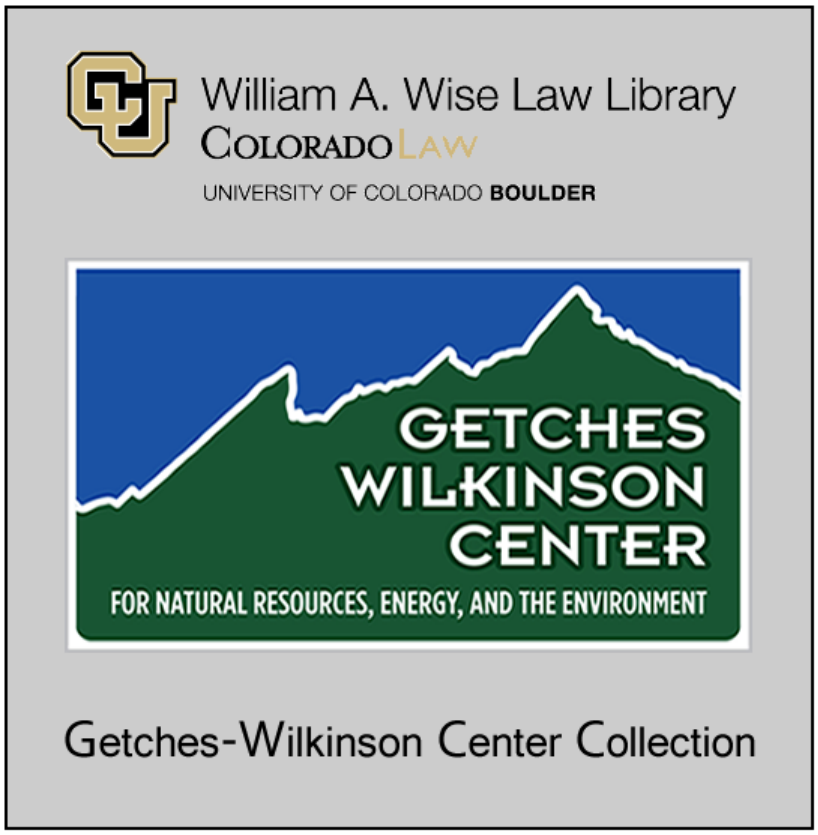
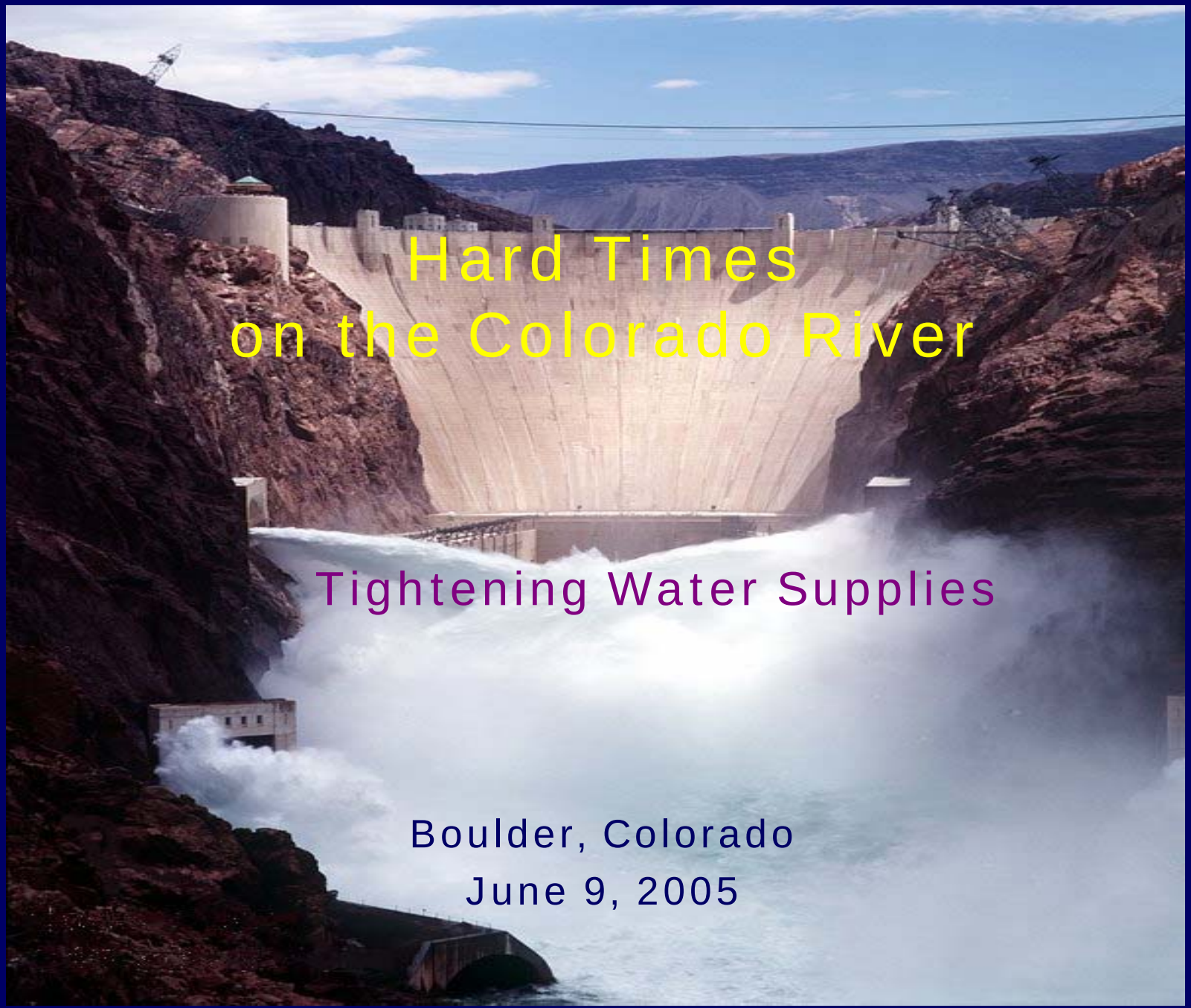
6-9-2005

SLIDES: Hard Times on the Colorado River: Tightening Water Supplies

Jerry Zimmerman



Jerry Zimmerman, *Hard Times on the Colorado River: Tightening Water Supplies*, *in* HARD TIMES ON THE COLORADO RIVER: DROUGHT, GROWTH AND THE FUTURE OF THE COMPACT (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law, 2005).



Hard Times on the Colorado River

Tightening Water Supplies

Boulder, Colorado

June 9, 2005

Focus of the Presentation

- Provide an overview of plumbing system in Southern California
- Importance of the Colorado River to California
- Sources of tightening water supplies being addressed in California
- Provide background for the afternoon panel, where specifics of California's actions will be discussed


CALIFORNIA SERVICE AREAS
AND MAJOR FACILITIES OF ENTITIES USING COLORADO RIVER WATER
HOOVER DAM
LAKE MEAD
NEVADA
LAKE MOJAVE
DAVIS DAM
FORT MOJAVE INDIAN RESERVATION
COLORADO RIVER
ARIZONA
CALIFORNIA
CALIFORNIA AQUEDUCT
CHEMEHUEVI INDIAN RESERVATION
CENTRAL ARIZONA PROJECT
PARKER DAM
LAKE HAVASU
COLORADO RIVER AQUEDUCT
DESERT WATER AGENCY
METROPOLITAN WATER DISTRICT
PACIFIC OCEAN
COLORADO RIVER INDIAN RESERVATION
PALO VERDE IRRIGATION DISTRICT
COACHELLA CANAL
COACHELLA VALLEY WATER DISTRICT
SALTON SEA
IMPERIAL IRRIGATION DISTRICT
IMPERIAL DAM
YUMA PROJECT RESERVATION DIVISION
UNITED STATES
MEXICO
ALL AMERICAN CANAL

Importance of the Colorado River

- Provides about 50 percent of the water used in southern California
  - Serves over 18 million people in seven counties
  - Provides water for about 900,000 acres of irrigated cropland
- Provides about 3.5 billion kwh of hydroelectric energy
- Supports fish, wildlife, and recreational resources
- Supports a southern California service area economy in excess of $700 billion

Sources of Water for the Colorado Desert

- Colorado River (about 95 percent)
- State Water Project (about 1 percent)
- Local sources (about 4 percent)

Sources of Water for the South Coast

- Colorado River (about 15 percent)
- State Water Project (about 30 percent)
- Los Angeles Aqueducts (about 10 percent)
- Local sources (about 45 percent)

Origin of Tight Water Supplies

- Administratively driven
  - Legal constraints
  - Political considerations
- Hydrology driven
  - Low precipitation and runoff
  - Low reservoir conditions
- Infrastructure driven
  - Lack of storage or transportation facilities
  - Water quality or other considerations
- Demand driven
  - New development or demands
  - Increased population

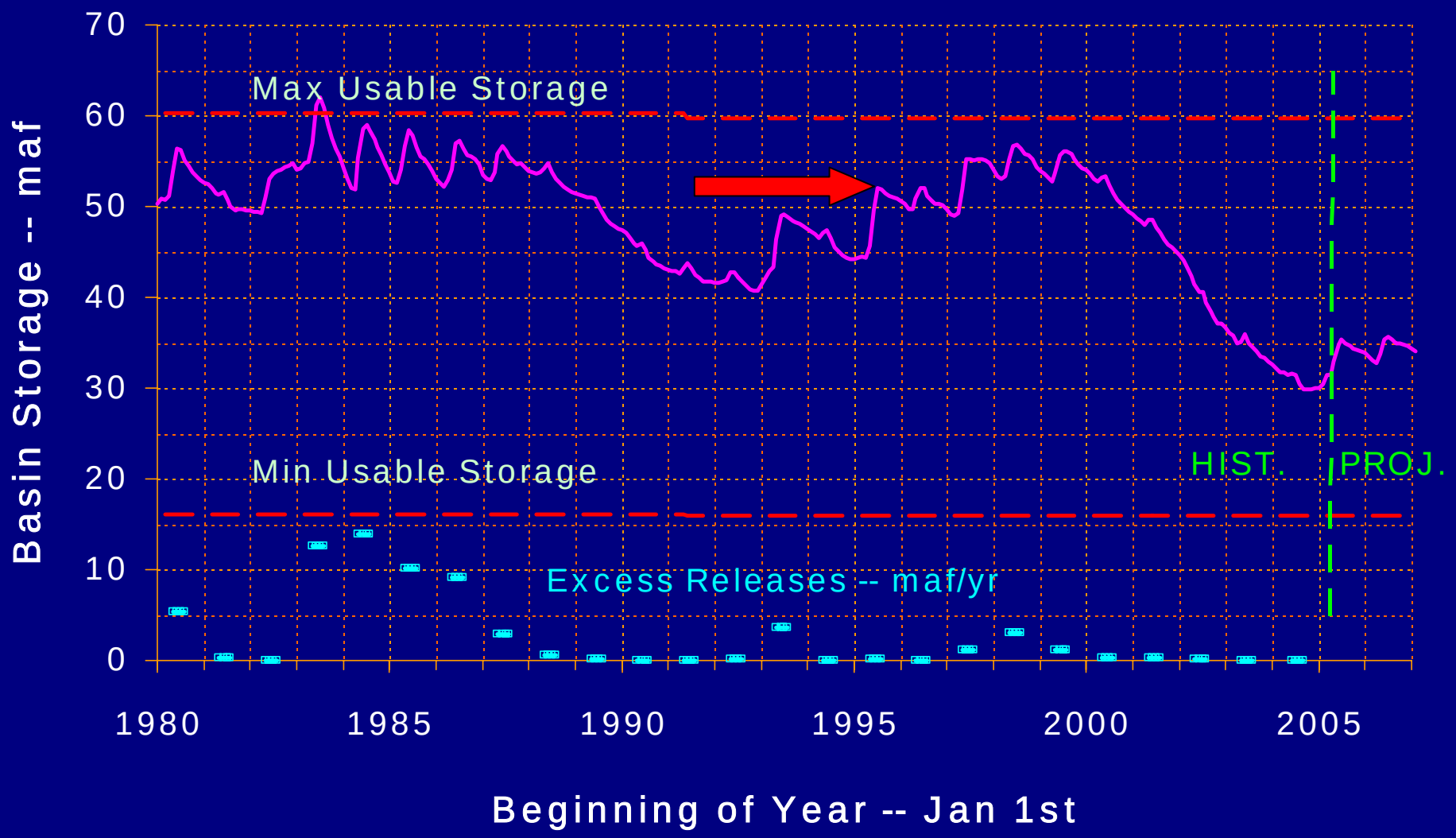
Administratively Driven Tight Supplies

1996 Conditions on the River

- California's use was 5.2 maf while "basic" apportionment is 4.4 maf
- Arizona's & Nevada's use was essentially at their "basic" apportionments (2.8 maf & 0.3 maf respectively)
- Water use in Lower Basin exceeded 7.5 maf
- If California's use was limited to 4.4 maf, MWD would receive about 0.6 maf (aqueduct capacity 1.3 maf)
- Former Secretary Babbitt's and Colorado River Basin states' December 1996 call for a plan

COLORADO RIVER BASIN STORAGE

May 2005



The Deal

- California would develop and implement a water use plan demonstrating that it could live within its annual apportionment of Colorado River water
- Interior and the Basin states would agree to Interim Surplus Guidelines
  - ISG would be in effect for 15 years, through 2016
  - Provide California a “soft landing” as:
    - Elements of the Plan were implemented
    - Colorado River water use transitioned from 5.2 maf to 4.4 maf, as conditions on the River dictated

Challenge Acceptance

- The Colorado River Board accepted the challenge
- First draft was released in December 1997
- A comprehensive working draft of California's Colorado River Water Use Plan was released in May 2000

Basic Plan Elements

- Further quantification of California's rights and use of Colorado River water
- Core voluntary agriculture to urban and agriculture to agriculture water transfers and exchanges
- Conjunctive use and storage programs
- Dry-year water supply options
- Water acquisitions
- Interim Surplus Guidelines
- Inadvertent Overrun and Payback Policy
- Other projects and programs

Plan Implementation

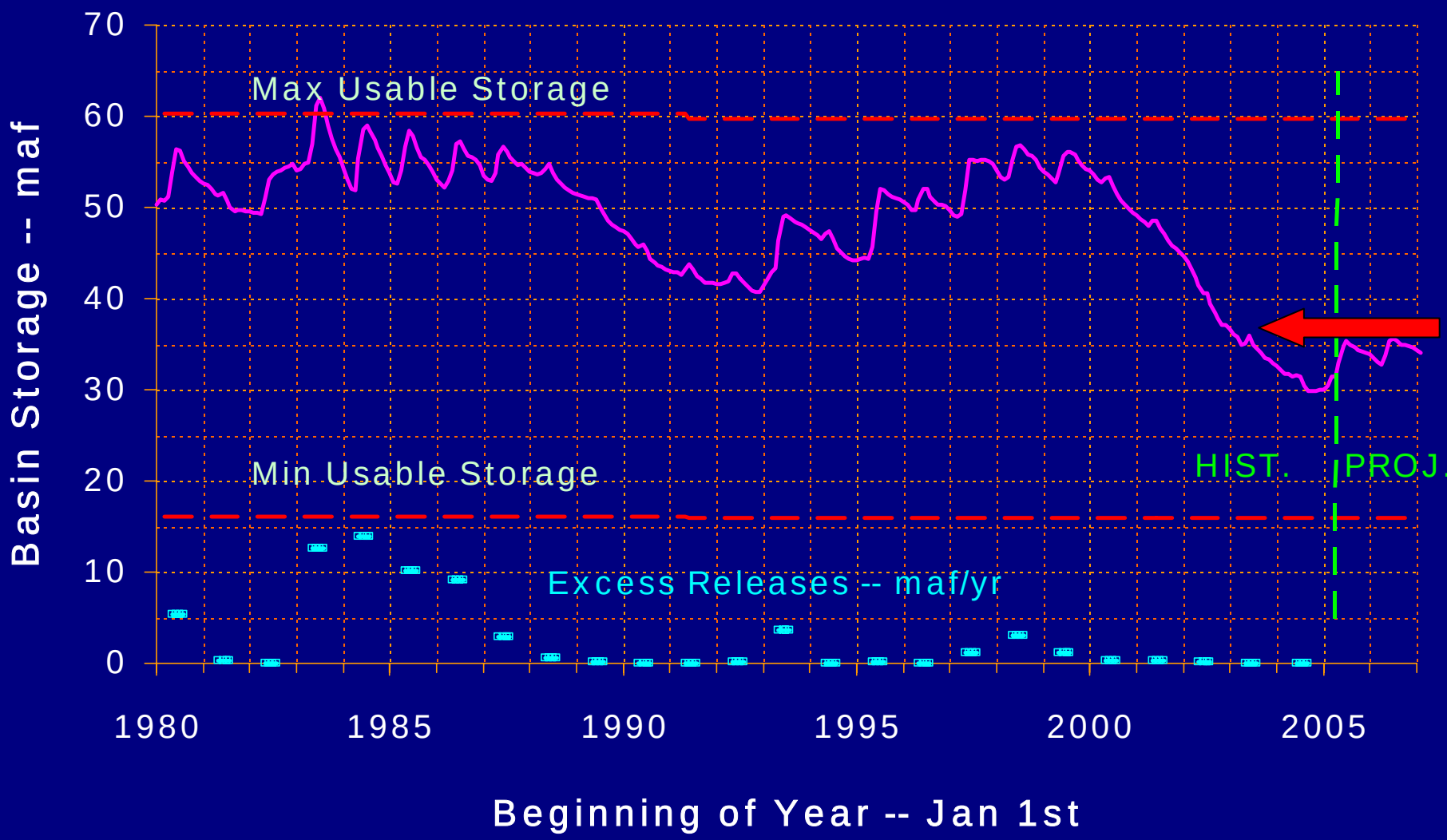
- Secretary Babbitt signed the Record of Decision on the Interim Surplus Guidelines on January 16, 2001
- Quantification Settlement Agreement was signed by the California parties on October 10, 2003

The Transition

- The transition from administratively driven tight water supplies to hydrology driven tight water supplies

COLORADO RIVER BASIN STORAGE

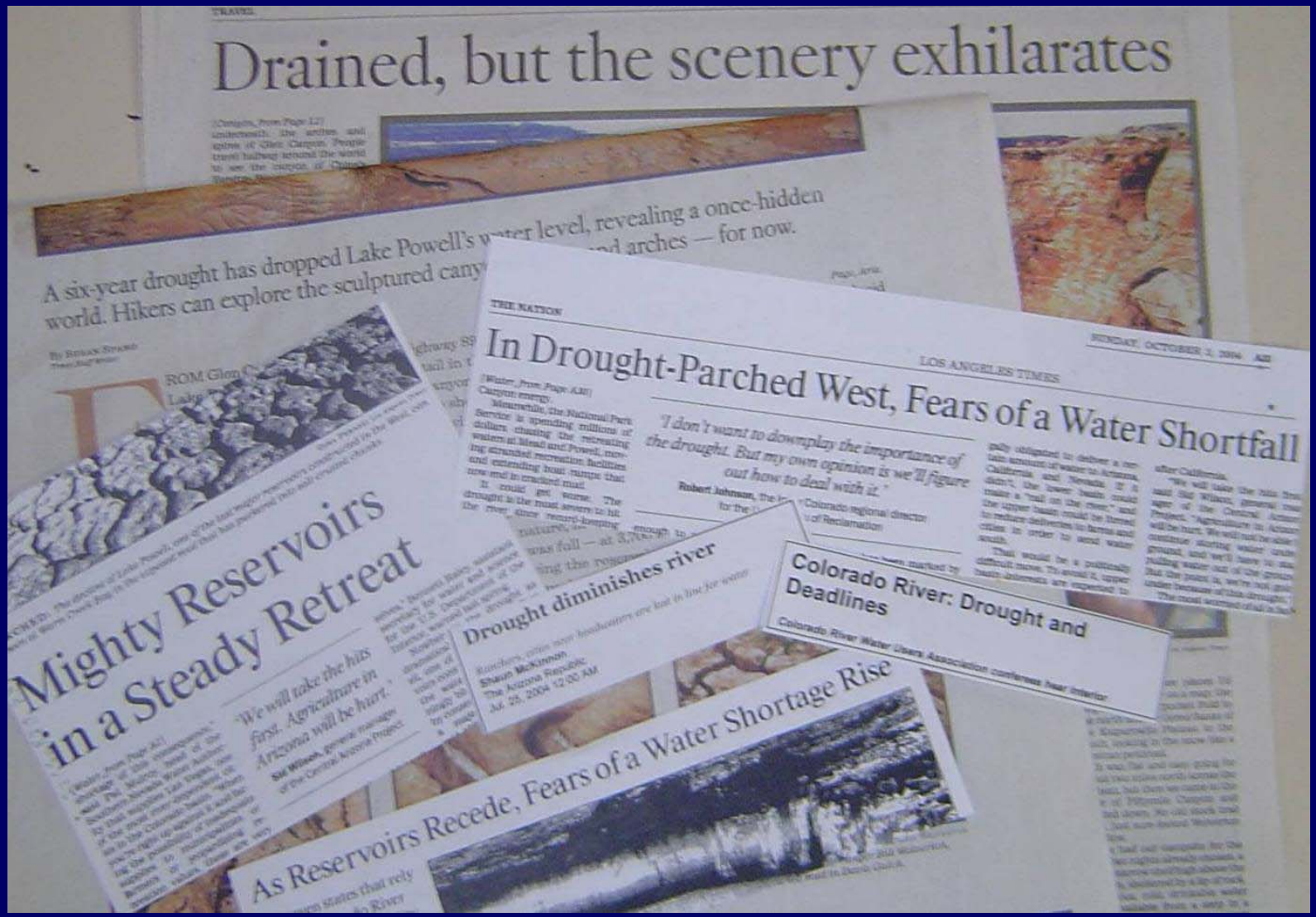
May 2005



Hydrology Driven

- After reinstatement of the ISG on October 10, 2003, the 2004 AOP allowed a “partial domestic surplus” for releases from Lake Mead
- Because of the dropping reservoir conditions, MWD elected not to take surplus Colorado River water in 2004
- This resulted in further tight water supplies that were hydrology driven

Headlines

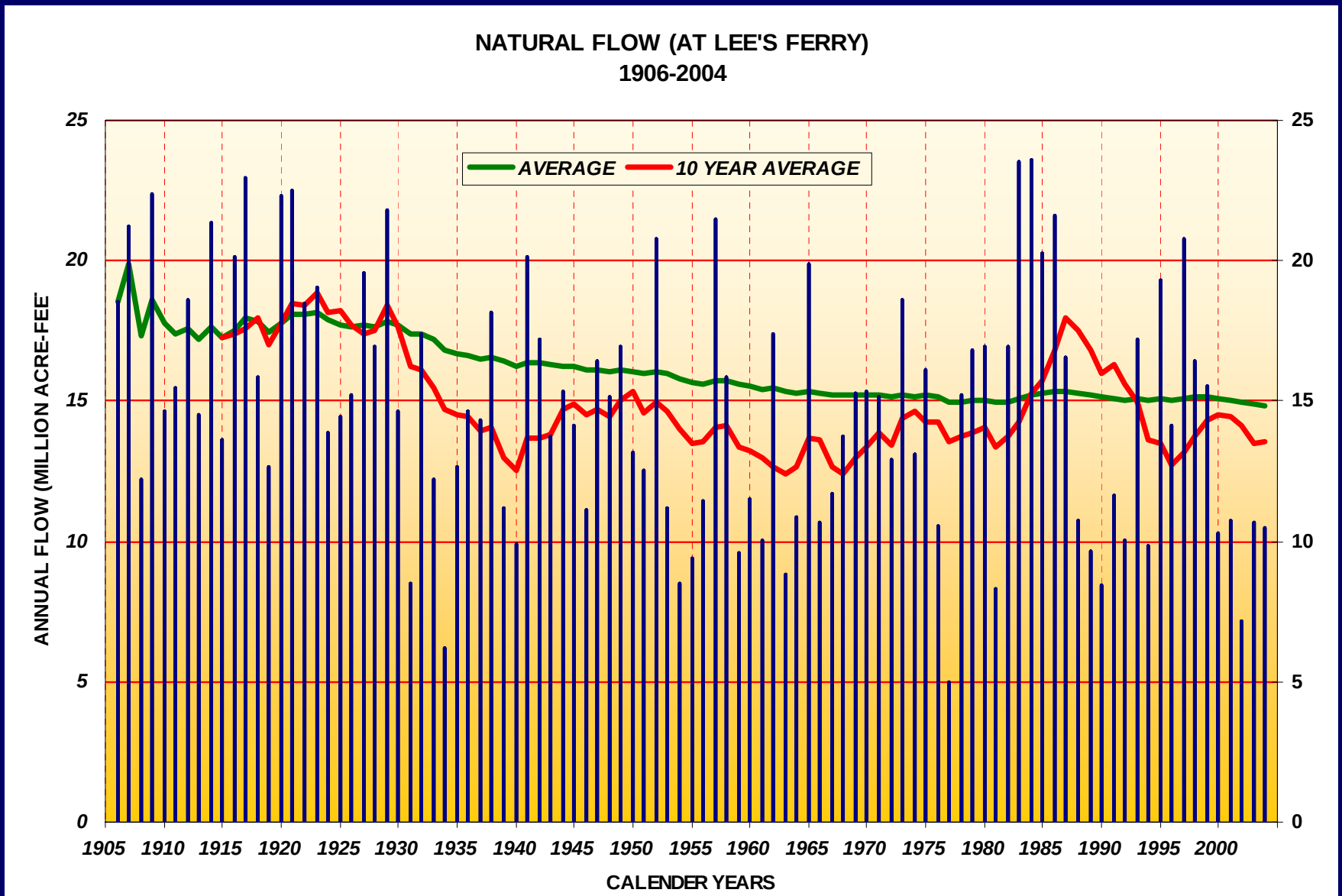

Drained, but the scenery exhilarates
A six-year drought has dropped Lake Powell's water level, revealing a once-hidden world. Hikers can explore the sculptured canyons — for now.
Mighty Reservoirs in a Steady Retreat
In Drought-Parched West, Fears of a Water Shortfall
Drought diminishes river
Colorado River: Drought and Deadlines
As Reservoirs Recede, Fears of a Water Shortage Rise

Five Years of Drought

Natural Flow into Lake Powell

(average = 15.0 maf)

2000	12.9 maf	86% of avg.
2001	11.9 maf	80% of avg.
2002	6.4 maf	43% of avg.
2003	10.7 maf	71% of avg.
2004	10.5 maf	70% of avg.


NATURAL FLOW (AT LEE'S FERRY)
1906-2004
AVERAGE
10 YEAR AVERAGE
ANNUAL FLOW (MILLION ACRE-FEE
CALENDER YEARS
0
5
10
15
20
25
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000

2005 AOP

- The 2005 AOP included provisions for:
  - The releases from Hoover Dam to be under a “normal condition”, i.e., releases to satisfy 7.5 maf of consumptive use from the mainstream in the Lower Basin
  - The 2005 AOP called for a release of 8.23 maf to be released from Glen Canyon Dam
    - At the request of the Upper Division states, a mid-year review of the releases from Glen Canyon Dam to determine if an adjustment was warranted

Basin States Discussions

- As storage in the reservoir system dropping, during 2004 and 2005 representatives from the Basin states discussed management of the reservoir system under low runoff and drought conditions
  - Run computer hydrologic simulation studies of potential hydrologic sequences and potential future water supply conditions
  - Identified and studied potential programs and management activities that could be implemented immediately and in the near term that would reduce the reservoir system draw down and hasten the recovery reservoir system storage
  - Evaluated potential shortage guidelines for the Lower Basin

Basin States Discussions

- Efforts to obtain consensus on potential reservoir management options were not successful
- In part, that was due to the different positions regarding
  - What the releases from Glen Canyon Dam in 2005
  - Lack of consistent management objectives for Lakes Powell and Mead in the future

2005 AOP Mid-Year Review

- Upper Division States & UCRC submitted letters to Secretary Norton indicating
  - There is not an obligation for the Upper Basin to deliver 8.23 maf annually to the Lower Basin
  - The hydrologic conditions, this year, warrant a delivery of less than 8.23 maf from Glen Canyon Dam
  - Requested that the Secretary hold as much mainstream water as possible in the Upper Basin reservoir system

Lower Division States Letter

- The LD states maintained that the release must remain at 8.23 maf
  - A reduction would undercut the current efforts among the Basin states
  - Hydrologic conditions do not warrant a reduction
  - LROC do not allow a reduced release
- LD states are willing to continue to explore various strategies for operating the reservoir system that could result in a release of less than 8.23 maf in a given year

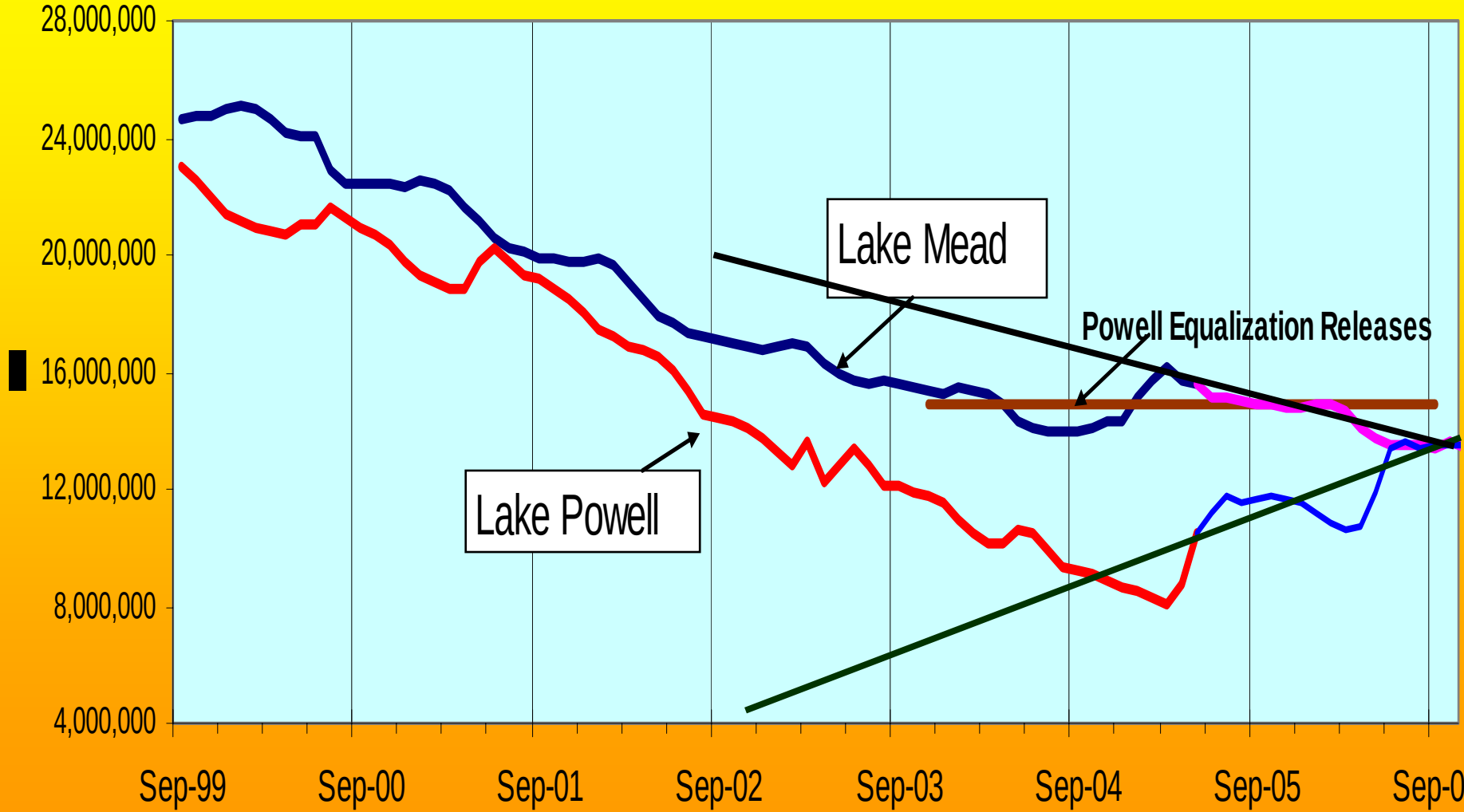
Secretary Norton's Decision

- On May 2nd, Secretary Norton issued her decision regarding the mid-year review
  - An adjustment to the releases from Glen Canyon Dam is not warranted
  - This decision was based upon the improved hydrologic conditions in the Basin
  - Storage in Lakes Powell and Mead will be approximately equal by September 2006
  - The DOI has the authority in this and future mid-year reviews to release less than 8.23 maf
  - The DOI would propose that a mid-year review be included in the 2006 AOP

Secretary Norton's Decision (continued)

- Secretary Norton's further directed the Reclamation to convene the Colorado River Management Work Group by May 31, 2005
- The purpose of this meeting will be to consult the states and the public on the appropriate processes and mechanisms to address the management challenges in operation of the reservoir system including:
  - Development of Lower Basin Shortage Guidelines
  - Development of Conjunctive Management Guidelines for Lake Powell and Lake Mead
- By June 15th a *Federal Register* notice will be issued announcing this public process that would conclude by December 31, 2007

Lake Mead and Lake Powell Storage
Actual and Projected (2000-06)



Key Considerations

- The objective "minimum release" of 8.23 maf Glen Canyon Dam contained in the LROC:
  - Is a negotiated release, not an interpretation of the 1922 Colorado River Compact
  - Is used as the basis for:
    - The 602(a) storage requirement
    - The Upper Basin's hydrologic determination
    - The CRSP power rate and repayment studies
- Defined releases from Glen Canyon Dam are critical for establishing shortage guidelines for the Lower Basin
- The Lower Division states are placed at substantial risk, if the releases from Glen Canyon Dam are modified without adjusting other determinations that are made by the Secretary

Infrastructure Driven Supplies

Infrastructure Driven

- Lack of adequate storage
  - Diamond Valley
  - Water management reservoirs
- Water quality considerations
  - Maintain 500 ppm salinity
  - Trihalomethanes concentrations

Demand Driven Supplies

Marsh rehabilitation, Arizona side – Imperial Division

Demand Driven

- Environmental demands
  - Salton Sea (600 kaf to 1.2 maf)
  - LCR MSCP (up to 50,000 ac-ft/year)
  - Others ?
- Population growth -- Department of Finance population estimates
  - 2000 – 35 million
  - 2015 – 42 million (about 500,000 per year)
  - 2025 – 49 million (about 700,000 per year)
- Industrial growth and other demands

Conclusions

- If the last decade has proven anything, it is that we still have challenges
- Tight water supplies can result from several factors:
  - Administratively driven
  - Hydrology driven
  - Infrastructure driven
  - Demand driven

Conclusions
(continued)

- The challenge is to recognize the possibility of there occurrence and provide proper planning
- The agencies in southern California have been able to weather unexpected reductions in its Colorado River supplies without major consequences
- As we look to the future, there will be further challenges
- We need to continue to work together so that these challenges do not result in hard times

Thank You