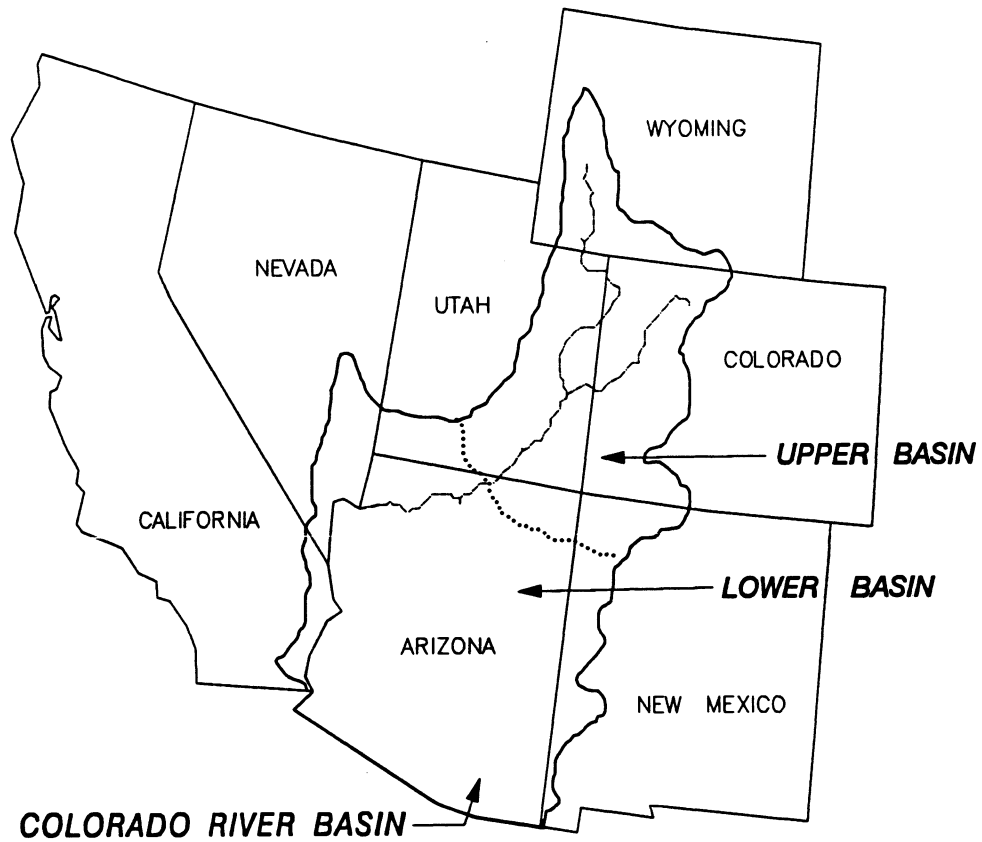


**ANNUAL OPERATING PLAN
FOR
COLORADO RIVER RESERVOIRS
1993**



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INTRODUCTION

Authority

This 1993 annual operating plan (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 1993 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 through the Colorado River Management Work Group.

Purpose

The purposes of the AOP are to determine (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, 1993, 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, basin storage, and flow conditions.

Summary

Upper Basin Delivery. Glen Canyon Dam will be operated to meet the minimum objective release of 8.23 million acre-feet (MAF) for water year 1993 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 7.5 MAF of reasonable beneficial consumptive use requirements by mainstream users in the Lower Division States during calendar year 1993 in accordance with Article III(a) of the Operating Criteria and Article II(B)(1) of the decree in *Arizona v. California*. Any Lower Division State will be allowed to utilize apportioned, but unused, water from another Lower Division State, in accordance with Article II(B)(6) of the decree in *Arizona v. California*; provided that, the calendar year 1993 consumptive use by mainstream Lower Division States users does not exceed 7.5 MAF.

1944 Mexican Water Treaty Delivery. The guaranteed annual quantity of 1.5 MAF of water will be delivered to Mexico during calendar year 1993 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 1993, 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 probable maximum 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. The resulting operation will benefit all authorized project purposes at each of the reservoirs.

1992 OPERATIONS SUMMARY AND RESERVOIR STATUS

Water year 1992 can be characterized by a wide variation in water supply conditions within the basin. Basinwide precipitation during 1992 was almost 90 percent of average with tributary river basin precipitation ranging from 60 to 150 percent of the 25 year average. Although precipitation was nearly normal basinwide, it did not translate into normal snowpack or runoff. In early fall of 1991, snowpack levels were well above average throughout the basin. As the snow accumulation season continued, a pattern of southerly storms developed. This left the northern portion of the basin with extremely low snowpack levels, and the southern portion of the basin with slightly above normal levels. These factors combined to produce a near record low runoff in the Green River, lower decile runoff in the Gunnison Basin and into Lake Powell, and slightly above average runoff in the San Juan Basin.

Table 1
Expected Reservoir Conditions
as of October 1, 1992

Reservoir	Vacant Space (1,000 AF)	Live Storage (1,000 AF)	Percent of Capacity (percent)	Change in Storage* (1,000 AF)	Change in Elevation* (feet)
Fontenelle	132	213	62	-112	-15.6
Flaming Gorge	620	3,129	83	-262	-6.9
Blue Mesa	227	602	73	-98	-12.0
Navajo	167	1,529	90	-57	-4.0
Lake Powell	10,055	14,267	59	-432	-3.0
Lake Mead	6,514	19,363	75	+130	+1.0
Lake Mohave	385	1,371	78	-200	-7.8
Lake Havasu	62	557	90	+1	0.0
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Totals	18,162	41,031	69	-1,030	--

* from October 1, 1991, to September 30, 1992

Inflow into Lake Powell was only 4.16 MAF or 51 percent of average during April through July 1992. This resulted in the continued drawdown of the Colorado River system reservoirs. It is estimated that an additional 1.1 MAF will be lost from storage during 1992. The October 1, 1992, system vacant space is expected to be about 18.1 MAF. This large vacant space is a result of the lowest 6 consecutive years of inflow on record (1987 through 1992) into Lake Powell. During this drawdown period, all deliveries of water to meet obligations pursuant to "The Law of the River" have been maintained. Table 1 lists the expected October 1, 1992, reservoir vacant space, reservoir storage, percent of capacity, change in storage, and change in elevation during water year 1992.

1993 WATER SUPPLY ASSUMPTIONS

For 1993 operations, three reservoir inflow scenarios were developed and analyzed and have been labeled as probable maximum, most probable, and probable minimum. The attached graphs provide the reservoir projected inflows, releases, and contents for each scenario. The National Weather Service Extended Streamflow Prediction (ESP) computer model uses current basin conditions, as well as historical data, to predict a range of possible future streamflows. The ESP model was employed to develop each inflow scenario, based on current soil moisture conditions within the basin. Although confidence

Table 2
Projected Unregulated Inflow Into Lake Powell
for 1993

(Units: 1,000 acre-feet)

Time Period	Probable Maximum	Most Probable	Probable Minimum
10/92 - 12/92	1,364	1,125	782
1/93 - 3/93	1,420	1,223	804
4/93 - 7/93	11,517	7,200	3,955
8/93 - 9/93	1,536	987	796
10/93 - 12/93	1,297	1,297	1,297
WY 1993	15,837	10,535	6,337
CY 1993	15,770	10,707	6,852

in streamflow forecasts made a year in advance is limited, the data are valuable in analyzing the possible impacts on project uses and purposes.

Based on the ESP model results, three different hydrologic scenarios were developed and are shown in Table 2. With the exception of the San Juan River Basin, dry basin conditions resulted in the magnitude of inflows in the three scenarios that are less than the historical upper decile, mean and lower decile.

Reclamation's monthly reservoir computer model is used to plan reservoir operations for the upcoming 12-month period. The inflow volumes resulting from the above assumptions and current reservoir storage conditions were used as model input and monthly releases were adjusted until release and storage levels accomplished project purposes and priorities.

1993 RESERVOIR OPERATIONS

At several locations in both the Upper and Lower Basins, minimum instream flow levels have been established which preserve the present aquatic resources downstream of certain Colorado River Basin dams. The construction and operation of dams in the basin have had both positive and negative effects on aquatic resources. Controlled cool water releases from dams in the Colorado River Basin have provided for increased productivity of some aquatic resources and the development of significant sport fisheries. However, the same releases could be detrimental to endangered and other native species of fishes. Section 7 consultations were continued in 1992 on the operation of the Aspinall Unit on the Gunnison River and the Animas LaPlata Project on the San Juan River (which affects the operation of Navajo Reservoir). These, along with the ongoing Section 7 consultation on Flaming Gorge and the interim flow restriction on releases from Lake Powell, will continue in water year 1993. Studies associated with these consultations will be used to better understand the flow-related needs of the endangered and other native species of fish.

Modifications to planned operations may be made based upon changes in forecasted conditions. However, because of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, Section 7 consultations, and other downstream concerns, modification to the monthly operation plans are no longer primarily forecast based. Decisions on spring peak releases and downstream habitat target flows must be made midway through the runoff season. Reclamation and the Fish and Wildlife Service (FWS) will initiate meetings with interested parties, including representation of the basin states, to facilitate the decisions necessary to finalize site specific operations plans. All operations will be undertaken subject to the primary water storage and delivery requirements established by the Law of the River.

The following paragraphs discuss the operation of each of the reservoirs with respect to compact, decree, statutory, water delivery obligations, and instream flow needs for maintaining or improving aquatic resources, where appropriate.

Fontenelle Reservoir

April through July runoff into the reservoir during water year 1992 was only 255,000 acre-feet (AF) or 29 percent of average. This is approximately the same runoff that was experienced in 1977, the previous record low runoff year. Even though releases were made at near minimum levels commencing in April 1992, and remained at this level through the remainder of water year 1992, Fontenelle was approximately 20 feet short of filling in 1992.

Because the mean annual inflow of 1.2 MAF far exceeds the storage capacity of 345,000 AF, there is little chance that the reservoir will not fill during water year 1993. In order to minimize high spring releases and to maximize downstream fishery resources and power production, the reservoir will probably be drawn down to minimum pool elevation (6463.5 feet) which corresponds to a volume of 93,000 AF of live storage.

To meet the previously stated operational objectives, a constant release of approximately 500 to 600 cubic feet per second (cfs) will be made through the fall and winter months. Releases at this level will provide an appropriate level of reservoir drawdown for the 1993 runoff season, while ensuring that downstream water rights and municipal and industrial needs are met. The reservoir is expected to fill in the summer of 1993 under all three inflow scenarios.

Flaming Gorge Reservoir

Water year 1992 inflow into Flaming Gorge Reservoir is expected to be only 740,000 AF or 45 percent of average and the April through July runoff was only 343,000 AF (only 60,000 AF more than the record low runoff of 1977). With this low level of inflow, Flaming Gorge is expected to lose approximately 270,000 AF of storage in water year 1992.

A Final Draft Biological Opinion (FDBO) from FWS on the operation of Flaming Gorge Reservoir was issued in February of 1992. The FDBO outlined how the reservoir should be operated during the spring, summer, and early fall months in order to provide better habitat for endangered endemic species of fish. In addition, it requires 5 years of additional studies to determine the flow needs of the endangered fish during the spring and winter months. In 1992, Flaming Gorge was operated in accordance with the draft biological opinion by making a 4,200 cfs release for 1 week in May and by maintaining a flow of between 1,350 and 1,800 cfs at the Green River near Jensen, Utah, gaging station after the completion of the runoff season.

In water year 1993, Flaming Gorge will be operated according to the FDBO. This operation will include high spring releases to coincide with the peak flow of the Yampa River and low

stable flows between 1,100 and 1,800 cfs on the Green River near the Jensen, Utah, gaging station during the summer and fall months.

Flaming Gorge is not expected to fill in 1993 except under the probable maximum inflow scenario. Under the most probable inflow scenario, Flaming Gorge is expected to gain storage but will still be approximately 6 feet short of filling.

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

The April through July runoff during 1992 into the Aspinall Unit was only 450,000 AF or 65 percent of average. Blue Mesa was approximately 130,000 AF short of filling in 1992.

Section 7 consultation with FWS on the operation of the Aspinall Unit was continued in 1992. As a result, Reclamation and FWS developed a 5 year plan of study to assess the effects of various reservoir release patterns on fish habitat, reproduction success, and possible re-introduction of endangered fish into the Gunnison River. Studies began during the spring of 1992. The plan recommends that through 1996, peak spring flows in the Gunnison River at the Whitewater gage should be 2,000 to 5,000 cfs for 1 year; 5,000 to 10,000 cfs for 1 year; above 12,000 cfs for 2 years; and above 15,000 cfs for 1 year (basically, 2 years of relatively low flows and 3 years of relatively high flows). Peak flows will be timed to coincide with peaks on the Colorado River, most likely to occur between May 15 and June 15. A gradually descending limb of the hydrograph will be followed by lower stable flows the remainder of the year. Gunnison flows during 1992 were in the low range and will be counted as one of the two low years. Current most probable forecasts for 1993 are for Blue Mesa to fill and a peak representative of a high flow year (12,000 cfs at the Whitewater gage) will most likely be provided. Ramping rates will not exceed 250 cfs/day.

By December 1992, Blue Mesa Reservoir will be drawn down to at least an elevation of 7490.0 feet in order to minimize icing problems in the Gunnison River. Blue Mesa will continue to be drawn down through April 1993 to a level that will accommodate the most probable inflow scenario and accomplish the release objectives with a minimum of powerplant bypasses at Crystal. Blue Mesa is expected to fill in the summer of 1993 and flows through the Black Canyon of the Gunnison National Monument are expected to be above the minimum release objective during the summer months under all three inflow scenarios. The filling of the reservoir next year will ensure that reasonable specific releases required to study the protection and improvement of habitat for endangered fish can be accommodated. The forecasted runoff for the spring of 1993 will be monitored to achieve these objectives.

The minimum release objective of the 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. To protect the blue ribbon trout fishery in the

Black Canyon and maximize recreation potential, releases during 1993 will be carefully planned to minimize large fluctuations in the daily and monthly flows.

Navajo Reservoir

The 1992 April through July runoff was 790,000 AF or 103 percent of average. Navajo Reservoir nearly filled in April 1992 and releases of 4,000 cfs were made in order to bypass the larger than expected April inflow.

Section 7 consultation with FWS for the construction of the Animas-LaPlata Project was completed in 1992. A 7 year study to evaluate alternative operations of Navajo Reservoir to benefit endangered fish were outlined in the FDBO. In accordance with this 7 year study, spring operations of Navajo were modified in 1992 and large releases of up to 4,500 cfs were made in order to study the effect of large spring flows on the spawning success of Colorado River squawfish. After the completion of the large spring releases, flows were reduced to approximately 600 cfs. The objective is to maintain a minimum release of 500 cfs from the reservoir to meet downstream water rights and to preserve the blue ribbon sport fishery located immediately downstream of the reservoir.

In 1993, Navajo Reservoir is expected to be 3 feet short of filling under the most probable inflow scenario. Releases from the reservoir will be held near 500 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 Colorado River squawfish located in the San Juan River. Additionally, specific releases will be made from the reservoir in order to study habitat requirements of the squawfish.

Lake Powell

The years 1987 through 1992 have been the lowest 6 consecutive years of inflow into Lake Powell on record. Maintaining the minimum release objective of 8.23 MAF annually from Lake Powell as set forth in the Operating Criteria during these years has reduced the reservoir storage by 9.8 MAF. By September 30, 1992, it is expected that Lake Powell will be about 76 feet from full or 58 percent of capacity at 14.1 MAF. The reservoir storage is projected to continue to decline through the fall and winter, reaching a seasonal low in March 1993 of about 90 feet from full at 12.8 MAF.

During water year 1993, the minimum release objective of 8.23 MAF as set forth in the Operating Criteria will be met. Under most probable inflow conditions, the reservoir will only recover to a level about 63 feet from full or 15.7 MAF. Due to the extended drought, it will take approximately 10 years of average inflow to refill the reservoir.

During water year 1993, the interim flow restrictions placed on the releases from Glen Canyon in 1992 will continue. These interim flow restrictions are based on the best technical information available and are designed to minimize any damage to downstream resources

until a Record of Decision is made on the Glen Canyon Environmental Impact Statement (GCEIS) some time in 1994. The interim flow restrictions are as follows:

Parameter

Maximum Flow	20,000 cfs ¹
Minimum Flow	5,000 cfs - nighttime 8,000 cfs - 7 a.m to 7 p.m
Ramp Rates	
Ascending	8,000 cfs per 4 hours ²
Descending	1,500 cfs per hour
Daily Fluctuations	5,000/6,000/8,000 cfs ³

These flow restrictions are being monitored to observe their effects on downstream resources.

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.

Lake Mead

Lake Mead pumping and releases during calendar year 1993 will be allowed, sufficient to satisfy up to 7.5 MAF of beneficial consumptive use 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 1993 will be 500,000 AF and 1.05 MAF, respectively.

Lake Mead is expected to finish calendar year 1992 at 19.2 MAF, 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 1,176 feet in February 1993, which is 19.7 MAF or 75 percent of capacity and approximately 43 feet from full capacity. Storage elevation is

¹to be evaluated and potentially increased as necessary in years when delivery to the Lower Basin exceeds 8.23 MAF

²not to exceed 2,500 cfs per hour

³daily fluctuations limited to 5,000 cfs for monthly release volumes less than 600,000 acre-feet, 6,000 cfs for monthly release volumes of 600,000 to 800,000 acre-feet and 8,000 cfs for monthly volumes over 800,000 acre-feet

projected to decline to 1,166 feet in June 1993, which is 18.4 MAF or 71 percent of capacity and approximately 54 feet below 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 5 year study by the Arizona Game and Fish Department and the Nevada Department of Wildlife. No flood control releases are scheduled for 1993, 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 these releases over the fall and winter months to avoid high flow releases during the January or 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 elevation 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 centimeters before being released into Lake Mohave. The goal for the next 5 years is to produce and release a minimum of 10,000 razorback suckers measuring at least 25 centimeters 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. 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 CAP to pump and store Colorado River water in the Phoenix area during the winter months when energy and water demands are low, and then release 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, with initial pump tests and reservoir filling beginning in the fall of 1992. Current construction schedules indicate that operational testing of the pumps will begin in October 1992 and the first pump will be available for commercial operation by November 15, 1992. All eight units are scheduled to be operational by the end of August 1993. Low-speed generator tests will be accomplished through the summer of 1993 when the stored water is released for delivery to CAP customers.

In order to facilitate high-speed generator testing required for contract completion, the active conservation storage space in New Waddell Reservoir must be virtually full. To complete this testing before the summer of 1994, the Central Arizona Water Conservation District must pump at the maximum capacity from the Colorado River beginning in the fall of 1993. Current projections indicate that CAP's use could increase by approximately 400,000 to 500,000 AF as a result filling New Waddell reservoir during calendar year 1993.

Senator Wash and Laguna Reservoirs

Water conservation operations at Senator Wash Reservoir allow regulation of water deliveries to Mexico and other irrigation agencies. The reservoir 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 Dam 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 1993 are to continue operation of the plant at one-third capacity. Provisions of Minute 242 of the International Boundary and Water Commission will continue to be met by additional releases from storage to compensate for the water bypassed from the Wellton-Mohawk Irrigation District. The water recovered by operating the Yuma Desalting Plant will be used to reduce the additional releases required.

1993 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 Operating Criteria, it has been determined that the active storage in Upper Basin reservoirs forecasted for September 30, 1993, 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 1993.

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, and 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 use 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 probable maximum 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 8.23 MAF from Lake Powell pursuant to Article II(2) of the Operating Criteria.

Lower Basin Reservoirs

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 CAP, 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 use 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 7.5 MAF 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 and expected consumptive use requirements of mainstream users in 1993, it has been determined that annual pumping and releases from Lake Mead will be allowed, sufficient to satisfy up to 7.5 MAF of consumptive use in accordance with Article II(B)(1) of the decree in *Arizona v. California*. The "normal" condition is the criterion governing the operation of Lake Mead for calendar year 1993.

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; any Lower Division State will be allowed to utilize apportioned, but unused, water from another Lower Division State in calendar year 1993 to the extent that the total annual consumptive use by mainstream users in the Lower Division States does not exceed 7.5 MAF.

Reclamation acknowledges that there are instances of unauthorized use of mainstream water in the Lower Basin. An unauthorized use means any diversion or use of Colorado River water without an entitlement to use the water or use which is not in conformance with an

entitlement. Reclamation is attempting to bring such uses into compliance with the law. Concurrent with this effort, Reclamation is engaged in developing formalized rules for the administration of entitlements to the Colorado River in the Lower Basin. Reclamation believes the codification of such rules will eliminate unauthorized uses which cannot be legitimized and provide the framework to take action against identified unauthorized users. Reclamation expects final rules to be published by January 1995.

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 1.5 MAF of water will be delivered to Mexico during calendar year 1993. The delivery of 1.5 MAF 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 .14 MAF 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.

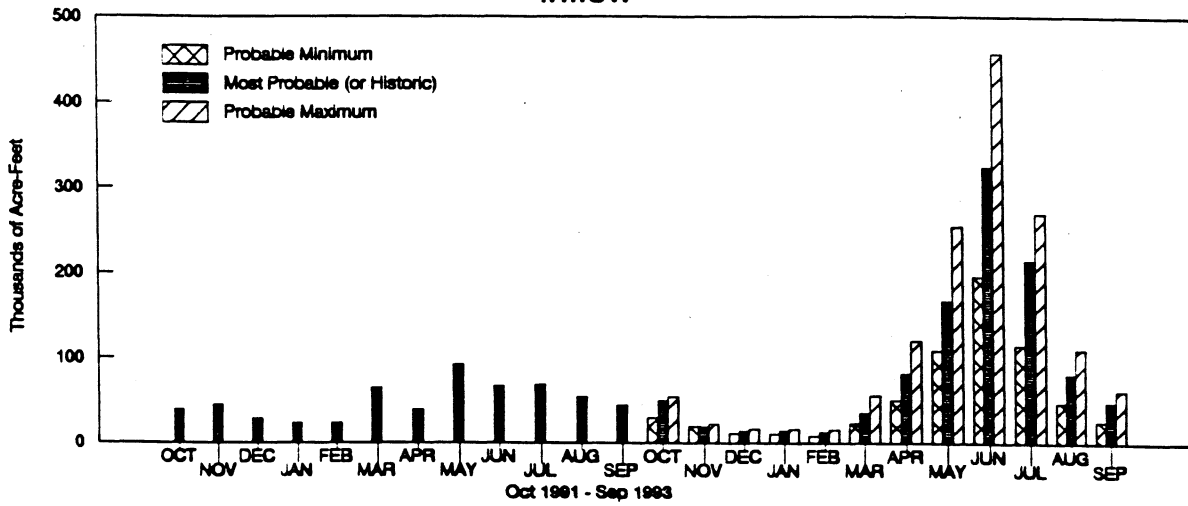
DISCLAIMER

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).

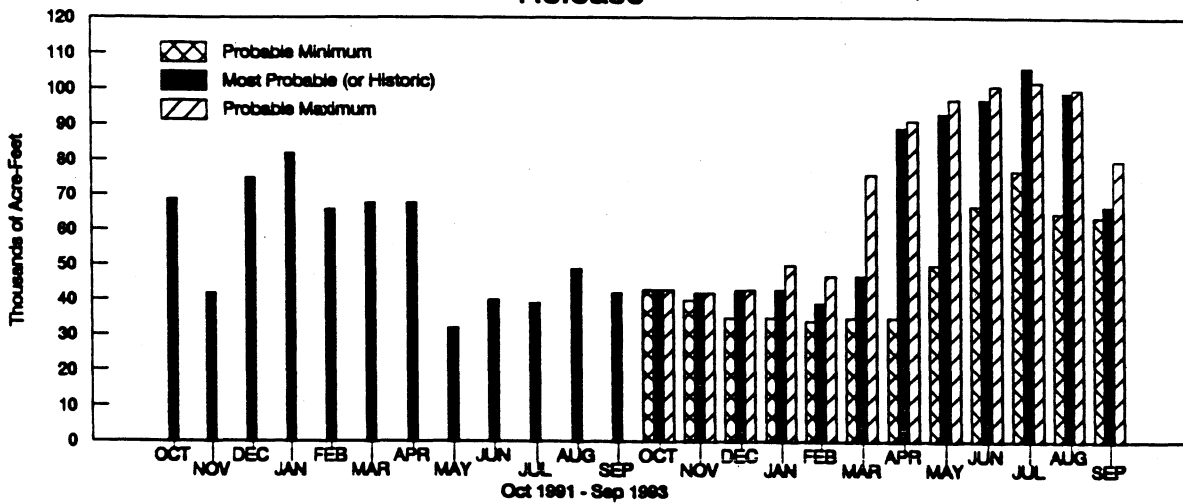
Fontenelle Reservoir

Colorado River 1993 AOP

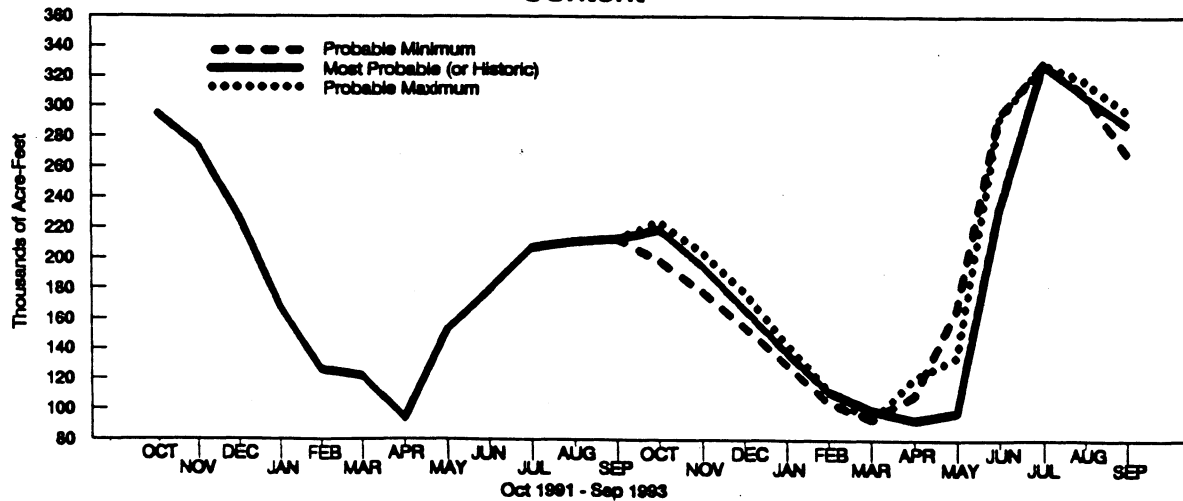
Inflow



Release



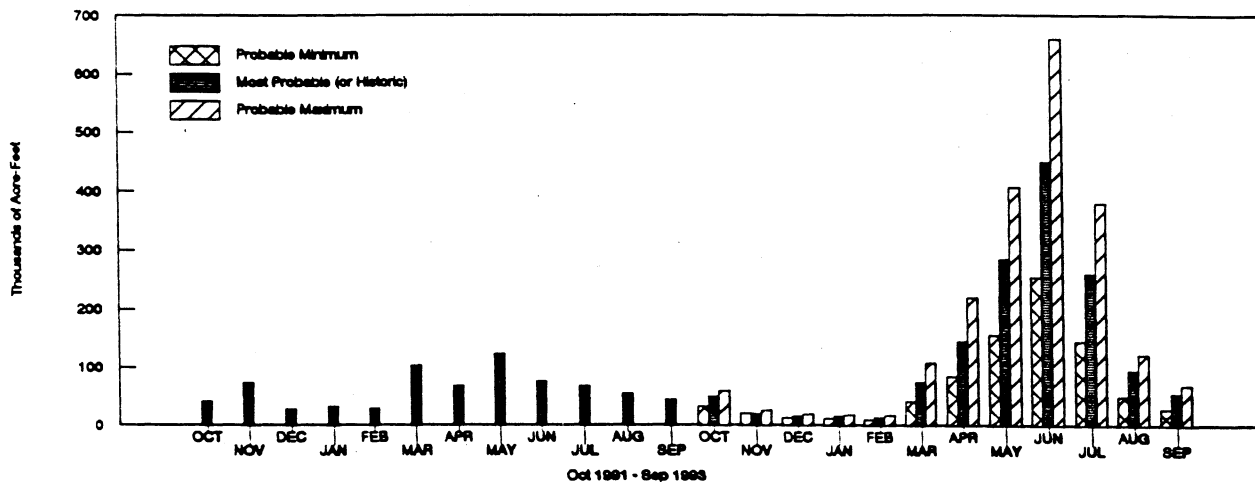
Content



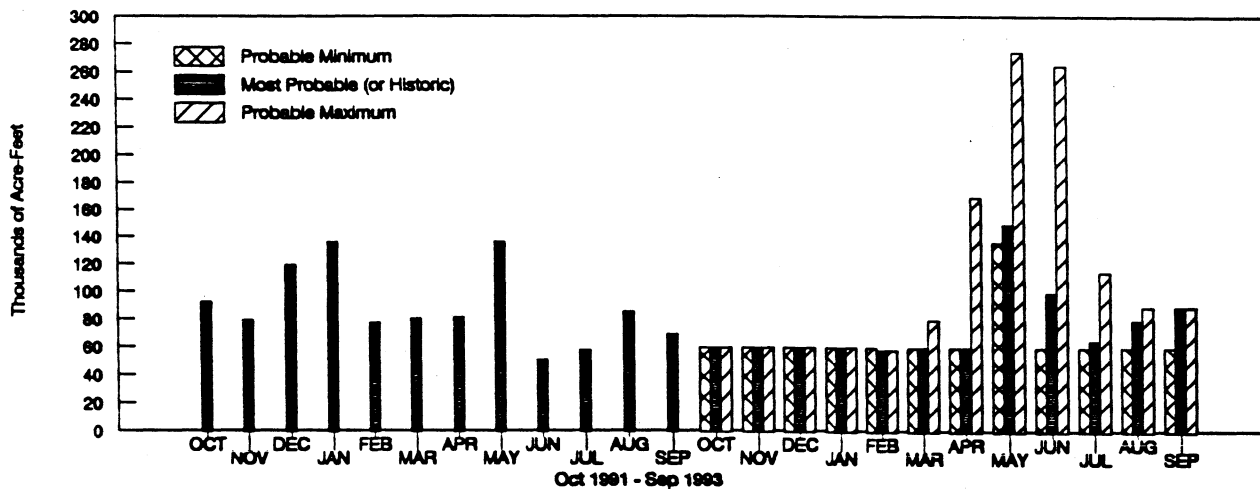
Flaming Gorge Reservoir

Colorado River 1993 AOP

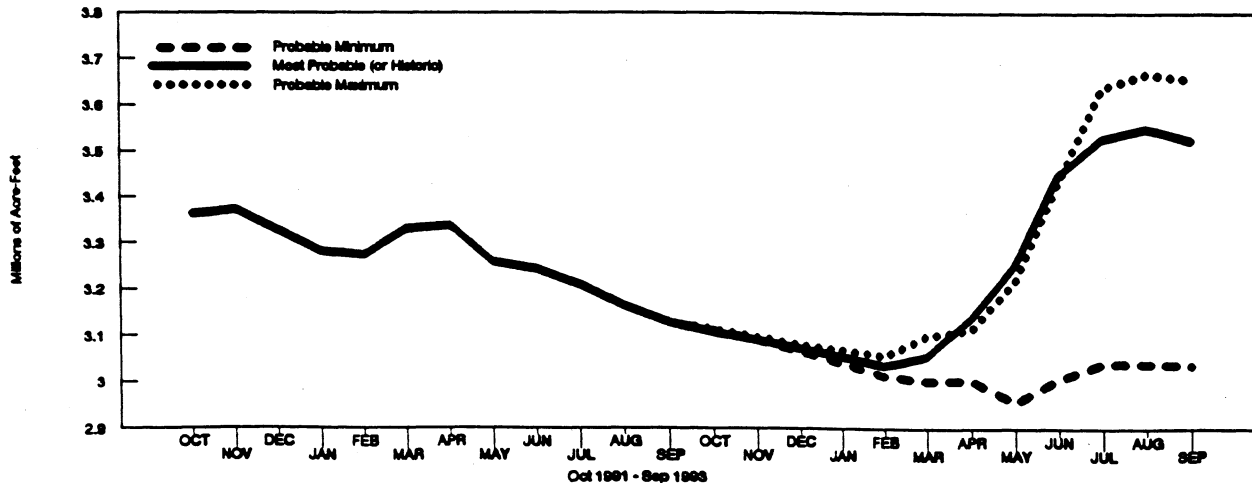
Inflow



Release



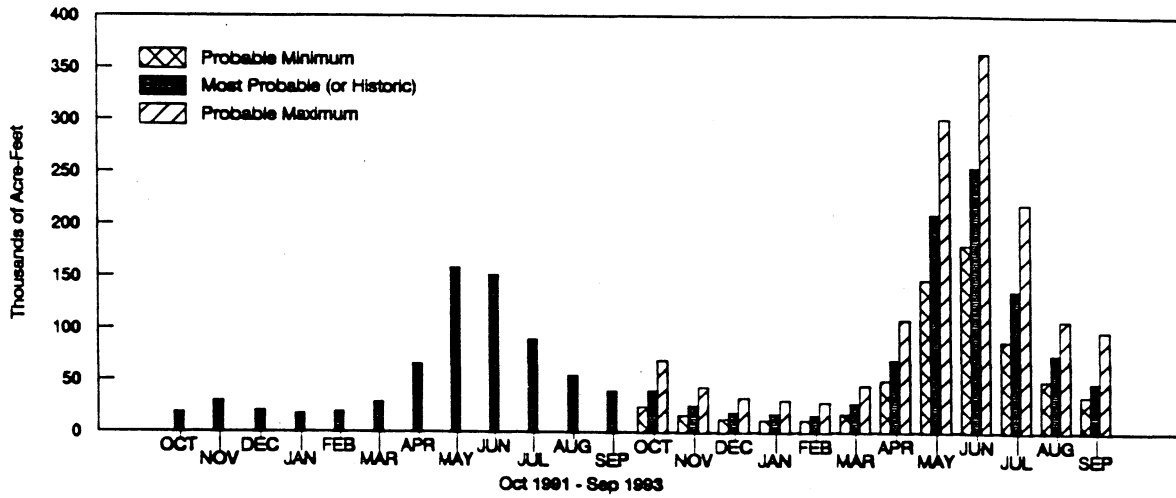
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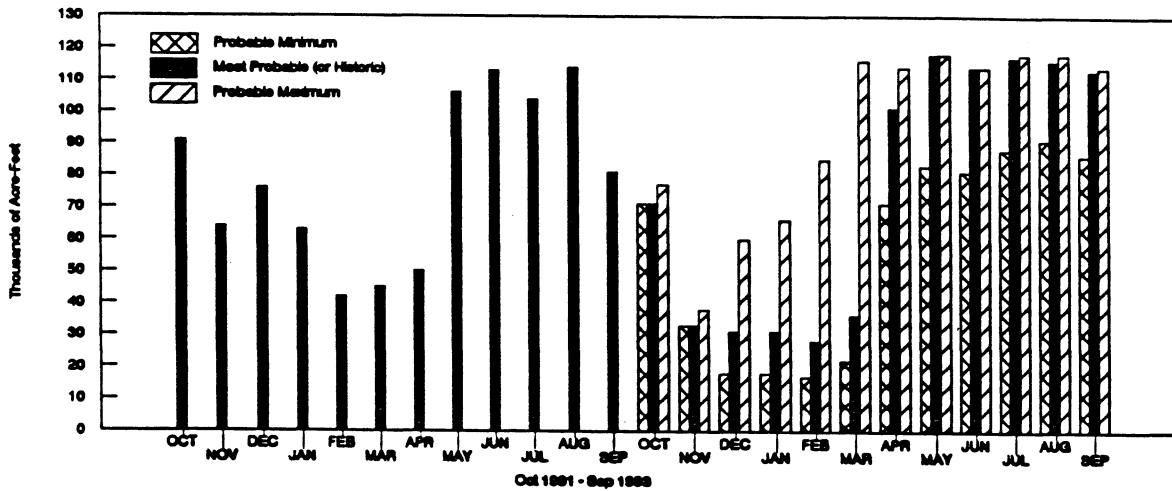
Blue Mesa and Crystal Reservoirs

Colorado River 1993 AOP

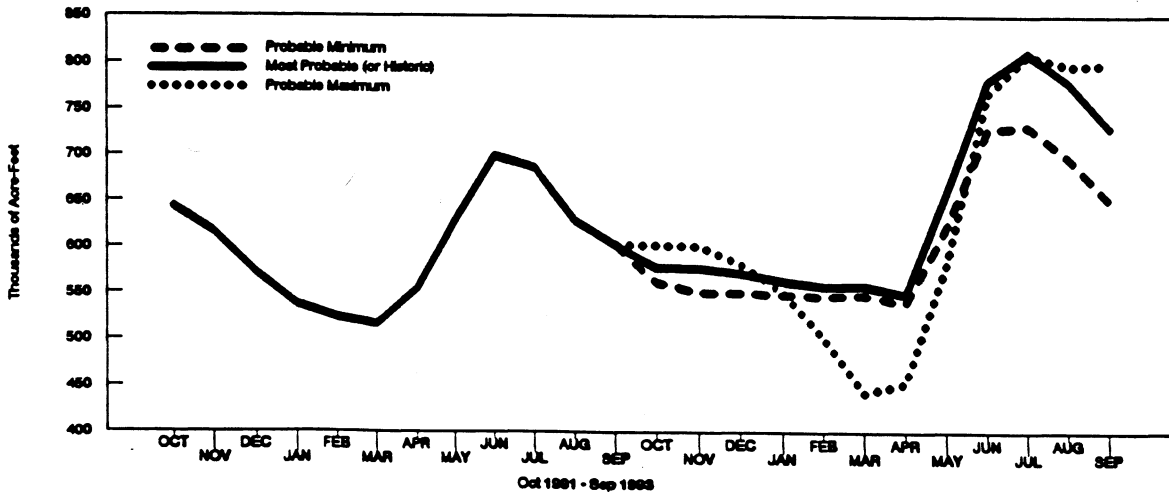
Blue Mesa Inflow



Crystal Release



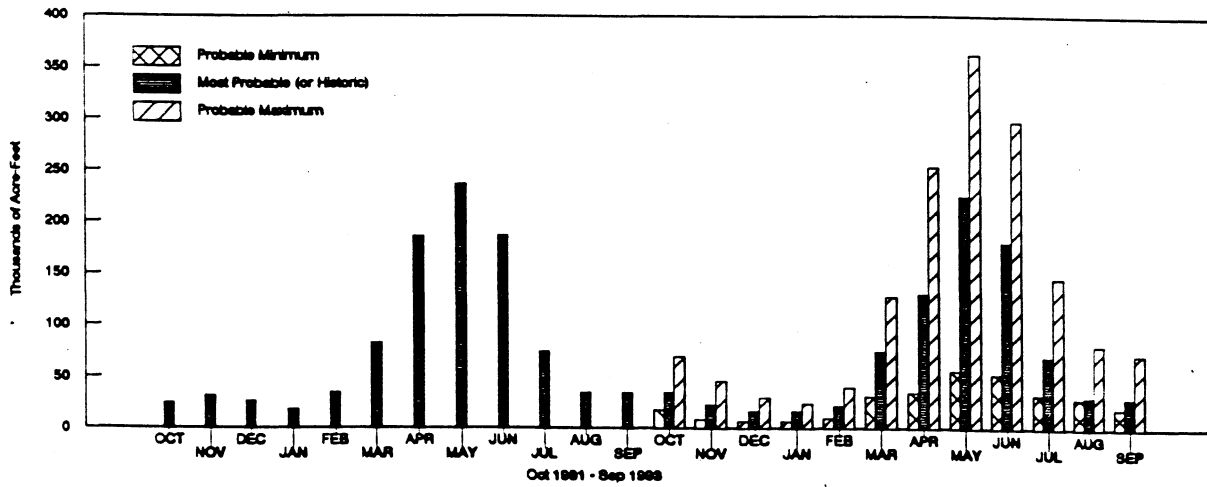
Blue Mesa Content



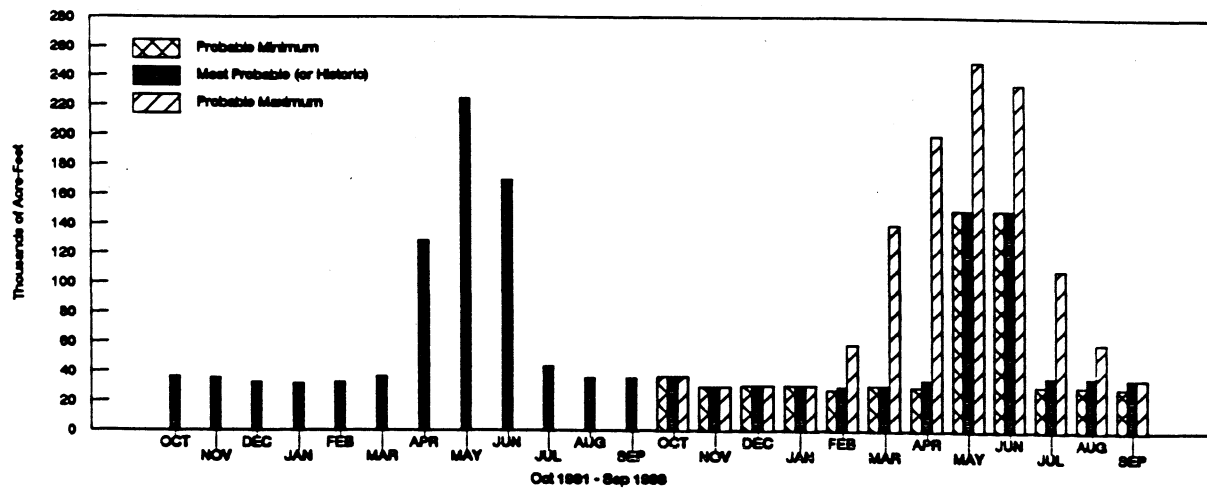
Navajo Reservoir

Colorado River 1993 AOP

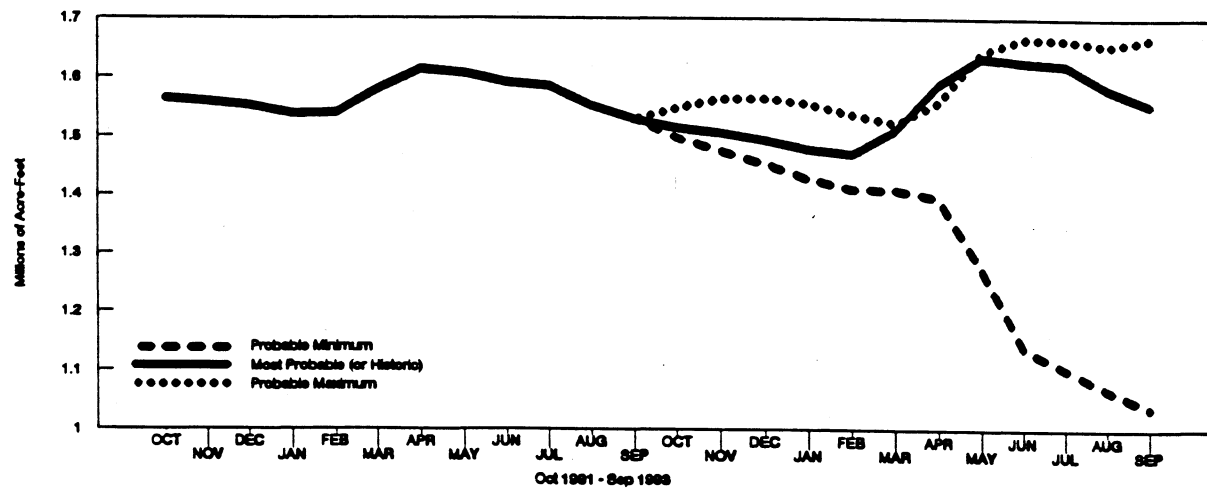
Inflow



Release



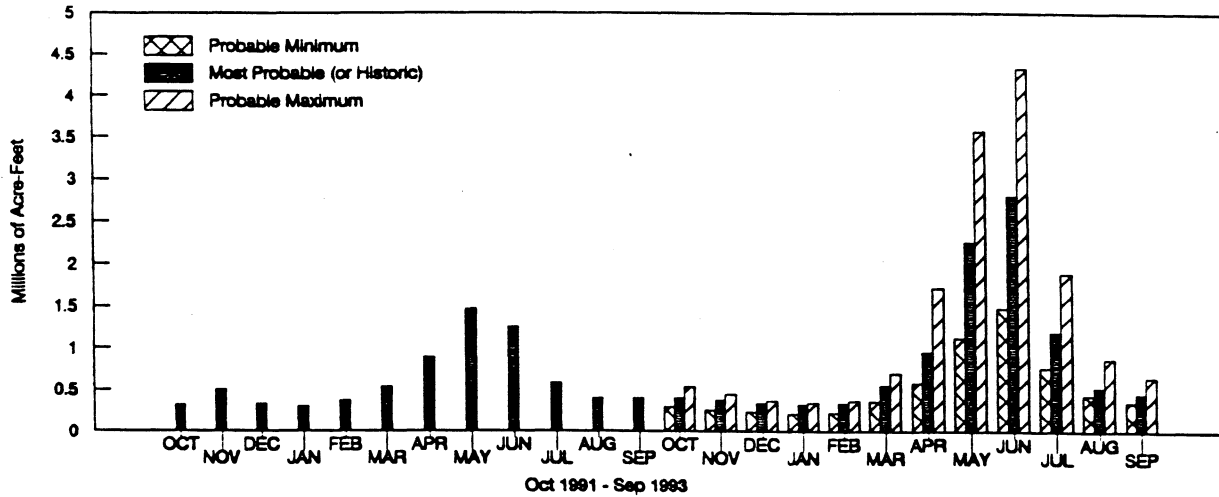
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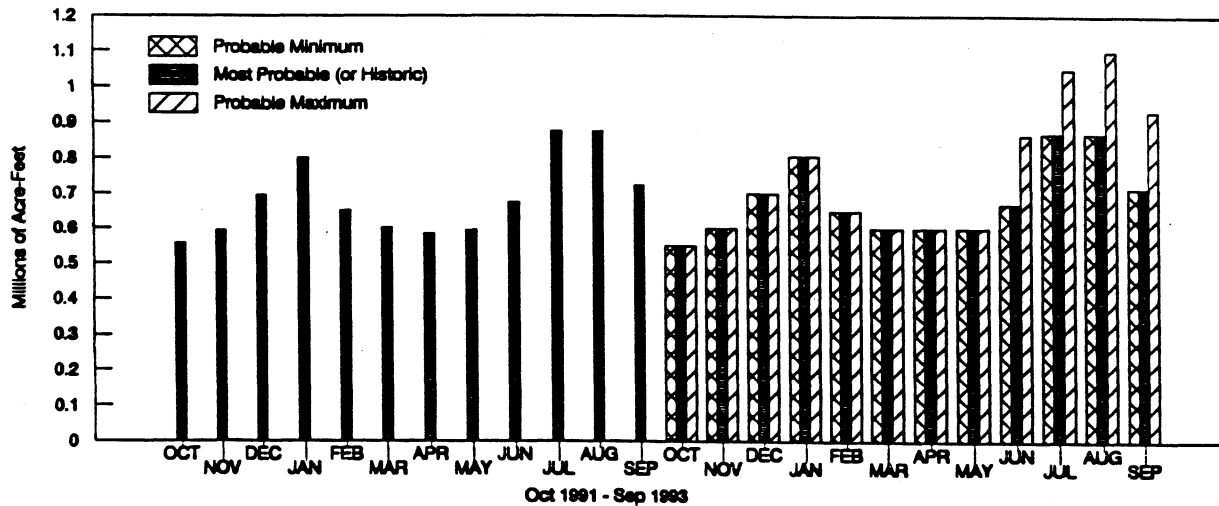
Lake Powell Reservoir

Colorado River 1993 AOP

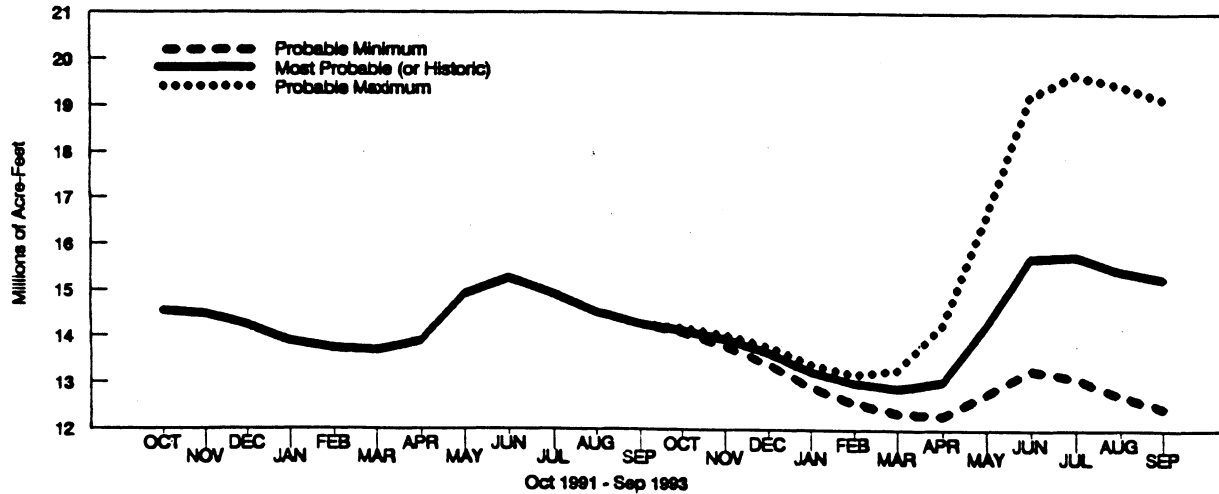
Inflow



Release



Content



Lake Mead

Colorado River 1993 AOP Inflow

