Southern Nevada Water Authority

Legal Mechanisms and Management Under Continuing Drought

Implications of Lower Lake Levels
Colorado River Commission of Nevada
2010 Symposium

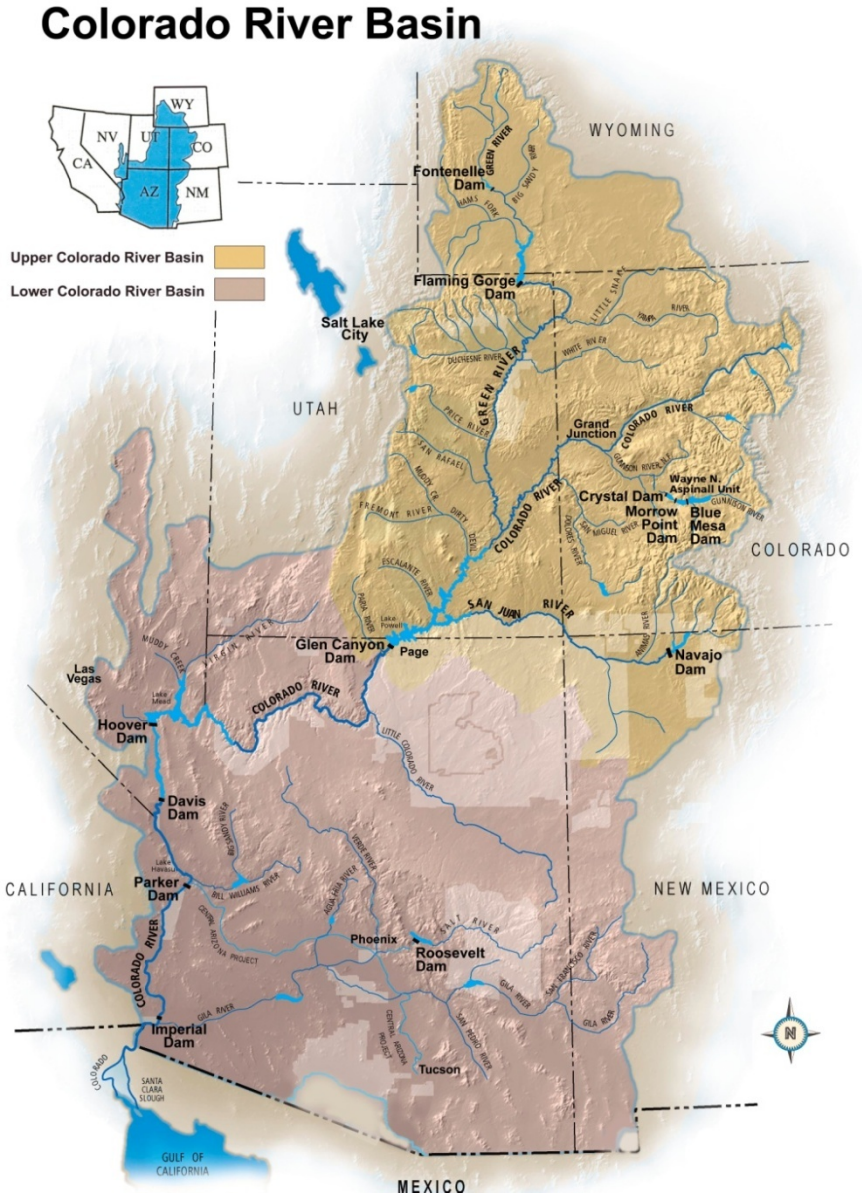
April 22, 2010

Background:

Law of the River
Colorado River Hydrology

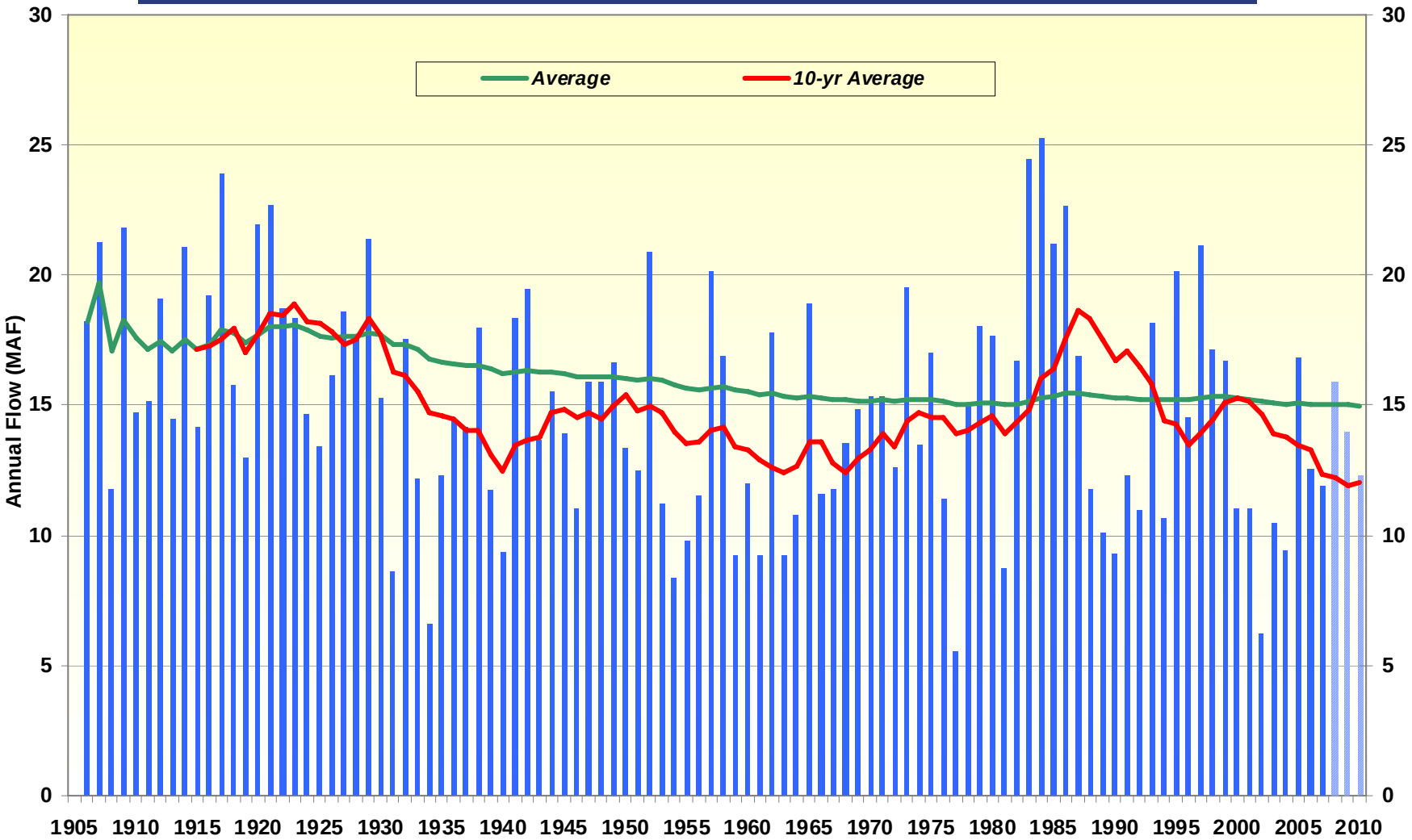
Colorado River Basin

- 16.5 million acre-feet (maf) allocated annually
- 1.7 maf lost to evaporation annually
- 15.1 maf average annual “natural” inflow into Lake Powell over past 100 years
- 66% of average annual inflow to Lake Powell for last 9 years
- Irrigates 3 million acres
- Serves about 30 million people including Phoenix, Las Vegas, Los Angeles, Denver, Albuquerque and San Diego areas



Natural Flow

Colorado River at Lees Ferry - Water Year 1906 to 2010



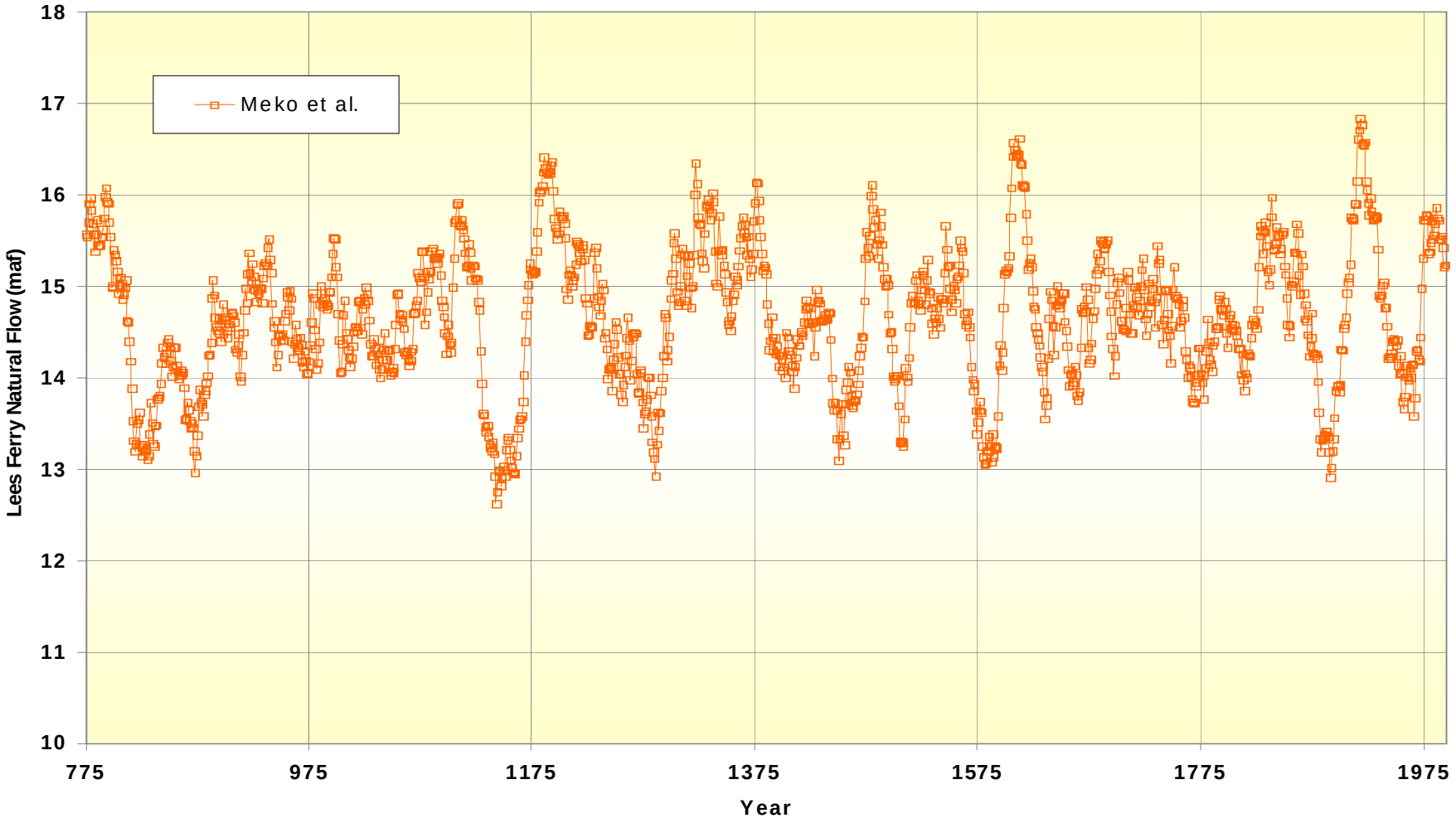
Provisional data, subject to change

Estimated values for 2008-2010

Annual Natural Flow at Lees Ferry

Tree-ring Reconstruction (Meko et al., 2007)

25-Year Running Mean

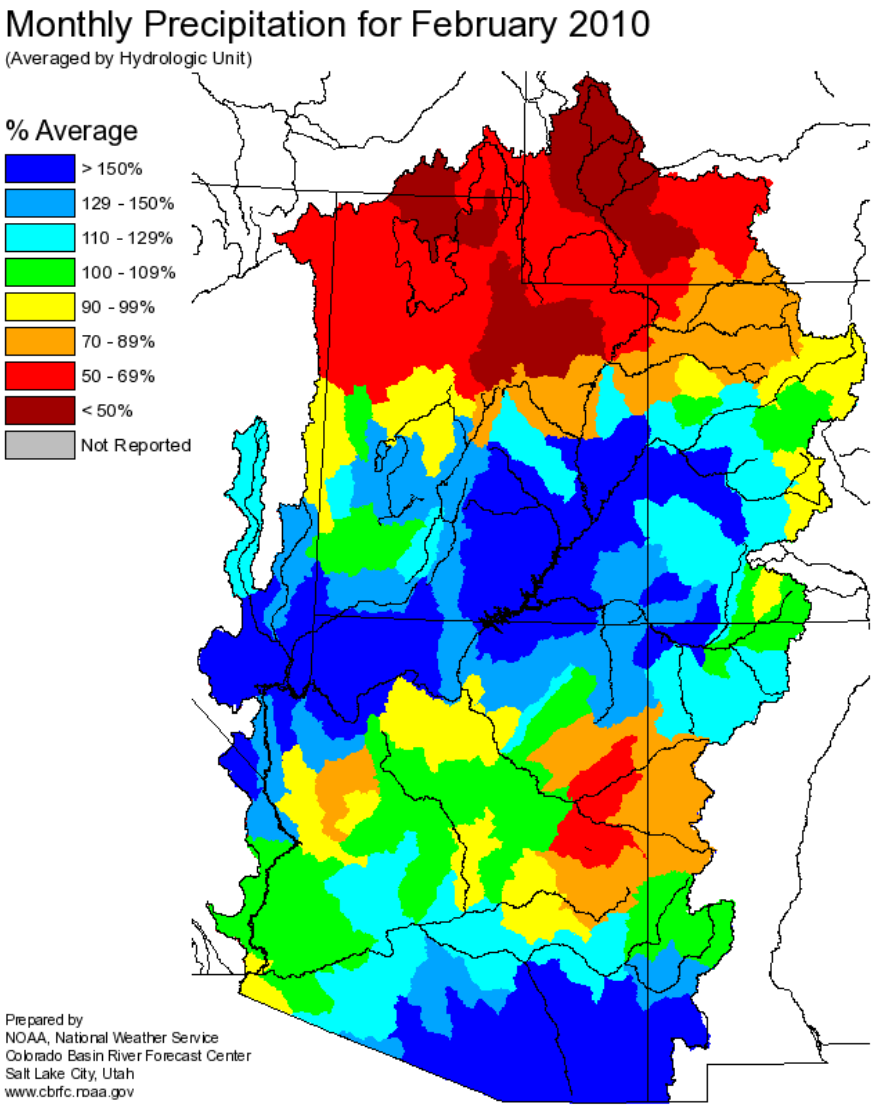


Colorado River Drought

Hoover Dam, Lake Mead **1983**

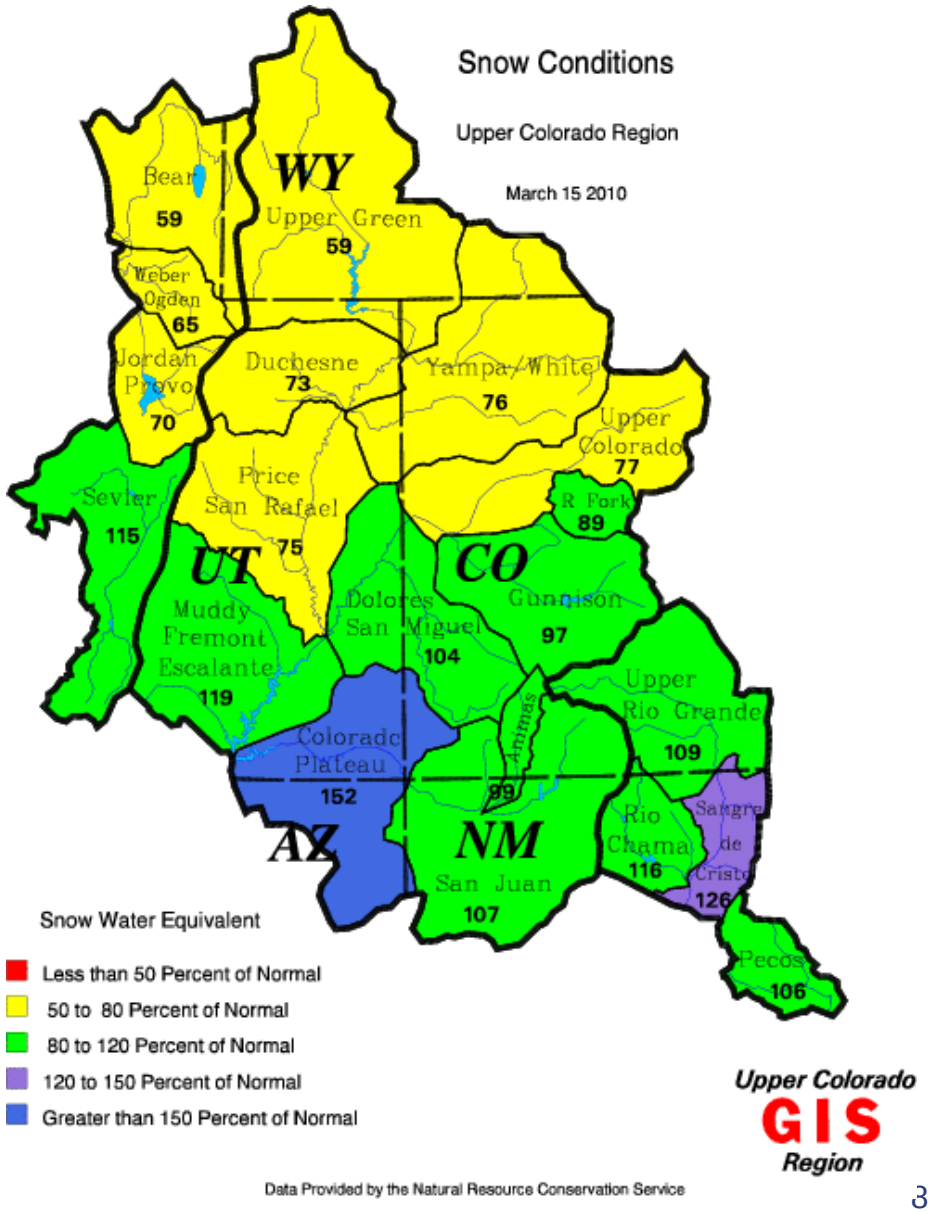
Hoover Dam, Lake Mead **2009**

Colorado River Basin Precipitation



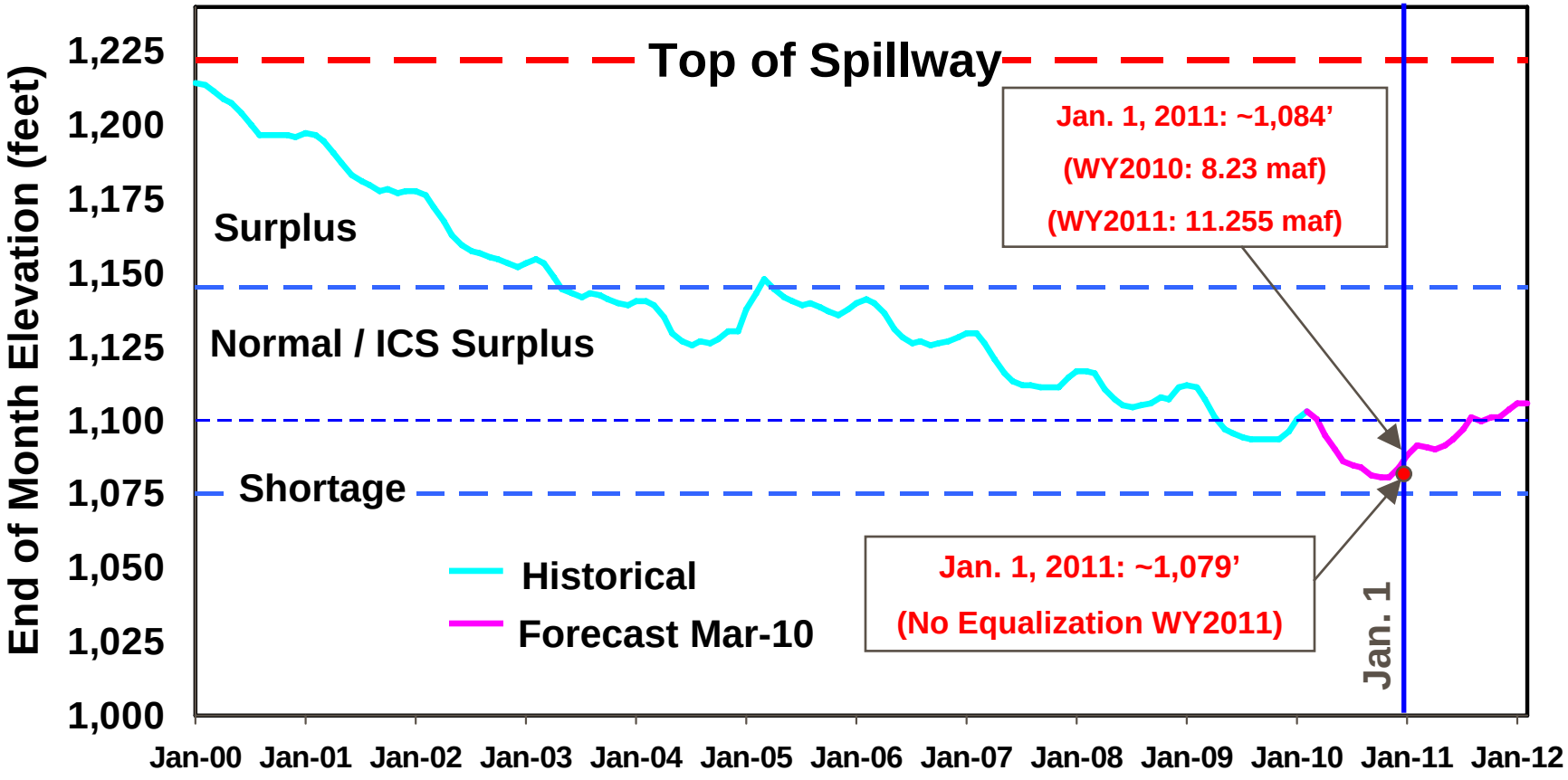
Colorado River Basin Snow Pack

Mid-February	**82% of average**
Mid-March	**84% of average**



Lake Mead Elevations

(Historical and Forecasted)



Source: Bureau of Reclamation, March 2010

Law of the River

- **1922 Colorado River Compact**
  - Defines Upper and Lower Basin and apportions 7.5 million acre-feet to each
  - Flow at Lee Ferry must be 75 million acre-feet over 10 years
- **Boulder Canyon Project Act**
  - Apportions water to Lower Division States
    - California 4.4 million acre-feet
    - Arizona 2.8 million acre-feet
    - Nevada 0.3 million acre-feet
  - Secretary of the Interior is the “water master” for lower basin

Law of the River

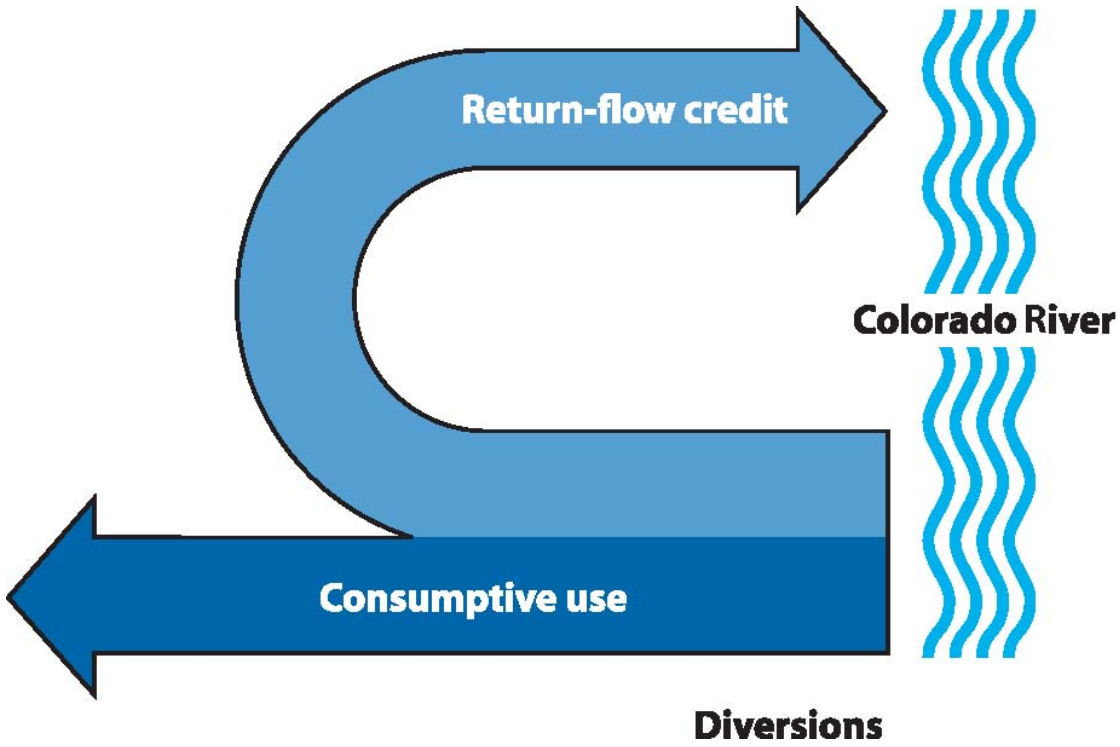
- **1944 Mexican Treaty**
  - Mexico guaranteed 1.5 million acre-feet
  - 200,000 acre-feet additional water during surplus
  - Mexico will reduce allotment in the same proportion to consumptive uses in the United States during "extraordinary drought" or serious accident to the irrigation system
- **1948 Upper Colorado River Basin Compact**
- **1956 Colorado River Storage Project Act**
- **Arizona v. California (Supreme Court Decree – 1964, Consolidated Decree - 2000)**
  - Articles II(B)(3), II(B)(2) and II(B)(6)
- **1968 Colorado River Basin Project Act**
- **Minute 242 (1973)**
- **1974 Colorado River Basin Salinity Control Act**
- **2001 Interim Surplus Guidelines**
- **2007 Interim Guidelines**

Responses to Drought and Lower Lake Levels

- **Conservation**
- **Colorado River**
  - Interim Guidelines
    - Shortage Sharing
    - Intentionally Created Surplus
  - Intentionally Created Unused Apportionment
- **Groundwater Project**
- **Third Intake**

Conservation

Indoor Water Use



Southern Nevada recycles nearly every drop of water that is used indoors and receives return-flow credits for this water

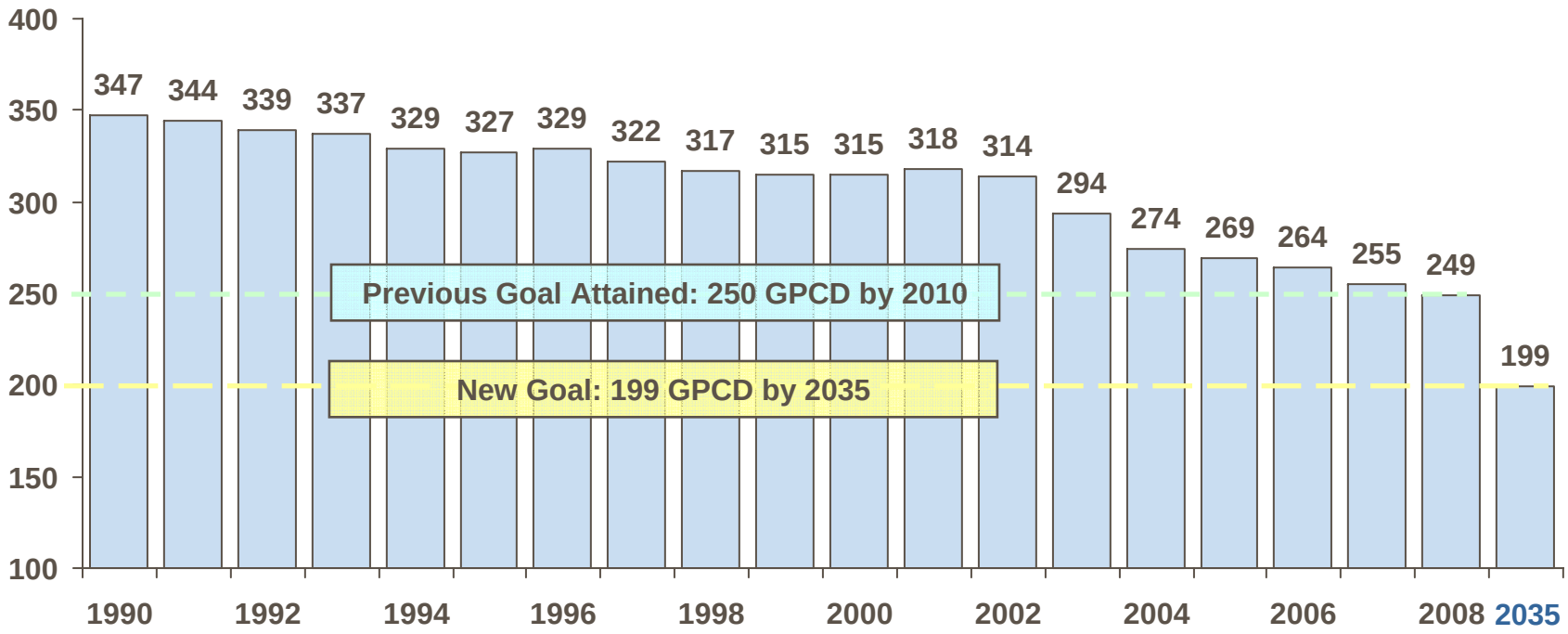
Water Smart Landscaping Rebate Program

- **Provides residents with $1.50 rebate for each square foot of lawn that is upgraded to water-efficient plants and trees**

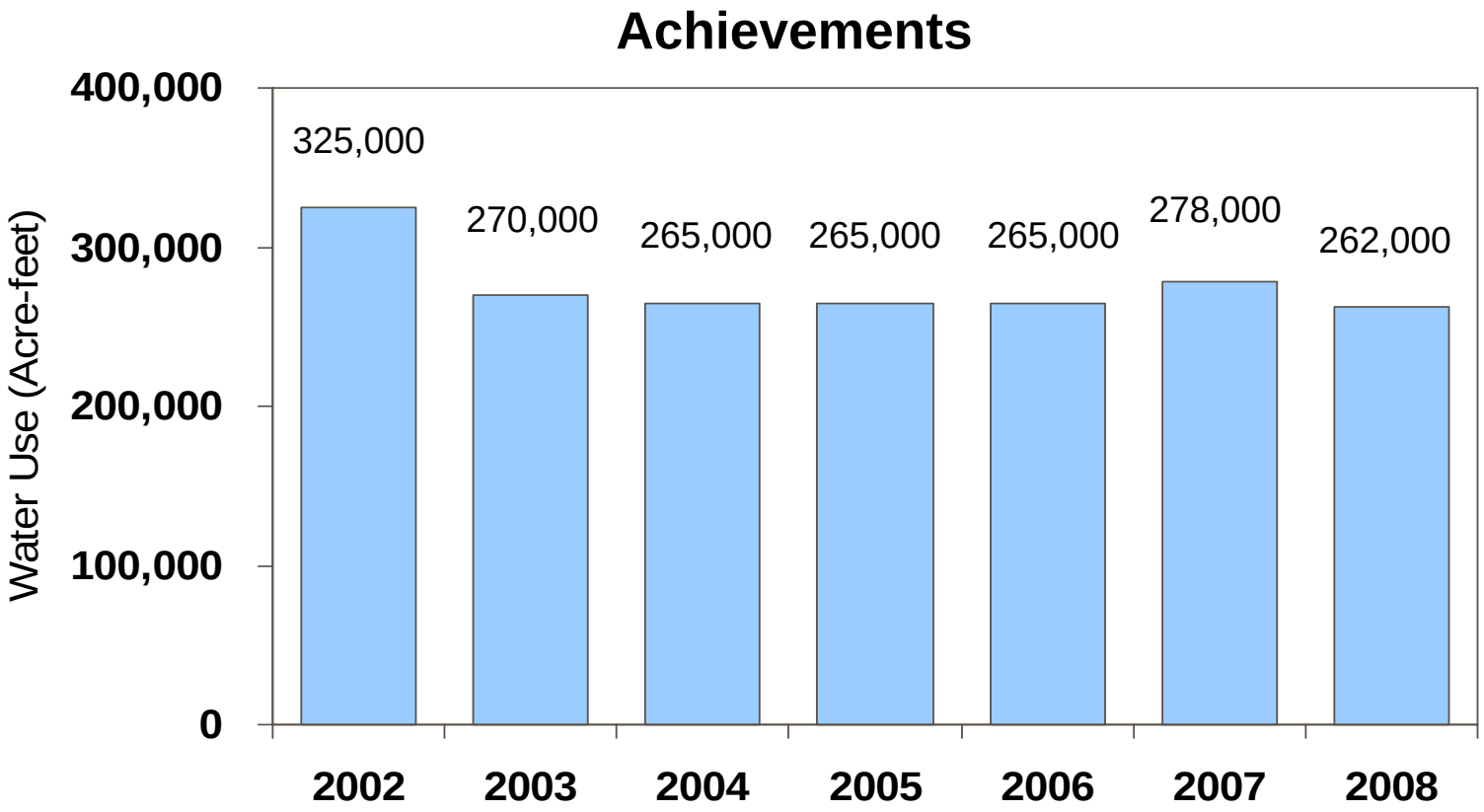
- **Numbers to date:**
  - 117 million square feet converted
  - More than $122 million rebated
  - More than 6 billion gallons of water saved annually

Water Conservation

1990 - 2008 Gallons Per Capita Per Day (GPCD) Water Usage

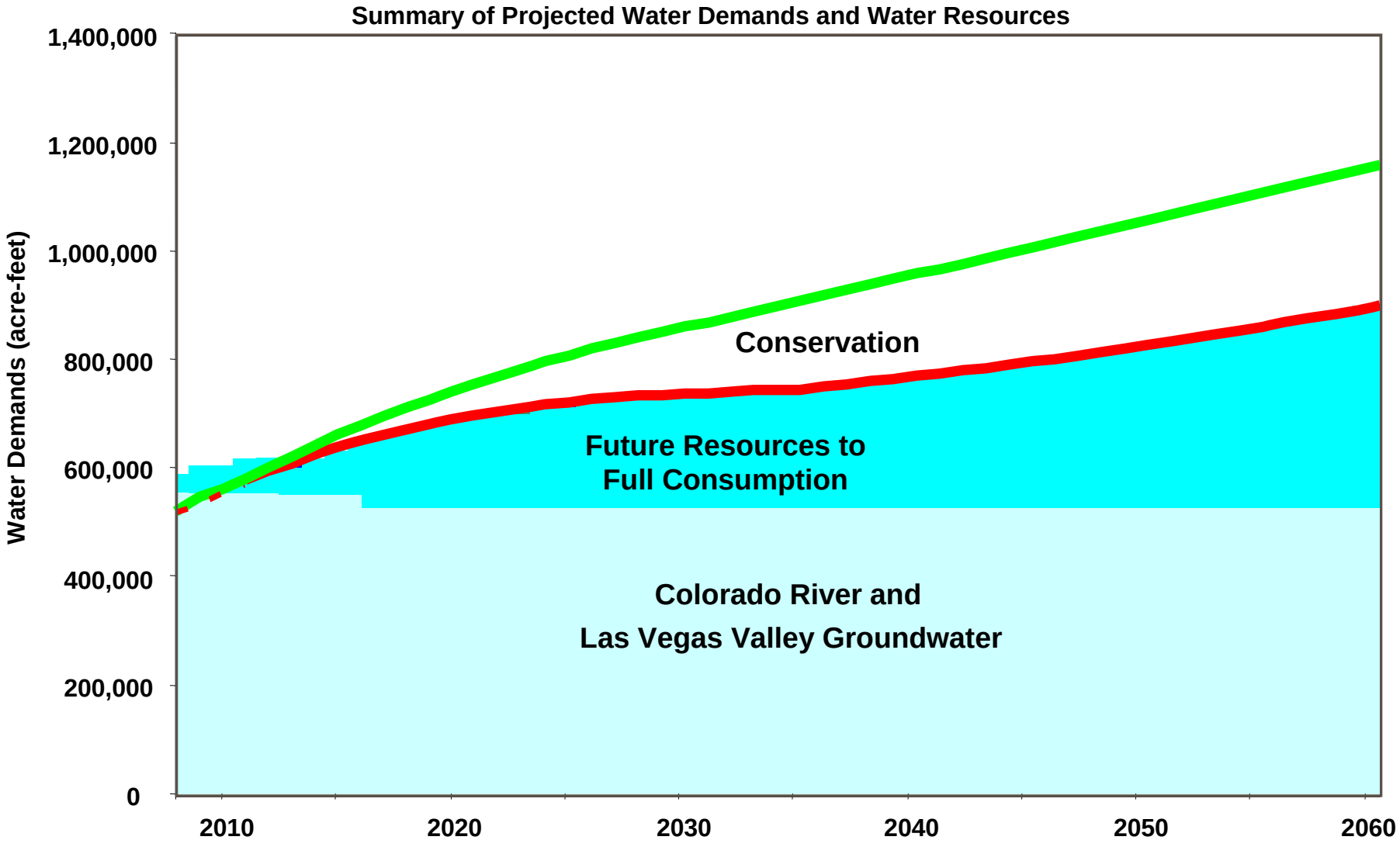


Water Conservation



Southern Nevada's annual water consumption decreased by approximately 20 billion gallons between 2002 and 2008, despite a population increase of 400,000 during that span

Meeting Future Demands



Colorado River

Colorado Resources Used to Meet Demands

- **Basic Apportionment**
  - 300,000 acre-feet for Nevada
- **Intentionally Created Unused Apportionment**
  - Water banking agreements with California and Arizona
- **Intentionally Created Surplus**

Existing Law of the River Concerning Shortages

Existing Law of the River Concerning Shortage

- **1944 Treaty between the United States and Mexico**
  - In the event of extraordinary drought or serious accident to the irrigation system in the United States, Mexico will be reduced in the same proportion as consumptive uses in the United States are reduced

Existing Law of the River Concerning Shortage

- **1964 U.S. Supreme Court Decree Arizona v. California, Article II(B)(3)**
  - If less than 7.5 million acre-feet is available, Secretary of the Interior will satisfy demands based on present perfected water rights regardless of state lines
  - Anything remaining will be apportioned in accordance with the Boulder Canyon Project Act
  - California will not receive more than 4.4 million acre-feet

Existing Law of the River Concerning Shortage

- **1968 Colorado River Basin Project Act**
  - When there is insufficient water to meet lower basin demands, Central Arizona Project shall be limited as to assure the availability of water for consumptive uses of present perfected rights
  - Nevada shall not bear in shortages greater than it would have to before this Act
  - Act does not affect relative priorities of water in CA, AZ, and NV that are senior to Central Arizona Project

2007 Shortage Sharing Agreement

Parties to the Shortage Sharing Agreement

- Colorado River Commission of Nevada (CRCN)
- Southern Nevada Water Authority (SNWA)
- Arizona Water Banking Authority (AWBA)
- Arizona Department of Water Resources (Arizona)

Development of Agreement

- States decided shortages be implemented in increments of 333,000, 417,000 and 500,000 acre-feet for Lower Division States depending upon water levels in Lake Mead
- Effective until December 31, 2036
- States expressed that Mexico should share in shortages equally in Letter to the Secretary of the Interior
- The Lower Division States proposed Mexico should be responsible for approximately 17% of the shortage volume

Final Shortage Allocations

Lake Mead Levels	Nevada's Share of the Shortage	Arizona's Share of the Shortage
1,050 -1,075 feet	13,000 af	320,000 af
1,025-1,050 feet	17,000 af	400,000 af
Below 1,025 feet	20,000 af	480,000 af

- The states will consult with the Secretary for any shortages (cumulative) above 500,000 acre-feet

Existing Law of the River

- **1964 U.S. Supreme Court Decree Arizona v. California (2006 Consolidated Decree), Article II(B)(2)**
  - If more than 7.5 million acre-feet is available for consumptive use the Secretary of the Interior will apportion 50% to California, 46% to Arizona, and 4% to Nevada
- **1964 U.S. Supreme Court Decree Arizona v. California (2006 Consolidated Decree), Article II(B)(6)**
  - If, in one year, water apportioned for use in a State will not be consumed, the Secretary of the Interior may release the apportioned but unused water for consumptive use in other states
  - No rights to recurrent use of the water shall accrue

Intentionally Created Surplus (ICS)

- **Nevada can create and utilize Intentionally Created Surplus by conveying Nevada groundwater and water from the Virgin and Muddy Rivers through Lake Mead**
- **The Shortage Sharing Agreement and Interim Guidelines provide that this water will be available during declared shortages as Developed Shortage Supply (DSS)**

Tributary Conservation

- **Allows a water user to fallow water rights in tributaries that were in use prior to the effective date of the Boulder Canyon Project Act (1929)**
  - Water is transported through the Colorado River
  - Nevada has approximately 50,000 acre-feet within this category on the Virgin and Muddy rivers (SNWA currently owns or controls about 30,000 acre-feet)

- **Can be taken during shortage (DSS)**

System Efficiency Projects

- Allows a water user to fund a system efficiency project that would conserve Colorado River water
- Such projects include the Drop 2 Reservoir Project and the operation of the Yuma Desalter
- The project must increase the amount of water available in the U.S. and a portion of the saved water is credited to the user funding the project
- Cannot be taken during shortage

Drop 2 Reservoir Project

System Efficiency ICS Project

Drop 2 Reservoir Project

- **Design and construction cost: $172 million (with 20% contingency, $206 million)**
- **SNWA will provide up to $148 million to fund the design, construction and operation of the Drop 2 reservoir and SNWA will receive up to 456,667 acre-feet of ICS credits**
- **The Metropolitan Water District of Southern California and the Central Arizona Water Conservation District have exercised their option to contribute $28.67 million each in return for 100,000 acre-feet each of ICS credits**

Imported ICS

- **Allows non-Colorado River system water to be conveyed through and diverted from system reservoirs**
  - Includes SNWA's Coyote Spring groundwater rights that will be introduced into Lake Mead via the Muddy River (Currently 9,000 acre-feet)

- **Can be taken during shortage (DSS)**

Intentionally Created Unused Apportionment

Existing Law of the River concerning Surplus and Unused Water

- **1964 U.S. Supreme Court Decree Arizona v. California (2006 Consolidated Decree), Article II(B)(2)**
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Existing Law of the River concerning Surplus and Unused Water

- **1999 Final Rule for Offstream Storage of Colorado River Water (43 CFR Part 414)**
  - Regulation promulgated by the Secretary of the Interior to establish a procedural framework for facilitating interstate off-stream banking transactions including a commitment by the Secretary to release Intentionally Created Unused Apportionment (ICUA) as a part of such transactions

Intentionally Created Unused Apportionment

- **SNWA has entered into interstate water banking agreements with both California and Arizona**
- **Agreements allow for SNWA to store water in California, and at a later date when SNWA needs the water, California will intentionally reduce their consumptive use below 4.4 MAF and the unused water will be directed to SNWA**

Interstate Water Banking Agreement with Arizona

- **Original agreement signed in 2001, amendments entered into 2004 and 2009**
- **Guaranteed 1.25 million acre-feet of credits for SNWA with return flow credits an estimated diversion of 2.125 million acre-feet**
- **Allowed Nevada to utilize Arizona bank to make up shortages, unless a shortage impacts Arizona municipalities, then Nevada will reduce recovery proportionally to Arizona's municipal shortage**
- **Established SNWA schedule to pay $330 million between 2005 and 2018**

* AWBA has stored approximately 527,000 acre-feet of credits for SNWA

Groundwater Project

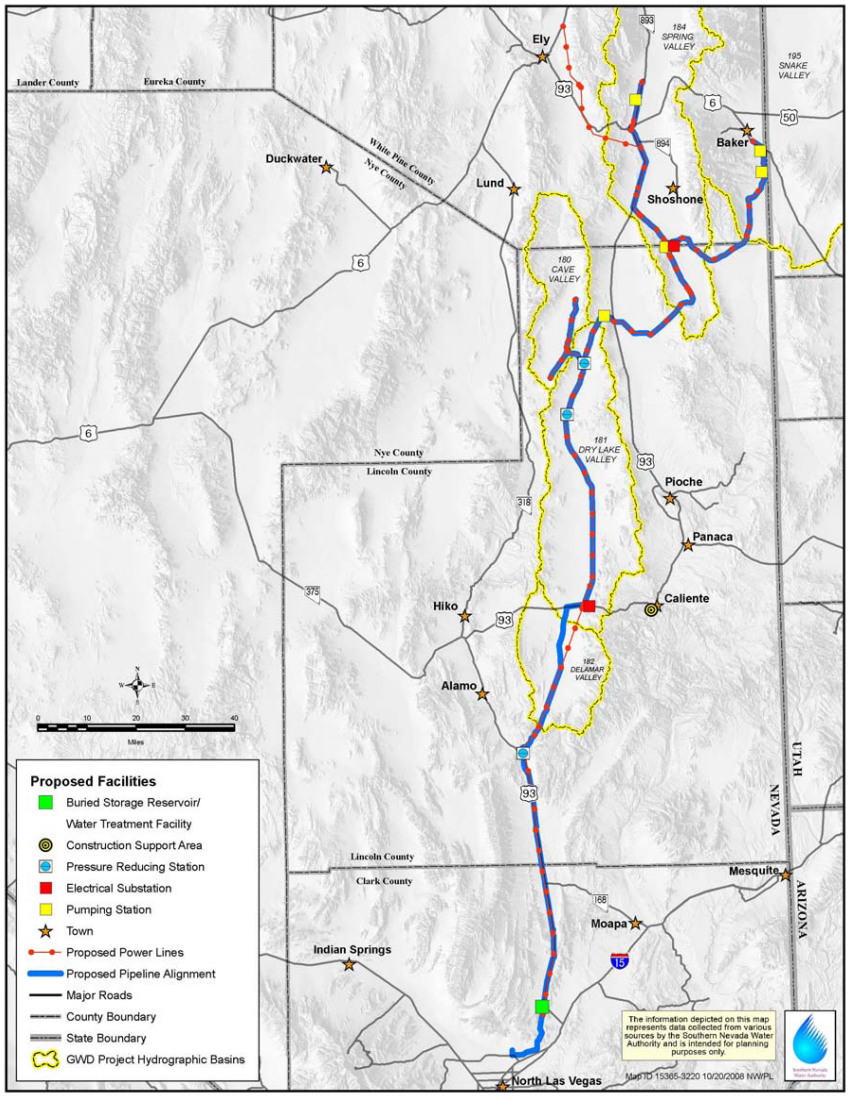
Groundwater Resources

- **In 1989, the LVVWD filed applications* with the Nevada Division of Water Resources to appropriate unallocated groundwater in Delamar, Dry Lake, Cave, Spring and Snake valleys**
- **The State Engineer has acted on most of these applications**

Spring Valley	**60,000 AFY permitted, subject to staged pumping restrictions**
Delamar, Dry Lake and Cave Valleys	**18,755 AFY permitted**
Snake Valley	**50,679 AFY requested; hearing scheduled for 2011**

**** These applications were later transferred to SNWA***

Groundwater Resources



Clark, Lincoln & White Pine Counties Groundwater Development Project

Proposed Facilities

- Groundwater wells
- Pipelines
- Pumping stations
- Regulating tanks
- Water treatment facilities
- Power lines/facilities
- Support facilities

Groundwater Resources

- **Development of these in-state resources will:**
  - Diversify available water resources to meet near and long-term demands (reduce dependence on Colorado River from 90% today)
  - Ensure resources are available if Colorado River shortages are instituted or resources become inaccessible due to low lake levels

Third Intake

Impacts

- **Current Lake Mead water elevation is at 1,095 feet**
- **Intake No. 1 will not operate at a lake levels below 1,050 feet**
- **The loss of Intake No. 1 will have a critical impact on the community water system, especially in the ability to meet summer demands**

Drought Issues

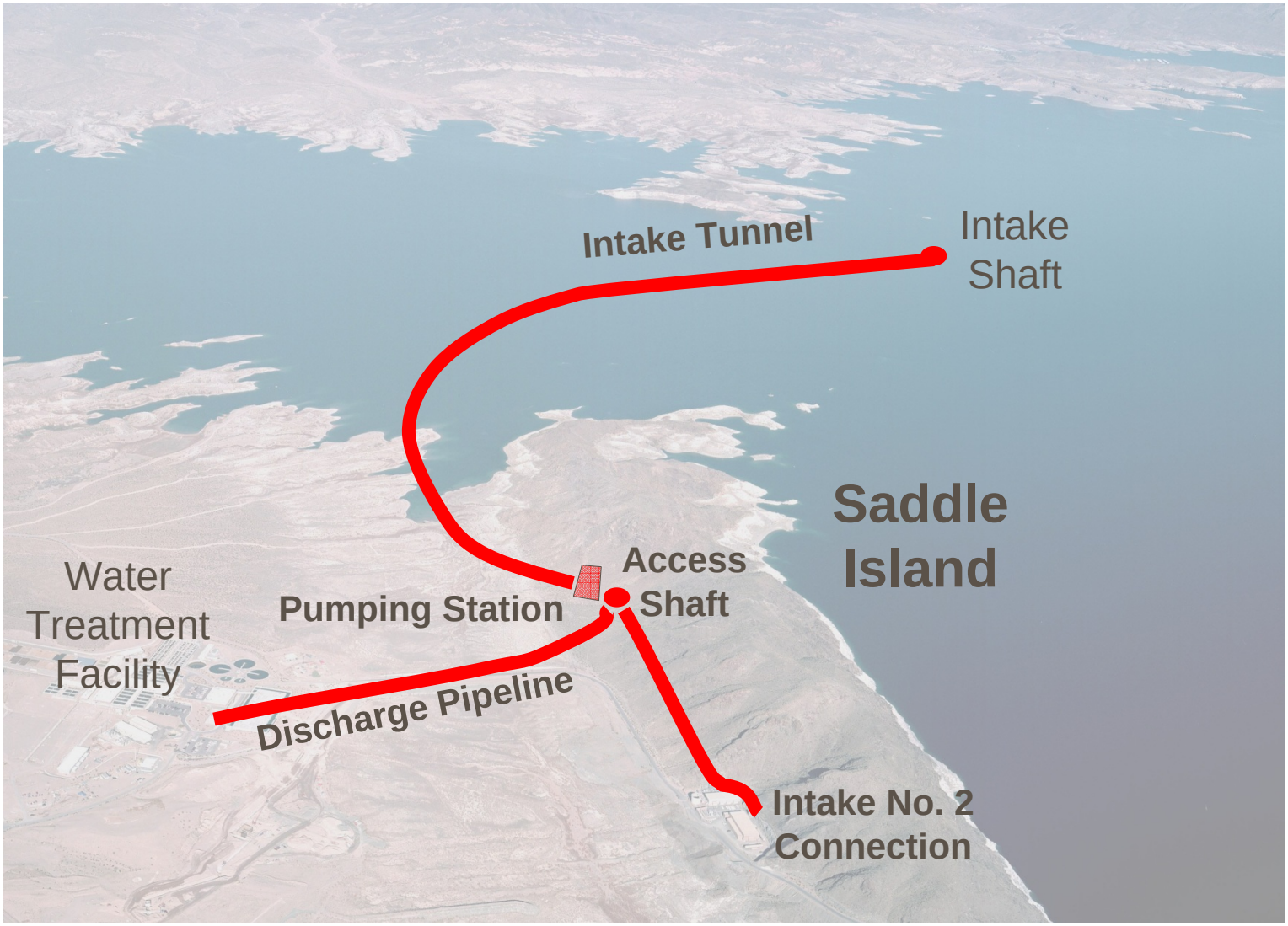
The SNWA is constructing a new Lake Mead Intake

- **Increase pumping capacity of Intake No. 2 (600 mgd to 720 mgd)**

- **Lake Mead Intake No. 3 will:**
  - Preserve existing capacity
  - Provide access to cooler water at elevation 860 ft
  - Help maintain water quality

- **Estimated cost: $817 million**

Intake No. 3 Components



Meeting Demands

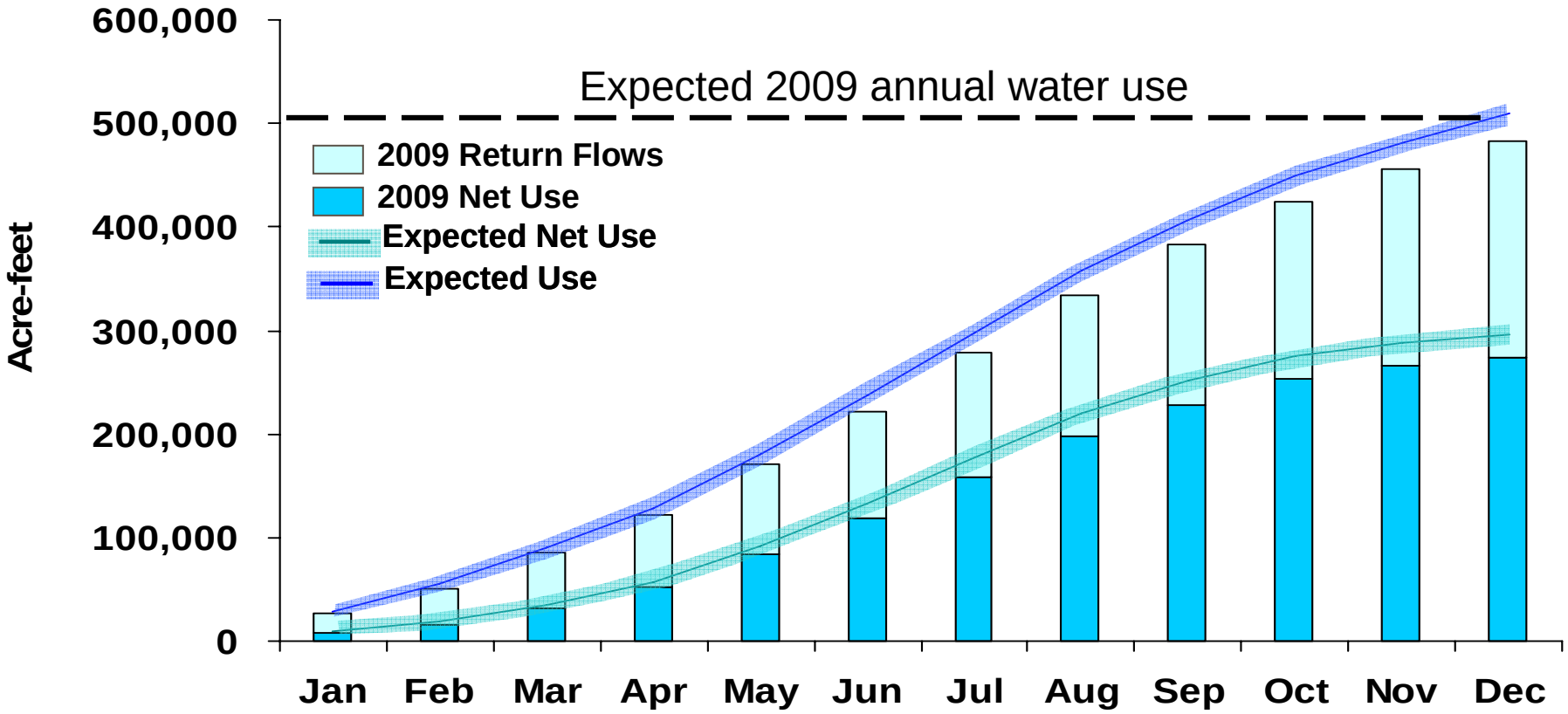
2009 Case Study

- **2009 is a normal year on the Colorado River so Nevada gets 300,000 acre-feet of basic apportionment**
- **Nevada creates approximately 28,500 acre-feet of ICS**
- **Nevada has a total of 328,500 acre-feet of resources**

Nevada's Water Use

- **In 2009 demands in Nevada were very low due to a combination of conservation and economic downturn**

SNWA Cumulative Total and Net Water Use



Preliminary 2009 Water Use

482,000 acre-feet	**Estimated SNWA water deliveries** (Colorado River and groundwater)
245,000 acre-feet	**Preliminary Nevada Colorado River consumptive use** (About 4,000 af of in-lieu recharge)
328,500 acre-feet*	**NV Colorado River consumptive use with local and interstate banking**

*** Nevada's available Colorado River resources in 2009 were increased to 328,500 acre-feet due to Intentionally Created Surplus (ICS) credits (e.g. Muddy and Virgin River water)**

Decision Making

- **What do we do with our extra 83,500 acre-feet of water?**
- **Bank in California**
  - Advantages/Disadvantages
  - Physical Limitations
- **Bank in Arizona**
  - Advantages/Disadvantages
- **Store in Lake Mead as ICS**
  - ICS “taxes” for evaporation
  - Cannot be used during shortages in the future

Questions