Background on Colorado River Augmentation Efforts

Chuck Cullom

Colorado River Programs Manager

Central Arizona Project

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Overview

- Origin of the imbalance in the Colorado River system
- Implications of long-term imbalance on the Colorado River System
- Augmentation expectations – CRBPA and 1975 Westwide Study
- Conclusions and Observations

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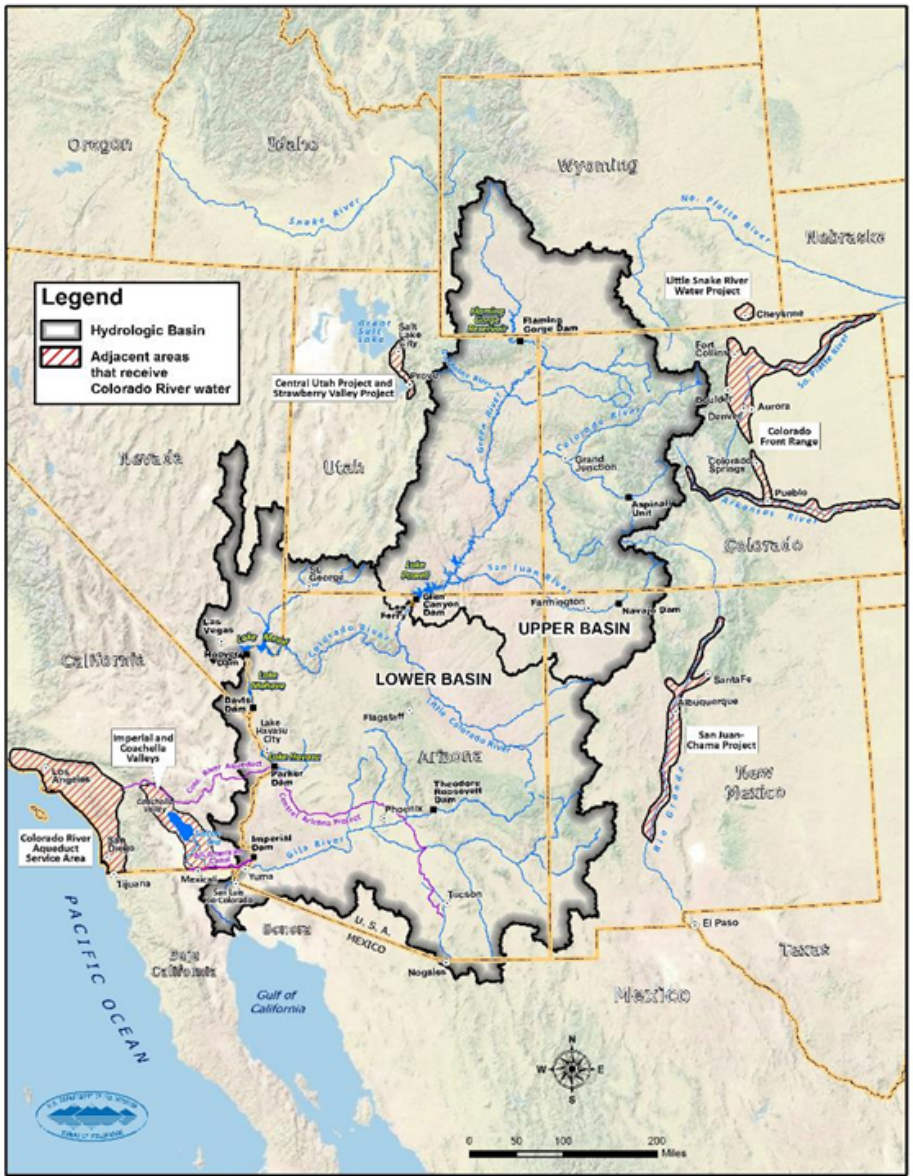
Colorado River System Overview



- $1.5 trillion/yr economic activity (~12th largest GDP)
- Serves US & Mexico
- ~40 million people
- ~ 5 million irrigated acres
- ~$5 billion/yr Ag Value
- ~ 15 MAF/yr runoff
- 10 major reservoirs (60 MAF)
- Environmental values

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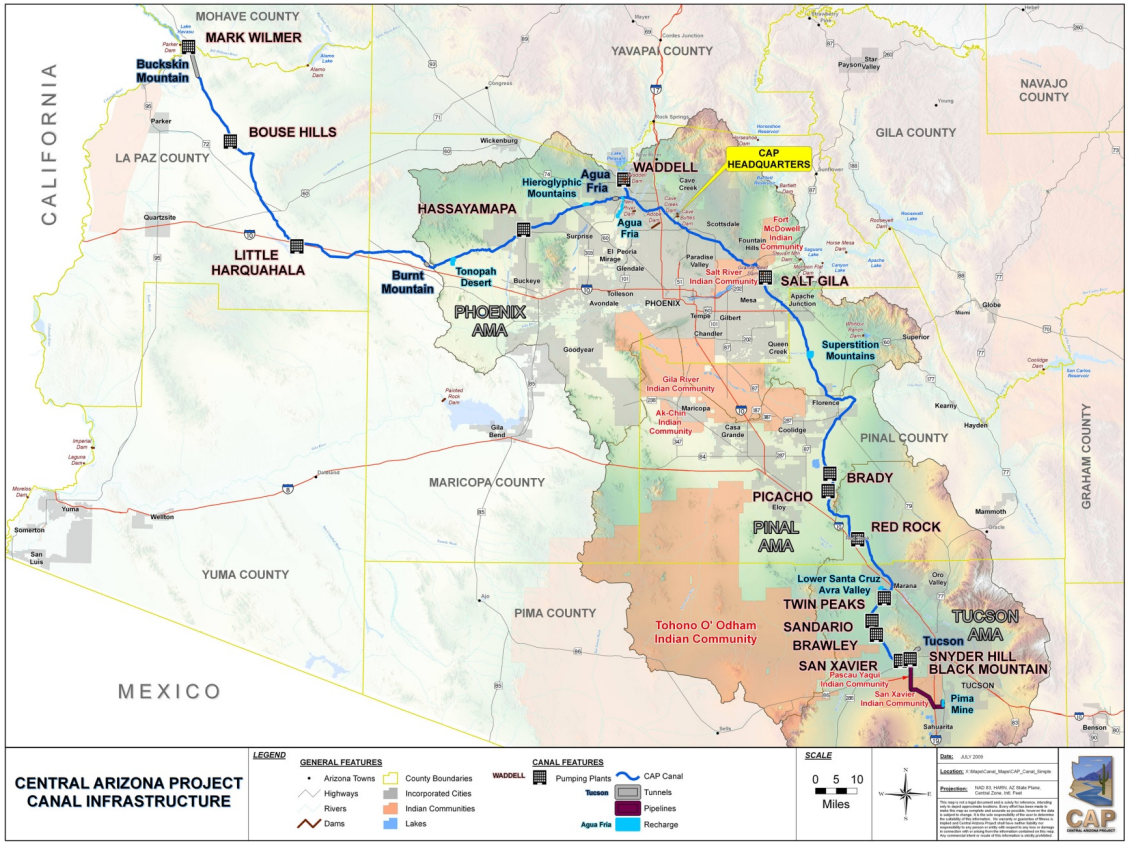

336-mile aqueduct

14 pumping plants lift water nearly 3,000 feet

Delivers ~ 1.6 MAF/yr

Diverse customers: 11 tribes, ~ 10 irrigation districts, ~ 50 cities

80% AZ pop. reside in CAP Service Area

50% of AZ's economy related to CAP deliveries

Junior Priority, vulnerable to shortages

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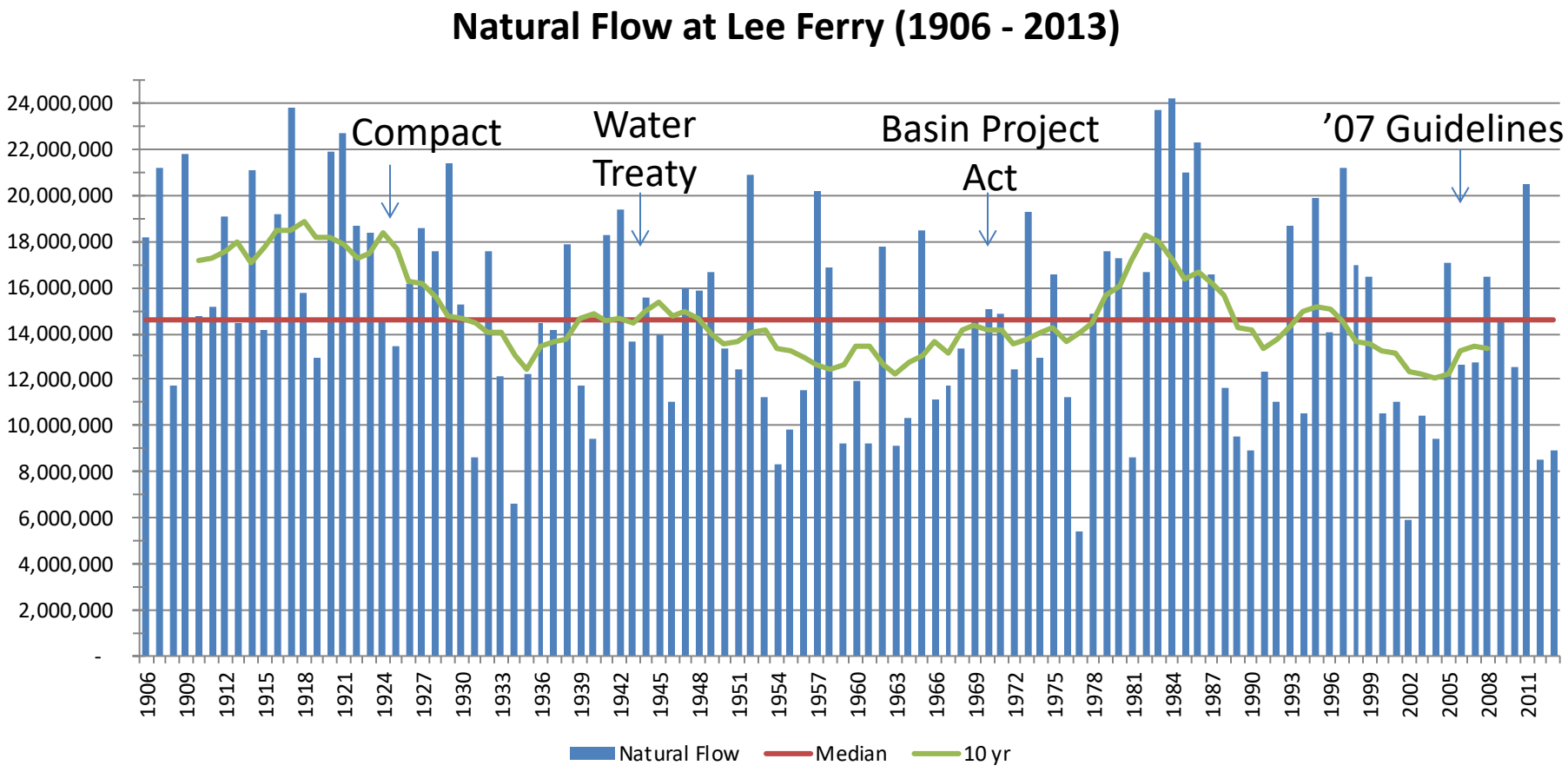
Observed Hydrology & Key Decisions



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Colorado River Imbalance: Who's to Blame

- 1922 Compact – Original Over-allocation? (allocation =/ use)
- 15 MAF Total = 7.5 MAF LB + 7.5 UB

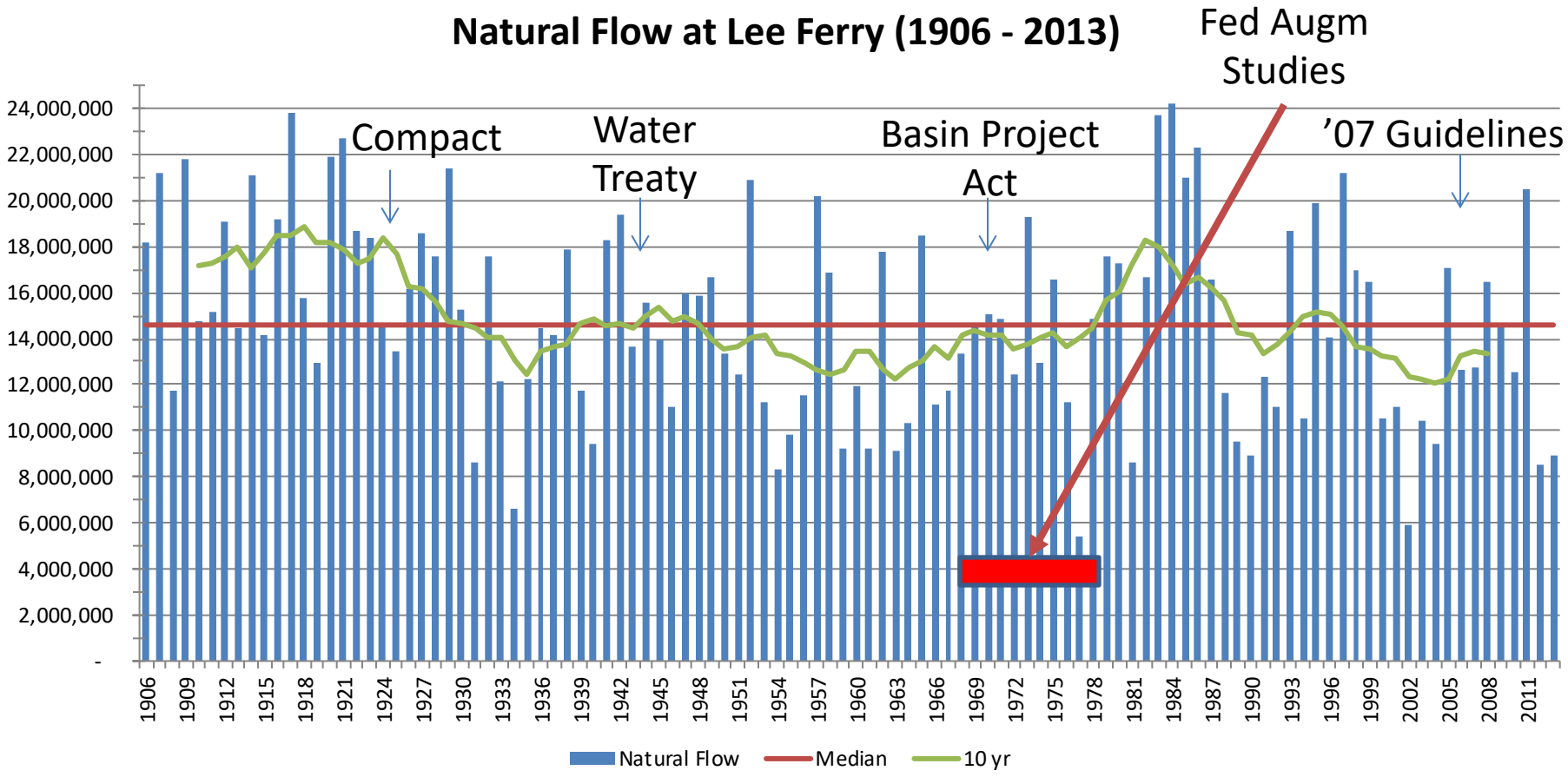
Colorado River Imbalance: Who's to Blame

- 1944 – US-Mexico Water Treaty additional allocation?
  - 16.5 MAF = 15 MAF + 1.5 MAF (allocation =/ use)
  - California witnesses noted that the additional 1.5 MAF allocation would create a "permanent imbalance in the Lower System"
  - US assumed ½ Treaty obligation to derive from return flows, 15.75 MAF

Colorado River Imbalance: Who's to Blame

- 1968 Colorado River Basin Project Act – Building junior priority projects vulnerable to shortage?
  - US assumed to resolve the issue by 2.5 MAF augmentation to the Colorado River system, making priority "moot"

Observed Hydrology & Key Decisions



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Full Recognition of Potential Imbalances: What does CBRPA Say

- CRBPA recognized that significant portion of the Basin States are largely dependent on the Colorado River and are vulnerable to shortage/drought
- Title 1 called for “the provision of additional and adequate water supplies for use in the Upper as well as the Lower Colorado River Basin.”
- Title 2 directed the Secretary of the Interior to conduct reconnaissance investigations and to prepare a general plan to meet the future water needs of the Western United States

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The Westwide Study: Critical Water Problems Facing 11 Western States

- Estimates of long-range water supplies and water requirements for each water resource region of the 11 Western States.
- Develop a general plan to meet future water needs of the Western United States.
- The Study investigated the “possible means of augmentation of the natural water supplies the Upper and Lower Colorado River Basins from sources within the Basin …”

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The Westwide Study: Critical Water Problems Facing 11 Western States

- The Study investigated the augmentation including weather modification, desalting, water conservation and geothermal, as well as irrigation and municipal conservation and reuse strategies.
- Also investigated possible means and sources of augmentation from sources outside of the Basin in Arizona, California, Colorado and New Mexico.
- Recommend such feasibility studies as warranted of sources and means of augmentation.

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Results of Westwide Study

- Projected increasing risks of shortages in the Colorado River Basin beginning in 1990 and becoming progressively greater thereafter.
- To assure the avoidance of serious water shortages, programs to augment riverflows or to match water supply with water demand should be in operation in 1995-2000
- Augmentation target of 1.3 MAF/yr is feasible using multiple approaches
- Called for total water management programs (aka holistic) to optimize existing supplies including conservation and reuse.

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Technical Results of Westwide Study

- Called for multiple hydrologic and demand scenarios be developed and used in the Colorado River Basin Model (precursor to CRSS)
- Recognition that scenario based planning is important in highly variable systems with significant uncertainty
- Outlined the need for continued development of data regarding hydrology, flow, land cover and environmental values
- Recognized the need for balance between water uses, future development and environmental values

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Results of Westwide Study

- Projected full use in the Upper and Lower Basin by mid-1990s will give rise to 2 significant problems ***to address now***:
  - ***Demands will exceed natural supply. Unless flows are augmented, growth will be impeded OR supplies must be redistributed.***
  - As the Basin approaches full use, ***salinity issues will increase,*** particularly in the lower reaches in the Lower Basin. ***Programs to promote water conservation and best practices to augment supplies and reduce salts are extremely important to the future of the Colorado River Basin.***

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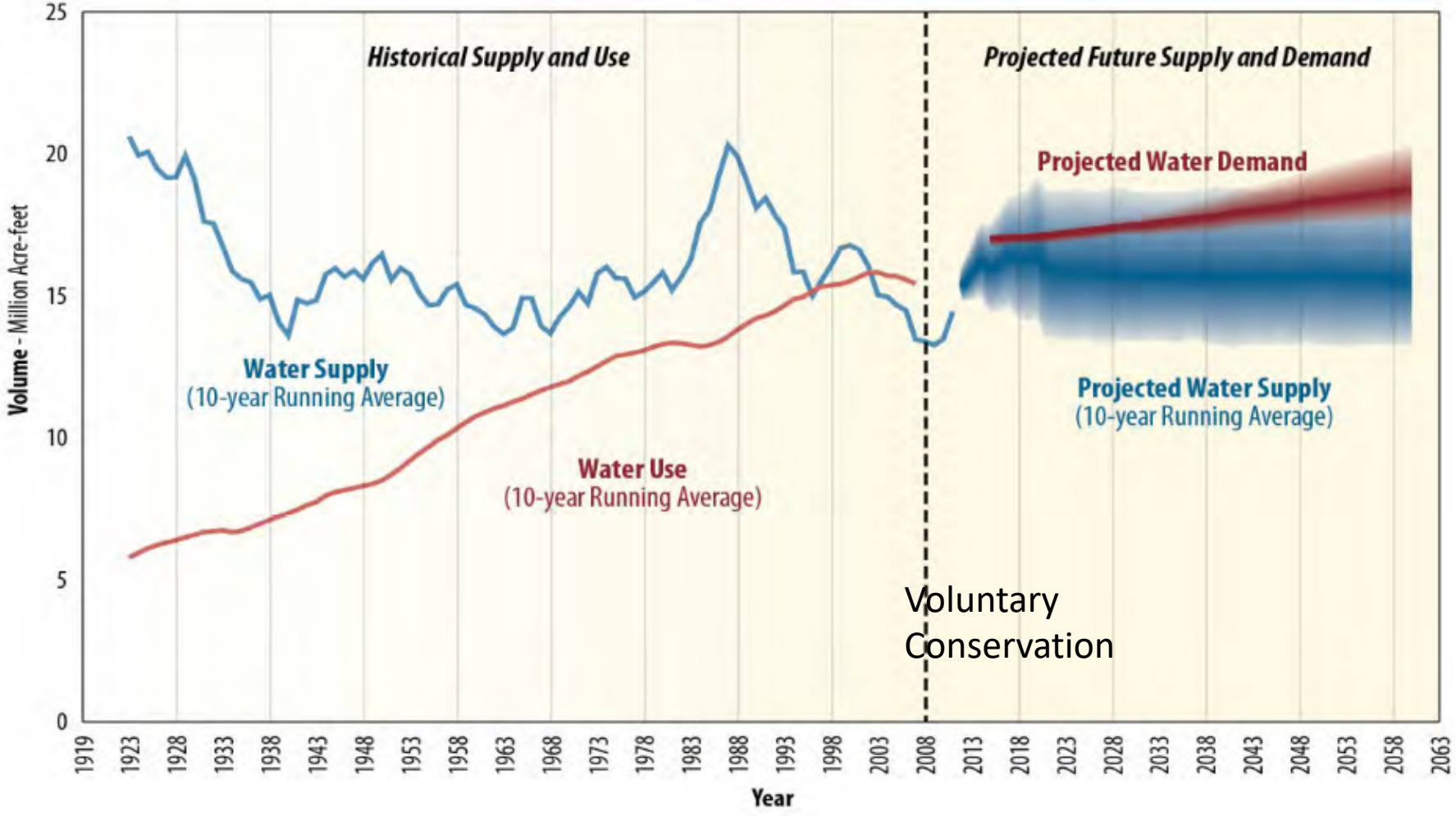
Colorado River Supply/Demands



Voluntary Conservation

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Observations

- The need for augmentation as a means to address the long-term imbalance in the Colorado River Basin, has been well understood for more than 50 years.
- The Westwide study was a significant federal effort to frame the problem, offer solutions and meet the requirements to study augmentation outlined in the CRBPA. The 2012 Basin Study was in some ways a follow up to the Westwide Study.
- Few tangible results emerged from the study.
- Augmentation efforts have pivoted toward non-federal "coalitions of the willing" to develop and augment supplies.

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Conclusions

- The key findings from the Westwide Report remain valid today:
  - ***Demands may exceed natural supply. Without augmentation, growth will be impeded OR supplies must be redistributed.***
  - ***Programs to promote water conservation and application of best practices to augment supplies and reduce salts are extremely important to the future of the Colorado River Basin.***
- The future roles of the United States, Basin States and water users in augmentation will need to continue to evolve.

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