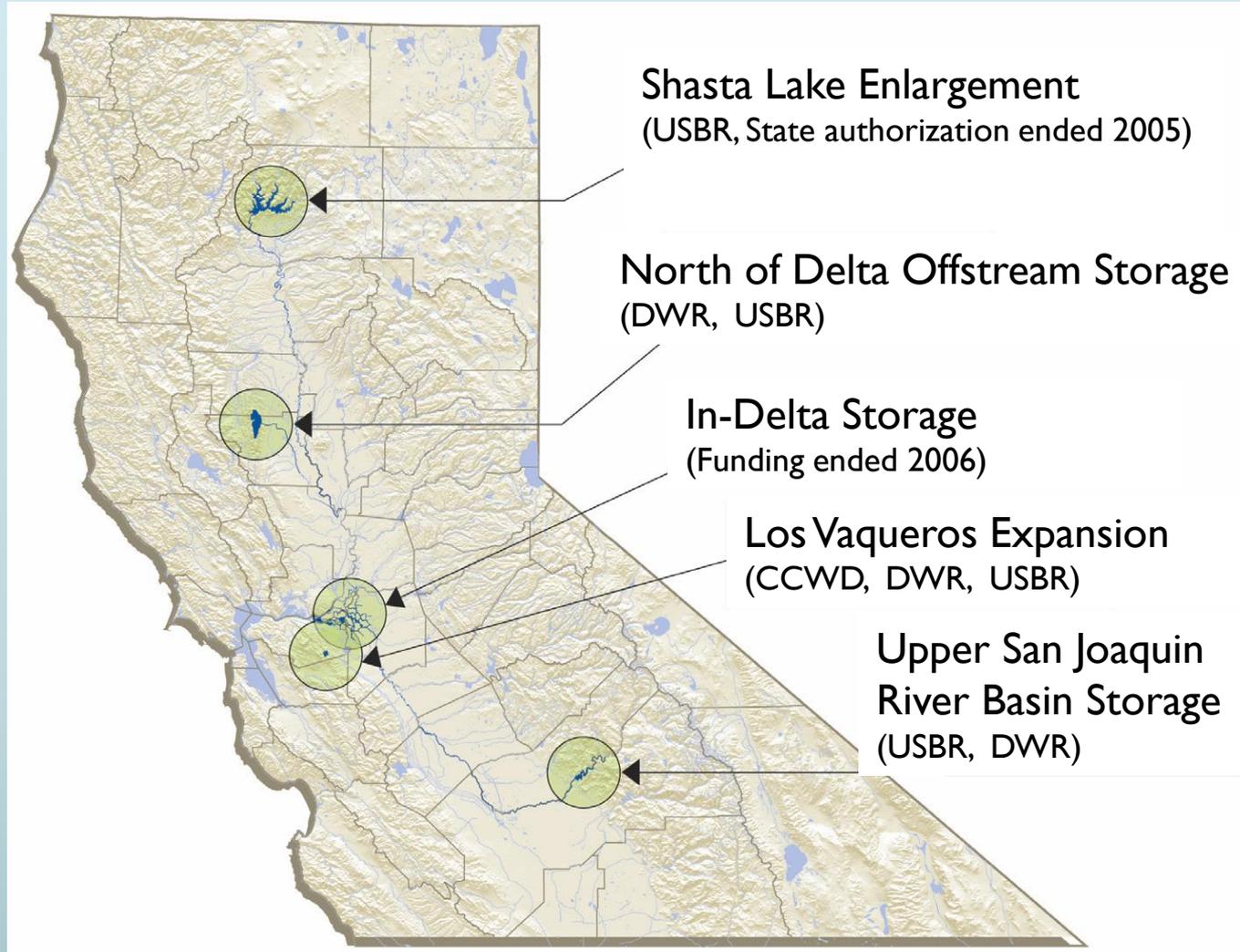


CALFED Surface Storage Investigations

Progress Report
November 2010

Five Surface Storage Investigations In 2000 CALFED Record of Decision



Background

CALFED Surface Storage Investigations

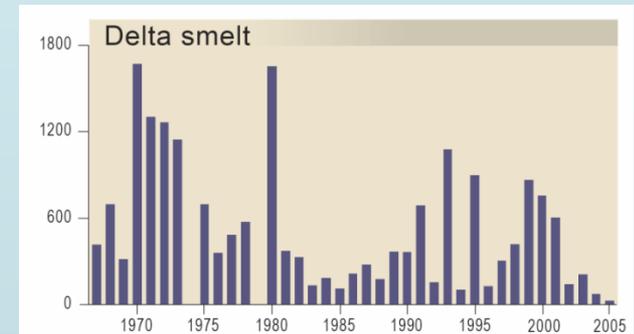
- ▶ Five investigations formulated to meet three objectives
 - ▶ Water supply reliability
 - ▶ Water quality improvement
 - ▶ Ecosystem restoration
- ▶ Focus on either *expanding* existing storage facilities or developing new *offstream* storage
- ▶ Designed to improve environmental conditions in addition to mitigating for all project impacts
- ▶ Emphasis on multi-benefit storage projects combining:
 - ▶ Supply reliability, hydropower & flood protection
 - ▶ With water efficiency, demand management, water quality & ecosystem restoration



Water Management Challenges and Opportunities

Challenges

- ▶ Declining ecosystems and water quality
- ▶ New Delta export pumping regulations
- ▶ Greater impacts of droughts and floods
- ▶ Climate change impacts
- ▶ Sea level rise



Programs that are addressing these challenges

- ▶ 2008/2009 Biological Opinions
- ▶ Bay Delta Conservation Plan (BDCP)
- ▶ Delta Habitat Conservation & Conveyance Program (DHCCP)
- ▶ 2009 Comprehensive water legislation

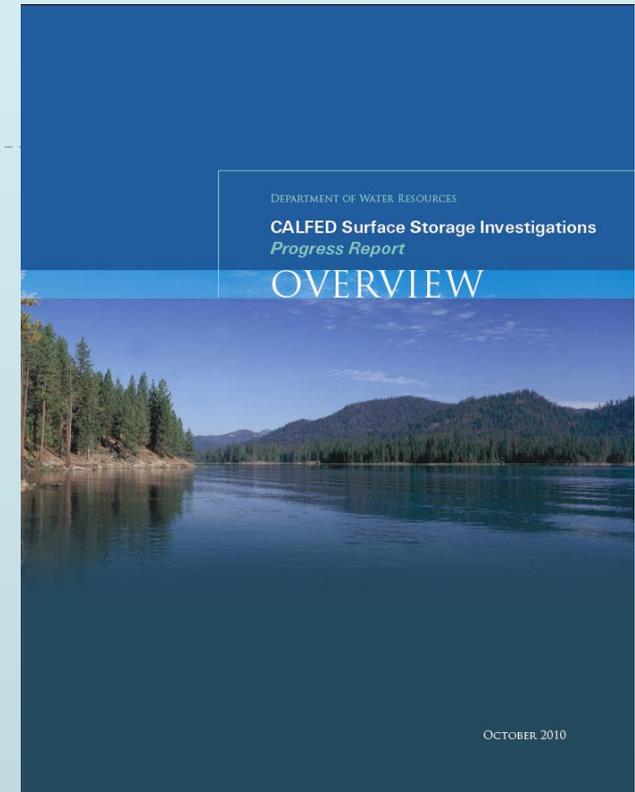
2010 Progress Report

Update on changes and next steps for:

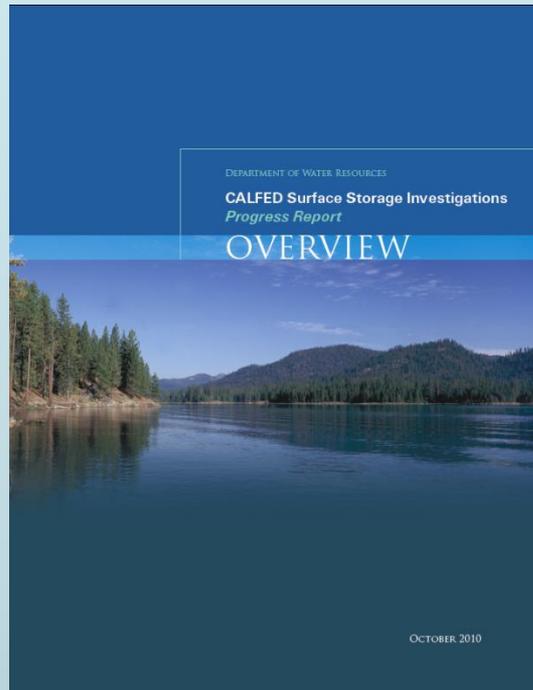
- ▶ California Water Commission
- ▶ Existing & potential partners
- ▶ Stakeholders
- ▶ Public

Presents preliminary analysis of surface storage projects with:

- ▶ Operation criteria from 2008/2009 Biological Opinion
- ▶ New Delta conveyance as proposed by BDCP in Oct. 2009
- ▶ Climate change considerations



Progress Report Content



- ▶ Background
- ▶ Water Management Challenges
- ▶ Current Surface Storage Feasibility Studies
 - North-of-the-Delta Offstream Storage
 - Upper San Joaquin River Basin Storage Investigation
 - Los Vaqueros Expansion
 - Shasta Lake Water Resources Investigation
- ▶ New Delta Conveyance & Climate Change
- ▶ 2009 Water Package and Bond
- ▶ Next Steps and Schedule
- ▶ Partnership and Outreach

Content on Companion CD & Online

Available Nov 19, 2010

- ▶ Progress Report – Overview booklet
- ▶ 2010 Progress Report
- ▶ North of the Delta Offstream Storage
 - ▶ IAIR & PFR
- ▶ Upper San Joaquin River Basin Storage
 - ▶ IAIR, PFR & Phase I-Investigation Report
- ▶ Las Vaqueros Expansion
 - ▶ PFR & EIR/EIS
- ▶ Shasta Lake Water Resources
 - ▶ PFR & IAIR
- ▶ California Water Plan Update 2009
 - ▶ Chapter – CALFED Surface Storage

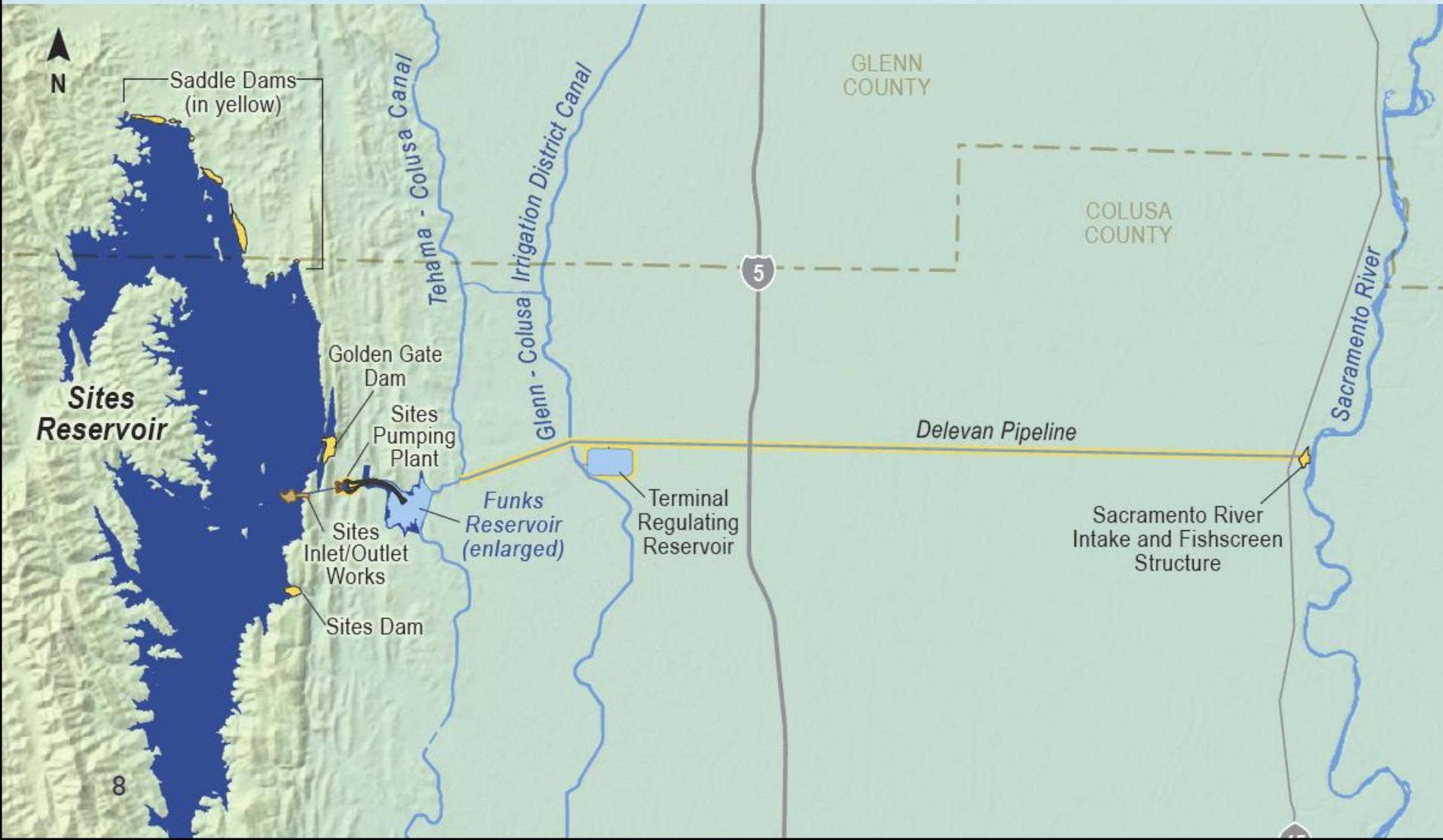
The screenshot shows a web browser window displaying the Surface Storage Investigations website. The page features a navigation menu on the left and a main content area with several sections:

- OVERVIEW**: A section with a large image and text describing the CALFED Surface Storage Investigations Progress Report.
- PROGRESS REPORT 2010**: A table listing chapters and their descriptions, with download links for each.
- NORTH OF THE DELTA OFFSTREAM STORAGE (NODS) INVESTIGATION**: A section listing reports such as the Plan Formulation Report and Initial Alternatives Information Report (2009).
- UPPER SAN JOAQUIN RIVER BASIN STORAGE INVESTIGATION (USJRSB)**: A section listing reports such as the Plan Formulation Report.

Chapter	Description	Download
Full Report	Full Report: This report provides information on how active surface storage investigations are evaluating alternatives to address regional and statewide challenges and uncertainties related to climate change and water management in the Sacramento-San Joaquin Delta.	261 MB
TOC	Table of Contents, Acronyms and Abbreviations	16 KB
1	Introduction	16 KB
2	Water Management Issues and Challenges	16 KB
3	North of the Delta Offstream Storage Investigation	16 KB
4	Upper San Joaquin River Basin Storage Investigation	16 KB
5	Los Vaqueros Expansion Investigation	16 KB
6	Shasta Lake Water Resources Investigation	16 KB
7	Summary and Next Steps	16 KB
8	References	16 KB
APP	Appendices	16 KB

Posted on Surface Storage Program Website
www.water.ca.gov/storage

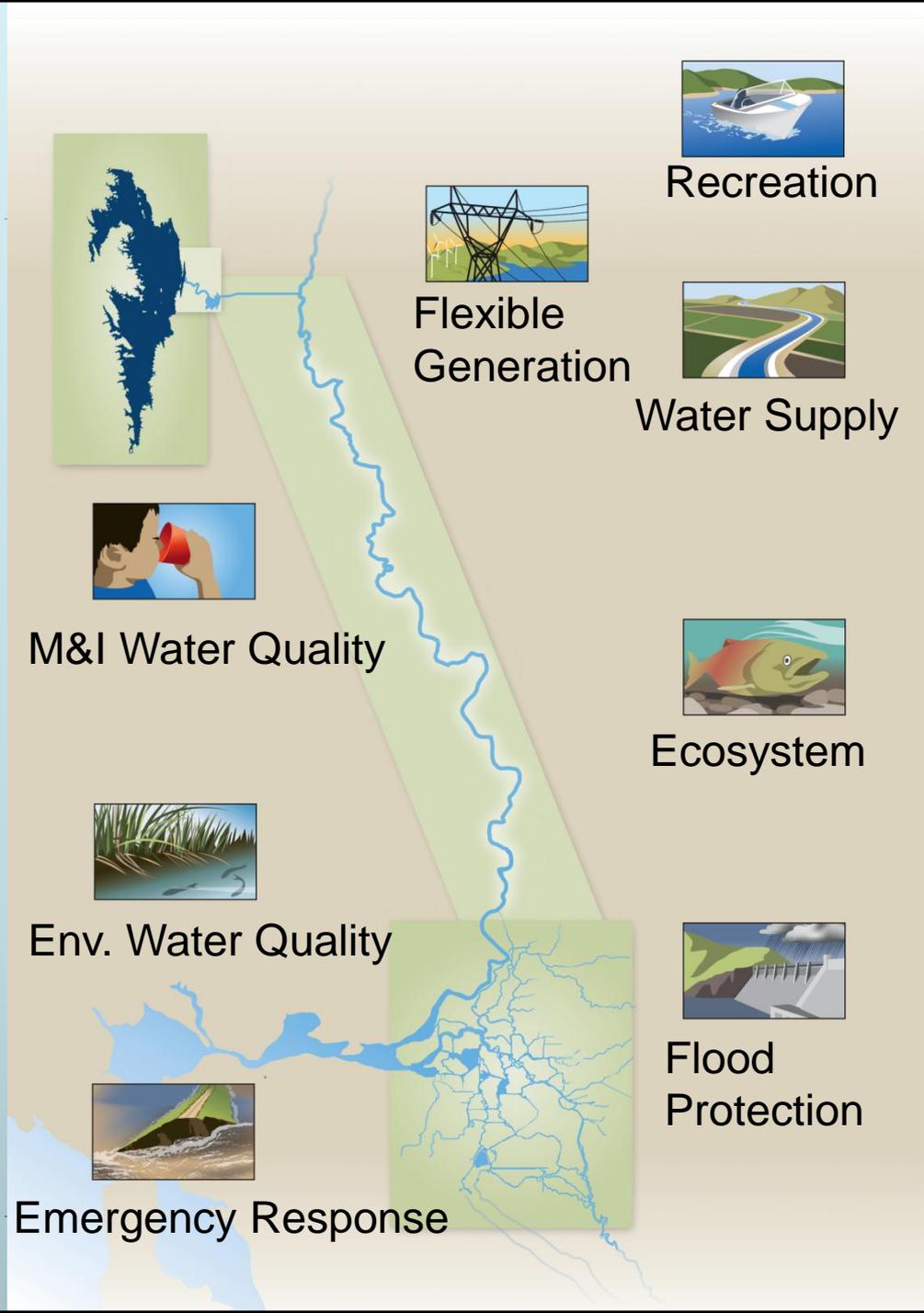
North of Delta Offstream Storage Sites Reservoir Formulation



Sites Reservoir Benefits

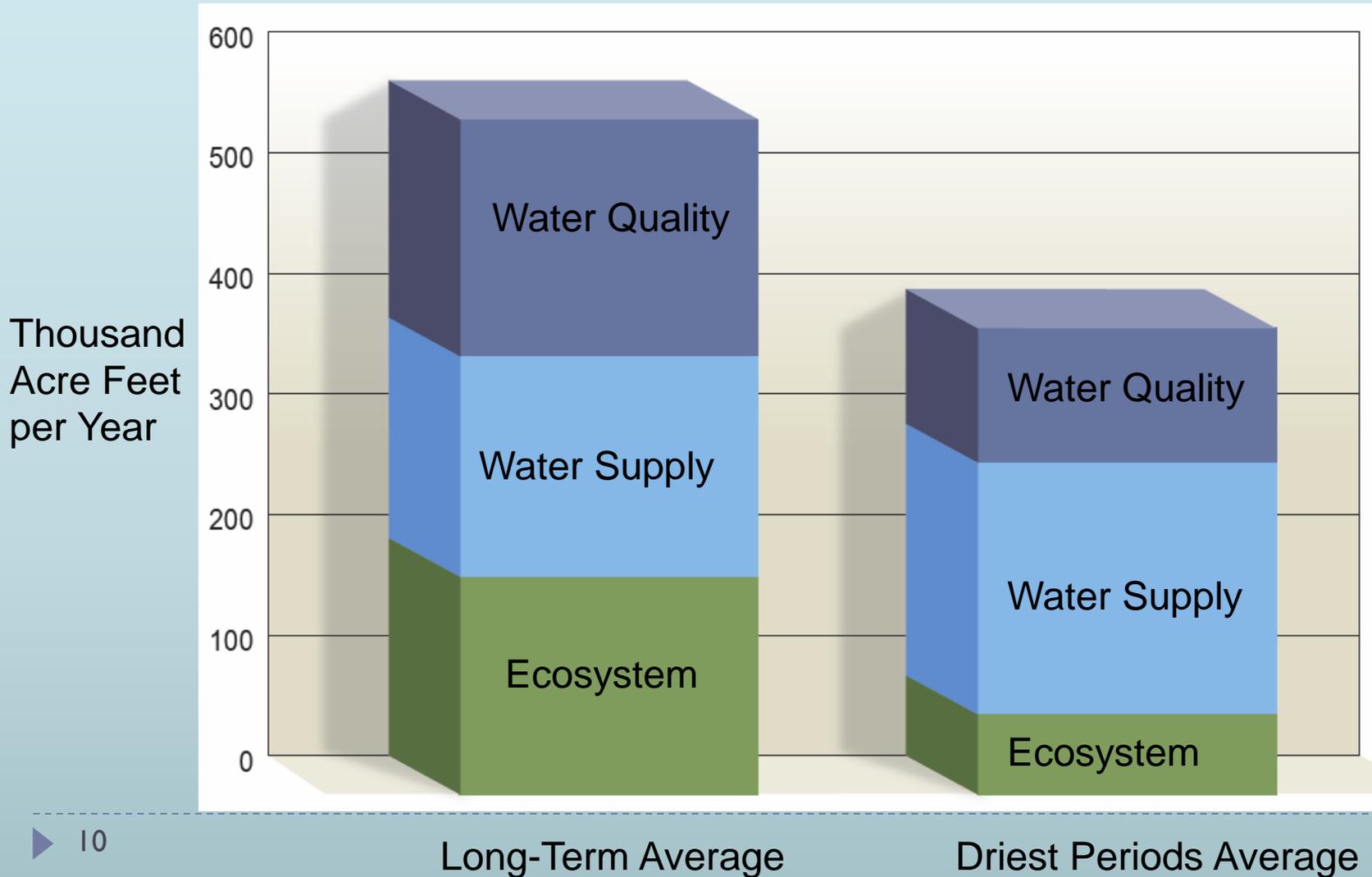


Example Project 1.8 MAF
Estimated Cost (2007) = \$3.6 B

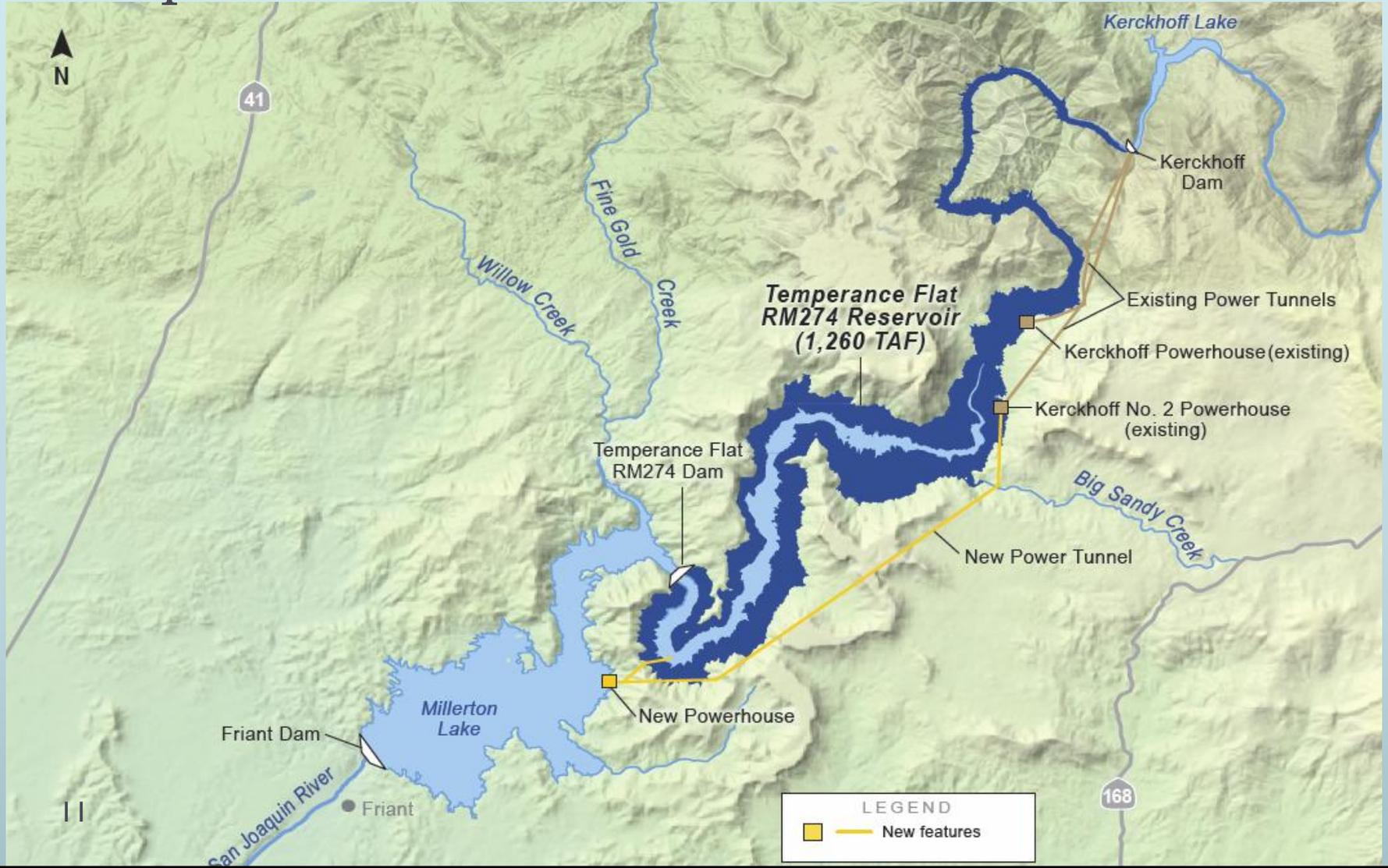


Sites Reservoir Formulation

Water Supply Benefits



Upper San Joaquin River Basin Storage Temperance Flat Reservoir Formulation



Temperance Flat Reservoir Benefits

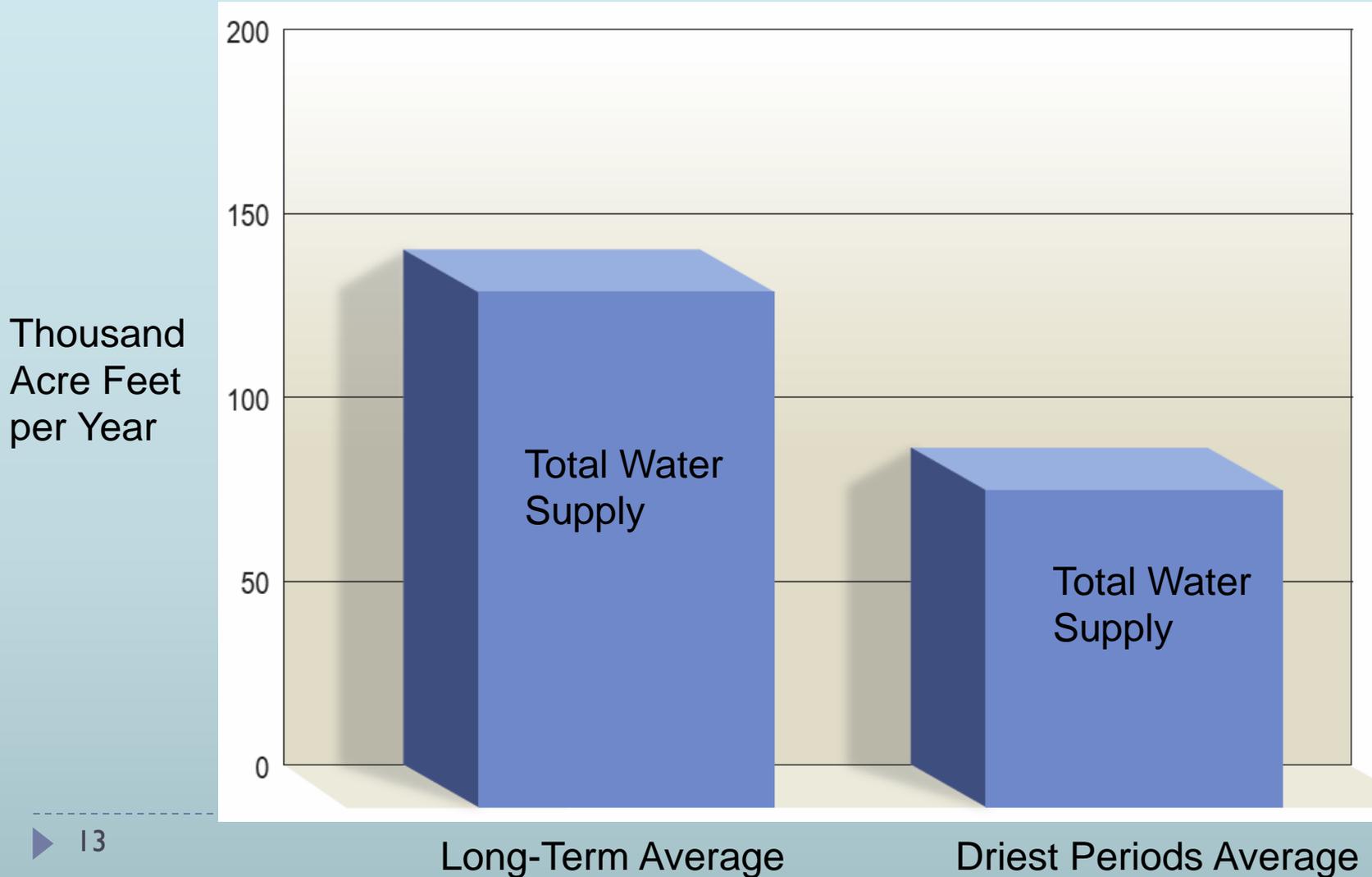
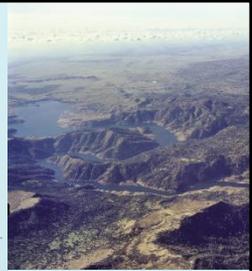


Example Project 1.26 MAF
Estimated Cost (2006) = \$3.36 B

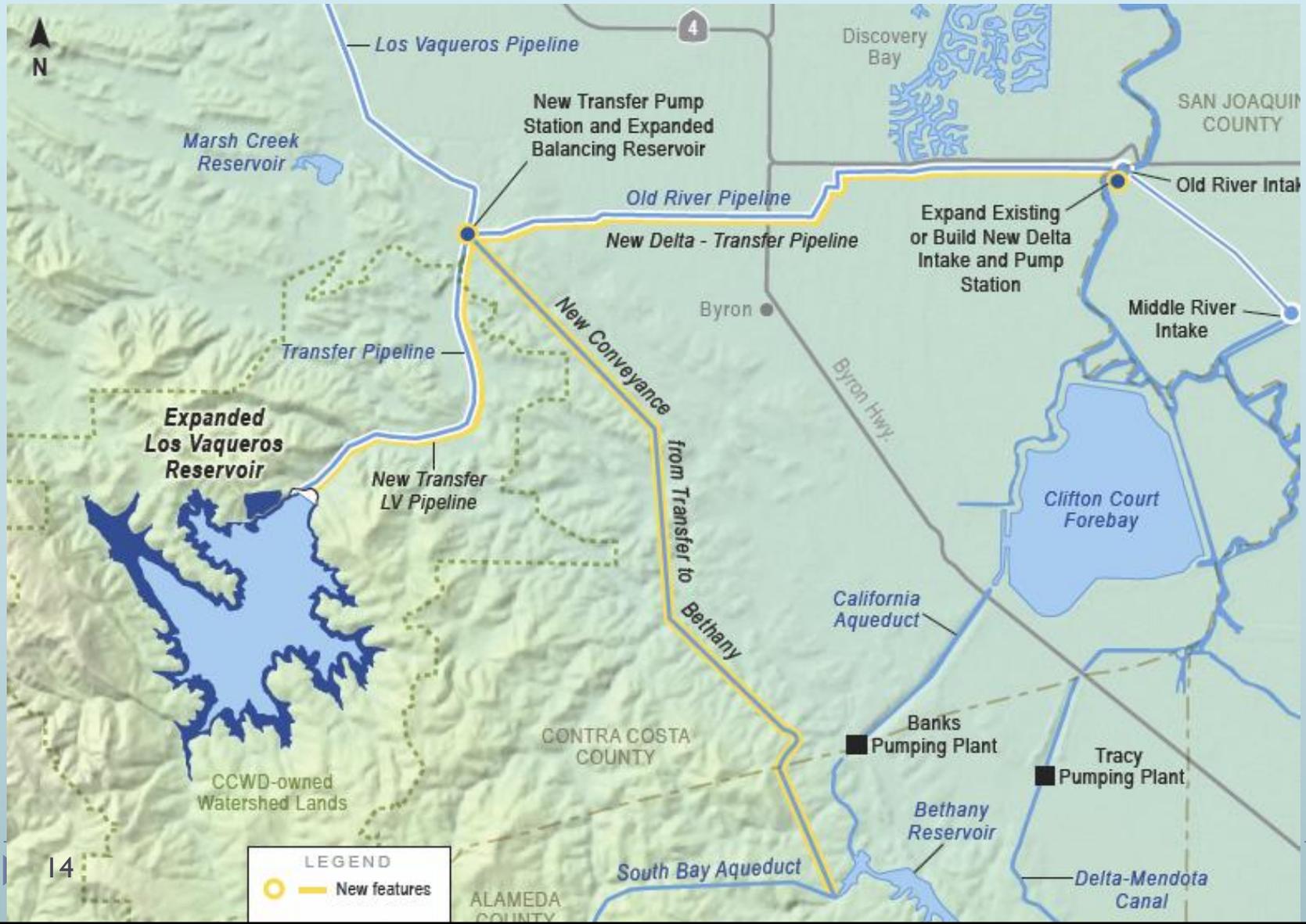


Temperance Flat Reservoir

Water Supply Benefits



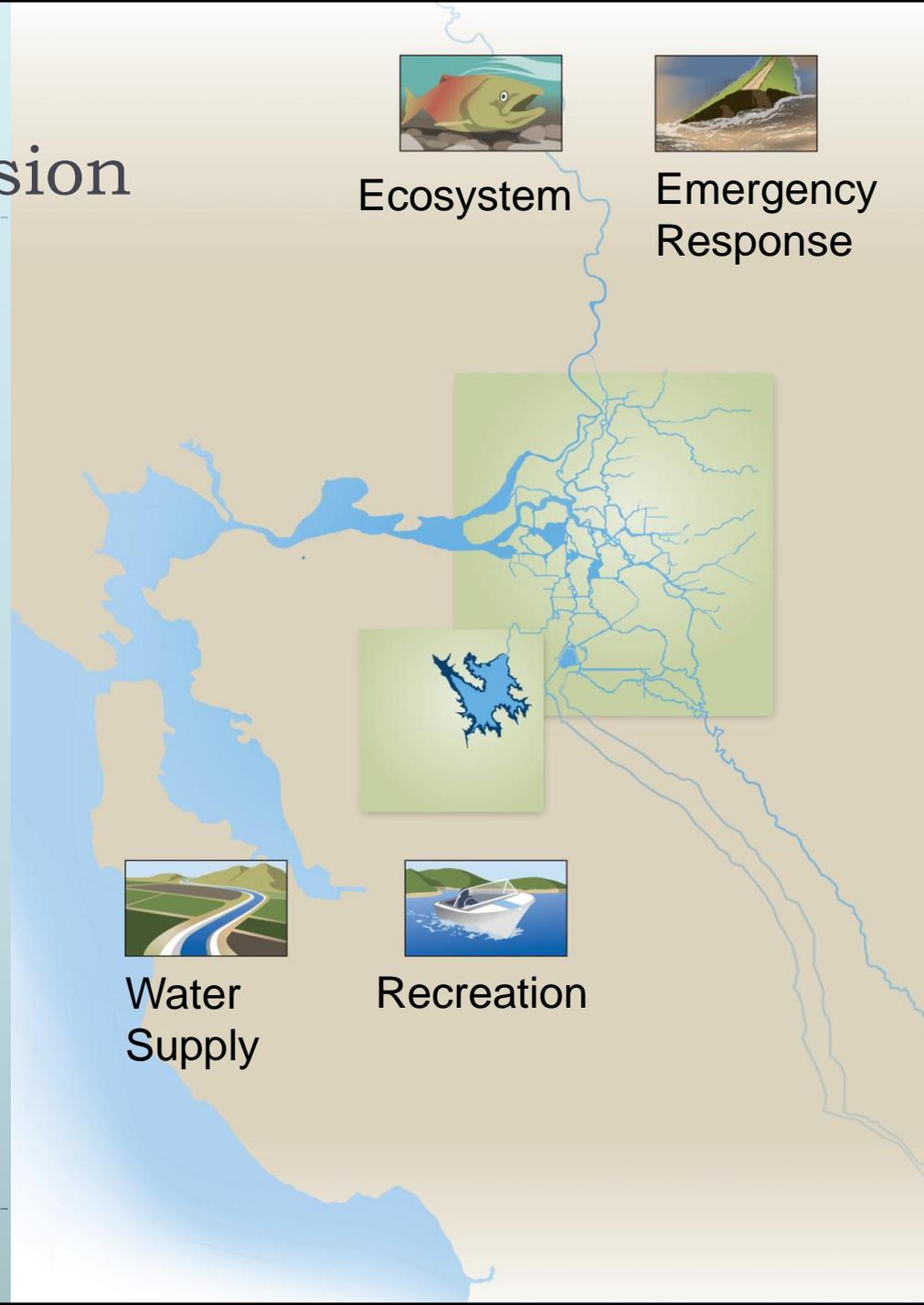
Los Vaqueros Expansion



Los Vaqueros Expansion Benefits



Example Project: From 160 to 275 TAF
Estimated Cost (2008) = \$985 M

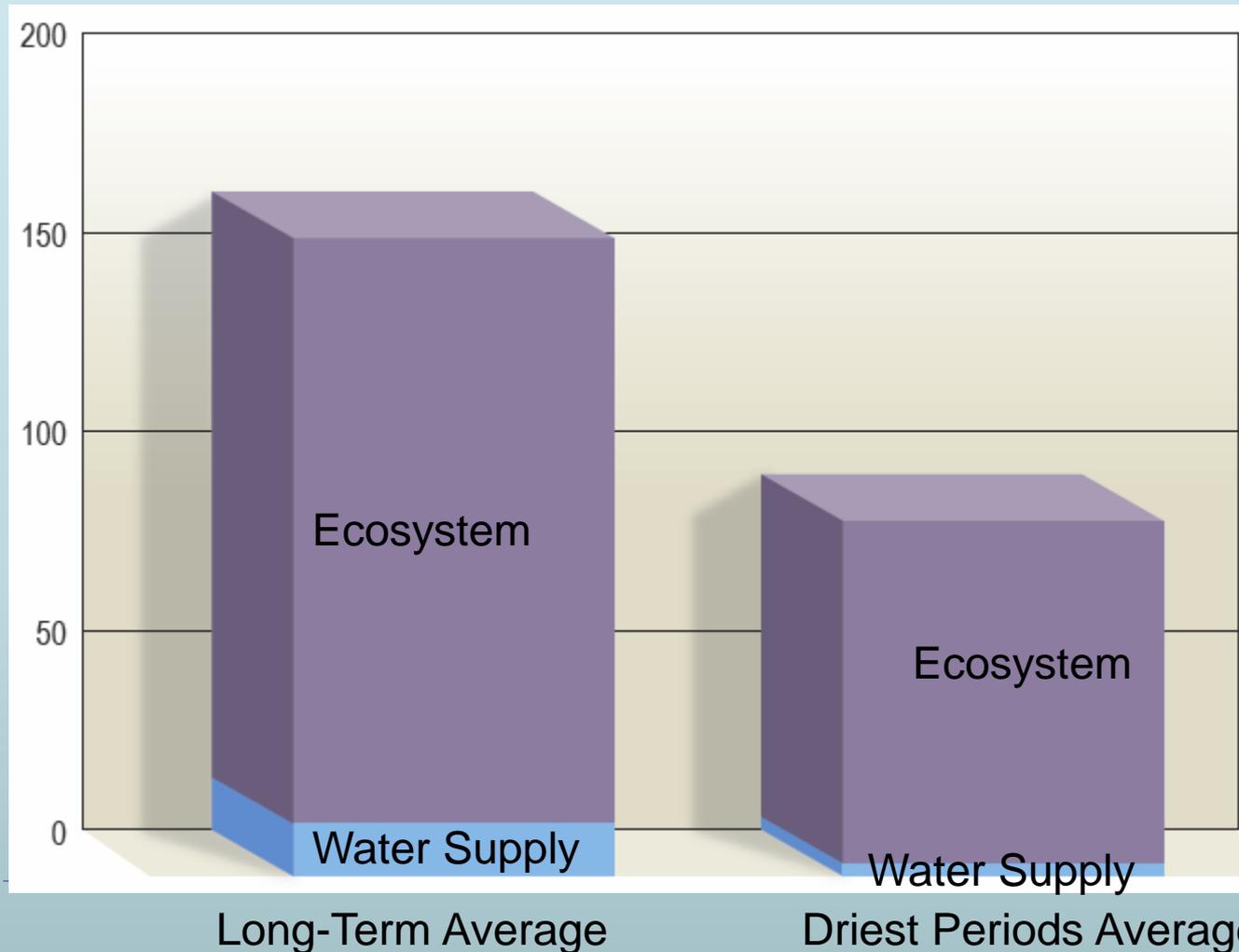


Los Vaqueros Expansion

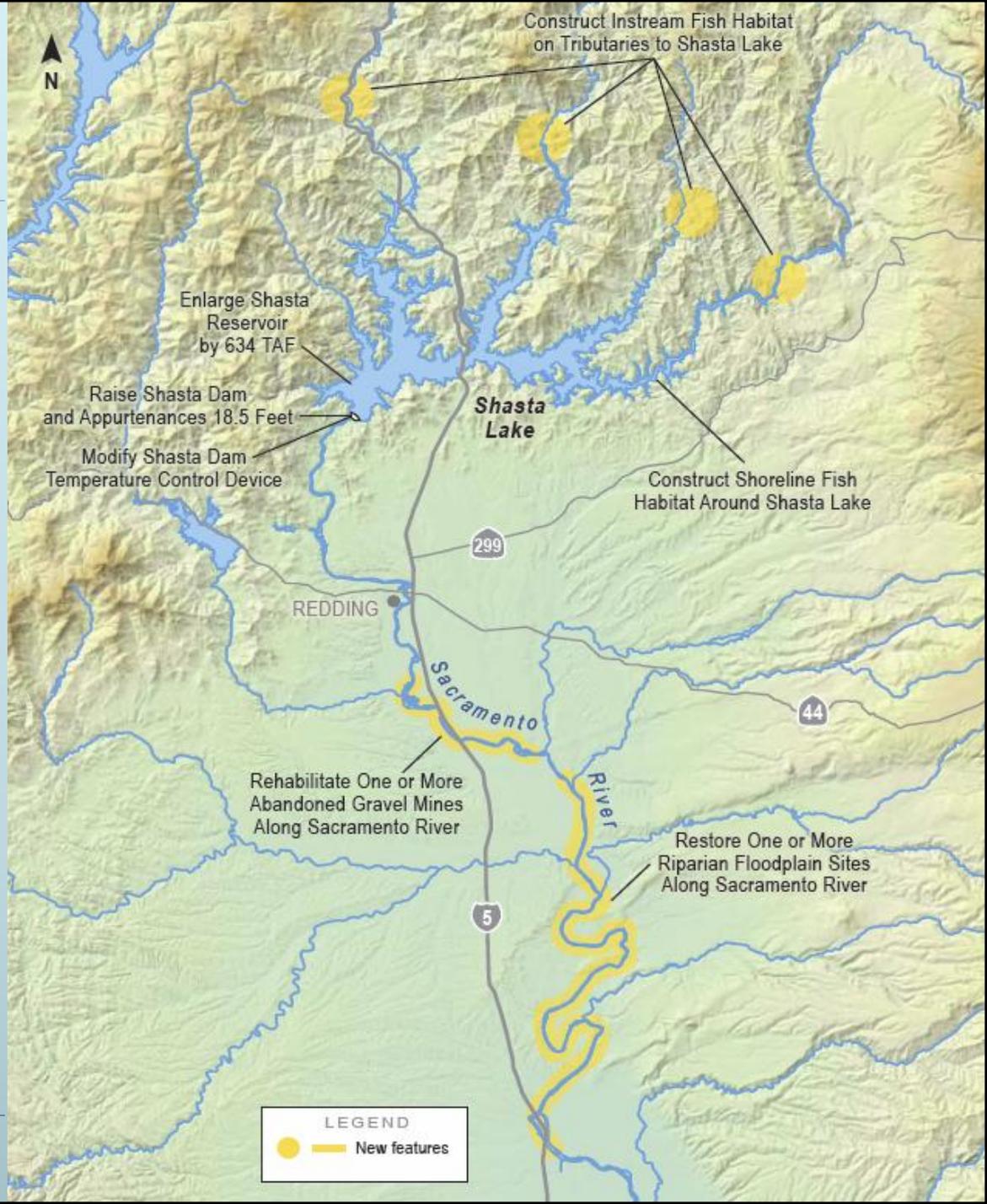
Water Supply Benefits



Thousand
Acre Feet
per Year

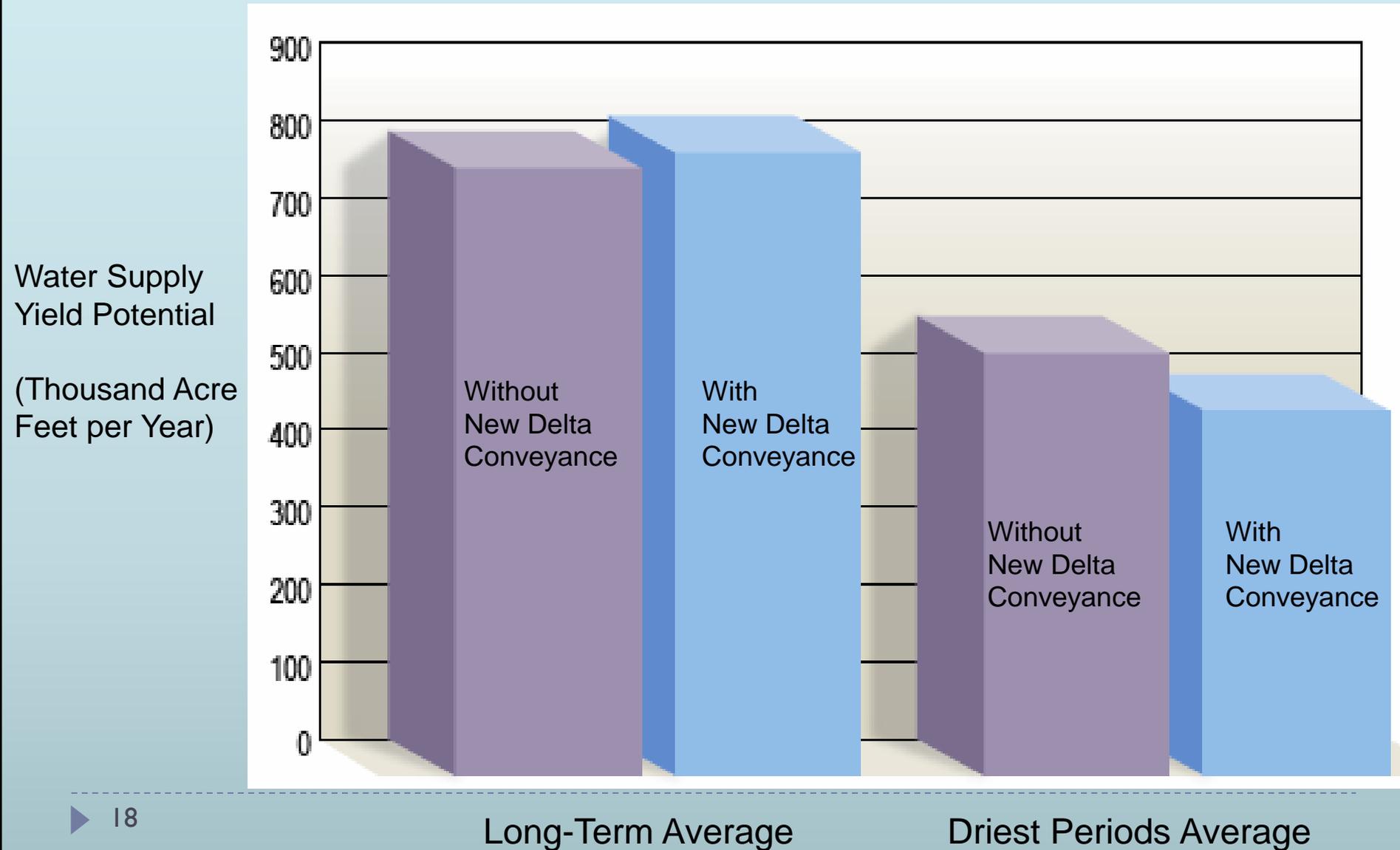


Shasta Lake Enlargement



Potential Effects of New Delta Conveyance

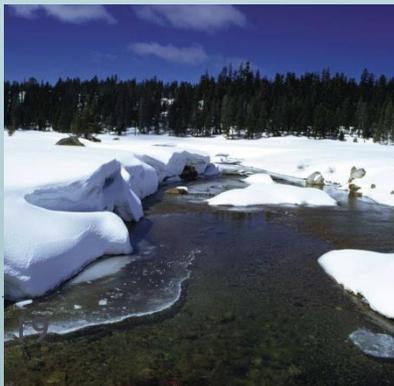
Combined Yield of Four CALFED Surface Storage Projects



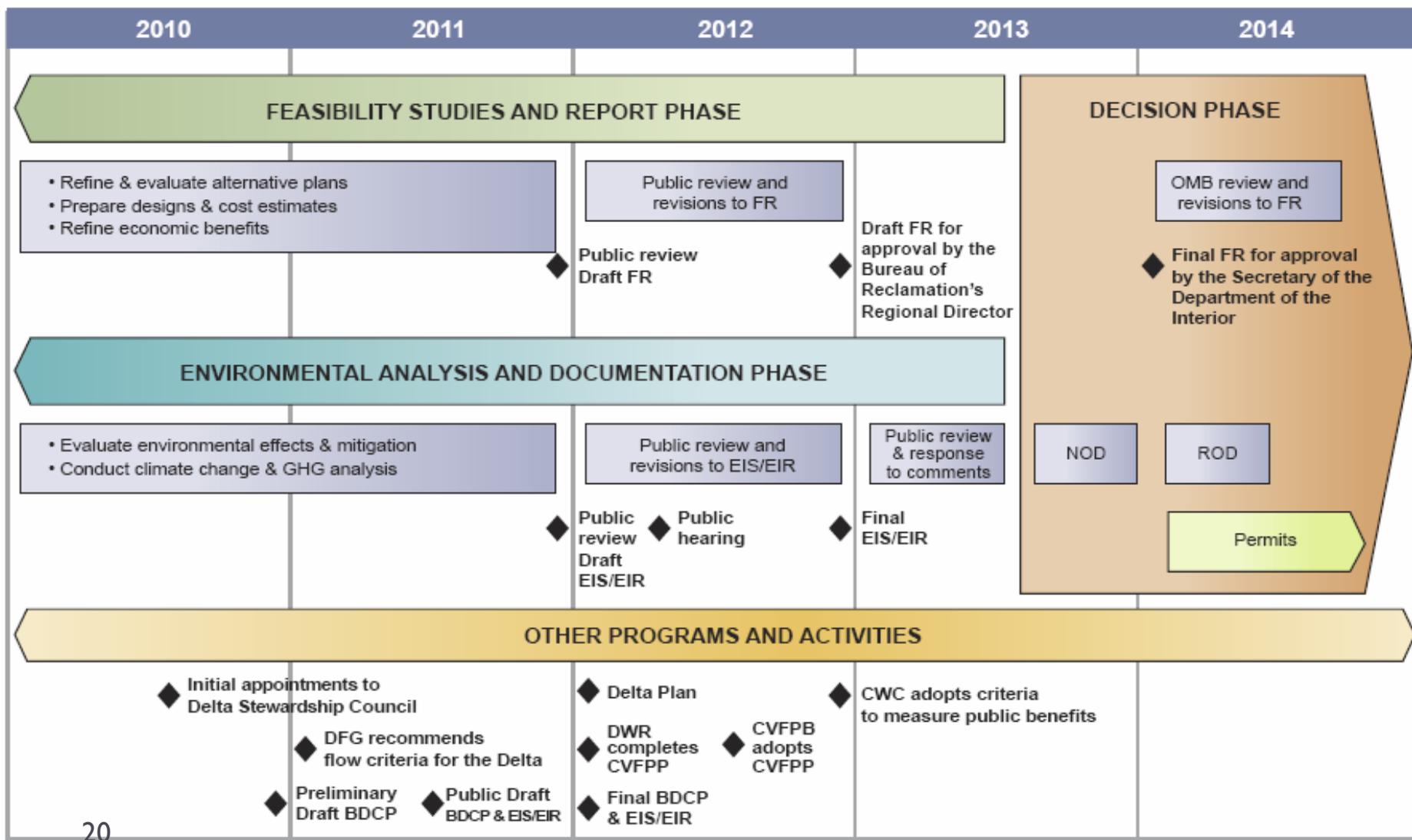
Potential Effects of Climate Change

- ▶ Earlier snow melt and Sierra snowpack storage ↓
- ▶ Change in runoff pattern and extreme events ↑
- ▶ Sea level rise ↑
- ▶ Releases from reservoirs to reduce sea water intrusion ↑
- ▶ Water demands ↑
- ▶ Carryover storage in reservoirs ↓
- ▶ Cold water pool reservoirs ↓
- ▶ System vulnerabilities and adverse environmental effects ↑

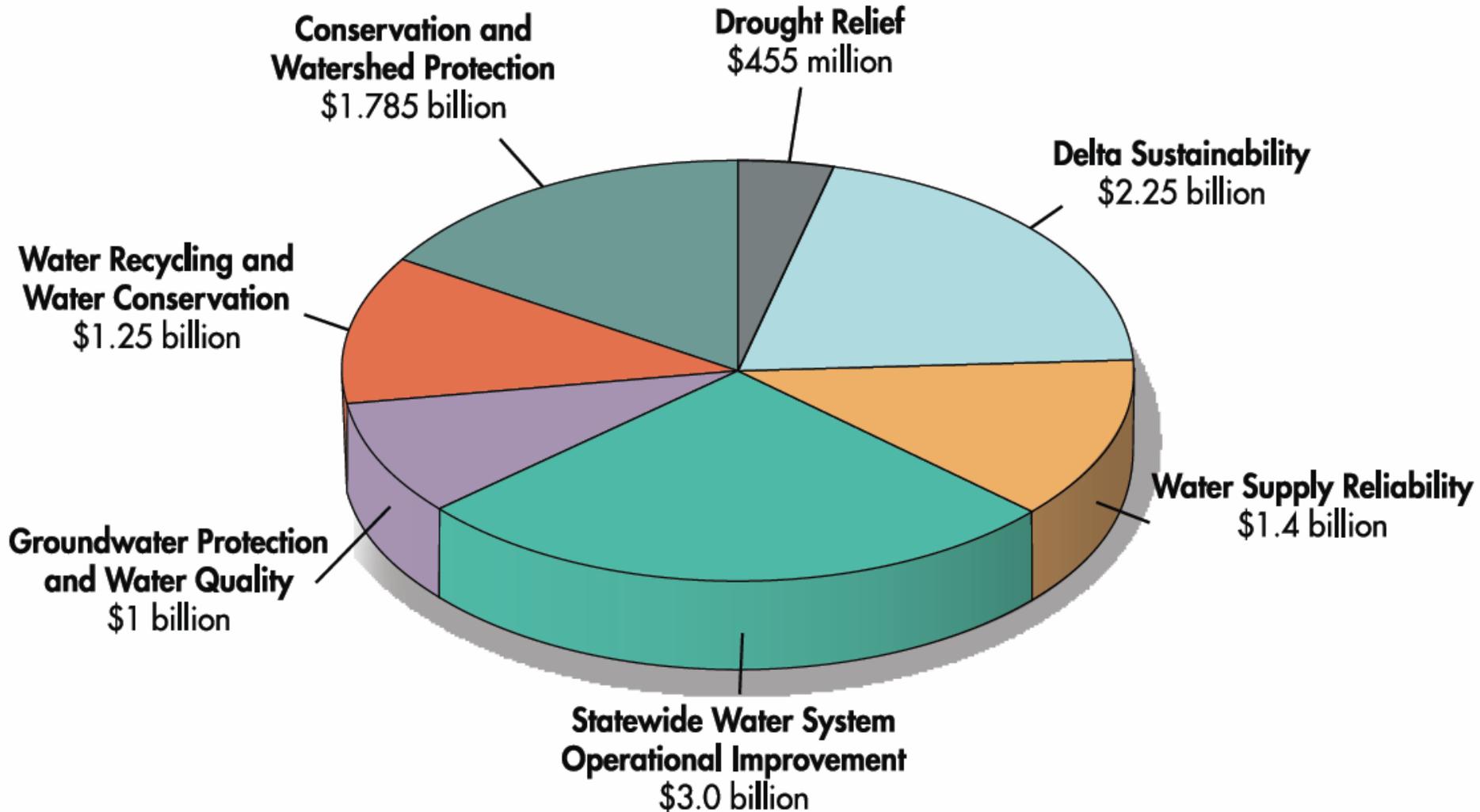
Additional surface storage can help manage many of these impacts



Timeline for Surface Storage Investigations & Related Programs & Activities

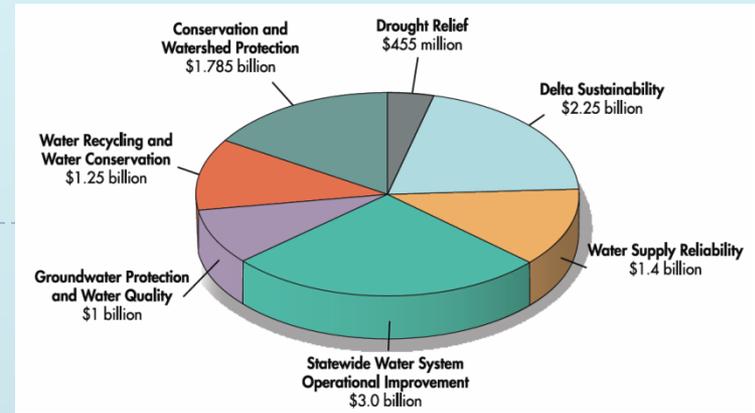


2009 Water Bond



2009 Water Bond

- ▶ \$3 Billion only for public benefits from:
 - ▶ CALFED Surface storage projects
 - ▶ Groundwater storage projects
 - ▶ Conjunctive use and reservoir reoperation projects
 - ▶ Local and regional surface storage projects that improve operation of water systems in the State
- ▶ Public benefits can include:
 - ▶ Ecosystem improvements
 - ▶ Water quality improvements
 - ▶ Flood control
 - ▶ Emergency response
 - ▶ Recreation
- ▶ Bond funds can cover up to 50% of a project's cost
- ▶ 50% of public benefits must be for ecosystem improvements
- ▶ Beneficiaries pay for urban or agricultural water supply benefits



2009 Water Bond

California Water Commission Role

- ▶ By December 15, 2012 -- in consultation with DFG, SWRCB & DWR develop and adopt, by regulation, *methods for quantification and management of public benefits*
- ▶ Select projects through a competitive public process based on the expected return for public investment

SBX7-2, Chapter 8

Questions & Comments



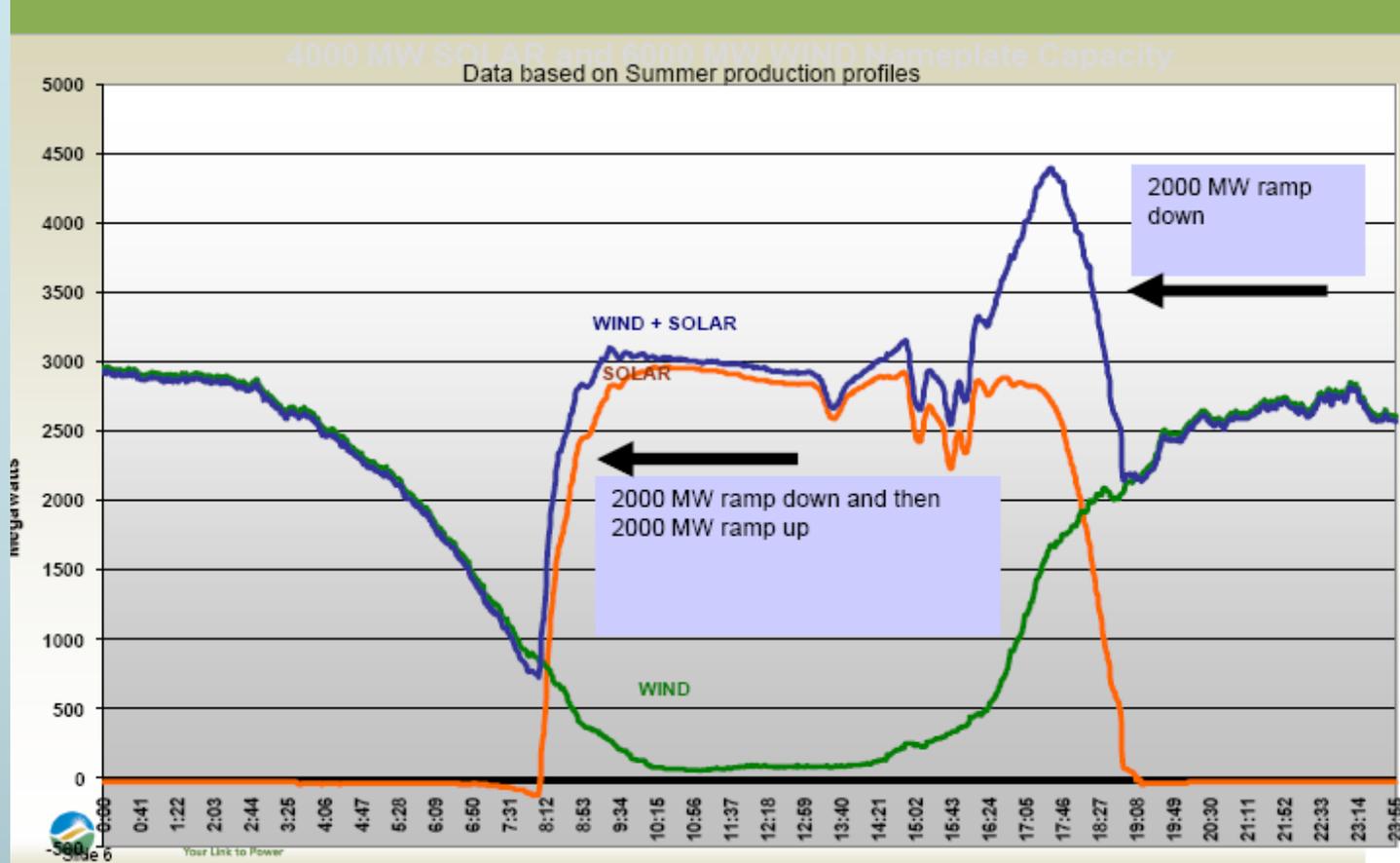
Offstream Storage: Sites and Temperance Flat Potential Flexible Generation Benefits

- ▶ DOI Secretarial Order 3285 promotes renewable development/integration
- ▶ Offstream Storage Attributes
 - ▶ Firming Capacity
 - ▶ Ability to balance large swings in renewable generation
 - ▶ Ability to provide flexible load
- ▶ Process to identify local partner to study daily pump-back operation, design incremental infrastructure & contribute funding



Market Values Flexible Generation

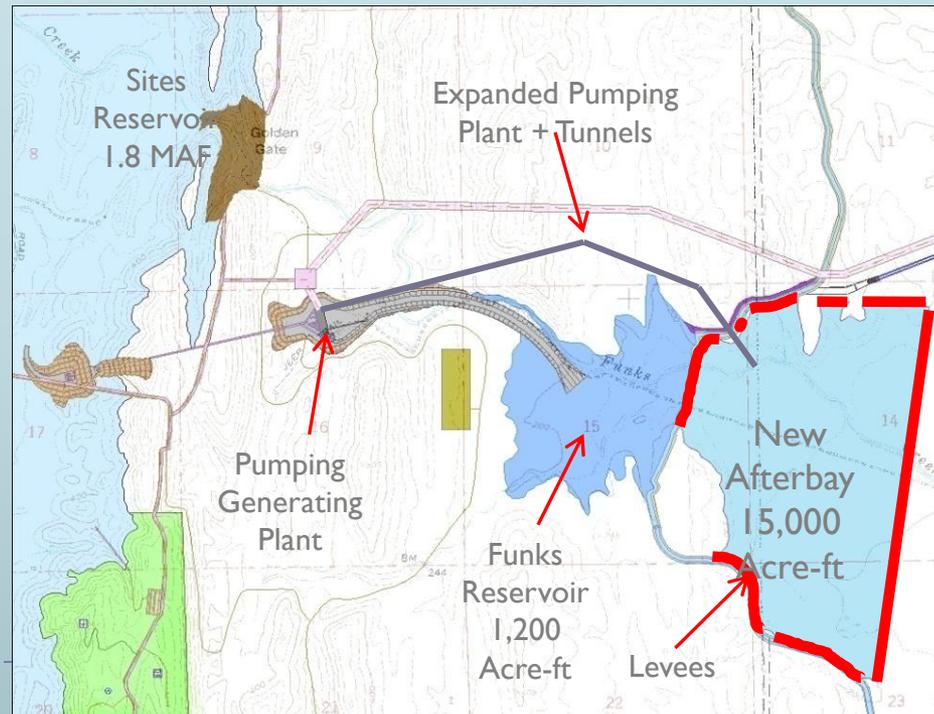
Example of ramping challenges at ~20% RPS



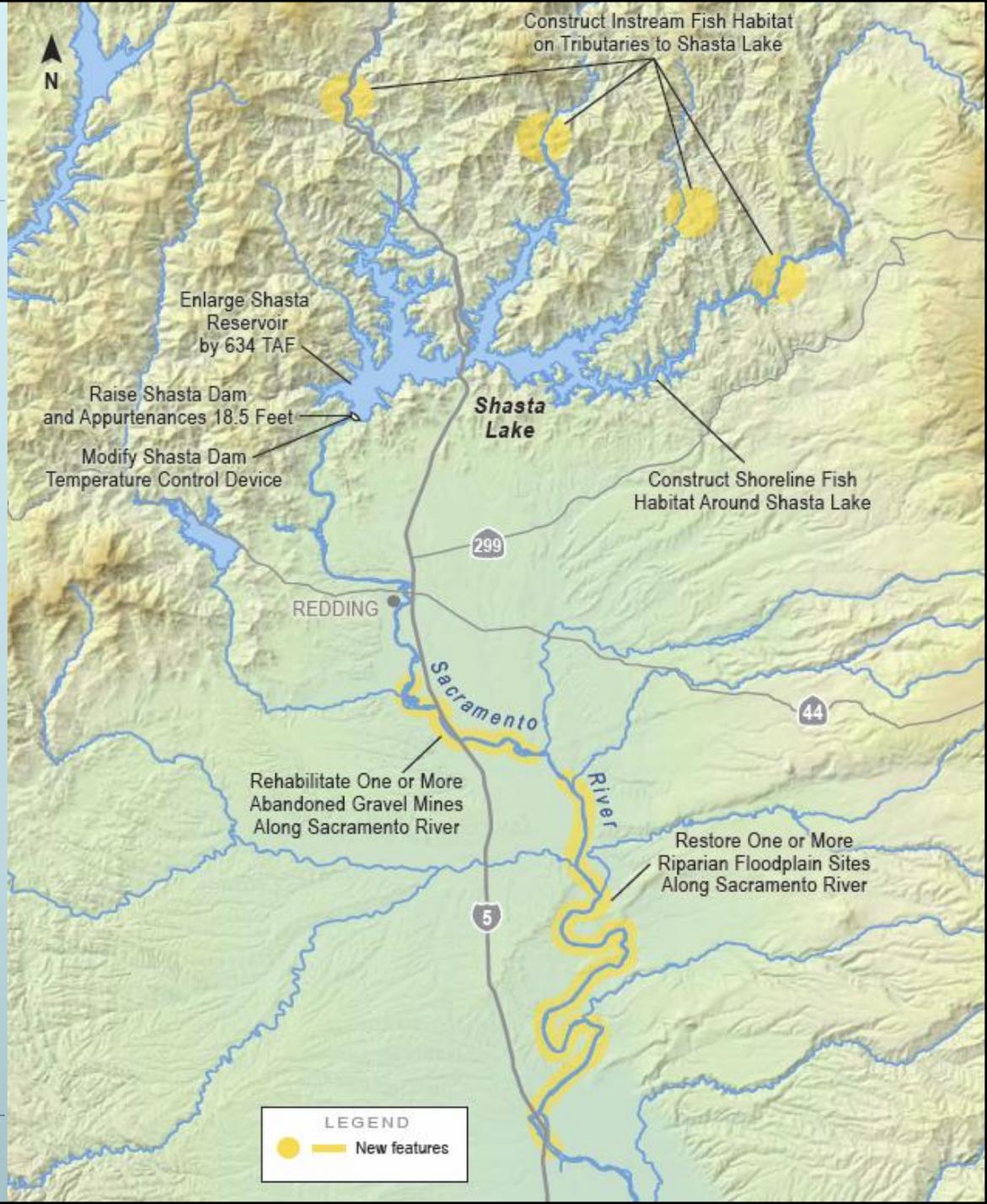
Proposed Daily Pump-Back Operation

- ▶ Need Hydraulically Isolated Forebay/Afterbay
- ▶ State-of-the-Art Pump Generator
 - ▶ No dead zone
 - ▶ Ability to switch between Pump/ Generator mode quickly
 - ▶ Ability to generate for a minimum of 8 hrs/day

- ▶ Example for Sites Reservoir



Shasta Lake Enlargement



Shasta Lake Enlargement Benefits



Project : 5 alternatives

18.5 ft raise → 634 TAF increase

Estimated Capital Cost (2006)

= \$942 M



Hydro
Generation



Recreation



Anadromous
Fish Survival /
Ecosystem



Water
Supply
Reliability



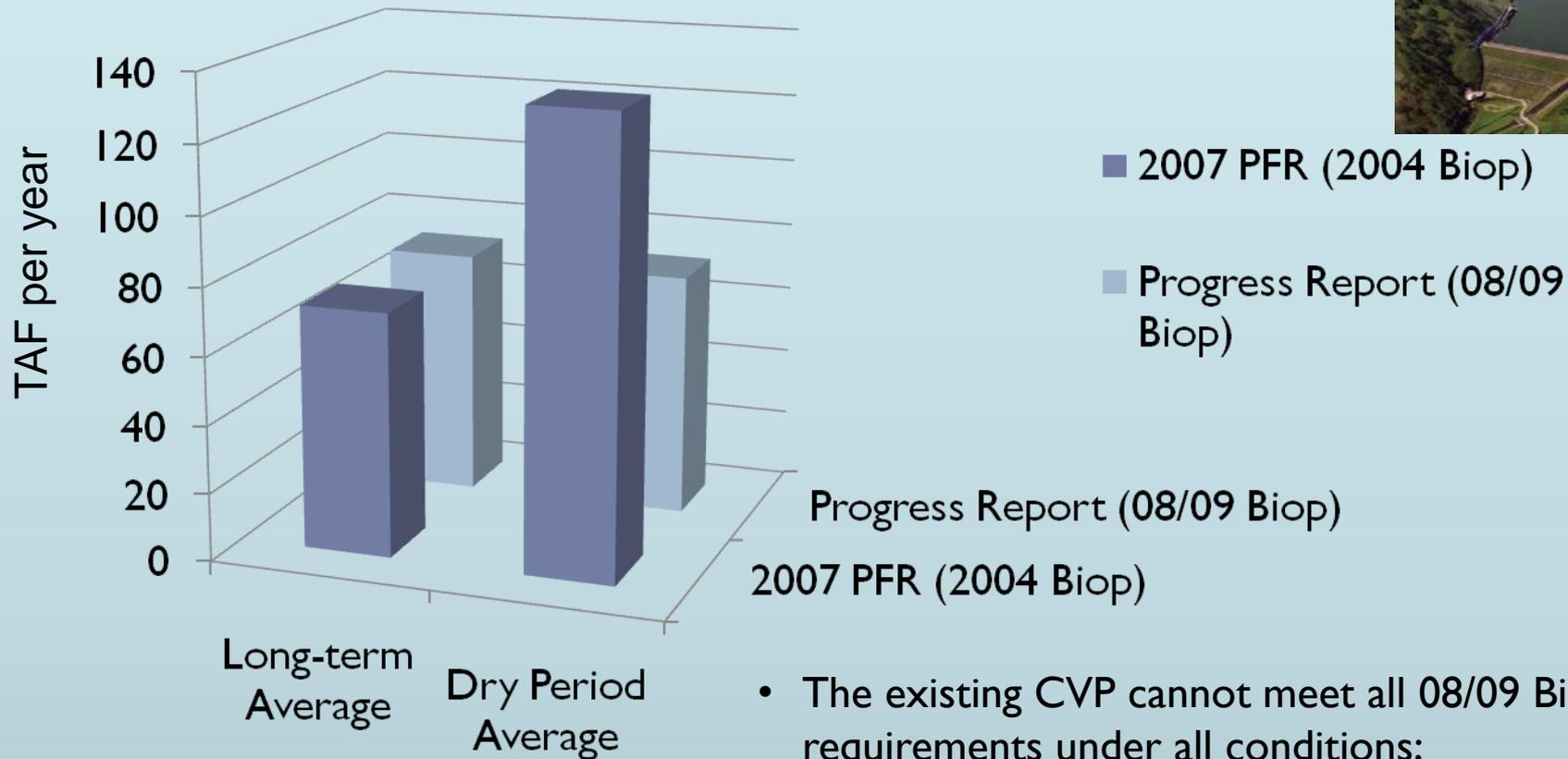
Water Quality



Flood
Damage
Reduction



Shasta Lake Enlargement Comparison of Water Supply Benefits



Progress Report (08/09 Biop)
2007 PFR (2004 Biop)

- The existing CVP cannot meet all 08/09 Biop requirements under all conditions;
- Enlarged Shasta accomplishments are masked by need to meet more of the 08/09 Biop requirements

Questions & Comments

