



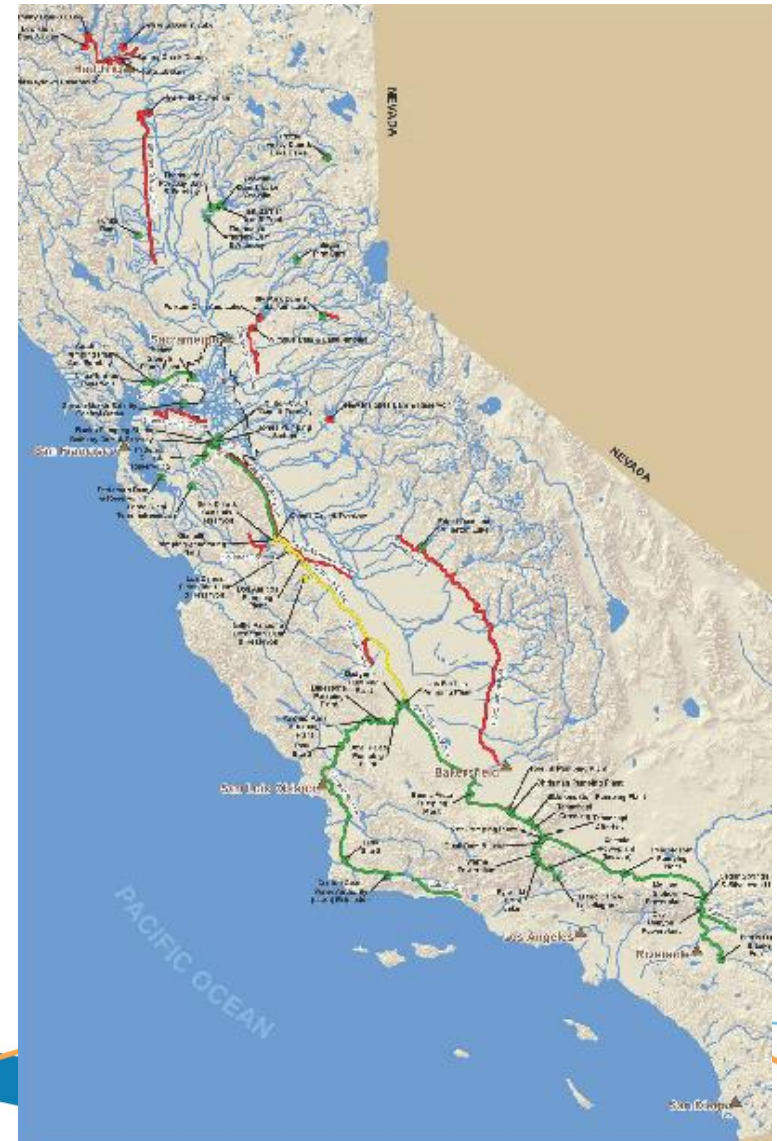
Bay Delta Conservation Plan

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California's Water Distribution System

- Population is concentrated in the South
- Water sources are predominately in the North
- 2/3 of Californians rely on Delta water
- Over 500,000 people live in the Delta
- 80% of the state's commercial fishery species live in or migrate through the Bay-Delta
- Habitat for 700 species, including 20 listed by ESA
- Average Annual Gross Value Agriculture totals more than \$2 billion



Historic Delta Conflicts



Center of competing demands for quantity and quality



Water supplies are not fully reliable



Water quality degradation makes it difficult and expensive to meet drinking water standards



Levee failures threaten agricultural and urban uses

Where Do We Go From Here

The Bay Delta Conservation Plan

Co-equal goals

- Contribute toward the recovery of endangered and sensitive species and their habitats
- Allow for the protection and restoration of water supplies

<http://baydeltaconservationplan.com>



Assembling Major Stakeholders

- Department of Water Resources
- Bureau of Reclamation
- Santa Clara Water Agency
- Metropolitan Water District of Southern California
- San Luis & Delta-Mendota Water Authority
- Mirant Energy
- Westlands Water District
- Zone 7 Water Agency

- State Water Resources Control Board
 - US Army Corps of Engineers
 - US Fish and Wildlife Services*
 - CA Department of Fish and Game*
 - National Marine Fisheries Service*
 - California Bay Delta Authority
- *Ex Officio status



- American Rivers
- Defenders of Wildlife
- Environmental Defense Fund
- Natural Heritage Institute
- The Bay Institute
- The Nature Conservancy

- North Delta Water Agency
- California Farm Bureau Federation
- California Resources Agency
- Contra Costa Water District
- Friant Water Authority

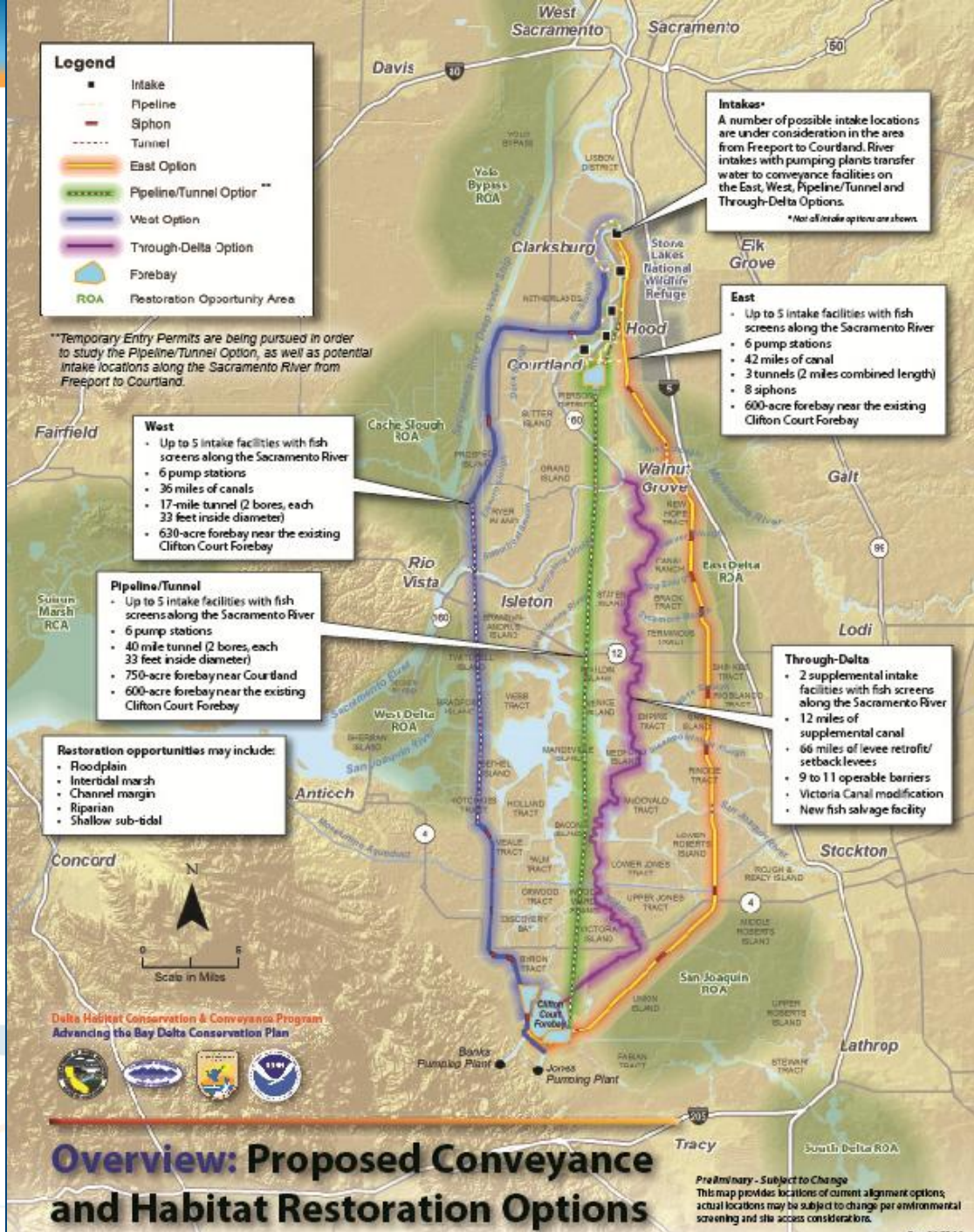
Project Elements

Restoration Actions

- Ecosystem Goals
- Natural Communities Goals
- Species Goals

Conveyance

- Up to 5 intake sites
- 4 conveyance options



Project Operations Considerations

- Geographic extent of water operations
- Restoration effects
- Conveyance effects
- Climate Change



Challenges of Balancing Recovery of Endangered/Threatened Species and Water Supply

- Habitat conversion creates social impacts from loss of jobs and homes
- Habitat enhancements do not equally benefit sensitive species

Delta smelt vs. Salmonids

Aquatic vs. Terrestrial

- Habitat restoration can mobilize hazardous materials—methylmercury
- Competition for water by people and fish

Surface Water

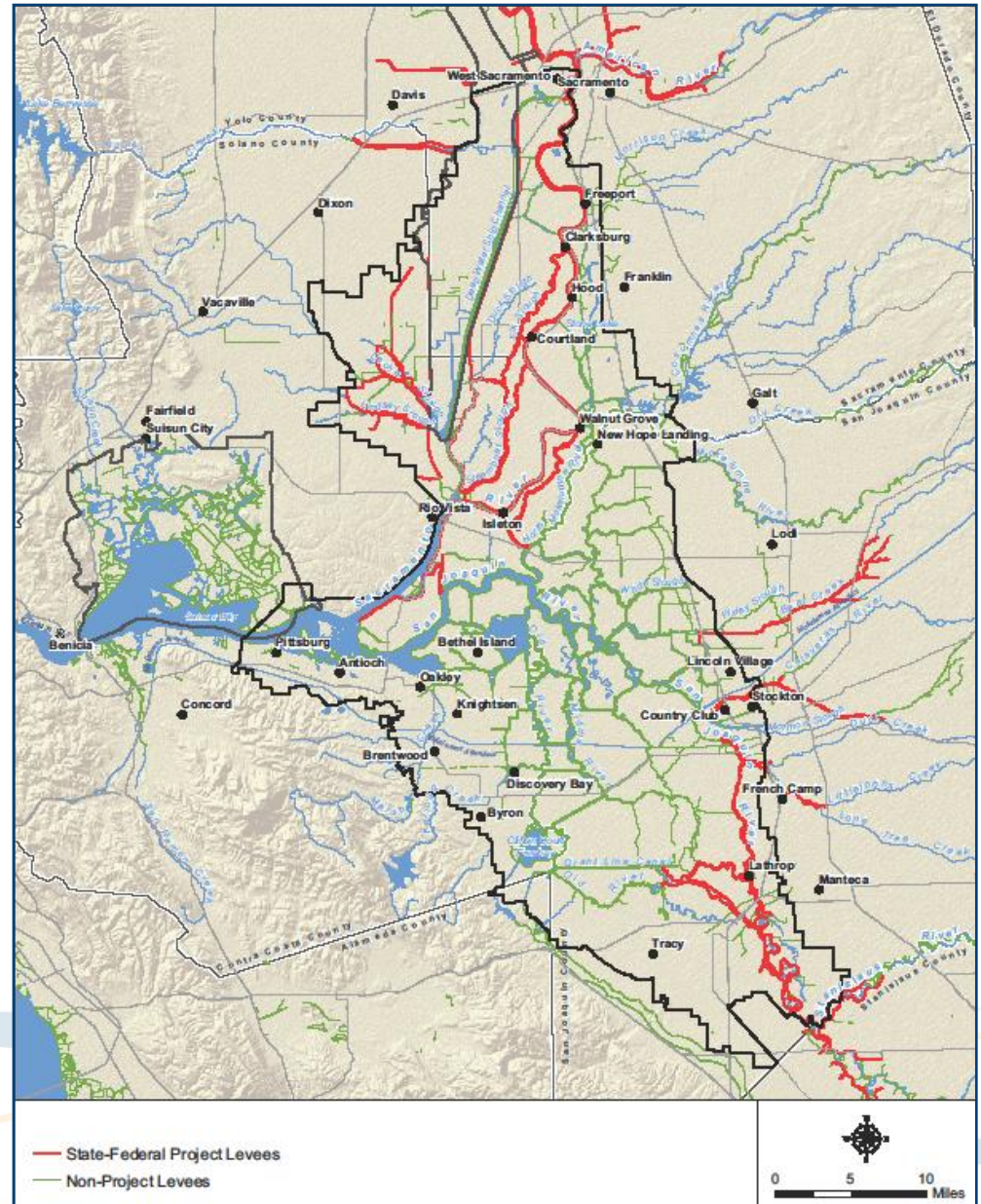
1,115 miles of levees protect about 700,000 acres within the Delta, directing water from the;

- Sacramento
- San Joaquin
- Cosumnes
- Mokolumne
- and Calaveras rivers

Minimal topographic relief = high flood potential

Levee reliability concerns

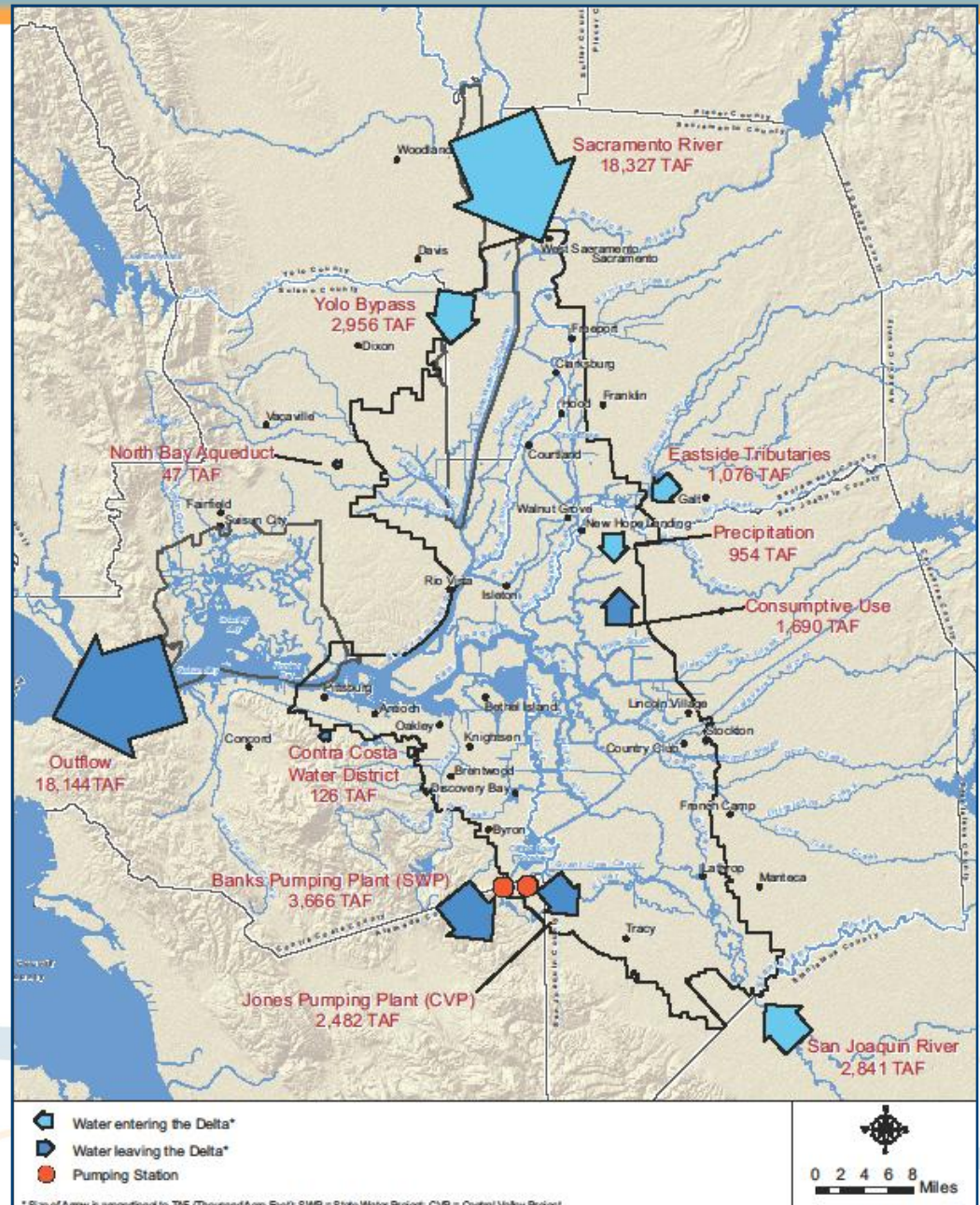
- Subsidence
- Sea Level Rise
- Climate Change
- Seismicity



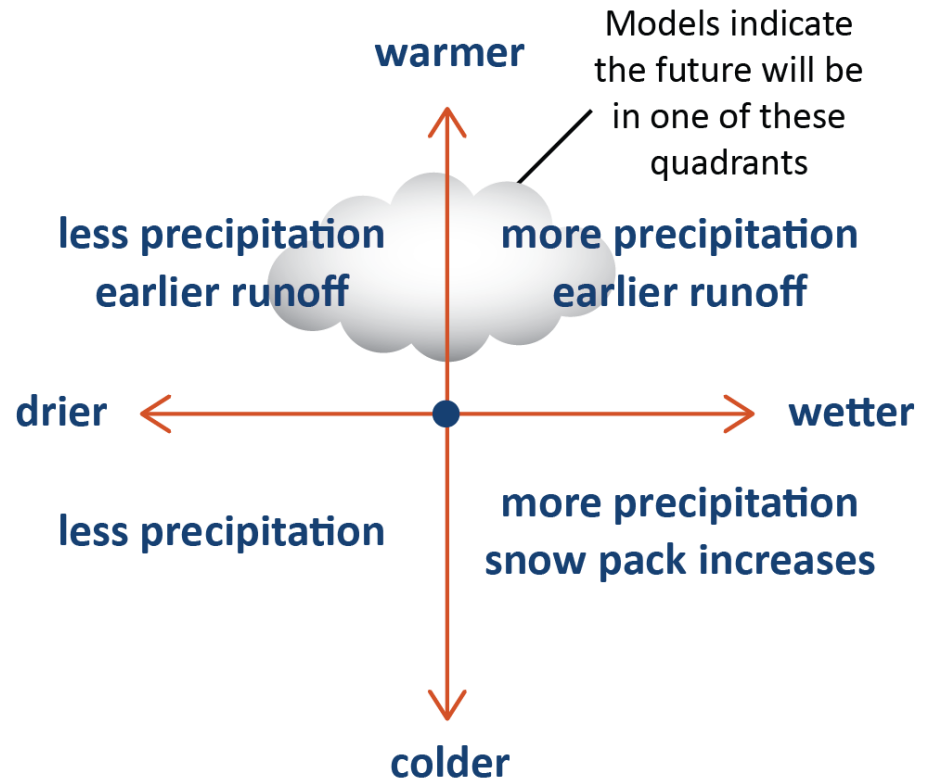
Water Balance

Water balance in the Delta is influenced by;

- Inflow from the tributaries, controlled by;
 - Operations of the dams and reservoirs
 - Snowmelt and other runoff
- Exports to the Central Valley from the SWP and CVP pumping stations
- Outflows to the Pacific Ocean
- Tidal influences in the San Francisco bay
- Roughly 40% of the drainage water in California travels through the Delta each year.

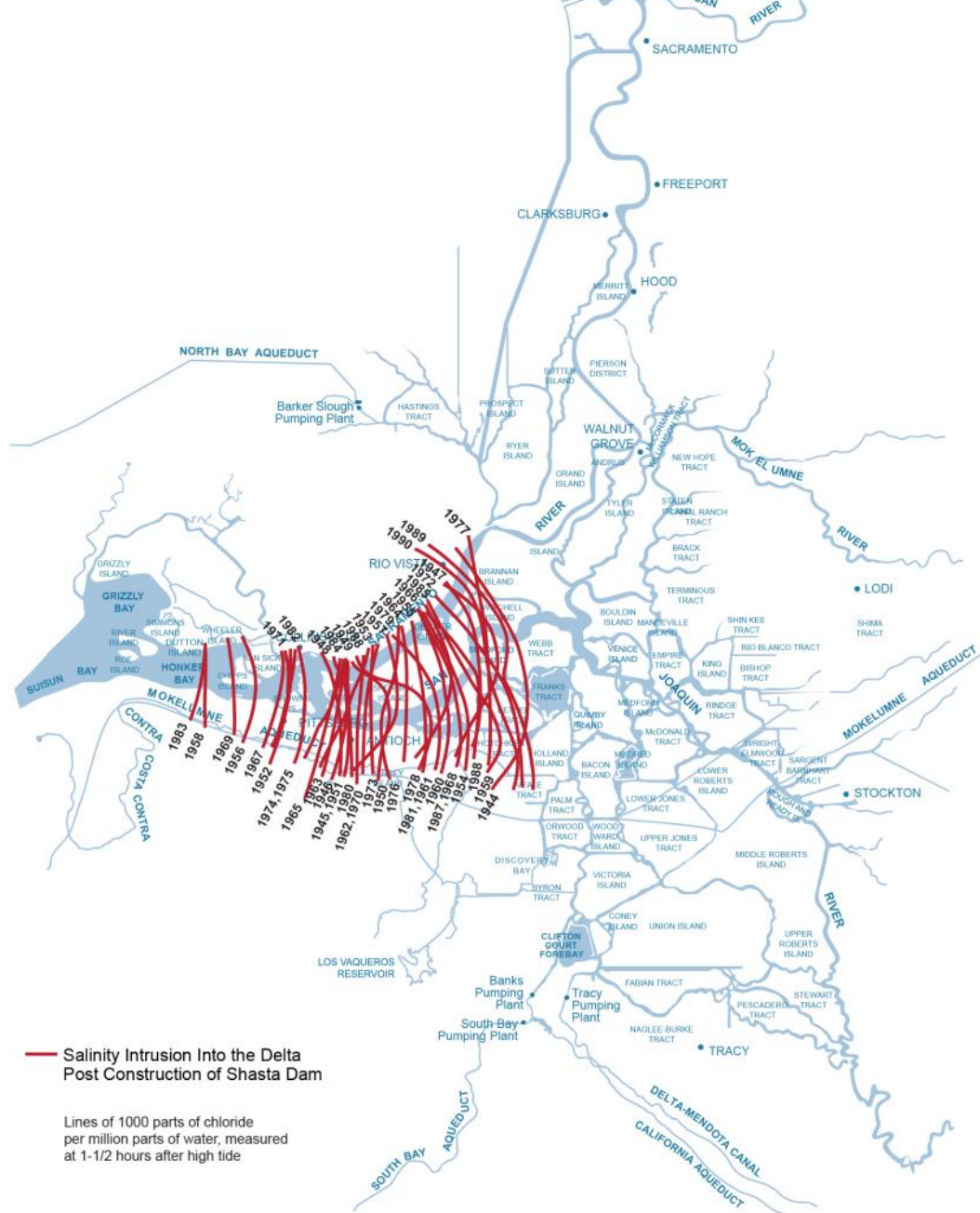


Climate Change



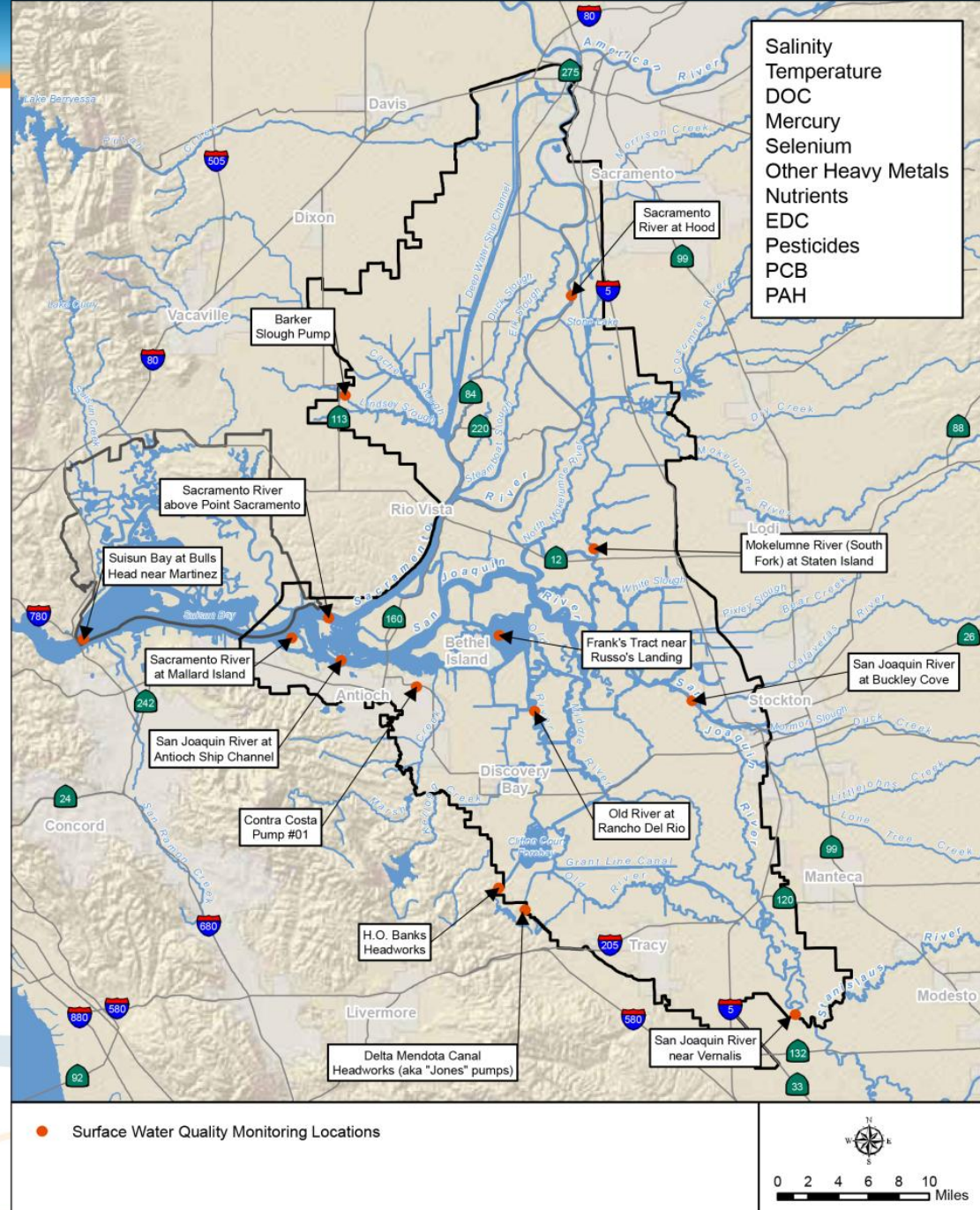
Salinity Intrusions

Salinity in the Delta has changed due to water operations



Water Quality Analysis

- Water quality analysis to address construction, operations and restoration activities in 3 time steps
- 33 scenarios × 5 water year types × 14 sampling locations × 20 constituents = 46,200



Fish and Aquatic Resources Evaluation Focus

BDCP Covered Species

- Delta smelt
- Longfin smelt
- Chinook salmon
(winter, spring, fall and late fall)
- Green and white sturgeon
- Central valley steelhead
- Sacramento splittail
- River and Pacific lamprey

EIR/EIS Species

All BDCP covered species plus

- Warmwater game fishes
- American Shad
- Striped Bass
- Bay Shrimp
- Hardhead
- Sacramento-San Joaquin Roach
- Tule Perch

Other Stressors Consideration

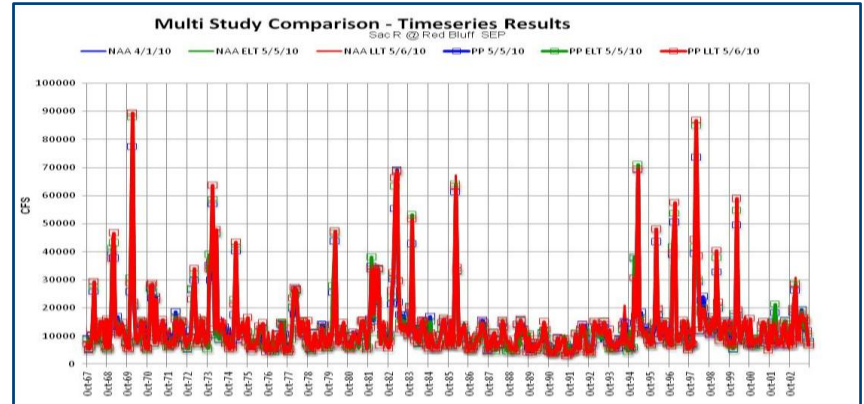
- Ammonia and Endocrine Disruptors in Wastewater
- Agricultural Contaminants
- Urban Runoff
- Low dissolved oxygen
- Methylmercury
- Non-native Species
- Fish Hatcheries and Harvest
- Entrainment by Non-project Diversions
- Predator Control



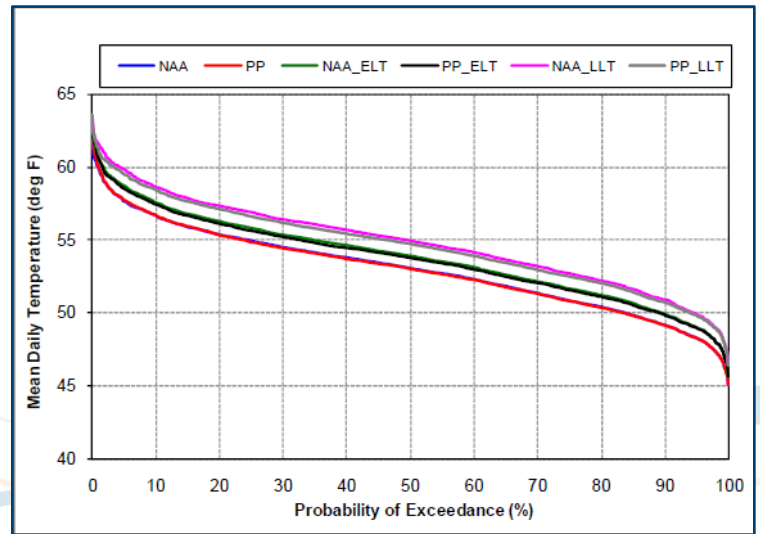
Species-Specific Evaluation

Model Dependent Analyses

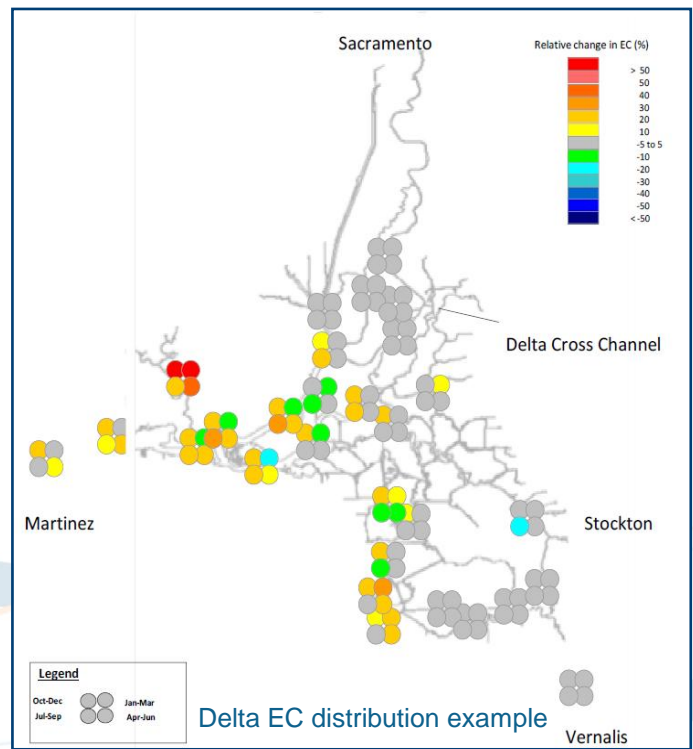
- Parameters
- Data reduction
- Data presentation
- Life cycle models



Flow time Series example



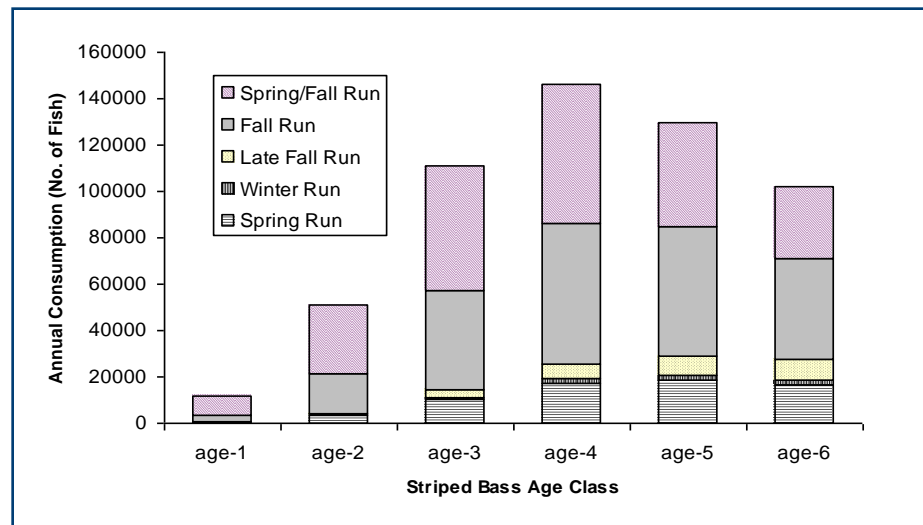
Temperature exceedance probability distribution example



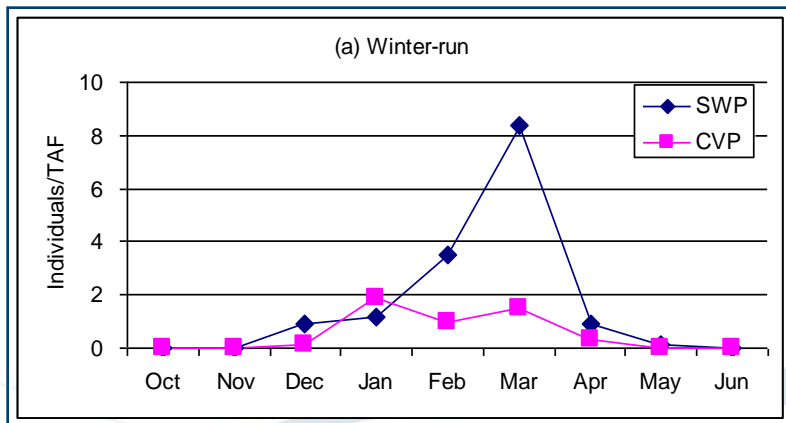
Delta EC distribution example

Species-Specific Evaluation

- Predation
- Food Web
- Entrainment



Predation bioenergetics model example output



Historical monthly average loss rate of winter-run Chinook salmon at CVP and SWP salvage facilities.

- Construction
- Essential Fish Habitat
- Other Stressors

It Is A Major Challenge

to restore an ecosystem in an environment like the Delta that is highly altered and largely unnatural

