

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com



WATER EFFICIENCY AND THE COLORADO BASIN: A NEW LANDSCAPE?

WSI Panel, Oct. 6, 2017

Current state of the river

A different water availability landscape

A different federal landscape



WATER EFFICIENCY ACTION NETWORK
FOR THE COLORADO BASIN STATES

Panelists

- Tina Mullis, U.S. Bureau of Reclamation
- Jorge Figueroa, Western Resources Advocates
- Bill McDonnell, Metropolitan Water District of Southern California
- Tony Willardson, Western States Water Council
- Moderator Cindy Dyballa, Sligo Creek Resources



WATER EFFICIENCY ACTION NETWORK
FOR THE COLORADO BASIN STATES

Colorado River basin

Not enough water in the Basin:
now and in future,
drought or not

Ramping up water efficiency
fastest and least cost solution

New approaches needed,
old ones not enough





RECLAMATION

Managing Water in the West

Colorado River System Status Update and Program Overviews

Tina Mullis, Water Resources Program Manager
Water Accounting and Verification Group
Boulder Canyon Operations Office
Lower Colorado Regional Office
Boulder City, Nevada

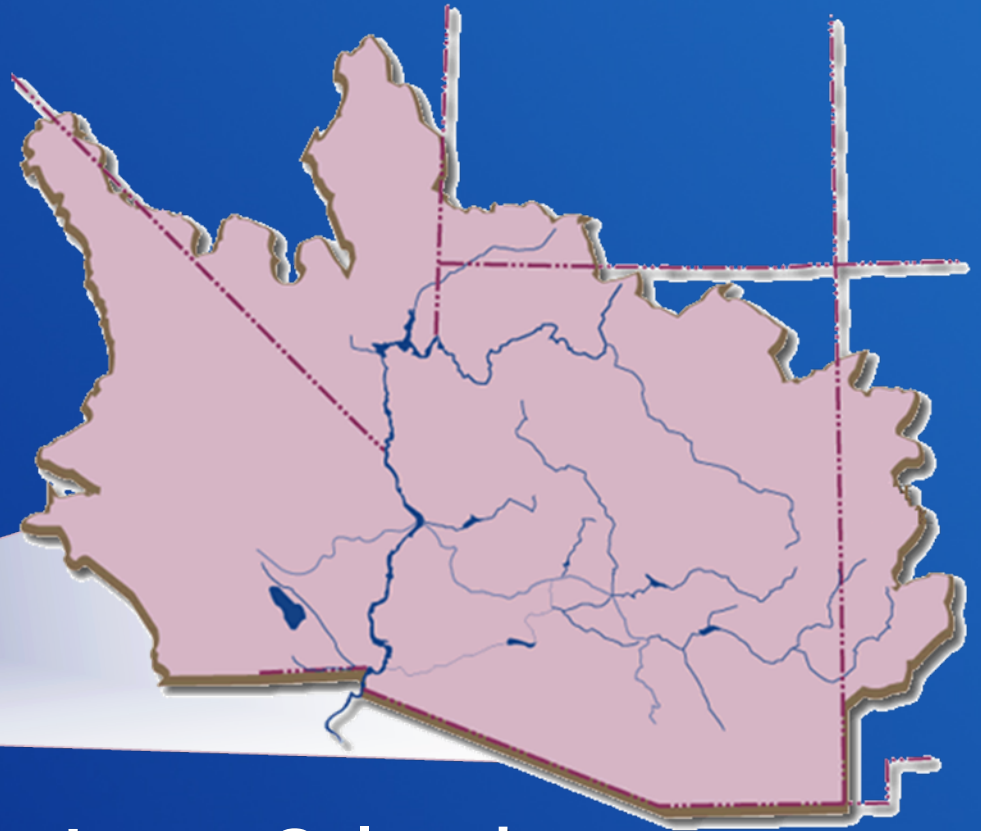
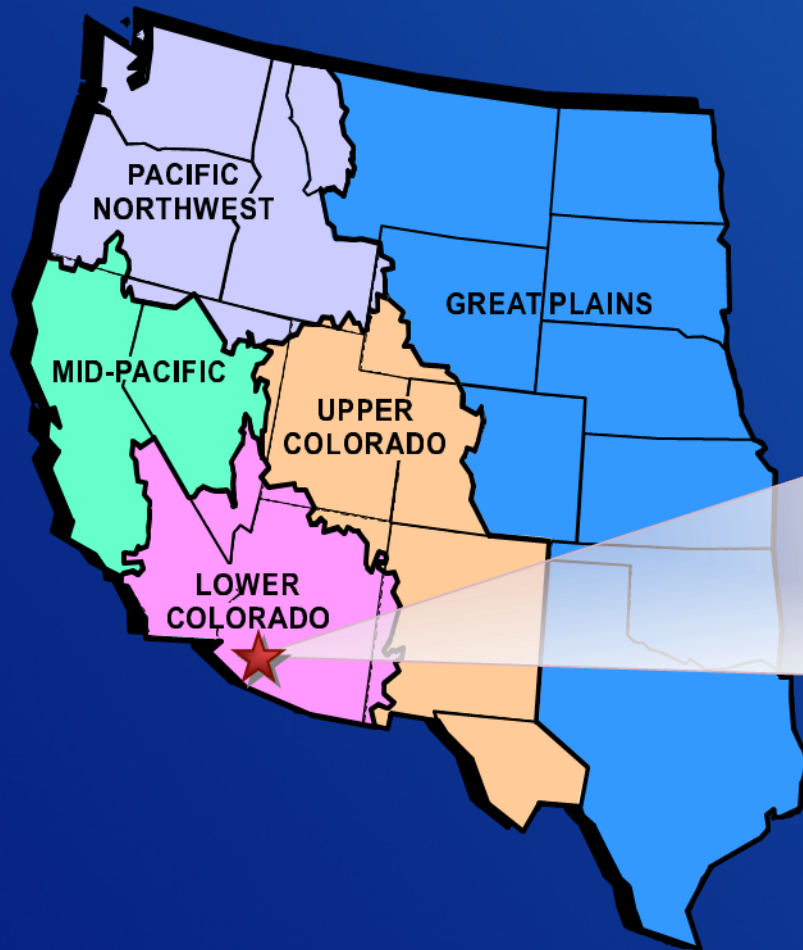
October 6, 2017



U.S. Department of the Interior
Bureau of Reclamation

Bureau of Reclamation

- 5 Regions



Lower Colorado
Region

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Colorado River Basin Overview

- 16.5 million acre-feet (maf) allocated annually
 - 7.5 maf each to Upper and Lower Basins
 - 1.5 maf to Mexico
- 14.8 maf average annual “natural” inflow into Lake Powell over past 110 years
- Inflow is highly variable year-to-year
 - Snowmelt dominated system
- 60 maf of storage
 - 4 times the annual inflow
- Operations and water deliveries governed by “Law of the River”

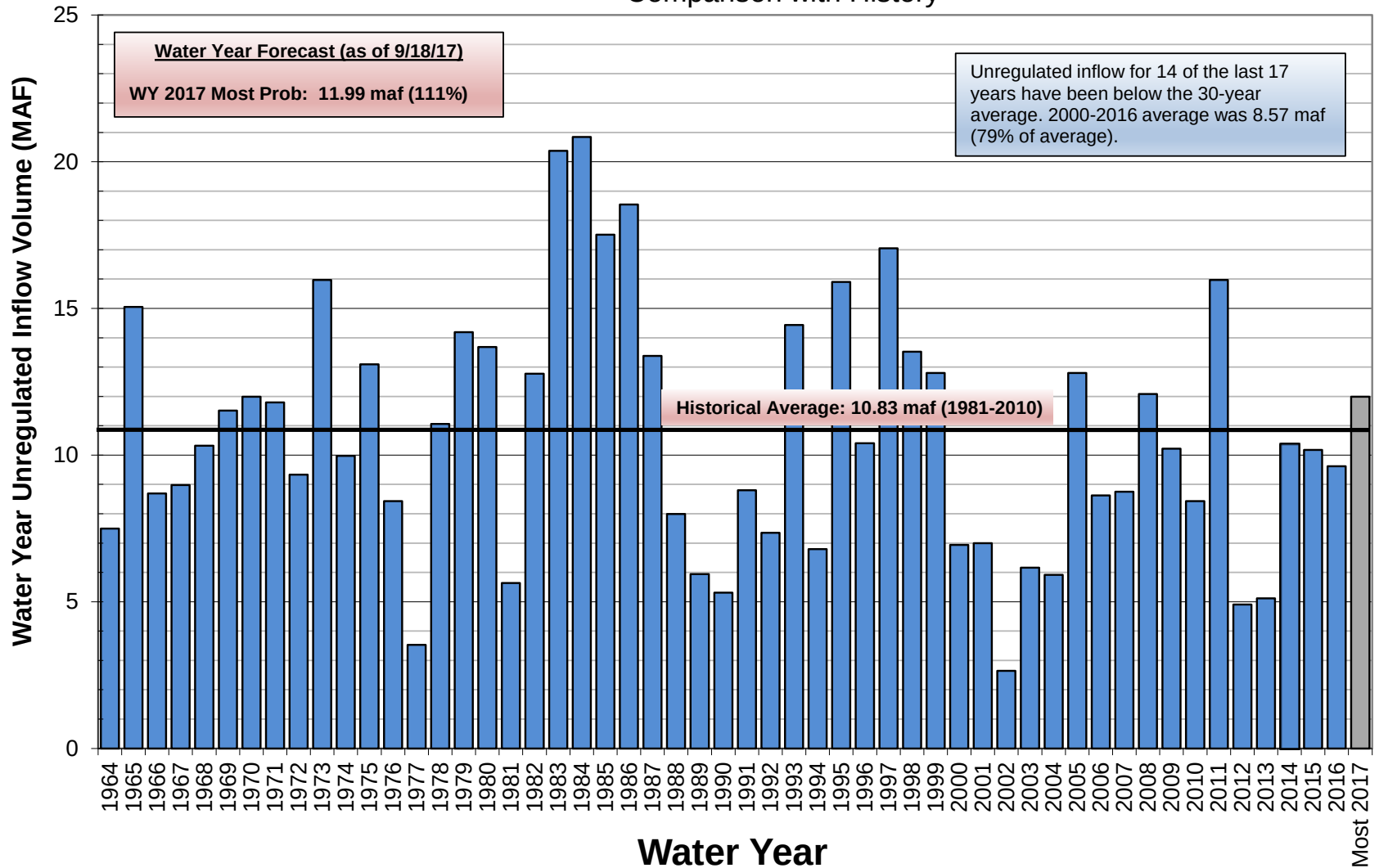


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Powell Water Year Unregulated Inflow

Water Year 2017 Forecast

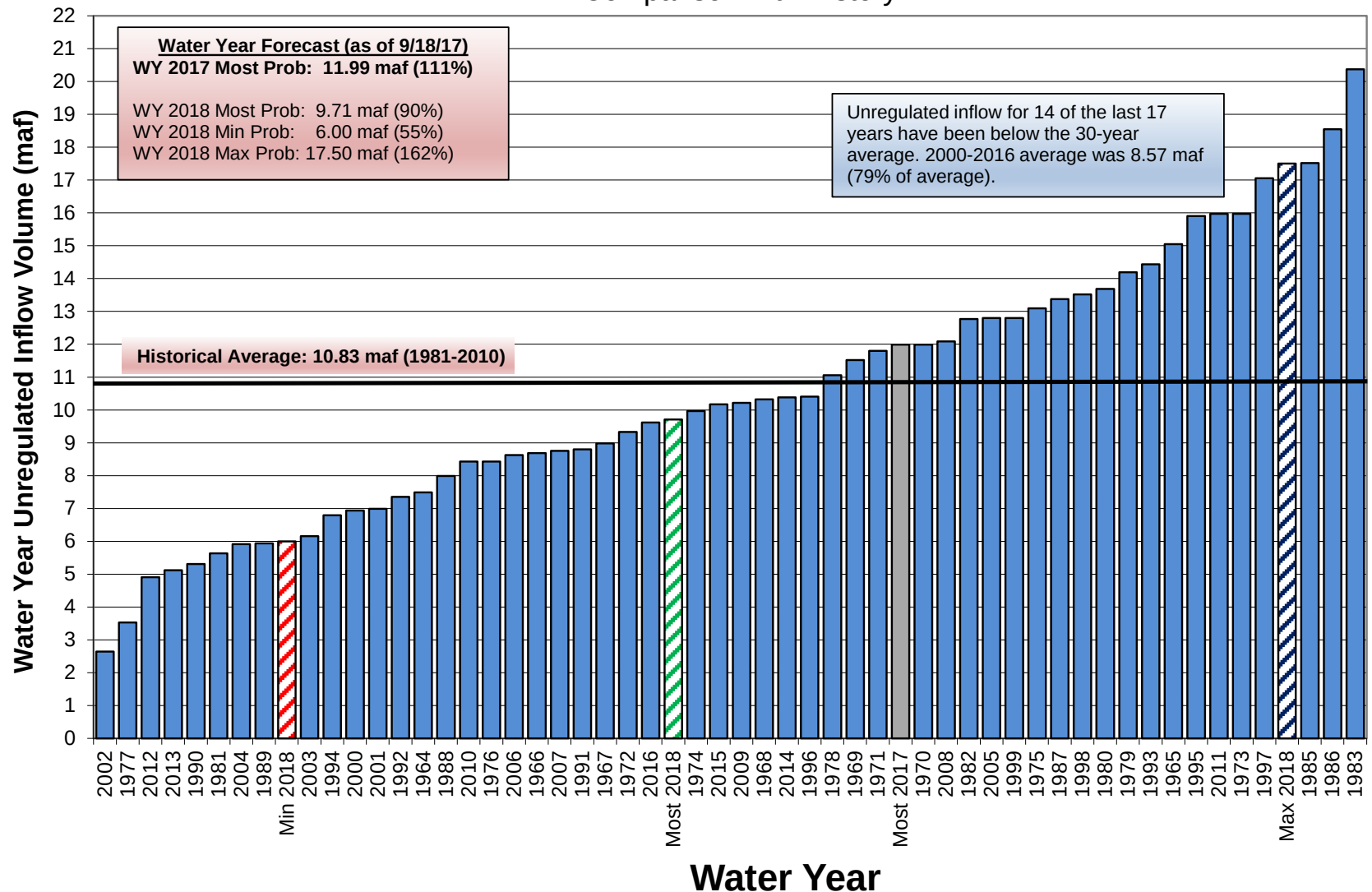
Comparison with History



Powell Water Year Unregulated Inflow

Water Year 2017 and 2018 Forecast

Comparison with History

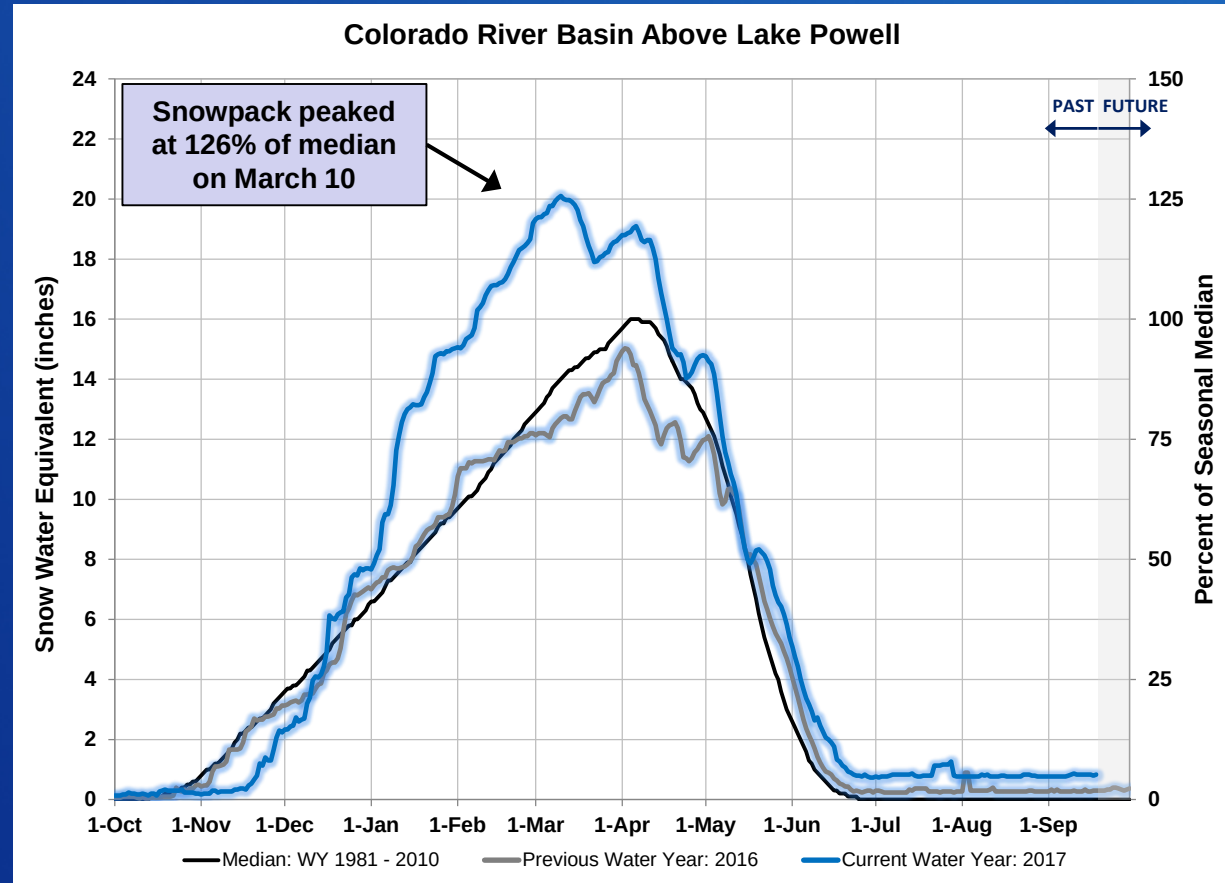


Water Year 2017 Snowpack and Precipitation as of October 2, 2017

Colorado River Basin Above Lake Powell

Water Year 2017
Precipitation
109% of average

Water Year 2017
Inflow into Lake Powell
111% of average



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Colorado River Basin Storage (as of October 1, 2017)

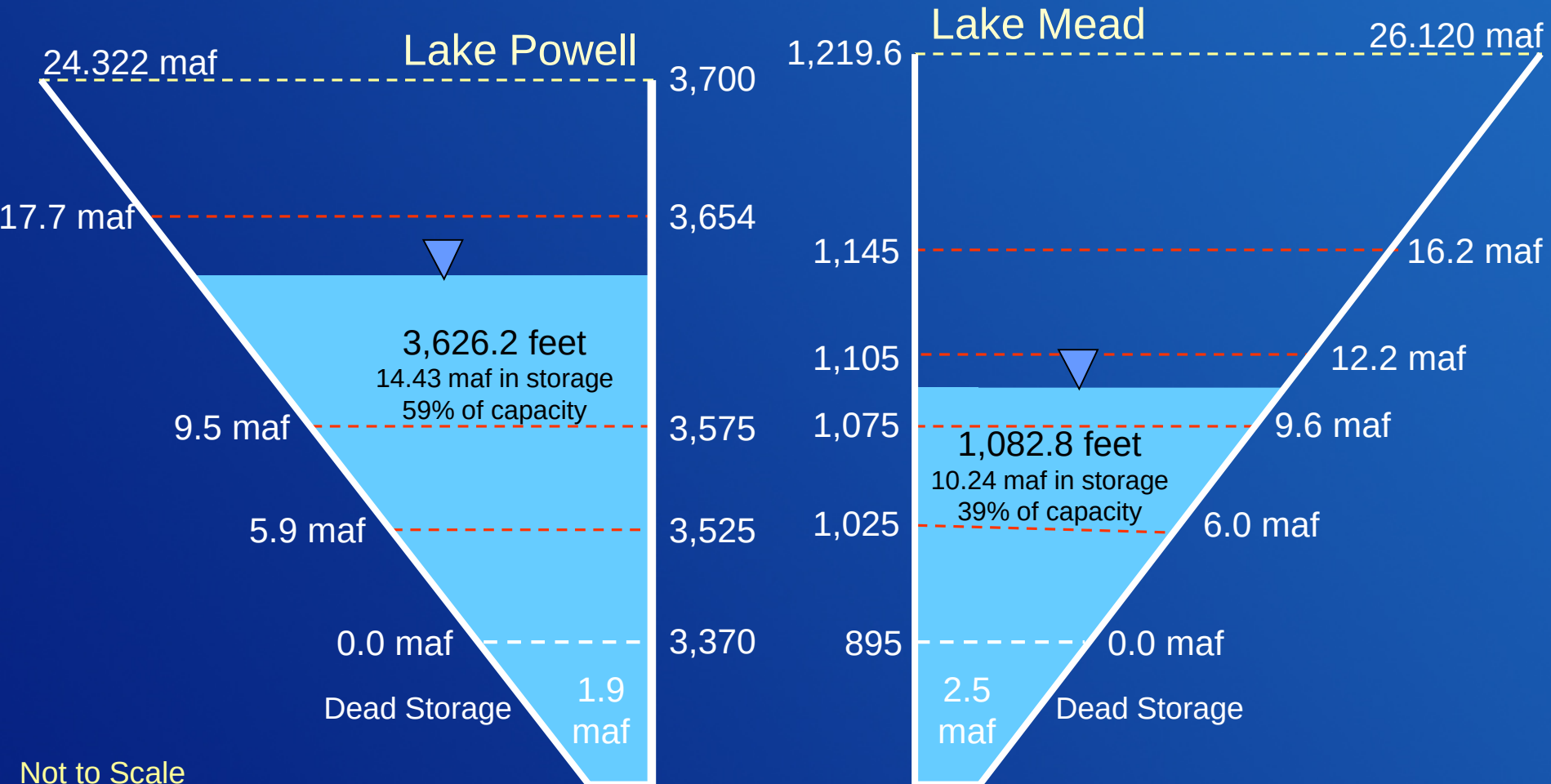
Reservoir	Percent Full	Storage (MAF)	Elevation (Feet)
Lake Powell	60%	14.68	3,628
Lake Mead	39%	10.19	1,082
Total System Storage*	55%	32.93	NA

***Total system storage was 30.18 maf or 51% this time last year**

End of Calendar Year 2017 Projections

September 2017 24-Month Study Most Probable Inflow Scenario¹

Based on an 9.00 maf release from Lake Powell in Water Year 2018

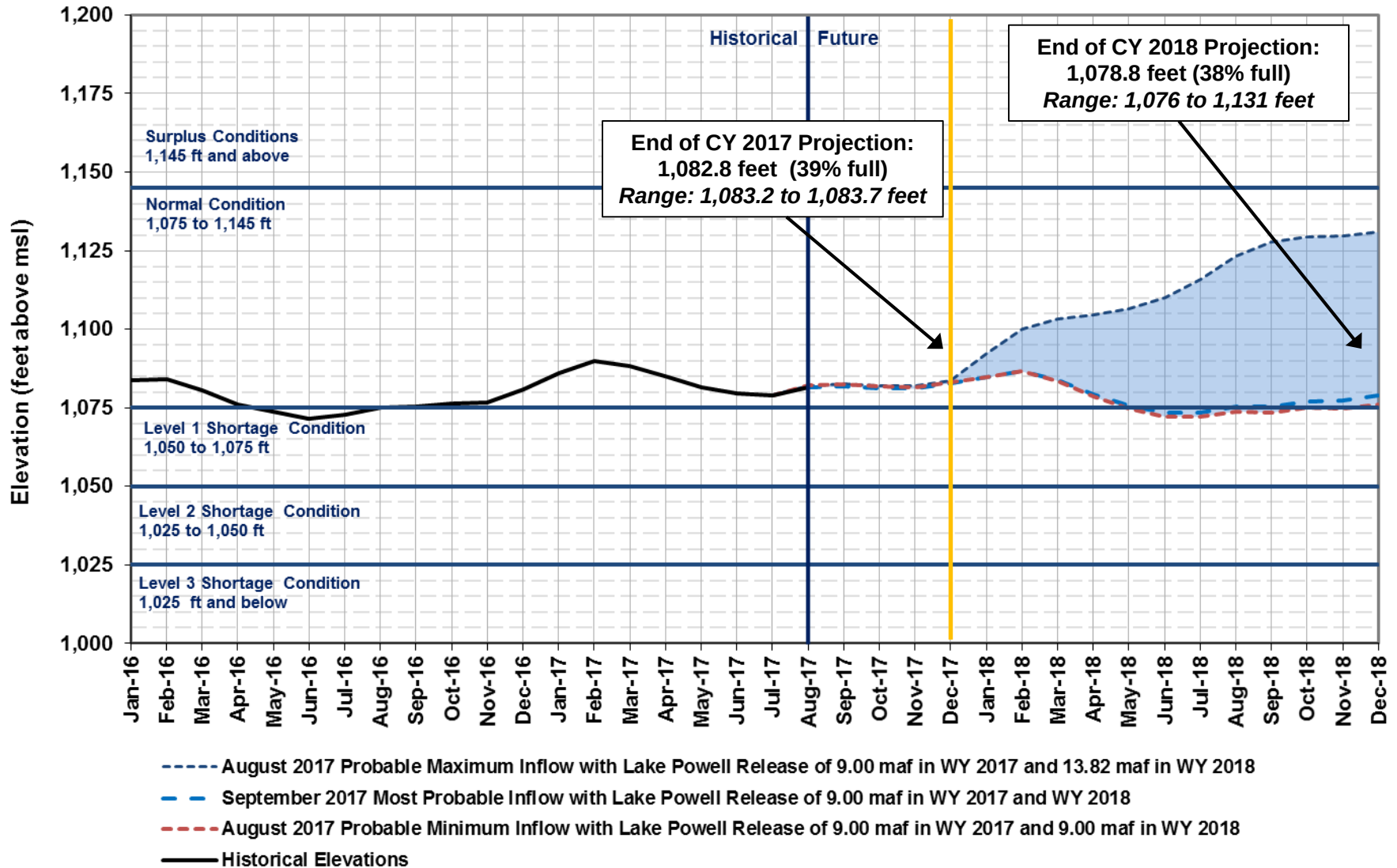


¹ WY 2017 unregulated inflow into Lake Powell is based on the CBRFC forecast dated 9/1/17.

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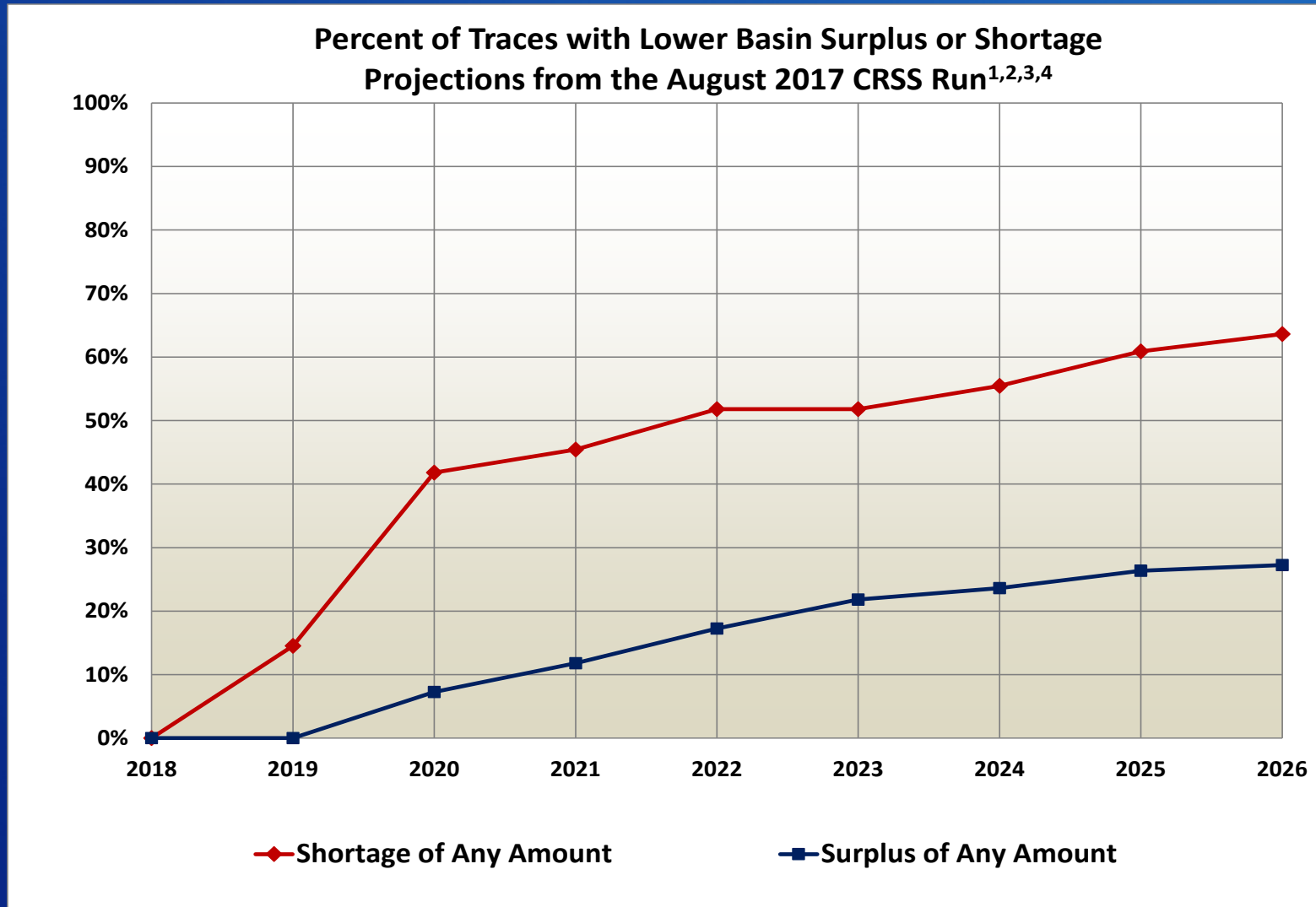
Lake Mead End of Month Elevations

Projections from August and September 2017 24-Month Study Inflow Scenarios



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Lower Basin Surplus & Shortage through 2026



¹ Reservoir initial conditions based on results from the August 2017 most-probable 24-Month Study.

² Percentages computed from 110 hydrologic inflow sequences based on resampling of the observed natural flow record from 1906-2015 for a total of 110 traces analyzed.

³ Percentages shown may not sum to 100% due to rounding to the nearest percent.

⁴ Percentages shown may not be representative of the full range of future possibilities that could occur with different modeling assumptions.

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Lower Basin Drought Response Activities

- Through 2016, four conservation programs have resulted in about 1 maf of additional water in Lake Mead, equivalent to about 12 feet in elevation
 - U.S. Intentionally Created Surplus (nearly 3 feet)
 - Mexican deferred water under IBWC Minute 319 (about 2½ feet)
 - LB Drought MOU voluntary protection volumes (about 6 feet)
 - Pilot System Conservation Program (about 1 foot)
- As of September 2017, planned conservation activities in 2017 are projected to result in another 550 kaf of additional water in Lake Mead, equivalent to about 6½ feet in Lake Mead elevation
- Lower Basin Drought Contingency Planning (in development)
 - Goal: Reduce the risk of reaching critical Lake Mead elevations

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Pilot System Conservation Program

- Funders: Reclamation, CAWCD, SNWA, MWD, & Denver Water
- Goal: evaluate the effect of Basin-wide solutions on declining levels in Lakes Powell and Mead by conserving water that will remain in reservoir storage through temporary, voluntary, and compensated conservation mechanisms
- Another aim: explore our ability to develop projects with geographic and methodological diversity among diverse water use sectors

Agreement No. 14-XX-30-W0574

AGREEMENT AMONG
THE UNITED STATES OF AMERICA, THROUGH THE
DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
THE CENTRAL ARIZONA WATER CONSERVATION DISTRICT,
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA,
DENVER WATER, AND
THE SOUTHERN NEVADA WATER AUTHORITY,
FOR A PILOT PROGRAM FOR FUNDING THE CREATION OF COLORADO RIVER
SYSTEM WATER THROUGH VOLUNTARY WATER CONSERVATION AND
REDUCTIONS IN USE

1. PREAMBLE: THIS AGREEMENT ("Agreement") is entered into this ~~30th~~ day of ~~July~~, 2014 ("Effective Date"), by and between the UNITED STATES OF AMERICA ("United States"), represented by the Secretary of the Interior ("Secretary") acting through the officials executing this Agreement, the CENTRAL ARIZONA WATER CONSERVATION DISTRICT, a multi-county water conservation district duly organized and existing under the laws of the State of Arizona ("CAWCD"), the METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, a regional public water district duly organized under California law ("MWD"), DENVER WATER, a municipal corporation and political subdivision of the State of Colorado ("DW"), and the SOUTHERN NEVADA WATER AUTHORITY, a political subdivision of the State of Nevada ("SNWA"), each being referred to individually as "Party" and collectively as the "Parties", and pursuant to the Act of Congress approved June 17, 1902 (32 Stat. 388), designated the Reclamation Act, and acts amendatory thereof or supplementary thereto, the Act of March 4, 1921 referred to as the Contributed Funds Act (41 Stat. 1404, 43 U.S.C. § 395), the Act of January 12, 1927 (44 Stat. 957, 43 U.S.C. § 397a), the Act of December 21, 1928 (45 Stat. 1057), designated the Boulder Canyon Project Act, the Act of April 11, 1956 (70 Stat. 105), designated the Colorado River Storage Project Act; the Act of September 30, 1968 (82 Stat. 885), designated the Colorado River Basin Project Act, the Act of

Pilot System Conservation Program (PSCP)

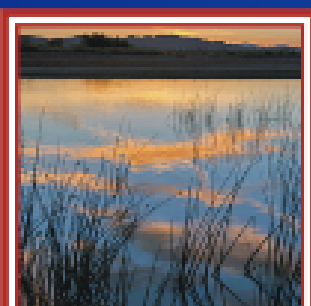
- Initial & second phase provided ~\$17 million for voluntary pilot projects that have created system water in both basins
- ~ 63 kaf of water conserved under the initial phase, a second phase conserved an additional 54 kaf, for a total of ~117 kaf
 - Tables on the following two pages provide summary of projects that have created system conservation water
- The program has been extended (third solicitation) for projects that will begin in 2017 or 2018.
- Information about the Lower Basin's PSCP at:

www.usbr.gov/lc/region/programs/PilotSysConsProg/pilotsystem.html

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WaterSMART Program

(Sustain and Manage America's Resources for Tomorrow)



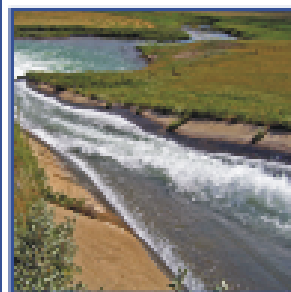
**Basin Study
Program**

Collaborative
Planning



**Title XVI
Program**

Water Reclamation
and Reuse



**WaterSMART
Grants**

Water Conservation
and Efficiency



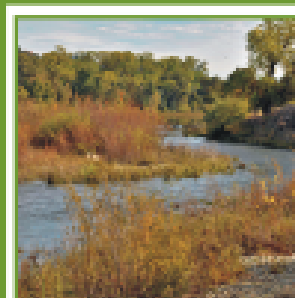
**Water
Conservation
Field Services
Program**

Water Conservation
Planning and Design



**Drought
Response
Program**

Planning and
Building Resiliency



**Cooperative
Watershed
Management
Program**

Watershed
Management and
Restoration

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

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Quantifiable Water Savings

- Canal Lining/Piping
- Municipal Metering
- Irrigation Flow Measurement
- Landscape Irrigation Measures

Energy-Water Nexus

- Renewable energy related to water management and delivery
- Increased energy efficiency

WaterSMART Grants

**Water and
Energy
Efficiency
Grants**

Increasing Water Supply Reliability

- Water Access and Conveyance System Improvements
- Aquifer Storage and Recovery
- Development of alternative water sources

Improved Water Management

- Modeling
- Decision support tools
- Measurement and Monitoring

Drought Response
Program

**Drought
Resiliency
Projects**

Cooperative
Watershed
Management Program

**Watershed
Manageme
nt Projects**

**Small-
Scale
Water
Efficiency
Projects**

WaterSMART Grants

Small-scale efficiency and water management projects

- Canal Lining/Piping
- Municipal Metering
- Irrigation Flow Measurement.
- Supervisory Control and Data Acquisition (SCADA) and Automation.
- Landscape Irrigation Measures

**WaterSMART
Construction
Opportunities**

- Improving Stream Channel Structure and Complexity
- Restoring or Enhancing Floodplains and Riparian Vegetation
- Invasive Species Prevention/Control
- Water Conservation/Management to Improve Ecological Resilience

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Departmental Priority Goals for Reclamation

- 1) Creating a conservation stewardship legacy second only to Teddy Roosevelt
- 2) Utilizing our natural resources (ensure American Energy is available to meet our security and economic needs)
- 3) Restoring trust with local communities
- 4) Ensuring sovereignty means something (support tribal self-determination, self-governance, and sovereignty)
- 5) Generating additional revenues to support DOI & National interests
- 6) Striking a regulatory balance
- 7) Modernizing our infrastructure



Secretary Ryan Zinke
Department of the Interior

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Questions / Discussion

Thank You!

Tina Mullis - tmullis@usbr.gov

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Sustainable Western Water Supply Strategies



WESTERN STATES
WATER COUNCIL

WaterSmart Innovations Conference

October 6, 2017

Tony Willardson
Executive Director



Western States Water Council

- Advisory body to 18 western Governors on water issues
- Ensure adequate supplies of water of suitable quality
- Provides states collective voice
- Fosters state/state and federal/state collaboration
- Works with the Western Governors' Association (WGA)
- Western Federal Agency Support Team (WestFAST)

Water Needs and Strategies for a Sustainable Future



1. Growth and Water Policy
2. Meeting Future Water Demands
3. Water Infrastructure Needs and Strategies
4. Resolution of Indian Water Rights Claims
5. Climate Change Impacts
6. ESA & Protecting Aquatic Species

Water Needs and Strategies for a Sustainable Future: *Next Steps*



Lake Powell and the Upper Colorado River



To Foster Sustainable Growth Policies

1. Encourage water use efficiency
2. Recognize all uses and needs
3. Develop integrated growth impact scenarios (water & energy)
4. Identify present/future water supplies and water use requirements
5. Increase availability & storage capacity
6. Place an appropriate value on water
7. Facilitate voluntary water transfers, water markets and water banking

Water Transfers in the West

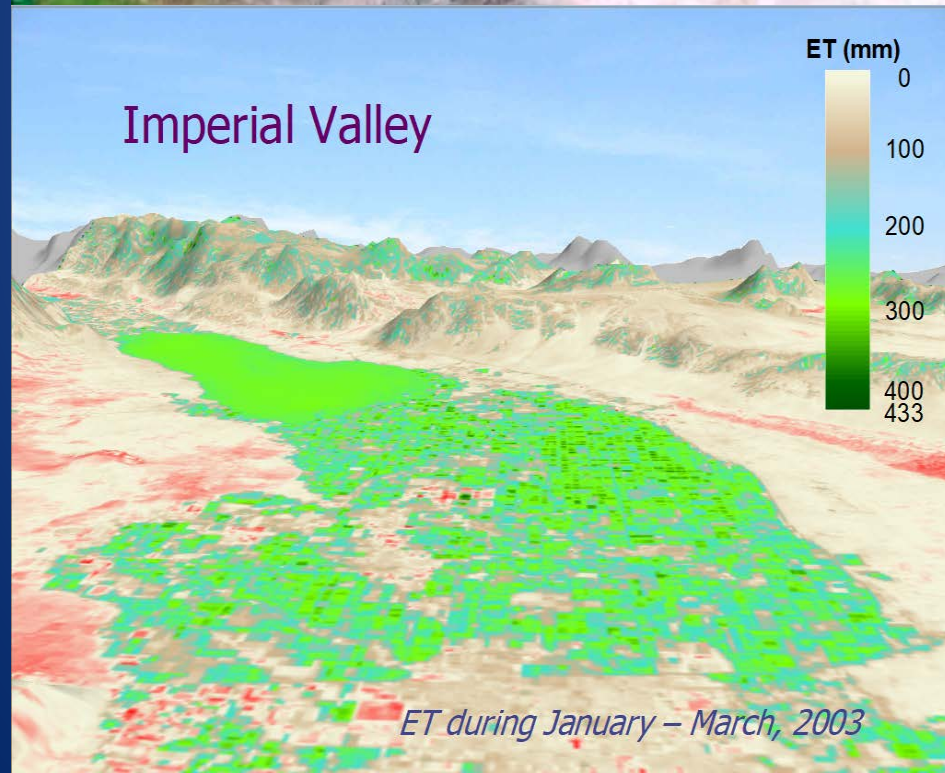
A Western States Perspective

Western Governors believe states should identify and promote innovative ways to allow water transfers from agricultural to other uses (including urban, energy and environmental) while avoiding or mitigating damages to agricultural economies and communities.

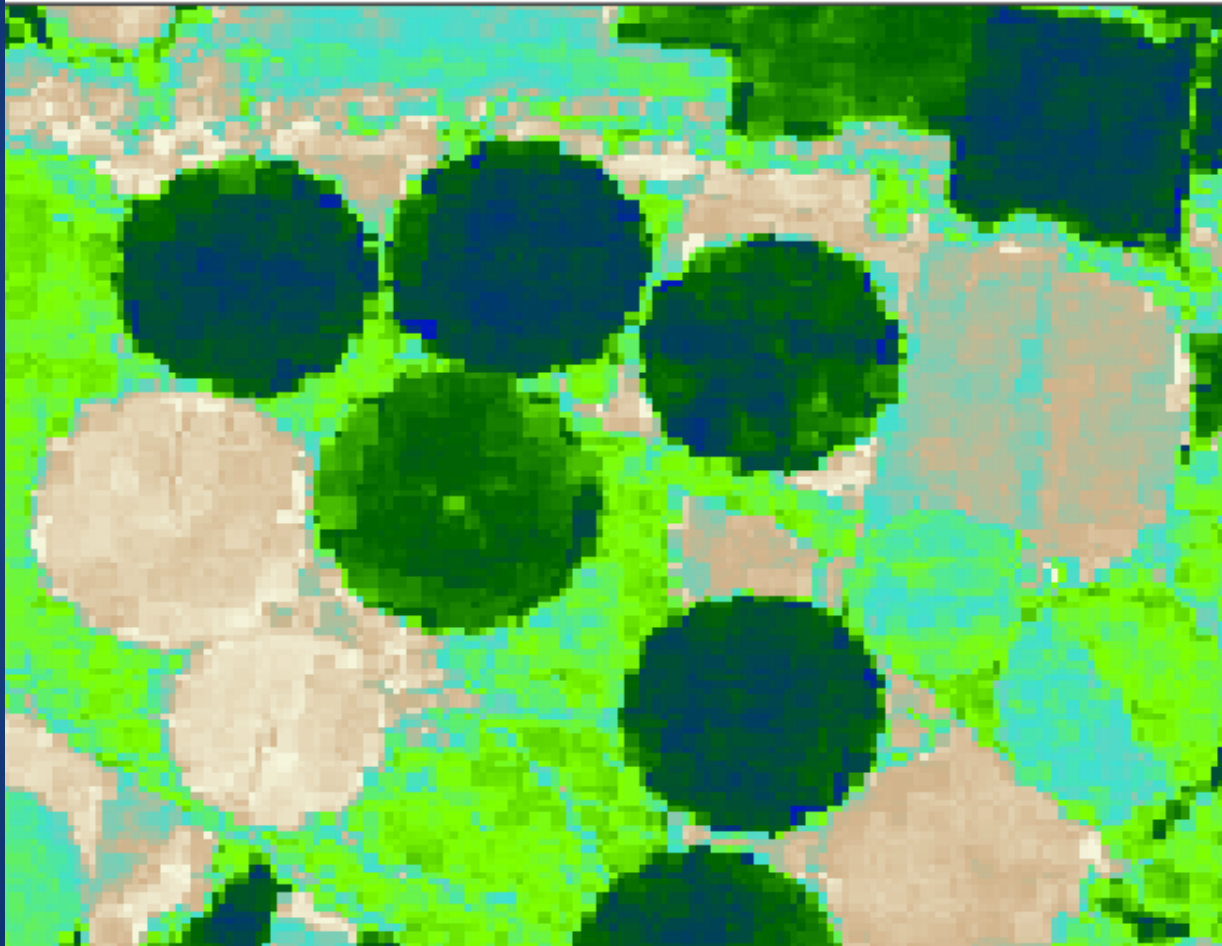
-WGA Resolution #11-7



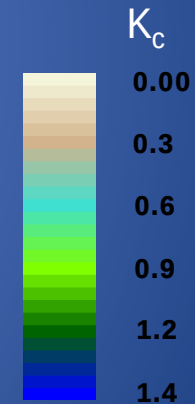
Imperial Valley, CA
via Landsat 7



Why use High Resolution Imagery?



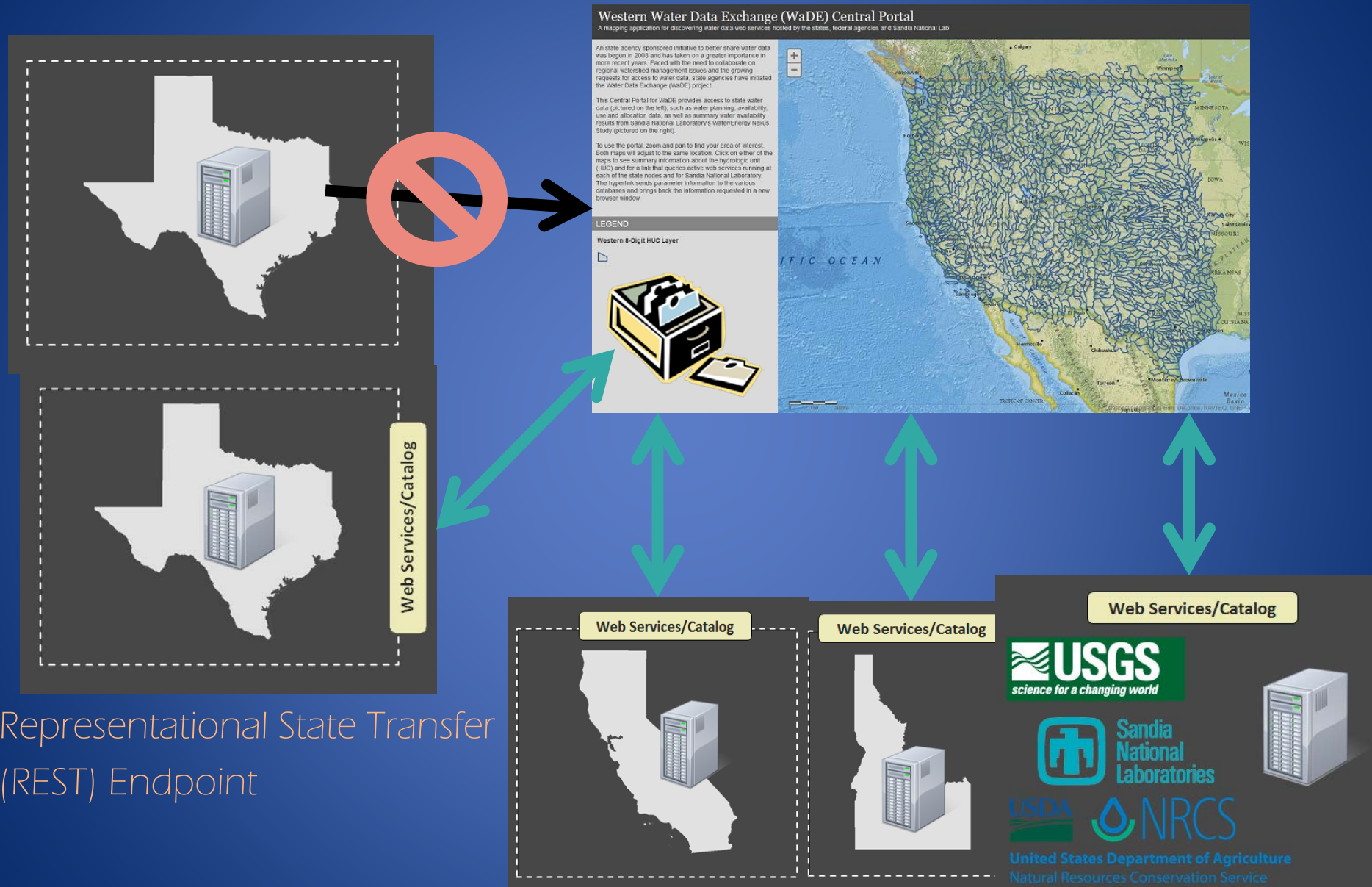
ET from
Landsat 5
with thermal
sharpened to
30 m



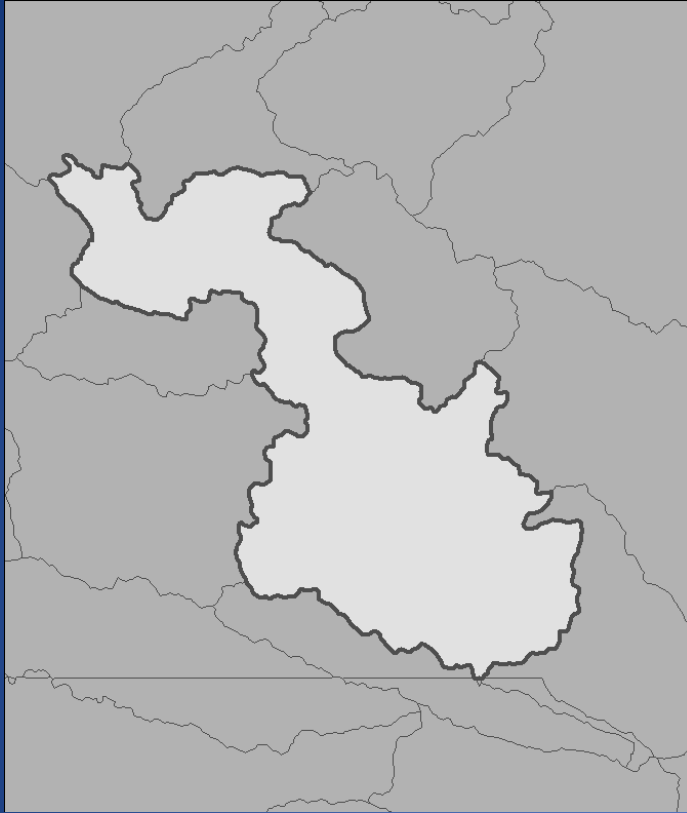
$$(K_c = ET_{act} / ET_{ref})$$

*ET from individual fields is essential for: Water Rights,
Water Transfers, Farm Water Management*

HOW DOES IT WORK?



WHAT WILL IT PROVIDE?



Water Supply Summary: 24,000 acre-feet

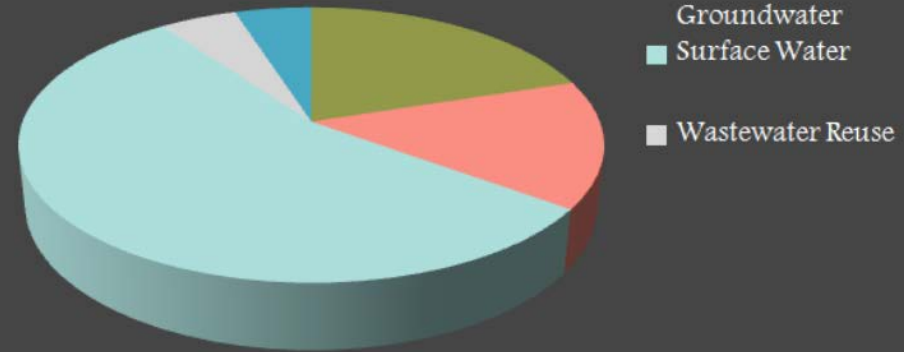
Regulatory & Allocation Summaries:

- Groundwater Management Areas
- % of Allocations by Beneficial Use Category

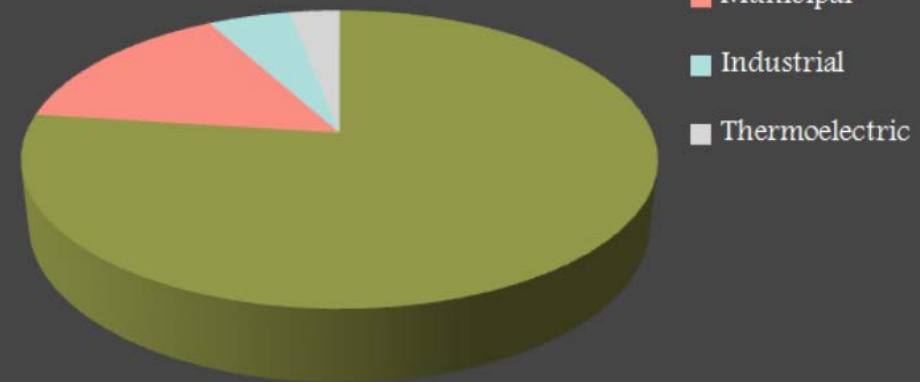
Summaries of Data

7,550 acre-feet

Water Availability



Water Use



2,850 acre-feet

Western Water Resources Infrastructure Strategies: Identifying, Prioritizing and Financing Needs.



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- Federal, state, tribal and local governments face significant challenges in addressing their infrastructure needs.
- Investing to support the availability of clean water is a key to continued economic growth.
- Water stress is becoming a concern for investors. Investing in our water infrastructure provides a needed long-term foundation for maintaining and growing the economy by ensuring plentiful and clean water supplies.
- Water is an important consideration in sustainable economic growth, and a lack of adequate supplies of water of suitable quality can be a significant limiting factor.

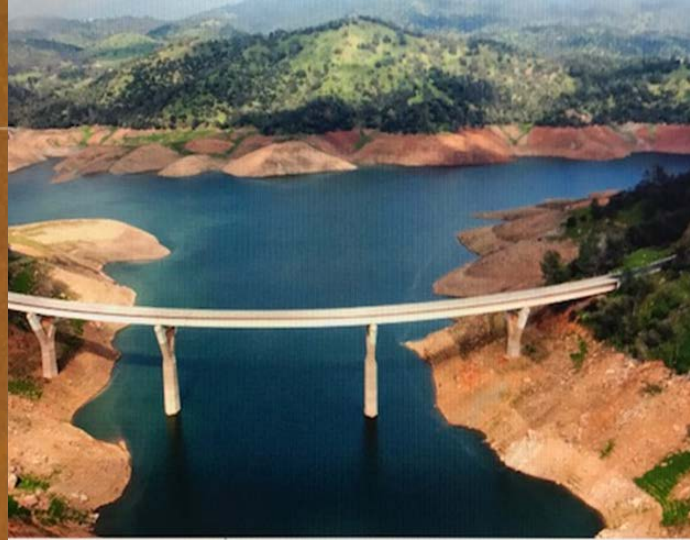
WSWC/WGA Infrastructure Report

- 1) **Value of Water** – Water is a valuable asset. Investors are beginning to look at “water stress” as a competitive disadvantage for the West. Water = Jobs!
- 2) **Water Conservation and Reuse** – Water conservation and reuse can help alleviate water stress and need to be taken into account in land-use planning and decision-making. Conjunctive management of surface and groundwater resources.
- 3) **Asset Management Principles** – Infrastructure needs must be evaluated based on standard criteria that evaluate risks to: (1) health and human safety; (2) economic growth; and (3) the environment. Investments should be made based on long-term capital budgeting efficiencies, not “annual incremental choices.”
- 4) **Private Financing and Construction** – Public private partnerships and alternative project services delivery offer various advantages and may be employed with acceptable returns on investments. Streamline regulatory requirements.
- 5) **Federal and State Infrastructure Investments** – The need for stable or increasing funding of infrastructure, especially in small and rural communities, must be addressed. Support greater public and private investment.

Improving
Sub-Seasonal to Seasonal
Precipitation Forecasting for
Water Management



WESTERN
STATES
WATER
COUNCIL



*Workshop on Improving
Sub-Seasonal and Seasonal
Precipitation Forecasting
for Drought Preparedness*

May 2015 | San Diego



IMPROVING SUB-
SEASONAL TO SEASONAL
PRECIPITATION
FORECASTING FOR
WATER MANAGEMENT

A Workshop Series | June 2016



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