Integrated Resources Planning Committee

Item 4c

Subject: Colorado River Outlook and the IRP

Purpose: The purpose of this oral report is to highlight potential challenges to CRA supplies in the context of setting revised targets in the 2015 IRP Update.

IRP Committee September 29, 2015

Integrated Resources Planning Committee

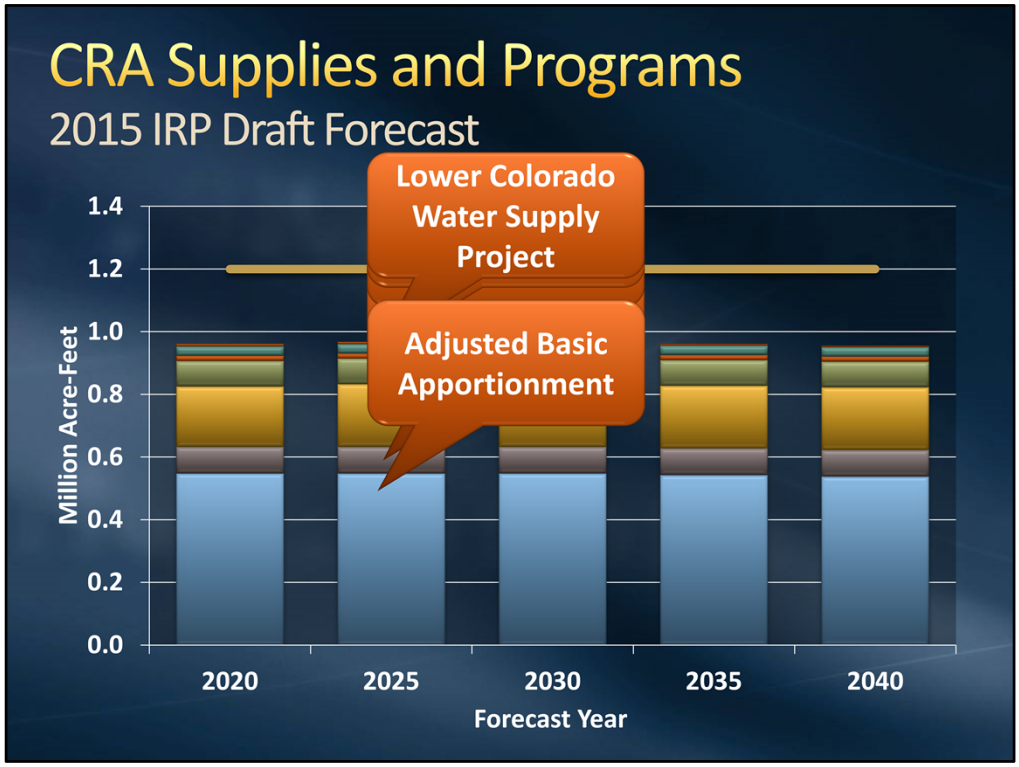
Item 4c

Summary

This oral report outlines some of the challenges to Colorado River Aqueduct supplies that could impact long-term goals in the IRP.

Colorado River Outlook and the IRP

Integrated Resources Planning Committee
Item 4c
September 29, 2015

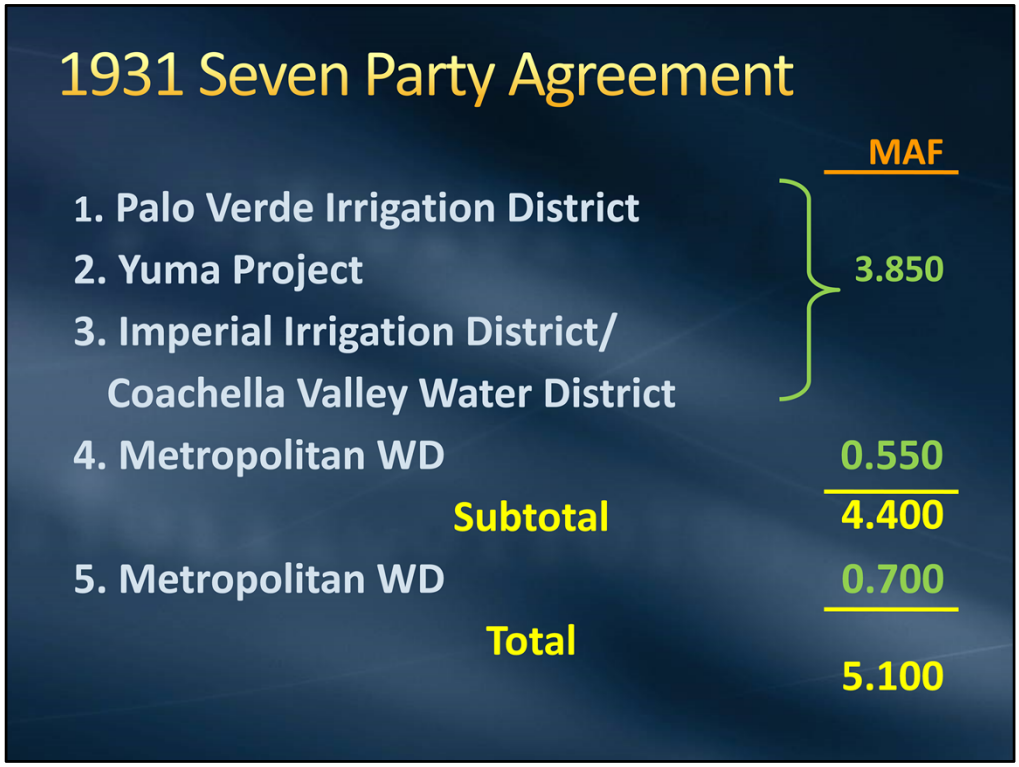

CRA Supplies and Programs
2015 IRP Draft Forecast
Lower Colorado Water Supply Project
Adjusted Basic Apportionment
Million Acre-Feet
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2020
2025
2030
2035
2040
Forecast Year

Colorado River Long-term Goals

- Maintain a reliable base of supply programs on the Colorado River Aqueduct
  - 0.9 MAF growing to 1.0 MAF
- Develop and implement options that can be used to fill the Aqueduct in dry years
  - 1.2 MAF


Challenges to Meeting
Long-Term Goals

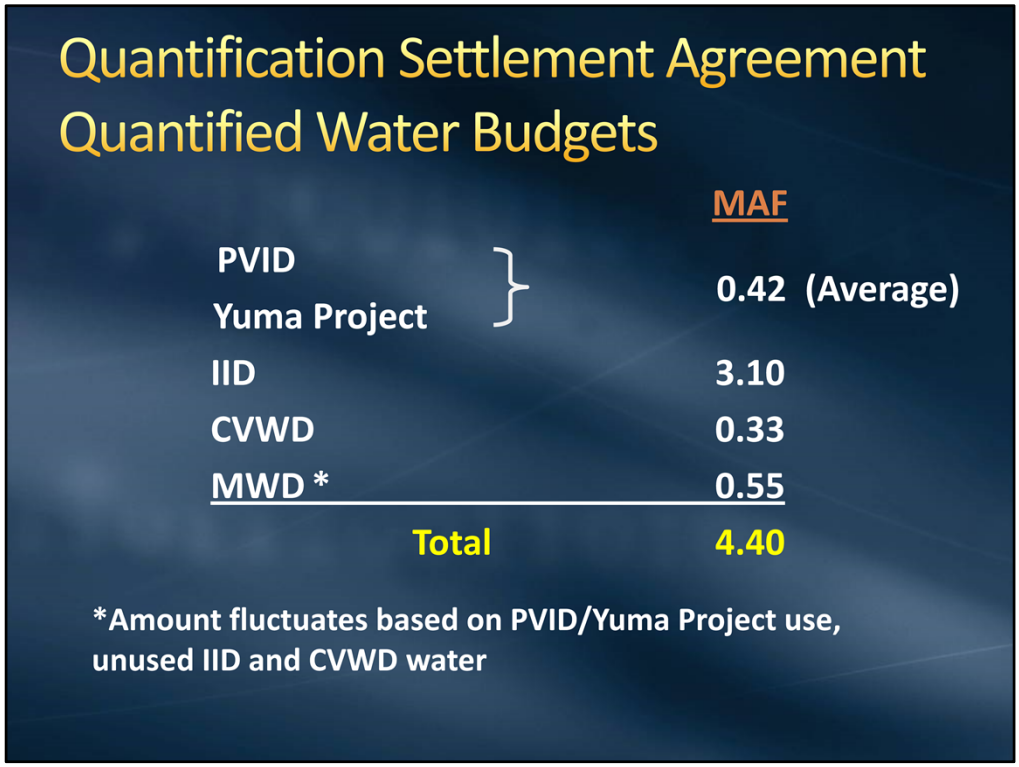
Issue #1: Minimizing Colorado River Supply Losses



So these agencies needed to figure out a way to divide up the 4.4

But they didn't need to start from scratch, back in 1931 an agreement was reached that outlined how CA share of CR water would be allocated, called the 7 party agreement

They came up with a priority system



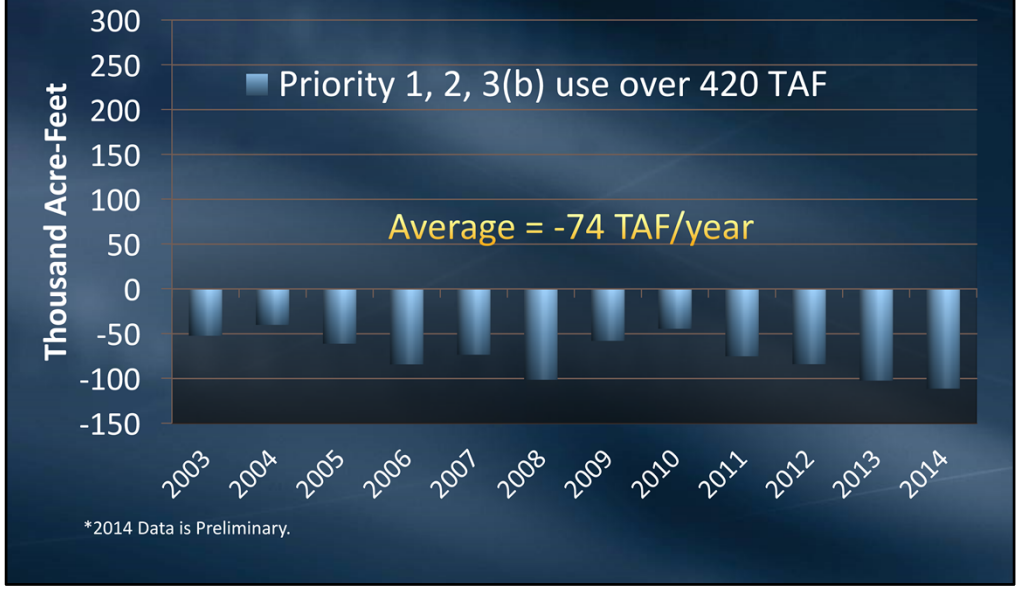
On April 24, 1930, Metropolitan and the Secretary entered into a water delivery contract pursuant to the Boulder Canyon Project Act. As a result of concerns voiced over the contract by other California agencies, and to provide more specific information on the distribution of water for incorporation into other California water delivery contracts, the Secretary requested the State of California to provide a recommendations as to the allocation of the State's apportionment.

This resulted in the Seven Party Agreement executed on August 18, 1931 by the:

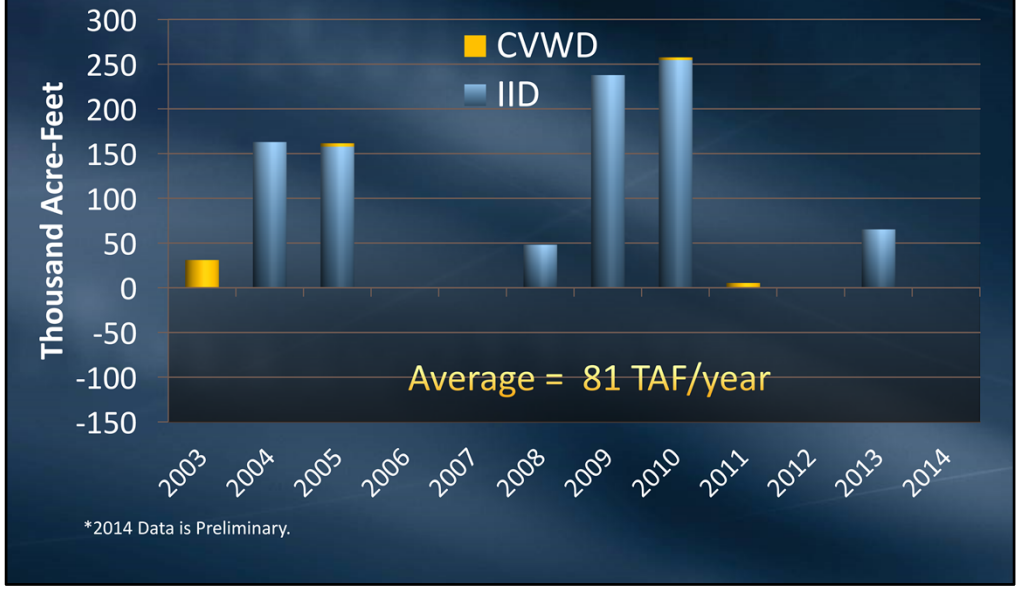
- Palo Verde Irrigation District
- Imperial Irrigation District
- Coachella Valley Water District
- Metropolitan
- City of Los Angeles
- City of San Diego
- County of San Diego

The Seven Party Agreement was incorporated into the water delivery contracts which Palo Verde, Imperial, Coachella, and the City of San Diego entered into with the Secretary. Metropolitan's 1930 contract was supplemented accordingly.

Agricultural Adjustments from Priority 1, 2, and 3(b) Use

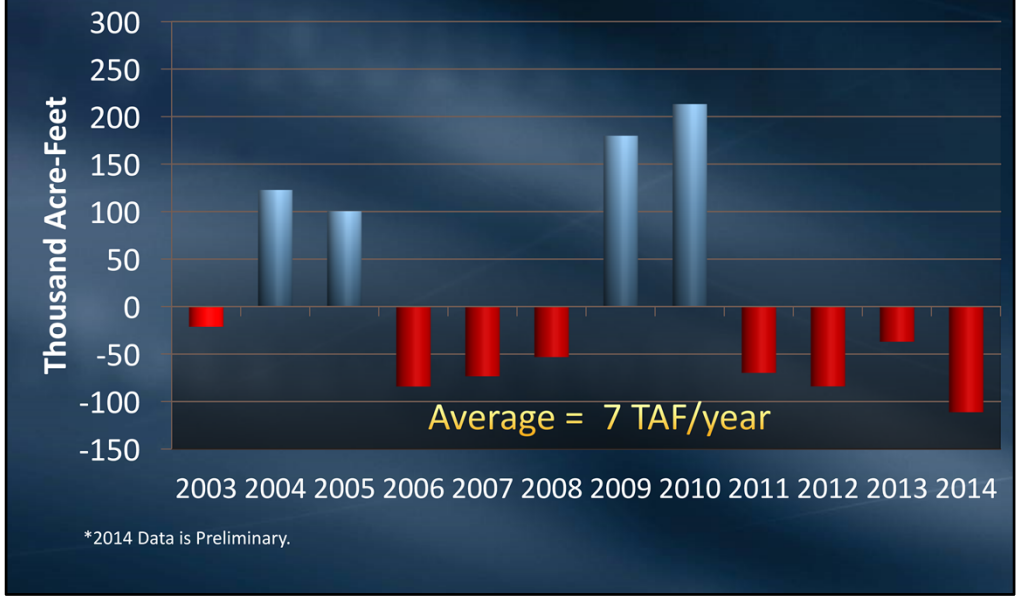


Annual Unused Apportionment from IID and CVWD



*2014 Data is Preliminary.

Annual Net Adjustment to Metropolitan's Basic Apportionment

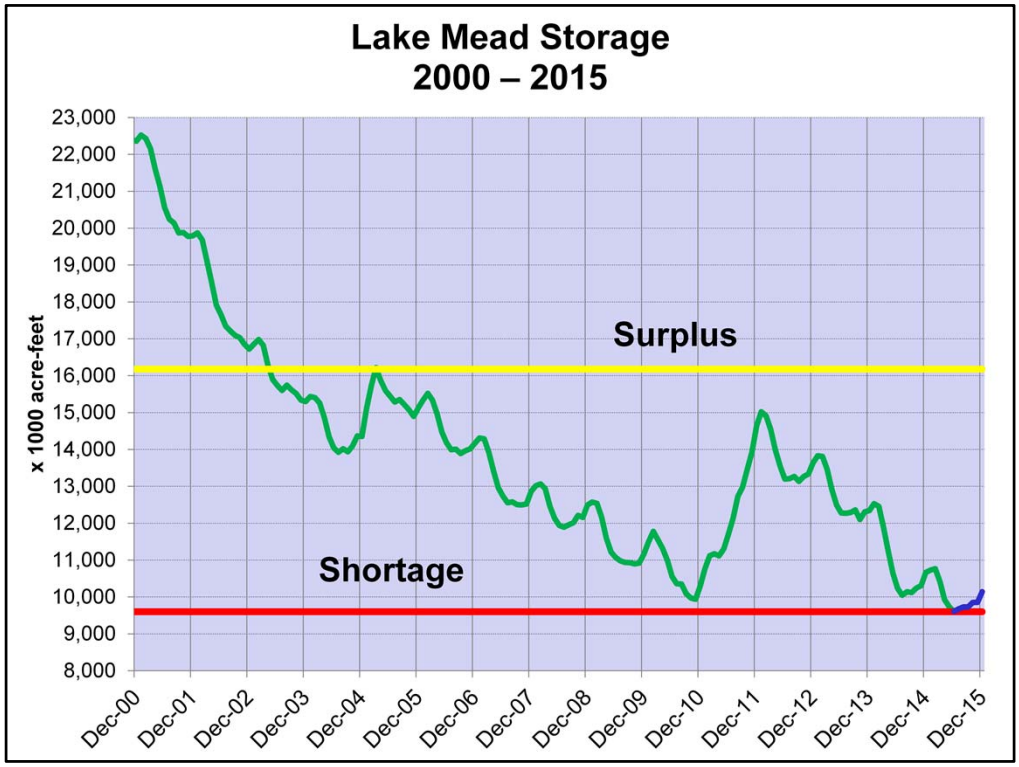


*2014 Data is Preliminary.

Water Supply Risks to Metropolitan

- Agricultural demand could grow along the Colorado River
  - PVID: 16,000 additional mesa acres
  - CRIT: 56,000 AF of unused water rights
  - Other areas could grow
- Water use increases would affect MWD's supply
- Options to address increases include expanded agricultural conservation, purchasing land to manage water supply

Issue #2: Dealing with Drought


Lake Mead Storage
2000 – 2015
x 1000 acre-feet
23,000
22,000
21,000
20,000
19,000
18,000
17,000
16,000
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
Surplus
Shortage
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
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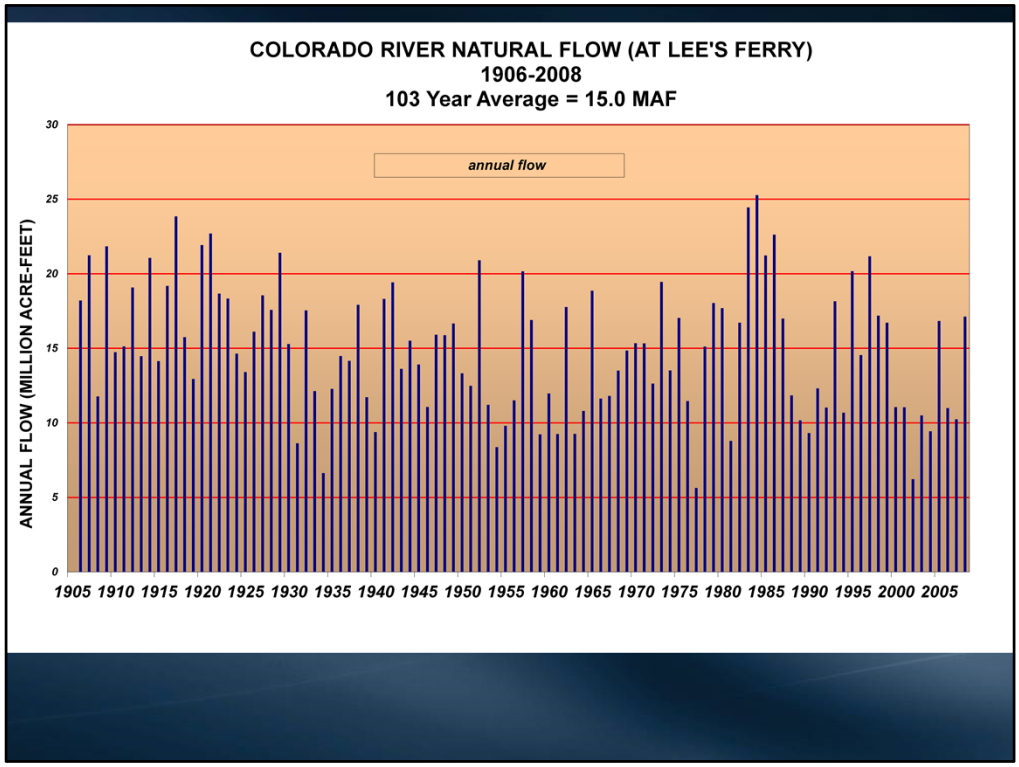
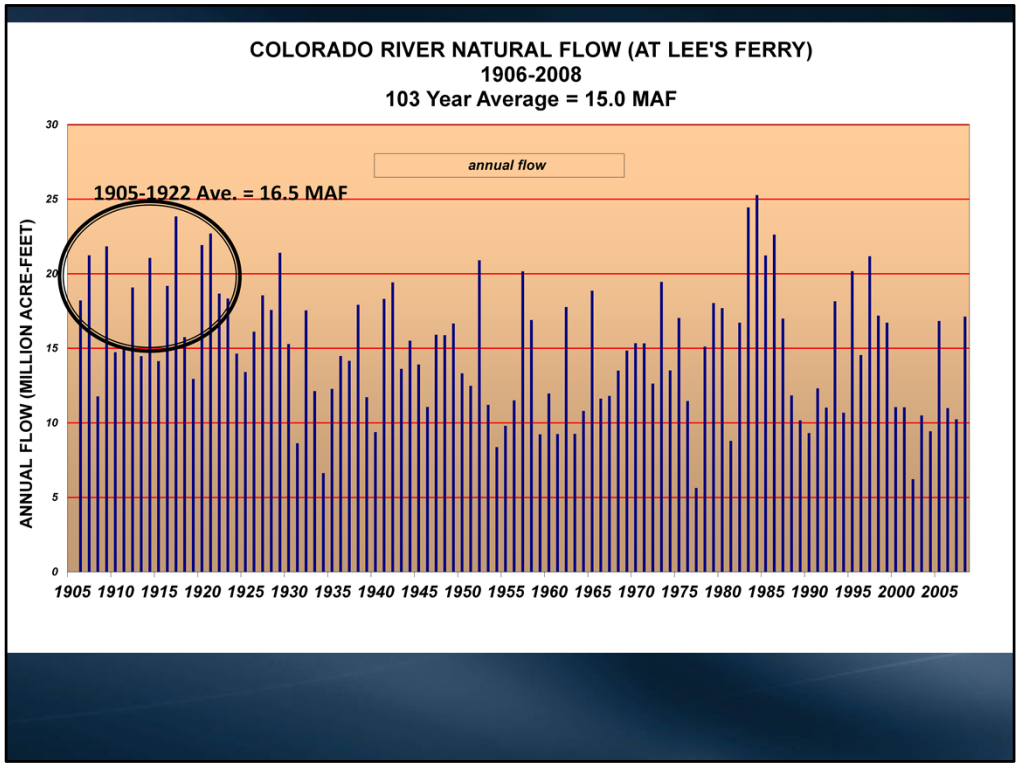
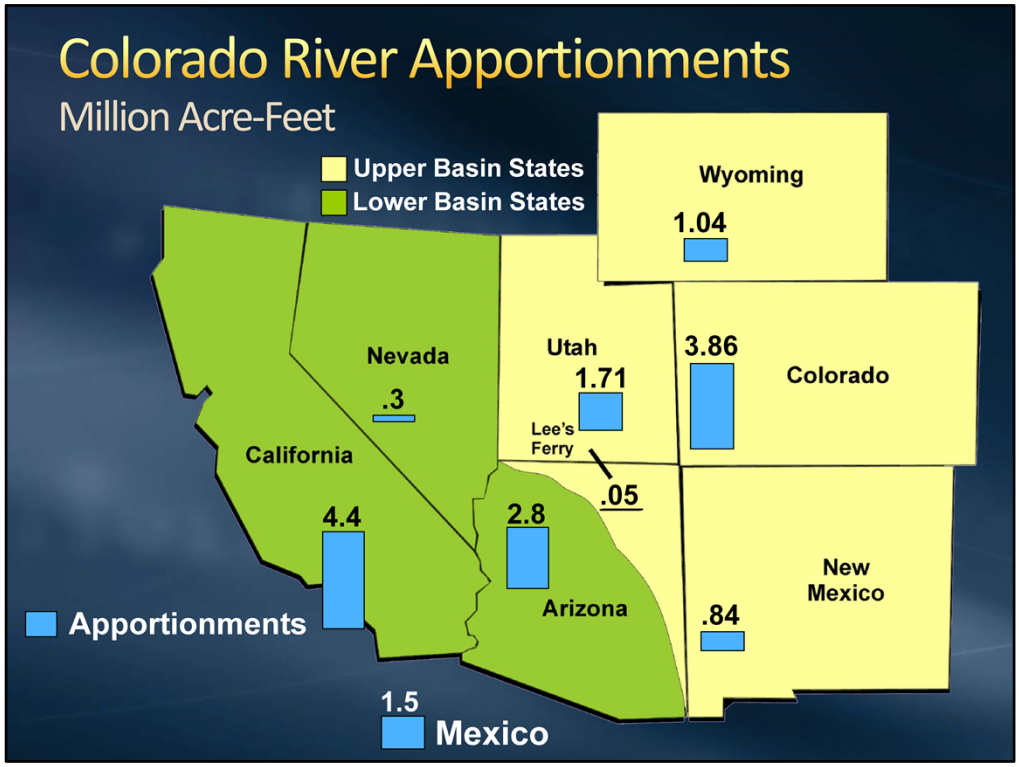
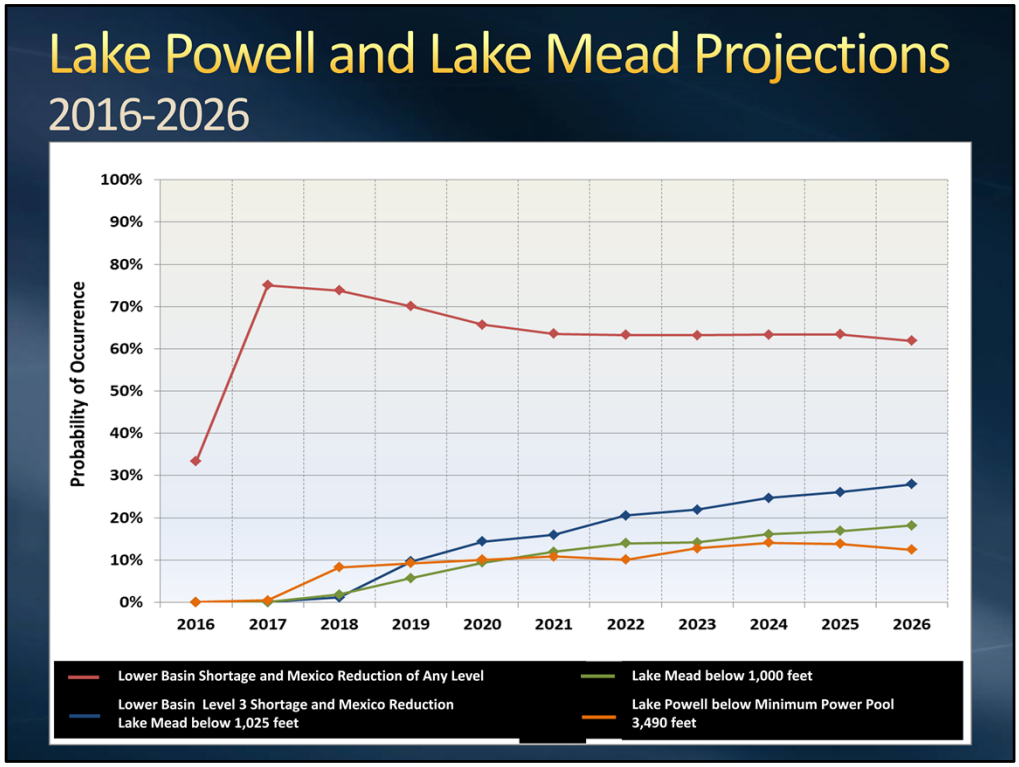
Dec-13
Dec-14
Dec-15


COLORADO RIVER NATURAL FLOW (AT LEE'S FERRY)
1906-2008
103 Year Average = 15.0 MAF
annual flow
ANNUAL FLOW (MILLION ACRE-FEET)
30
25
20
15
10
5
0
1905 1910 1915 1920 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005


COLORADO RIVER NATURAL FLOW (AT LEE'S FERRY)
1906-2008
103 Year Average = 15.0 MAF
annual flow
1905-1922 Ave. = 16.5 MAF
ANNUAL FLOW (MILLION ACRE-FEET)
30
25
20
15
10
5
0
1905 1910 1915 1920 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005


Colorado River Apportionments
Million Acre-Feet
Upper Basin States
Lower Basin States
Wyoming
1.04
Utah
1.71
Lee's Ferry
.05
Colorado
3.86
Nevada
.3
California
4.4
Arizona
2.8
New Mexico
.84
Apportionments
1.5
Mexico



Key points:

- This figure illustrate the probabilities of reaching critical reservoir elevations in Lakes Powell and Mead through 2026 assuming observed historical hydrology.
- Based on the January CRSS Run:
    - Projections show approximately a 21% chance of a U.S. Lower Basin shortage and Mexico reduction in 2016, with a more significant chance (approximately 50%) in 2017.
    - Under the 2007 Interim Guidelines, the probability of a U.S. Lower Basin shortage is around 60% for most of the remainder of the interim period (through 2026).
    - These projections will be updated in April.
- Climate models indicate we should expect increased variability in the future which may include longer, more extreme dry and wet periods than previously observed.

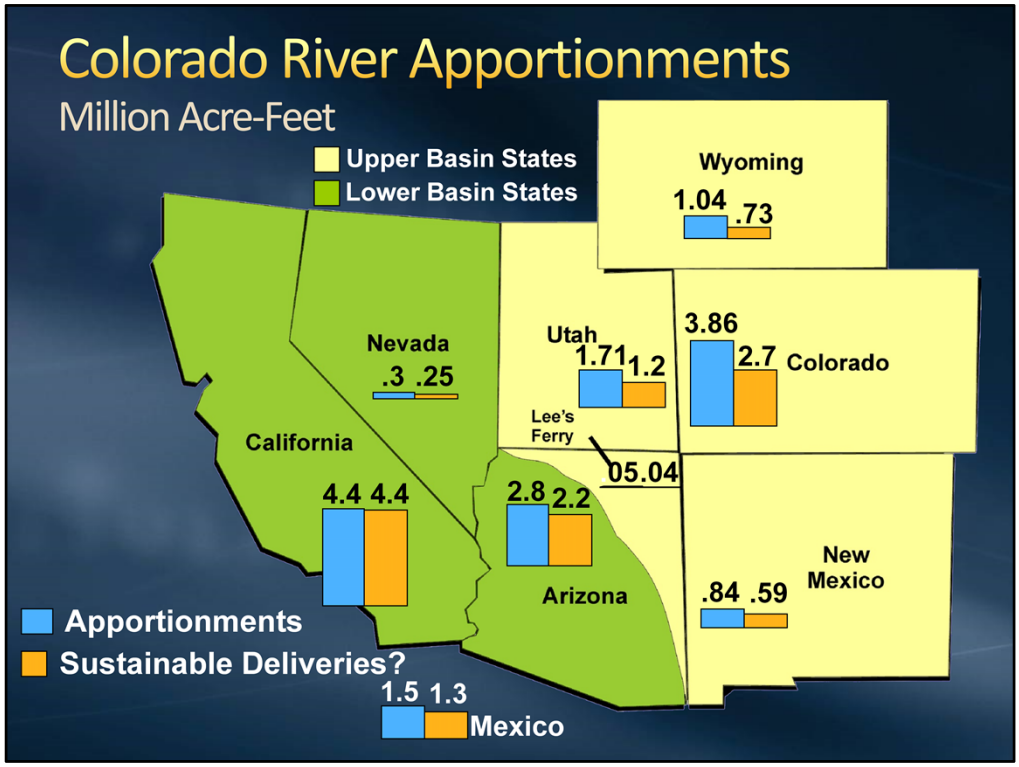
- At elevation 1,000 feet (304.8 meters), Lake Mead's storage is approximately 4.5 maf (5,550 mcm), or 17% of capacity.
- At elevation 3,490 feet (3,063.8 meters), Lake Powell's storage is approximately 4.0 MAF (4,930 mcm), or 16% of capacity.

- Projections are done using the Colorado River Simulation System (CRSS) with

initial conditions projected by the October 24-Month Study.

- Observed Historical Hydrology resamples the observed historical record of 1906-2010 for 105 future sequences.

Lake Mead's Future in Average Years



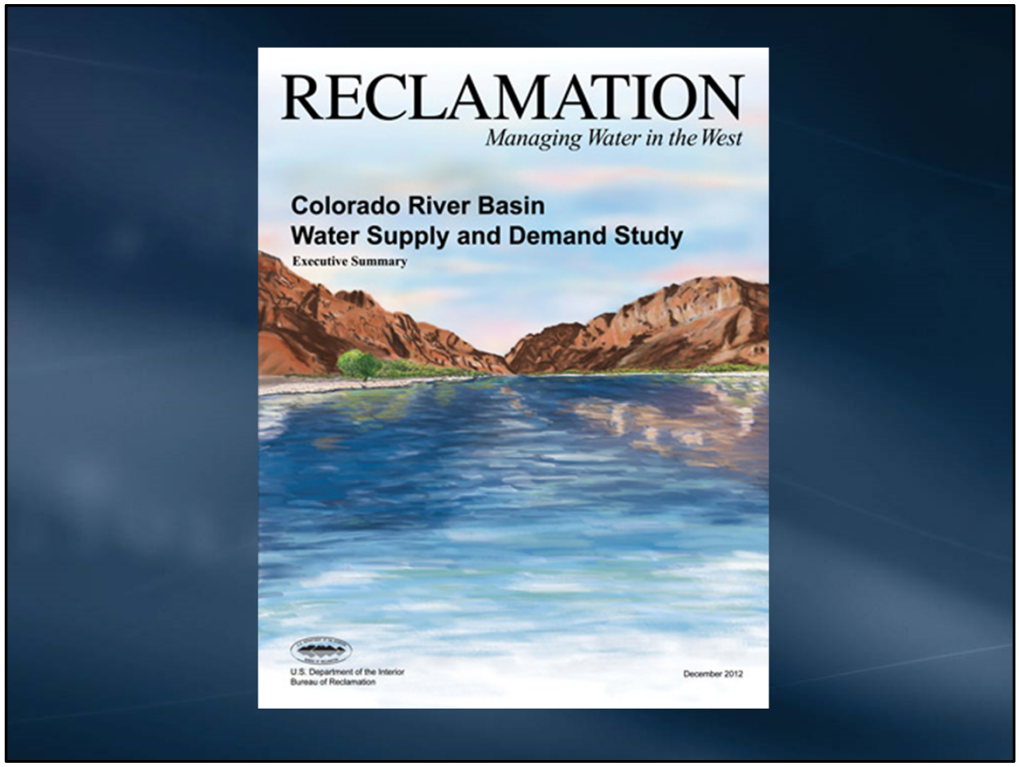
So as you probably got a sense of yesterday, the Colorado river is divided up between a series of compacts and decrees
The upper basin received 7.5 maf, the lower basin received 7.5 maf and through a Treat with the US, Mexico received 1.5 maf
Subsequent agreements further divided the river and as you can see here each state received an apportionment of that water
So why all the fuss… this looks pretty straightforward… not everything is as simple as it looks.

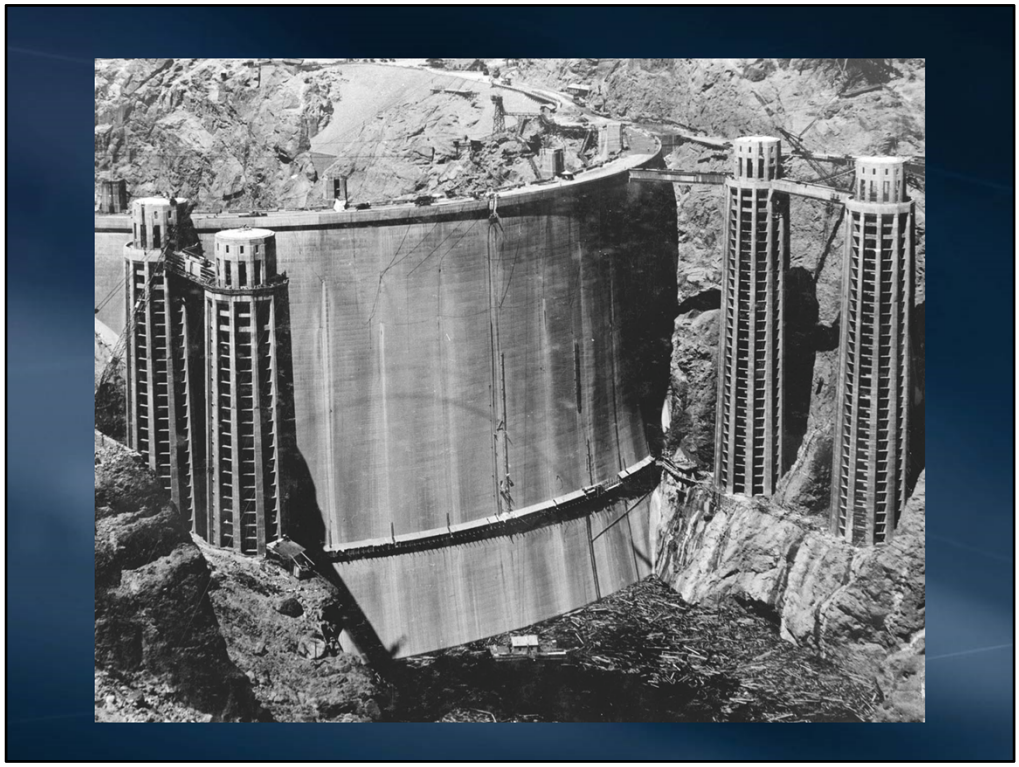
So these are the apportionments… now here is how the actual water deliveries looked like in the 1990's. All states, except for one, was using well below their apportionments.

CA developed faster then the other states, and it was able to use water the other slower developing states were not using and this allowed CA to bring in 5.1 maf.
OK, so this worked, for a while… that all changed in 2002 when NV and AZ started to use their full apportionments and told CA, you need to live within your means.
So CA had to develop a plan to reduce its use down to 4.4 maf

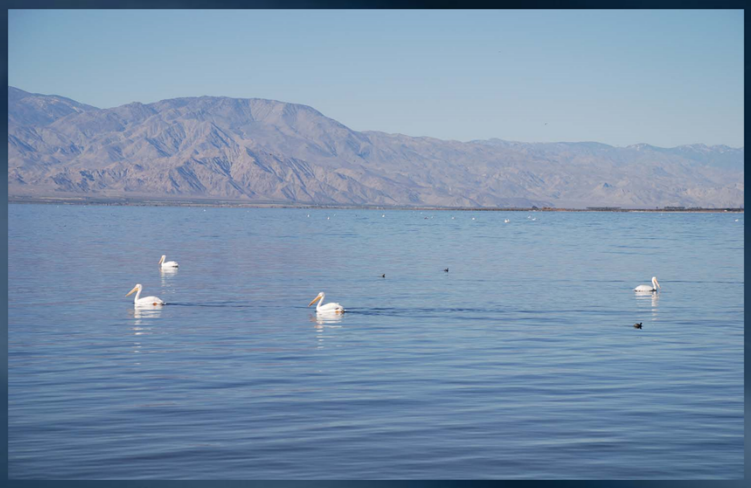
Shortage Impacts to Metropolitan

- Many water management and supply programs impacted
  - ICS Storage in Lake Mead
  - SNWA Exchange Program
  - Fund conservation outside of CA
  - Overrun flexibility
- If shortage severe enough, California could be cut back
- Working with other states to address issues


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



Issue #3: Uncertain Future of the Salton Sea



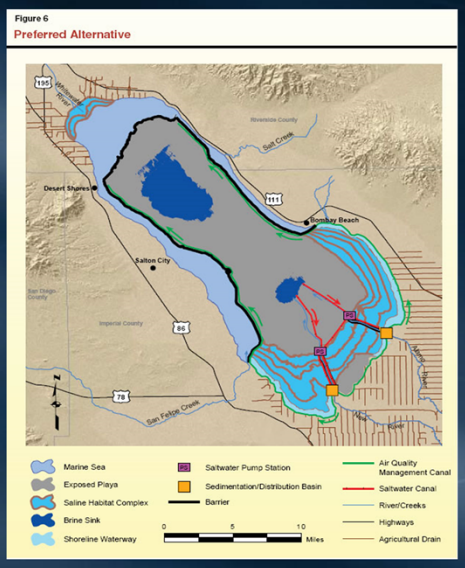
QSA Provided Time to Restore the Salton Sea

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

Frequent Fish Kills on the Salton Sea

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

- State has done little to advance Sea's restoration
- Issued Draft EIR
  - Preferred Alternative $9 billion, $100 million O&M
- IID petitioned SWRCB to condition QSA transfers on Salton Sea restoration
- Resources agencies hosting meetings with stakeholders



Using Trust Fund monies, Needles would be responsible for:
-constructing Stage 2 of the Project to increase Project capacity to 10,000 acre-feet per year,
-conducting studies to forecast the future salinity of Project water and assessing potential solutions should the salinity be projected to exceed the threshold,
-implementing a solution to reduce the salinity of Project water, or acquiring a less expensive alternative supply to replace Project water, and
-defraying any incremental increase in operation, maintenance, replacement, and administration costs necessary to operate and maintain the solution to reduce salinity.

Salton Sea Risks to the QSA

- IID threatens to end transfers to SDCWA and CVWD without restoration plan
- If dust not sufficiently mitigated, lawsuits could block QSA transfers
- Encouraging state to develop consensus Salton Sea solution

Summary

- Metropolitan, along with SDCWA, have implemented significant ag to urban transfers to help CA live within 4.4 MAF Apportionment
- New tools have been developed to help manage those supplies
  - Lake Mead ICS
- The Colorado River faces continued challenges to its water supply reliability that will require new and innovative agreements and actions

Summary

- Potential approaches to stabilizing CRA supplies
  - Increase fallowing (Bard, PVID) to offset higher priority use
  - Incentivize lower water use crops
  - Purchase land
  - Be proactive in Salton Sea solutions
  - Negotiate ICS and exchange flexibility rules during shortages


THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA