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Managing Water in the West

Maintaining Water Supply Resilience in Extreme Times

**Presented to the
Western Coalition of Arid States**

June 20, 2018



**U.S. Department of the Interior
Bureau of Reclamation**

Presentation Outline:

- Snapshot of Reclamation Offices
- West-wide Precipitation and Storage
- Colorado River Basin Hydrology
- Lower Basin Colorado River Management Objectives
- Lake Mead Projections
- Risk of Lake Mead Reaching Critically Low Elevations (1,025')
- Drought Contingency Plan
- Pilot System Conservation Program
- Implementation of Minute 323
- Federal Participation in the Salton Sea Fix
- WaterSMART Programs

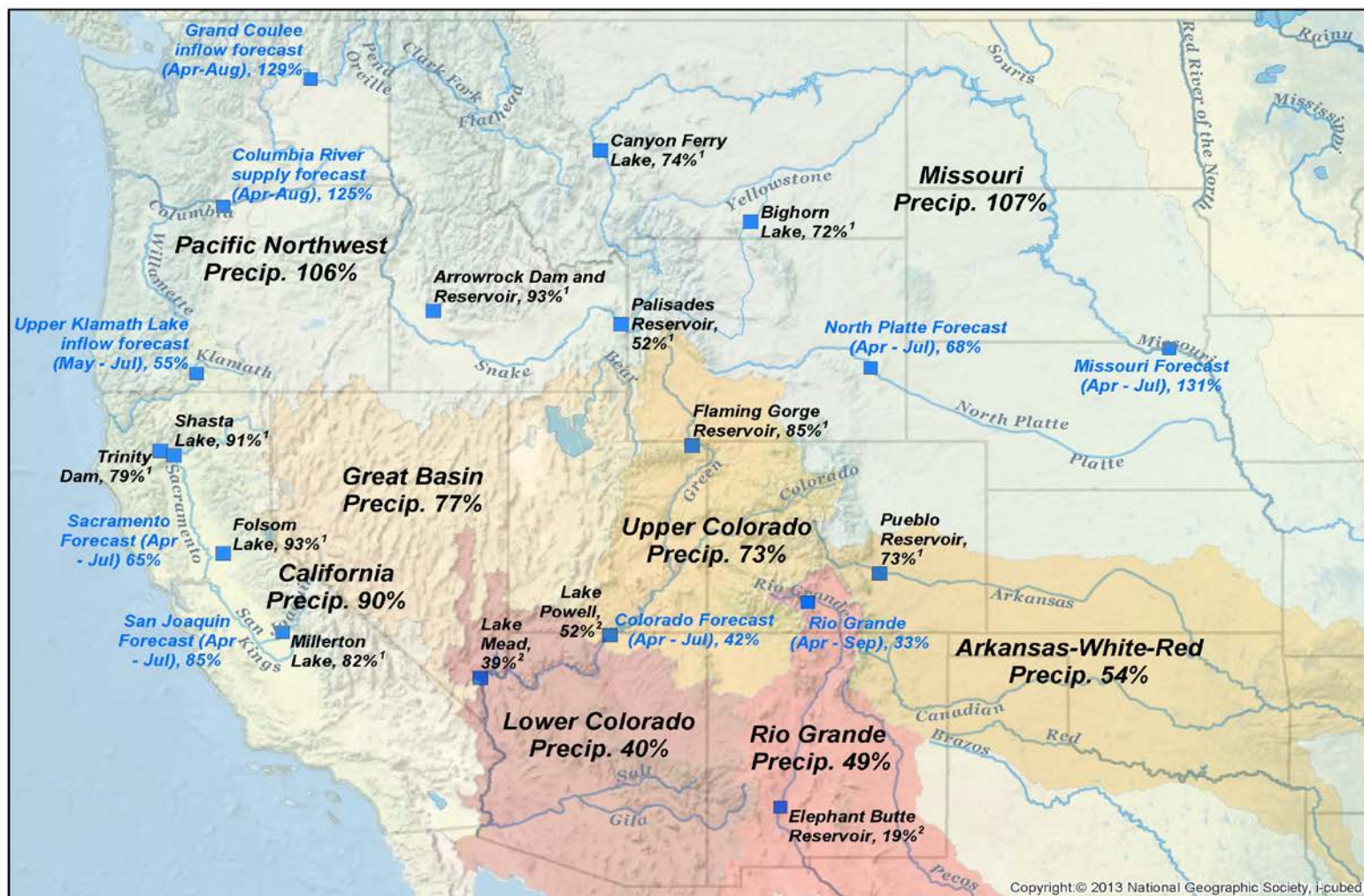
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Reclamation Offices



West-wide Precipitation and Storage



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Managing Water in the West

Reclamation West-Wide Summary Precipitation and Storage Figures

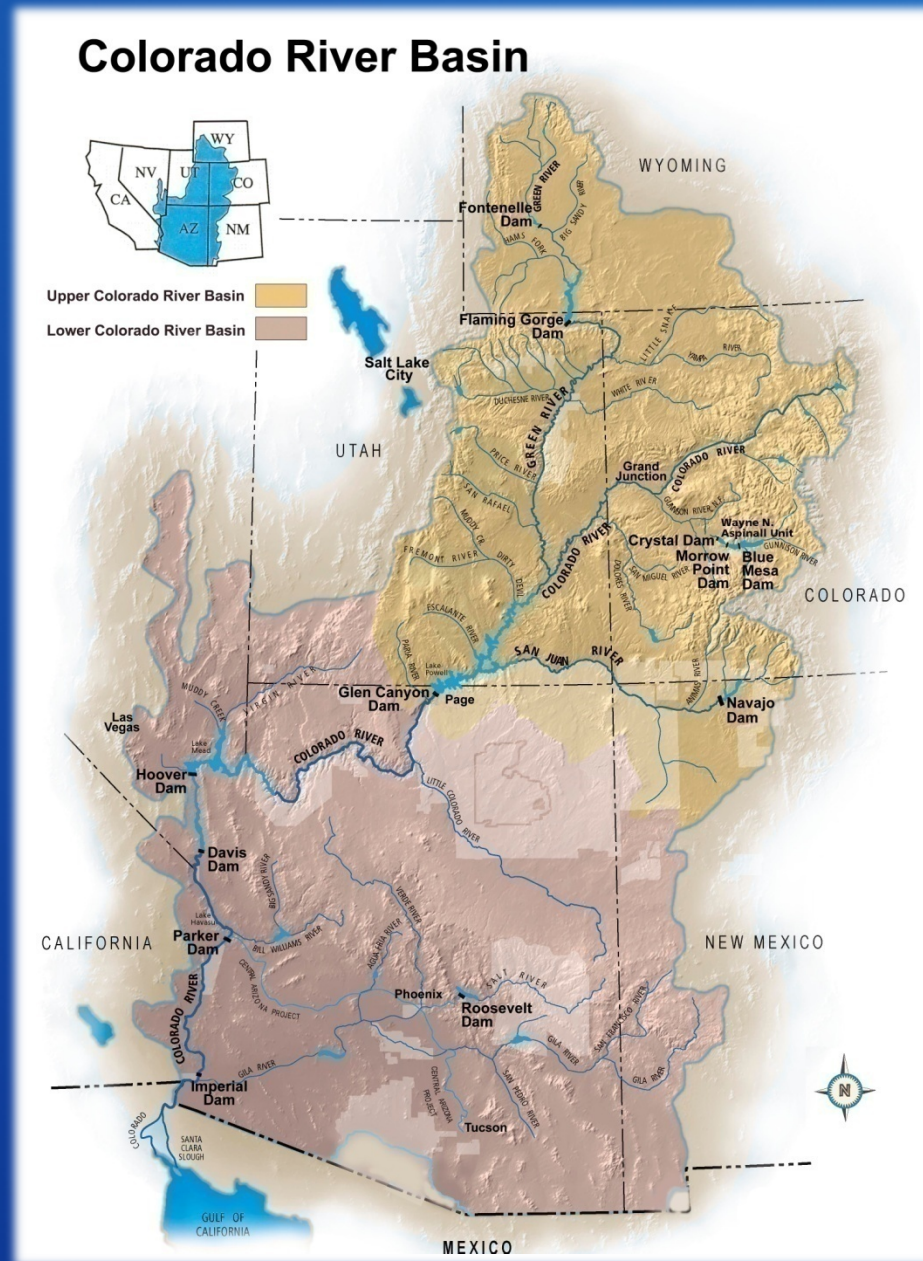
¹Storage percent of capacity more sensitive to seasonal inflows

²Storage percent of capacity less sensitive to seasonal inflows

Water year-to-date precipitation (precip) provided as % of average
Reservoir storage provided as percentage of capacity
Forecast data as % of average, updated May 1, 2018 (4/1 for California)
Precipitation and reservoir data available from NRCS/BOR/CDEC
Updated as of May 10, 2018

Colorado River Basin Hydrology

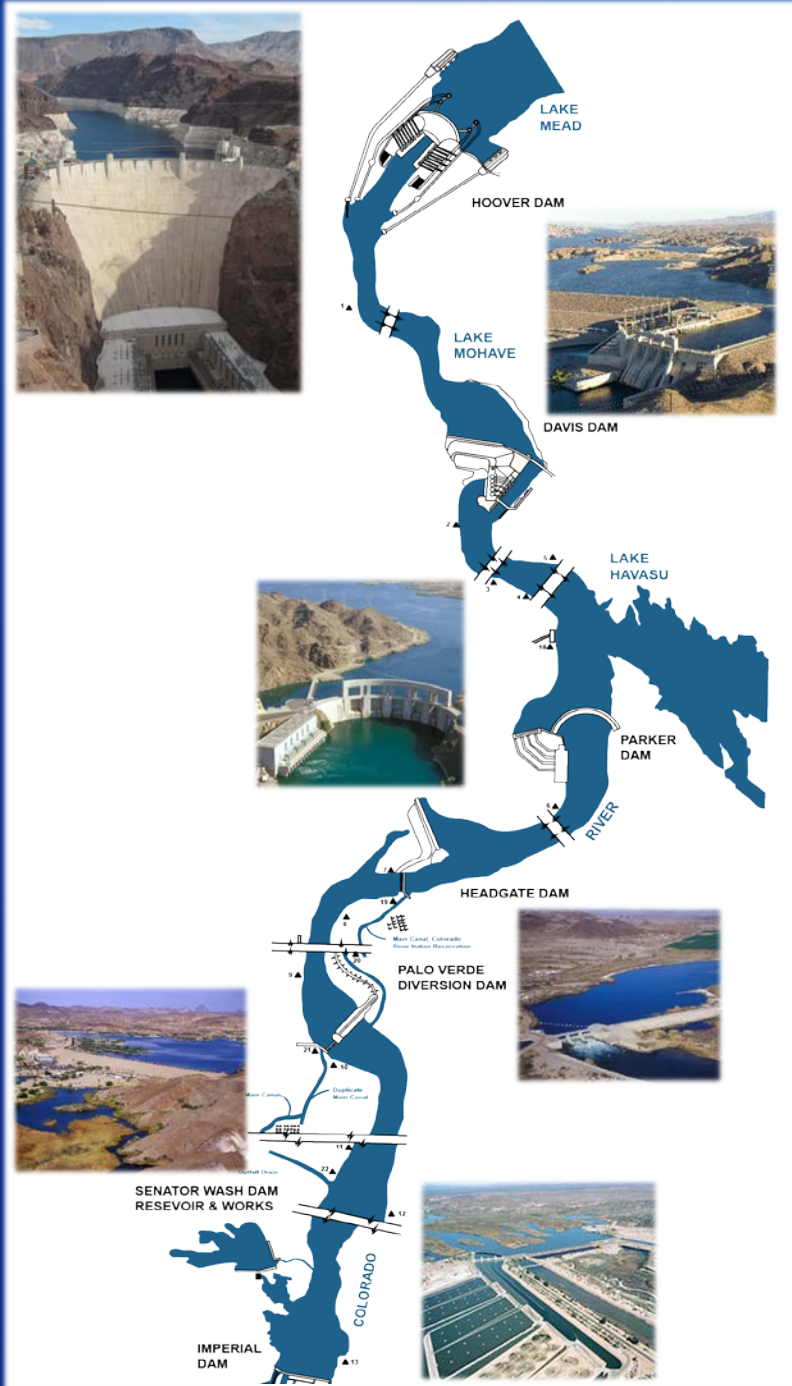
- 16.5 million acre-feet (maf) allocated annually
- 13 to 14.5 maf of consumptive use annually
- 60 maf of storage
- 14.8 maf average annual “natural” inflow into Lake Powell over past 110 years
- Inflows are highly variable year-to-year



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Lower Basin Colorado River Management Objectives

- Provide flood control and river regulation
- Meet water demands
- Generate hydropower
- Enhance and maintain ecosystem habitat
- Recover and protect endangered species
- Provide recreation

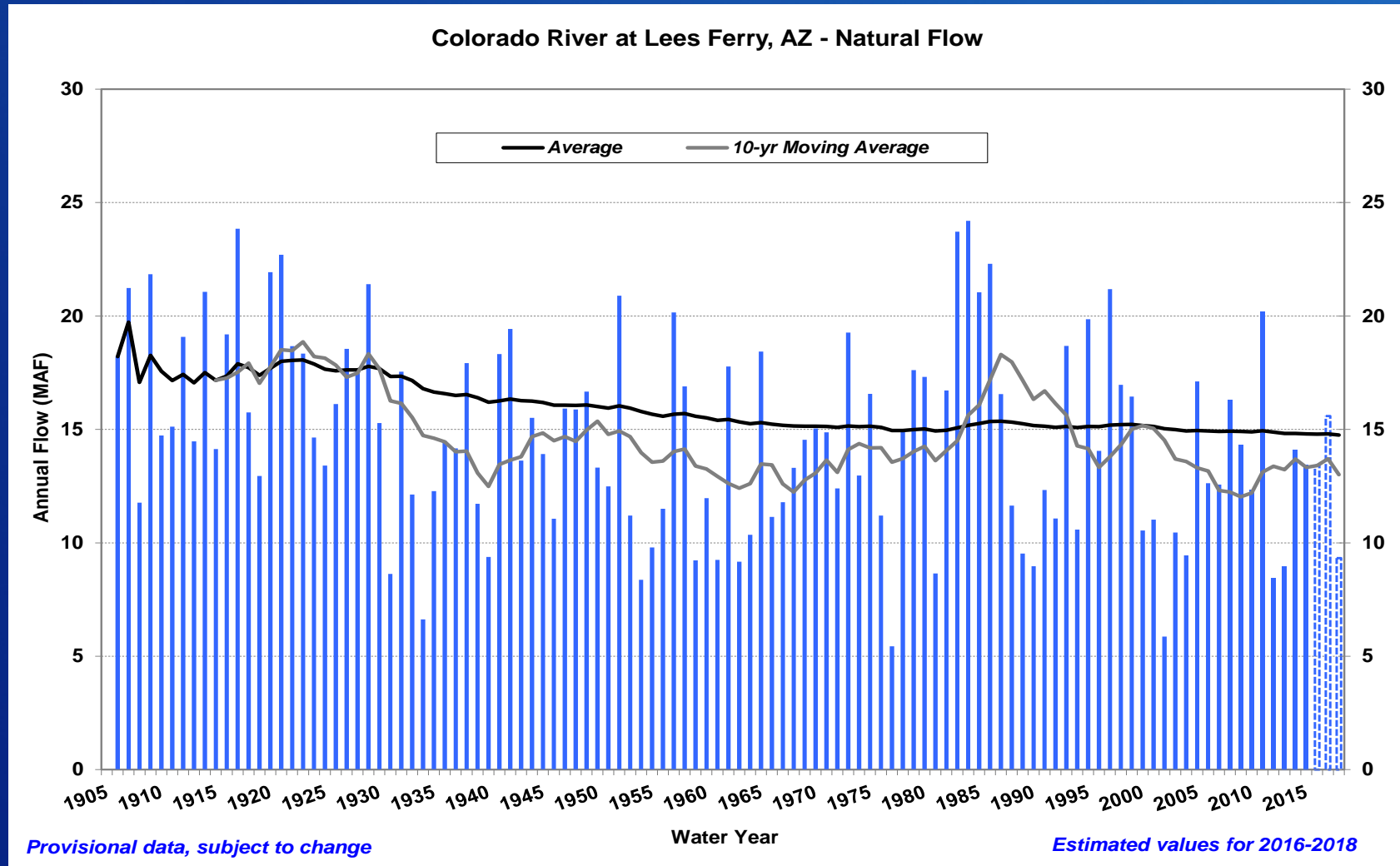


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Natural Flow

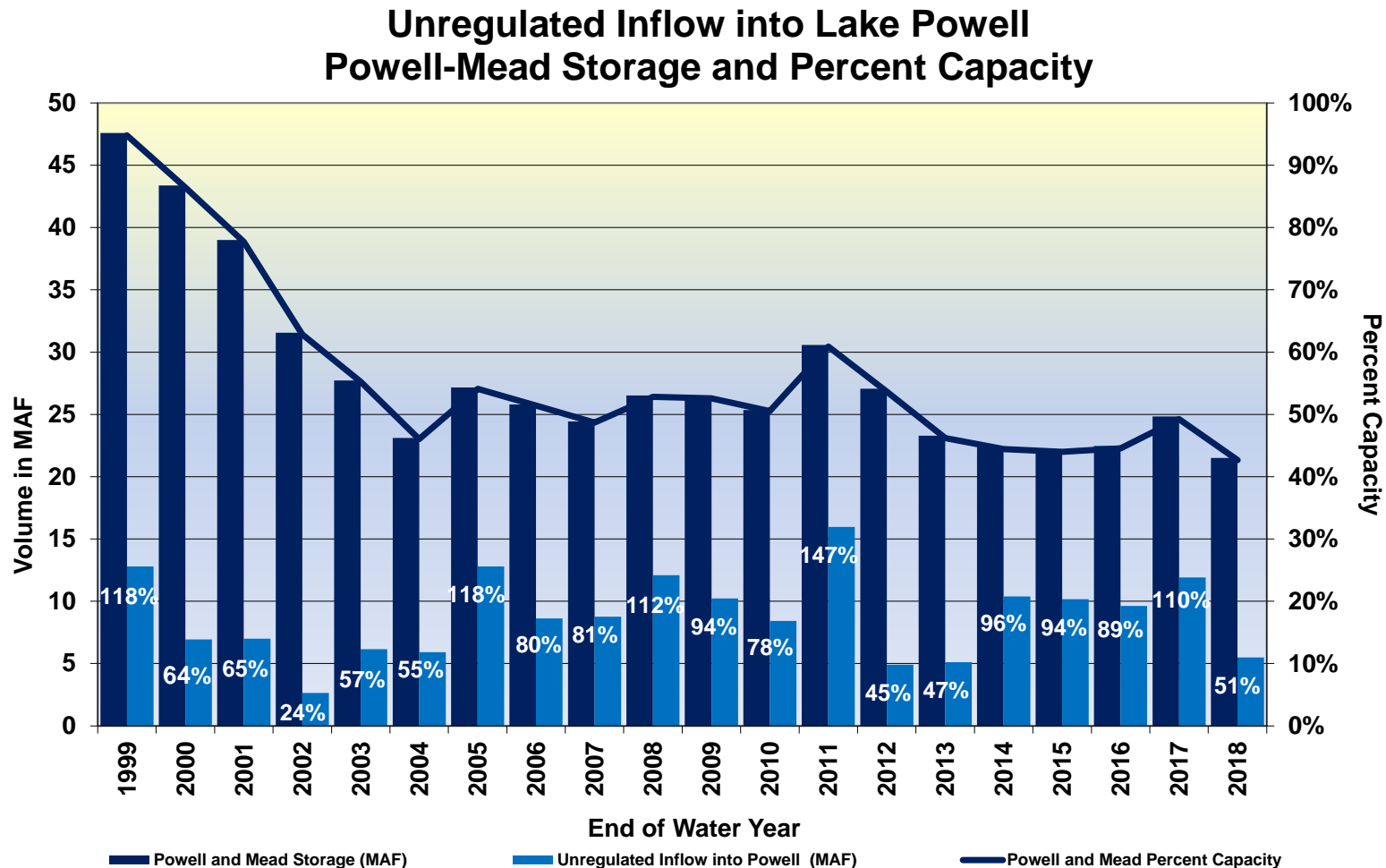
Colorado River at Lees Ferry Gaging Station, Arizona

Water Year 1906 to 2018



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State of the System (Water Years 1999-2018)^{1,2}



¹Values for Water Year 2018 are projected. Unregulated inflow is based on the latest CBRFC forecast dated May 2, 2018. Storage and percent capacity are based on the April 2018 24-Month Study.

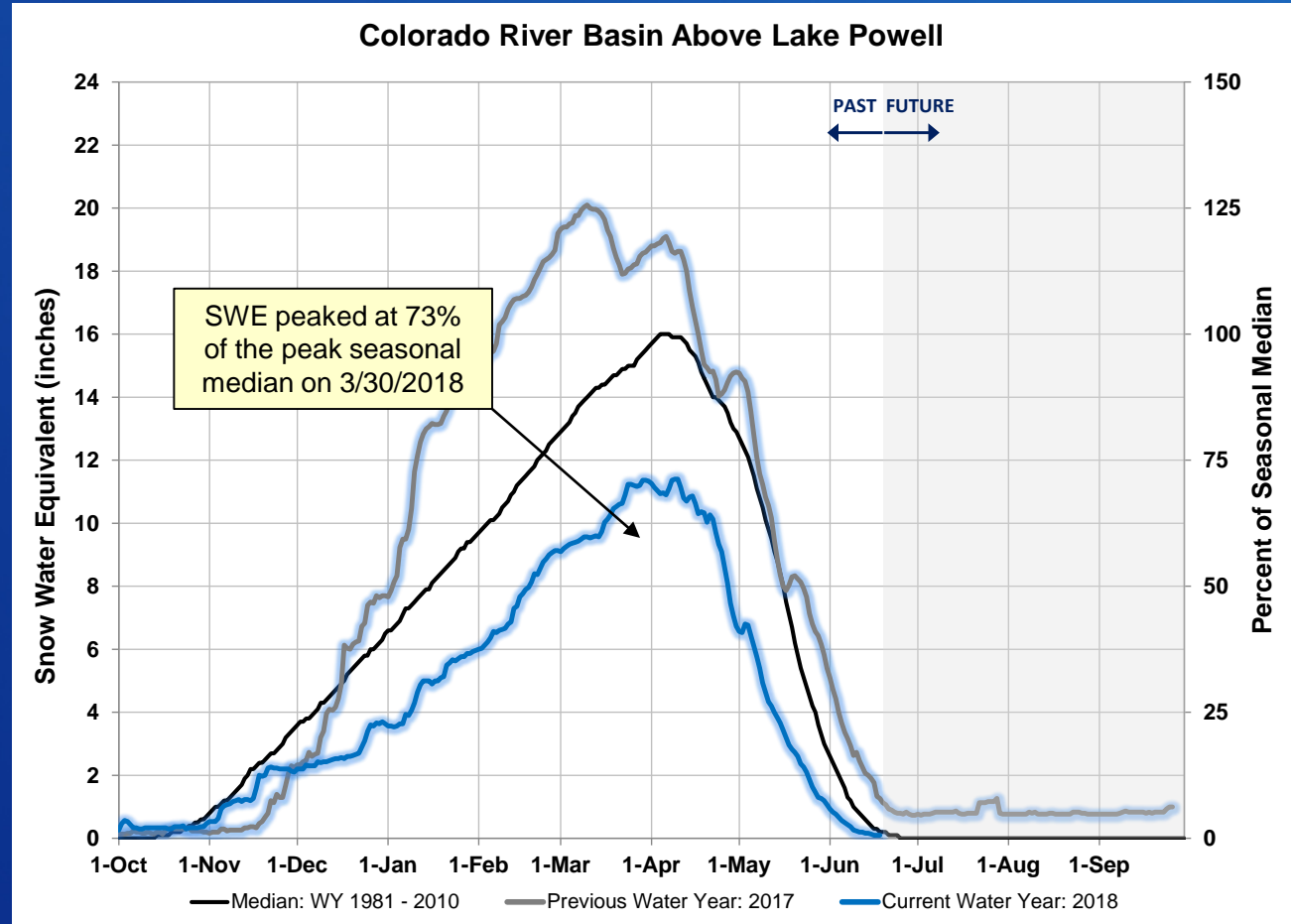
²Percentages at the top of the light blue bars represent percent of average unregulated inflow into Lake Powell for a given water year. The percent of average is based on the period of record from 1981-2010.

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Water Year Snowpack and Precipitation¹ as of June 18, 2018

Colorado River
Basin above Lake
Powell

Water Year 2018
Precipitation
(year-to-date)
70% of average



¹Percent of normal precipitation is based on an arithmetic mean, or average; percent of normal snowpack is based on the median value for a given date.

Colorado River Drought

- 2000-2017 is the driest 18-year period in over 100 years of historical records (2016-2017 are estimated)
- Tree-ring reconstructions show more severe droughts have occurred over the past 1200 years (e.g., drought in the mid 1100s)
- The 2018 April through July runoff forecast is 37% of average¹ as of June 18, 2018.
- Not unusual to have a few years of above average inflow during longer-term droughts (e.g., the 1950s)

¹ Percent of average is based on the period of record from 1981-2010.

Colorado River Basin Storage (as of June 17, 2017)

Reservoir	Percent Full	Storage (maf)	Elevation (Feet)
Lake Powell	53%	12.90	3,612
Lake Mead	38%	9.87	1,078
Total System Storage*	51%	30.60	NA

***Total system storage was at 55% or 33.07 maf this time last year**

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Pilot System Conservation Program



- In 2014, the Bureau of Reclamation, the Colorado River Basin States and Colorado River water users explored ideas that could mitigate the impacts of the ongoing drought in the Colorado River Basin.
- One idea that received broad support was funding projects that would test a wide range of measures to conserve Colorado River water in Lake Powell or Lake Mead as Colorado River System water for the benefit of all users to help offset declining reservoir elevations.

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Drought Contingency Plan



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Total Contemplated Lower Basin Volumes (in KAF)
2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan &
Binational Water Scarcity Contingency Plan

Lake Mead Elevation (ft msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by Country <i>US: (2007 Interim Guidelines Shortages + DCP Contributions)</i> <i>Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)</i>					Total Combined Volumes
	AZ	NV	Mexico	Lower Basin States + Mexico	AZ	NV	CA	Mexico	AZ Total	NV Total	CA Total	Lower Basin States Total	Mexico Total	Lower Basin States + Mexico
1,090 - >1,075	0	0	0	0	192	8	0	41	192	8	0	200	41	241
1,075 - >1050	320	13	50	383	192	8	0	30	512	21	0	533	80	613
1,050 - >1,045	400	17	70	487	192	8	0	34	592	25	0	617	104	617
1,045 - >1,040	400	17	70	487	240	10	200	76	640	27	200	867	146	867
1,040 - >1,035	400	17	70	487	240	10	250	84	640	27	250	917	154	917
1,035 - >1,030	400	17	70	487	240	10	300	92	640	27	300	967	162	967
1,030 – 1,025	400	17	70	487	240	10	350	101	640	27	350	1,017	171	1,017
<1,025	480	20	125	625	240	10	350	150	720	30	350	1,100	275	1,375

The US will work to create or conserve 100,000 af or more of Colorado River system water on an annual basis to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs. All actions taken by the United States shall be subject to applicable federal law, including availability of appropriations.

Implementation of Minute 323 - 1944 Treaty with Mexico



2014 Minute 319 Pulse Flow Celebration
Algodones, Baja California, Mexico

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Federal Participation in the Salton Sea Fix



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WaterSMART Program

Supports Reclamation's mission through collaboration with stakeholders to improve water management, increase conservation, and stretch scarce water resources



Drought Response Program



Drought Contingency Planning



Drought Resiliency Projects



Emergency Response Actions

Drought Response Program Program Requirements

Eligible Applicants

- States, Indian Tribes, Irrigation Districts, Water Districts, and other organizations with water or power delivery authority

Cost Share

- 50% non-Federal cost-share required

Drought Plans

- Up to \$200,000 per plan, completed within 2 years

Drought Projects

- Funding Group I: Up to \$300k and completed within 2 years
- Funding Group II: Up to \$750k and completed within 3 years

Drought Response Program Drought Contingency Plans

The **East Bay Municipal Utility District** and other regional water management agencies within the Bay Area in California will develop a drought contingency plan

The **Washington State Department of Ecology** will update its drought contingency plan, last published in 1992.

The **Dolores Water Conservancy District in Colorado** will develop a drought contingency plan with the Ute Mountain Ute Tribe Farm and Ranch Enterprise, and the Montezuma Valley Irrigation Company.

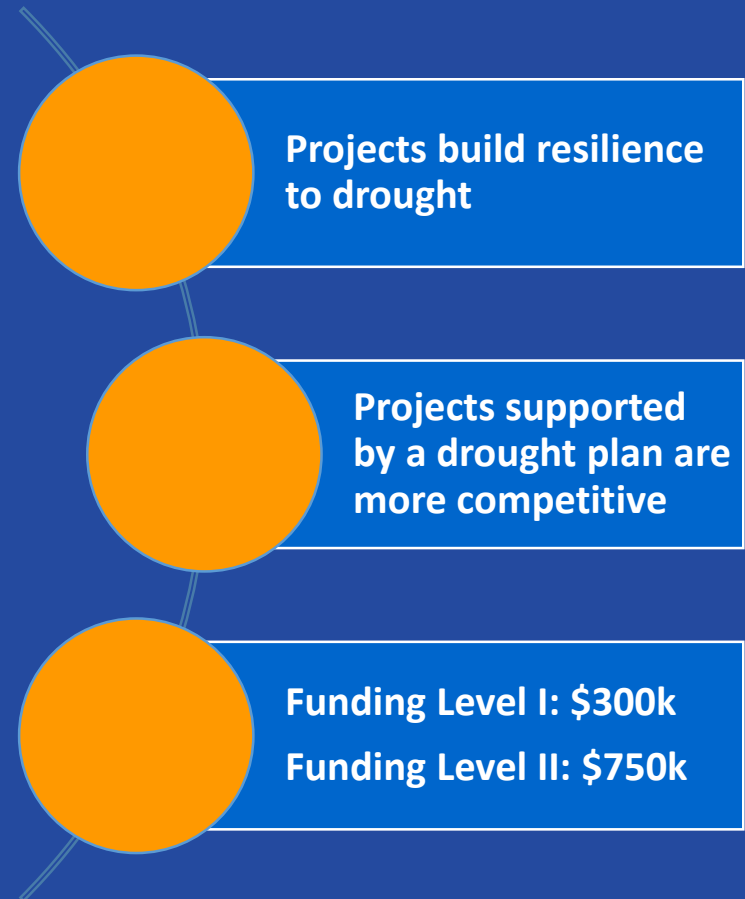


Drought Response Program

Drought Resiliency Projects

Eligible Projects Include:

- **Infrastructure Improvements**
 - Modifying surface water intakes
 - New conveyance system components
 - Additional water storage
 - Aquifer Storage and Recovery
 - Capture and treat alternative supplies
- **Decision Support Tools & Modeling**
 - Tools to support water marketing
 - Tools to convey water supply information
 - Measurement
- **Environmental Protection**
 - Improve habitat
 - Install fish screens and ladders



WaterSMART – Title XVI



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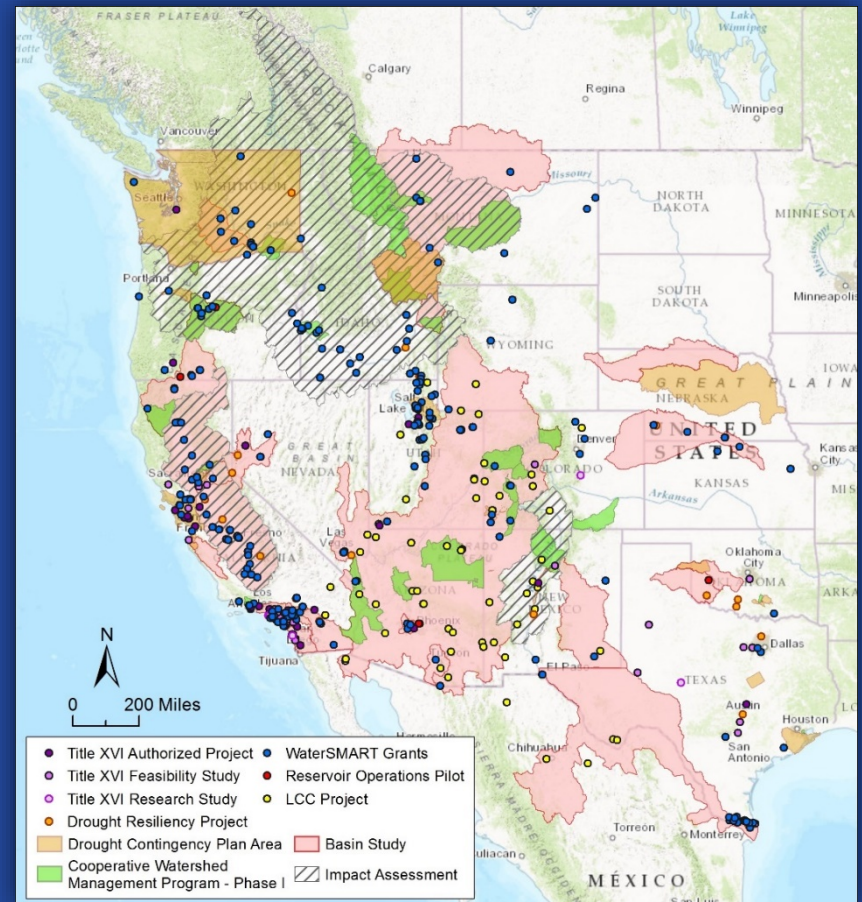
WaterSMART Data Visualization Tool

Data visualization site is an interactive companion to this report:

- Interactive maps
- Featured project tours
- Program growth over time

<https://www.usbr.gov/watersmart/>

Data Visualization Tool:
arcg.is/1TcT68S



An aerial photograph of a large concrete dam with multiple spillways, situated in a deep, arid canyon. The reservoir behind the dam is a vibrant blue-green color, contrasting with the brown, rocky terrain. The sun is high, casting long shadows from the canyon walls and the dam structure onto the water and the surrounding landscape.

Thank You!

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