

RECLAMATION

Managing Water in the West

Colorado River Basin:

- **Current System Conditions**
- ***Moving Forward* after the Water Supply & Demand Study**

Colorado River Citizens Forum
Yuma, AZ
September 9, 2015



U.S. Department of the Interior
Bureau of Reclamation

Colorado River Basin Hydrology

- 16.5 million acre-feet (maf) allocated annually
- 14.8 maf average annual “natural” inflow into Lake Powell over past 110 years
- 13 to 14.5 maf of consumptive use annually
- Snowmelt dominated system
- Flow is highly variable year-to-year
- Approximately 60 maf of storage



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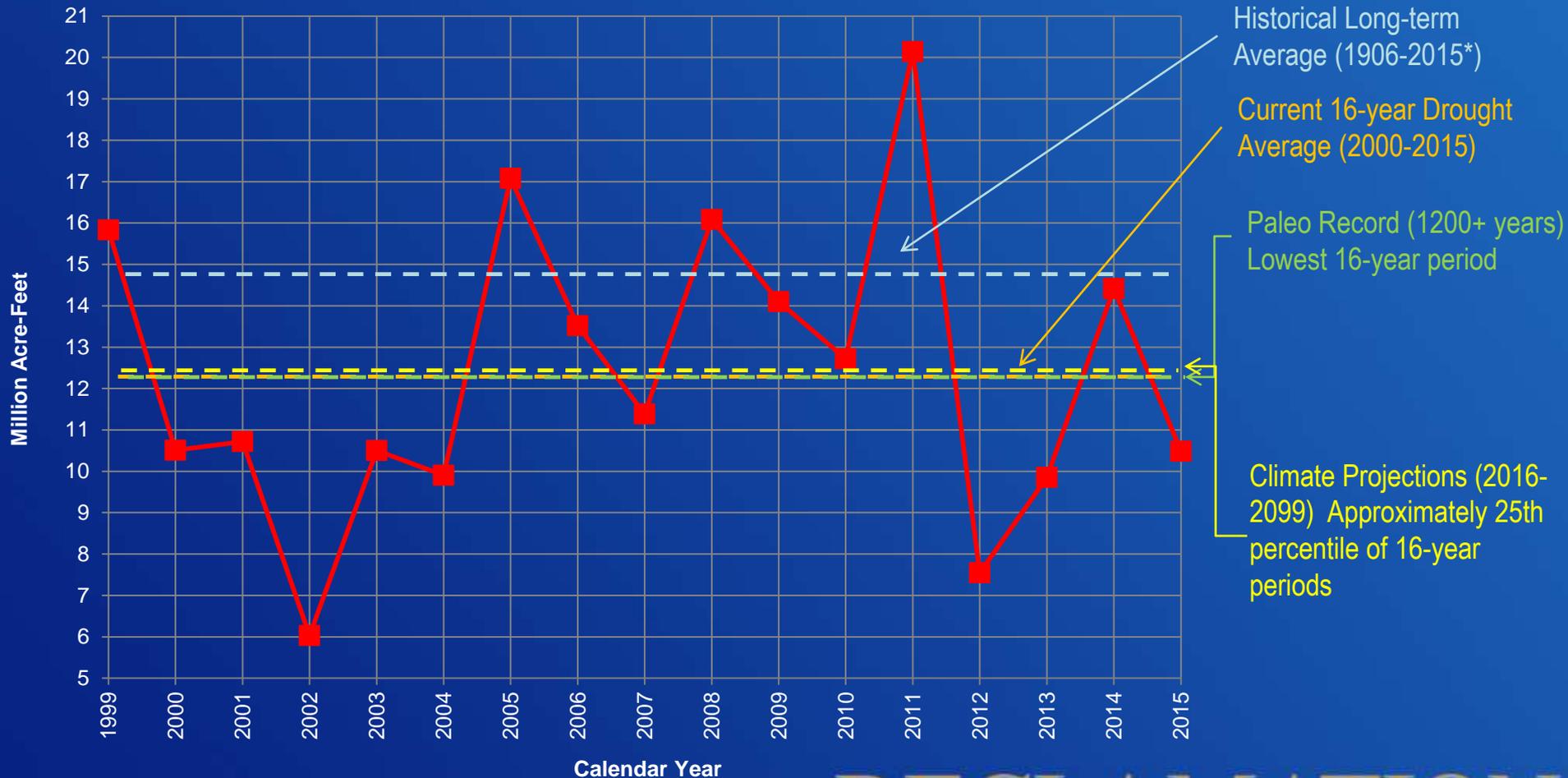
Colorado River Drought

- 2000-2015 is the driest 16-year period in over 100 years of historical records (2013-2015 are estimated)
- Tree-ring reconstructions show more severe droughts have occurred over the past 1200 years (e.g., drought in the mid 1100s)
- The preliminary observed 2015 April through July runoff is 94% of average¹ as of September 1
- Not unusual to have a few years of above average inflow during longer-term droughts (e.g., the 1950s)

¹ Percent of average is based on the period of record from 1981-2010.

Current 16-year Drought (2000-2015)

Natural Flow at Lees Ferry

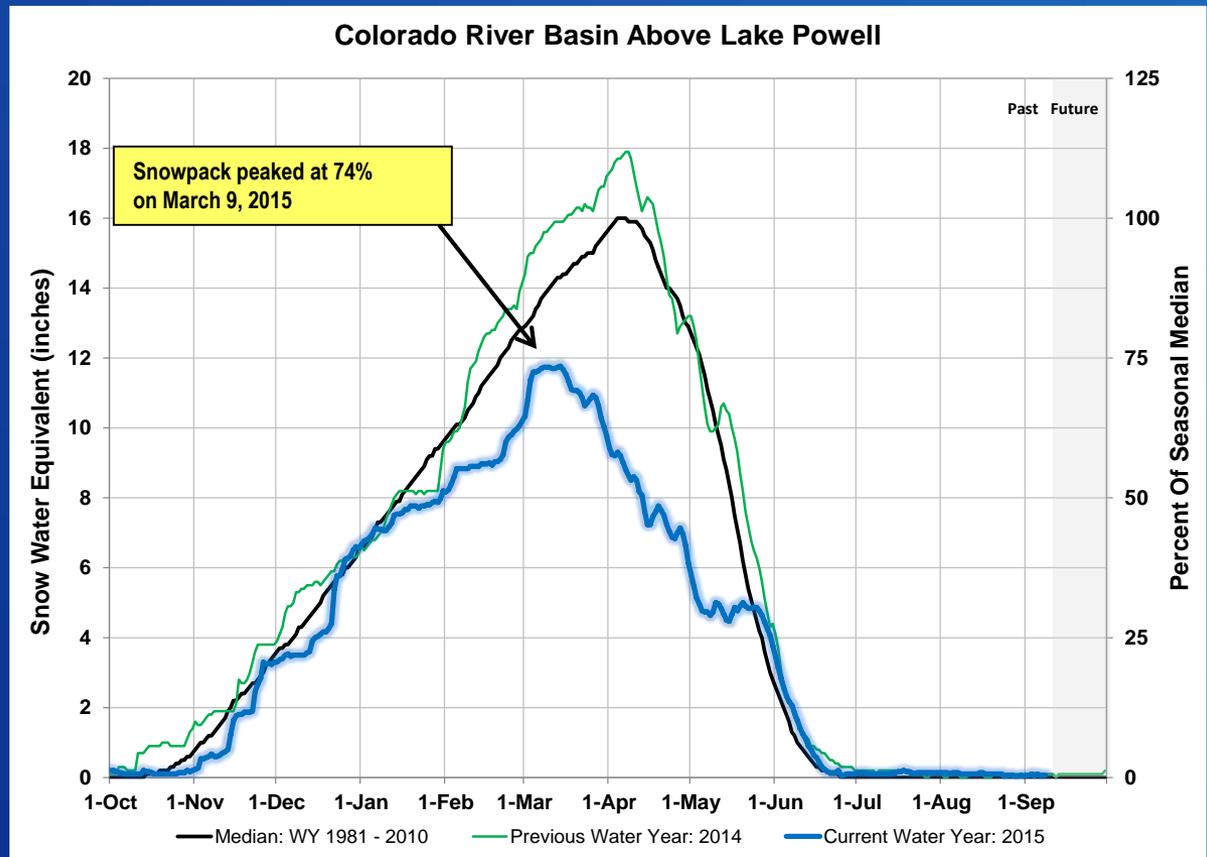


*2013-2015 natural flows are provisional

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Water Year Snowpack and Precipitation (as of September 8, 2015)

- Colorado River Basin above Lake Powell
- Water Year 2015 Precipitation to date: 93% of average
- Current Snowpack: NA



Colorado River Basin Storage

(as of September 7, 2015)

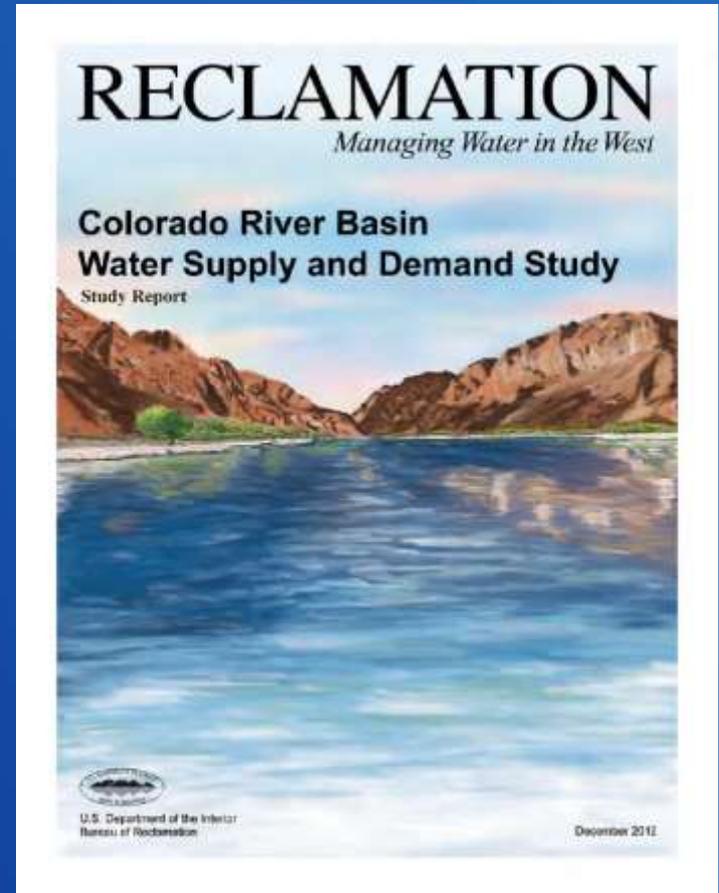
Reservoir	Percent Full	Storage (MAF)	Elevation (Feet)
Lake Powell	52%	12.56	3,608
Lake Mead	38%	9.87	1,078
Total System Storage*	52%	30.73	NA

*Total system storage was 30.15 maf or 51% this time last year

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Study Summary

- The system is vulnerable if we do nothing
- Doing something greatly reduces that vulnerability and makes the system more resilient but does not eliminate vulnerability
- In the near term, all portfolios show that conservation, transfers, and reuse are cost-effective ways to reduce vulnerability
- In the longer term, more tradeoffs emerge to achieve an acceptable level of risk in terms of options, cost, resources, and other implications



<http://www.usbr.gov/lc/region/programs/crbstudy.html>

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- Moving Forward effort*
- State-led
- Reclamation-led
- Tribes/Reclamation-led
- Area identified in Basin Study where next steps should be taken

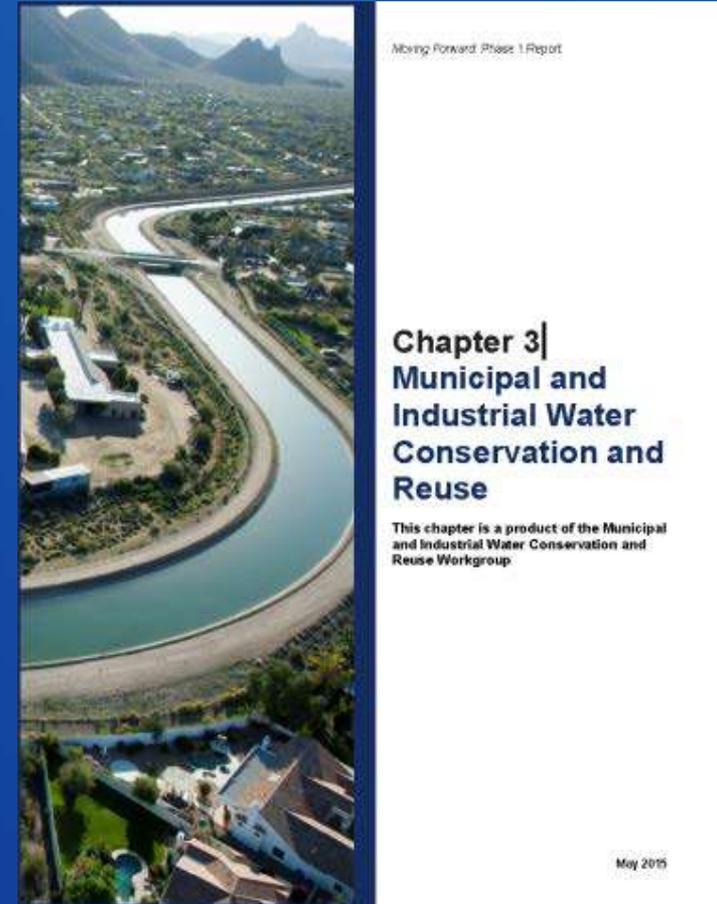
Next Steps Areas Identified in the Basin Study

Moving Forward Effort

- Stakeholder kickoff in May 2013
- Ultimate goal: identify actionable steps to address projected water supply and demand imbalances that have broad-based support and provide a wide-range of benefits.
- Phase 1 began with the formation of:
 - Coordination Team
 - M&I Water Conservation and Reuse Workgroup
 - Agricultural Water Conservation, Productivity, and Transfers Workgroup
 - Environmental and Recreational Flows Workgroup
- Phase 1 Report published in May 2015
- Commenting encouraged – visit website

M&I Water Conservation and Reuse Workgroup

- Co-Chairs – Denver, MWD, Arizona Municipal Water Users
- Objectives: document trends in M&I conservation/reuse in areas that receive Colorado River water; identify opportunities and challenges for expanding M&I conservation/reuse programs to address projected future imbalances and enhance overall resiliency.
- Chapter 3 of the Phase 1 Report documents Workgroup's activities
 - Appendix 3B – Case Studies
 - Appendix 3C – Summary of M&I Water Conservation and Reuse Programs

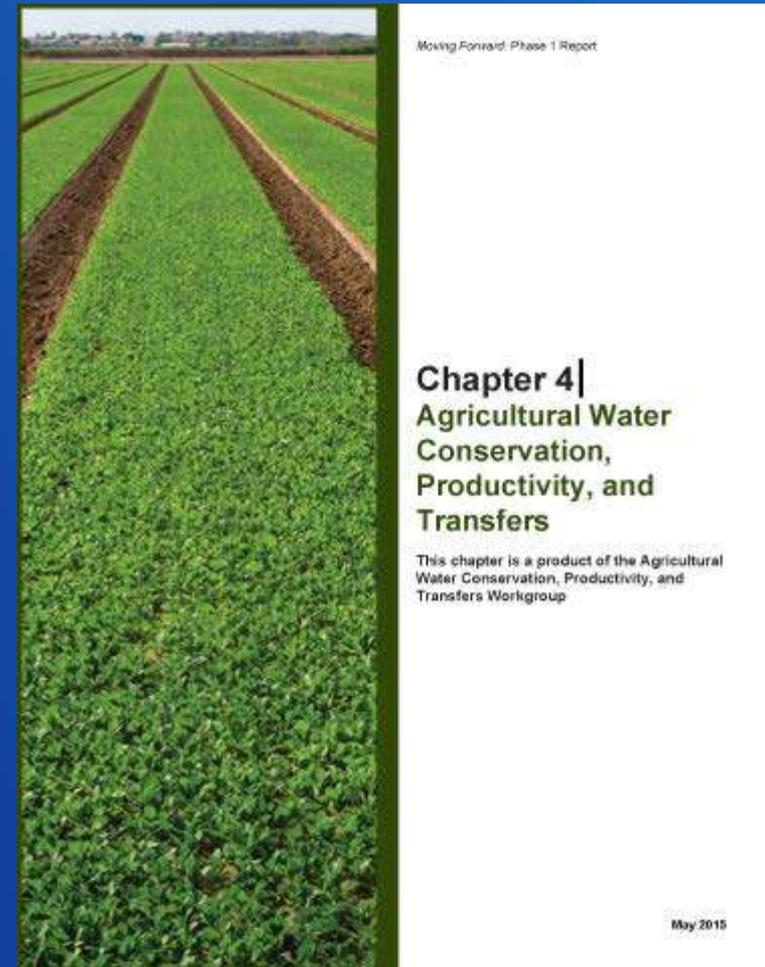


M&I Workgroup Highlights

- Municipal conservation and reuse
 - Per capita use decreased by 11 percent to 38 percent since 1990, due in part to water conservation
 - Suggest an additional 700,000 acre-feet per year (AFY) of conservation and 400,000 AFY of reuse by 2030
- Types of water conservation measures metering and billing, public outreach, residential indoor practices, and outdoor landscaping practices
- Opportunities and potential actions exist to increase water conservation and reuse by and, in many cases, are currently being pursued; however, these opportunities will vary depending on many factors

Agricultural Water Conservation, Productivity and Transfers Workgroup

- Co-Chairs – Colorado State University, IID, BOR
- Objectives: document trends in agricultural conservation and transfer of Colorado River water; identify opportunities and challenges for expanding agricultural conservation to address projected future imbalances and enhance overall resiliency.
- Chapter 4 of the Phase 1 Report documents Workgroup's activities
 - Appendix 4B – Case Studies
 - Appendix 4C – Productivity, Hydrologic Conditions, and Consumptive Use
 - Appendix 4D – Historical Agricultural Water Conservation and Transfer Programs



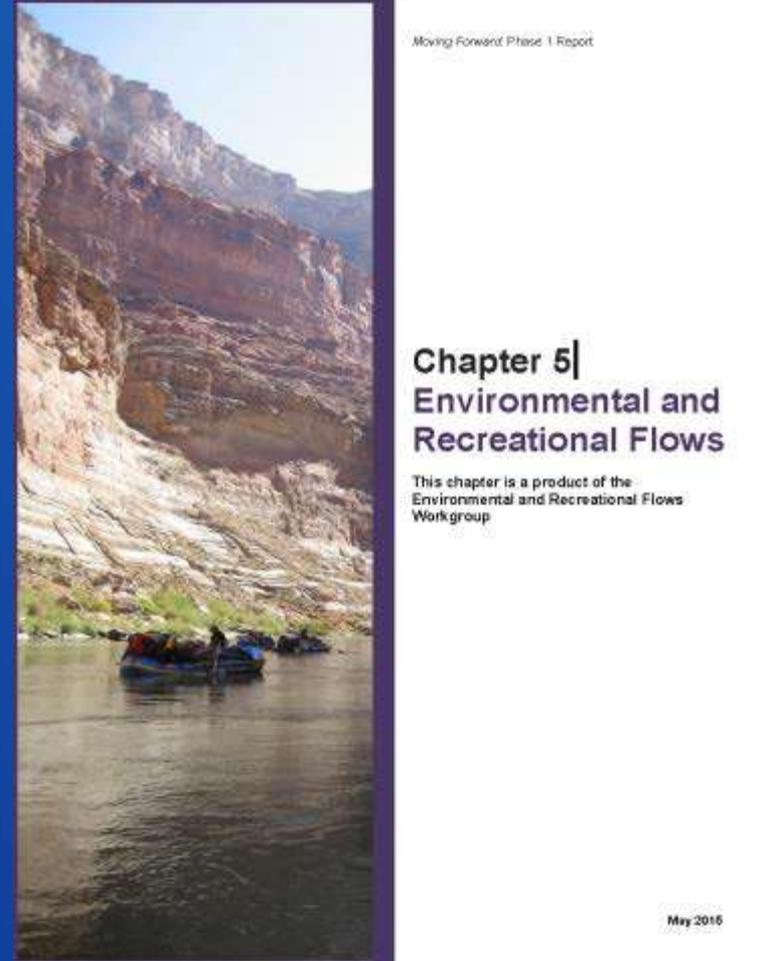
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Ag Workgroup Highlights

- Historically, water use per acre remained relatively constant; productivity increased Basin-wide about 25 percent since 1980
- Data reporting/availability reflect the varying nature of agriculture across the Basin - consistent water use analyses may not be feasible
- Many advances in agricultural conservation achieved with a variety of federal, state, and local stakeholders working toward mutually beneficial solutions
- Efficiency of water use will increase depending location, crops, economic, and other considerations.

Environmental and Recreational Flows Workgroup

- Co-Chairs – Colorado, the Nature Conservancy, BOR
- Objective - identify ideas for potential future voluntary, non-regulatory solutions that protect or improve ecological and recreational resources while supporting other management goals to achieve integrated solution that benefit multiple uses, both consumptive and non-consumptive, including hydropower.
- Chapter 5 documents Workgroup's activities
 - Appendix 5B – Existing Ecological, Recreational, and Hydropower Programs



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Env/Rec Workgroup Highlights

- Basin Study modeling indicates environmental, recreational, and hydropower resources are increasingly vulnerable through time
- Currently, many programs and processes use a range of effective mechanisms to address ecological and recreational resources
- Cooperative, multi-interest/multi-party voluntary mechanisms have proven to be successful in protecting or improving ecological and recreational resources
- Opportunities exist to expand or implement new environmental and recreational flow programs, particularly through programs designed to benefit other Basin resources.

Summary

- Twenty-five opportunities were identified by the workgroups to address projected imbalances and enhance system resiliency
- Workgroups also identified potential actions associated with each opportunity
- Similar between each workgroup's individual set of findings include opportunities related to:
 - Funding and incentives
 - Data and tools
 - Outreach and partnerships
 - Coordination and integration
 - Infrastructure improvements
 - Flexible water management

Moving Forward Effort, Phase 2

- Phase 2, which will begin in 2015, signals the transition from study to action
- Building from the Phase 1 Workgroups' proposed opportunities for future actions, several pilot projects will be identified and implemented
- The specifics of the pilot projects are unknown at this time but will be related to M&I and Ag conservation and environmental and recreational flows

Colorado River Basin Updates



Questions?

For more information

- Lower Colorado River Operations: <http://www.usbr.gov/lc/riverops.html>
- Basin Study: <http://www.usbr.gov/lc/region/programs/crbstudy.html>
- Moving Forward:
<http://www.usbr.gov/lc/region/programs/crbstudy/MovingForward/index.html>

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