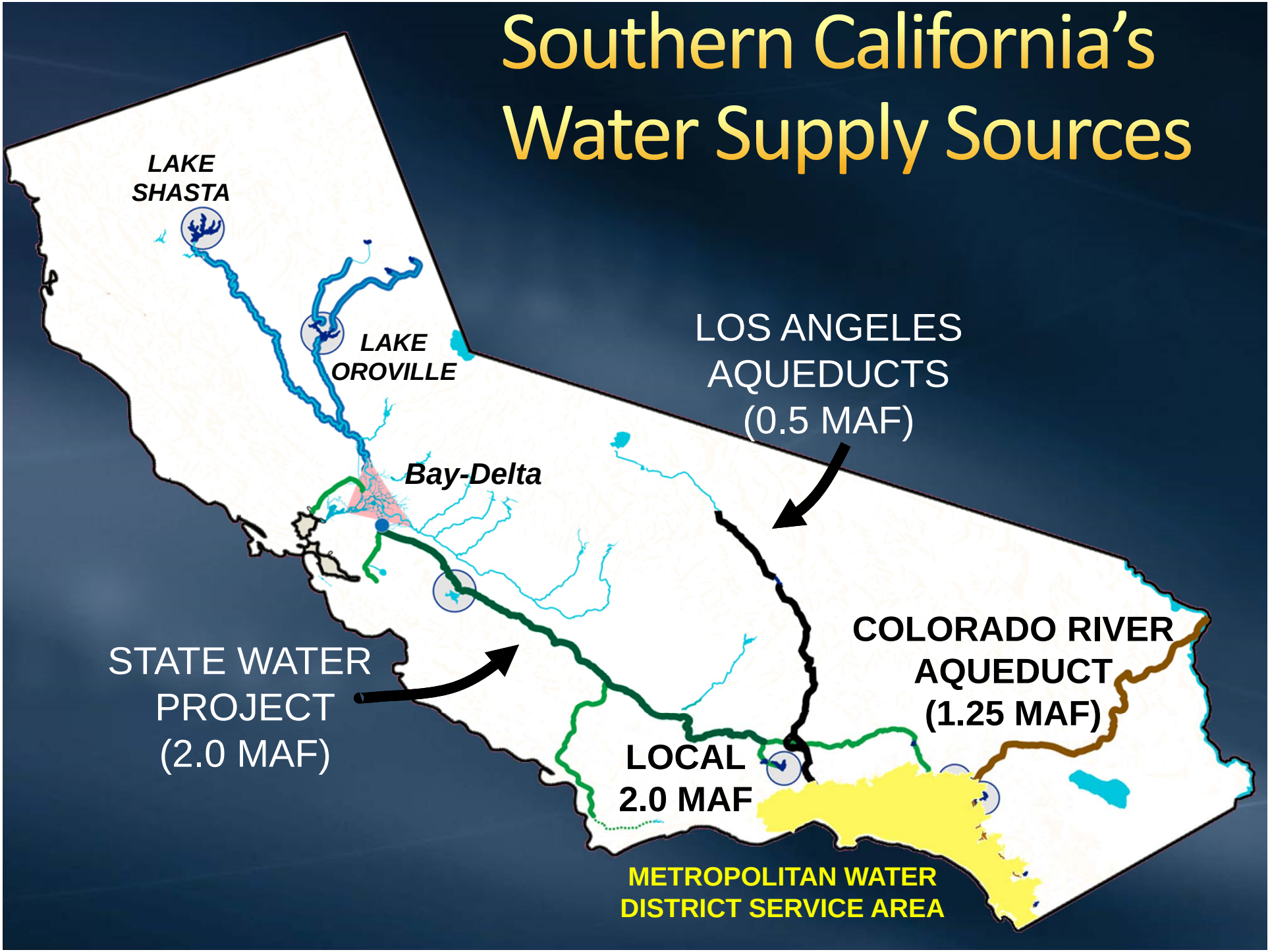
MWDOC Board Workshop

July 1, 2015

The Colorado River: The Lifeblood of the Southwest

Bill Hasencamp
Metropolitan Water District

Southern California's Water Supply Sources




Colorado River Basin
WY
UT
NV
CO
NM
AZ
CA
MEXICO
UPPER BASIN
LAKE POWELL
LEE FERRY
LAKE MEAD
LAKE MOHAVE
LAKE HAVASU
LOWER BASIN
California Aqueduct
Los Angeles Aqueduct
Colorado River Aqueduct
MWD
CVWD
IID
PVID
Yuma Project
All-American Canal
COLORADO RIVER DELTA
GULF OF CALIFORNIA

Headwaters – Rocky Mountain National Park, Colorado

Delicate Arch– Arches National Park, Utah

Canyon Lands National Park, Utah

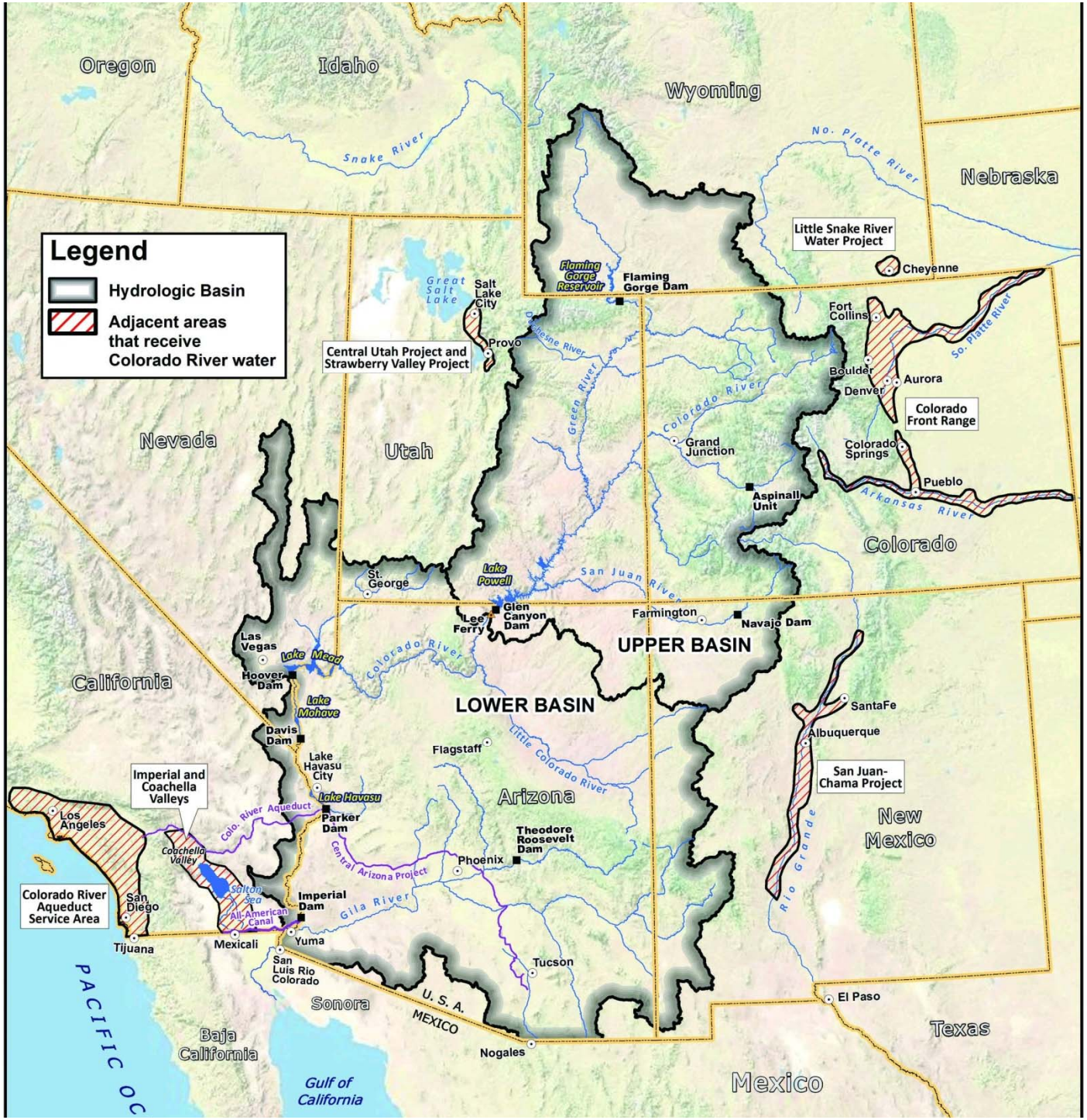
Colorado River entering Lake Powell

Rainbow Bridge National Monument

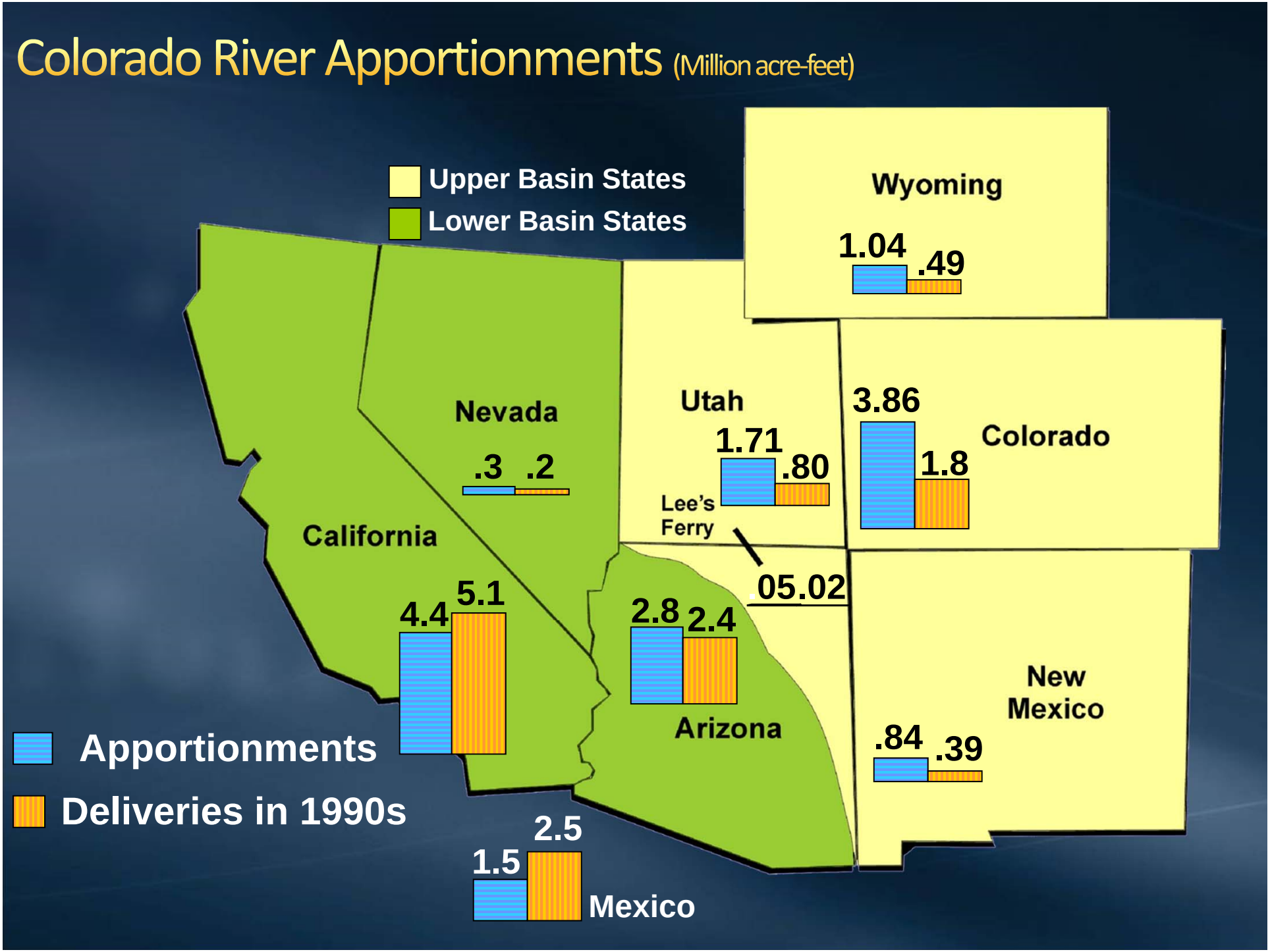
Goose Neck State Park, Utah

Havisupa Falls, Grand Canyon National Park

Hoover Dam


Legend
Hydrologic Basin
Adjacent areas that receive Colorado River water
Oregon
Idaho
Wyoming
Nebraska
Nevada
Utah
Colorado
California
Arizona
New Mexico
Texas
Mexico
Snake River
No. Platte River
So. Platte River
Little Snake River Water Project
Cheyenne
Flaming Gorge Reservoir
Flaming Gorge Dam
Great Salt Lake
Salt Lake City
Provo
Duchesne River
Central Utah Project and Strawberry Valley Project
Green River
Colorado River
Fort Collins
Boulder
Aurora
Denver
Colorado Front Range
Grand Junction
Colorado Springs
Pueblo
Arkansas River
Aspinall Unit
St. George
Lake Powell
San Juan River
Glen Canyon Dam
Lee Ferry
Farmington
Navajo Dam
UPPER BASIN
LOWER BASIN
Las Vegas
Lake Mead
Hoover Dam
Lake Mohave
Davis Dam
Lake Havasu City
Lake Havasu
Parker Dam
Flagstaff
Little Colorado River
Theodore Roosevelt Dam
Phoenix
Central Arizona Project
Gila River
Imperial Dam
Yuma
Mexicali
Tijuana
San Luis Rio Colorado
Tucson
El Paso
Nogales
U. S. A.
MEXICO
Sonora
Baja California
Gulf of California
PACIFIC OC
Imperial and Coachella Valleys
Colo. River Aqueduct
Coachella Valley
Salton Sea
All-American Canal
Los Angeles
San Diego
Colorado River Aqueduct Service Area
SantaFe
Albuquerque
San Juan-Chama Project
Rio Grande

Colorado River Apportionments (Million acre-feet)




California Service Areas
NEVADA
Lake Mead
Hoover Dam
Colorado River
Lake Mohave
Davis Dam
ARIZONA
Los Angeles Aqueduct
California Aqueduct
CALIFORNIA
Lake Havasu
Colorado River Aqueduct
Parker Dam
Coachella Valley W.D.
MWD
Palo Verde I.D.
Coachella Canal
Salton Sea
Senator Wash Reservoir
Imperial Dam
IID
All American Canal
Yuma Project
PACIFIC OCEAN
UNITED STATES
MEXICO

1931 Seven Party Agreement

	MAF
1. Palo Verde ID (104,500 acres valley)	
2. Yuma Project (25,000 acres)	
3. (a) Imperial ID/Coachella Valley WD	3.850
(b) PVID (16,000 acres mesa)	
4. Metropolitan WD	0.550
Subtotal	4.400
5. Metropolitan WD	0.700
Total	5.100

What is Grown in the Desert?

2012 Top 13 Crops (Acres)

Alfalfa	155,355	28.9%
Wheat	89,866	16.7%
Sudangrass	64,457	12.0%
Bermuda Grass	52,114	9.7%
Lettuce	31,028	5.8%
Sugar Beets	25,222	4.7%
Kleingrass	14,778	2.8%
Broccoli	12,532	2.3%
Carrots	12,230	2.3%
Duck Ponds	10,364	1.9%
Onions	8,400	1.6%
Citrus	7,810	1.5%
Corn	7,629	1.4%
Top 13 Crops Total Acres	**491,785**	**91.6%**
Total Acreage of Crops at IID	**537,098**	**100.0%**

Quantification Settlement Agreement Quantified Water Budgets

	maf
PVID Yuma Project	0.42 (Average)
IID	3.10
CVWD	0.33
MWD *	0.55
Total	4.40

*Amount fluctuates based on PVID/Yuma Project use, unused IID and CVWD water

California 4.4 Plan

Implement Agricultural Conservation Measures with IID

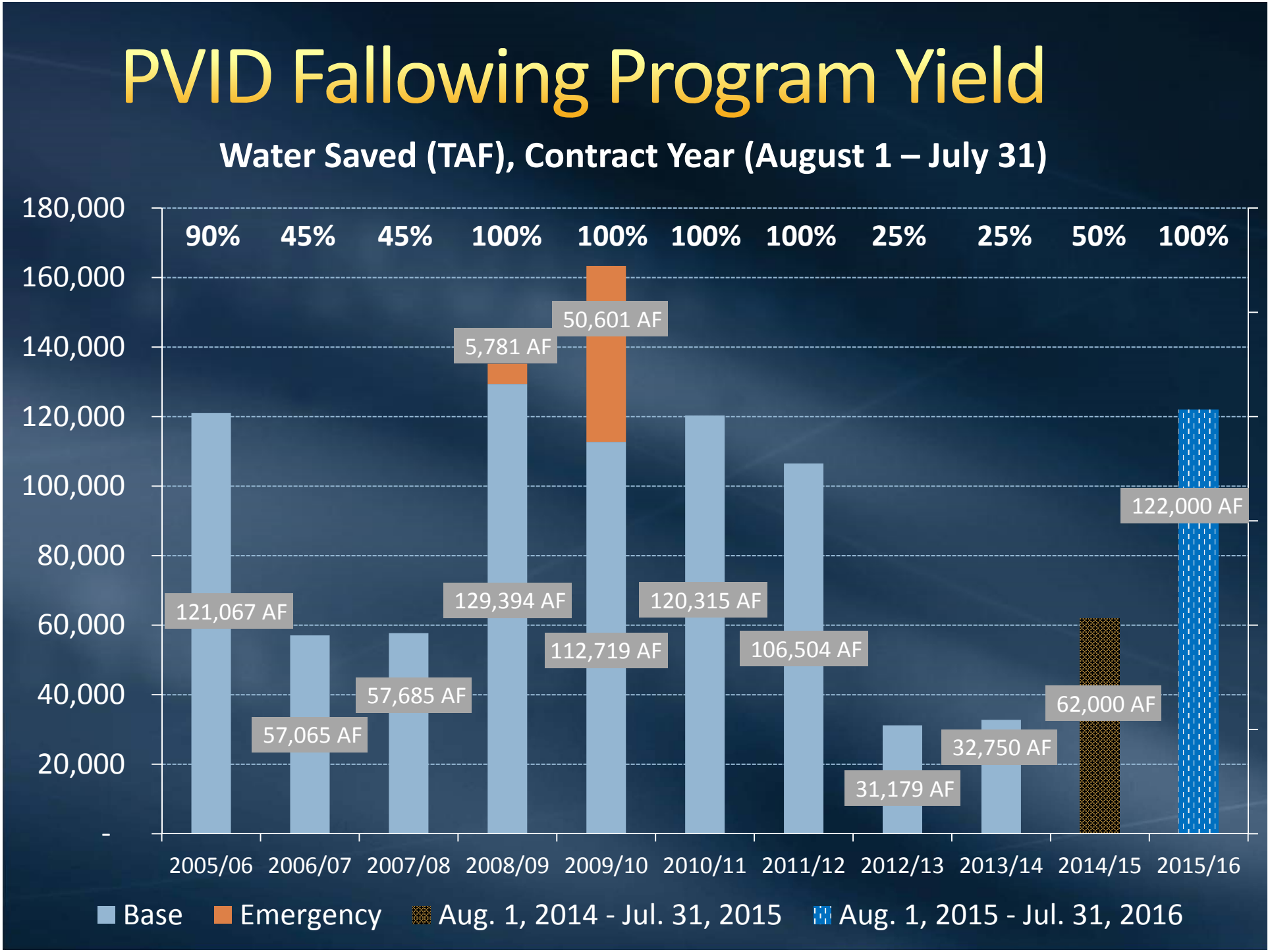
California 4.4 Plan

Line the All-American, Coachella Canals

California 4.4 Plan

Incentivie PVID Farmers to Not Grow Crops

PVID Fallowing Program Yield



Palo Verde Valley Community Improvement Fund

- Metropolitan provided $6 million in 2005
- Managed by Volunteer Board
- Half of Funds Distributed
  - Grants and loans
  - Included small business development; job training programs
- MWD, PVID non-voting members
- Economic study concluded program is successful

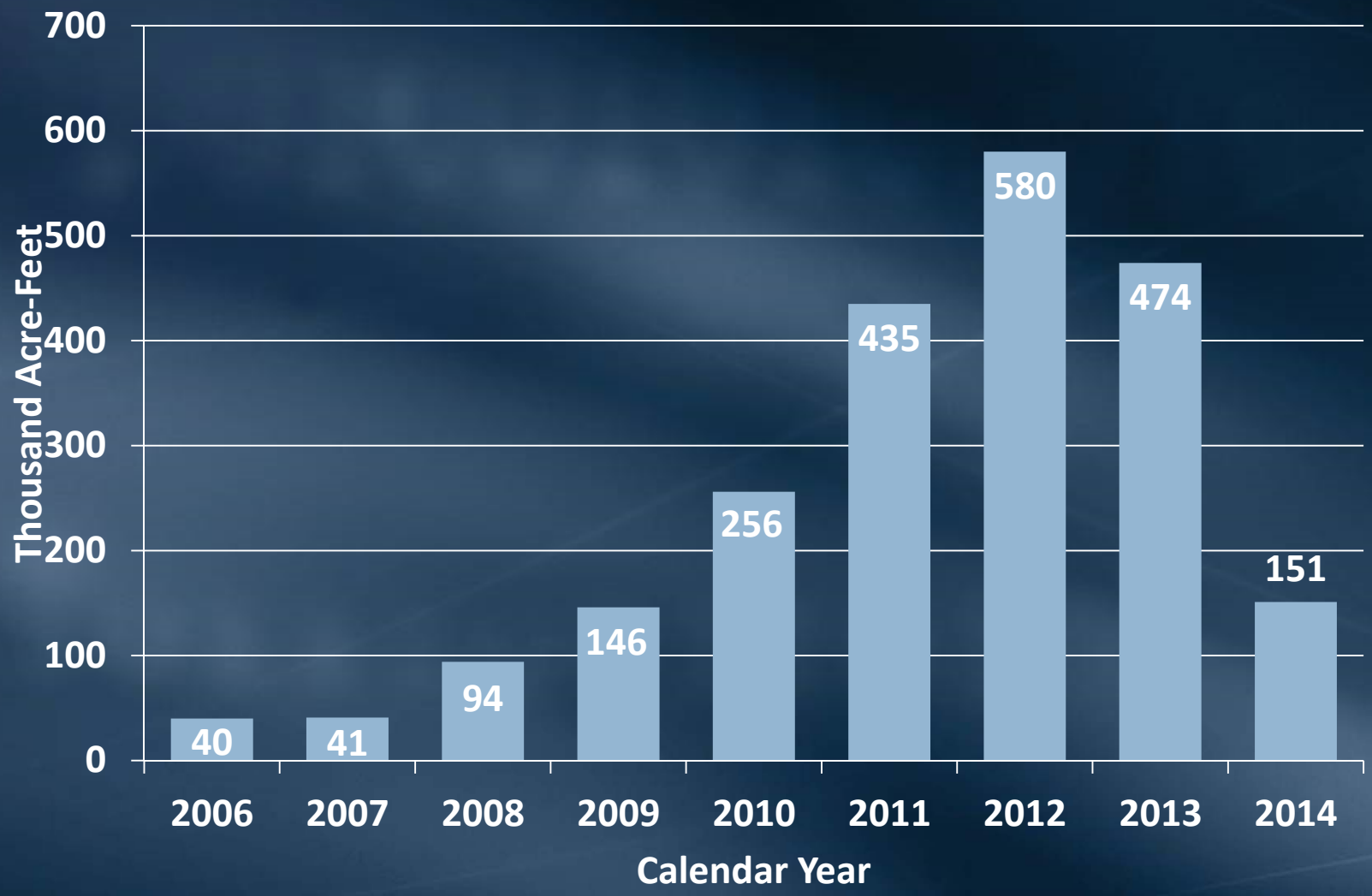
Water Sharing Agreement with Nevada

- Nevada's water use has dropped over past decade
- MWD has access to NV's unused water during current drought
- MWD to return water when Nevada's demands grow

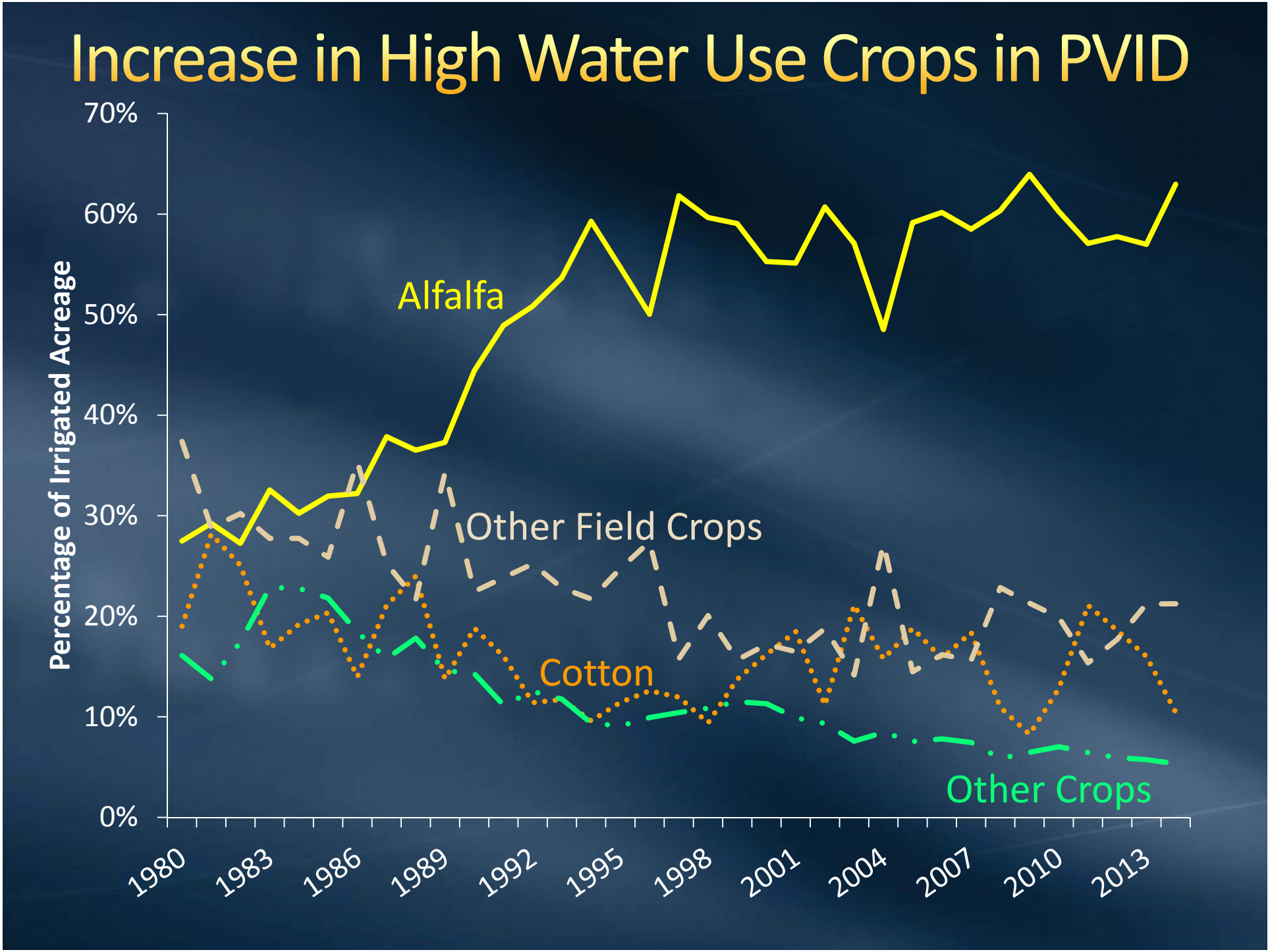
Development of Lake Mead Storage (ICS) Program

- MWD can store 1.5 million acre-feet in Lake Mead
- Avoids costs and impacts of building new storage reservoirs

MWD Storage Balance (ICS) in Lake Mead



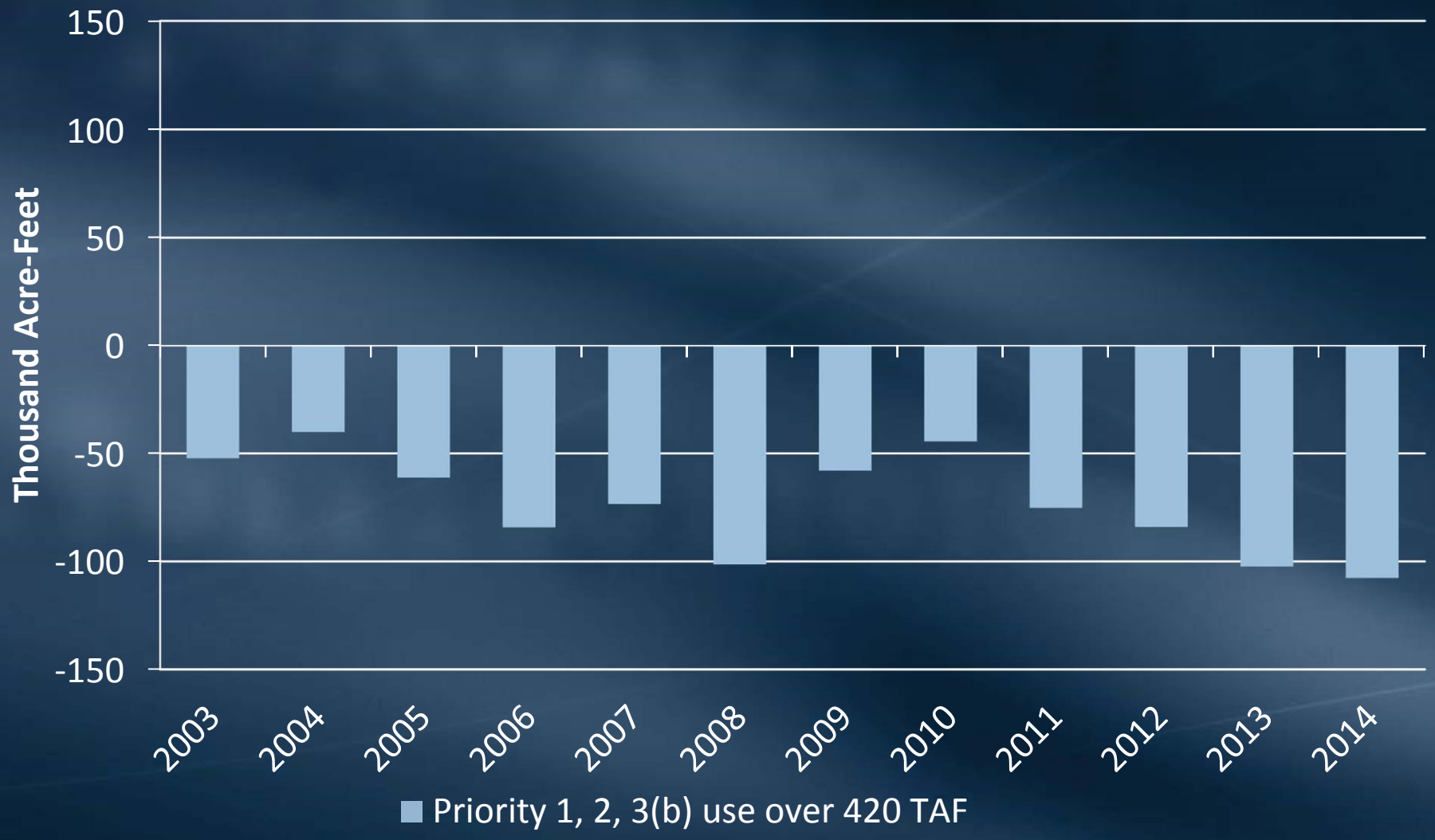
Increase in High Water Use Crops in PVID



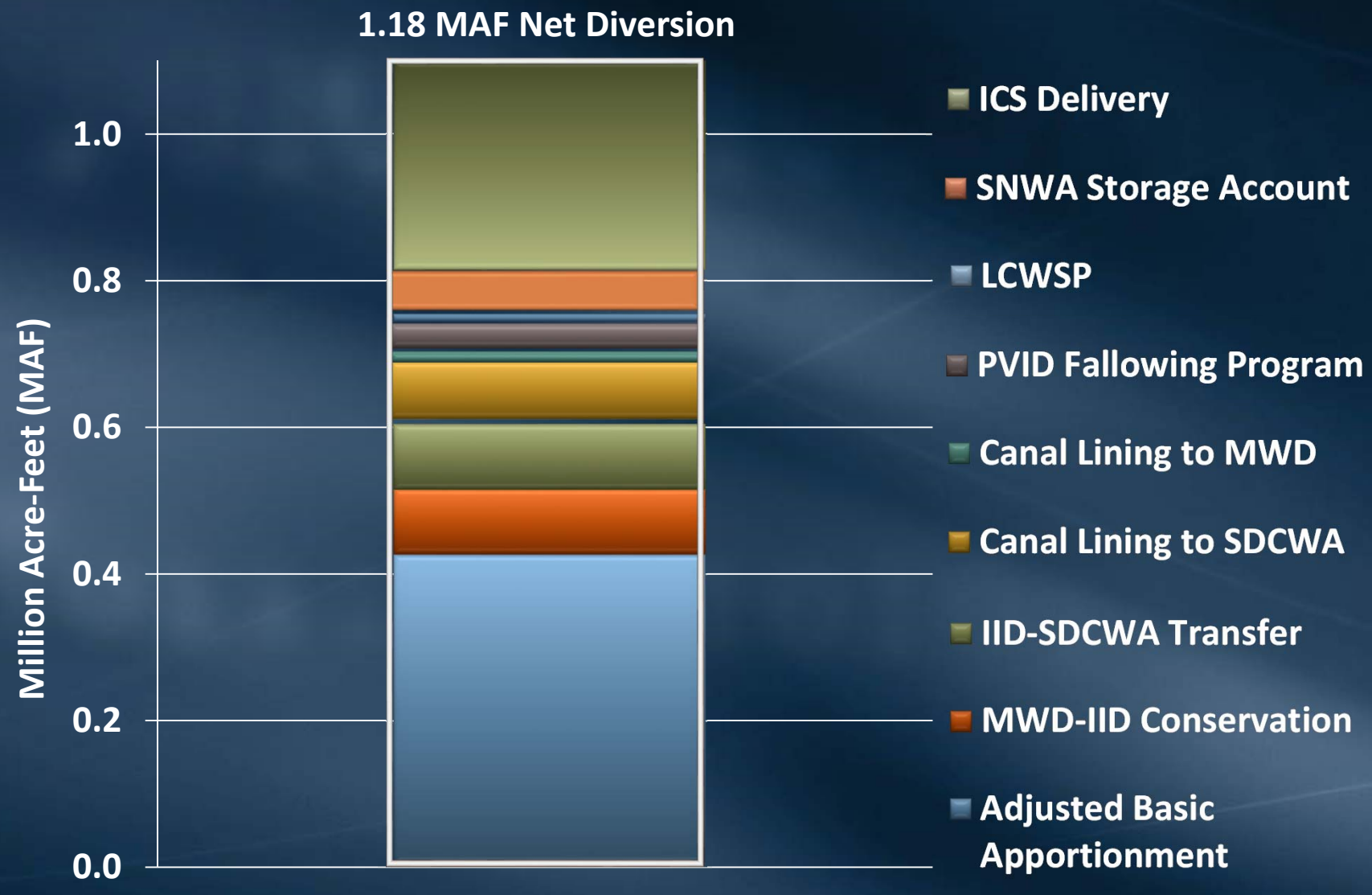
Alfalfa Has High Water Requirement

Crop	Approximate Water Use (AF/acre/year)
Alfalfa	5.1
Sudan Grass	3.4
Bermuda Grass	3.2
Melons (Spring + Fall)	3.1
Cotton	2.9
Small Grains (Spring + Fall)	1.8
Broccoli (Spring + Fall)	1.2
Lettuce (Spring + Fall)	1.2

Adjustment from Priority 1, 2, 3b Use

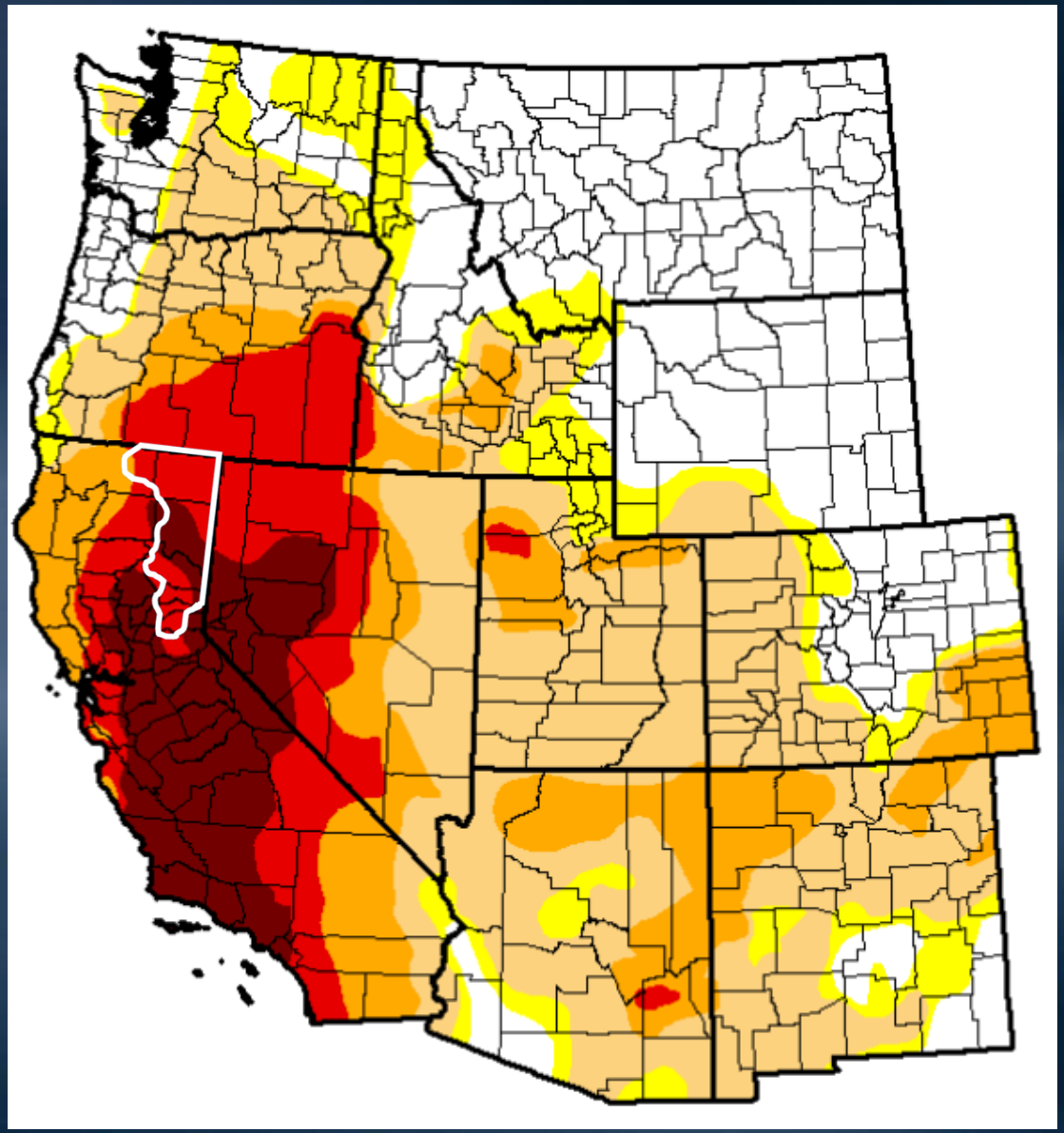


2014 Colorado River Aqueduct Supplies



Dealing with Drought

U.S. Drought Monitor - Current

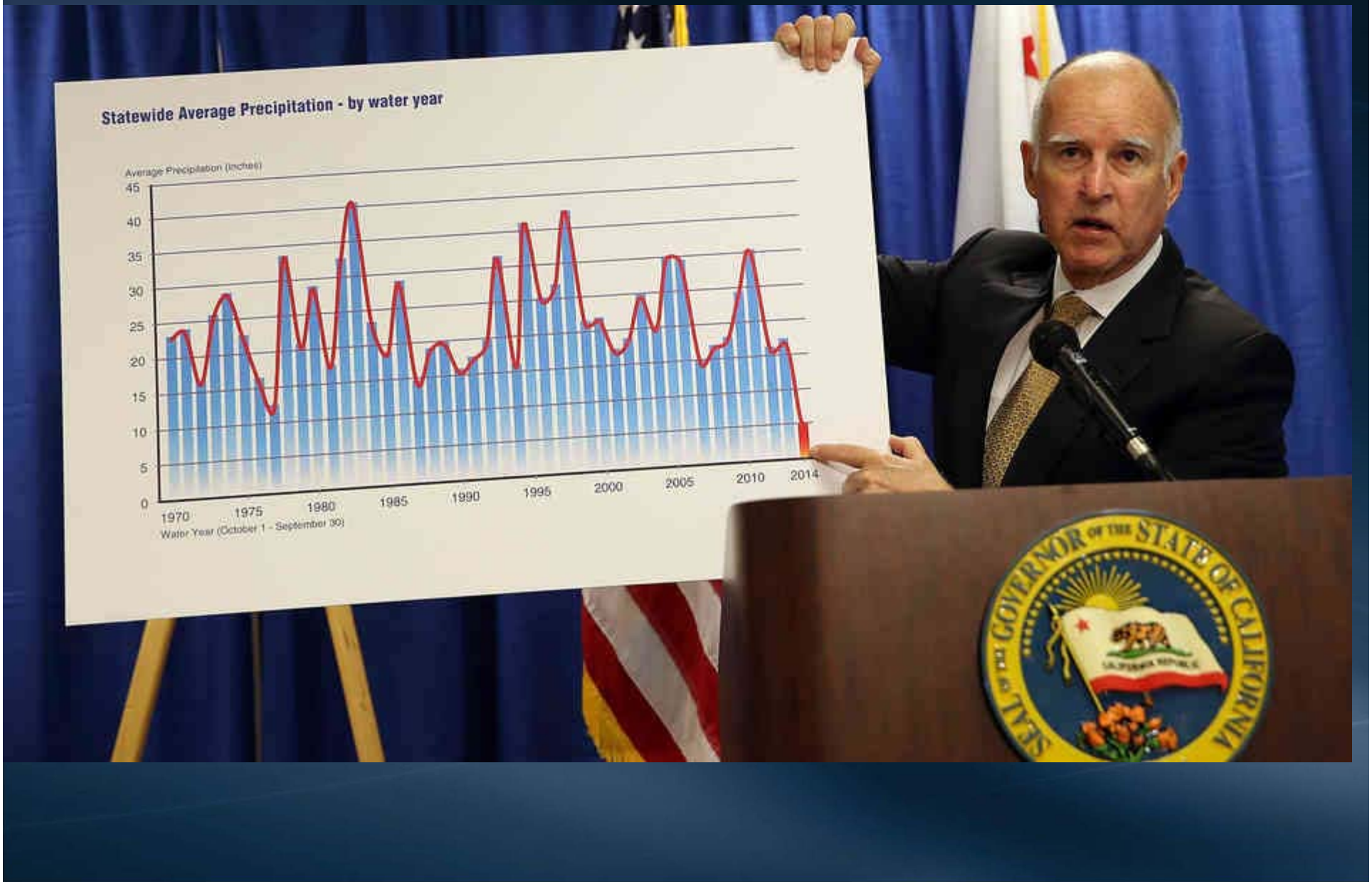


Abnormally Dry
Moderate Drought
Severe Drought
Extreme Drought
Exceptional Drought

Phillips Snow Course April 1, 2010

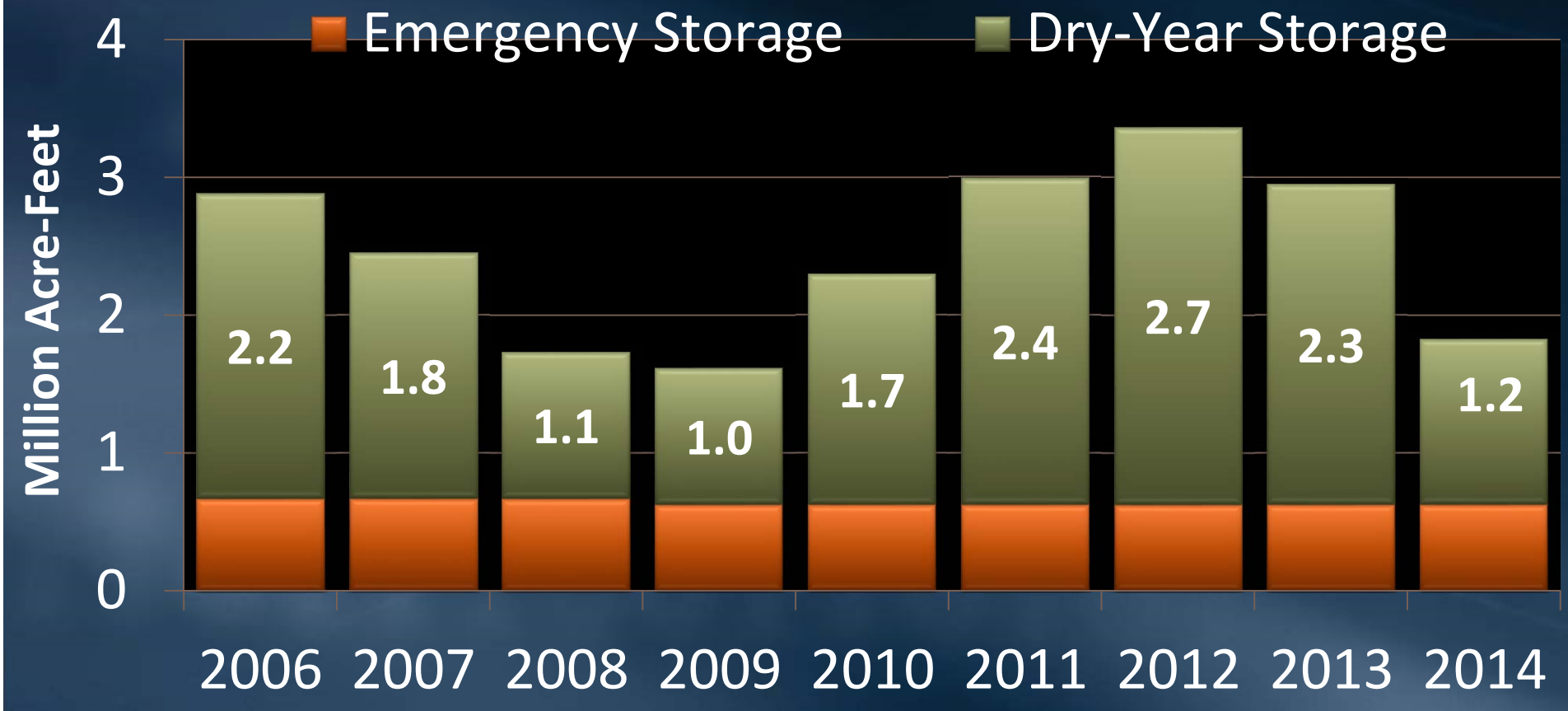
Phillips Snow Course April 1, 2015

Governor Declares Drought Emergency



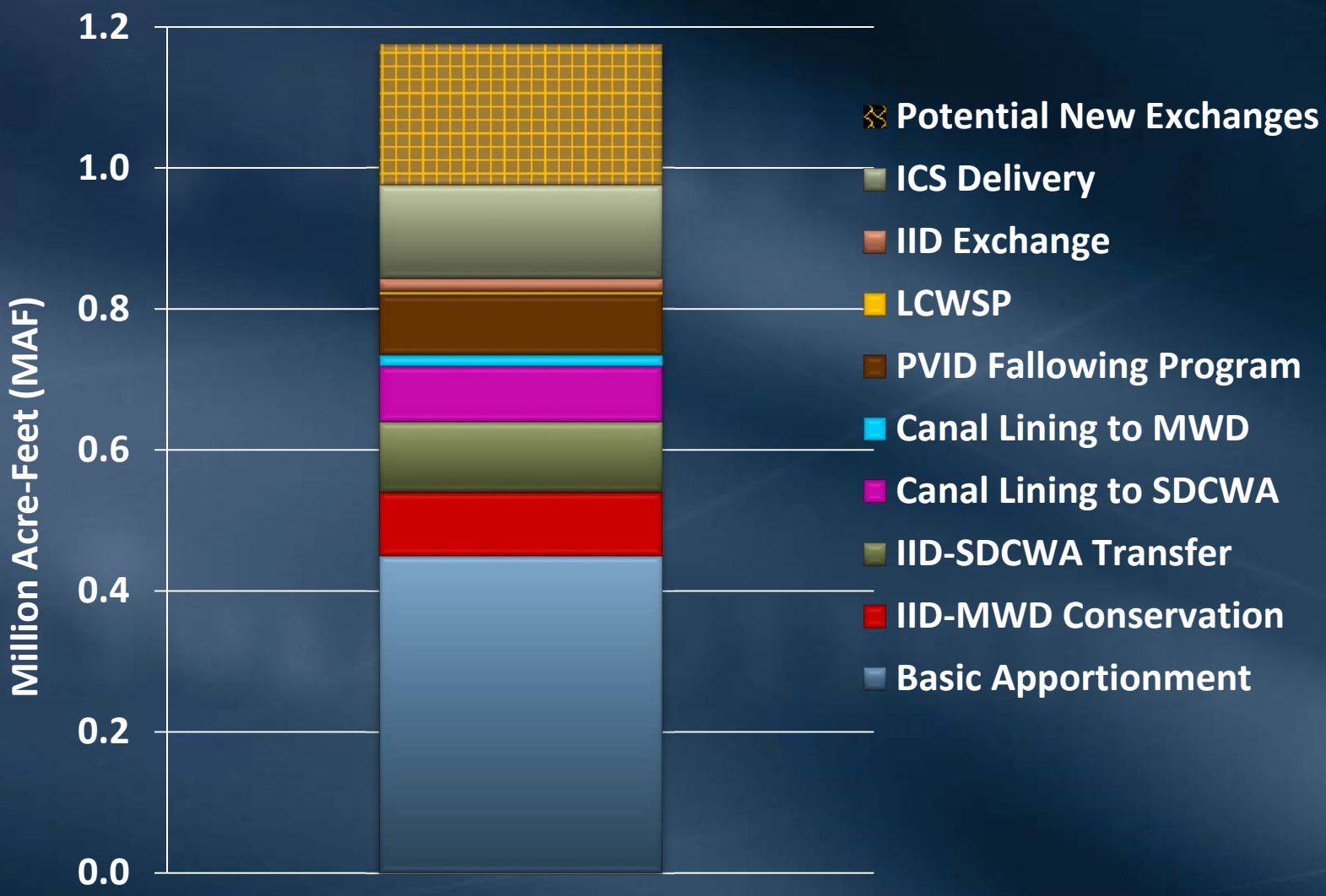
Metropolitan Storage Reserves

End of Year Balances*

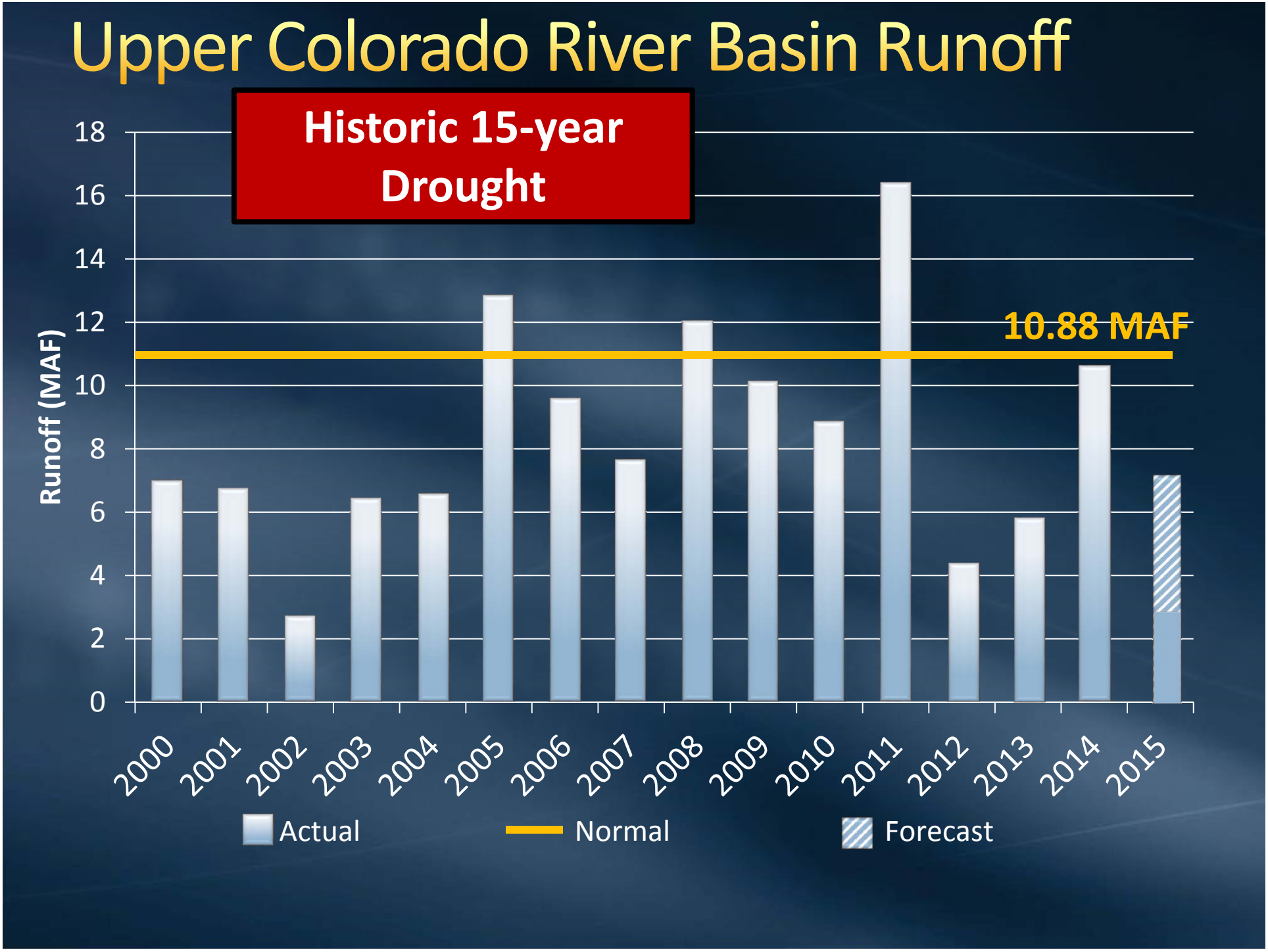


*Estimated actual storage balances, subject to change.

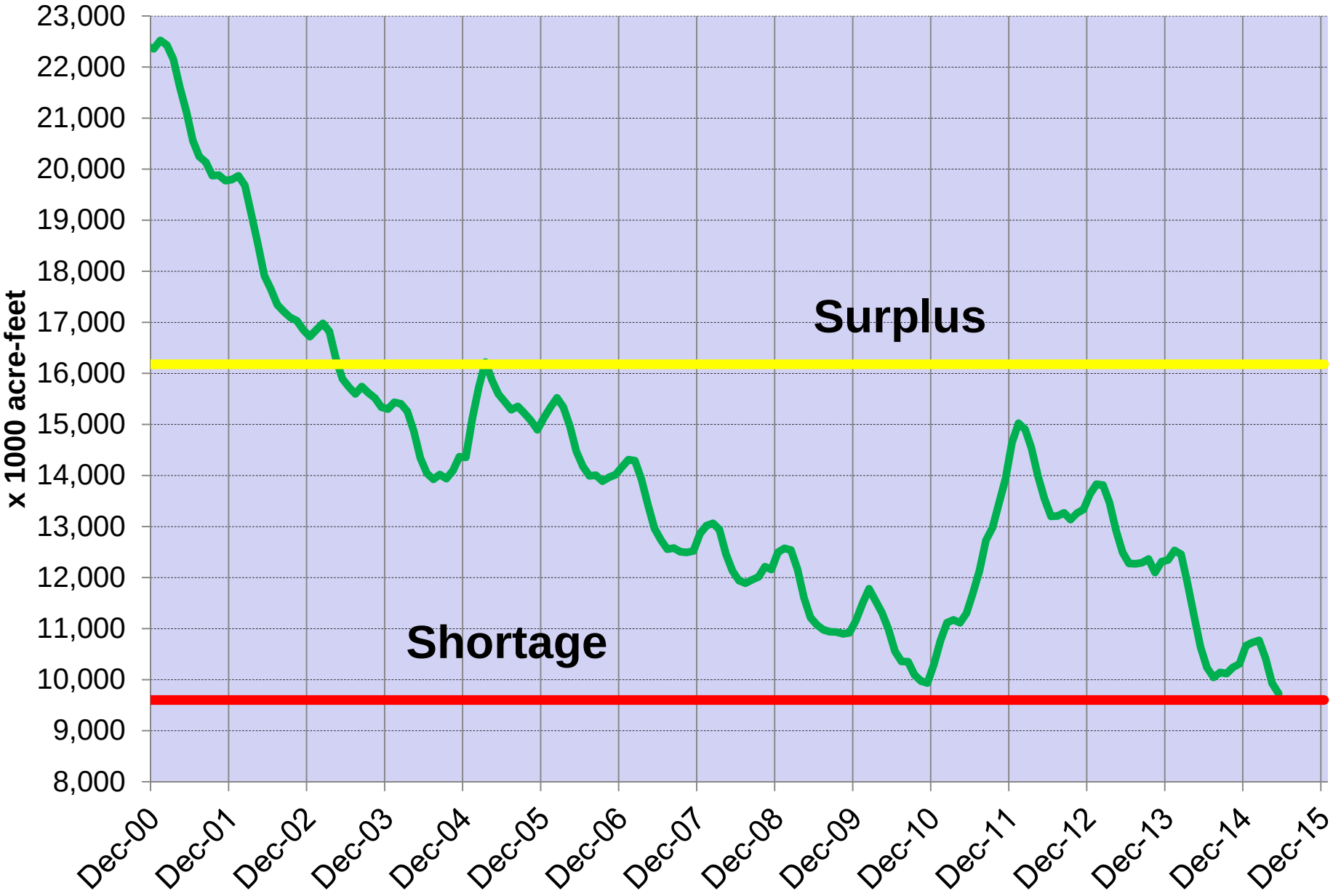
Projected 2015 CRA Supplies



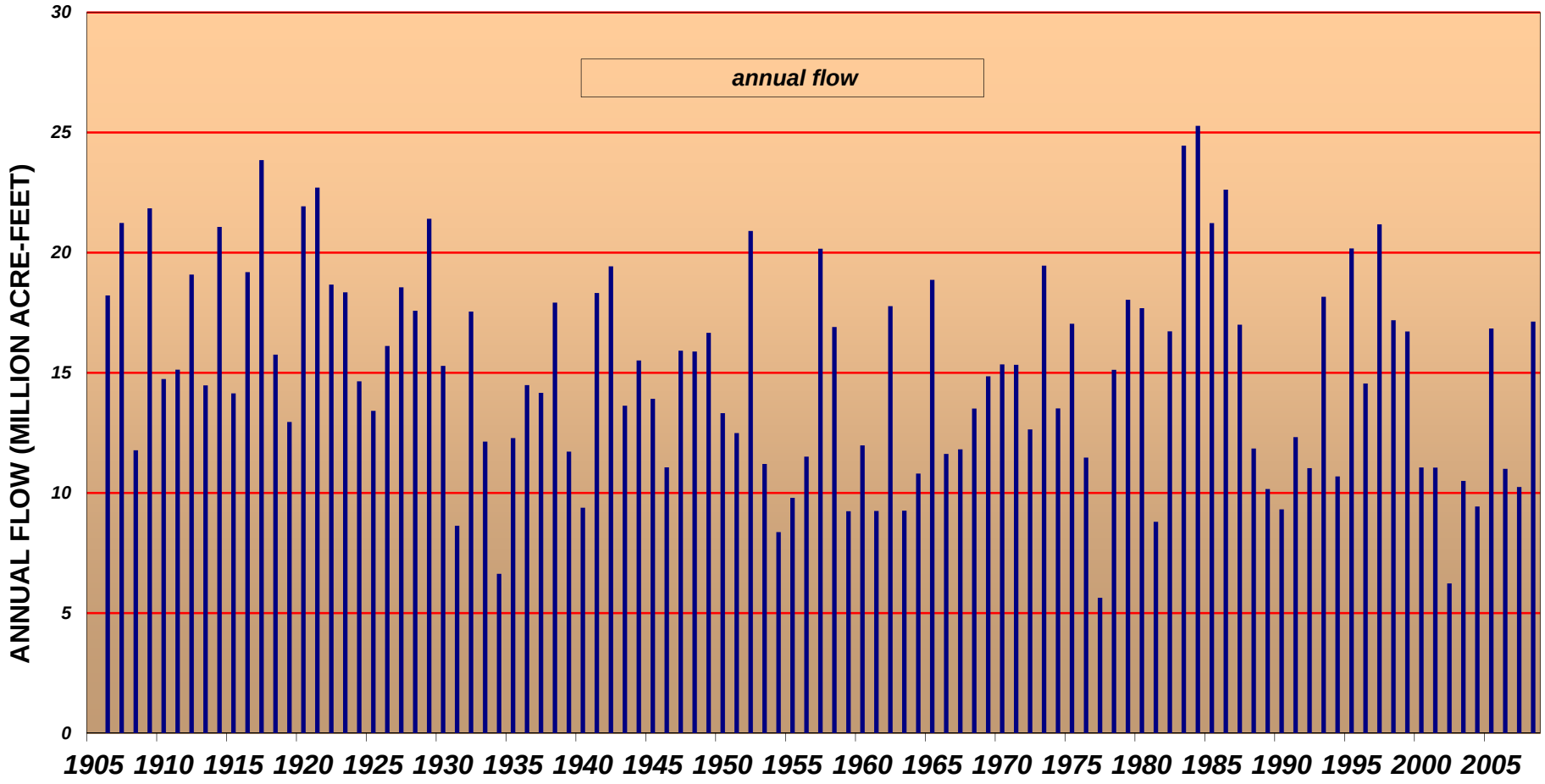
Upper Colorado River Basin Runoff



Lake Mead Storage
2000 – 2015



COLORADO RIVER NATURAL FLOW (AT LEE'S FERRY)
1906-2008
103 Year Average = 15.0 MAF



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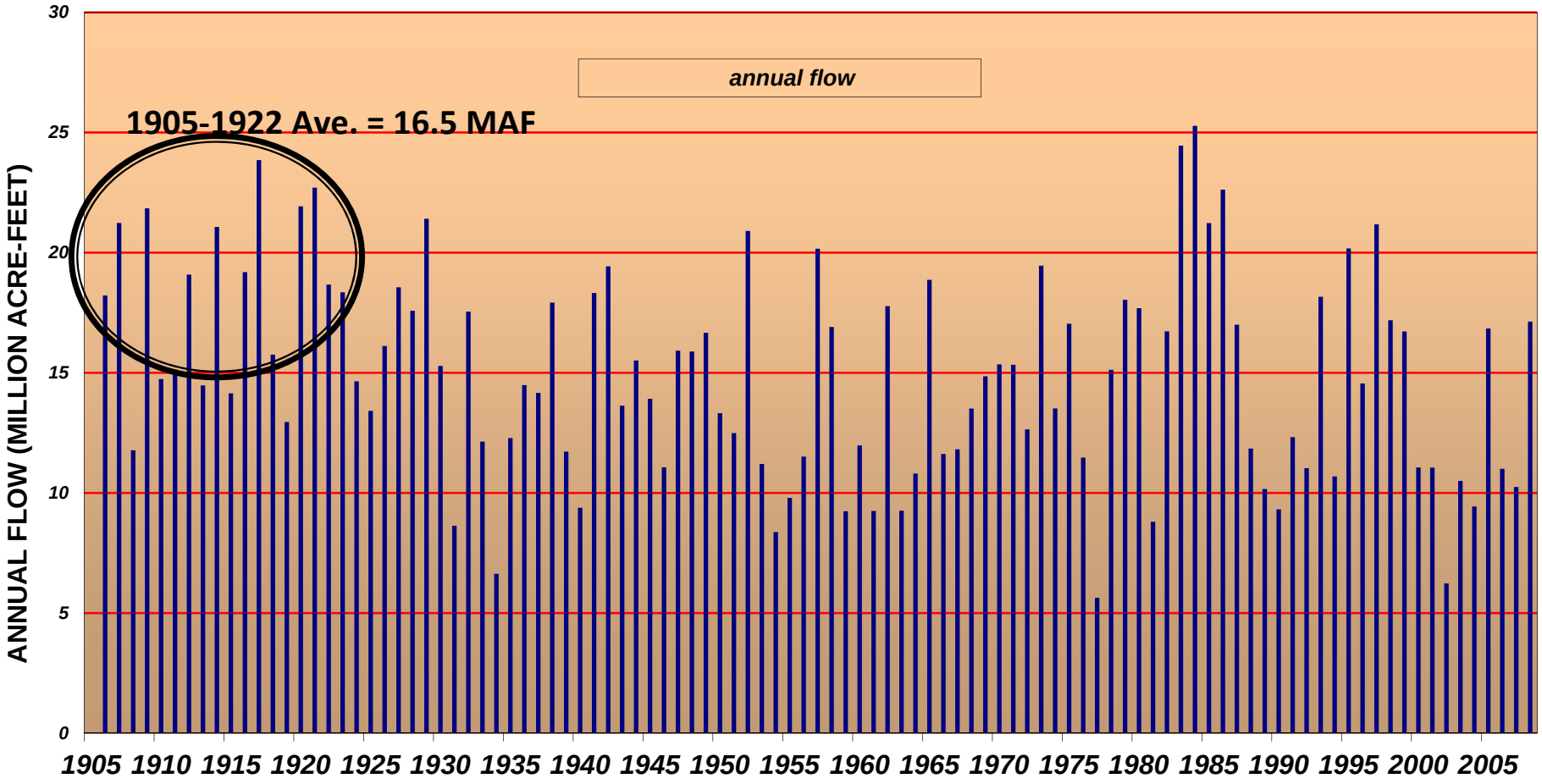
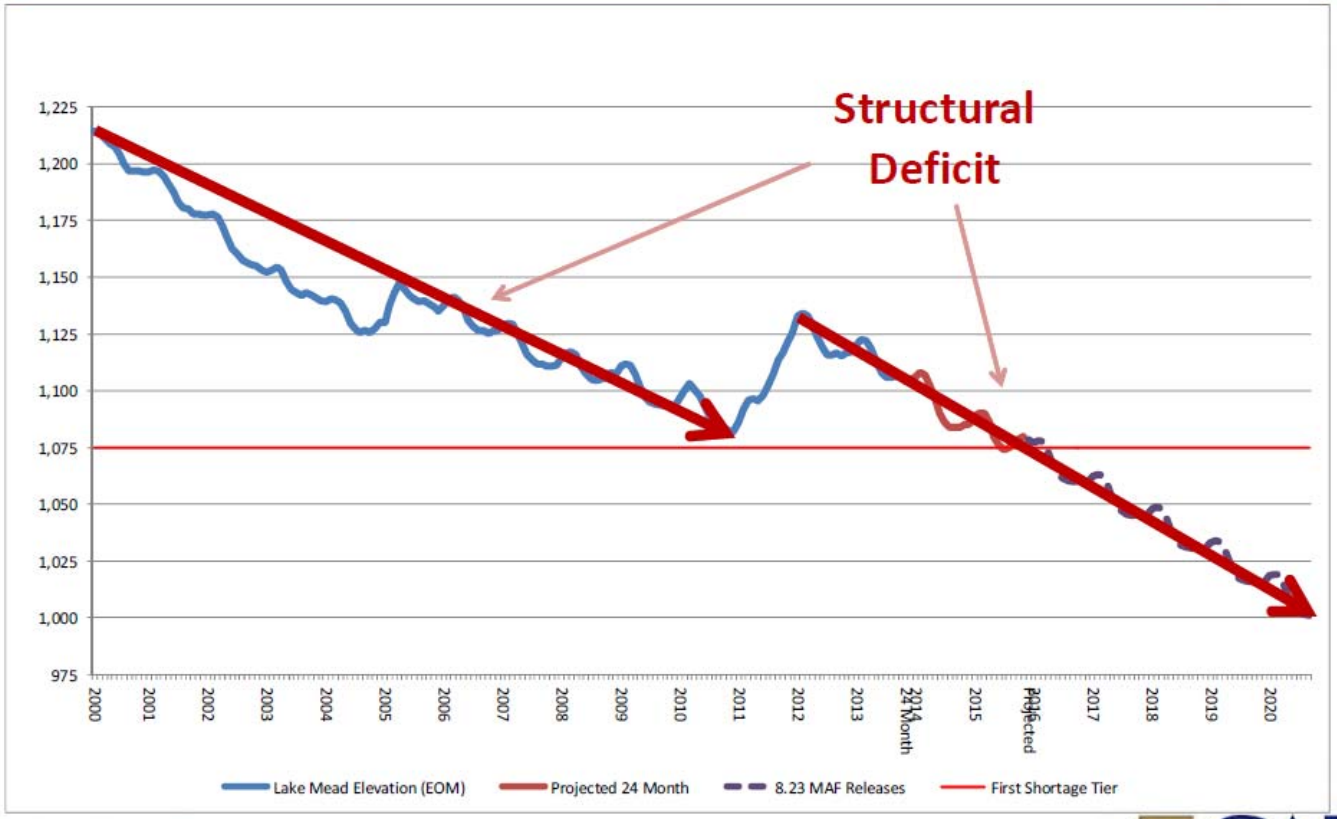
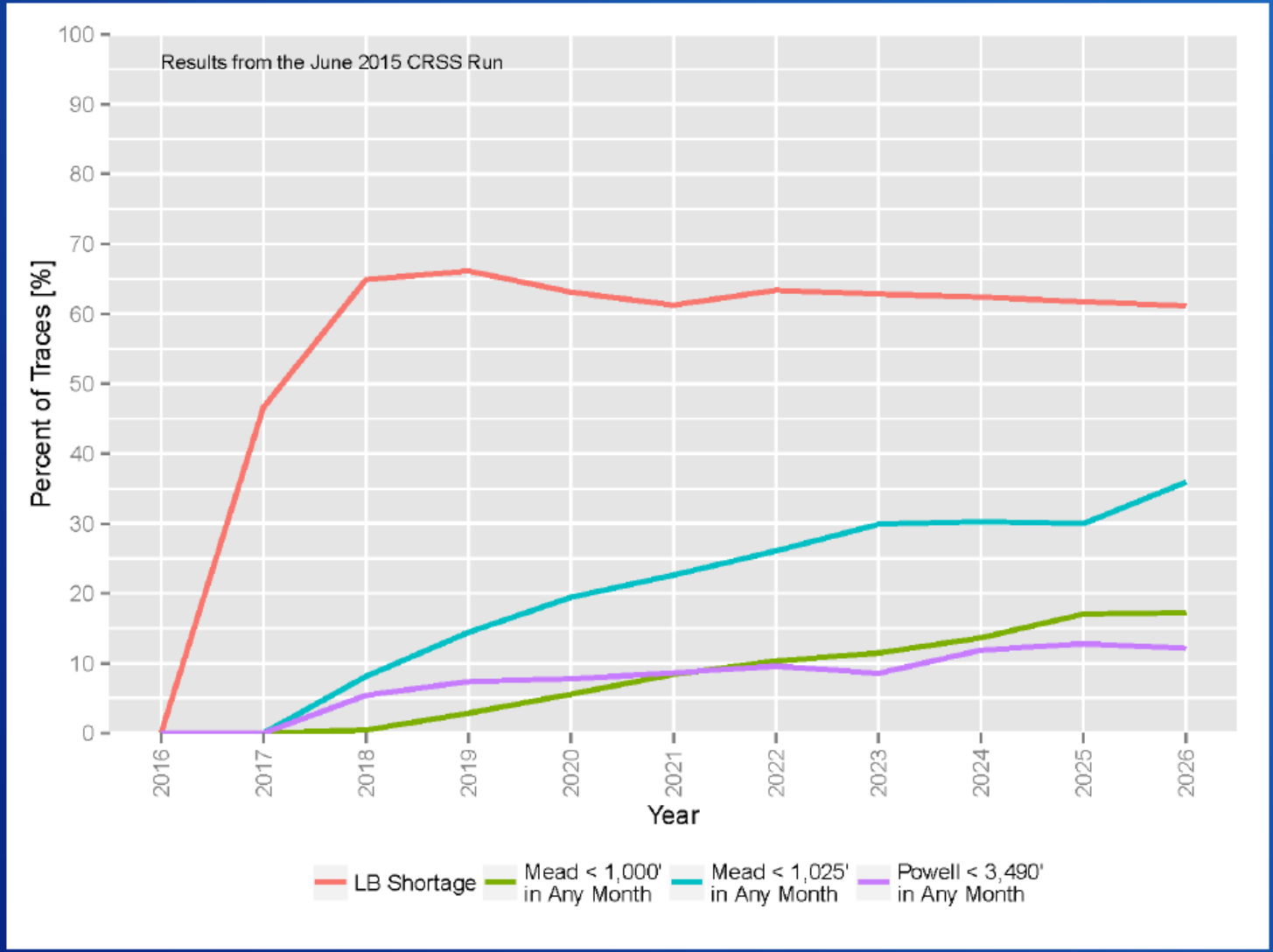


Near-Term Outlook



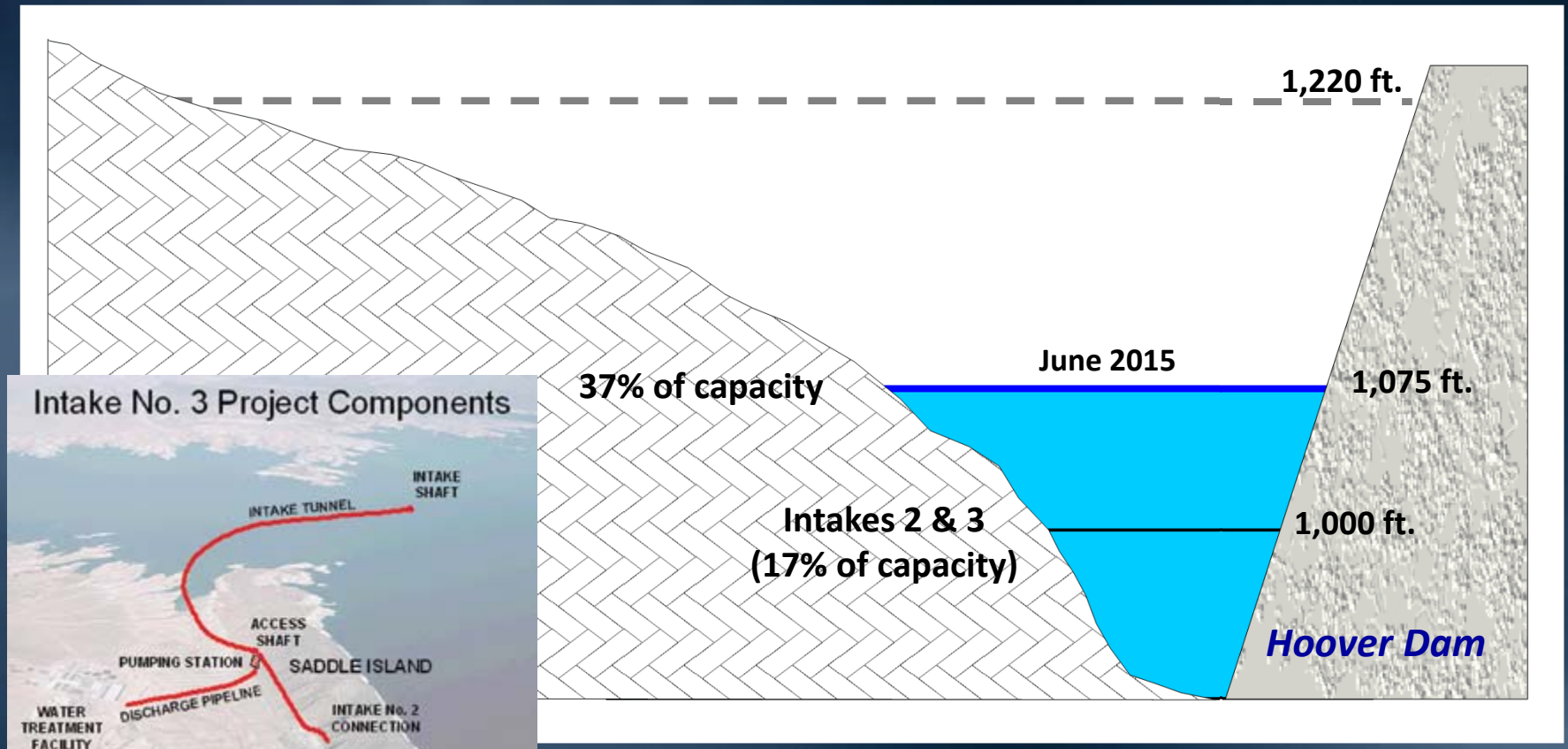
CAP
CENTRAL ARIZONA PROJECT

June 2015 CRSS Results



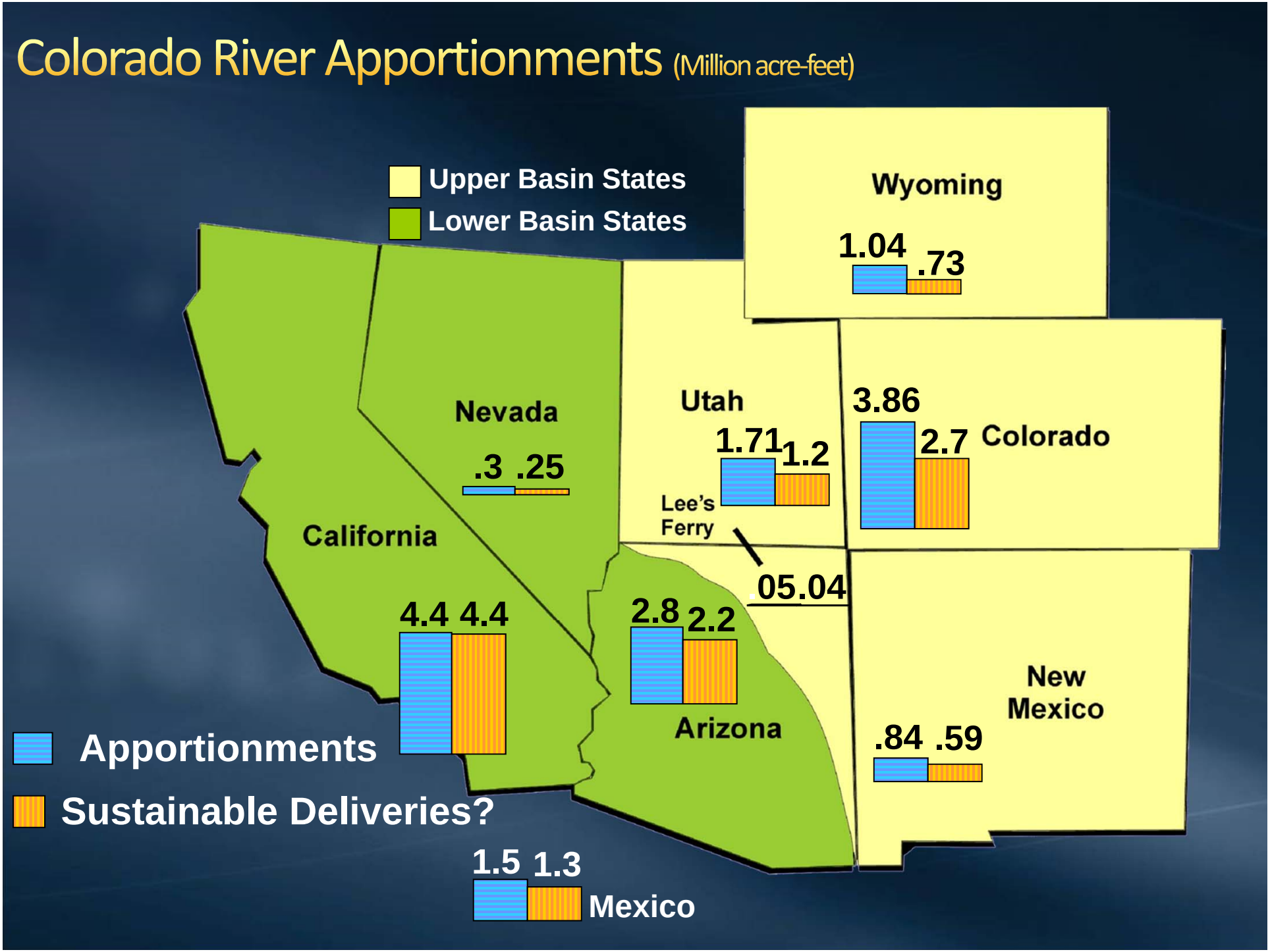
RECLAMATION

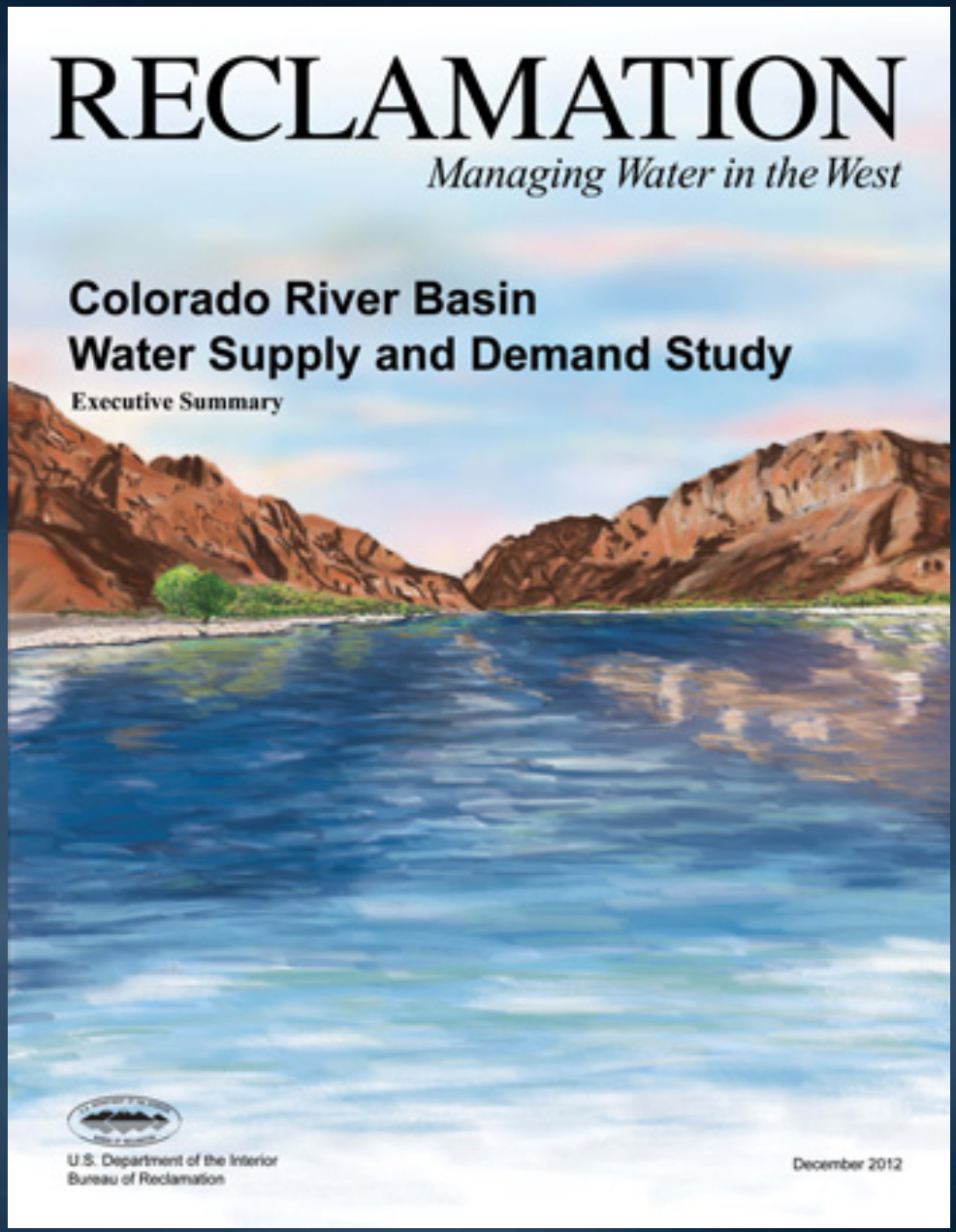
Nevada's Principal Concern: Not being able to access water



Source: Bureau of Reclamation

Colorado River Apportionments (Million acre-feet)




RECLAMATION
Managing Water in the West
Colorado River Basin
Water Supply and Demand Study
Executive Summary
U.S. Department of the Interior
Bureau of Reclamation
December 2012

Augmentation? Conservation?

The Uncertain Future of Salton Sea

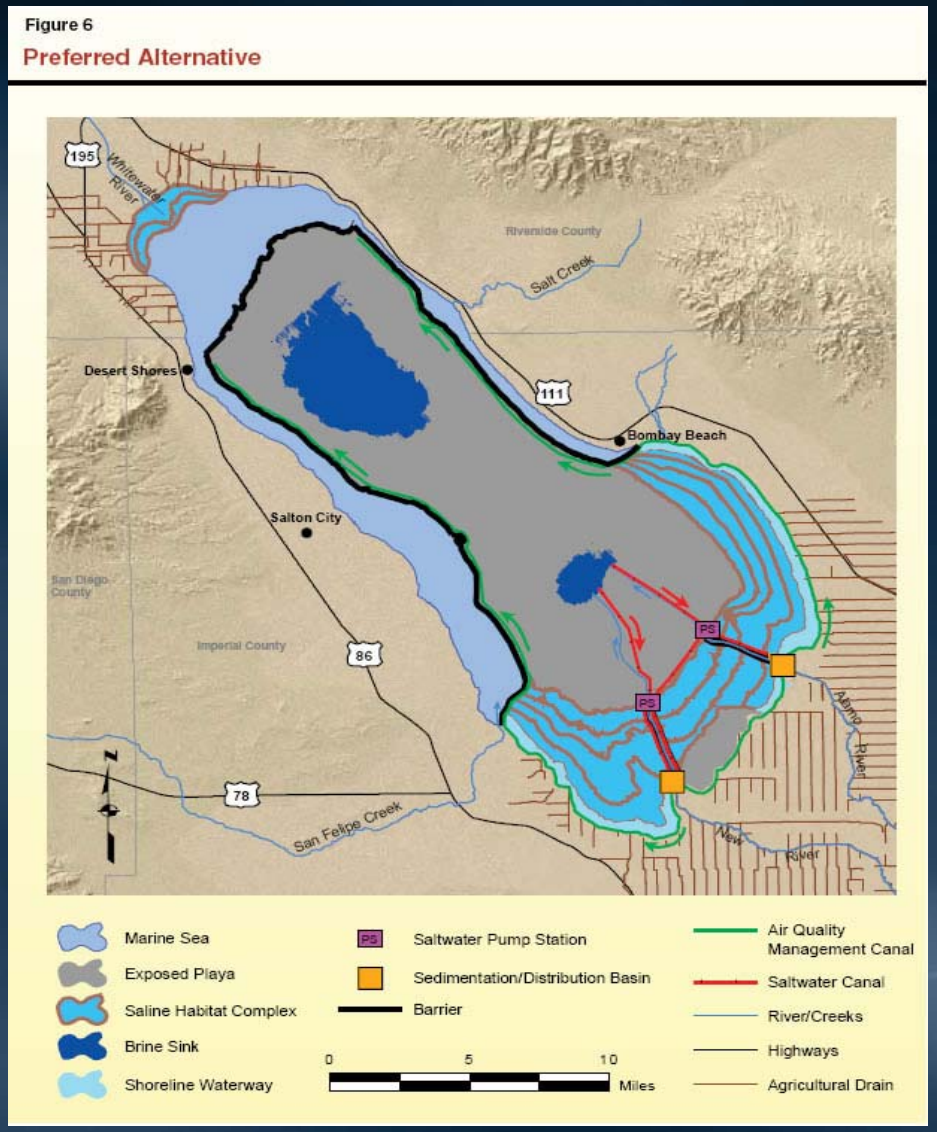
2003 Agreement Provided Time to Restore Salton Sea

- Formed in 1905
  - Sustained by Ag drainage
- 50% Saltier than Ocean
  - Salinity increase 1%/yr
  - Soon too Salty for Fish
- Sea protected from Impacts of transfer to San Diego County
  - IID to deliver 800 TAF of "mitigation water" to Salton Sea through 2017
  - Provided 15 years for state to develop long-term solution

Frequent Fish Kills on Salton Sea

15 Year Period Nearing End; No Action Taken to Save Salton Sea

- To date, state has done little to advance Sea's restoration
- State issued Draft EIR
  - Preferred Alternative cost $9 billion, with $100 million O&M
- IID issued petition to SWRCB to condition future transfers on Salton Sea restoration
- SWRCB considering petition



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QSA Legislation Authorized Potential Funding Source

- If consistent with restoration, mitigation water can be sold to DWR instead of delivered to Sea
- DWR, in turn, would sell water to MWD
- Proceed would benefit Salton Sea restoration
  - $125 million of funds available
  - Provide So. Cal. with up to 400,000 af, easing drought
- State of California would need to initiate this DFG Code provision

Summary

- Colorado River Supplies have been critical in dealing with current drought
- Colorado River faces two looming challenges:
  - River is over-allocated and not sustainable for current demands
  - A long-term solution to the Salton Sea is needed to avoid water conflicts in California
- Collaboration with other agencies will be needed to address challenges

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