

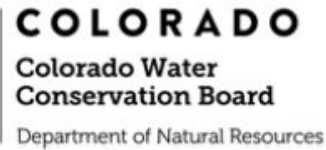


# Colorado River Climate and Hydrology Work Group

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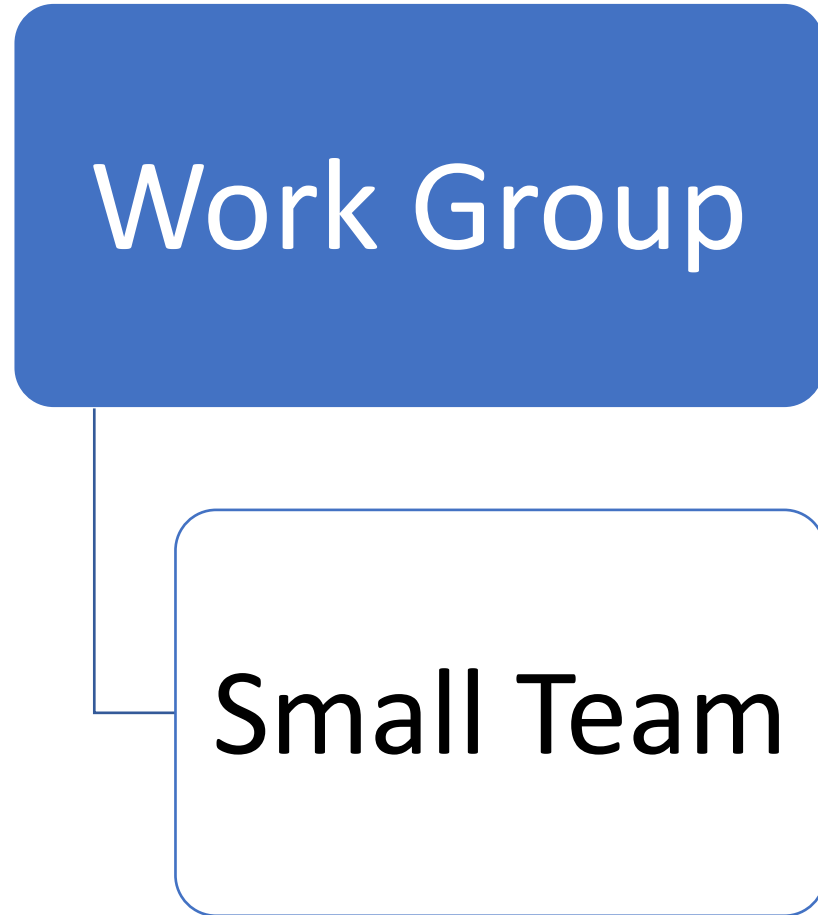
# Participants



# Work Group Goal

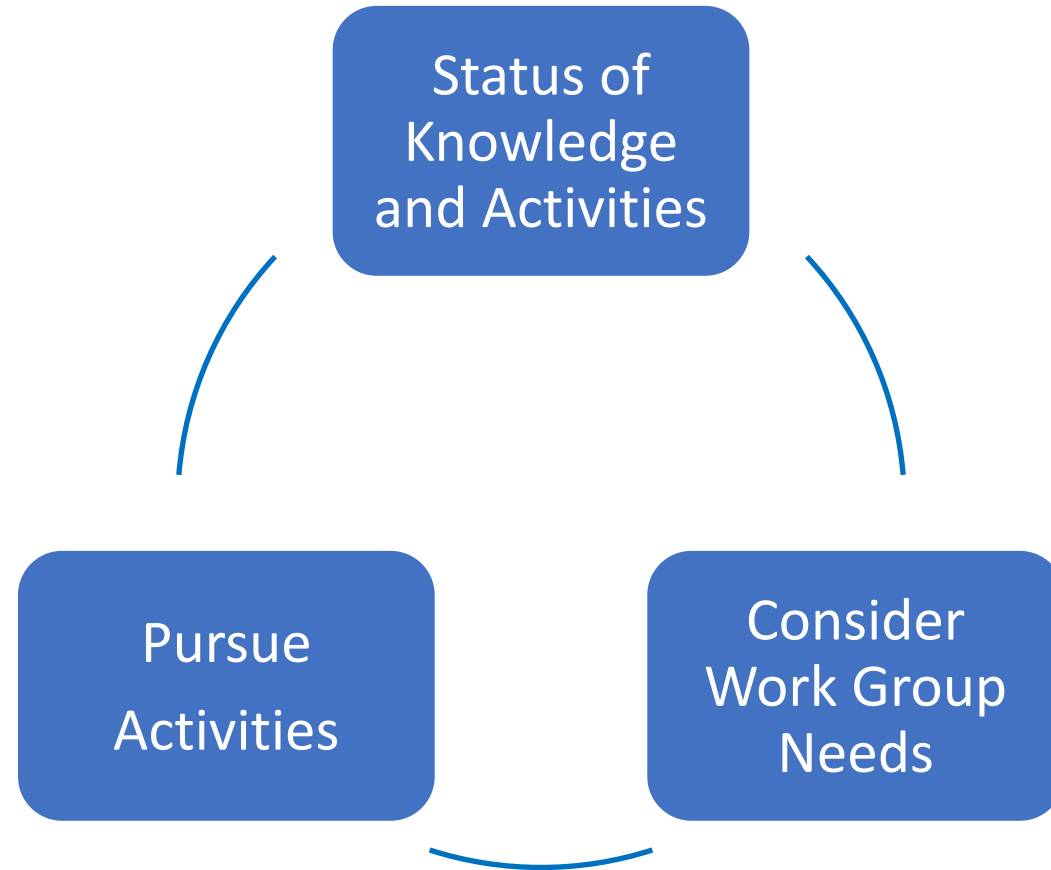
Advance scientific understanding to improve the accuracy of hydrological forecasts and projections, to enhance the performance of predictive tools, and to better understand the uncertainty related to future supply and demand conditions in the Colorado River Basin.

# Structure and Process



- Informal
- Voluntary
- Facilitated by coordinator(s)
- Driven by water user needs
- Consensus on priorities
- Willing parties implement
- Informative to other needs but not conflicting

# Knowledge and Activities

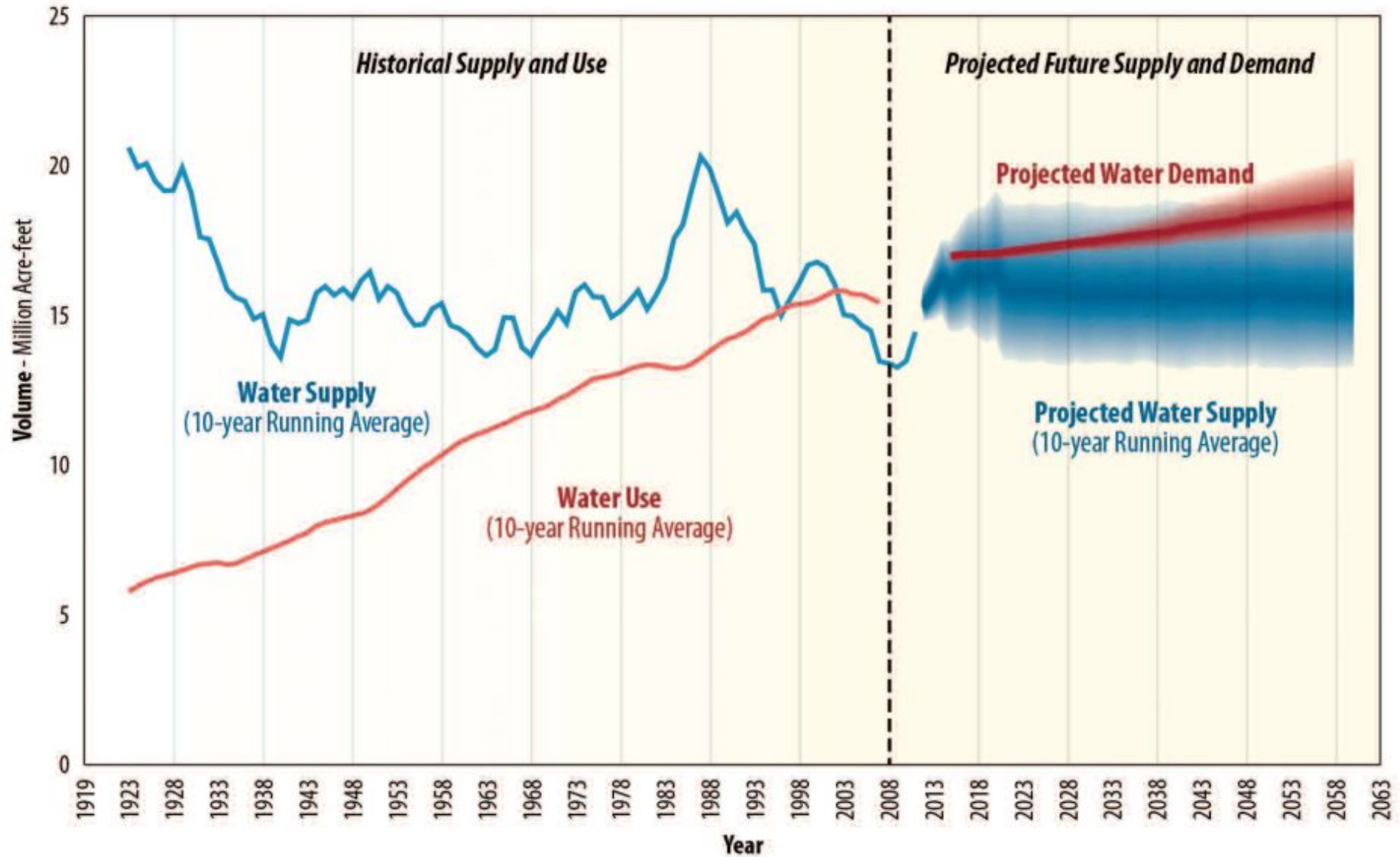


# Types of Decisions That Must Be Made

- Lake Powell release tier and volume
- Lake Mead shortage condition
- Drought Response Operations Agreement Plan
- Lower Basin DCP contributions
- Minute 323 shortages and recoverable water savings

**FIGURE 2**

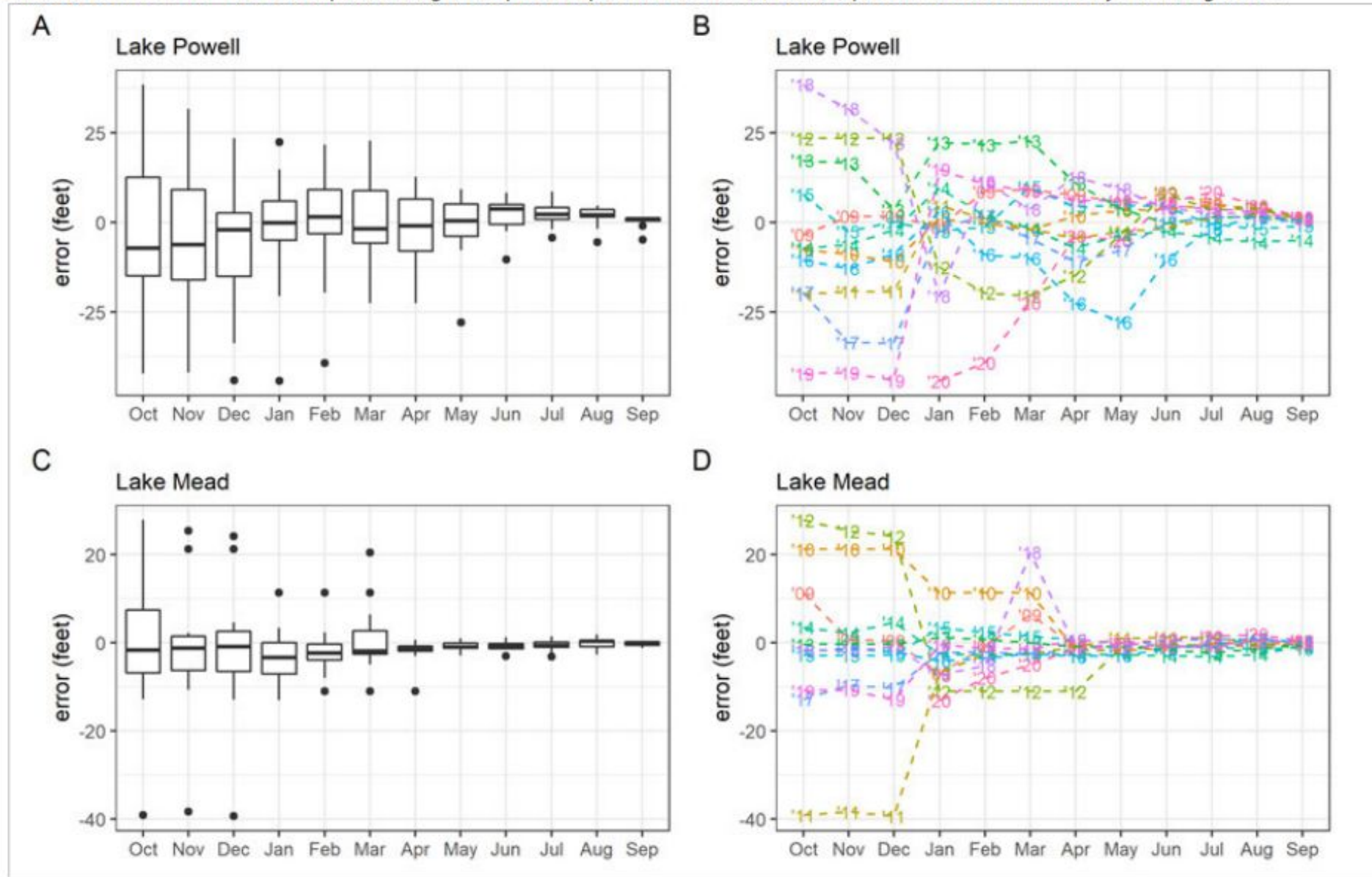
Historical Supply and Use<sup>1</sup> and Projected Future Colorado River Basin Water Supply and Demand



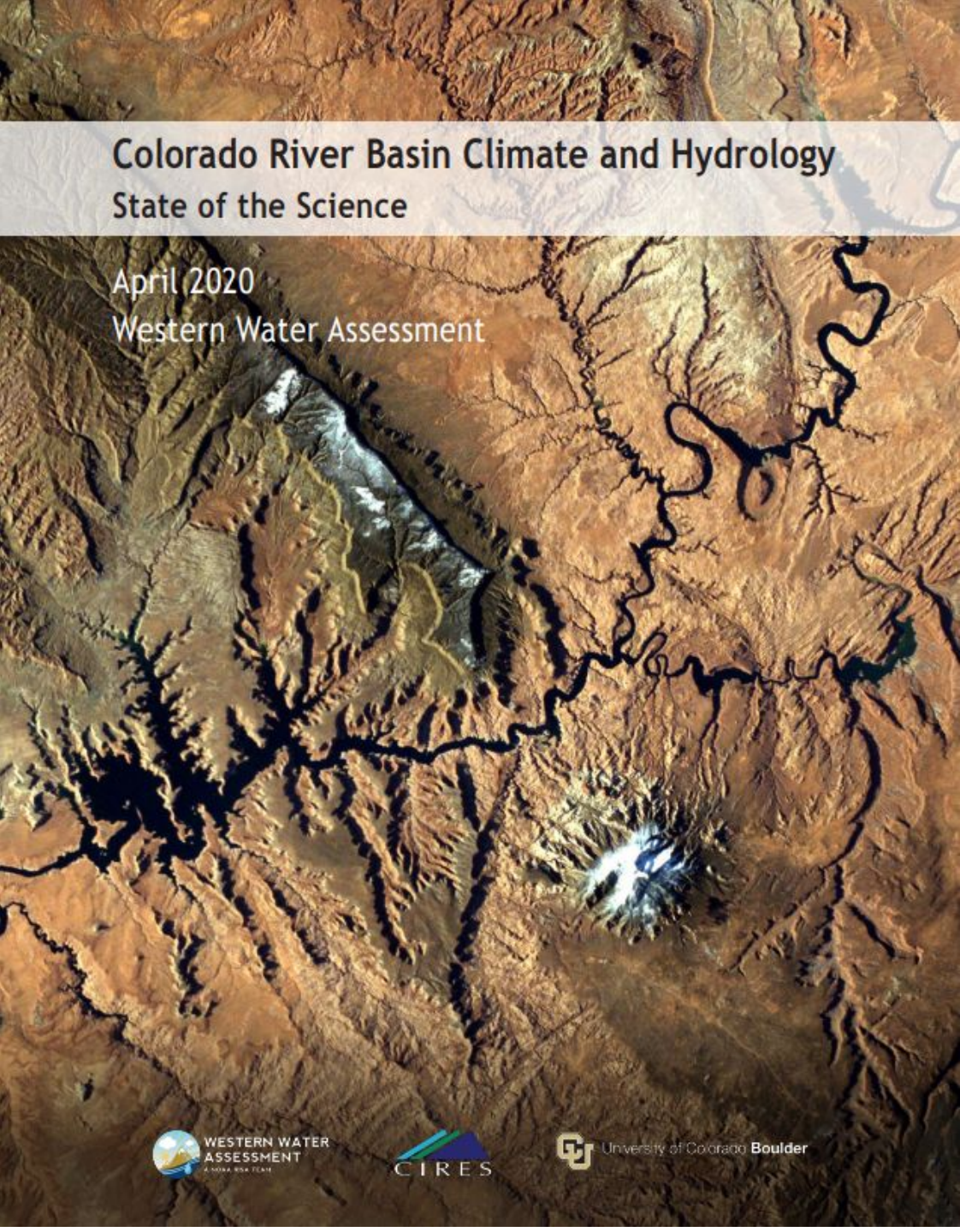
<sup>1</sup> Water use and demand include Mexico's allotment and losses such as those due to reservoir evaporation, native vegetation, and operational inefficiencies.



Figure A17. EOWY Lake Powell and Lake Mead projection errors for all 24-Month Studies from January 2008 – December 2019. (A) and (C) show the statistics of the errors as box and whisker plots where the horizontal line marks the median; the box extends to the 25<sup>th</sup> and 75<sup>th</sup> percentiles, the whiskers extend to 1.5 \* the inner quartile range, and points represent outliers. (B) and (D) present the errors for each year through time.







Colorado River Basin Climate and Hydrology  
State of the Science

April 2020  
Western Water Assessment

- Identified challenges and opportunities
- Documented state of knowledge and practice
  - Weather and climate
  - Hydrology
  - Decision-support tools
- Tool for engaging researchers

# Some Challenges

- Inadequate characterization of the snowpack
- Estimation of evapotranspiration and crop water use
- Soil moisture is poorly monitored and understood
- Improved sub-seasonal and seasonal climate predictions

# The “Blue Table” of Priorities

Timeframe	Number	Activity/Concept/Project	Models or Processes Benefitted by Activity				Activity Lead/Owner				Symposium Presentation #	Gap Analysis #	SOS Opportunity #	How to Complete
			CBRFC	BOR			CBRFC	BOR	State(s)	Other				
				24-IMS	MTOM	CRSS								
Short-term	1	Sensitivity Analysis of Hydroclimatic Parameters within CBRFC's Modeling Framework	X	X	X		X	X				SOS 2.2, 6.2	CBRFC (in-house) \$0 cash.	
Short-term	2	Create a new set of hydrological inputs that are not based on climatology (i.e. use the Weather Generation approach like Balaji) as an experiment and run side-by-side comparison to evaluate skill over time.	X	X	X		X	X		19, 3	U.10.3 (1) LT.3.03		BOR - Any new set of hydrolog could be tested using the Colc Streamflow Testbed.	
Short-term	2a	HEFS integration	X	X	X		X			10	U.10.3 (2)	SOS 7.7	CBRFC would test; would need develop	

- Focused on user needs and information gaps
- Leans toward near-term improvements
- Consider seasonal to multi-decadal lead times
- Educates about key findings
- Helps track other efforts
- Lists priorities agreed to by Work Group

# Some Current Priorities

- Develop CBRFC testbed framework
- Incorporate a dynamic ET term and improve unmeasured depletion calculations in CBRFC's modeling system
- Explore springtime precipitation predictability
- Improve 1-5 year water supply forecast skill
- Explore different statistical and dynamical downscaling methods and the streamflow ensembles that result
- Evaluate differences stemming from downscaling methods, bias-correction methods, and hydrologic models

Partnerships  
Make it  
Happen

