

RECLAMATION

Managing Water in the West

Colorado River Basin Water Supply and Demand Study

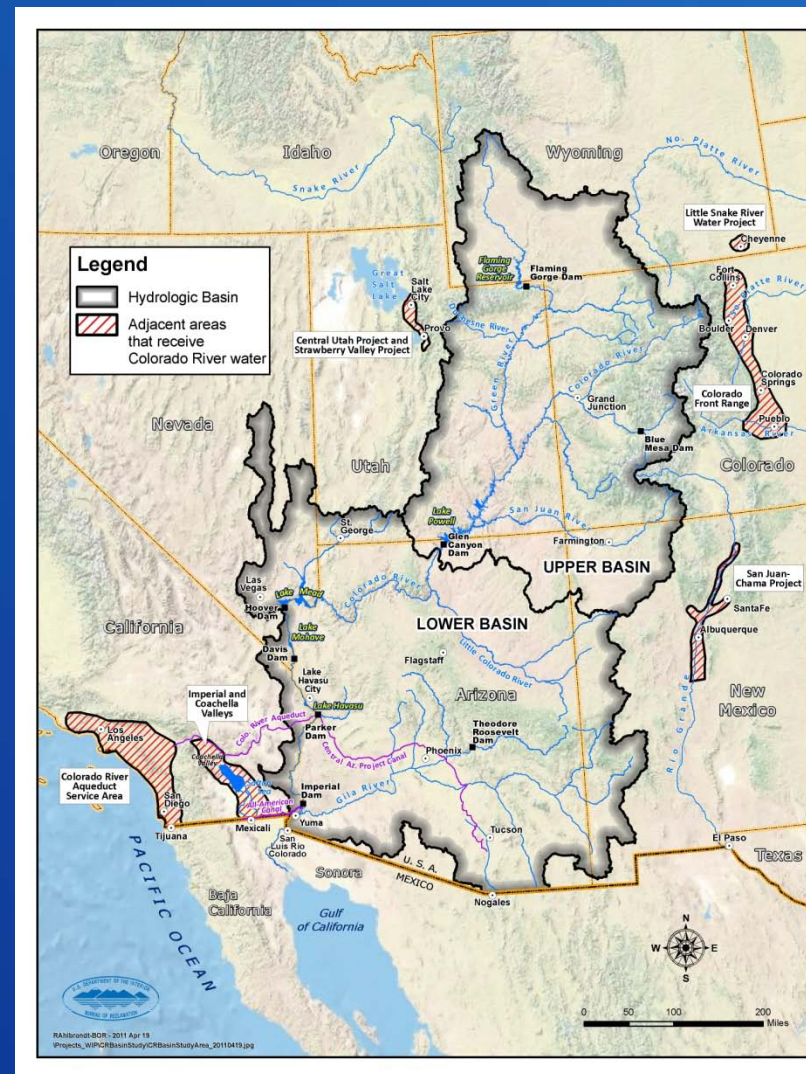
Landscape Conservation Cooperatives Webinar
Status of Study and Kickoff of Phase 4
January 10, 2012



U.S. Department of the Interior
Bureau of Reclamation

Colorado River Basin Water Supply and Demand Study

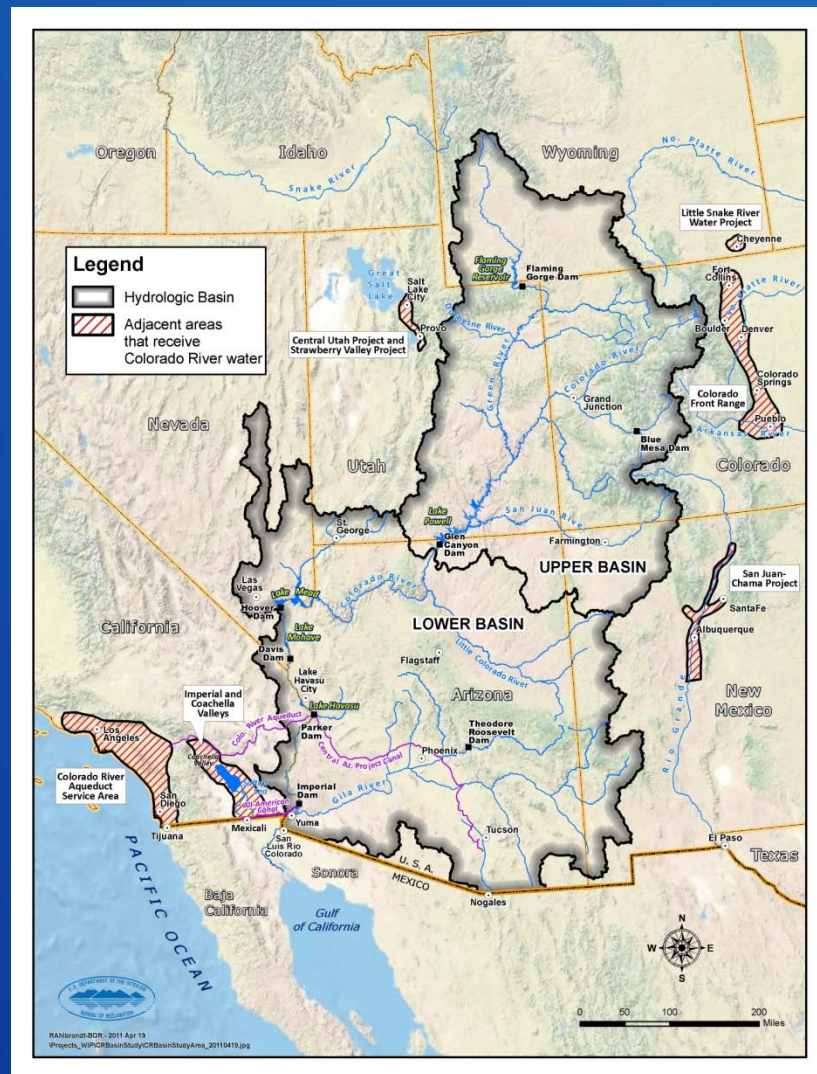
- Study Overview and Status
- Overview of Phase 4: *Developing and Evaluating Opportunities to Balance Supply and Demand*
- Schedule
- Questions



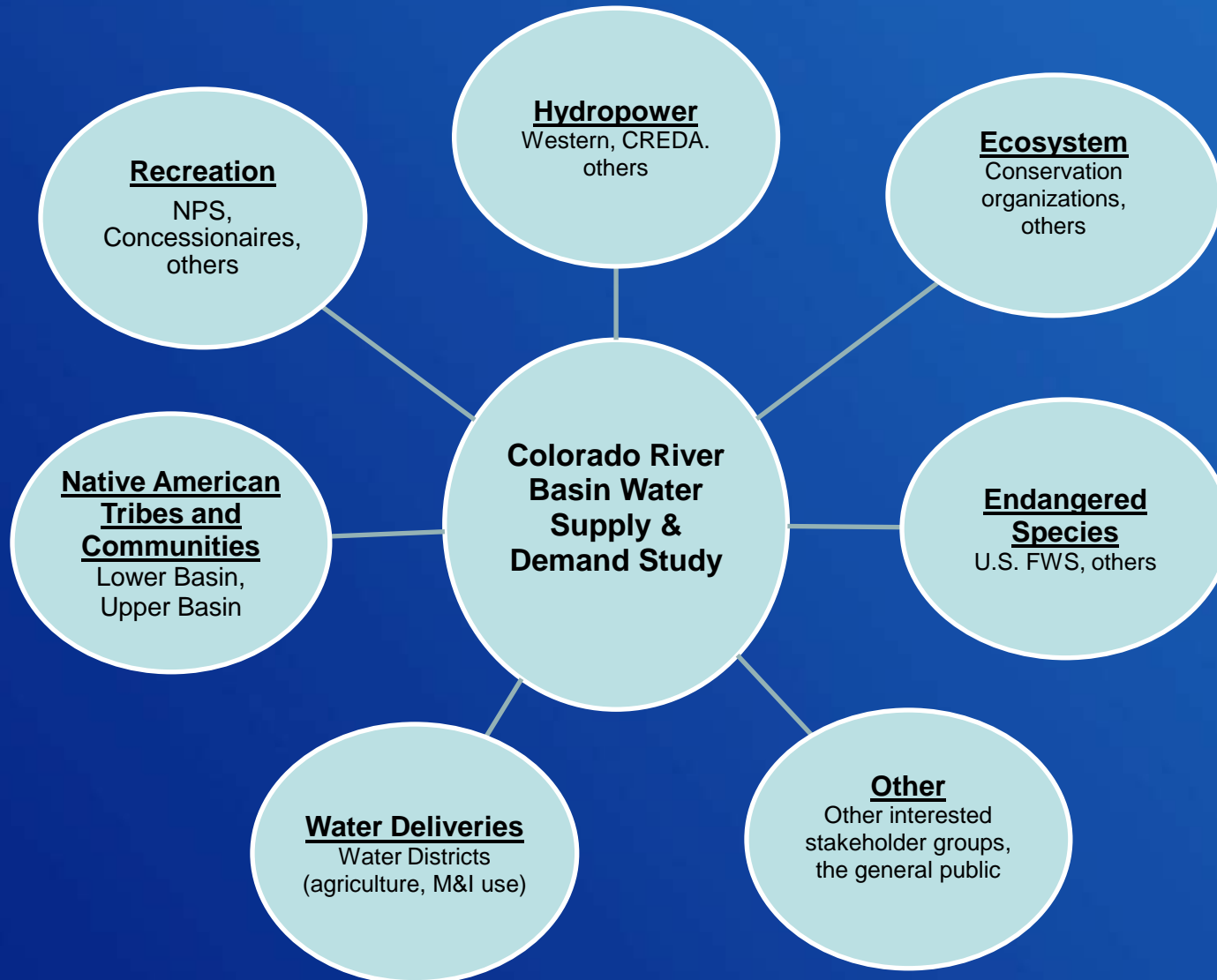
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Colorado River Basin Water Supply and Demand Study

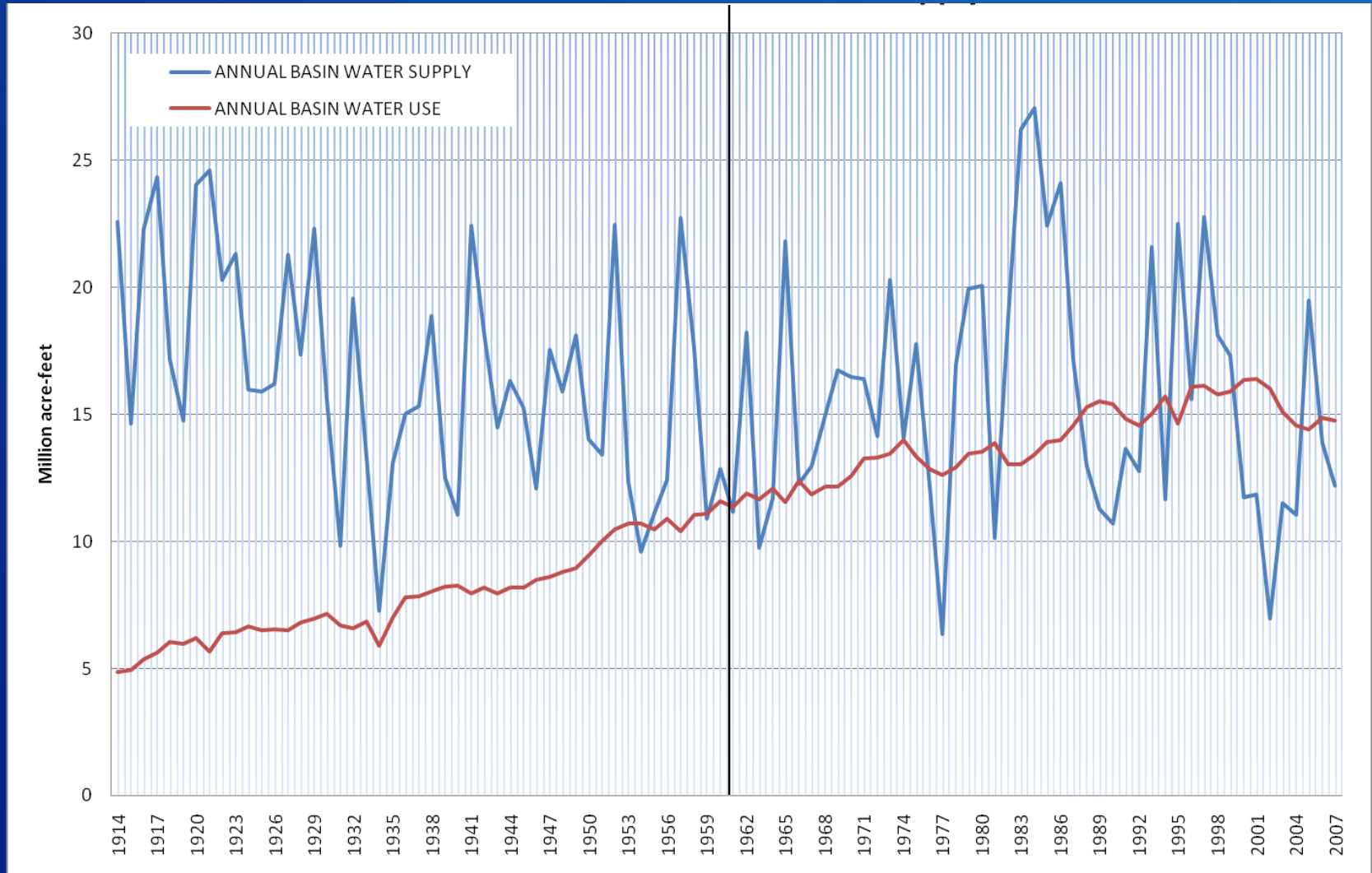
- Study Objective
 - Assess future water supply and demand imbalances over the next 50 years
 - Develop and evaluate opportunities for resolving imbalances
- Study being conducted by Reclamation and the Basin States, in collaboration with stakeholders throughout the Basin
- A 2.5 year-Study beginning in January 2010
- A planning study – will *not* result in any decisions, but will provide the technical foundation for future activities



Study Outreach



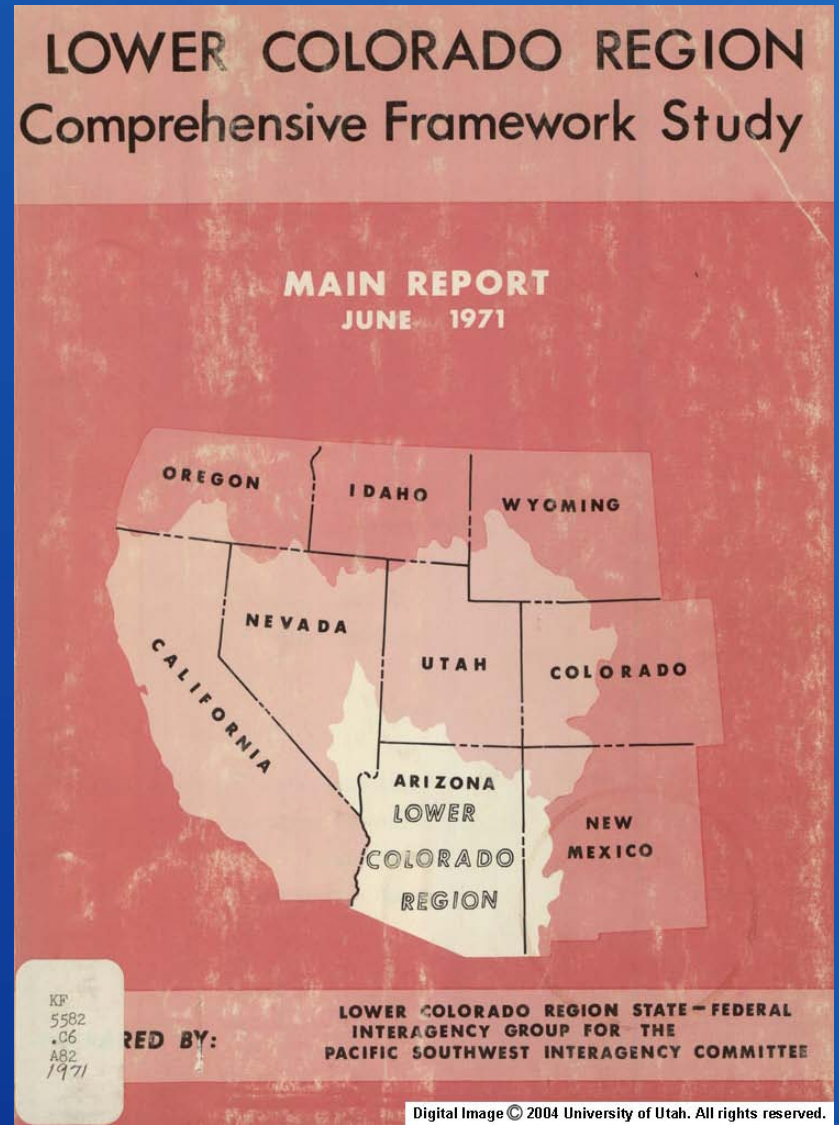
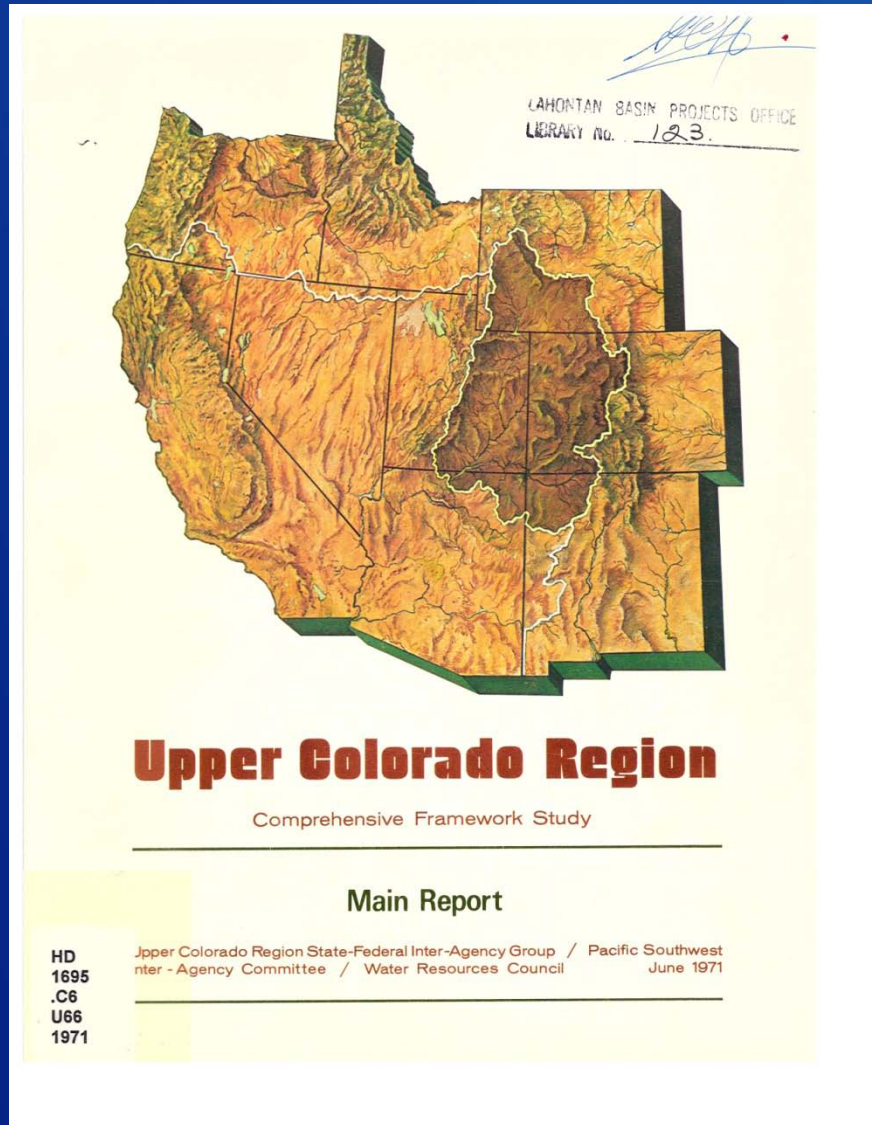
Historic Colorado River Water Supply & Use (Annual)



50 Years of Colorado River Changes

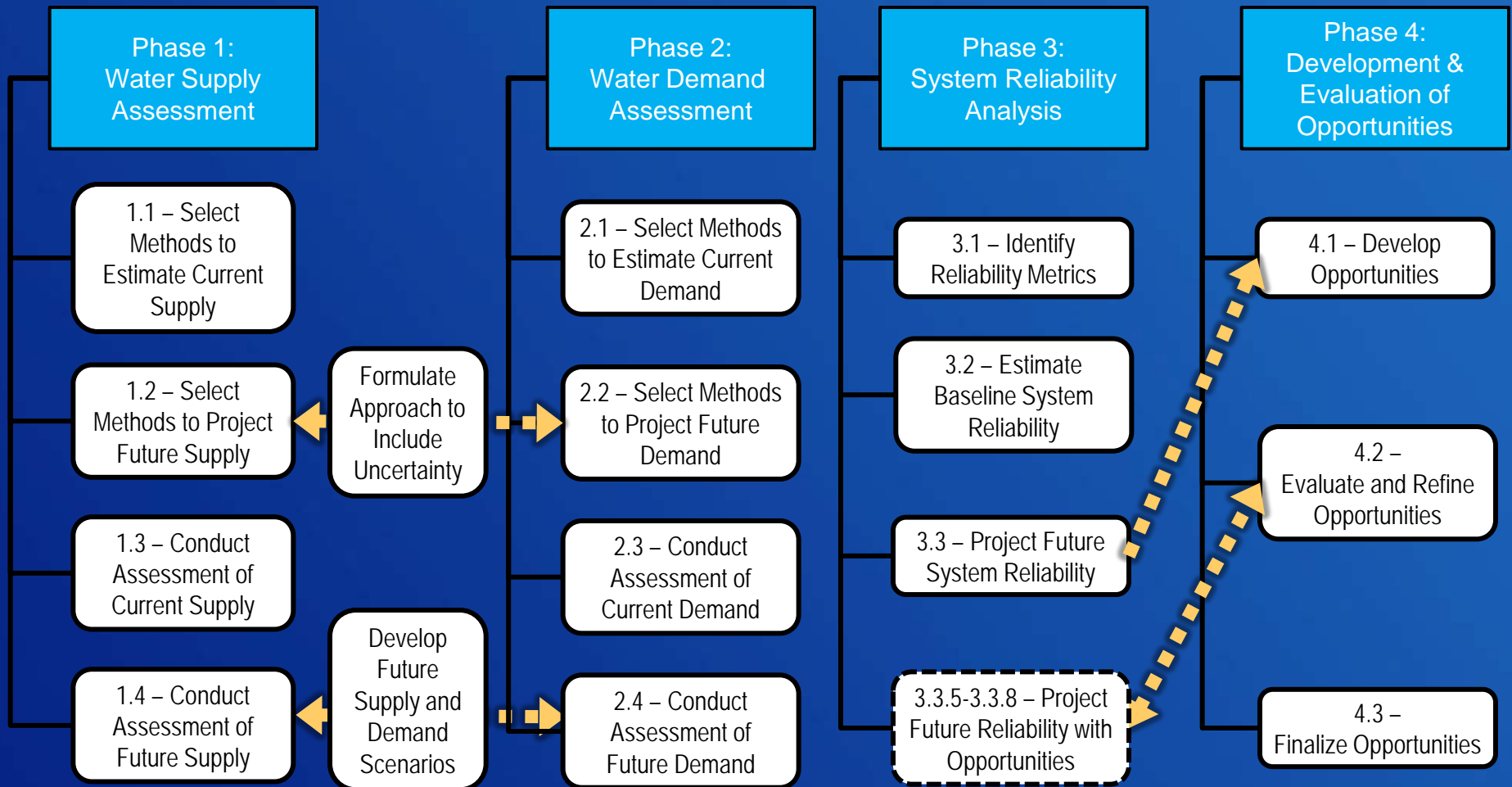
	1960	2010
Demographics / Land Use <ul style="list-style-type: none"> • Population served • Acres irrigated 	12 million < 3 million	30 million 3 million
Physical System <ul style="list-style-type: none"> • Storage capacity • Hydropower generation capacity 	30 maf 6,700 GW	67 maf 12,400 GW
Natural System <ul style="list-style-type: none"> • Annual mean natural flow at L.F. • Lowest 10-yr average flow at L.F. 	15.1 maf (14.9) 12.5 maf (1931-1940)	15.0 maf 12.0 maf (2001-2010)
Institutions, Governance <ul style="list-style-type: none"> • Legislation, Policies, Agreements 	<ul style="list-style-type: none"> • Colorado River Compact • Boulder Canyon Project Act • US-Mexico Water Treaty • UC River Basin Compact • CR Storage Project 	<ul style="list-style-type: none"> • Decree in <i>AZ v. CA</i> • NEPA • ESA • QSA • 2007 Interim Guidelines

1971 Comprehensive Framework Studies



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Study Phases and Tasks



Essentially complete and described in Interim Report No. 1

Ongoing work since Interim Report No. 1

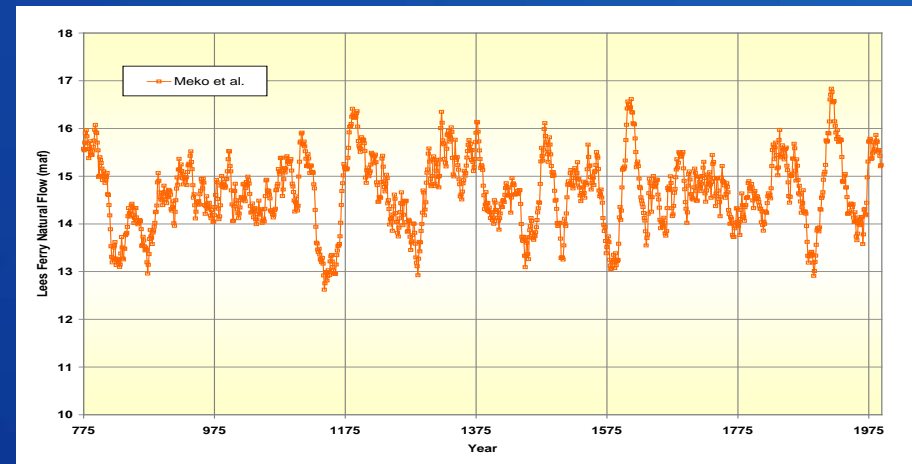
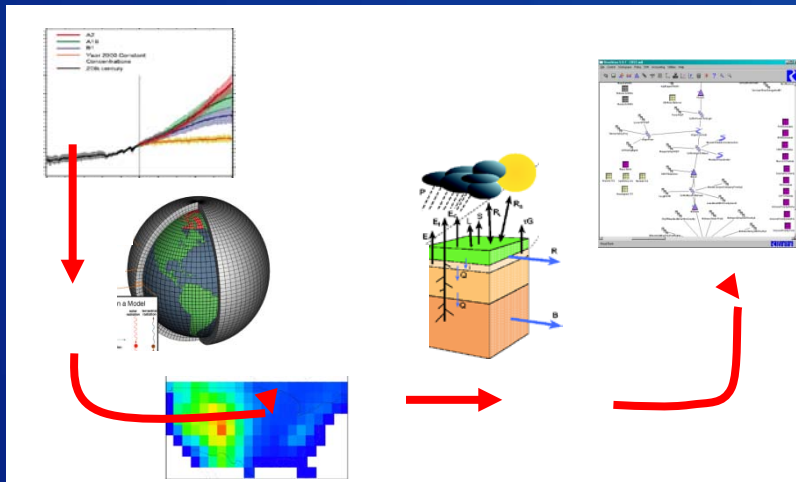
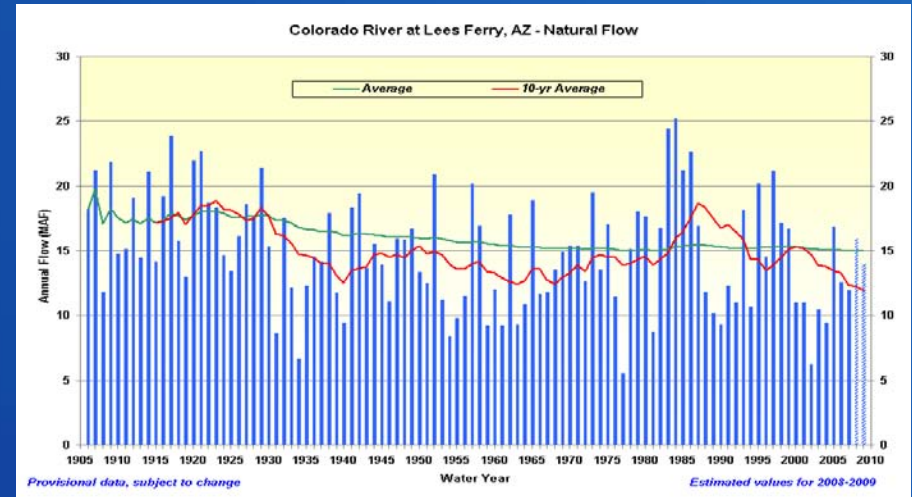
Kickoff in November 2011

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Phase 1: Water Supply Assessment

Scenarios *:

- Observed Resampled
- Paleo Resampled
- Paleo Conditioned
- Downscaled GCM Projected

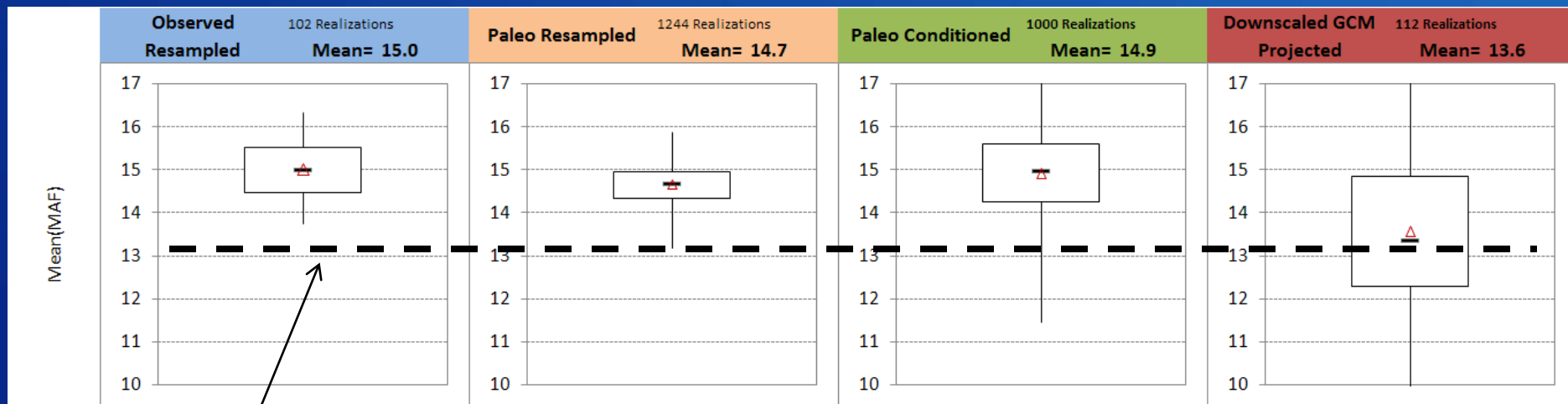


* Multiple realizations for each scenario

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Projections of Natural Flow at Lees Ferry

2011 – 2060 Period Mean Annual Flows



1988 – 2007 period mean

Box represents 25th – 75th percentile, whiskers represent min and max, and triangle represents mean of all traces

Phase 2: Water Demand Assessment

Scenarios*:

- **Current Trends:** growth, development patterns, and institutions continue along recent trends
- **Economic Slowdown:** low growth with emphasis on economic efficiency
- **Expansive Growth:** economic resurgence (population and energy) and current preferences toward human and environmental values **
- **Enhanced Environment and Healthy Economy:** expanded environmental awareness and stewardship with growing economy **

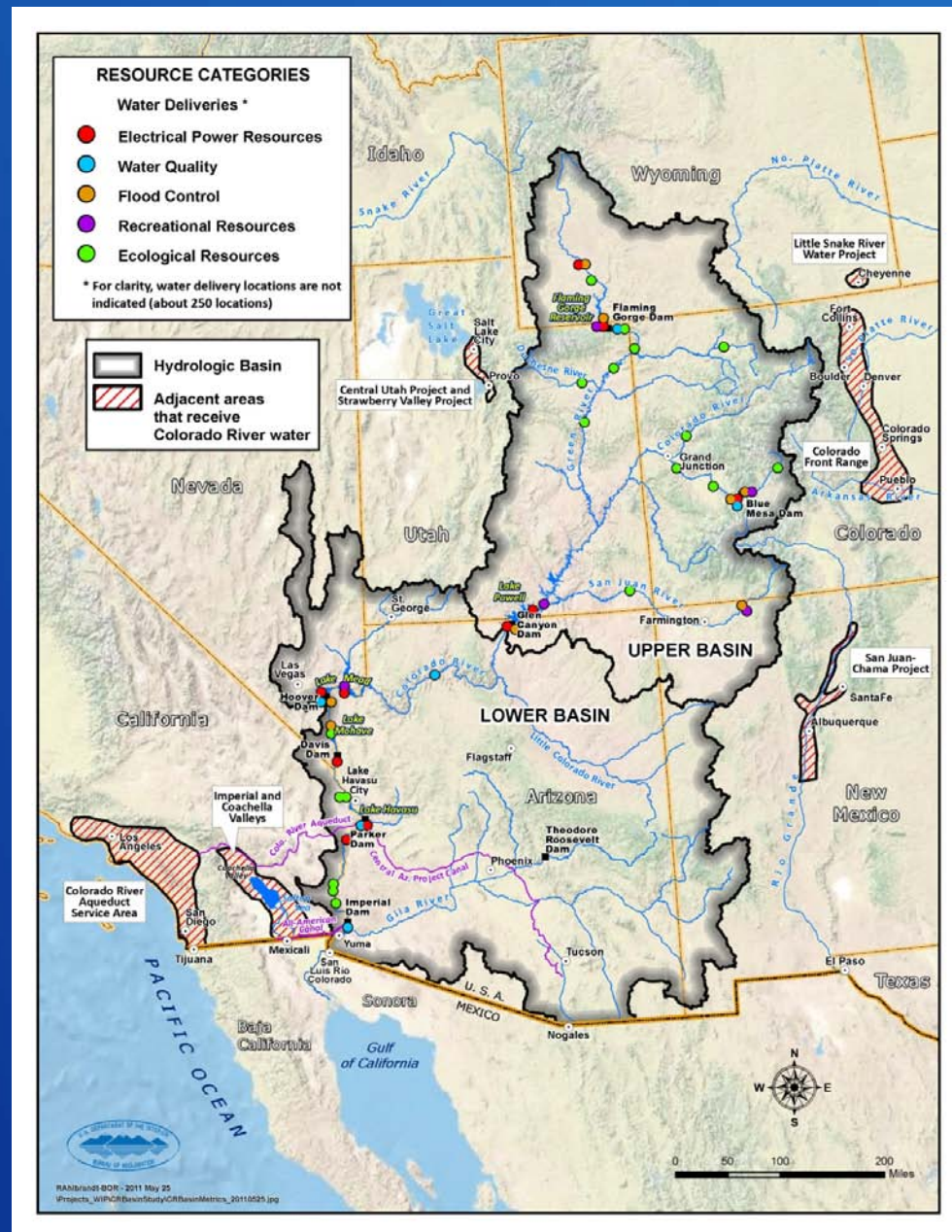
* Preliminary – Scenario names subject to change

** Additional “branches” possible depending upon assumed trajectory of specific socio-economic factors

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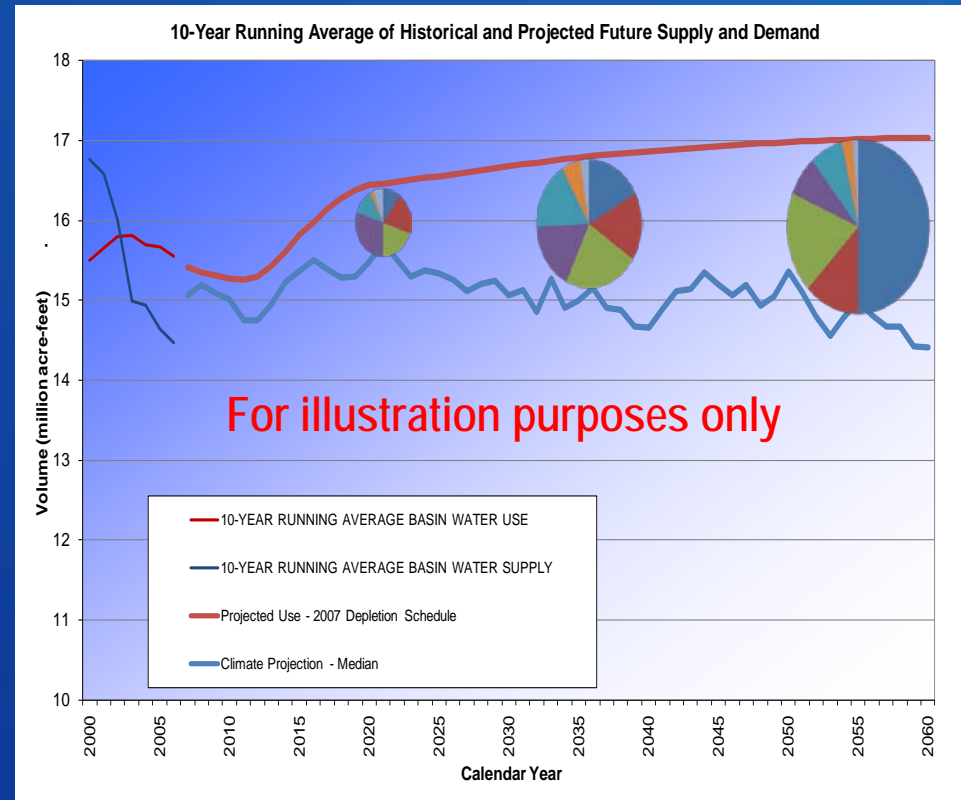
Phase 3: System Reliability Analysis

- Simulate the state of the system on a monthly time step over the next 50 years for each scenario, with and without options and strategies
- Metrics will be used to quantify impacts to Basin resources
- **Resource Categories**
 - Water Deliveries
 - Electrical Power Resources
 - Water Quality
 - Flood Control
 - Recreational Resources
 - Ecological Resources



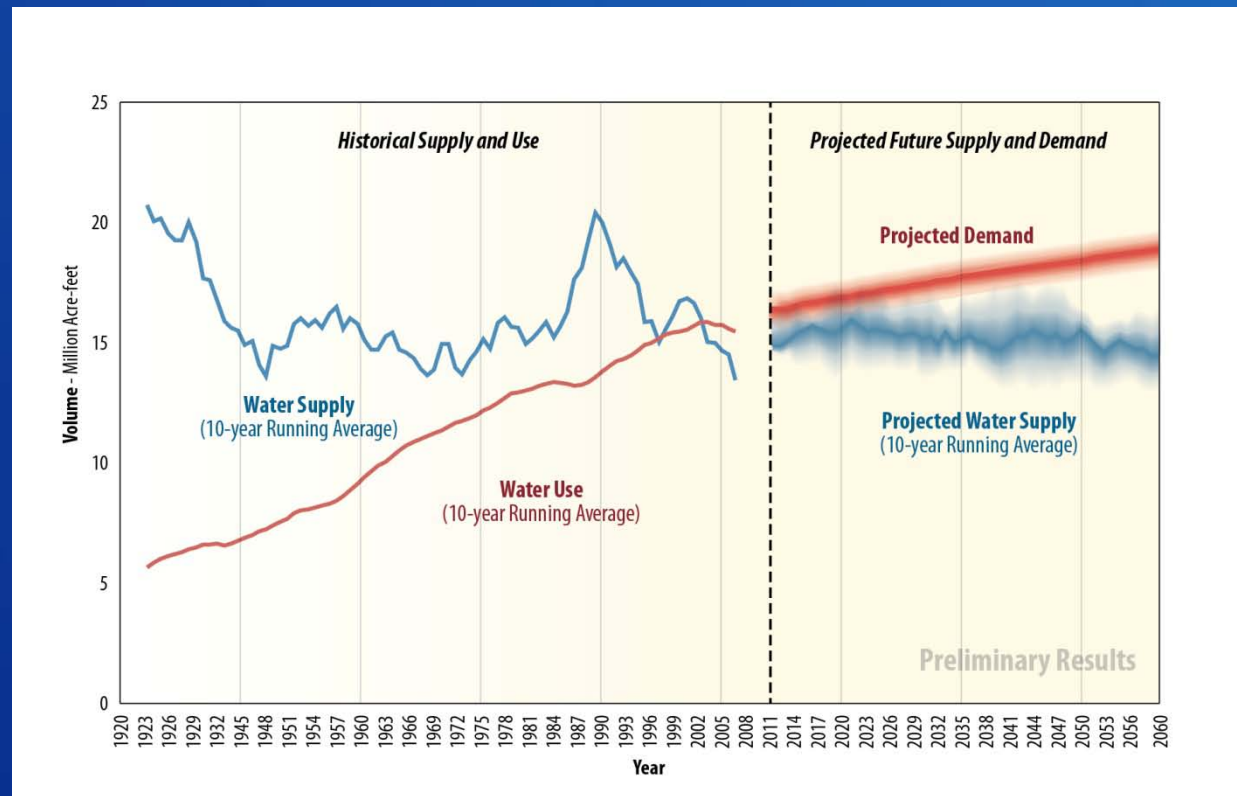
Phase 4: Development and Evaluation of Opportunities to Balance Supply and Demand

- Consider a wide range of options and strategies
- Consider “Portfolios” of unique combinations of options
- Will not result in selection or funding of a proposed project

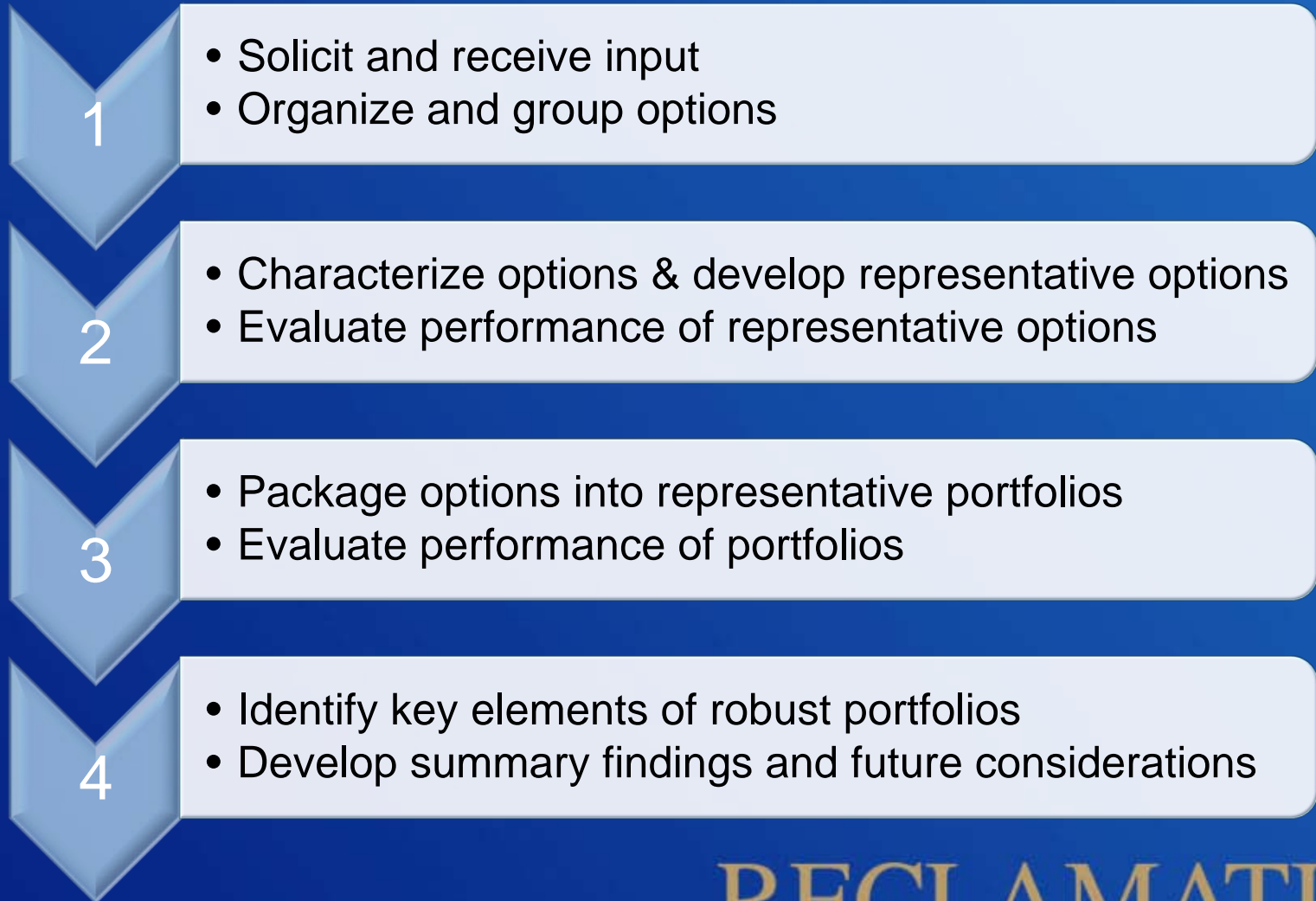


Projected Future Colorado River Basin Water Supply and Demand

- Based on preliminary assessments, supply-demand imbalances over the next 50 years are projected to be greater than 3.5 million acre-feet
- Assessment based on:
 - “Current Trends” demand scenario
 - supply scenario that considers a changing climate
- A broad range of imbalances will be considered when all supply and demand scenarios are combined

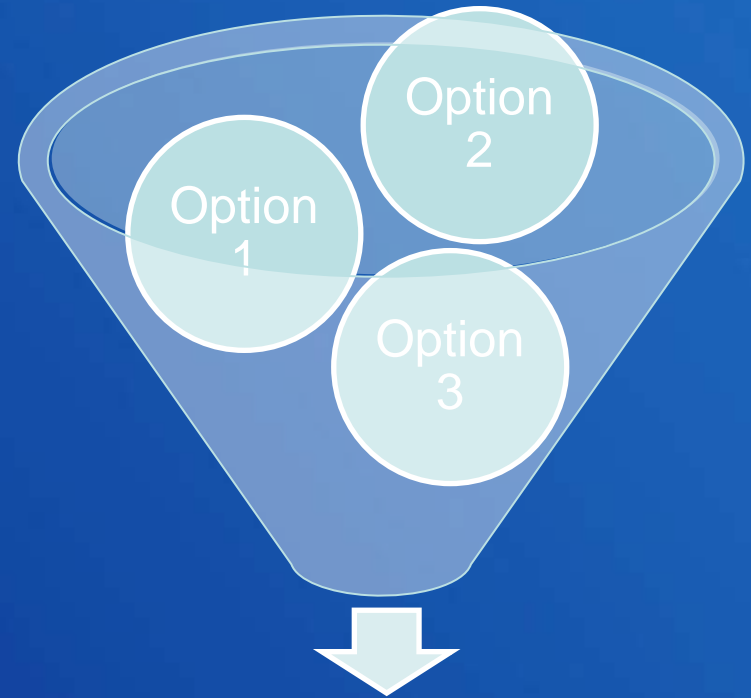


Phase 4 Approach



Organizing and Characterizing Options

- Evaluation Criteria may include:
 - Potential yield
 - Timing of implementation
 - Technical feasibility
 - Cost
 - Environmental impacts/permitting requirements
 - Legal/public policy
 - Risk/uncertainty



Importation

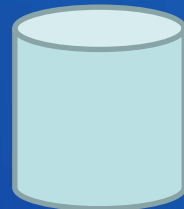
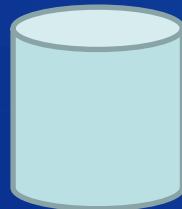
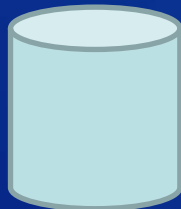
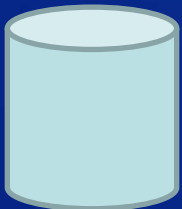
Desal/Reuse

Banking/Exchange

Demand
Management

Watershed
Management

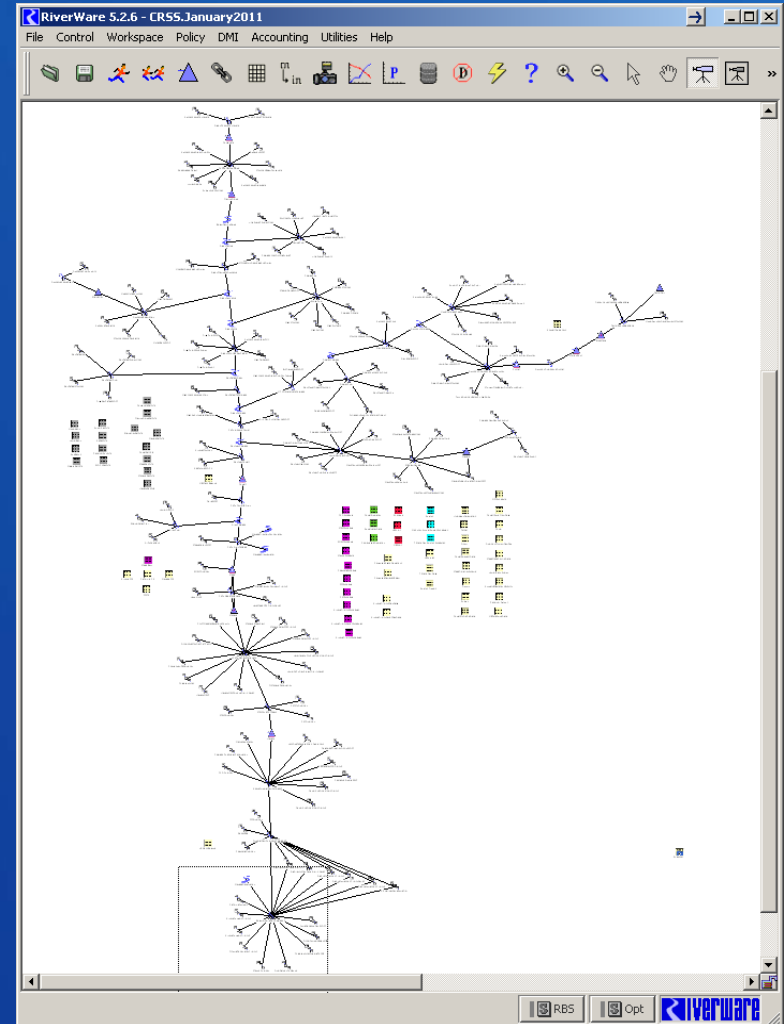
Operational
Efficiencies



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Analyze Representative Options and Develop Portfolios

- Assess performance for all future supply-demand combined scenarios
- Option performance to be summarized for both
 - Evaluation criteria
 - Metric performance
- Develop portfolios by unique combinations of options



How to Submit an Option

- Submit using the Option Submittal Form by February 1, 2012
- Form available on Study website at: <http://www.usbr.gov/lc/region/programs/crbstudy.html>
- Submit form via:
 - Study Website
 - E-mail to: ColoradoRiverBasinStudy@usbr.gov
 - U.S. mail to:
U.S. Bureau of Reclamation
Attention Ms. Pam Adams, LC-2721
PO Box 61470
Boulder City NV 89006-1470
 - Fax to: **702-293-8418**

Colorado River Basin Water Supply & Demand Study
Form to Submit Options to Resolve Future Supply and Demand Imbalances

Contact Information (optional):

Contact Name:	Title:
Affiliation:	
Address:	
Telephone:	E-mail Address:
Date Option Submitted:	

Option Name:
Click here to enter text.

Description of Option:
Click here to enter text.

Location: Describe location(s) where option could be implemented and other areas that the option would affect, if applicable. Attach a map, if applicable.
Click here to enter text.

Quantity and Timing: Roughly quantify the range of the potential amount of water that the option could provide over the next 50 years and in what timeframe that amount could be available. If option could be implemented in phases, include quantity estimates associated with each phase. If known, specify any important seasonal (e.g. more water could be available in winter) and/or frequency (e.g. more water could likely be available during a above-average hydrologic years) considerations. If known, describe any key assumptions made in order to quantify the potential amount.
Click here to enter text.

Milestones & Updated Study Timeline

February – November 2011	Quantify Demand Scenarios
December – February 2012	Perform “Baseline” System Reliability Analysis
November – February 2012	Develop Options & Strategies
January 2012	Publish Technical Updates
February – April 2012	Perform System Reliability Analysis with Options & Strategies
April 2012	Publish Technical Updates
April – June 2012	Finalize & Evaluate Options & Strategies
June 2012	Publish Draft Final Study Report
July 2012	Publish Final Study Report

Colorado River Basin Water Supply and Demand Study

QUESTIONS?

Study Contact Information

- Website: <http://www.usbr.gov/lc/region/programs/crbstudy.html>
- Email: ColoradoRiverBasinStudy@usbr.gov
- Telephone: 702-293-8500; Fax: 702-293-8418

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