that reservoirs need to refill when it melts each spring.

"The CRSP is a water project that was never needed. It is apparent that all it does right now is waste water and money, degrade the water quality, and destroy the national park values of Grand Canyon. The first step to survive the water scarcity situation we now face is to decommission the dam that was never needed in the first place--Glen Canyon Dam," concludes Weisheit.

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For more information:

[The report for "Surplus Criteria" by Living Rivers and called The One-Dam Solution:](http://www.livingrivers2.org/archives/article.cfm?NewsID=688)  
<http://www.livingrivers2.org/archives/article.cfm?NewsID=688>

[Bureau of Reclamation web page for "Shortage Criteria::](http://www.usbr.gov/lc/region/programs/strategies.html)  
<http://www.usbr.gov/lc/region/programs/strategies.html>

[The Colorado River Project Storage Act: \[PDF File\]](http://www.usbr.gov/lc/region/pao/pdfiles/crspuc.pdf)  
<http://www.usbr.gov/lc/region/pao/pdfiles/crspuc.pdf>

[Excerpt of congressional testimony opposing the CRSP: \[PDF File\]](http://www.livingrivers2.org/pdfs/LRlibrary/ColoradoRiverBoard1954.pdf)  
<http://www.livingrivers2.org/pdfs/LRlibrary/ColoradoRiverBoard1954.pdf>

[Western Area Power Administration article about drought impacts to hydropower:](http://www.wapa.gov/newsroom/cct/2004/may28/26no112.htm)  
<http://www.wapa.gov/newsroom/cct/2004/may28/26no112.htm>

[Western Area Power Administration to Upper Colorado River Commission: Letter concerning drought and hydropower revenues](http://www.livingrivers2.org/pdfs/LRlibrary/warren2004.pdf)  
<http://www.livingrivers2.org/pdfs/LRlibrary/warren2004.pdf>

[Climate forecast by USGS/NOAA on stream flow reduction due to global warming](http://www.livingrivers2.org/pdfs/milly.pdf)  
<http://www.livingrivers2.org/pdfs/milly.pdf>

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LR in the News 10/16/06

## **Glen Canyon still a lightning rod**

By Nancy Perkins for Deseret Morning News

Fifty years after the first explosive blast signaled the beginning of construction on Glen Canyon Dam and its mission to store and manage millions of gallons of water from the Colorado River, critics of the massive federal project are calling for its demise while other experts say it's vital to the West's water-storage system.

"Glen Canyon Dam is a boondoggle," said Richard Ingebretsen, president of the Glen Canyon Institute in Salt Lake City. "It has wreaked havoc on the ecosystem of a beautiful river. Of all the dams that are useless, this place, Glen Canyon Dam, is the worst."

On Thursday, the Bureau of Reclamation will host a 50th anniversary celebration of the Colorado River Storage Act of 1956 at Glen Canyon Dam. The act also authorized the construction of Flaming Gorge Dam. Mark Limbaugh, assistant secretary of water and science for the Department of the Interior, is scheduled to speak at the invitation-only event.

Dennis Strong, director of the Utah Department of Water Resources, said Glen Canyon Dam is fulfilling its purpose, not only as a critical piece of the West's vast water storage program but in its role as a hydroelectric power plant producing electricity for nearly 6 million customers.

"There will always be a conflict between those who think we should let water run down the river and those who think we should manage it as a resource," Strong said. "Glen Canyon Dam and Lake Powell have functioned exactly as they were designed to do. They have allowed the upper Colorado basin states to deliver water to the lower basin states and fulfill their contract."

In 1956, Congress passed the Colorado River Storage Project Act, or CRSP, which authorized the initial construction of four large dams and reservoirs, including Glen Canyon Dam and Flaming Gorge Dam on the Green River tributary, to help tame and store 34-million acre-feet of water from the turbulent Colorado River.

Seven states — Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming — and Mexico all claim various complicated legal water rights in the Colorado River.

At the time of its passage, the act generated controversy because of its massive scope. Environmentalists argued the giant reservoirs would waste water through evaporation and seepage, and that the salt content in the water would rise. Sediment that normally flowed unimpeded down the Colorado River, they argued, would eventually clog the system and ruin the comprehensive system of dams, reservoirs, spillways and other measures taken along the length of the river.

"Now that 50 years have passed since the arguments were first made, the warnings have turned into fulfilling prophecies," said John Weisheit, conservation director of Living Rivers in Moab. "Instead of celebrating, the Bureau of Reclamation should be performing a wake for the pending funerals of communities that will run out of water once these reservoirs bottom out and the rivers run dry. It's time to develop a new project, the Colorado River Survival Project."

Don Ostler, executive director of the Upper Colorado River Commission in Salt Lake City, takes exception, saying CRSP projects such as Lake Powell have proven their worth.

"The construction of Glen Canyon Dam and other CRSP projects by the Bureau of Reclamation have been a lifesaver already for the people who use this water because of the recent drought," said Ostler. "I say we're not finished with the drought, either, with six out of the last seven years of precipitation below normal."

Even though both Lake Powell and Lake Mead, located further downstream near Las Vegas, are currently less than 50 percent full, the two reservoirs are meeting their obligations, he noted.

"If we didn't have Lake Powell, Lake Mead would have been empty by now," Ostler said. "We could not have supported the needs of the people without these two reservoirs. They are critically important and will become much more important in the future."

Lake Powell first reached capacity in 1980 and has had its ups and downs since then, although it was considered to be at its full capacity in 1999. Several states, including Utah, have initiated conservation measures aimed at curbing water use at every level.

"I'm darn proud of what Utah has done in reacting to a campaign of wise water use," Strong said. "I know we've been aided by the drought; that's certainly speeded up conservation. Six years later, we have a 13 percent reduction statewide in water use, and that's pretty amazing."

The challenge for water managers, Strong said, is to learn how to improve on the systems that are now in place.

"Society's needs change and as we learn more, we need to make adjustments," he said, adding one of the biggest challenges could be changing the attitude most people have when it comes to water conservation.

"As I look out my window here in Salt Lake City I can see green trees around the Capitol and barren mountains in the distance," he said. "We have an ethic in this state of being green. Conservation is going to have to play a larger role."

Add to that the alarm sounded by scientists around the world that global warming is shifting the Earth's climate, and the astounding population surge in cities throughout the west and "water wars" are bound to occur, Ingebretsen said.

"When are we going to stop building these megacities in the Mohave Desert?" he asked. "The Colorado Plateau is an extremely fragile ecosystem and my big plea to developers and the Bureau of Reclamation is to consider the animals, plants, reptiles and other creatures that live here. Somehow we've got to teach people that we cannot grow at the expense of other species."

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[LR Press Release and additional information](#)

Basin river projects saluted

Dignitaries gather to mark 50th anniversary of the Colorado River Storage Project Act

By Mark Havnes for The Salt Lake Tribune

Article Last Updated:10/20/2006 01:13:05 AM MDT

GLEN CANYON DAM - Gazing into Glen Canyon back in 1858, Army Lt. Joseph Ives predicted the river-sliced gorge and surrounding red-rock desert would be a "profitless locality . . . forever undisturbed and unvisited."

Wrong.

Instead, Glen Canyon Dam and its sister dams along the Upper Colorado River Basin have pumped nearly \$4 billion into the economy. They quench the water needs of 25 million people and generate 4.1 billion kilowatt hours of electricity annually. And visitors? Try more than 2 million a year at Lake Powell alone.

On Thursday, dignitaries gathered at Glen Canyon Dam - 710 feet above the Colorado River just south of the Utah line in northern Arizona - to mark the 50th anniversary of the Colorado River Storage Project Act, which gave birth to the dam and three others.

"It was an engineering marvel," Utah Lt. Gov. Gary Herbert told the crowd amid heavy security. "From a Utah perspective, we are an arid state, averaging 13 inches of rain a year. We know the challenge from our pioneer heritage that dictated they make the desert bloom like a rose. Their vision literally made it blossom."

Herbert urged current stewards to show the "same kind of vision" to ensure that today's quality of life continues tomorrow.

Not everyone is celebrating. The dams swallowed up scenic wonders and ignited an environmental uproar that echoes to this day.

John Weisheit, conservation director of Moab-based Living Rivers, said officials are miscalculating the true nature of the 1922 Colorado River Compact - which allowed for the storage and distribution in seven Western states of water in the Colorado River Basin - by elevating hydropower production above the original intention of providing clean, healthy water for people and the environment.

"It [hydropower] became the funding mechanism for the dams," Weisheit said from Moab.

He maintains that instead of farmers paying for the dams, as originally planned, the government changed the law so it could go into the power business. Now, rather than paying back the U.S. Treasury, the money is being tapped to mitigate problems caused by the dams.

"It's not about water anymore, it's about keeping it ticking," Weisheit said. "They've stretched water supplies to the limit. It [the water] is too salty and is being wasted in reservoirs because of evaporation.

"They should rename the Colorado River Storage [Project] Act the Colorado River Survival Project."

The four dams - Flaming Gorge on the Green River in eastern Utah, Glen Canyon on the Colorado River in northern Arizona, Navajo Dam on the San Juan River in New Mexico and the Wayne N. Aspinall Dam on the Gunnison River in west-central Colorado - together store 30.6 million acre-feet of water and help irrigate 2 million acres of farmland.

"It's hard to think these days they knew when they put the Colorado River Compact together, the impact they would have on the economic development in the upper states," said Mark Limbaugh, assistant secretary of the interior.

Rick Gold, regional director of the Upper Colorado Basin, told the crowd the dams allow for long-term storage so allocations can be met for compact states.

"The system is a gift to us all in this part of the world."

mhavnes@sltrib.com --- \* JOE BAIRD contributed to this story \* Paved the way for the construction of four dams on the Upper Colorado River Basin, Glen Canyon Dam being the largest. \* Cost \$760 million, with \$145 million going toward construction of Glen Canyon Dam. \* Provides an average of 30.6 million acre-feet of water. \* Irrigates 2 million acres of farmland. \* Meets water needs of 25 million people. \* Generates 4.1 billion kilowatt hours of electricity a year.

The 1956 Colorado River Storage Project Act Source: U.S. Bureau of Reclamation

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Regional News 10/26/06

## **As Utah and Nevada fight over water, some worry the West will turn into a new dustbowl**

By Ted McDonough for Salt Lake City Weekly

To get to Snake Valley in Utah's west desert, find a road less traveled and drive west. Then keep on driving. Past the last paved road, past swirling cyclones of dust, past the once vast Sevier Lake drained dry by farms of the earliest settlers and now usually marked by 200 square miles of white salt.

Keep driving past the point where dust coats your teeth and eyes, past any sign of human habitation to the very west end of the state. There, smack on the border with Nevada and seemingly rising out of nowhere, you'll find some of the highest peaks in Utah—the Deep Creek Mountains—and the Snake Valley stretched out below.

The Deep Creeks are 12,000-foot-high collectors of water, and home to seven creeks that flow year round, giving the mountains their name. Isolated since the Pony Express stopped passing through in the 1860s, the Snake Valley is thought by some to be one of few places left to search for the liquid gold needed to satisfy the thirst of the West's growing population. It's also here that Las Vegas is digging for water.

It's on the Nevada side of the mountains that Las Vegas is planning hundreds of wells and a 285-mile-long pipeline that will move the Deep Creeks' water to Las Vegas. A total of 200,000 acre-feet of water—that's 65 billion gallons—would be shipped from rural Nevada to Las Vegas each year under the plan. Nine of the wells are planned just five miles from the Utah border in a valley straddling the Utah-Nevada line. Las Vegas' water officials have targeted the Snake Valley to produce up to 50,000 acre-feet of water per year, pumping water into Nevada that would otherwise flow into Utah's Great Basin. Not all of those 50,000 acre-feet would have flowed into Utah. Nevertheless, those who populate one of the sparsest corners of Utah warn that such a massive transfer of water will cause irreparable environmental damage.

The vast valley floor appears deserted, but if you know where to look, you can find a handful of ranchers determined not to let Vegas have its way. They are few, but a tough bunch.

George Douglass moved his family to the base of a Deep Creek canyon on the Utah side 30 years ago. At the time, he thought civilization was about collapse and wanted to live where he could concentrate on becoming self-sufficient.

"It hasn't collapsed yet, so I'm really disappointed," Douglass says with a chuckle. "I'll tell you what, my two daughters never let me live that down." Douglass' wife Ronnie thinks Vegas will be disappointed if it goes looking for water in this part of the desert. After seven years of drought, the family no longer grows crops. George must travel to make a living. Ironically, he's currently working in Cedar City, drilling wells for that fast-growing town.

Ronnie spends her days petitioning Utah's congressman and state water officials.

She said she fears removing any water from the valley will ruin the already tenuous existence of Snake Valley's ranchers and the unique animals and plants that call the area home. The Douglass ranch is home to wild Mustang, pronghorn antelope and the Bonneville cutthroat trout, a species that was near extinction until the Douglasses created a fish hatchery on their ranch preserving the native fish.

The small trickle of water that flows on their property feeds not alfalfa but a series of small fish breeding ponds that are primarily responsible for repopulating east slope Deep Creek streams with Utah's state fish thought extinct just 40 years ago.

Like George Douglass, many of the ranchers of Utah's west desert would prefer to be left alone. But trouble keeps invading their solitude. In the late 1970s, they fought plans to put the MX Missile on their valley floor.

Their new fight may be as difficult. It pits them against Las Vegas developers and against Harry Reid, Nevada's powerful U.S. senator. Reid has close ties to Sin City developers but also strong pull with Utah's politicians. They will need the Senate minority leader's help if the Beehive State's own plans for massive water projects are to become reality. It's Sen. Reid who holds many of the cards, by way of his various committee memberships at the federal level, to water that would enrich Utah's St. George area, and some worry Utah can't afford to anger him by opposing the Las Vegas pipeline.

The Las Vegas pipeline is just one of a series of massive Western water projects planned on a scale not seen since Lake Powell and Lake Mead were created to tame the Colorado River. Utah's plans include a pipeline to bring Lake Powell water to St. George, the nation's fastest-growing metropolitan area. A second project on Utah's books would take water from the Bear River to feed the growing thirst of the Wasatch Front, portions of which are projected by state water officials to run short of water at mid-century. Private speculators are even getting in on the act. One Colorado investor, Aaron Million, has proposed a pipeline from the Flaming Gorge reservoir to Denver.

With the Colorado River no longer able to keep up with water demands of Western states, everyone is getting desperate. Some proposed solutions sound like science fiction. Las Vegas has funded studies to determine if the Pacific Ocean could be made drinkable by removing its salt. Then, the thinking goes, California wouldn't need its share of Colorado River water, which could instead be sent to Nevada. But any such massive ocean desalinization programs are decades into the future.

And as Western states gear up for huge water projects, scientists warn increasingly that they are digging for fool's gold. The water, some say, simply isn't there. And squeezing the last drops out of the turnip could cause unprecedented environmental disasters, from the dust bowl Douglass fears to the environmental devastation of one of the Western Hemisphere's most important breeding grounds for migrating birds—the Great Salt Lake.

Environmentalists warn the West is undergoing a massive conversion of public land to private homes too rapidly to foresee the consequences. This summer, 80 environmental organizations called for a moratorium on Western land privatization laws moving through Congress.

Janine Blaeloch, with the Seattle-based Western Lands Project, heads the opposition, noting that both the Nevada and Utah pipeline proposals have been helped along by federal legislation she criticizes as giveaways of public land to private development.

Utah Sen. Bob Bennett and Rep. Scott Matheson are sponsoring a law that would sell off 24,000 acres of land for private development around St. George while setting aside rights of way for water from the Lake Powell pipeline. Similarly, a Nevada land privatization bill sponsored by Sen. Reid gave free rights of way over federal land for the pipes to bring Snake Valley water to Las Vegas. Sen. Reid's connections to the pipeline are personal. The project was redesigned in January so water could be shipped not just to Las Vegas, but also to a vast dry area one-hour northeast of the city known as Coyote Springs. There, casino lobbyist Harvey Whittemore—a heavy donor to Reid's campaigns who also employs one of Reid's sons as his personal lawyer—is planning a development described as one of the largest since the founding of Vegas itself: 159,000 homes and 16 golf courses on 43,000 acres of what's now bone-dry ground.

A second Reid son sits on the board of the Southern Nevada Water Authority, the Las Vegas water supplier proposing the pipeline project. Proponents of the federal land-trading bills deny it, but Blaeloch predicts much of the cash raised by selling off public lands will end up funding the massive water projects.

“Growth is putting so much pressure on public lands, there really is a huge impetus to privatize more land to make way for retirement communities, second homes and the normal population,” she said. “And this incredible growth is in the West, where you have a huge amount of pressure on water supplies and not a whole lot of forethought on whether the water is going to be there to supply the development that is occurring.” Blaeloch lumps proposed development of St. George and Las Vegas into the same basket as “unsustainable.” Which means, quite simply, that if huge amounts of water must be shipped to develop land, maybe it shouldn't be developed at all.

“If you have to build 450 miles of pipeline to bring water to your community, there's a problem there.”

Snake Valley rancher Cecil Garland puts it another way. “We ain't got water for Las Vegas,” he says.

The 79-year-old Garland was one of the leaders in the campaign against the MX. Now he's determined to fight the Las Vegas pipeline. He lives in what was once the post office of the tiny Utah town of Callao, settled as a stop in the Pony Express route. His wife is the town schoolteacher.

Garland moved to Callao 30 years ago following a stint in Las Vegas where he claims to have dealt cards to Bugsy Siegel, the mobster often credited with the idea of a building

a wide-open city in Nevada's desert. Seventy percent of the Snake Valley is located in Utah, Garland notes, and Utah ranchers have historically used most of the area's water.

"If they build the pipeline, they'll get the water," said Garland. "They've got enough money to buy the ranches, the farms, everything else."

Where springs once bubbled from the surface of his ranch, today there are dry scars, the result, Garland says, of pumping by him and his neighbors during times of drought. Some climate scientists say the drought conditions Garland complains of might now be a permanent feature of the West.

Marty Hoerling, meteorologist with the National Oceanic and Atmospheric Administration's Earth System Research Laboratory in Boulder, Colo., recently examined temperature data collected by the world's climate scientists for a new assessment of climate change due out next year. His analysis focusing on Utah and Colorado, predicts a 5-degree rise in temperatures by 2050, perhaps as early as 2020. That means less snow pack, the area's primary means of storing water, and more evaporation. For the Colorado River, Hoerling predicts the change will mean a decrease in annual river flow to 10 million acre-feet, barely enough to meet current demand of California, Arizona and Nevada.

Years of drought have already robbed the Colorado River of much of its water. When the river was divided between Western states, it was thought to have a yearly flow of more than 16 million acre-feet. The flow in the last decade has measured about 13 million acre-feet. That level just matches current demand, Hoerling noted. "If flow is to decline because of climate change, it will move below current demand, let alone any growth in demand for water that some states have in mind," he said. The Southern Nevada Water Authority claims there is a lot of unclaimed water deep beneath the valleys on either side of the Deep Creek Mountains. The authority says it won't pump more than will be replaced each year by mountain runoff.

"There have been lots of claims that [Las Vegas] just wants the water, and they are going to take it. That's not at all how we are going about doing this," said Scott Huntley, water authority spokesman. "Our plan is based on the idea of doing this in a sustainable manner."

Garland has his doubts. "This was once a huge Ice Age lake," he said, noting scars left by the ancient Lake Bonneville on surrounding hills. "What makes them think it will recharge?"

Scientists with the Utah Geological Survey are busily trying to determine recharge rates for area underground aquifers but say too little is known about area geology to say for sure how water flows in the Snake Valley. And the Las Vegas pipeline project is moving through the permitting process ahead of ongoing federal studies aimed at determining how much water is available. Stefan Kirby with Utah Geological Survey agrees with the Southern Nevada Water Authority that there is significant water under the Snake Valley but said the water might not replace itself if taken out. The water now being pumped from deep wells may have been put down in prehistoric times, he said. And it's possible

the area's complex rock structure now carries mountain runoff sideways miles away before going to ground.

Kirby is performing Carbon-14 dating—the same process used to date dinosaur bones—on samples of water taken from area wells to determine how much of the water rolling off of the Deep Creeks actually makes it into the deepest underground aquifers. What Utah scientists believe they do know is that Nevada's wells will be placed precisely at the point where water from mountain creeks slips underground and makes its way into Utah. A 2005 Utah Geological Survey study found water currently flows from Nevada into Utah and predicted the Las Vegas pipeline would cause well levels in Utah to drop more than 100 feet, possibly drying up springs 30 miles into Utah. In a worst-case scenario, Nevada's pumping could cause water flow in the entire Great Basin to reverse direction. Instead of flowing from Nevada into Utah, water would be sucked from Utah into Nevada. Garland worries that reversal could suck brackish water near the Salt Flats onto his land, destroying forever its ability to be cultivated.

Utah ranchers plan to ask Utah's Legislature in January for \$1 million to fund test wells to monitor ground-water levels. They also want Utah to demand that Las Vegas switch off the pumps if those wells turn up signs that Utah's water is being impacted.

Responding to those calls, the Legislature's Natural Resources Agriculture and Environment Committee this summer passed a resolution asking Utah water officials to hold off signing the Snake Valley water agreement with Nevada until studies of area groundwater have been completed. Committee members hope to have the full Legislature pass the resolution in January—if, that is, it isn't too late.

Utah and Nevada water officials are on track to complete the Snake Valley water agreement by the first of next year. Utah's director of Natural Resources Mike Styler said he wants an agreement in place soon to protect Utah ranchers. He said the agreement he's negotiating calls for monitoring and other safeguards ranchers want.

All this hand-wringing may be in vain, Styler said. As part of negotiations, Utah and Nevada water officials estimated how much of the valley's water is already being used. The answer, Styler said, appears to be all of it.

"The amount of water available is so limited I think it will be marginal for southern Nevada to put a pipeline in [to Snake Valley]," he said. "One thing we've always said is any water right that belongs to Utah or could be used by Utah, we're not going to give up."

Ranchers point out they aren't the only ones using water in the west desert. On Dean Baker's ranch at the south end of Snake Valley, Baker points to a hole in the ground where a spring used to be. Animals, probably coyote, have dug a hole to reach the water now several feet underground, he said.

Today, without springs, the hundreds of antelope that range Baker's property drink from his irrigation ditches to quench their thirst.

Gandy Spring, a short drive from Baker's ranch, is home to the "least chub," a tiny prehistoric fish left behind in shallow pools when Lake Bonneville receded at the end of the Ice Age that is found almost nowhere else. Fish Spring National Wildlife Refuge and Great Basin National Park are also located in the area.

Don Duff, the man who in the mid-1970s discovered surviving populations of Bonneville cutthroat trout in two high Deep Creek streams and worked with the Douglass family to restore the fish, worries Las Vegas' pipeline could ruin his life's work. Overpumping of ground water, he notes, has been known to cause mountain streams to dry up.

"We can't have expanded growth without impacts in the environment," said Duff, a retired Forest Service aquatic ecologist who runs the Trout Unlimited chapter in Baker, Nev. "Once there are impacts shown, you've already lost. How do you shut the pumps down to a multibillion-dollar project? You can't pump water back into the basin."

Utah environmentalists share similar fears about their state's pending water projects. The Utah Rivers Council recently released a report asking Utah water officials to examine alternatives to developing water from the Bear River, noting the Bear provides 60 percent of the surface water to the Great Salt Lake. The lake and the river delta around it, including the Bear River Migratory Bird Refuge, are recognized as one of the most important refuges in the Western Hemisphere for migrating birds. Utah water officials say water would be taken only during high winter runoff, but the Rivers Council complains the lake is so shallow that small changes in water can have dramatic effects.

The Las Vegas pipeline project also could impact lake levels. Water flowing out from the Snake Valley is thought to contribute around 10,000 acre-feet per year to the Great Salt Lake.

Standing at the edge of his property where years of drought have killed even the tenacious plants that hold the desert together, Garland picks up a fistful of fine sand, then lets it fall through his fingers. Two years ago, before the worst of the recent drought abated, Garland said he witnessed clouds of dust 500 feet in the air. He predicted the result of Las Vegas pumping will be clouds thousands of feet high moving to Salt Lake City.

Garland isn't a man who shies from exaggeration. If the Las Vegas pipeline isn't stopped, he predicts the land will become, "New Orleans in reverse." But his vision of a new dust bowl isn't that far fetched. It happened before, not too far away, in California's Owens Valley, a one-time farming community at the base of the Sierra Nevada Mountains.

At Garland's invitation, attorney Greg James, the former water department director for Inyo County in Owens Valley, visited Callao this summer to speak to visiting lawmakers from Utah and Nevada. James told of Los Angeles raids on Owens Valley water beginning at the turn of the century and expanding through the 1970s. First the springs went dry. By the mid-1920s, the valley's entire river had gone to Los Angeles. Then a lake dried up.

By the time James got to Inyo County, Los Angeles had purchased all of the valley's farms and ranches for water rights, and Owens Valley had become the world's largest source of dust. The Clean Air Act eventually gave James some leverage to force Los Angeles to begin repairing the damage. Still, after decades of lawsuits, Owens Valley has managed to get back only about half the water.

"The lesson from L.A. is they came to the valley saying, 'Don't worry. It's very safe. We are going to take a little bit of water,'" James said. "But as the city continued to grow, they couldn't stop."

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World News 10/30/06

## **Global Warming Could Devastate Economy**

BY THOMAS WAGNER FOR ASSOCIATED PRESS LONDON (AP)

[Stern Report](#)

[Stern Report Executive Summary](#) [1m PDF File]

Unchecked global warming will devastate the world economy on the scale of the world wars and the Great Depression, a British government report said Monday, as the country launched a bid to convince doubters that environmentalism and economic growth can coincide.

Britain hired former Vice President Al Gore, who has emerged as a powerful environmental spokesman since his defeat in the 2000 presidential election, to advise the government on climate change - a clear indication of Prime Minister Tony Blair's dissatisfaction with current U.S. policy.

Blair, President Bush's top ally in the Iraq war, said unabated climate change would eventually cost the world between 5 percent and 20 percent of global gross domestic product each year. He called for "bold and decisive action" to cut carbon emissions and stem the worst of the temperature rise.

"It is not in doubt that, if the science is right, the consequences for our planet are literally disastrous," he said. "This disaster is not set to happen in some science fiction future many years ahead, but in our lifetime."

The report emphasized that global warming can only be fought with the cooperation of major countries such as the United States and China, and represents a huge contrast to the Bush administration's wait-and-see global warming policies.

Sir Nicholas Stern, the senior government economist who wrote the report, said that acting now to cut greenhouse gas emissions would cost about 1 percent of global GDP each year. He recommended a "low-carbon global economy" through measures including taxation, regulation of greenhouse gas emissions and carbon trading.

"That is manageable," he said. "We can grow and be green."

Bush kept America - by far the biggest emitter of carbon dioxide and other gases blamed for global warming - out of the Kyoto international treaty to reduce greenhouse gases, saying the pact would harm the U.S. economy. The international agreement was reached in Kyoto, Japan, in 1997 and expires in 2012.

Blair made his displeasure with U.S. environmental policy clear when he signed an agreement this year with California Gov. Arnold Schwarzenegger to develop new technologies to combat the problem. The measure imposed the first emissions cap in the United States on utilities, refineries and manufacturing plants in a bid to curb the gases that scientists blame for warming the Earth.

The prime minister and the report also said that no matter what Britain, the United States and Japan do, the battle against global warming cannot succeed without deciding when and how to control the greenhouse gas emissions by such fast-industrializing giants as China and India.

Stern's 700-page report said evidence showed "that ignoring climate change will eventually damage economic growth."

"Our actions over the coming decades could create risks of major disruption to economic and social activity, later in this century and in the next, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century," he said.

The report said at current trends average global temperatures will rise by 3.6 to 5.4 degrees within the next 50 years or so, and the earth will experience several degrees more of warming if emissions continue to grow.

It said such warming could have effects such as melting glaciers, rising sea levels, declining crop yields, drinking water shortages, higher death tolls from malnutrition and heat stress, and widespread outbreaks of malaria and dengue fever. Developing countries often would be the hardest hit.

The report acknowledged that its predictions regarding GDP relied on sparse data about high temperatures and developing countries, and placed monetary values on human health and the environment, "which is conceptually, ethically and empirically very difficult."

Treasury Chief Gordon Brown, who is expected to replace Blair as prime minister next year, said Britain would lead the international effort against climate change, establishing "an economy that is both pro-growth and pro-green." He called for Europe to cut its carbon emissions by 30 percent by 2020 and 60 percent by 2050 - and Blair's government on Monday said it would propose a British law to that effect.

Under the 1997 Kyoto accord, 35 industrialized nations committed to reducing emissions by an average 5 percent below 1990 levels by 2012.

But Britain is one of only a handful of industrialized nations whose greenhouse gas emissions have fallen in the last decade and a half, the United Nations said Monday.

The U.N. said Germany's emissions dropped 17 percent between 1990 and 2004, Britain's by 14 percent and France's by almost 1 percent.

Overall, there was a 2.4 percent rise in emissions by 41 industrialized nations from 2000 to 2004, mostly because former Soviet-bloc countries, whose emissions declined in their economic downturn of the 1990s, increased emissions during the recent four-year period by 4.1 percent.

The British government is considering new "green taxes" on cheap airline flights, fuel and high-emission vehicles.

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Regional News 10/31/06

### **States to begin augmentation study to prepare for water scarcity**

Excerpt: "The Colorado River Basin States are currently collaborating on a system-wide study examining augmentation options, such as desalination, weather modification and other emerging technologies."

Press Release

Source: Southern Nevada Water Authority

Interior Secretary Kempthorne, Colorado River Water Users Discuss Drought Management

Tuesday October 31

LAS VEGAS, Oct. 31 /PRNewswire/ -- Secretary of the Interior Dirk Kempthorne met yesterday (Oct. 30) with representatives from the seven states that share the Colorado River's flows to discuss water management issues related to the drought-plagued river.

"The key issue for this river system, as it is for many other river systems around the West, is the competition and demand for a limited resource, and the need to find solutions to this demand that will meet both current and future needs," Kempthorne told the representatives. "This is a tough job, and I look forward to working with you to find consensus solutions to these issues."

Among the items discussed were shortage sharing arrangements associated with persistent Colorado River drought conditions and potential options for augmenting the river system's flows. The Colorado River Basin States are currently collaborating on a system-wide study examining augmentation options, such as desalination, weather modification and other emerging technologies. The results of the study are scheduled for release next summer. An Environmental Impact Statement related to managing the river system is also being developed.

Representatives from the Colorado River Basin States expressed that Kempthorne's visit underscored his commitment to working proactively and collaboratively on difficult Colorado River issues such as shortage management. The meeting was productive and set a positive tone for the critical times ahead.

This was Kempthorne's first opportunity to meet collectively with officials from the Colorado River Basin States. The Secretary, who was appointed in May 2006, recently made an aerial tour of the Colorado River. Attending the meeting were representatives of all seven Basin States: Wyoming, Colorado, Utah and New Mexico (Upper Basin); and Arizona, California and Nevada (Lower Basin). Interior Assistant Secretary for Water and Science Mark Limbaugh, Bureau of Reclamation Commissioner Bob Johnson, Upper Colorado Regional Director Rick Gold and Lower Colorado Acting Regional Director Jayne Harkins rounded out the Interior team.

Contacts: Kip White, Bureau of Reclamation (202) 513-0684 Scott Huntley, Southern Nevada Water Authority (702) 258-7258

[Additional information from the consulting firm of Black and Veatch](#)

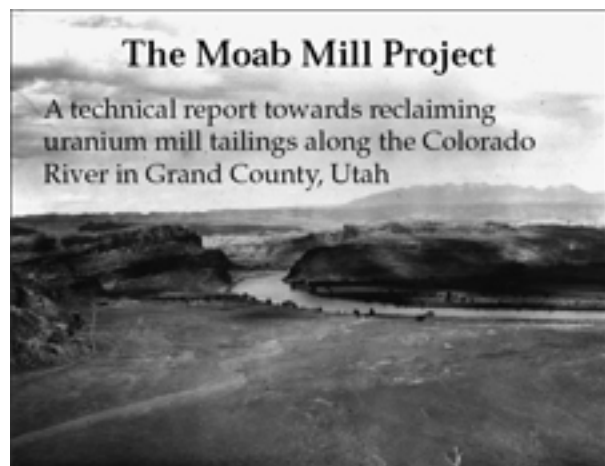
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LR Testimony 11/01/06

### **The Moab Mill Project: A Technical Report Towards Reclaiming Uranium Mill Tailings**

[This report](#) about the Department of Energy's (DOE) reclamation of uranium waste along the Colorado River, is a project supported by a grant from the [Citizens' Monitoring and Technical Assessment Fund](#).



The report includes two studies related to the behavior of the Colorado River in the vicinity of the Moab where DOE is carrying out the remediation of the former Atlas Corporation Uranium Mill, pursuant to federal law.

The first study, by Dr. John C. Dohrenwend, is "A Review: Department of Energy's Assessment of Potential Flood Hazards at the Moab Project Site (Atlas Tailings Pile)," January 2005.

The second, by Dr. Noam Greenbaum, is "Paleofloods in the Upper Colorado River near Moab, Utah," May 2006.

The first report was submitted to the DOE as comment on the Draft Environmental Impact Statement for Remediation of the Moab Uranium Mill Tailings. Dr. Dohrenwend's review was one of the studies relating to the potential long-term impact of the Colorado River should the estimated 16-million tons of uranium mill tailings be left on site.

It was one of the studies that the DOE took into consideration when the Record of Decision determined that the Moab Mill tailings should be moved from the floodplain of the Colorado River to a site at Crescent Junction, 30 miles north.

The second report is the result of a paleoflood study carried out upstream of the Moab site. The study, based on fieldwork carried out in the summer of 2005, brings forth a whole new set of data related to the flood behavior of the Colorado River within the past several thousand years.

Most significantly, the study provides new information that alters previous determinations of the flood discharge rates for the 100-year and 500-year floods and the probable maximum flood (PMF).

This new data must be considered and further investigations initiated.

Additional copies of this report can be obtained by contacting:

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Additional Information:

[Living Rivers press release](#)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=730>

[Cover Letter: Moab Mill Project](#) [PDF File]

[Brochure: Moab Mill Project](#) [PDF File]

[Poster \(17 x 22\): Moab Mill Project](#) [1.5m PDF File]

[Times-Independent newspaper clippings: Moab Mill Project](#) [7m PDF File]

[Department of Energy: Moab Project](#)

<http://gj.em.doe.gov/moab/>

Regional News 11/03/06

## **Reclamation announces new EIS for Glen Canyon Dam**

First posted on November 3, 2006

The Bureau of Reclamation today announced it will begin to develop an Environmental Impact Statement (EIS) on the implementation of a Long-Term Experimental Plan (LTEP) for operational activities at Glen Canyon Dam and other management actions on the Colorado River.

This EIS is in response to a settlement agreement in the 9th District Court by the plaintiffs: Center for Biological Diversity, Living Rivers, Sierra Club Grand Canyon Chapter, Glen Canyon Institute and the Arizona Wildlife Federation.

In that agreement, Reclamation committed to further NEPA and Endangered Species Act compliance activities, in concert with the Adaptive Management Program, which began in 1996 following the completion of the first EIS, which began in 1989.

The development of the present EIS continues the efforts of the Adaptive Management Program and created to protect the resources of Grand Canyon National Park below Glen Canyon Dam.

A component of that program has been the work of the Adaptive Management Working Group (AMWG) and the Technical Working Group (TWG) through adaptive management and scientific experimentation.

The AMWG provides the Secretary of the Interior with recommendations on the development and review of science-related work and changes to management practices.

Since its inception in 1996, the AMWG and the TWG have been working to develop long-term planning and monitoring through structured experimentation related to operations of the dam (flow) and other management actions (non-flow).

The EIS on the Long-Term Experimental Plan will rely on the extensive scientific studies that have been undertaken by the U.S. Geological Survey's Grand Canyon Monitoring and Research Center (GCMRC).

The AMWG will inform Reclamation of options for a long-term experimental plan during the EIS process and will also have the opportunity to recommend other experiments related to the plan.

The public has the opportunity to provide oral and written comments to Reclamation on options and experiments until the last day of February 2007.

The AMWG will hold a public meeting December 5, 2006, in Phoenix, Ariz., at the Fiesta Inn at 2100 S. Priest Drive, Tempe, Arizona.

The Bureau of Reclamation will hold two public meetings:

January 4, 2007 at Phoenix, Arizona, Embassy Suites Phoenix Airport at 44th Street (Cholla room), 1515 North 44th Street. Meeting time: 6:00 p.m. - 8:00 p.m.

January 5, 2007: Salt Lake City, Utah, Hilton Salt Lake City Center, (Salon 1), 255 South West Temple. Meeting time: 6:00 p.m. - 8:00 p.m.

These meetings will provide an opportunity for public input on the Long-Term Experimental Plan. An agenda for the meeting, including projected times for the discussion of this action, has been posted on the Upper Colorado Region's web page at [www.usbr.gov/uc](http://www.usbr.gov/uc). Click on the Adaptive Management Program listing for details.

The Department of Interior anticipates publishing a draft EIS in the spring of 2008.

THE COMMENT PERIOD ENDS FEBRUARY 28, 2007

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Website: <http://www.usbr.gov/uc/rm/gcdltep/index.html>

[Additional Information](#)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=753>

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Regional News 12/12/06

### **Stegner Center 12th Annual Symposium: The Colorado River**

**Location:** University of Utah / S.J. Quinney College of Law / Sutherland Moot Courtroom

**Date:** Friday Mar 2, 2007 (7:00 AM) to Saturday Mar 3, 2007 (5:00 PM)

**Contact:** 801.585.3440 [Link to the Stegner Center](#)

The Wallace Stegner Center's 12th annual symposium will explore issues of Colorado River management, focusing on the seven-state Colorado River Compact and other aspects of the "Law of the River," the complex set of laws, treaties, cases, regulations, and other documents that govern use and management of the Colorado River. The fundamental question to be explored in this two-day symposium is whether the 1922 Compact is resilient enough to meet the environmental needs and to withstand the hydrological, climatic, economic, and other real-world changes of the next century, or whether significant changes to the compact or other laws are necessary.

The Stegner Center will be joined by policy analysts, water users, scientists, economists, political leaders, environmental advocates, and others to consider whether the Colorado River Compact needs to be refashioned. Critical issues include how Colorado River water might be re-allocated among the Upper and Lower Basin states, Native American tribes, Mexico, and instream environmental uses, and what effect this might have on the ecological health of the river as well as surrounding communities and other users of Colorado River resources.

The goal for this year's symposium is to promote understanding of the cultural and historical forces that shaped the Colorado River Compact and how the realities of the New West, including the urbanization of the region, population growth, environmental damage, and increased water demands, along with a changing environmental ethic, might suggest a need to reconsider something as fundamental as the 1922 Colorado River Compact.

The symposium will feature the following speakers:

Robert Adler, Associate Dean for Academic Affairs and James I. Farr Chair in Law and Professor of Law, University of Utah S.J. Quinney College of Law

Niklas Christensen, Water Resource Engineer, Herrera Environmental Consultants

Steven E. Clyde, Shareholder and Managing Director of Clyde Snow Sessions & Swenson, P.C.

Karl W. Flessa, Professor of Geosciences, University of Arizona

Justice Gregory J. Hobbs, Jr., Colorado Supreme Court David H. Getches, Dean and Raphael J. Moses Professor of Natural Resources Law, University of Colorado School of Law

Richard J. Ingebretsen, MD, PhD, Professor, University of Utah Department of Physics and Clinical Instructor of Medicine, University of Utah School of Medicine

Robert W. (Bob) Johnson, Commissioner of the Bureau of Reclamation (invited)

Patty Limerick, Faculty Director and Chair of the Board, Center of the American West

Pat Mulroy, General Manager, Southern Nevada Water Authority

Don A. Ostler, Executive Director, Upper Colorado River Commission

Jennifer Pitt, Senior Resource Analyst, Environmental Defense

John (Jack) C. Schmidt, Professor, Department of Watershed Sciences, Utah State University

Tom Till, Nature Photographer and Author; Fellow of the North American Nature Photography Association

Susan M. Williams, Owner/Partner, Williams & Works, P.A.

David S. "Sid" Wilson, Jr., General Manager, Central Arizona Project

Connie A. Woodhouse, Associate Professor in Geography and Regional Development, University of Arizona

J. Francisco Zamora-Arroyo, Project Manager, Colorado River Delta, Sonoran Institute

Jerry Zimmerman, Executive Director, Colorado River Board of California

The Stegner Center will begin accepting registrations in January 2007. Registration fees are \$110 if received by February 16; \$140 if received on February 17 or later. Seniors and university and college faculty and staff are \$65 if received by February 16; \$90 if received on February 17 or later. Students are \$50 if received by February 16; \$75 if received on February 17 or later. Continental breakfast and lunch is included. Thirteen CLE credits are available for \$15.

Please contact the Stegner Center at 801-585-3440 or

[Link to the Stegner Center](http://www.law.utah.edu/stegner/)

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