THE SECRETARY OF THE INTERIOR

WASHINGTON

NOV 12 1991

Honorable Norman Bangerter
Governor of Utah
Salt Lake City, Utah 84114

Dear Governor Bangerter:

On August 13, 1990, representatives of the Colorado River Basin States, the Upper Colorado River Commission, appropriate Federal Agencies, and others interested in Colorado River operations met and discussed the Annual Operating Plan (copy enclosed) for the Colorado River reservoirs for water year 1992. The plan of operation reflects uses of the reservoirs for all purposes consistent with the Criteria for Coordinated Long-Range Operation of the Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968 (Operating Criteria).

Pursuant to required Secretarial determinations, Glen Canyon Dam will release the minimum objective of 8,230,000 acre-feet for water year 1992; Hoover Dam releases, including pumping from Lake Mead, will satisfy up to 7,500,000 acre-feet of reasonable beneficial consumptive use by mainstream users in the Lower Division States during calendar year 1992; and 1,500,000 acre-feet of water will be delivered to Mexico during calendar year 1992 in accordance with Article 15 of the 1944 Mexican Water Treaty and with Minute No. 242 of the International Boundary and Water Commission.

The 1992 operation plan reflects below average reservoir inflow during 1988, 1989, 1990, and 1991. However, recognizing the system storage available and the beneficial water needs of the Colorado River Basin States, requests for Colorado River water by holders of water delivery contracts with the United States and of other water rights recognized by the decree in Arizona v. California, 7,500,000 acre-feet of reasonable beneficial consumptive use by mainstream users in the Lower Division States will be satisfied during calendar year 1992.

Because of the extensive and continuing drought in California, use of non-Colorado River water by the Metropolitan Water District of Southern California (MWD) has been severely restricted. In addition to the 7,500,000 acre-feet available under a "normal" determination, California has requested up to 400,000 acre-feet of Colorado River water for beneficial consumptive use in calendar year 1992, primarily for use by MWD.

Based on the most recent data, there is a reasonable probability that MWD can divert Colorado River water at the full capacity of its aqueduct for calendar year 1992 without causing reasonable beneficial consumptive use by mainstream users in the Lower Division States to exceed 7,500,000 acre-feet. Therefore, MWD will be permitted to divert at full capacity for all of calendar year 1992.

Users of Colorado River water in the Lower Division States are required to limit their mainstream beneficial consumptive use to 7,500,000 acre-feet during calendar year 1992. In cases where diversions by any users in the Lower Division States are not in compliance with water entitlement or water use and conservation requirements contained in 43 CFR 417, we will take appropriate action. If the final Supreme Court decree accounting data for calendar year 1992 indicate that more than 7,500,000 acre-feet in the Lower Division States were consumed, MWD and other California contractors exceeding their entitlements will be required to compensate for their overuse by the end of calendar year 1995. Compensation for overuse will be in the form of adjustments to apportionments unless other forms of compensation or other timeframes are agreed to by the Governors' representatives of the Seven Colorado River Basin States and the Secretary of the Interior. The need for compensation will be eliminated in the event that system releases in excess of United States beneficial consumptive uses occur.

Sincerely,

MANUEL LUJAN JR.

Enclosure

cc: Mr. D. Larry Anderson
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bc: Secretary's Surname
Secretary's Reading File (2)
ES, AS/WS (3), CL, CLC, SOL
W-1000, W-1500, W-6500 (w/encls to each)
Regional Director, Boulder City, Nevada, Attention: LC-400
Regional Director, Salt Lake City, Utah, Attention: UC-400
Regional Solicitor, Intermountain Region, 6201 Federal Building,
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Regional Solicitor, Rocky Mountain Region, Denver, Colorado,
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Project Manager, Phoenix, Arizona, Attention: APO-100
Project Manager, Yuma, Arizona, Attention: YPO-100
(w/encls to each)

D-1000, D-5000, D-5100, D-5140, D-5300, D-5700, D-5750, D-5755, D-7920
(w/encls to each)

all Work Group members

WBR:RWCheney:lq:9/17/91:FTS 776-3813
(PC:5755:AOP92SEP.MWC) PRJ-13.00

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ANNUAL OPERATING PLAN

FOR

COLORADO RIVER RESERVOIRS

WATER YEAR 1992

ANNUAL OPERATING PLAN FOR
COLORADO RIVER RESERVOIRS
WATER YEAR 1992

INTRODUCTION

Authority

This document provides a summary of the annual operating plan (AOP) for water year 1992 for the Colorado River System. The 1992 AOP was developed in accordance with Section 602 of *Public Law 90-537*, and the *Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs Pursuant to the Colorado River Basin Project Act of September 30, 1968* (Operating Criteria), promulgated by the Secretary of the Interior pursuant thereto and other applicable statutes. In accordance with *Public Law 90-537* and the Operating Criteria, the AOP must be administered consistent with applicable Federal laws, the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande Treaty Between the United States of America and Mexico, signed February 3, 1944 (referred to as the 1944 Mexican Water Treaty), interstate compacts, court decrees, and other

documents relating to the use of the waters of the Colorado River, which are commonly known as "The Law of the River."

The Operating Criteria and Section 602 of *Public Law 90-537* mandate consultation with representatives of the Governors of the seven Basin States and the Upper Colorado River Commission relative to annual plans for operation of the Colorado River reservoirs. The 1992 AOP was prepared by the Bureau of Reclamation in consultation with the seven Basin States Governors' representatives, the Upper Colorado River Commission, appropriate Federal agencies, and others interested in Colorado River operations.

Purpose

The purposes of the AOP are to define (1) the projected operation of the Colorado River reservoirs to satisfy project purposes under varying hydrologic and climatic conditions; (2) the quantity of water considered necessary as of September 30, 1992 to be in storage in the Upper Basin reservoirs as required by Section 602(a) of *Public Law 90-537*; (3) water available for delivery pursuant to the 1944 Mexican Water Treaty and Minute No. 242 of the International Boundary and Water Commission, United States and Mexico (IBWC); (4) whether the reasonable consumptive use requirements of mainstream users in the Lower Division States will be met under a "normal," "surplus" or "shortage" condition as outlined in Article

III of the Operating Criteria; and (5) whether apportioned but unused water by one or more Lower Division States exists and can be used to satisfy beneficial consumptive use requests of mainstream users in other Lower Division States as provided in the decree in *Arizona v. California.*

Consistent with the above determinations and in accordance with other provisions of "The Law of the River," the AOP was developed with "appropriate consideration of the uses of the reservoirs for all purposes, including flood control, river regulation, beneficial consumptive uses, power production, water quality control, recreation, enhancement of fish and wildlife, and other environmental factors" (Operating Criteria Article I(2)).

Since the hydrologic conditions of the Colorado River Basin can never be completely known in advance, the AOP addresses the operations resulting from three different hydrologic scenarios: the probable maximum, most probable, and probable minimum reservoir inflow conditions. River operations under the plan are modified during the year as runoff predictions are adjusted to reflect existing snowpack and climate conditions.

Summary

Upper Basin Delivery. - Glen Canyon Dam will be operated to meet the minimum objective release of 8,230,000 acre-feet (AF) for water year 1992 in accordance with Article II(2) of the Operating Criteria.

Lower Basin Uses. - Hoover Dam releases (including pumping from Lake Mead) will be sufficient to satisfy up to 7,500,000 AF of reasonable beneficial consumptive use requirements by mainstream users in the Lower Division States during calendar year 1992 in accordance with Article III(a) of the Operating Criteria and Article II(B)(1) of the Decree in *Arizona v. California*. Because Arizona and Nevada will not fully consume their respective apportionments pursuant to Article II(B)(1), California will be allowed to utilize apportioned but unused water from these States, in accordance with Article II(B)(6) of the decree in *Arizona v. California*; provided that, the calendar year 1992 consumptive use by mainstream Lower Division States users does not exceed 7,500,000 AF.

1944 Mexican Water Treaty Delivery. - The guaranteed annual quantity of 1,500,000 AF of water will be delivered to Mexico during calendar year 1992 in accordance with Article 15 of the 1944 Mexican Water Treaty and Minute No. 242 of the IBWC.

Reservoir Operations. - Due to the amount of vacant storage space in the Colorado River reservoirs at the beginning of water year 1992, no flood control releases are anticipated from Hoover Dam pursuant to the Hoover Dam Flood Control Regulations, and no releases are contemplated from Glen Canyon Dam to avoid anticipated spills or to equalize active storage in Lakes Mead and Powell except under the maximum probable flow scenario. Water releases from each of the Colorado River reservoirs will be in accordance with minimum flow requirements, reservoir operating criteria, and target storage elevations. All releases will pass through the powerplants, except at Fontenelle, Blue Mesa, and Crystal Reservoirs. The resulting operation will benefit all authorized project purposes at each of the reservoirs.

WATER YEAR 1991 OPERATIONS SUMMARY AND RESERVOIR STATUS

Projected totals for the 1991 water year will mark the fourth consecutive below average annual flow in the Colorado River Basin. Although basinwide precipitation during 1991 was over 95 percent of normal, projected 1991 water year total runoff into Lake Powell is estimated to be approximately 69 percent of average. This illustrates the effect that previous years of low precipitation have had on the basin. Even though Colorado River inflow was well below average during water year 1991, there has been an overall improvement in the condition of the

basin. This is demonstrated by most of the reservoirs located upstream from Lake Powell filling during the year and the Palmer drought index improving from a severe drought to a moderate drought.

During water year 1991, the overall drawdown of the Colorado River reservoirs that began in 1988 continued. It is expected that an additional 2,000,000 AF will be drawn from storage during 1991. The October 1, 1991 system vacant space is expected to be about 17,400,000 AF. This vacant space is a result of the 5 lowest successive years (1987 through 1991) of inflow into Lake Powell on record. During this drawdown period, all minimum deliveries of water have been maintained to meet obligations pursuant to "The Law of the River". The following table lists the October 1, 1991 expected reservoir vacant space in 1000 AF, reservoir storage levels, and the percent of capacity:

Reservoir	Vacant Space (1,000 AF)	Live Storage (1,000 AF)	Percent of Live Capacity
Fontenelle	39	306	89
Flaming Gorge	384	3,365	90
Blue Mesa	98	731	88
Navajo	195	1,501	89
Lake Powell*	9,772	14,580	60
Lake Mead	6,670	19,207	74
Lake Mohave	385	1371	78
Lake Havasu	62	557	90
Totals	17,605	41,588	--

* The live capacity of Lake Powell is now estimated to be 24,322,000 AF. This is the result of a sedimentation survey that was completed in 1985 and has now been made official.

The specific release patterns required for the Glen Canyon Environmental Studies were completed in July of 1991. These releases were completed on schedule and within the minimum release objective of 8,230,000 AF due to the excellent cooperation of all of the agencies involved in the effort. The data collected during

the studies should increase the Federal Government's understanding of the environmental consequences of different hourly release patterns.

WATER YEAR 1992 AOP OPERATIONS ANALYSES

In addition to compliance with the Operating Criteria, several specific operating issues were addressed during the preparation of the annual operating plan for water year 1992. Consideration was given to the dry condition of the basin, the vacant reservoir space that currently exists, requests for water by holders of water delivery contracts with the United States, and other rights recognized in *Arizona v. California*. The operating issues addressed which are listed in no particular order of priority are:

- meeting the reasonable beneficial Colorado River mainstream consumptive water uses in the Lower Division States as provided by the Operating Criteria,
- the delivery of firm power in accordance with energy contracts,
- minimum and specific releases for fish and wildlife and recreational purposes,
- refilling of vacant system reservoir storage space,
- potential for flood control releases before shortages may occur,
- water wasted to the Gulf of California,

- compliance with the 1944 Mexican Water Treaty and Minute No. 242 of the IBWC,
- undeveloped water use in the Upper Basin, and in Arizona, and Nevada of the Lower Basin,
- the ability to store unused water apportionments,
- guidelines for reservoir filling and drawdown recommended for fish spawning periods in Lake Mead,
- complying fully with compact, decree, statutory, and water delivery obligations, and
- other short- and long-term effects of 1992 water use decisions.

Water Supply Assumptions

For 1992 operations, three reservoir inflow scenarios were developed and analyzed; statistically these are approximately the upper decile, mean, and lower decile inflows and have been respectively labeled the probable maximum, most probable, and minimum probable (see attached graphs of reservoir parameters). Each scenario was adjusted for current basin conditions; therefore, the magnitude of the three scenarios does not necessarily match the historical upper decile, mean, and lower decile inflows, respectively. The National Weather Services's computer model, known as the Extended Streamflow Prediction model (ESP), uses current basin conditions as well as historical data to predict a range of possible future

stream flows. Although there is a wide confidence band associated with stream flow forecasts made a year in advance, the data is valuable in analyzing the possible impacts on project uses and purposes.

The following assumptions were used in the three different assumed hydrologic scenarios:

UNREGULATED INFLOW ABOVE LAKE POWELL

(Units: 1,000 acre-feet)

	Probable Maximum	Most Probable	Probable Minimum
10/91 - 12/91	1,228	875	800
1/92 - 3/92	1,325	1,045	805
4/92 - 7/92	10,969	6,880	3,800
8/92 - 9/92	1,379	1,000	738
10/92 - 12/92	1,247	1,180	881
Water Year 1992	14,901	9,800	6,143
Calendar Year 1992	14,970	10,105	6,224
Water Year 1993	11,900	11,800	11,400

The inflow volumes resulting from these assumptions were used as input data in Reclamation's monthly reservoir operation planning computer model, which is used to plan reservoir operations for the upcoming 12-month period. With assumed water year 1992 inflow and current reservoir storage conditions, projected monthly releases were adjusted until release and storage levels accomplished project purposes and priorities.

Additional Analyses

Special long-range studies using Reclamation's Colorado River Simulation System (CRSS) were conducted to determine whether sufficient quantities of mainstream water were available for release from Lake Mead to satisfy reasonable beneficial consumptive use requests in excess of 7,500,000 AF in the Lower Division States. The studies were conducted using the entire hydrologic record (1906 through 1990), utilizing 85 hydrologic sequences indexed by one year. These studies simulated 30 years into the future to assess the risks of shortages to all users of Colorado River water for beneficial purposes and evaluated several specific parameters. Additional selected studies are suggested to further evaluate the impact of water use in excess of basic apportionment on the risk of future shortage.

WATER YEAR 1992 RESERVOIR OPERATIONS

At several locations in both Upper and Lower Basins, minimum instream flows have been established in order to preserve the present aquatic resources downstream of certain Colorado River dams. In many cases, these resources were poor or nonexistent prior to the time of dam construction, and the subsequent controlled, cool water releases have provided an improved environment for aquatic resources and sport fisheries. However these releases are believed to be detrimental to endangered endemic species of fish. In 1992 studies on the Gunnison and San Juan Rivers will be initiated in order to better understand the water needs of the endangered endemic species of fish in the basin. In general, controlled releases allow for an extended recreation season, reduce the high flow periods, and improve sport fisheries, but may be detrimental to endemic species of fish.

The following paragraphs discuss the operation of each of the reservoirs with respect to compact, decree, statutory, and water delivery obligations, as well as instream flow needs for present aquatic ecology where appropriate.

Fontenelle Reservoir

Water year 1991 marked the second full year of normal operations at the dam since the concrete cutoff wall was installed in the dam. The cutoff wall is still performing very satisfactorily as seepage has been considerably reduced. With the inflow during water year 1991 at about 83 percent of average, the reservoir easily filled in 1991 and approximately 150,000 AF of water bypassed the turbines.

Since the mean annual inflow of 1,200,000 AF far exceeds the storage capacity of 345,000 AF, there is little chance that the reservoir will not fill during water year 1992. In order to minimize high spring releases and to maximize downstream fishery resources and power production, the reservoir will probably be drawn down prior to the spring of 1992 to a minimum pool elevation of 6463.5 feet which corresponds to a volume of 93,000 AF of live storage.

To meet these operational objectives, a constant release of approximately 1,200 cubic feet per second (CFS) will be made through the fall and winter months. Releases at this level will provide an appropriate level of drawdown for next season, provide greater fishery benefits, and also improve the water quality of the river for downstream municipal and industrial uses. Under all but the most adverse inflow assumption, the reservoir is expected to fill in the summer of 1992.

Flaming Gorge Reservoir

The 1991 annual inflow into Flaming Gorge Reservoir is expected to be approximately 78 percent of the long term average. This inflow combined with slightly above minimum releases, increased the elevation of Flaming Gorge to 12 feet. But, even with this recovery, the reservoir was 8 feet short of filling in 1991. The special releases at Glen Canyon for the environmental studies resulted in releases from Flaming Gorge being above minimum levels in 1991. This increase in release was necessary to give Western Area Power Administration (WAPA) more flexibility in keeping the power system whole in the event of an emergency. The releases were increased with the understanding that Flaming Gorge would be used only as a last resort (i.e. power from other sources could not be purchased). A limited number of specific releases for research and data collection for studies concerning aquatic resources located below the dam were provided in 1991. Colorado Squawfish young-of-the-year were found in the main stem of the Green River in mid-July 1991 and, as recommended by the United States Fish and Wildlife Service, restrictions on powerplant releases were developed and implemented in order to provide better habitat for the young Colorado Squawfish.

With this operation plan, under all but the most adverse inflow scenarios, Flaming Gorge is expected to fill in the summer of 1992 and releases are expected to be above minimum levels.

Blue Mesa, Morrow Point, and Crystal Reservoirs (Aspinall Unit)

Even though water year 1991 inflow was only 77 percent of normal, the Aspinall Unit filled in early June. The filling of Aspinall Unit facilities during 1991 resulted because only minimum releases were made during 1989 and 1990. The minimum release objective of the Aspinall Unit is to meet the delivery requirements of the Uncompahgre Valley Project and to keep a minimum of 300 CFS flowing through the Black Canyon of the Gunnison National Monument. During 1991 flows of over 4,000 CFS were experienced in the Black Canyon as inflows of over 8,000 CFS occurred. To protect the blue ribbon trout fishery in the Black Canyon, releases were carefully planned to minimize large fluctuations in the daily and monthly flows. This was accomplished with only minimal amounts of water bypassing the powerplants at Blue Mesa and Morrow Point.

By December of 1992, Blue Mesa Reservoir will be drawn down to at least an elevation of 7495.0 feet in order to minimize icing problems in the Gunnison River. Blue Mesa will continue to be drawn down through April of 1992 to the level that will accommodate the most probable inflow scenario and accomplish the release objectives with a minimum of powerplant bypasses. Under all but the most adverse inflow scenarios, Blue Mesa is expected to fill in the summer of 1992. The filling of the reservoir next year will insure that reasonable specific releases required to study the protection and improvement of habitat for endangered fish can be made.

The forecasted runoff during the spring of 1992 will be constantly monitored to achieve these objectives.

Navajo Reservoir

With 1991 inflow expected to be 89 percent of normal, the storage in Navajo Reservoir recovered to the normal level, although the reservoir was approximately 90,000 AF short of filling. During May of 1991, releases of 3,000 CFS were made in order to accommodate studies for endangered fish and to flush silt from the river bed that has accumulated over the past 2 years of minimal releases. After the completion of the specific releases, discharge from the reservoir was reduced to 600 CFS. The objective is to maintain a release of 500 CFS from the reservoir to meet downstream water demands and to preserve the blue ribbon trout fishery located immediately downstream of the reservoir. The release of 500 CFS is an objective only and is not a minimum flow requirement.

Under all but the most adverse inflow scenarios, Navajo Reservoir should fill in 1992. Releases from the reservoir will be held near 600 CFS through the fall and winter months and large releases will be made in May and June in order to provide better spawning conditions for endangered fish located in the San Juan River. Additionally, specific releases will be made from the reservoir in order to study habitat requirements of the endangered fish. These specific releases will be part of

a seven-year study of the habitat needs of the endangered fish in the San Juan River Basin conducted by the United States Fish and Wildlife Service. After the study period, the data collected will be used to the determine flow requirements for these fish. The resulting flow requirements may be higher or lower than the flow releases for 1992.

Lake Powell

Maintaining a minimum release of 8,230,000 AF annually from Lake Powell combined with the lowest consecutive 5 years of inflow on record (1987 through 1991), and a refilling of the upstream reservoirs has reduced the storage of the reservoir by approximately 9,500,000 AF. Lake Powell is expected to finish 1991 at 14,700,000 AF, which is 61 percent of capacity and about 71 feet from full. The reservoir storage is projected to continue to decline through the fall and winter, reaching a seasonal low in March of 1992 of 13,600,000 AF, which is about 82 feet from full.

During water year 1992, the minimum objective release of 8,230,000 AF will be made. Under most probable inflow conditions, the reservoir will recover to only 17,200,000 AF which is about 50 feet from full. Due to the extended drought, it may take approximately nine years of average inflow to refill the reservoir.

Following the extreme flood runoff years of 1983 through 1986, the Glen Canyon Environmental Studies and reports identified releases greater than powerplant capacity as detrimental to the ecology of the Grand Canyon and recommended that steps be taken to limit the frequency of these flood releases. Based on these recommendations and similar concerns regarding powerplant bypass voiced by the power customers, an operating strategy was developed within the constraints of the existing Operating Criteria for Glen Canyon Dam that reduced the probability of releases greater than powerplant capacity. The frequency of these releases was reduced from approximately once in four years to approximately once in 20 years. In addition to reducing environmental damage, this also has the effect of decreasing spillway maintenance and repair costs and increasing total power generation.

This operating strategy is based on (1) a reduction in the July target storage content of Lake Powell by 500,000 AF, and (2) a more immediate response to updated forecasts as the runoff season progresses. These factors contribute to an operating flexibility during the late spring which can accommodate large increases in the forecasted spring runoff such as occurred in 1983, 1985, and 1986.

Because the level of Lake Powell has dropped considerably since 1987, the risk of releases greater than powerplant capacity during water year 1992 is negligible.

Test interim minimum and maximum releases and controlled fluctuations have been

established below Glen Canyon Dam, pending development of the interim criteria by November 1, 1991. The interim criteria is intended to reduce the effects of power operations on downstream natural resources until an Environmental Impact Statement is completed.

Lake Mead

Lake Mead withdrawals and releases during 1992 will satisfy 7,500,000 AF of beneficial consumptive use requests in the Lower Division States, treaty requirements with Mexico, conveyance losses, and river and reservoir regulation requirements. The outlook for lowest and highest monthly releases for 1992 will be about 500,000 AF and 1,050,000 AF, respectively.

Lake Mead is expected to finish 1991 at 19,200,000 AF, which is 74 percent of capacity and approximately 47 feet from its full capacity of 25,877,000 AF. Reservoir storage elevation is projected to rise to 1175 feet in February 1992, which is 19,500,000 AF or 75 percent of capacity and approximately 44 feet from full capacity. Storage elevation is projected to decline to 1161 feet in August 1992, which is 17,700,000 AF or 68 percent of capacity and approximately about 59 feet from full capacity.

Drawdown during the peak large mouth bass spawning period in April and May is planned to be near the limits of decline recommended in the July 1982 final report of a five year study by the Arizona Game and Fish Department and the Nevada Department of Wildlife. No flood control releases are scheduled for 1992, but in future years, as Lake Mead refills and flood control releases are again required by the Hoover Dam Flood Control Regulations, consideration will be given to making those releases over the fall and winter months to avoid high flow releases during the January to July runoff season. This distribution of water reduces the chance of bypassing hydroelectric powerplants below Hoover Dam and avoids the adverse impacts of higher flood control releases on fish and wildlife, recreation, water quality, and river stabilization.

Lakes Mohave and Havasu

Mohave and Havasu Reservoirs are scheduled to be drawn down in the fall and winter months to provide storage space for local storm runoff and will be filled in the spring to meet higher summer water needs. This drawdown will also correspond with maintenance at both Davis and Parker Powerplants which is scheduled for September through February. The normal filling pattern of these two reservoirs coincides well with the fishery spawning period. Since lake elevations will be typical of previous years, normal conditions are expected for boating and other recreational uses.

Lake Mohave - Accomplishments of the Native Fish Work Group

From earlier meetings involving the Bureau of Reclamation, Fish and Wildlife Service, National Park Service, Arizona Game and Fish Department, Nevada Department of Wildlife, and Arizona State University, a Management/Research Plan identified objectives, methodologies, and coordinated the berm modification at Yuma Cove creating a razorback sucker spawning cove in Lake Mohave. In January, 1991, Yuma Cove was stocked with 90 spawning razorback suckers for "on-site" production. Young suckers produced at Yuma Cove will be moved to a larger rearing facility at Davis Cove and allowed to grow to a length of 25-30 cm before being released into Lake Mohave. The efforts this year and in the next 5 years is to produce and release a minimum of 10,000 razorback suckers measuring at least 25 cm in length into Lake Mohave to augment the existing population.

Central Arizona Project

New Waddell Dam Operations

A key feature of the Central Arizona Project (CAP) is New Waddell Dam and Reservoir, which is currently under construction. This reservoir is located just northwest of the Phoenix metropolitan area and will serve as the primary regulatory storage facility for the CAP. Colorado River water will be pumped into and released from the reservoir via the Waddell Pumping-Generating Plant (P-G Plant).

The P-G Plant consists of four 2-speed pump-generator units and four adjustable-speed pumping units. New Waddell Dam and P-G Plant will allow most of CAP's Colorado River water entitlement to be pumped into the Phoenix area and stored during the winter months when energy and water demands are low, and then released for delivery in the summer months when energy and water demands are high. The dam and P-G Plant are scheduled to be fully operational in 1995, but initial pump tests and reservoir filling will begin in the fall/winter of 1992. Current construction schedules indicate that operational testing of the pumps will begin in October of 1992 and the first pump will be available for commercial operation by November 15, 1992. The schedules indicate that three pumps (two 2-speed and one adjustable-speed) will be in operation by the end of 1992, and the remaining pumps will come on line in 1993. Current planning studies show that approximately 110,000 AF of Colorado River water will be pumped into storage in New Waddell Reservoir in November and December, 1992.

Senator Wash & Laguna Reservoirs

Water conservation operations of Senator Wash allow regulation of water deliveries to Mexico and other irrigation agencies. The wash prevents excess flows in the Colorado River below Morelos Dam except during rainstorm or other unusual events. Operational objectives at and below Laguna Dam are to conserve water, control sediment, and maintain the river channel. Storage of water above Laguna

Dam in the reservoir, in surcharge, and in bank storage provides for controlled flows in the river at Yuma, which combined with seepage and drainage, allows a continuous live stream serving recreational and fish and wildlife purposes. On a few occasions each year, higher daily flows below Laguna caused by rainstorms or user rejected water orders are used to maintain sufficient river channel capacity. This occasional practice reduces channel maintenance expense without impairment of water conservation or power production.

Yuma Desalting Plant

Current plans for the Yuma Desalting Plant for fiscal year 1992 are to complete testing of all the physical features of the plant during the first part of the year, after which the plant will be brought up to one-third capacity and operated at that rate for the remainder of the year. Provisions of Minute 242 of the IBWC will continue to be met by additional releases from storage to make up for the water bypassed from the Wellton-Mohawk Irrigation district. The water produced from the Yuma Desalting Plant will be used to reduce the additional releases required.

WATER YEAR 1992 DETERMINATIONS

The AOP provides guidance regarding reservoir storage and release conditions during the upcoming year, based upon congressionally mandated and judicially

ordered storage, release and delivery criteria and determinations. After meeting these requirements, specific reservoir releases may be modified as forecasted inflows change in response to climate variability, and to provide additional benefits to the projects' multiple purposes.

Upper Basin Reservoirs

The Operating Criteria provide that the annual plan of operation shall include a determination of the quantity of water considered necessary to be in Upper Basin storage at the end of the water year. Taking into consideration all relevant factors required by the Criteria, it has been determined that the active storage in Upper Basin reservoirs forecast for September 30, 1992, exceeds the storage required under Section 602(a) of the Colorado River Basin Project Act (*Public Law 90-537*) under any reasonable range of assumptions which might be applied. Therefore, "602(a) Storage" is not the criterion controlling the release of water from Glen Canyon Dam during water year 1992.

Section 602(a)(3) of the Colorado River Basin Project Act, *Public Law 90-537*, provides for the storage of Colorado River water in Upper Basin reservoirs, not required to be released under Articles III(c) and III(d) of the 1922 Colorado River Compact, to the extent the Secretary of the Interior, after consultation with the Upper Colorado River Commission and representatives from the three

Lower Division States, and taking into consideration all relevant factors (including, but not limited to: historic stream flows, the most critical period of record, the probabilities of water supply, estimated future depletions), finds it necessary to assure deliveries to comply with Articles III(c) and III(d) of the 1922 Colorado River Compact, without impairment of annual consumptive uses in the Upper Basin. Water not required to be so stored shall be released from Lake Powell:

- to the extent it can be reasonably applied in the states of the Lower Division to the uses specified in Article III(e) of the Colorado River Compact, but no such releases shall be made when the active storage in Lake Powell is less than the active storage in Lake Mead,
- to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell, and
- to avoid anticipated spills from Lake Powell.

Because Lake Powell's active storage is projected to be less than Lake Mead's active storage (except for maximum probable inflow), storage equalization provisions will probably not control the release from Lake Powell. Therefore, the objective shall be to maintain a minimum annual release of 8,230,000 AF from Lake Powell pursuant to Article II(2) of the Operating Criteria.

Lake Mead

Water shall be released or pumped from Lake Mead to meet the following requirements:

(a) 1944 Mexican Water Treaty obligations;

(b) Reasonable beneficial consumptive use requirements of mainstream users in the Lower Division States;

(c) Net river losses;

(d) Net reservoir losses;

(e) Regulatory wastes.

The Operating Criteria provide that after the commencement of delivery of mainstream water by means of the Central Arizona Project, the extent to which the reasonable beneficial consumptive use requirement of mainstream users in the Lower Division States is met is to be determined by the Secretary of the Interior.

The reasonable beneficial consumptive uses requirements are met to differing extents depending on whether a "normal," "surplus," or "shortage" condition has been determined. The "normal" condition is defined as annual pumping and release from Lake Mead sufficient to satisfy 7,500,000 AF of consumptive use

in accordance with the decree in *Arizona v. California*, 376 U.S. 340 (1964). Taking into account relevant factors associated with existing and expected future conditions in the Basin, it has been determined that annual pumping and releases from Lake Mead are sufficient to satisfy 7,500,000 AF of consumptive use in accordance with Article II(B)(1) of the decree in *Arizona v. California*. Therefore, the "normal" condition is the criterion governing the operation of Lake Mead for calendar year 1992.

Nothing in the decree in *Arizona v. California* prohibits the Secretary of the Interior from releasing water apportioned but unused in any Lower Division State for that year for consumptive use in any other Lower Division State. No rights to the recurrent use of such water accrue by reason of the use of such water. In light of this provision, the special studies conducted in conjunction with the development of this AOP, and in accordance with Article II(B)(6) of the decree; California will be allowed to utilize water apportioned to, but unused by, Arizona and Nevada in calendar year 1992 in addition to the 4,400,000 AF apportioned to California in Article II(B)(1) to the extent that the total annual consumptive use by mainstream users in the Lower Division States does not exceed 7,500,000 AF. As decreed, California obtains no rights to the recurrent use of water apportioned to Arizona and Nevada but not used by those states.

The 1992 plan takes into consideration the unauthorized diversions for temporary beneficial consumptive use of mainstream water by present noncontract users. A task force has identified such unauthorized diversions (including underground diversions), and Reclamation is proceeding to develop rules and regulations under which these diversions would be eliminated and new unauthorized diversions prevented.

1944 Mexican Water Treaty

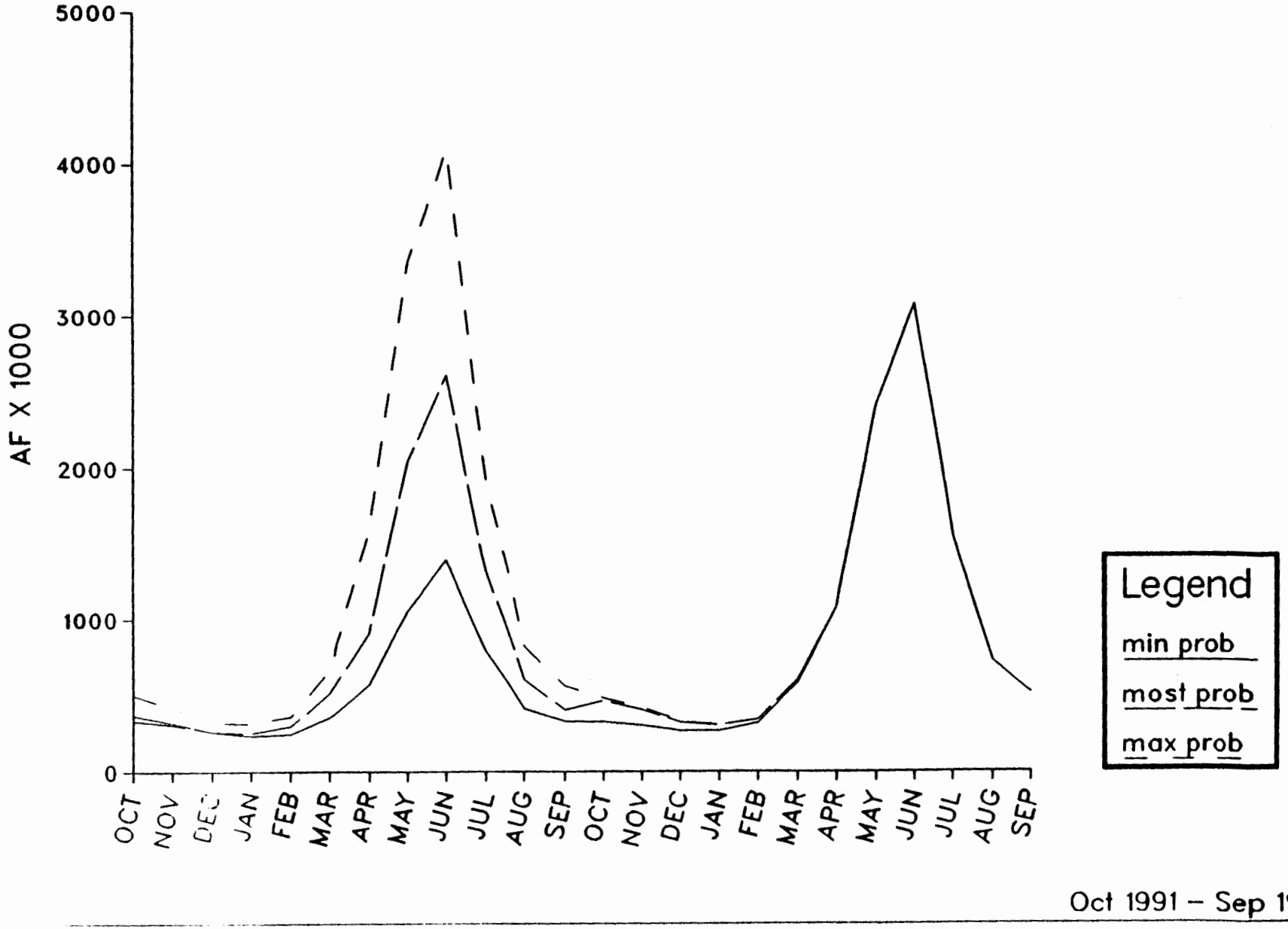
Pursuant to the 1944 Mexican Water Treaty (Treaty Series 994, 59 Stat. 1219) it has been determined that the guaranteed quantity of 1,500,000 AF of water will be delivered to Mexico during calendar year 1992. The delivery of 1,500,000 AF of water to Mexico will be in accordance with Article 15 of the 1944 Mexican Water Treaty and Minute No. 242 of the IBWC. Minute No. 242 provides that the United States may deliver up to 140,000 AF of water across the land boundary at San Luis, Sonora, and in the limitrophe section of the Colorado River downstream of Morelos Dam, in partial satisfaction of the 1944 Mexican Water Treaty. Calendar year schedules of monthly deliveries of Colorado River water are formulated by the Mexican Section of the IBWC and presented to the United States Section before the beginning of each calendar year. Additional scheduled deliveries of water to Mexico can only be made if

waters of the Colorado River exist in excess of the amount necessary to satisfy all uses within the United States.

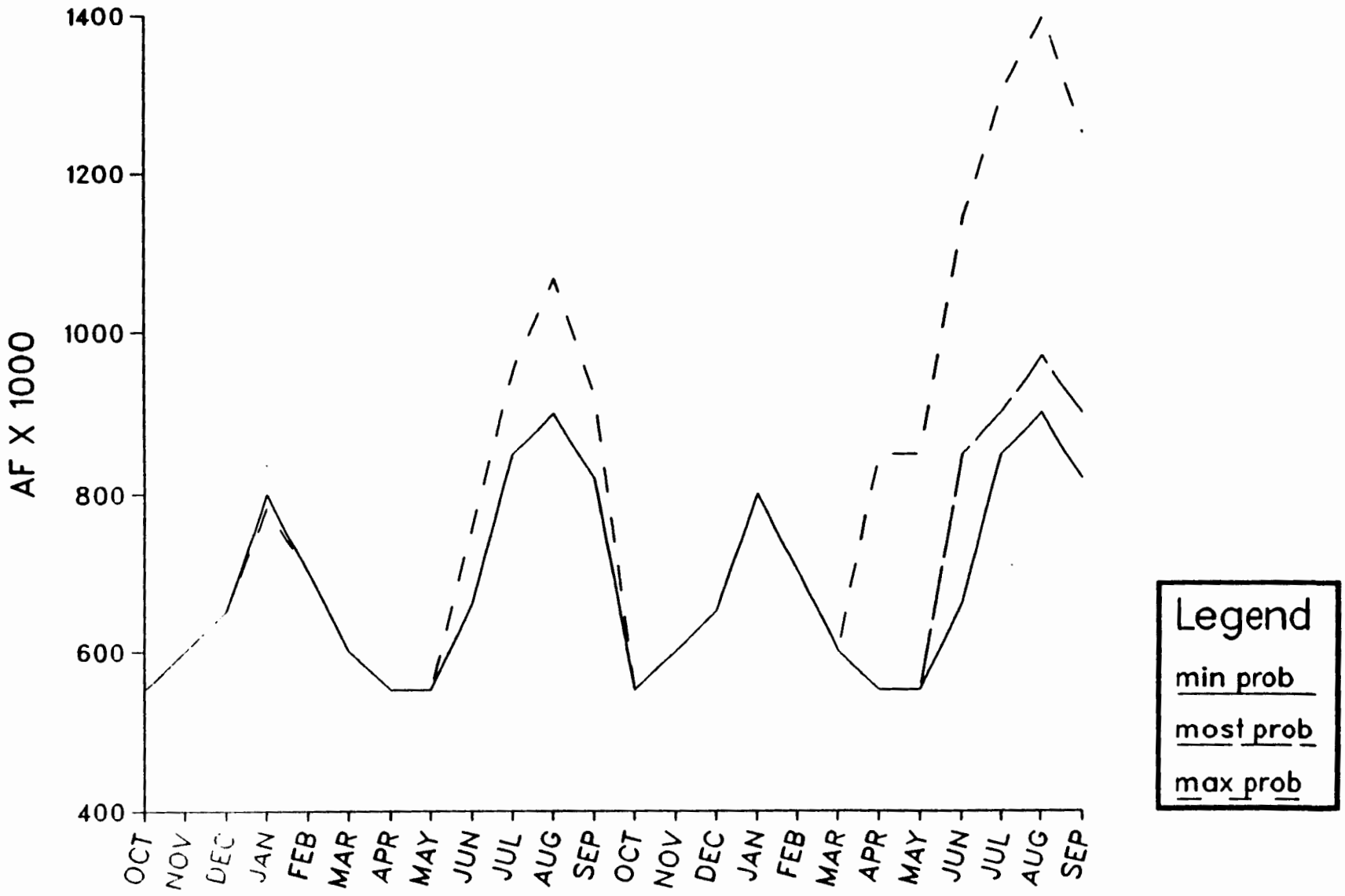
DISCLAIMER

Nothing in this Annual Operating Plan is intended to interpret the provisions of the Colorado River Compact (45 Stat. 1057), the Upper Colorado River Basin Compact (63 Stat. 31), the 1944 Mexican Water Treaty with the United Mexican States (Treaty Series 994, 59 Stat. 1219), the United States/Mexico agreement in Minute No. 242 of August 30, 1973, (Treaty Series 7708; 24 UST 1968), the Decree entered by the Supreme Court of the United States in *Arizona v. California* et al. (376 U.S. 340), the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a), the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620), the Colorado River Basin Project Act (82 Stat. 885; 43 U.S.C. 1501), the Colorado River Basin Salinity Control Act (88 Stat. 266; 43 U.S.C. 1951), or the Hoover Power Plant Act of 1984 (98 Stat. 1333).

COLORADO RIVER 1992 AOP
LAKE POWELL INFLOW



COLORADO RIVER 1992 AOP
LAKE POWELL RELEASES



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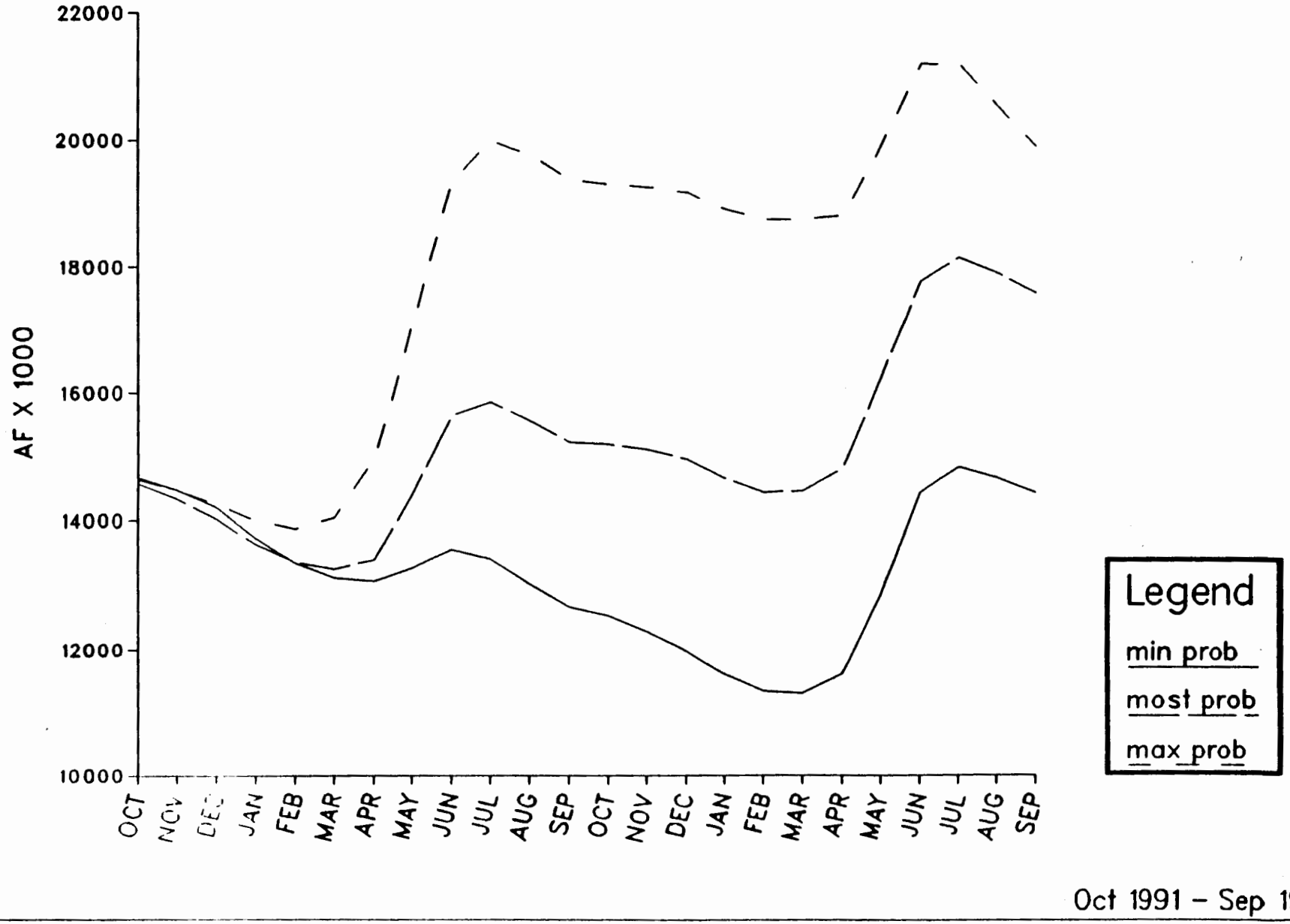
COLORADO RIVER 1992 AOP
LAKE POWELL CONTENT



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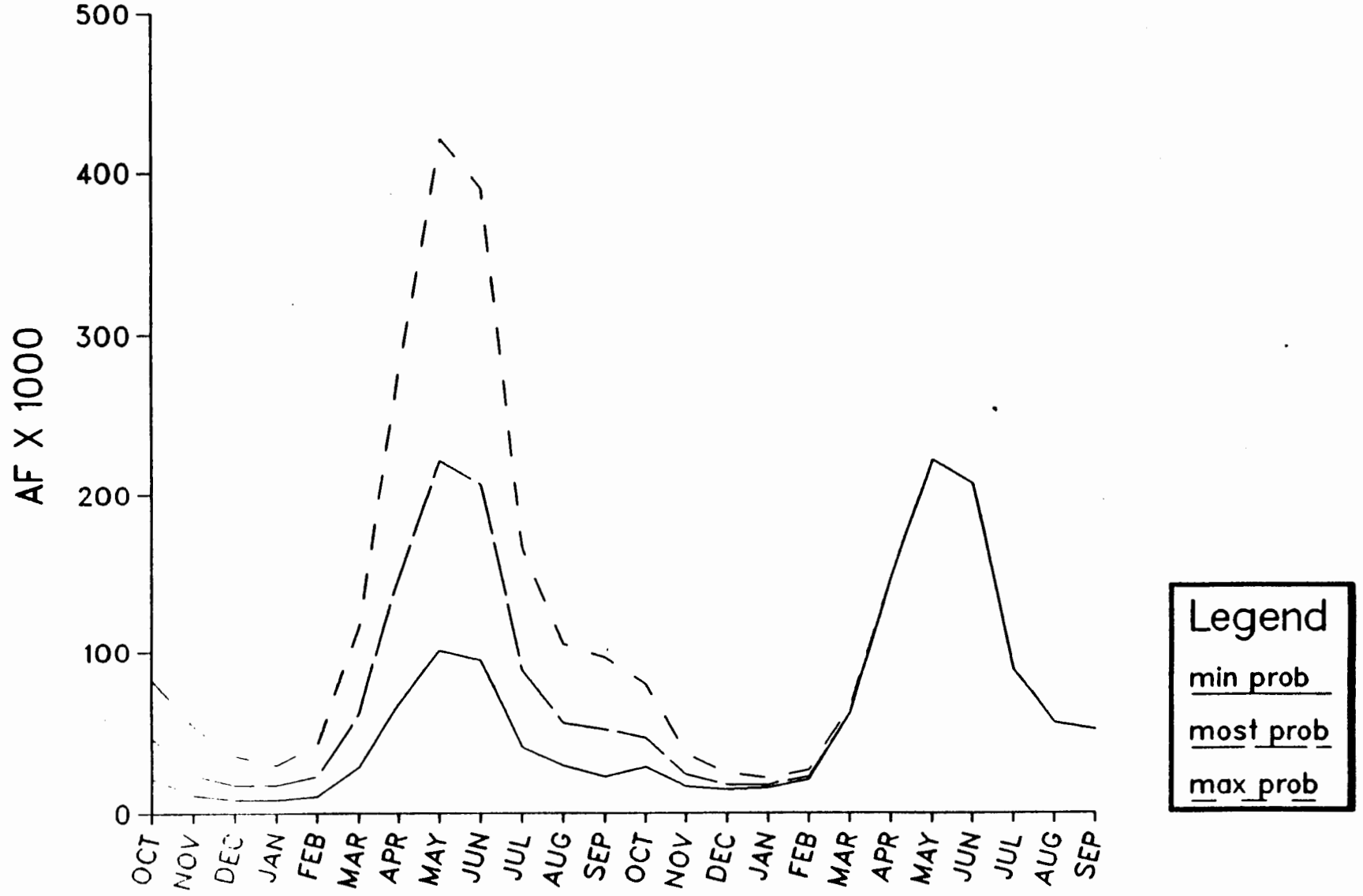
COLORADO RIVER 1992 AOP
NAVAJO INFLOW



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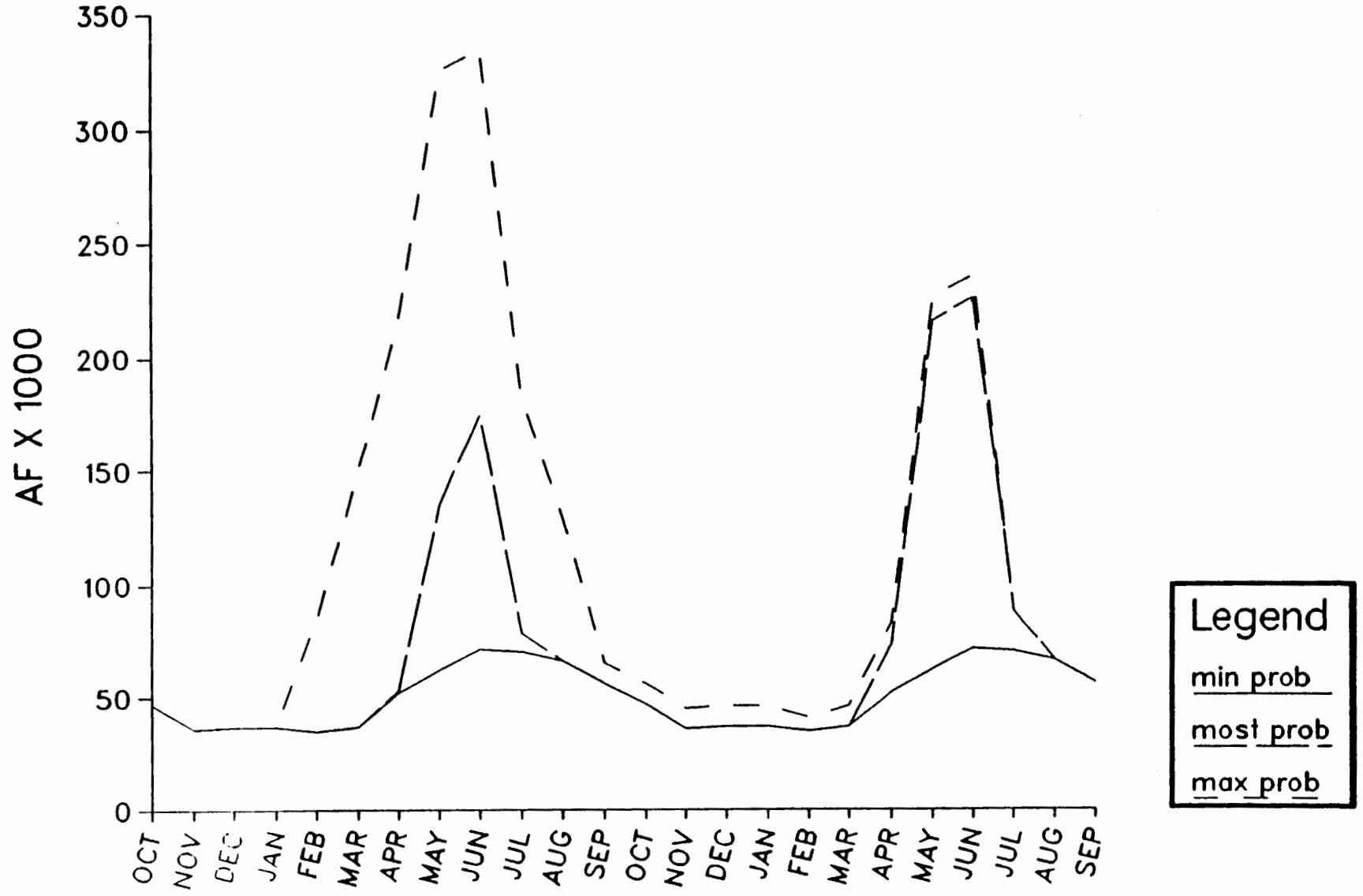
NAVAJO RELEASES



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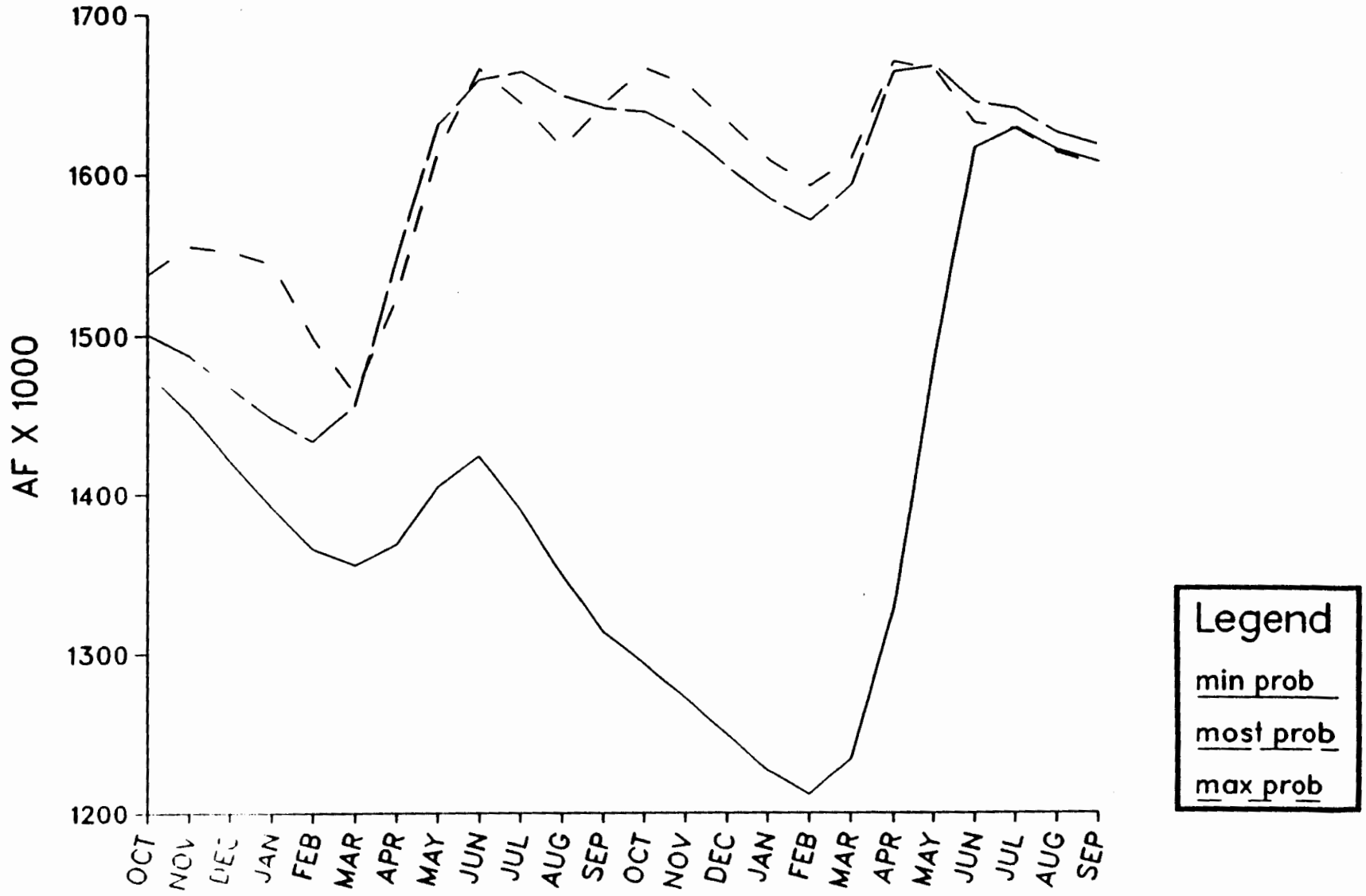
COLORADO RIVER 1992 AOP
NAVAJO CONTENTS



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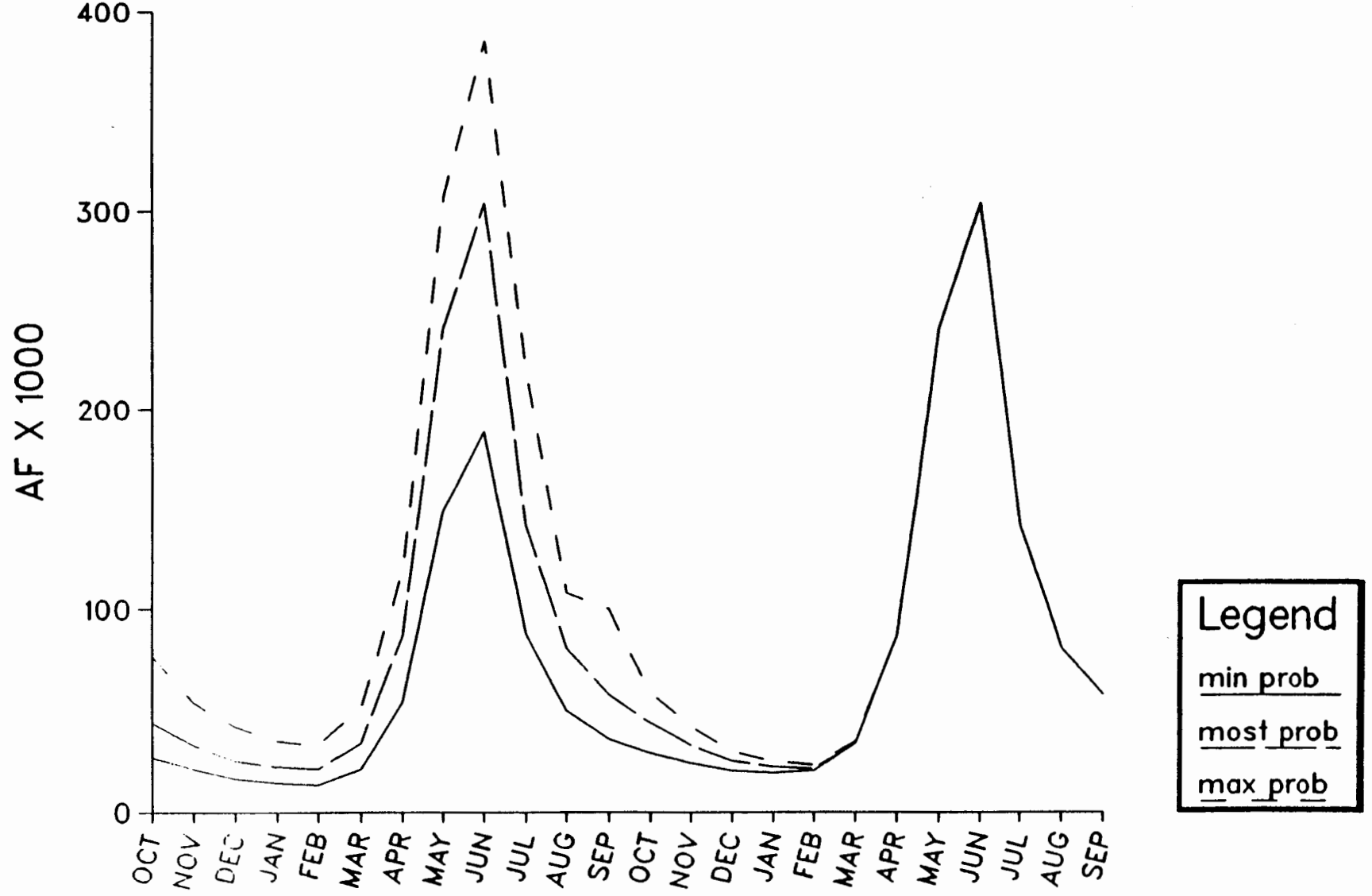
BLUE MESA INFLOW



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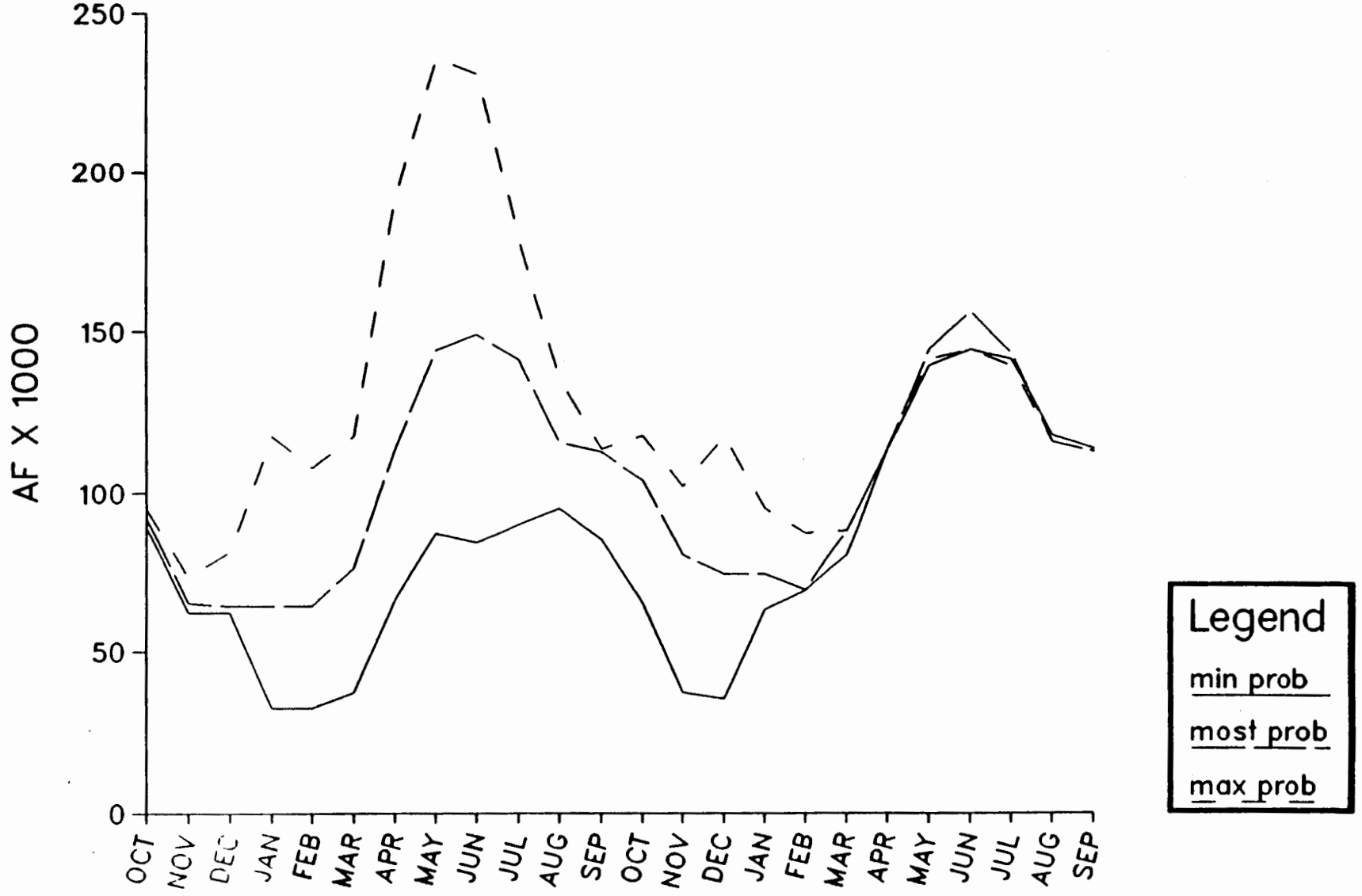
CRYSTAL RESERVOIR RELEASES



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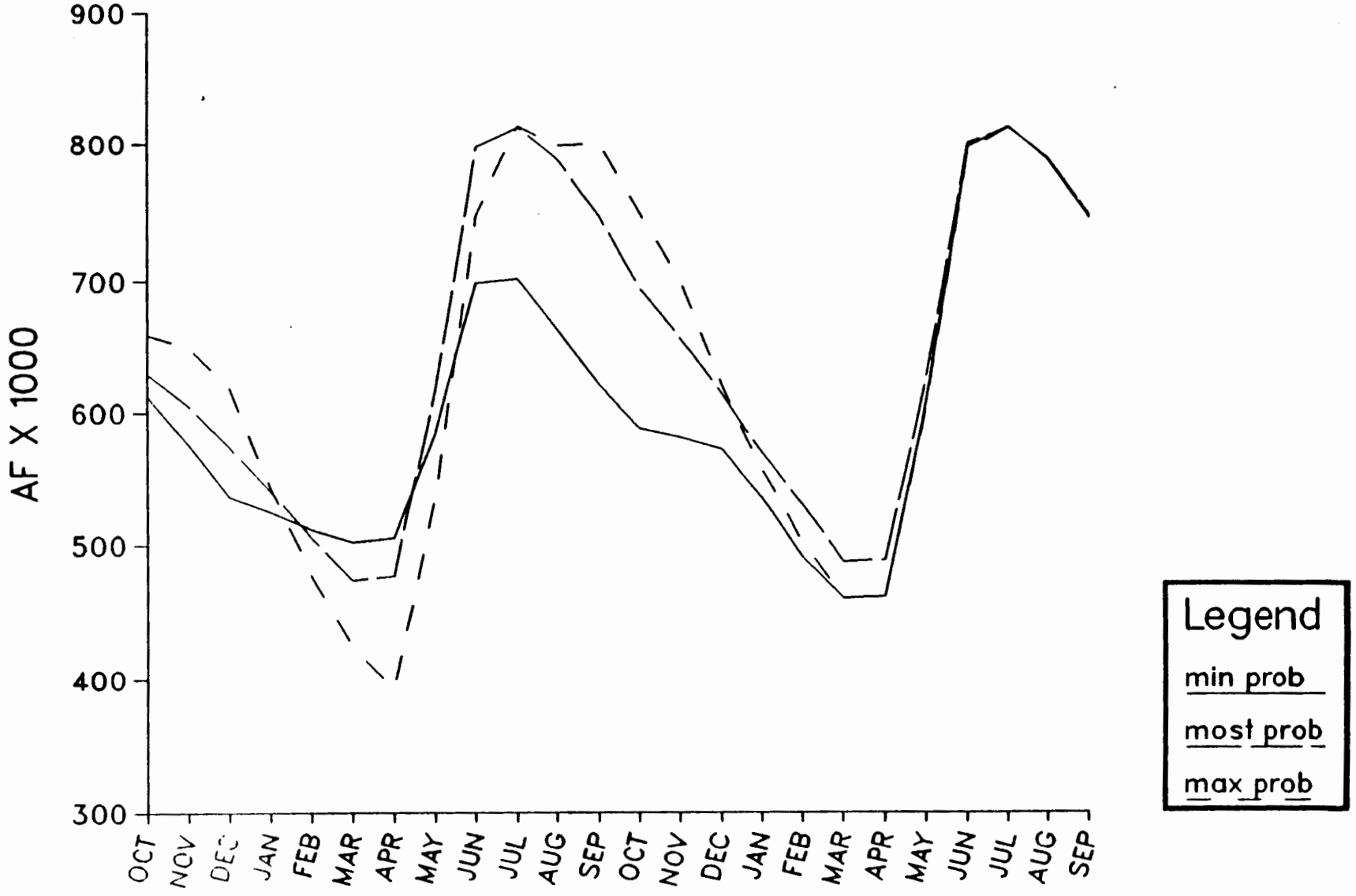
BLUE MESA CONTENT



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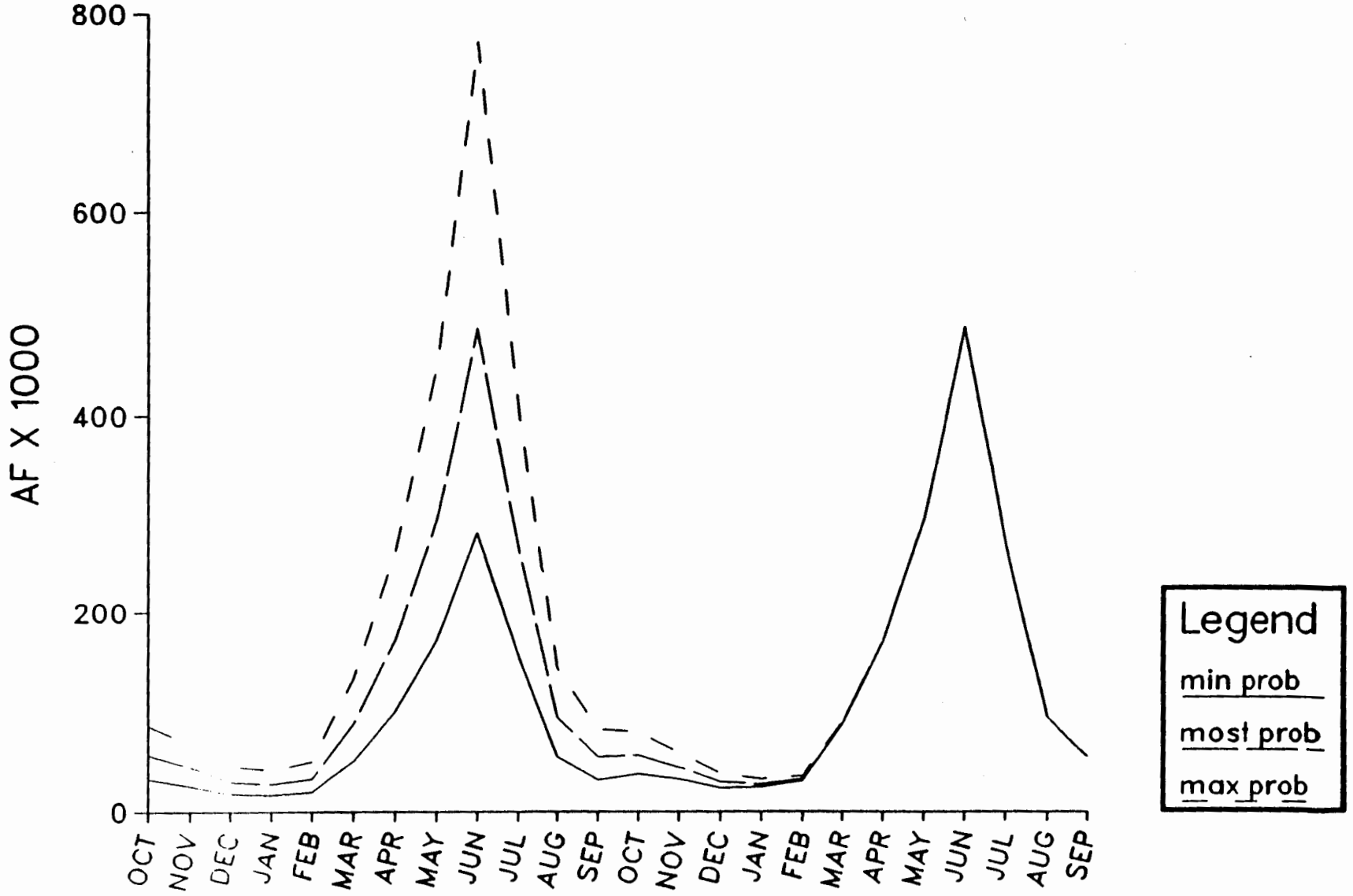
COLORADO RIVER 1992 AOP
FLAMING GORGE INFLOW



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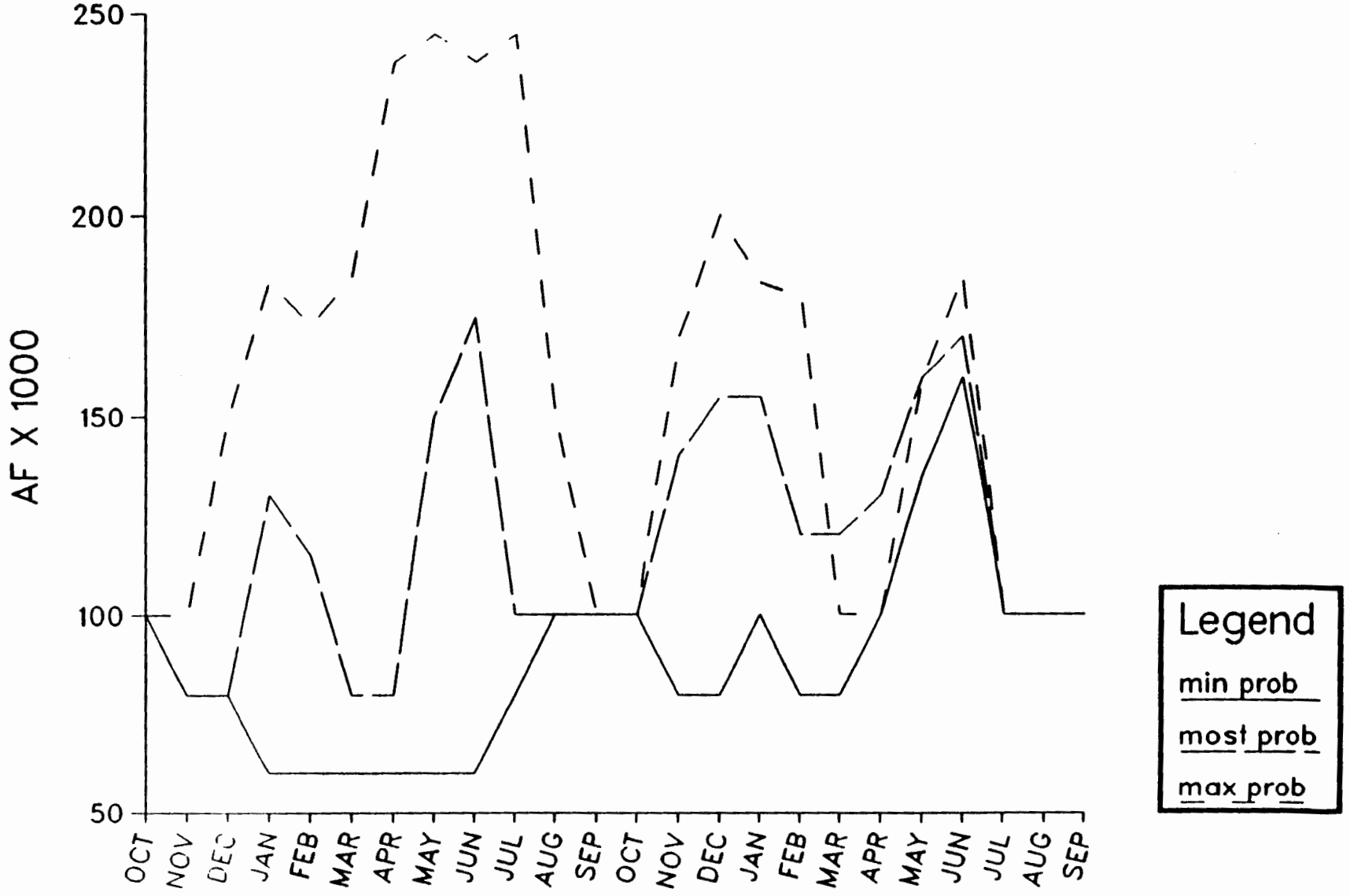
FLAMING GORGE RELEASES



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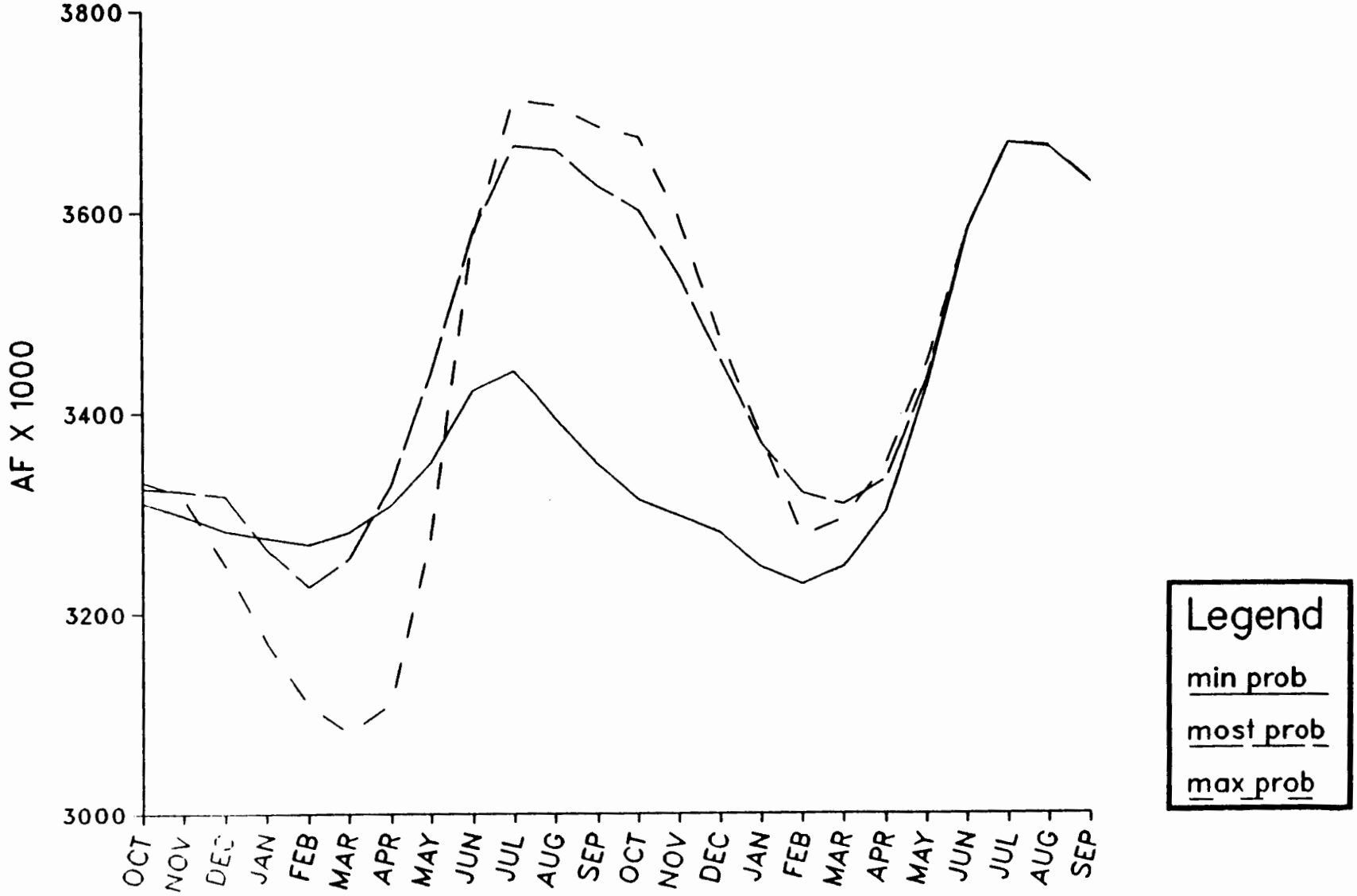
FLAMING GORGE CONTENT



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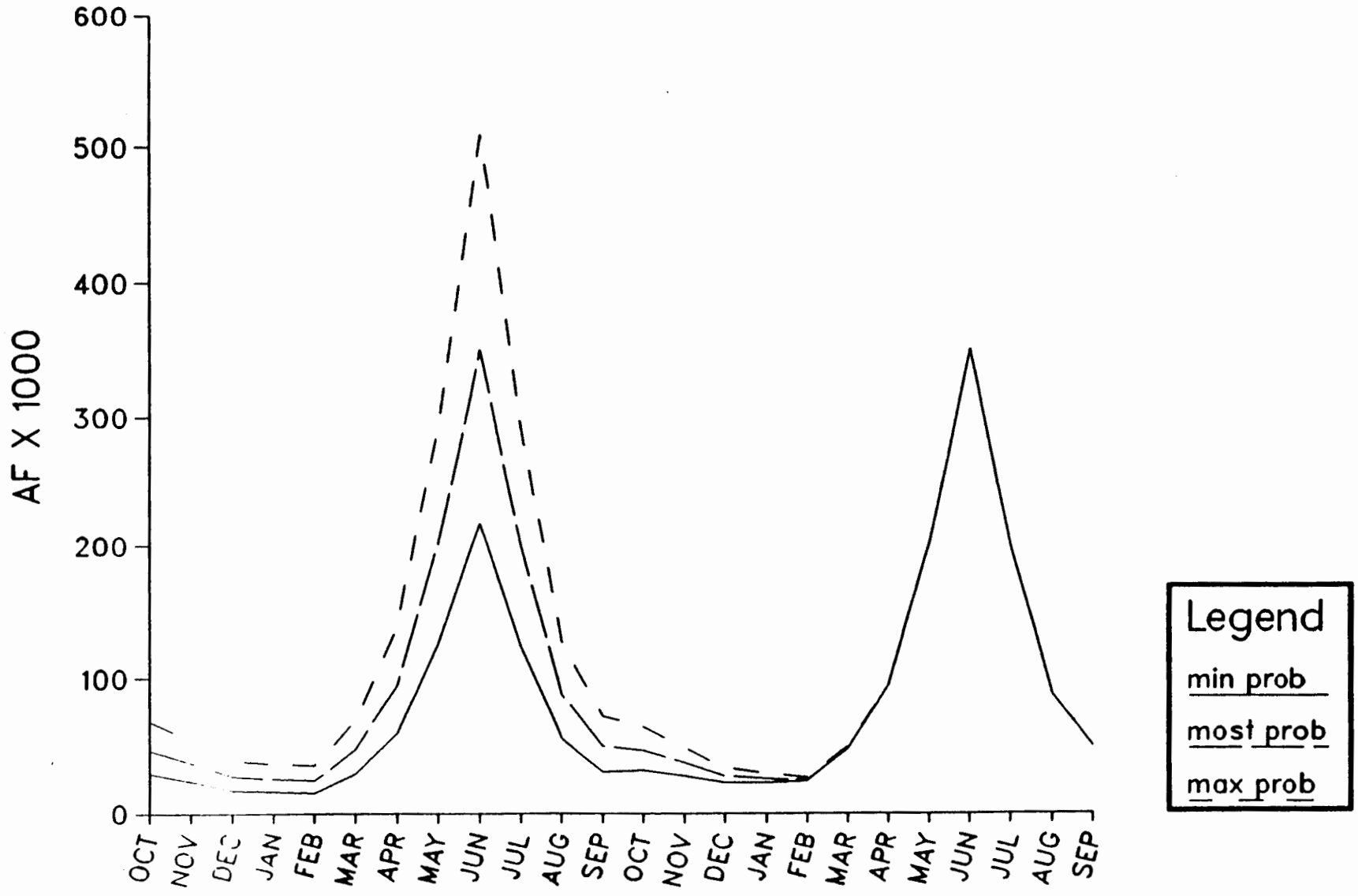
FONTENELLE INFLOW



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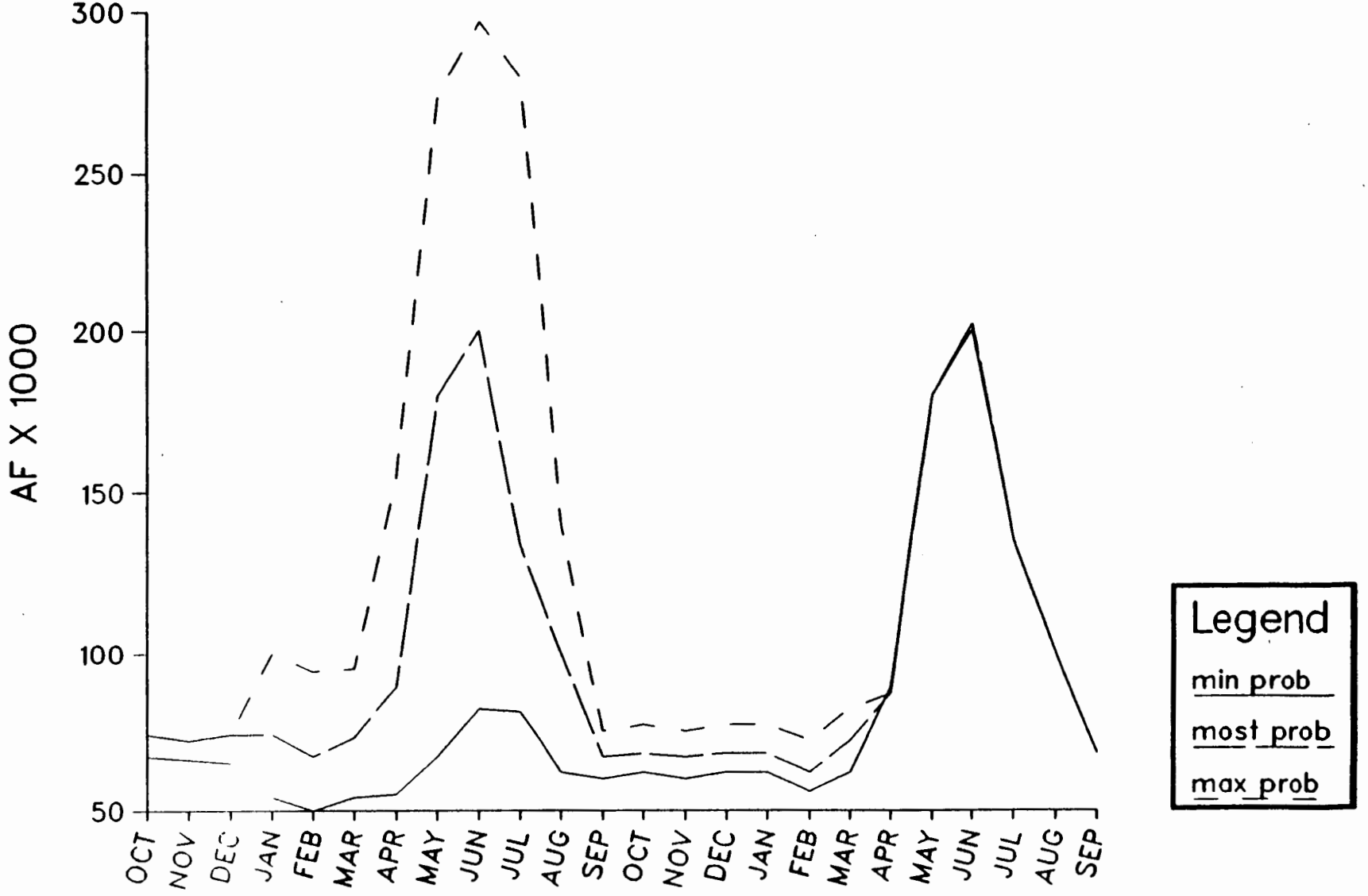
FONTENELLE RELEASES



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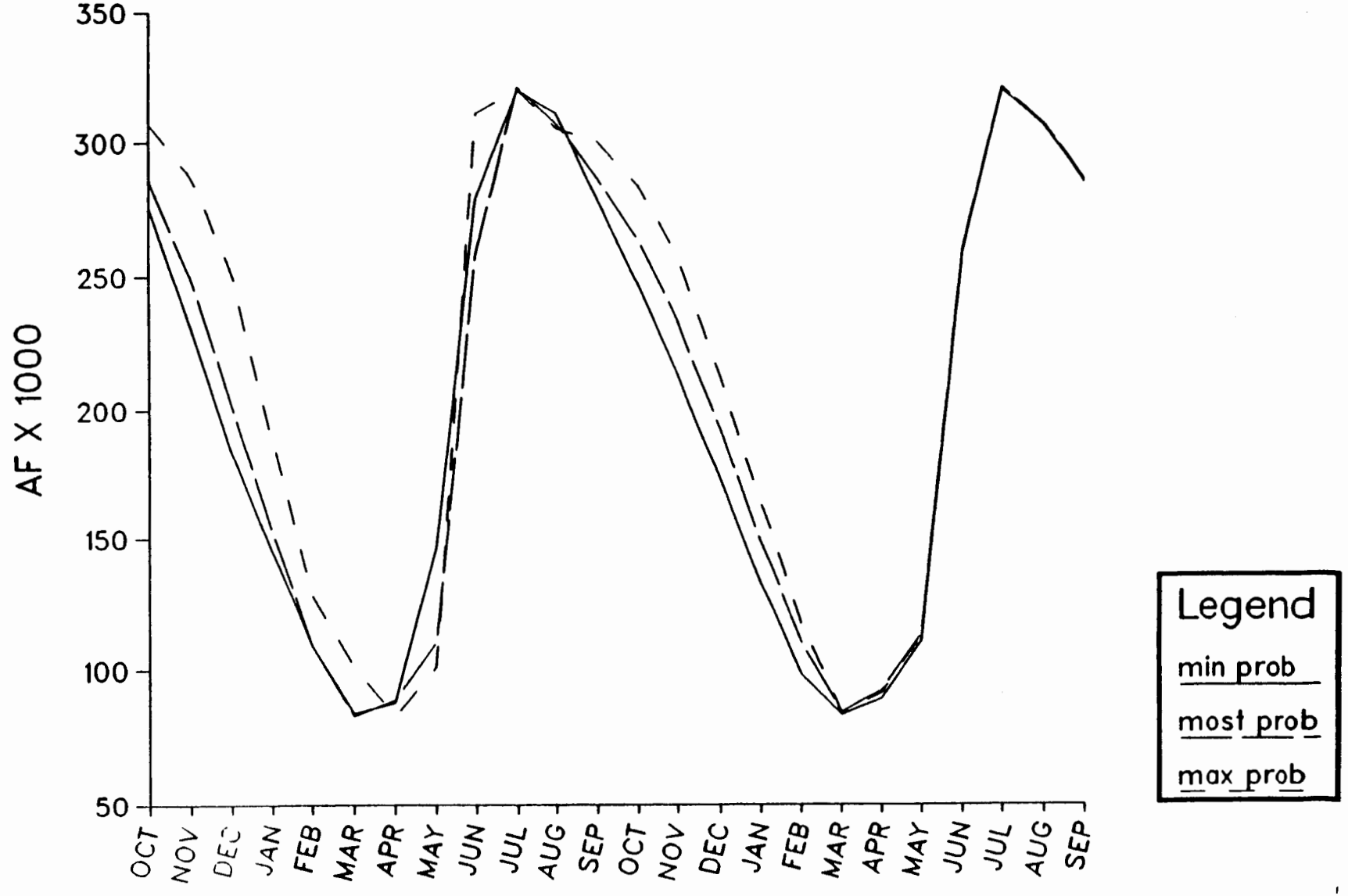
COLORADO RIVER 1992 AOP
FONTENELLE CONTENTS



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