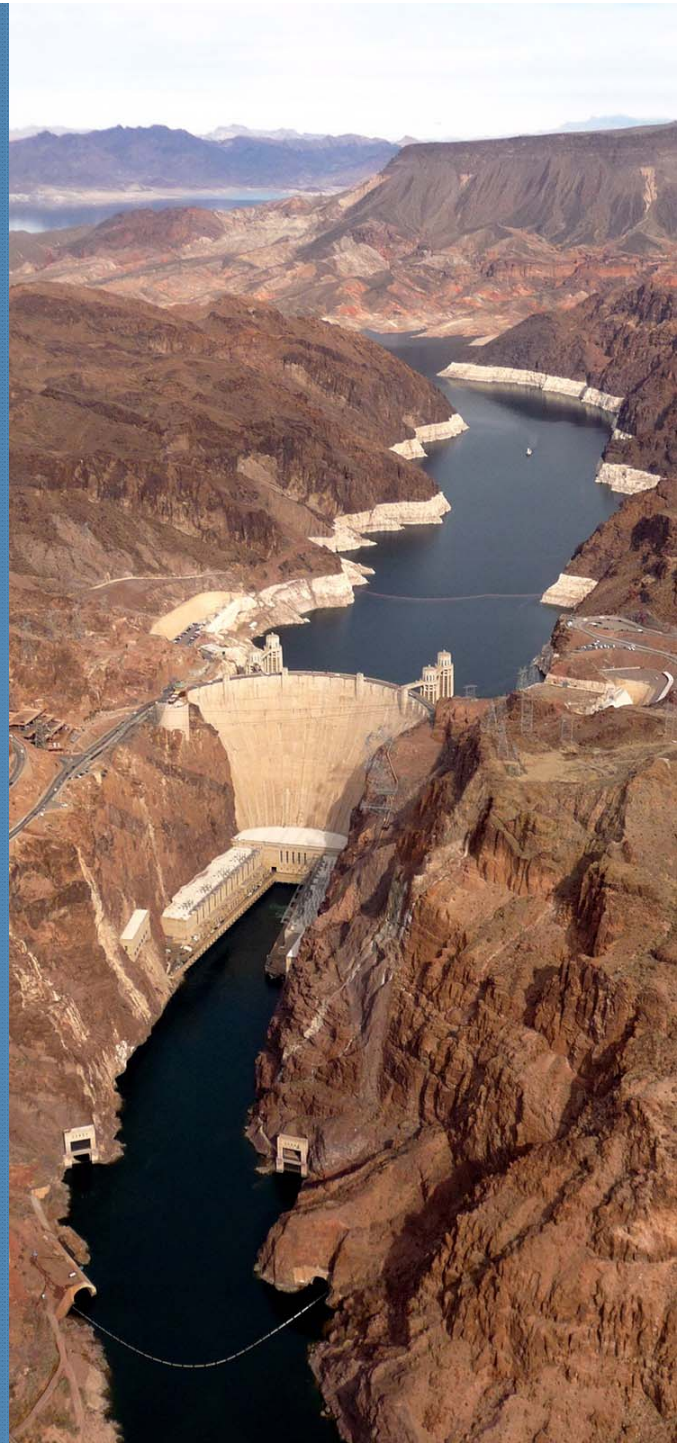
Southern California Water Dialogue: Colorado River Drought

Tanya Trujillo
Executive Director of the Colorado River Board of California

April 22, 2015



Colorado River Board of California

Established in 1937

California Water Code designates membership and purpose

Mission: to protect the interests and rights of the state of California, its agencies and citizens, in the water and power resources of the Colorado River System

Colorado River Board of California

California's Colorado River Water

Colorado River Basin

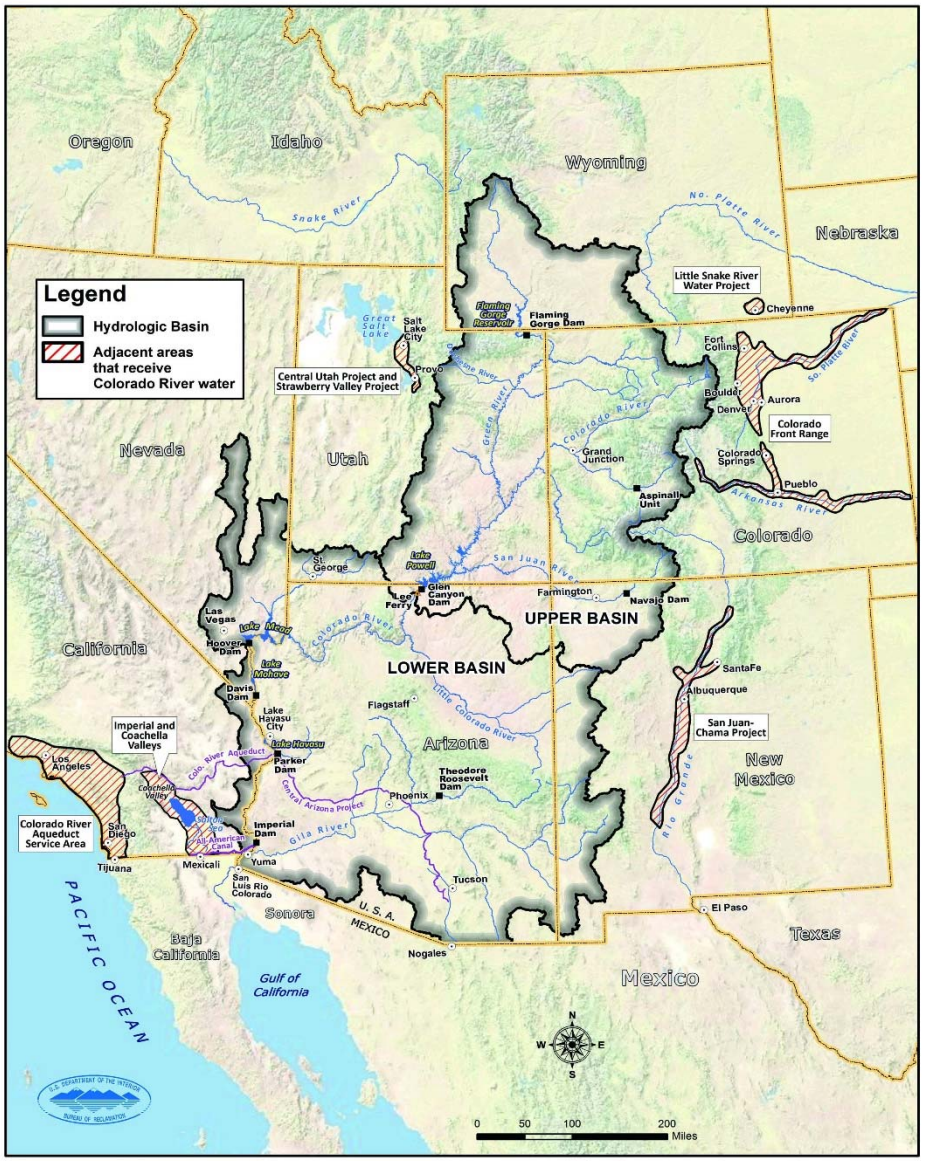
Upper Basin = 7.5 maf

- Colorado = 52%
- Utah = 23%
- Wyoming = 14%
- New Mexico = 11%

Lower Basin = 7.5 + 1.0 maf

- California = 4.4 maf
- Arizona = 2.8 maf
- Nevada = 300,000 af

Mexico = 1.5 maf



Colorado River Basin

Water for 35 million people:

- Los Angeles/San Diego
- Las Vegas, NV
- Phoenix, AZ
- Denver, CO
- Salt Lake City, UT
- Albuquerque, NM

Irrigation of 5.5 million acres

Hydropower

Habitat and Recreation

Water for 22 Tribes

Colorado River Basin Hydrology and Storage

Metropolitan's Imported Water Supply


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


Colorado River Basin
WY
Green River
UT
NV
CO
Colorado River
UPPER BASIN
LAKE POWELL
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MEXICO

Headwaters – Rocky Mountain National Park, Colorado

Delicate Arch– Arches National Park, Utah

Canyon Lands National Park, Utah

Colorado River entering Lake Powell

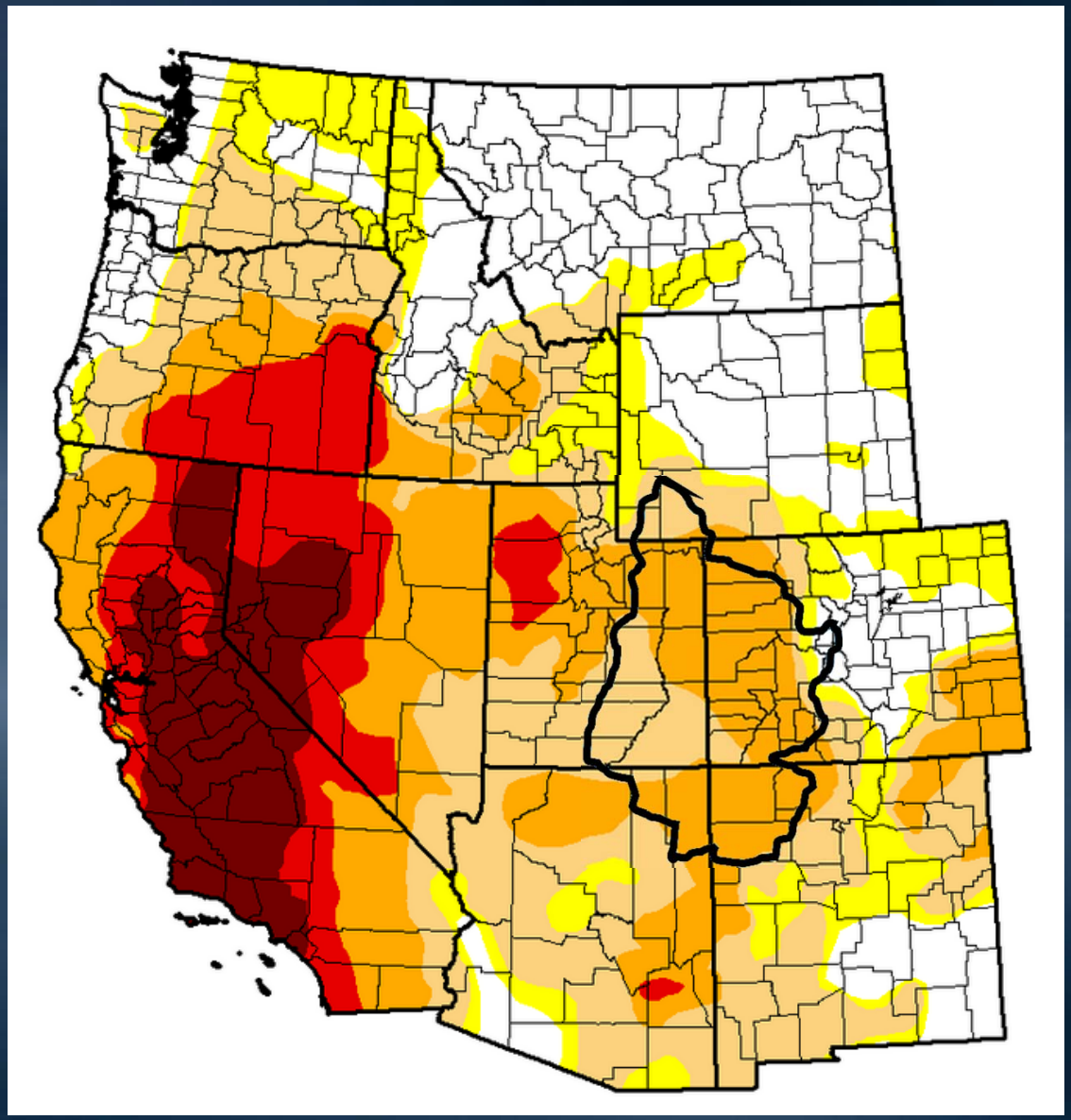
Rainbow Bridge National Monument

Goose Neck State Park, Utah

Havisupa Falls, Grand Canyon National Park

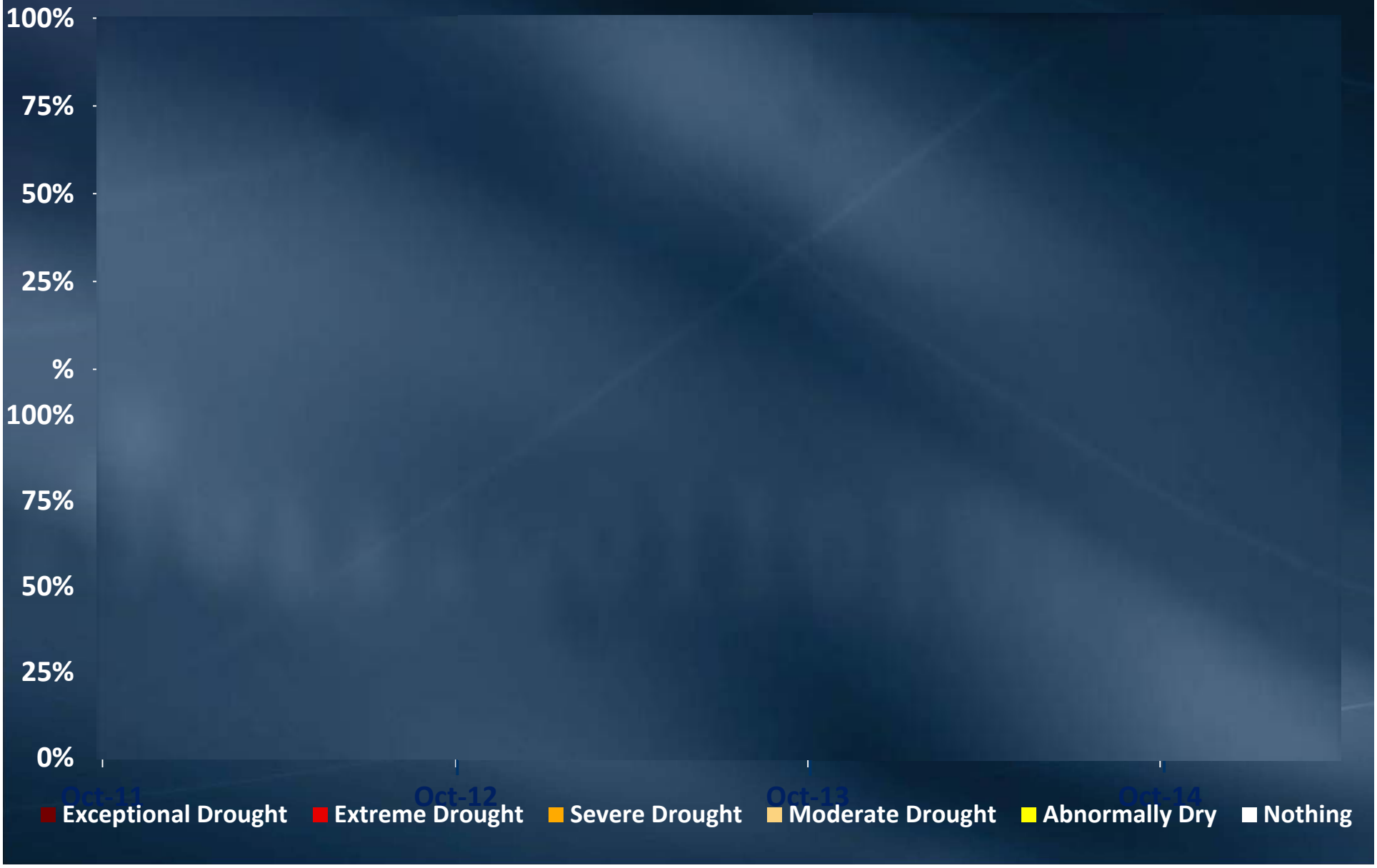
Hoover Dam

U.S. Drought Monitor - Current



Drought Evolution

Percent of area in each drought category



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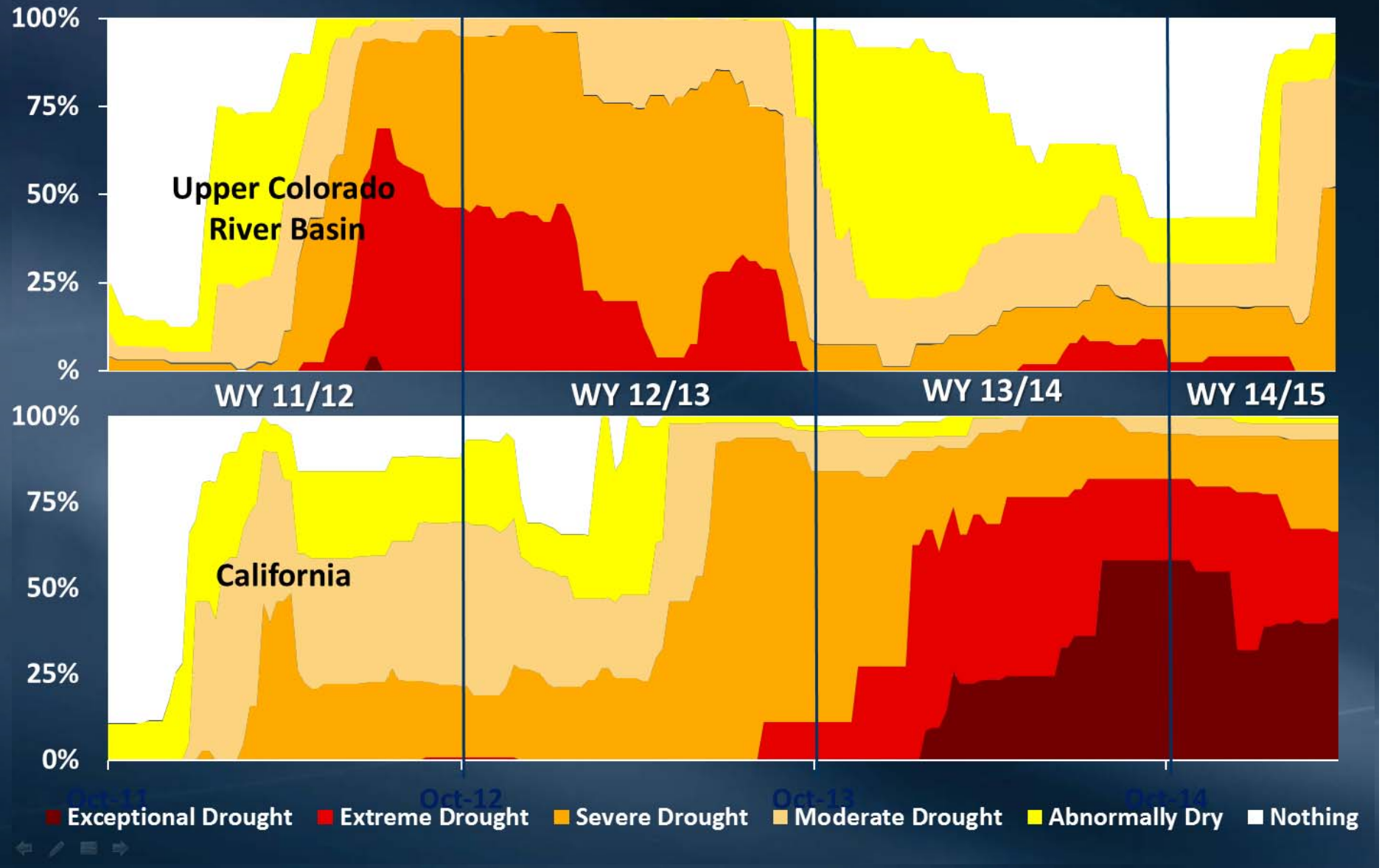
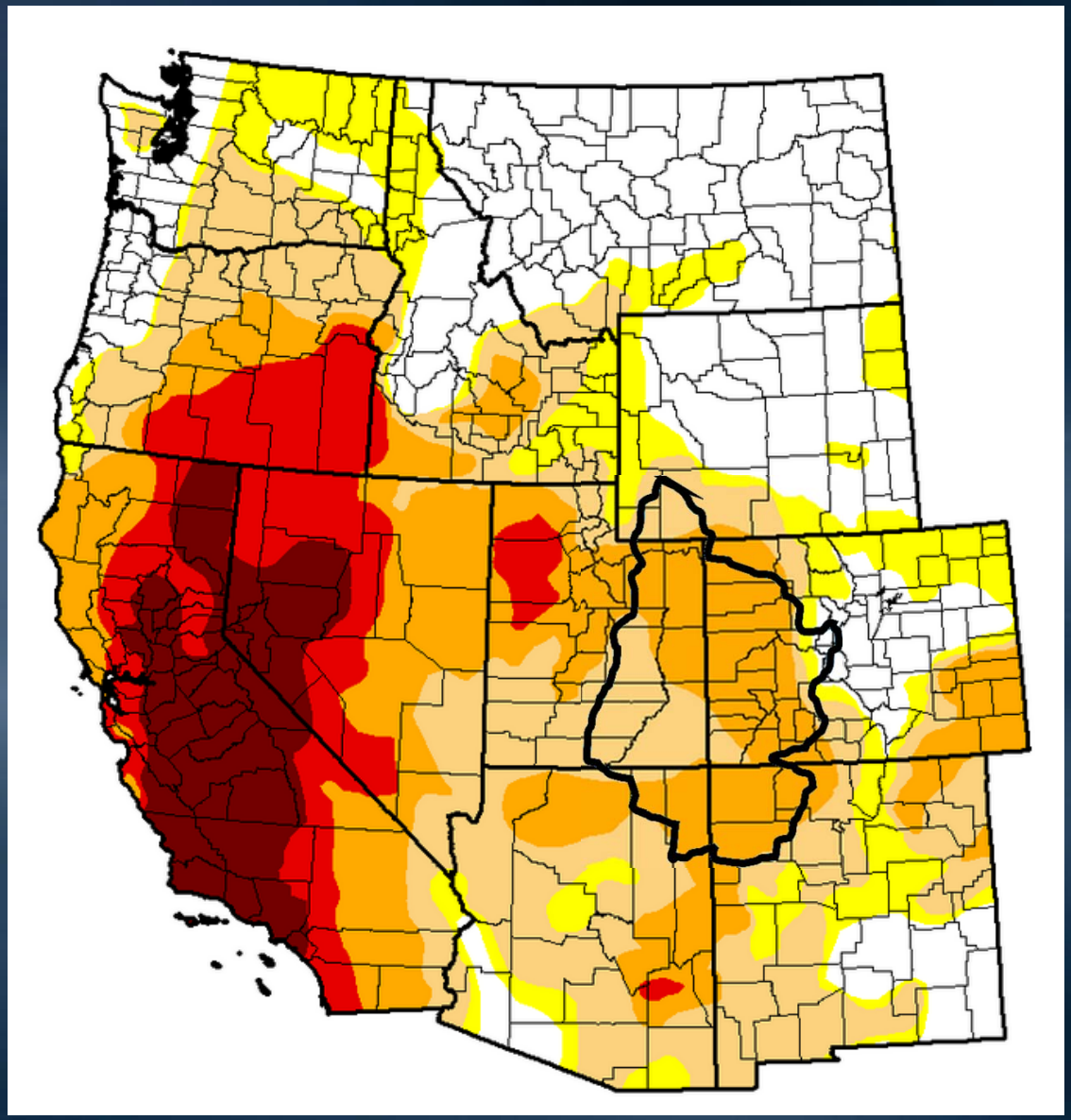
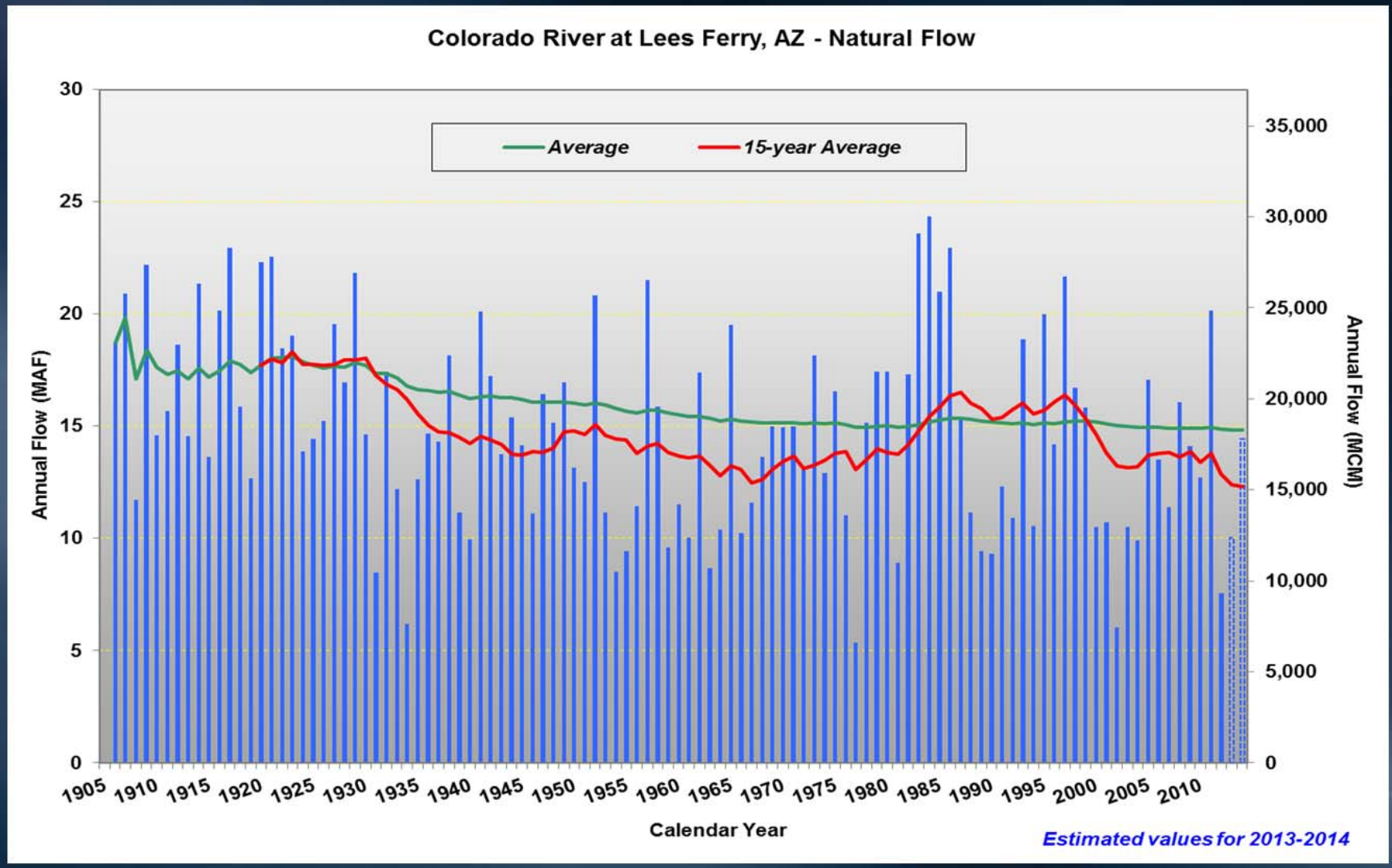


U.S. Drought Monitor - Current



Colorado River Basin Natural Flow at Lees Ferry, Arizona
Observed Historical Record (109 years) 1906 – 2014



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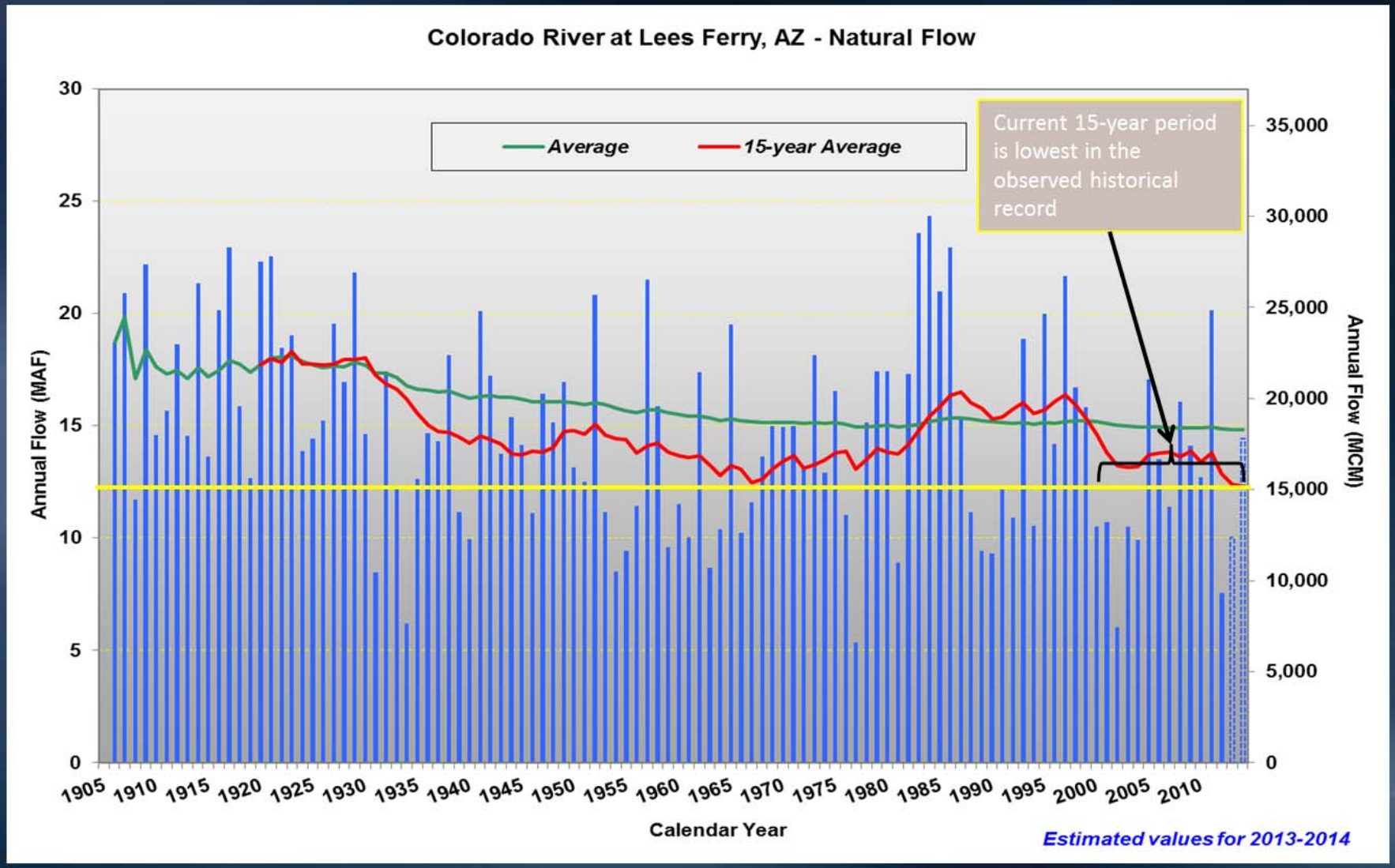
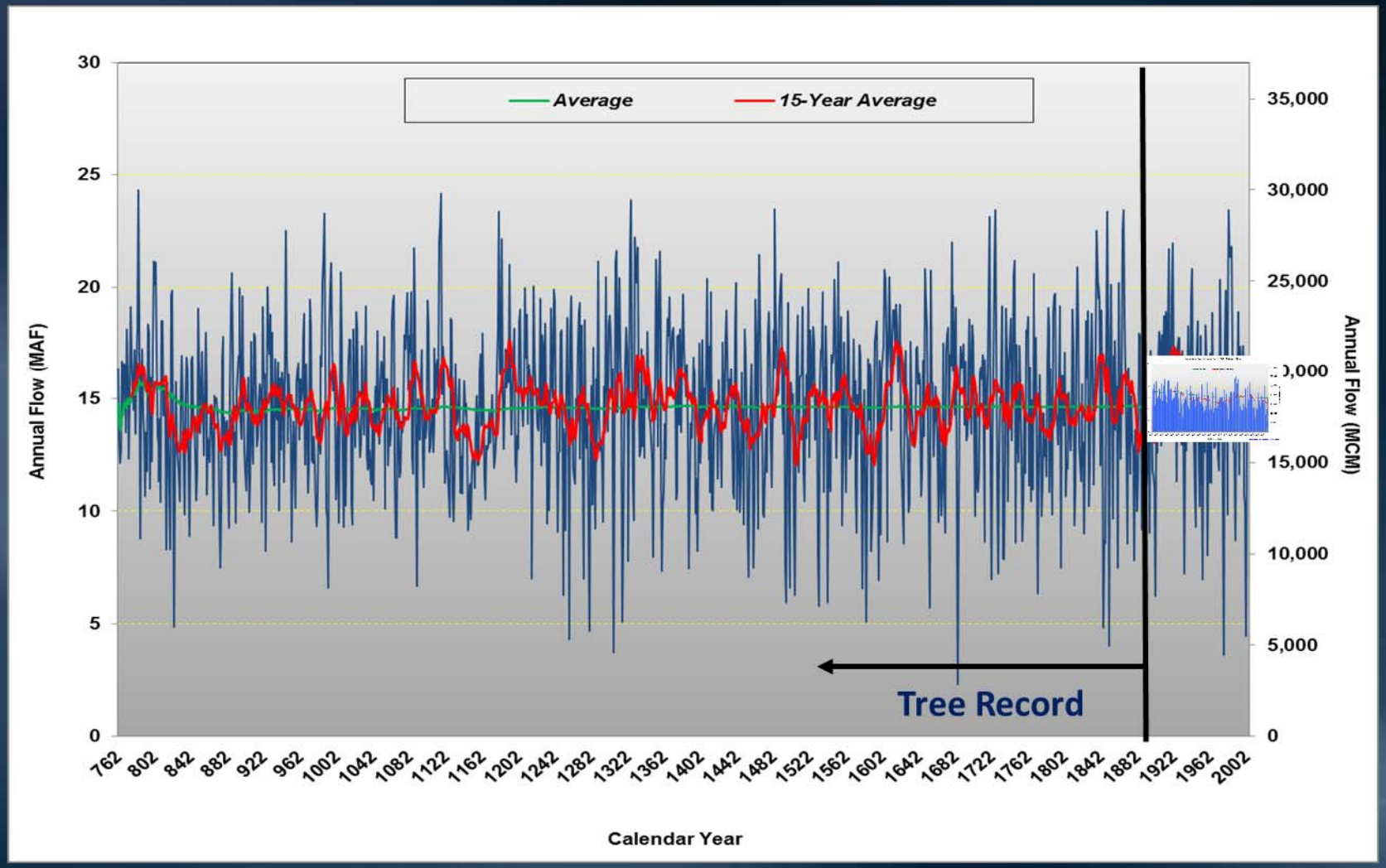


Colorado River Basin Natural Flow at Lees Ferry, Arizona
Tree-Ring Reconstructed Record 762 – 1905



Colorado River Basin Natural Flow at Lees Ferry, Arizona
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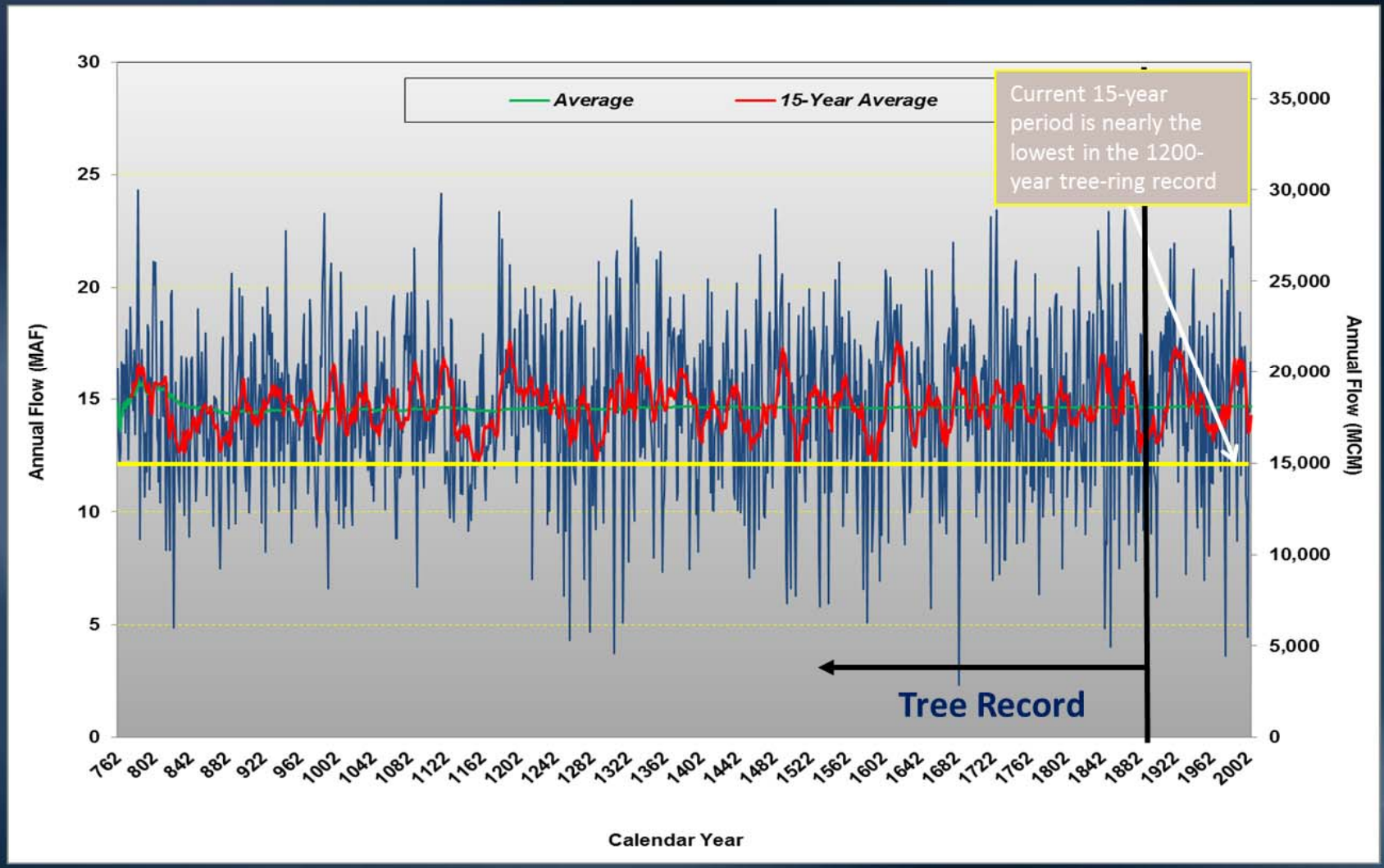
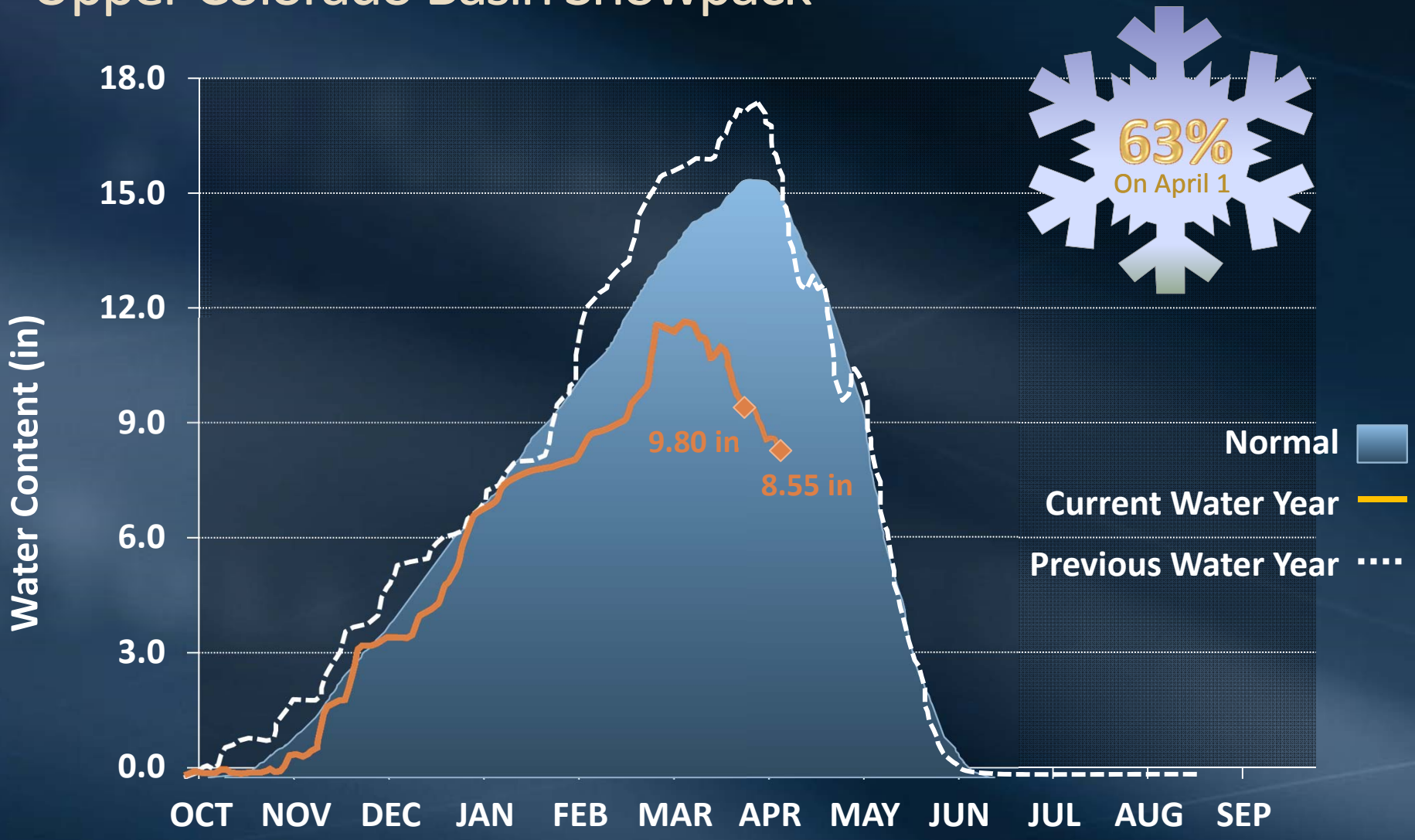
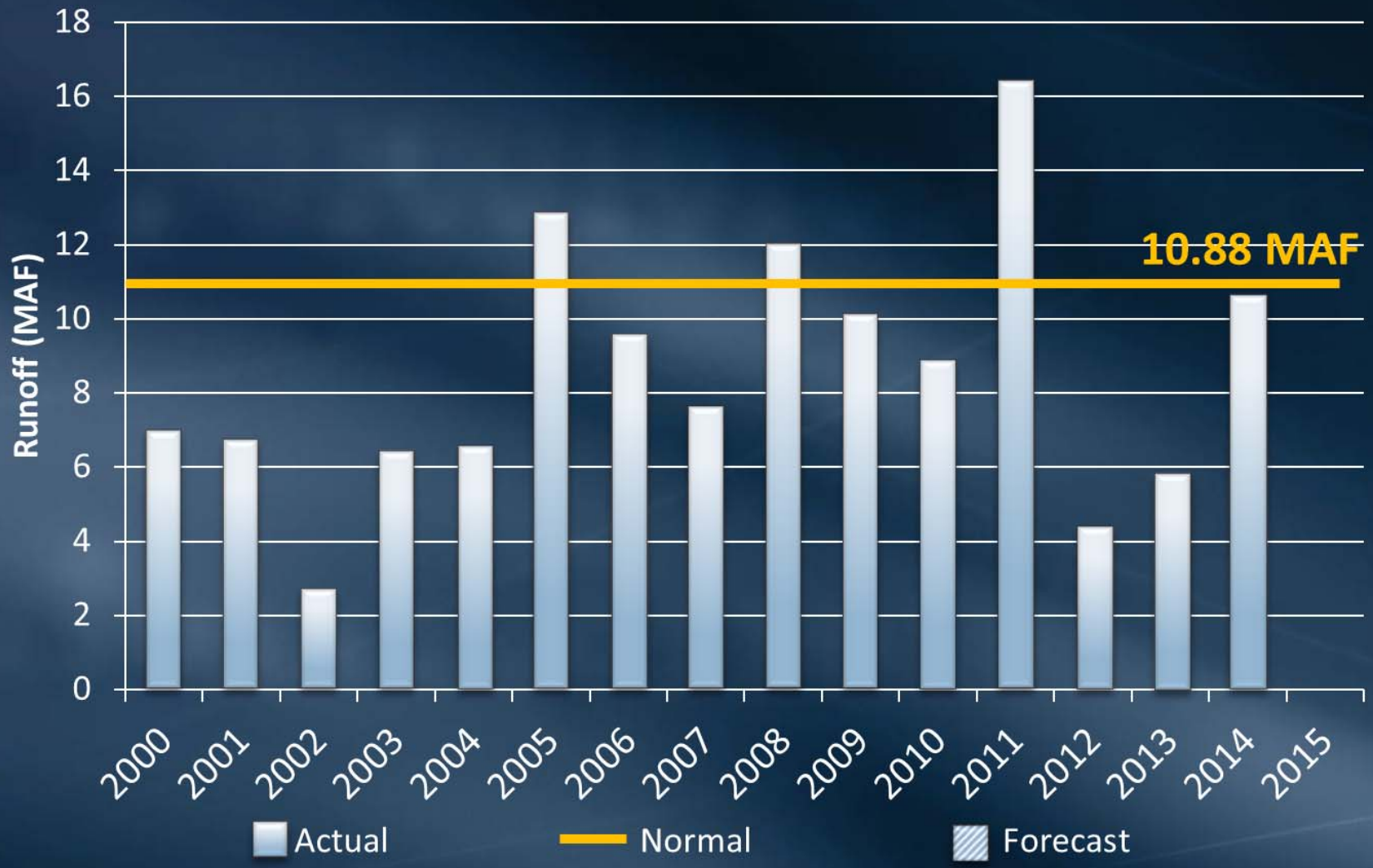


Colorado River Hydrologic Conditions

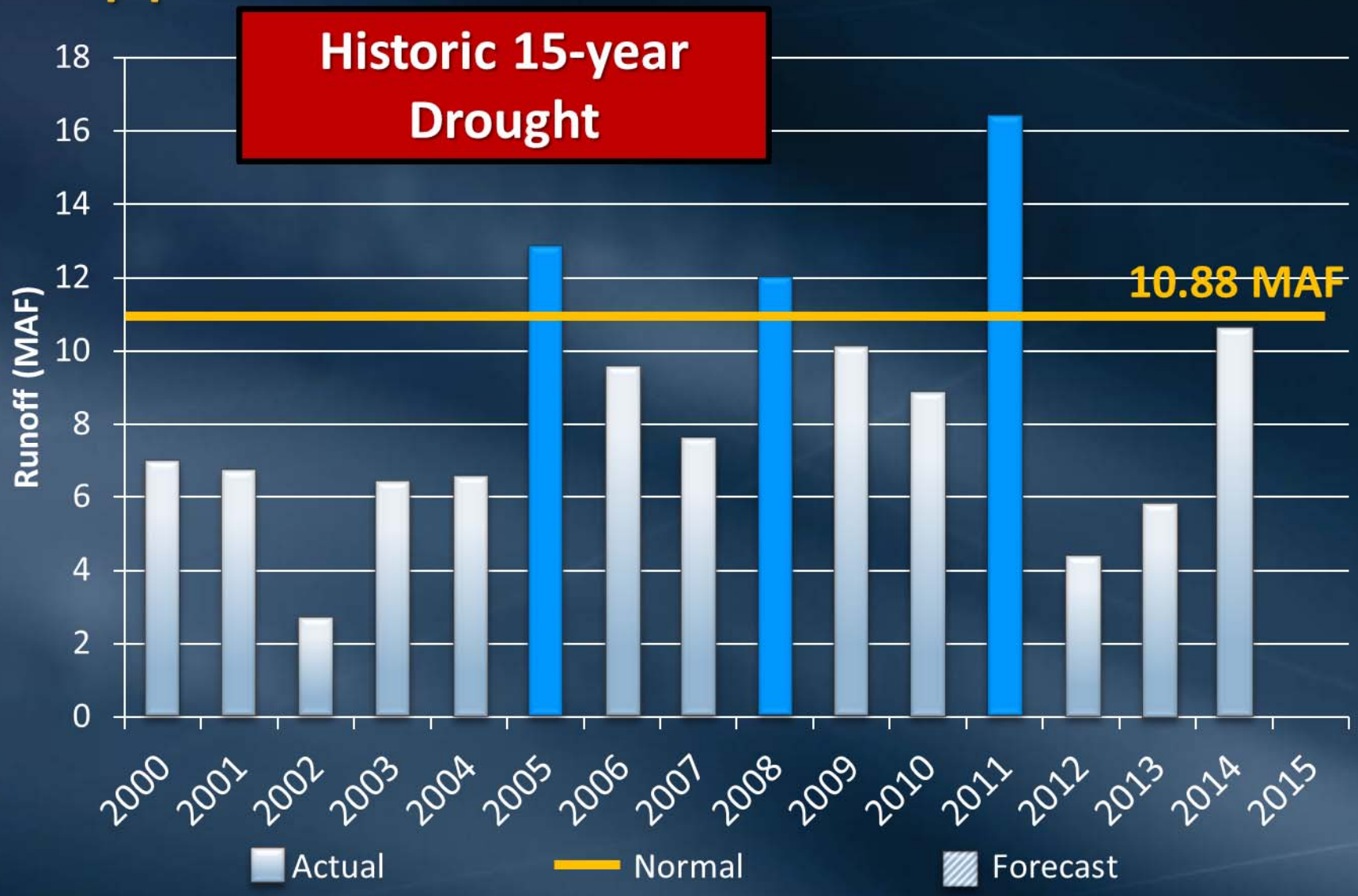
Upper Colorado Basin Snowpack



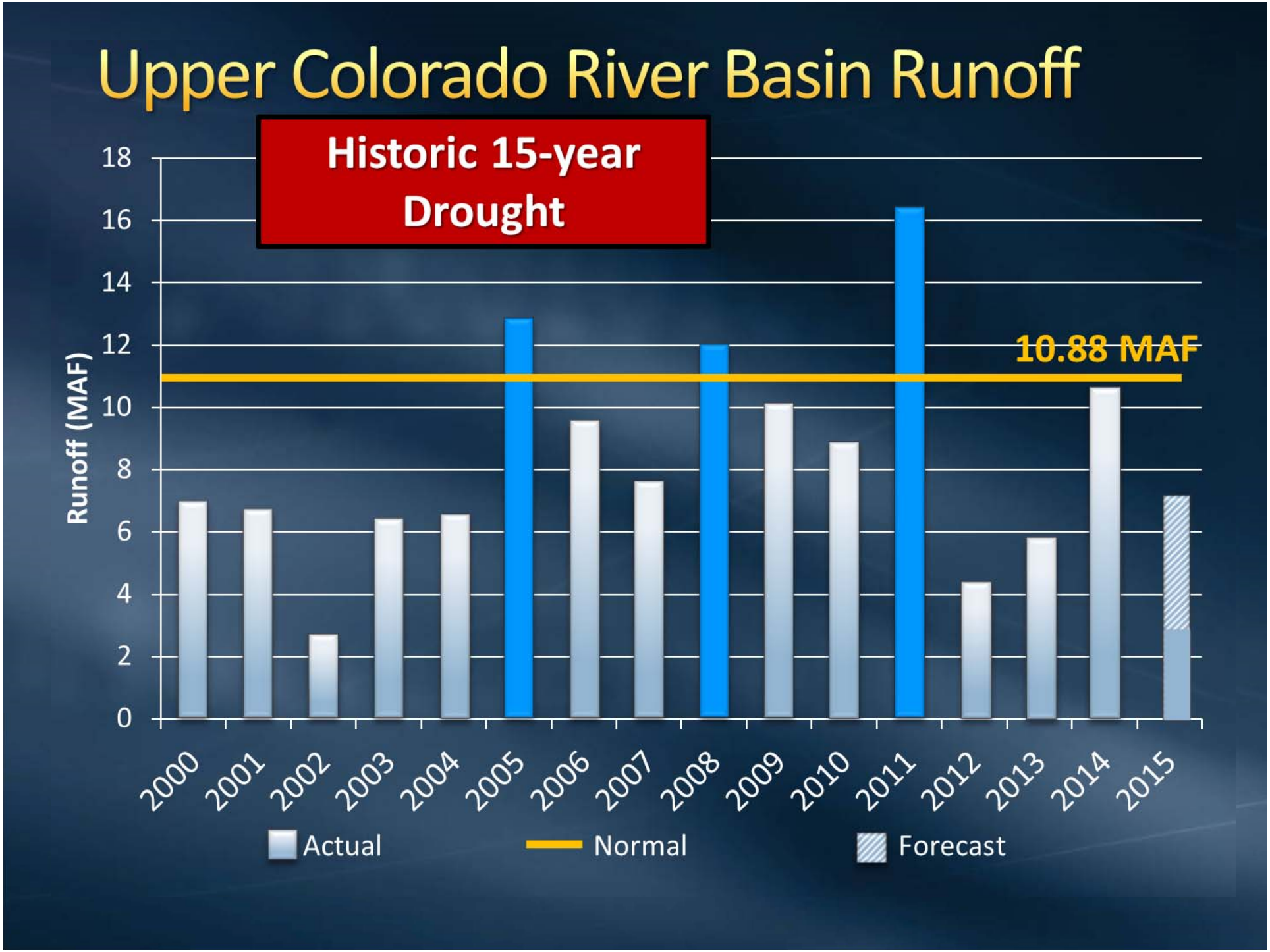
Upper Colorado River Basin Runoff



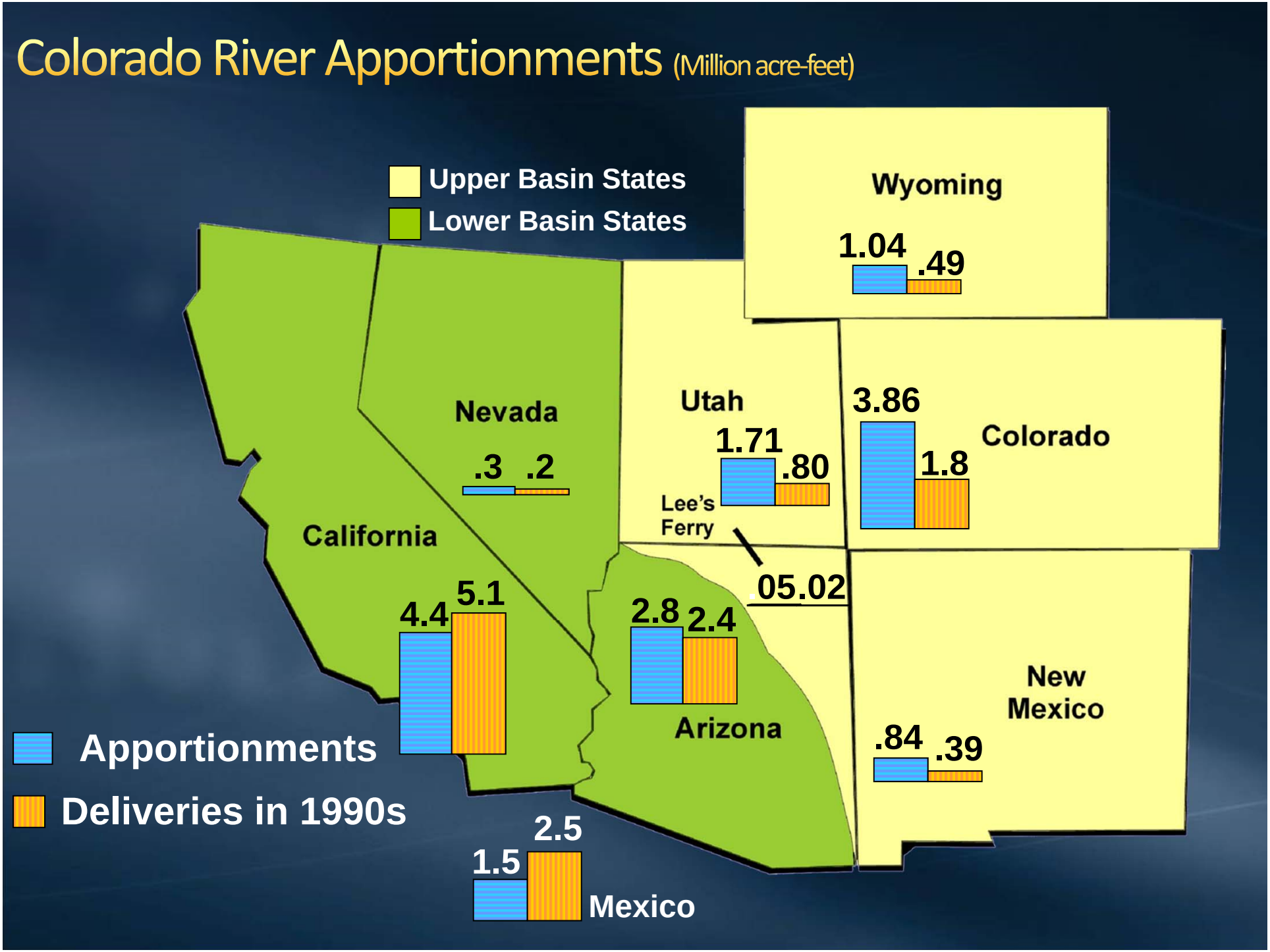
Upper Colorado River Basin Runoff



Upper Colorado River Basin Runoff



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

What is Grown in the Desert?

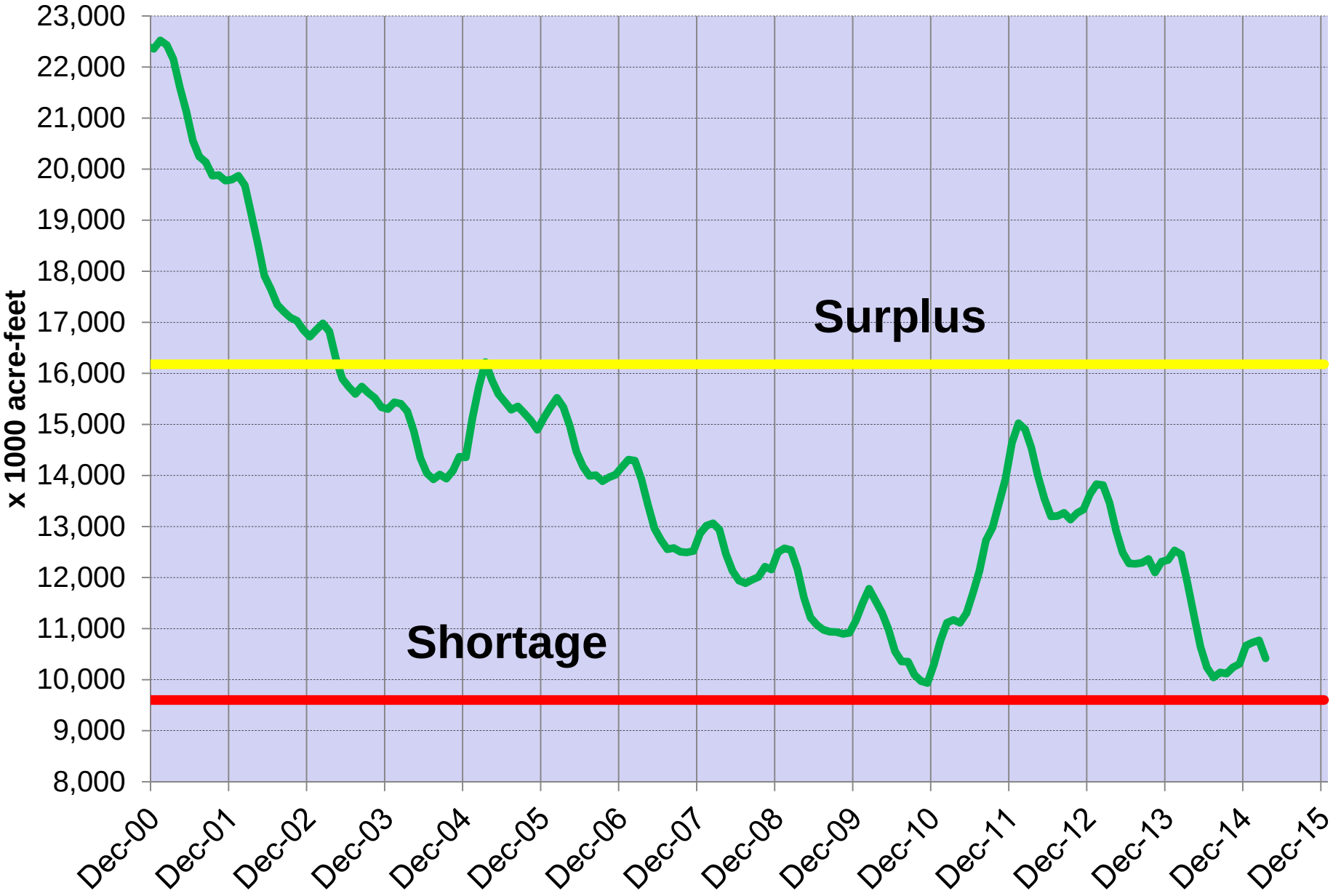
2012 Top 13 Crops (Acres)

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%**

1931 Seven Party Agreement

	MAF
1. Palo Verde Irrigation District	
2. Yuma Project	
3. Imperial Irrigation District/ Coachella Valley Water District	3.850
4. Metropolitan WD	0.550
Subtotal	4.400
5. Metropolitan WD	0.700
Total	5.100

Lake Mead Storage
2000 – 2015



How We Used to Fill the Colorado Aqueduct

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

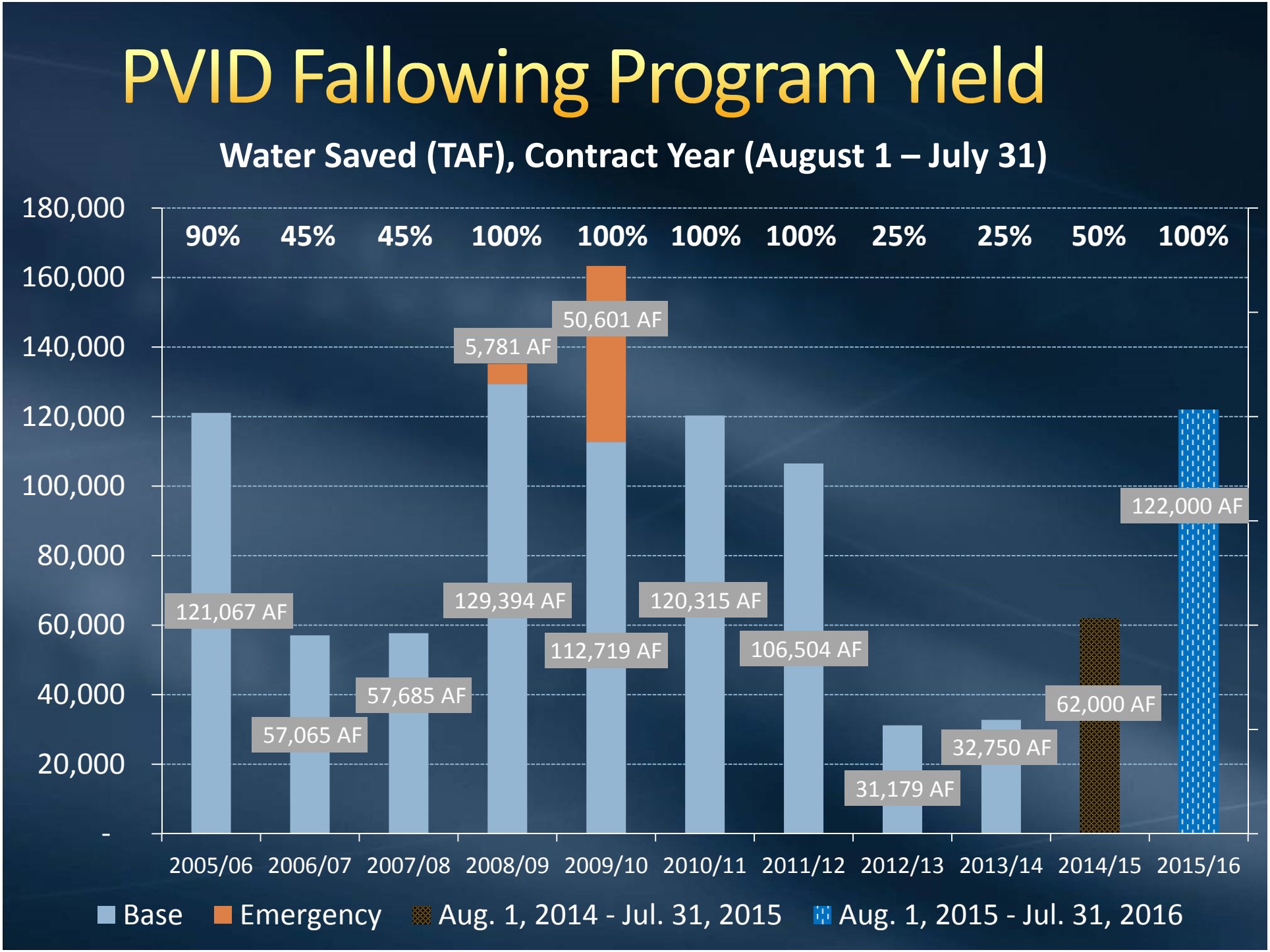
*Amount fluctuates based on PVID/Yuma Project use, unused IID and CVWD water

Agriculture Conservation Measures with IID

All-American, Coachella Canal Lining

PVID Land Fallowing

PVID Fallowing Program Yield



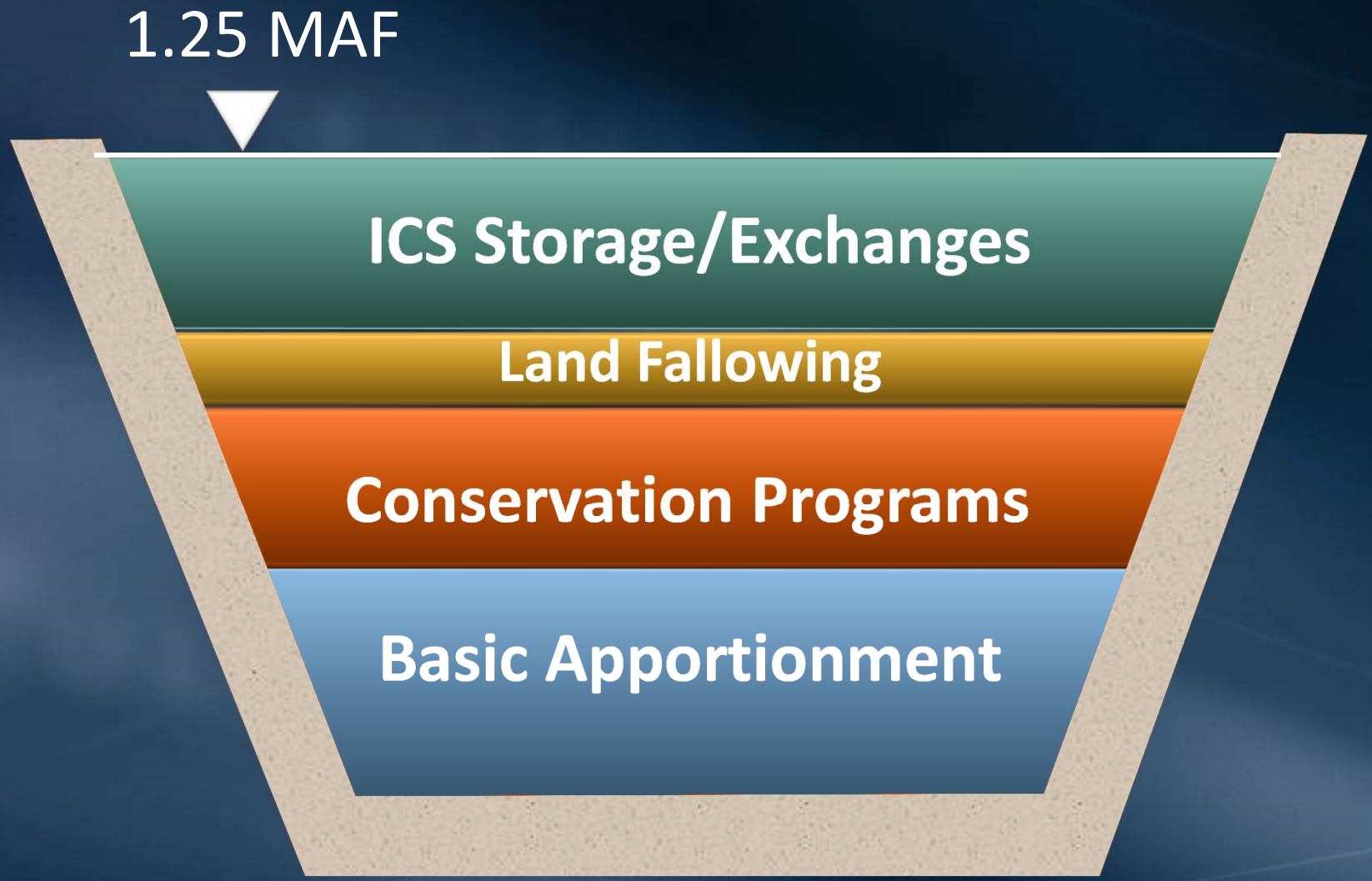
Water Sharing Agreement with Nevada

- Nevada's use down due to slow economy
- MWD has access to NV's unused water
  - 3:2 exchange; MWD retains 1/3 of water
  - Remaining 2/3 returned to Nevada after 2030

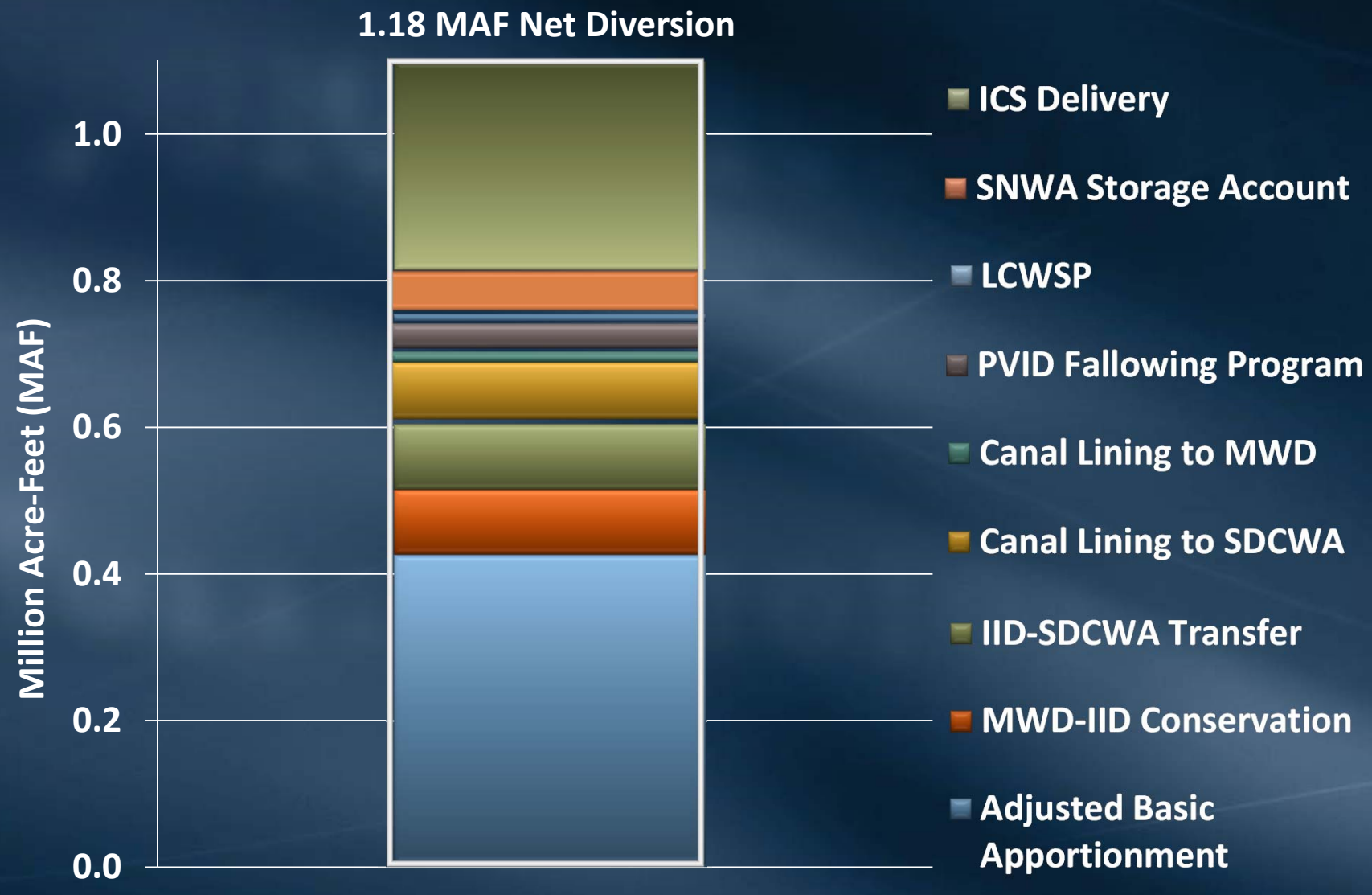
Development of Lake Mead Storage (ICS) Program

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

How We Fill the Colorado Aqueduct Today

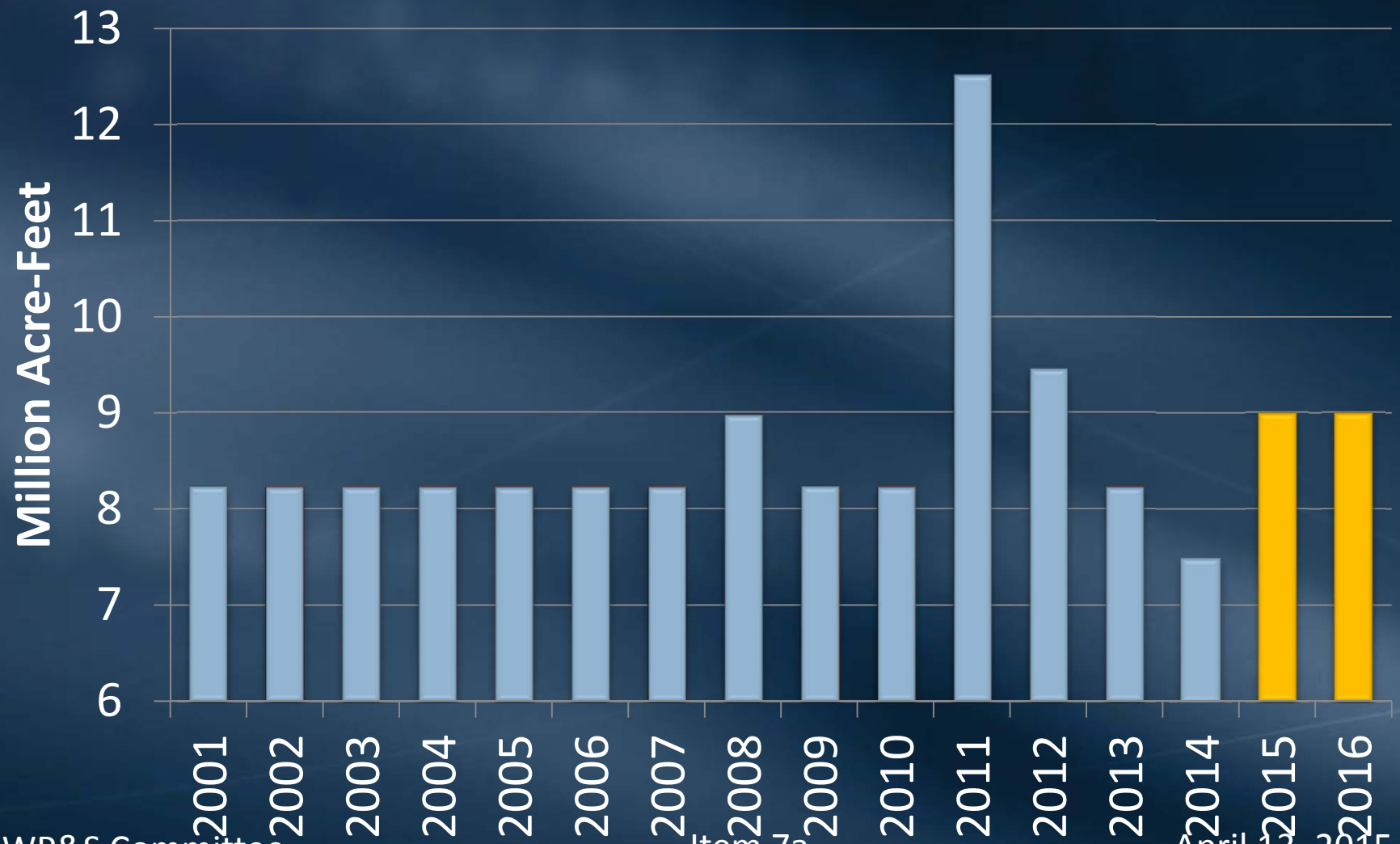


2014 Colorado River Aqueduct Supplies

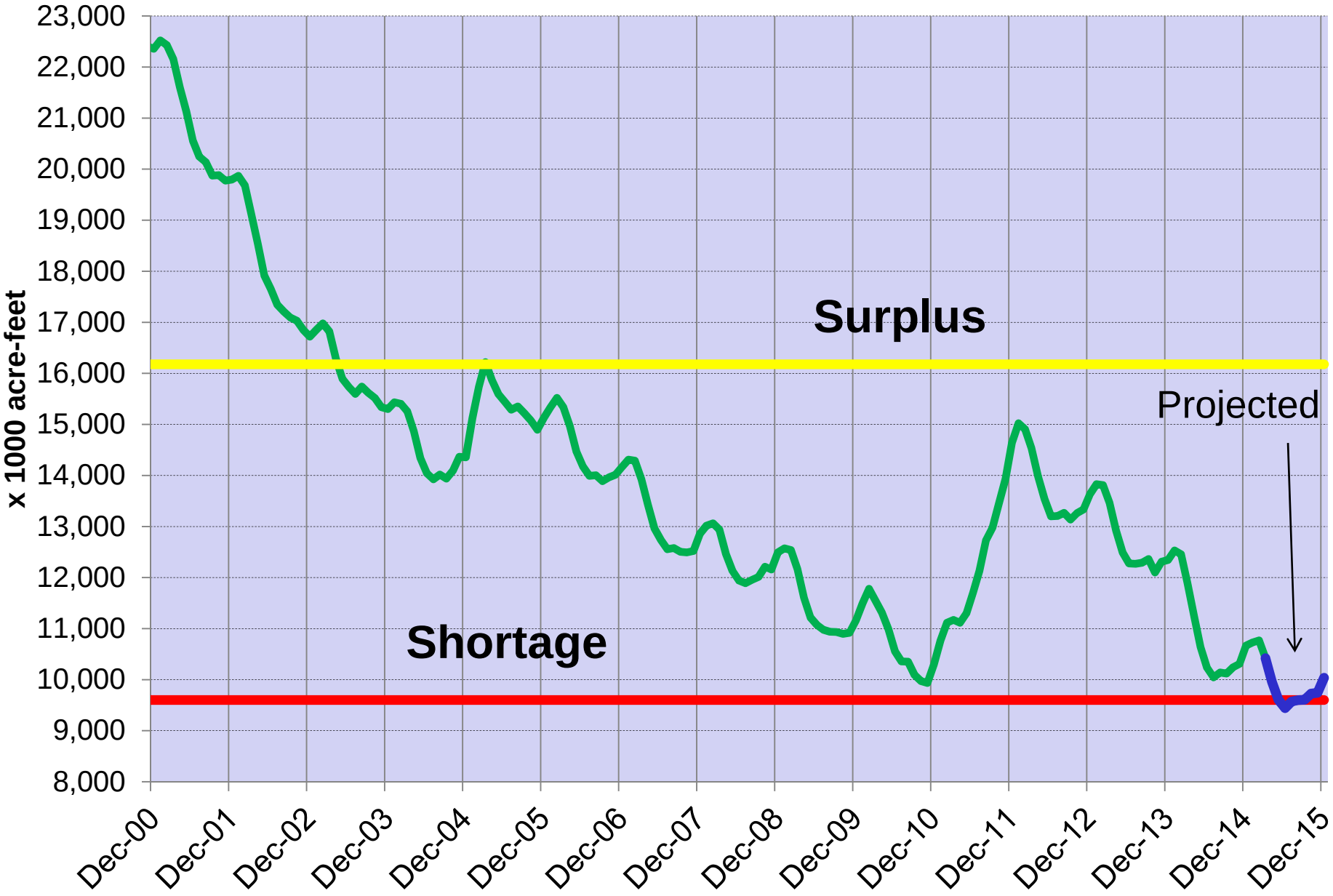


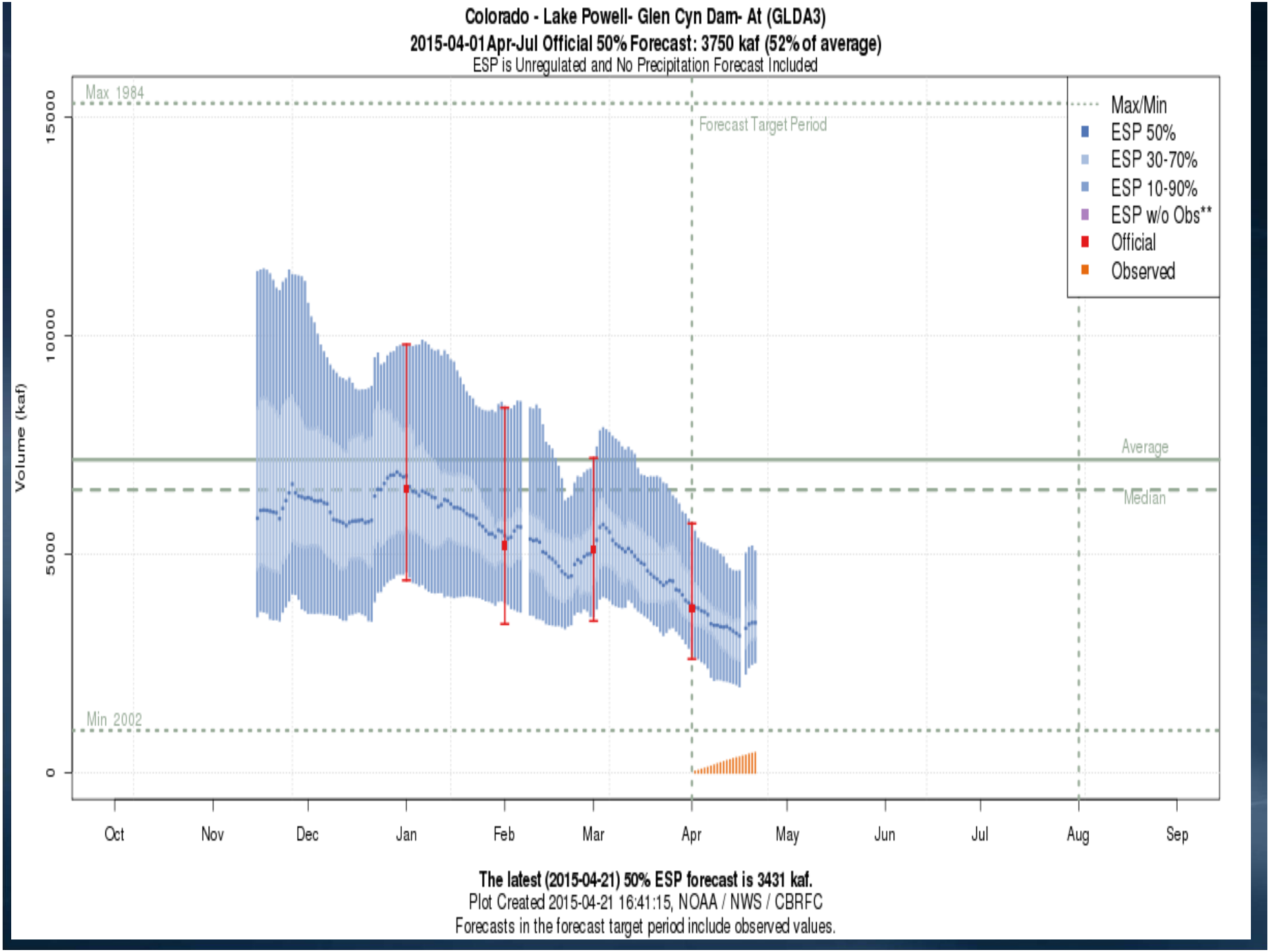
Lake Mead's Future???

Lake Powell WY Releases Based on April 1 Forecast

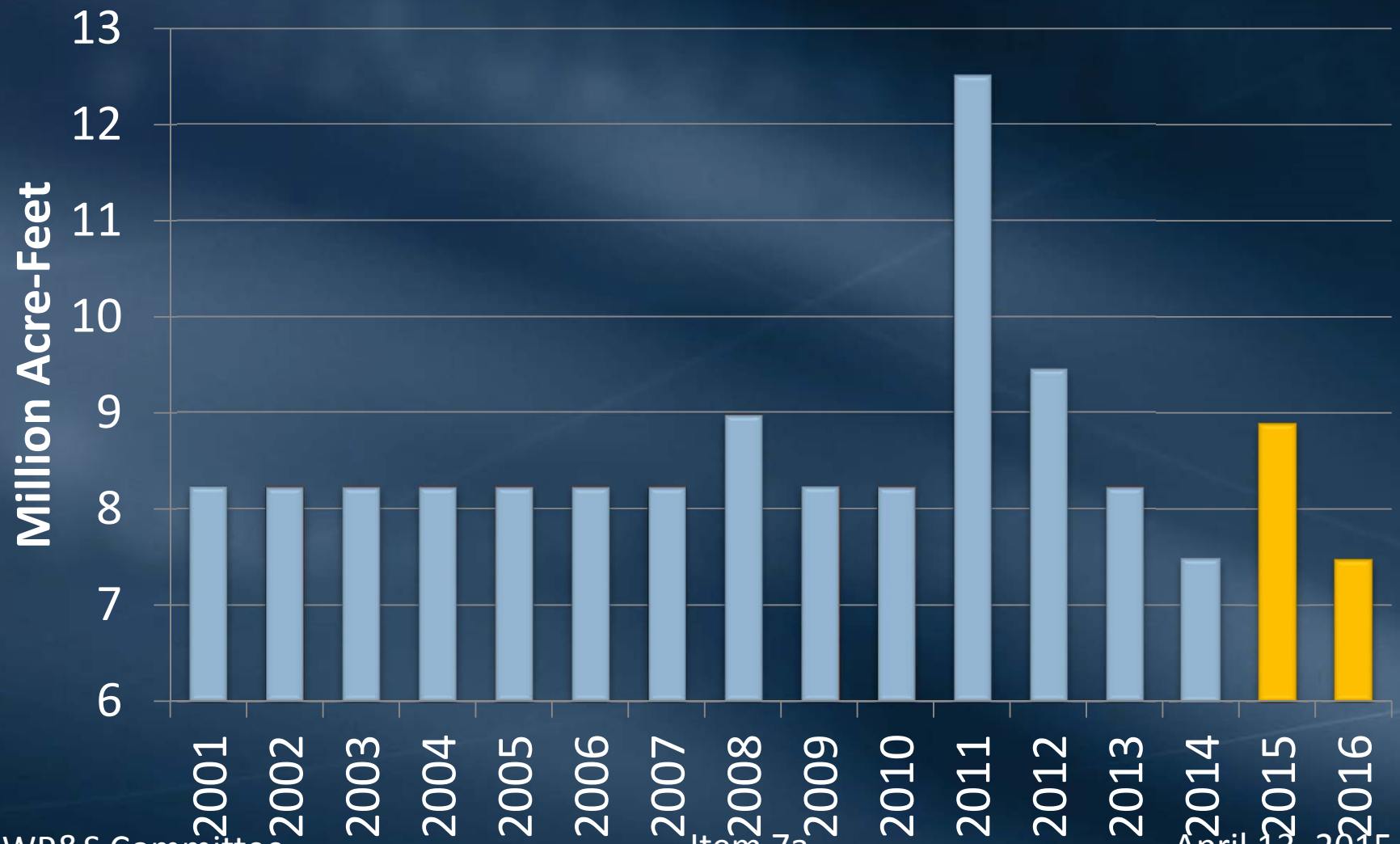


Lake Mead Storage
Actual and April 1 Projected, 2000 – 2015

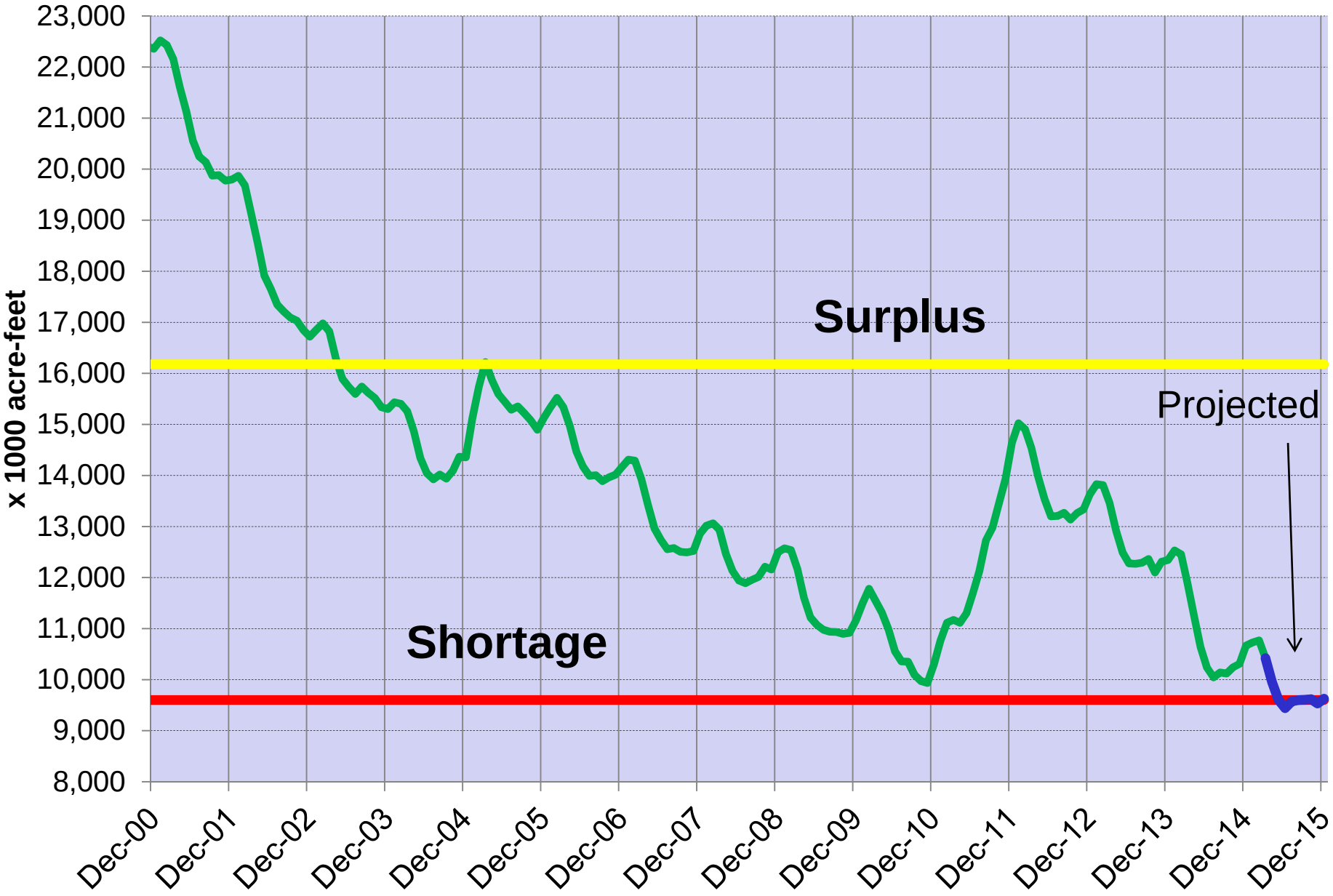



Colorado - Lake Powell- Glen Cyn Dam- At (GLDA3)
2015-04-01 Apr-Jul Official 50% Forecast: 3750 kaf (52% of average)
ESP is Unregulated and No Precipitation Forecast Included
Max 1984
Min 2002
Forecast Target Period
Average
Median
Max/Min
ESP 50%
ESP 30-70%
ESP 10-90%
ESP w/o Obs**
Official
Observed
Volume (kaf)
0
5000
10000
15000
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
The latest (2015-04-21) 50% ESP forecast is 3431 kaf.
Plot Created 2015-04-21 16:41:15, NOAA / NWS / CBRFC
Forecasts in the forecast target period include observed values.

Lake Powell WY Releases Based on April 16 Forecast



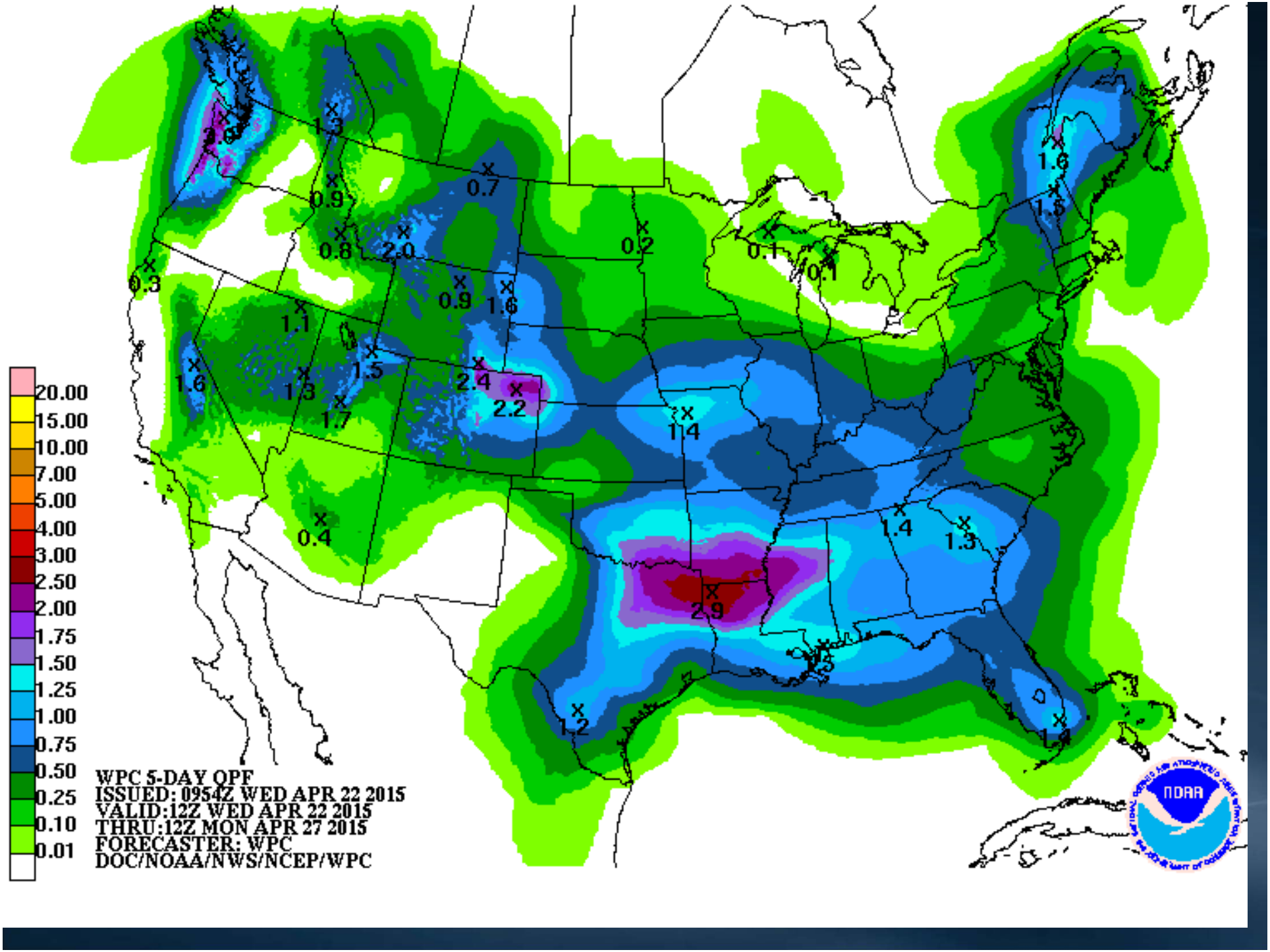
Lake Mead Storage
Actual and April 16 Projected, 2000 – 2015



MWD EOY ICS Balance in Lake Mead

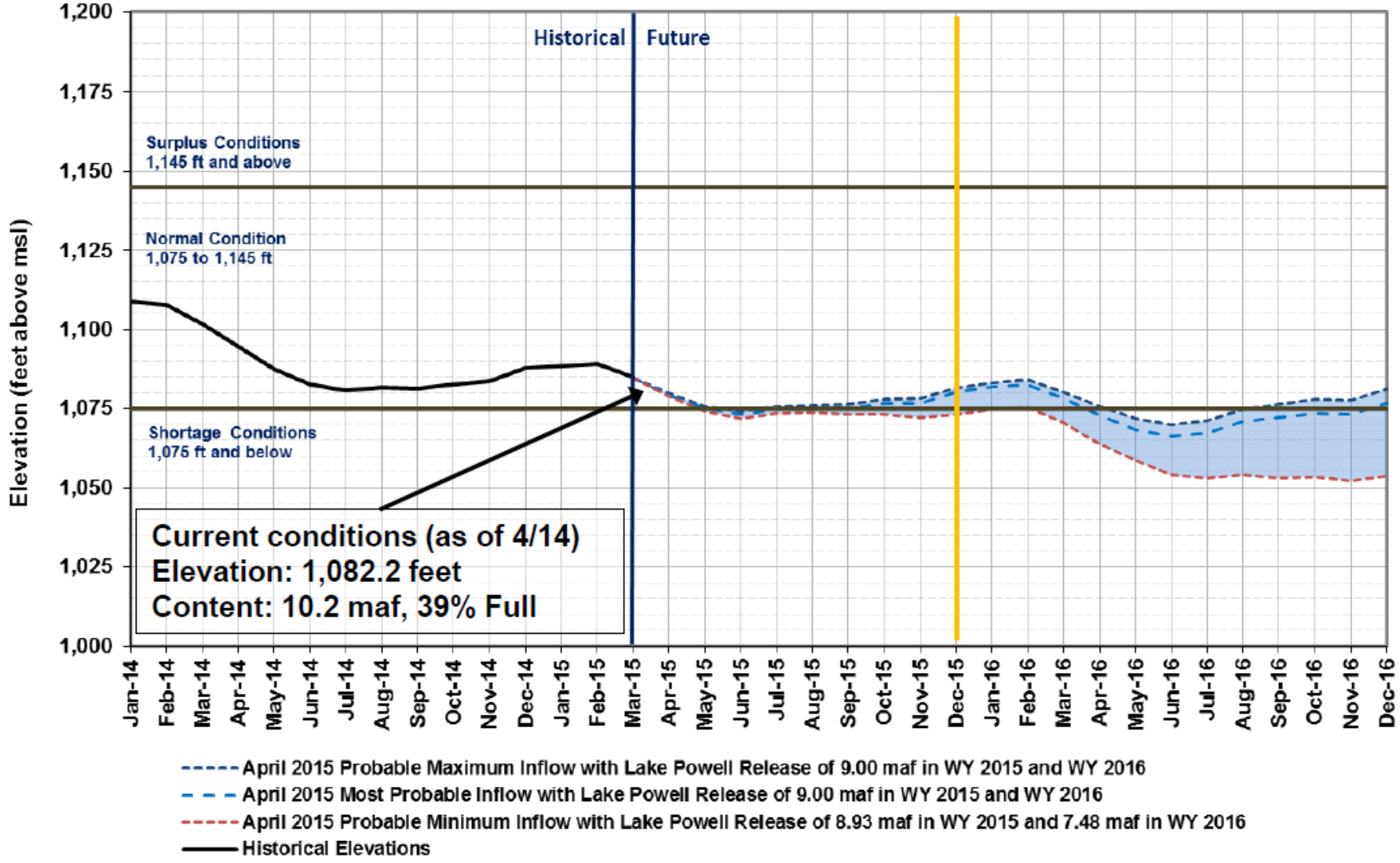
Excerpt from the 2007 Interim Guidelines

"If the May 24-Month Study for that Year indicates that a Shortage Condition would be determined in the succeeding Year if the requested amounts [of ICS] for the current Year were delivered, the Secretary may deliver less than the amounts of ICS requested to be delivered."

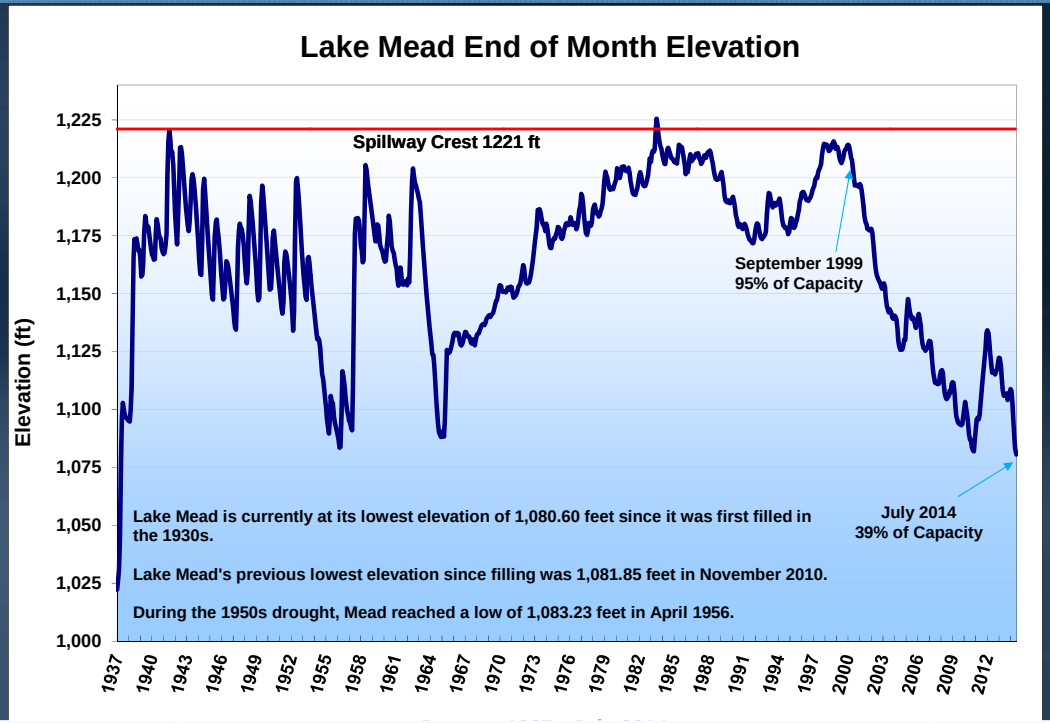

20.00
15.00
10.00
7.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
WPC 5-DAY QPF
ISSUED: 0954Z WED APR 22 2015
VALID:12Z WED APR 22 2015
THRU:12Z MON APR 27 2015
FORECASTER: WPC
DOC/NOAA/NWS/NCEP/WPC
NOAA

Lake Mead End of Month Elevations

Projections from April 2015 24-Month Study Inflow Scenarios



Colorado River Basin Hydrology and Storage



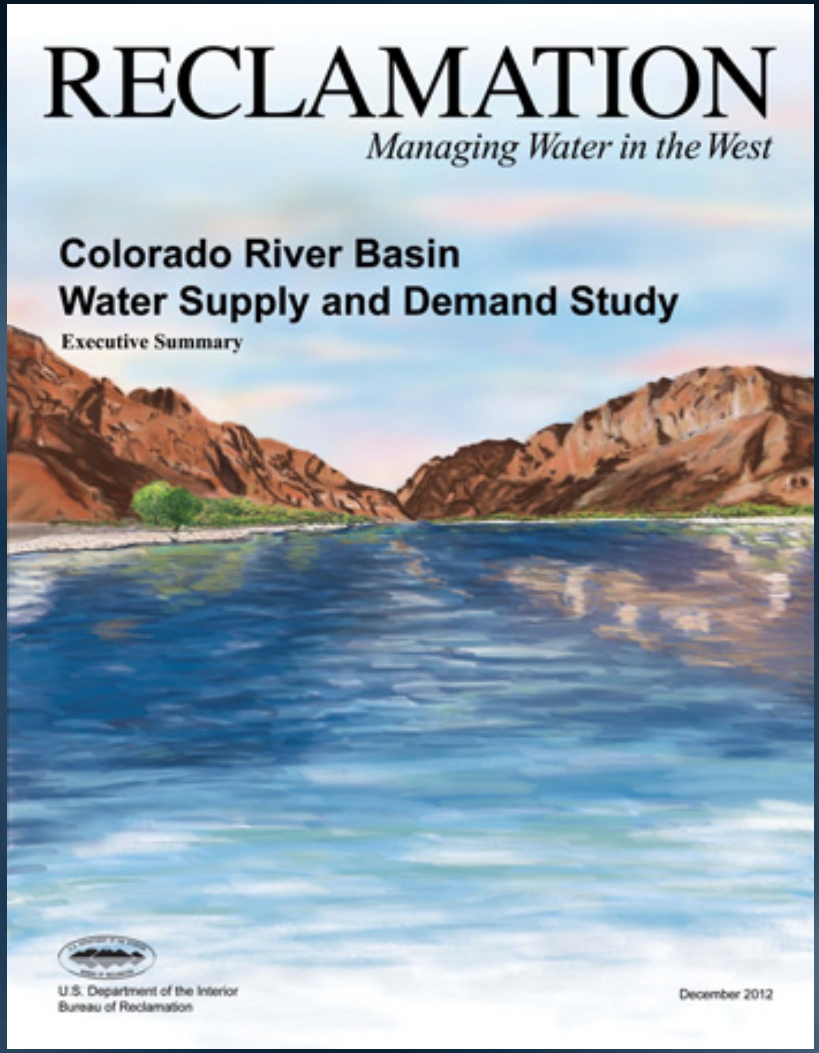
Lake Mead Elevation	Arizona Reduction	Nevada Reduction	Mexico Reduction
1075’	320,000 AF	13,000 AF	50,000 AF
1050’	400,000 AF	17,000 AF	70,000 AF
1025’	480,000 AF	20,000 AF	125,000 AF

Basin States Drought Contingency Planning

- Lower Basin Memorandum of Understanding
- Upper Basin Resolution
- Pilot System Conservation Agreement

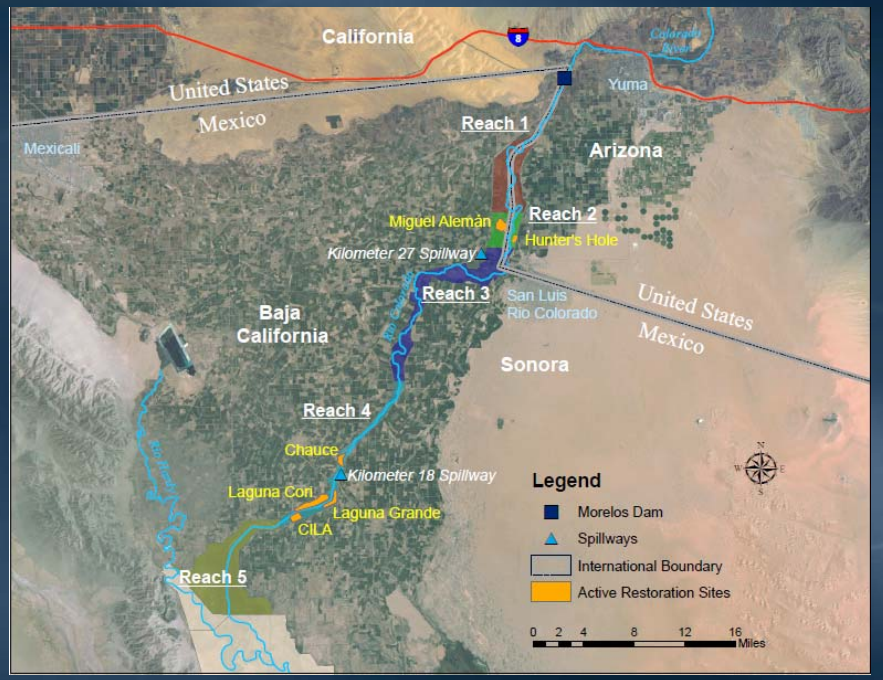
Water Supply and Demand Study

- Municipal & Industrial Conservation and Water Reuse
- Agricultural Conservation, Productivity and Water Transfers
- Environmental and Recreational Flows



Cooperation with Mexico – Minute 319

- Pulse Flow – March 23 – May 18, 2014
- Bi-national workgroups continue implementation progress



Salinity Control Forum

- Paradox Valley Unit EIS preparation
- 2014 Triennial Review

Glen Canyon Dam LTEMP & AMWG Update

- High Flow Experimental Releases
- LTEMP Environmental Impact Statement

LCR Multi-Species Conservation Program Update

- 10th Anniversary
- Planet Ranch/Hualapai Settlement
- Yellow Billed Cuckoo critical habitat

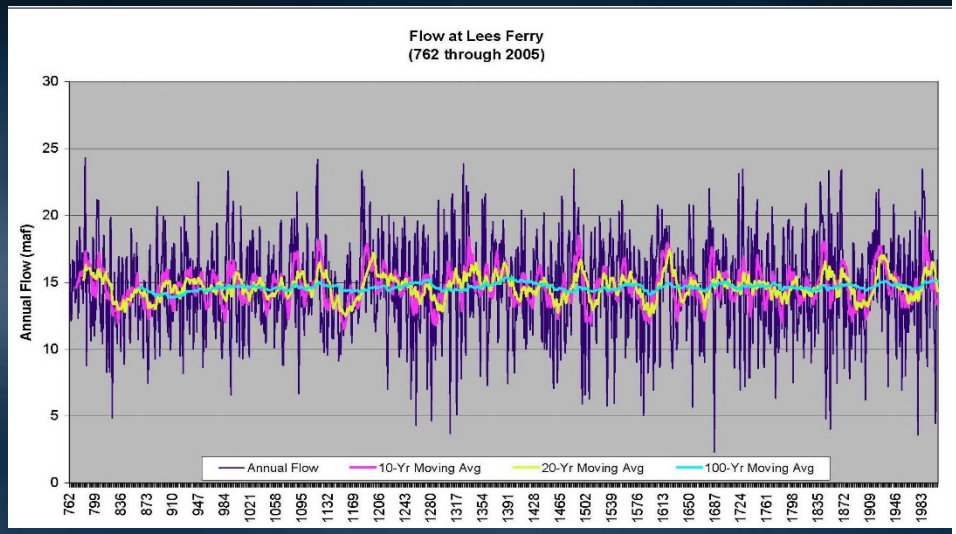
Looking Forward……

Uncertain hydrology

- **Potential for shortages**
  - **Hydropower impacts**
  - **Reduced flexibility**
  - **Water quality impacts**

Need for Continued Cooperation

- **QSA Implementation**
- **2007 Interim Guidelines**
- **Contingency Planning**



Questions?

Colorado River Board of California

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