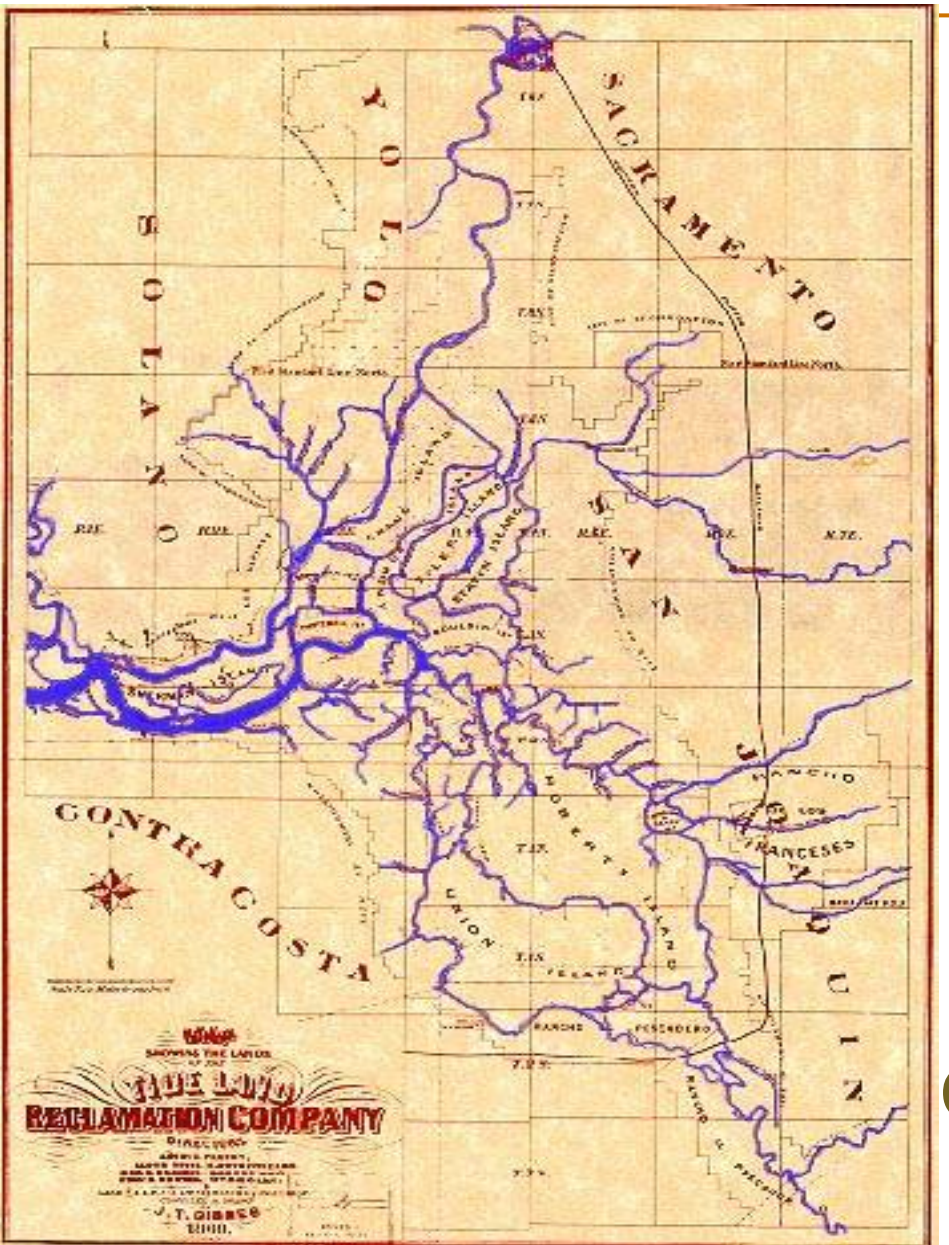
Transitions for the Sacramento-San Joaquin Delta



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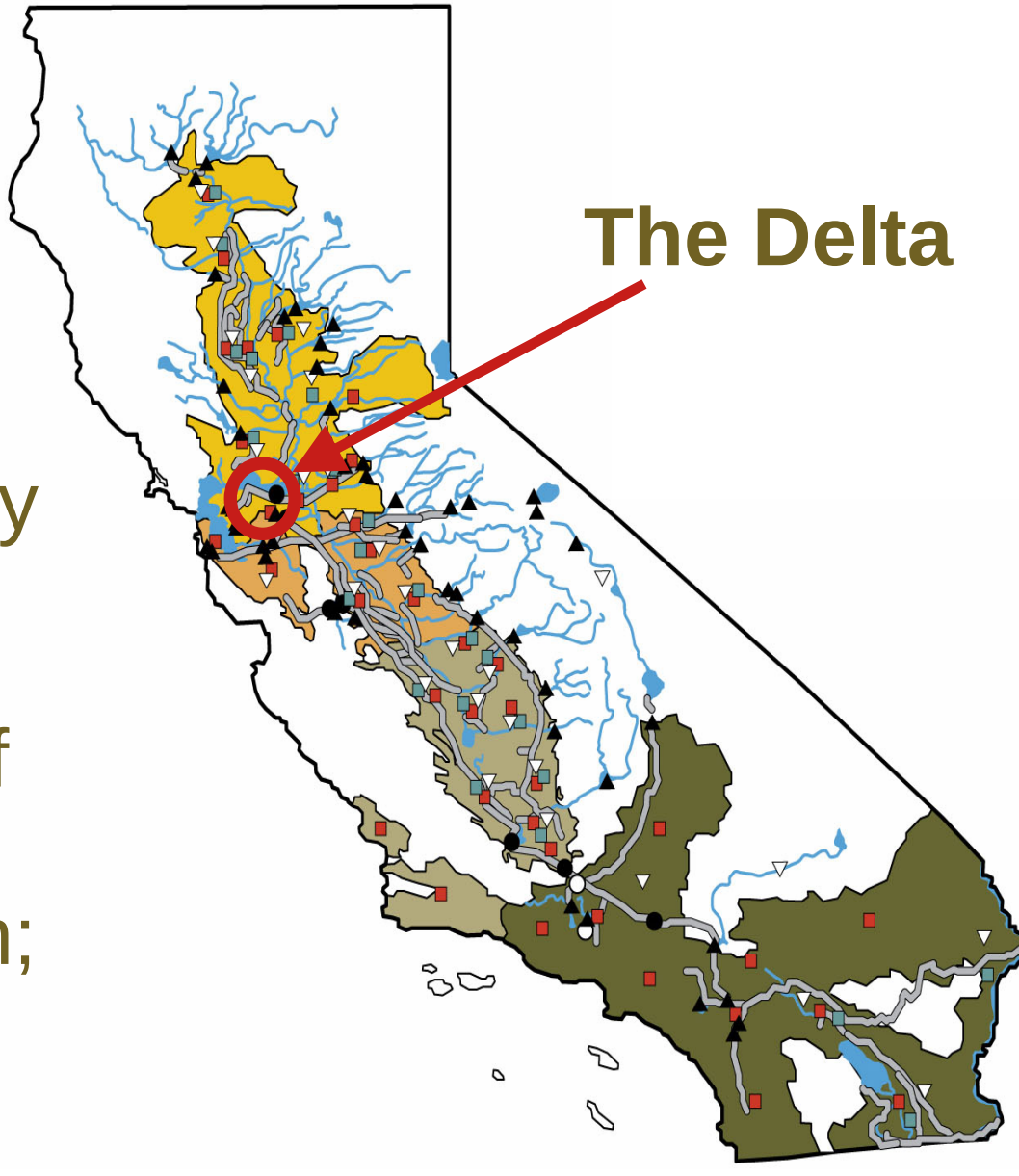
California's Water Supply System

- Diverse water supplies
  - Mostly in north
  - Mostly in wet season
- Diverse water demands
  - Mostly central & south
  - Mostly in dry season
- Extensive use of aqueducts, reservoirs, and groundwater
- Sacramento-San Joaquin Delta is the major "hub"

Who depends on the Delta?

- S. California – 30% of water supplies
- Bay Area – 30% of water supplies directly, another 40% upstream
- Southern Central Valley – 4 maf directly and 4 maf upstream
- Delta farmers – 1+ maf
- Sacramento Valley – 4+ maf taken upstream; water leasing by IDs

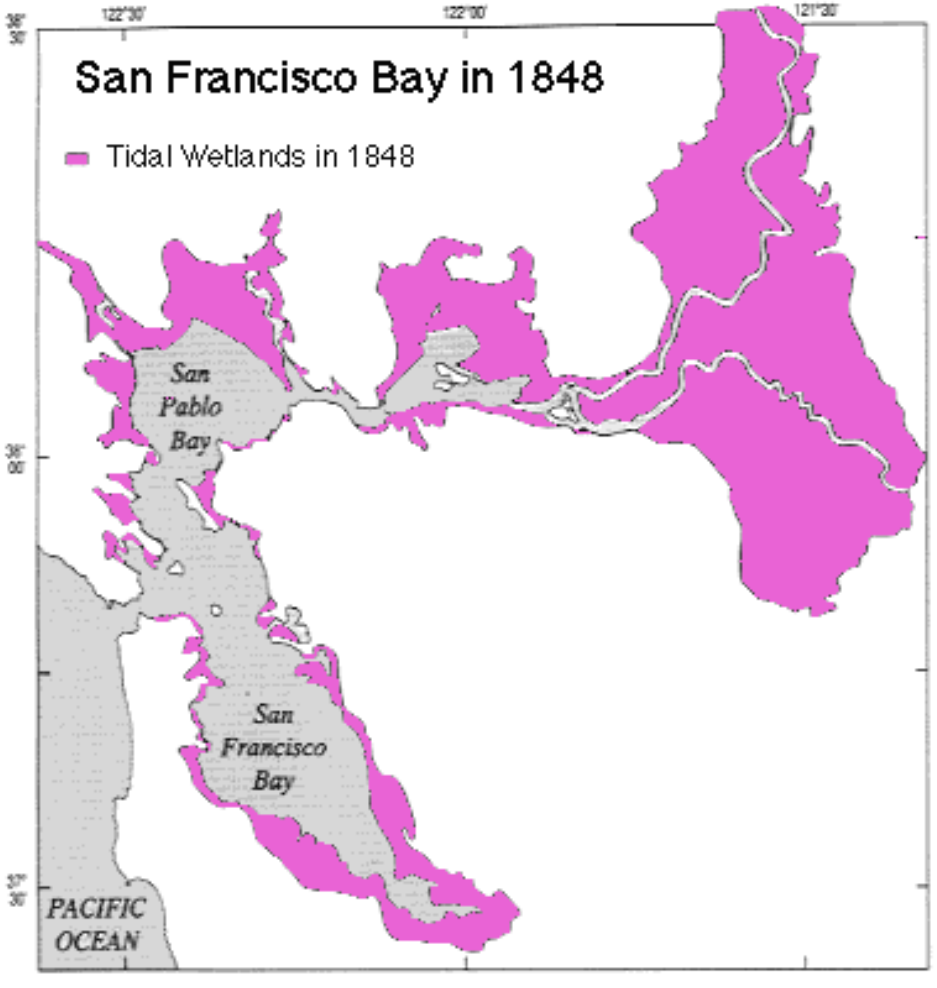


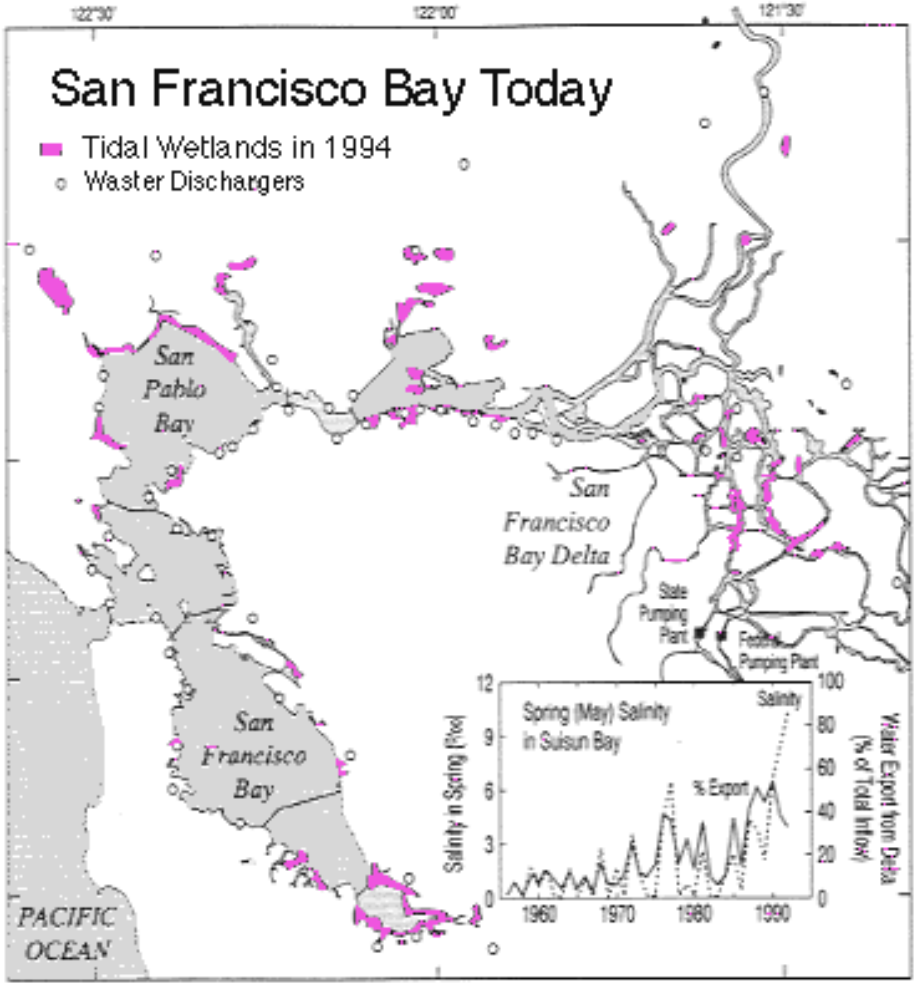
1. Pre-European Sacramento-San Joaquin Delta

- Formed 6,000 years ago
- Estuary from a drown river confluence
- 740,000 acres of marshland & waterways
- Largest estuary in the

Delta, 1905

San Francisco Estuary and Delta: 1848 and today



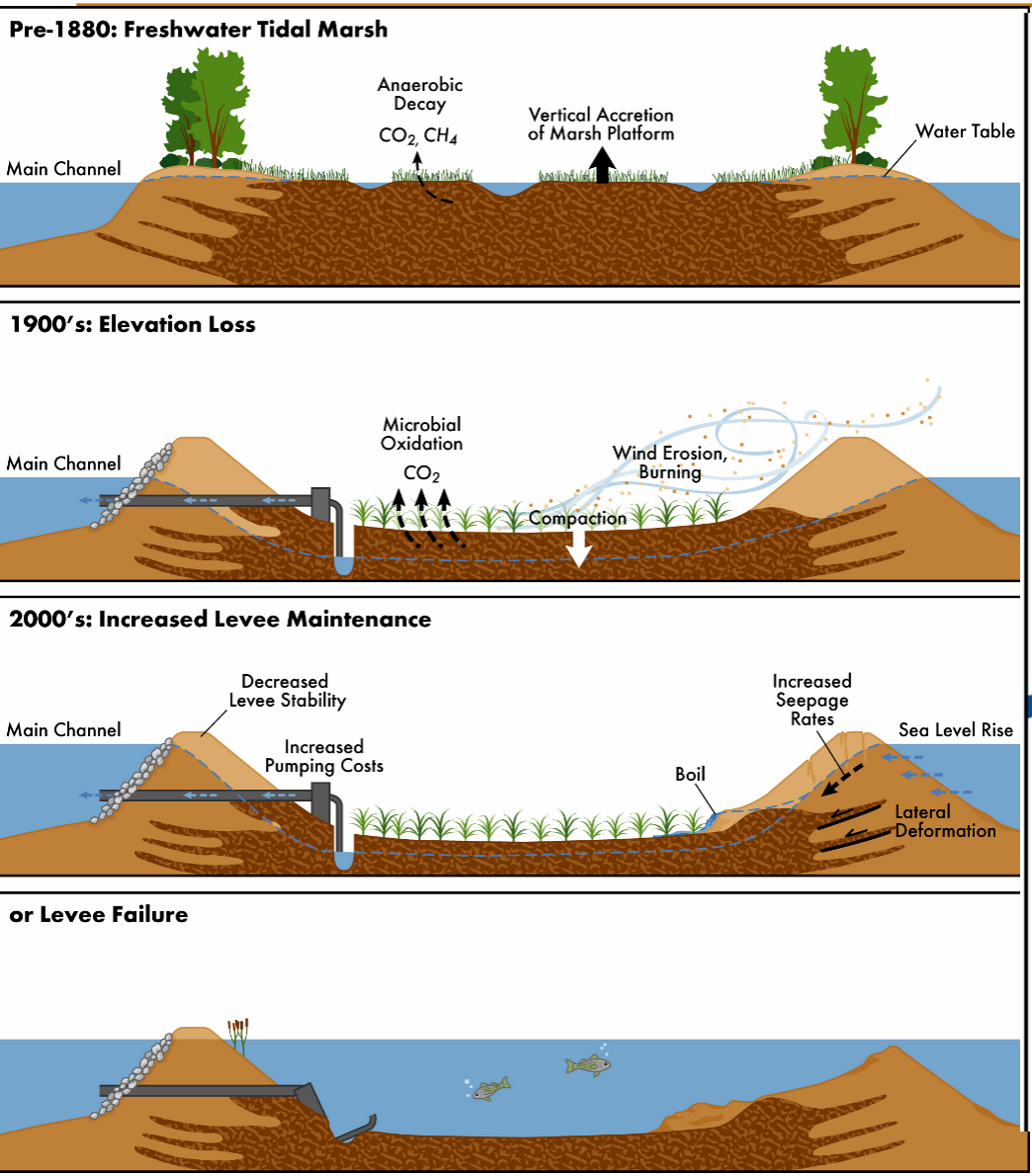


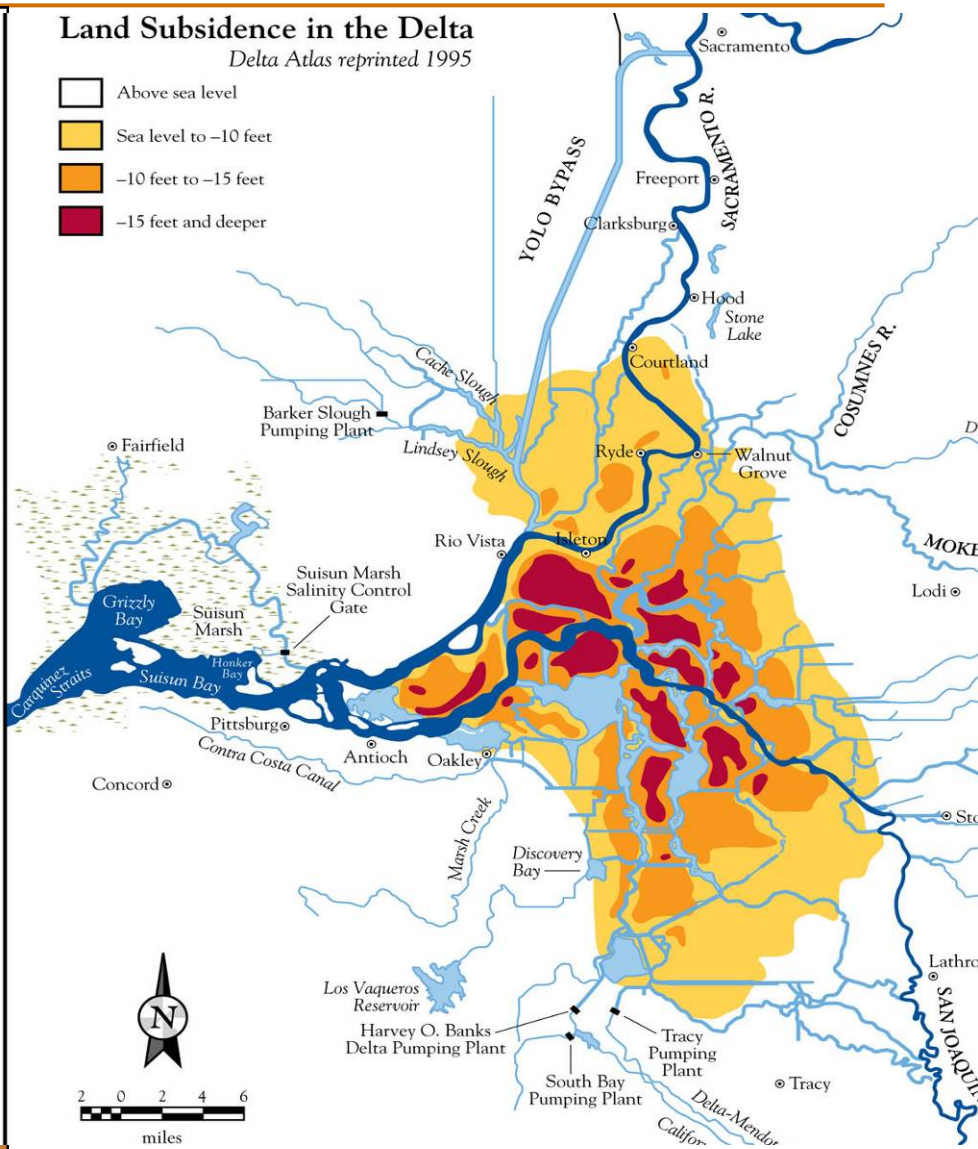
http://sfbay.wr.usgs.gov/access/yearbook.html

2. Agricultural Sacramento-San Joaquin Delta

- 1850s - present
- Leveeing wetlands – 1,100 miles
- 540,000 acres of farmland
- Early major irrigation
- Rapid land subsidence
- Rising costs to maintain levees
- Early extinctions

Delta Island Subsidence

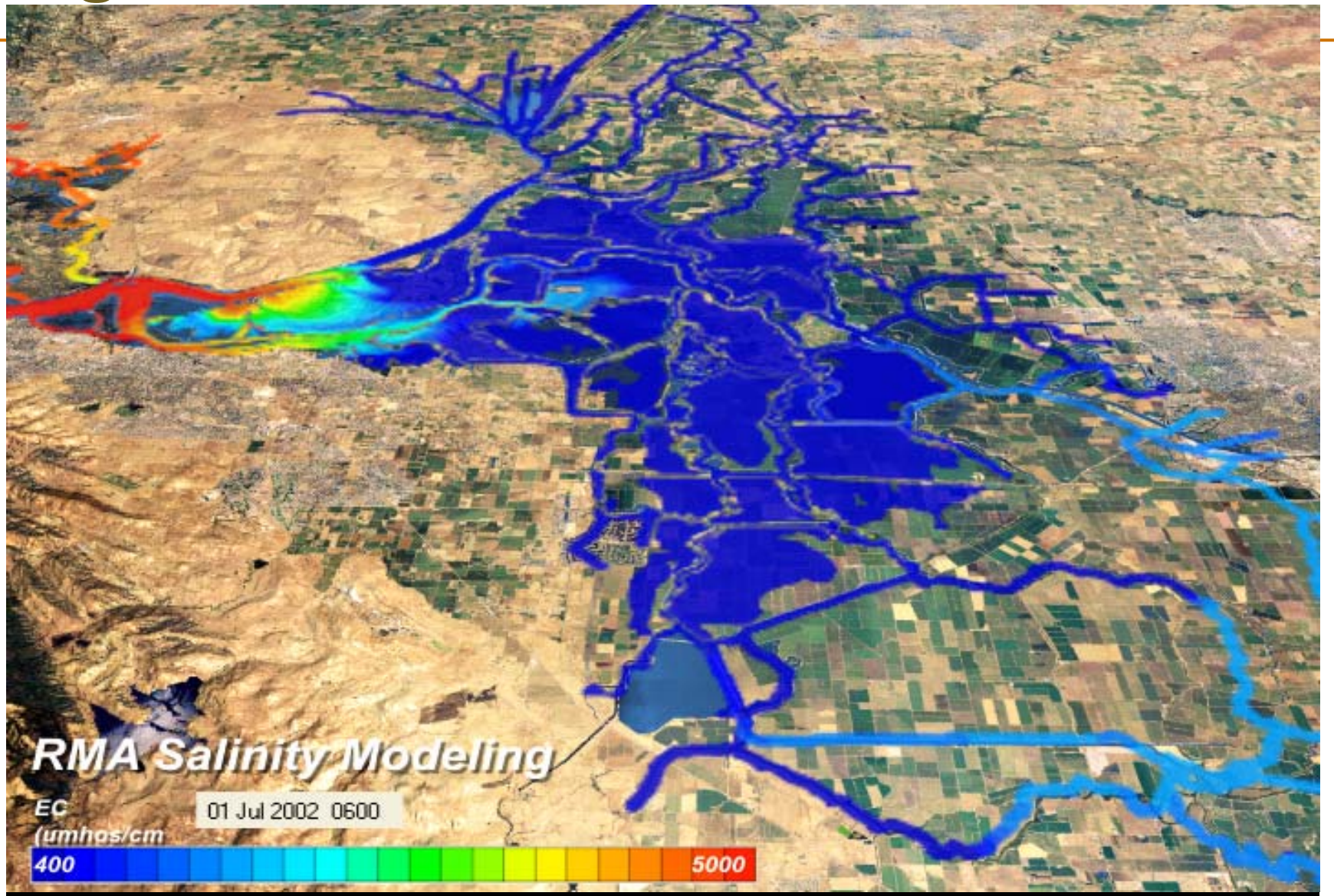




3. Water Supply Sacramento-San Joaquin Delta

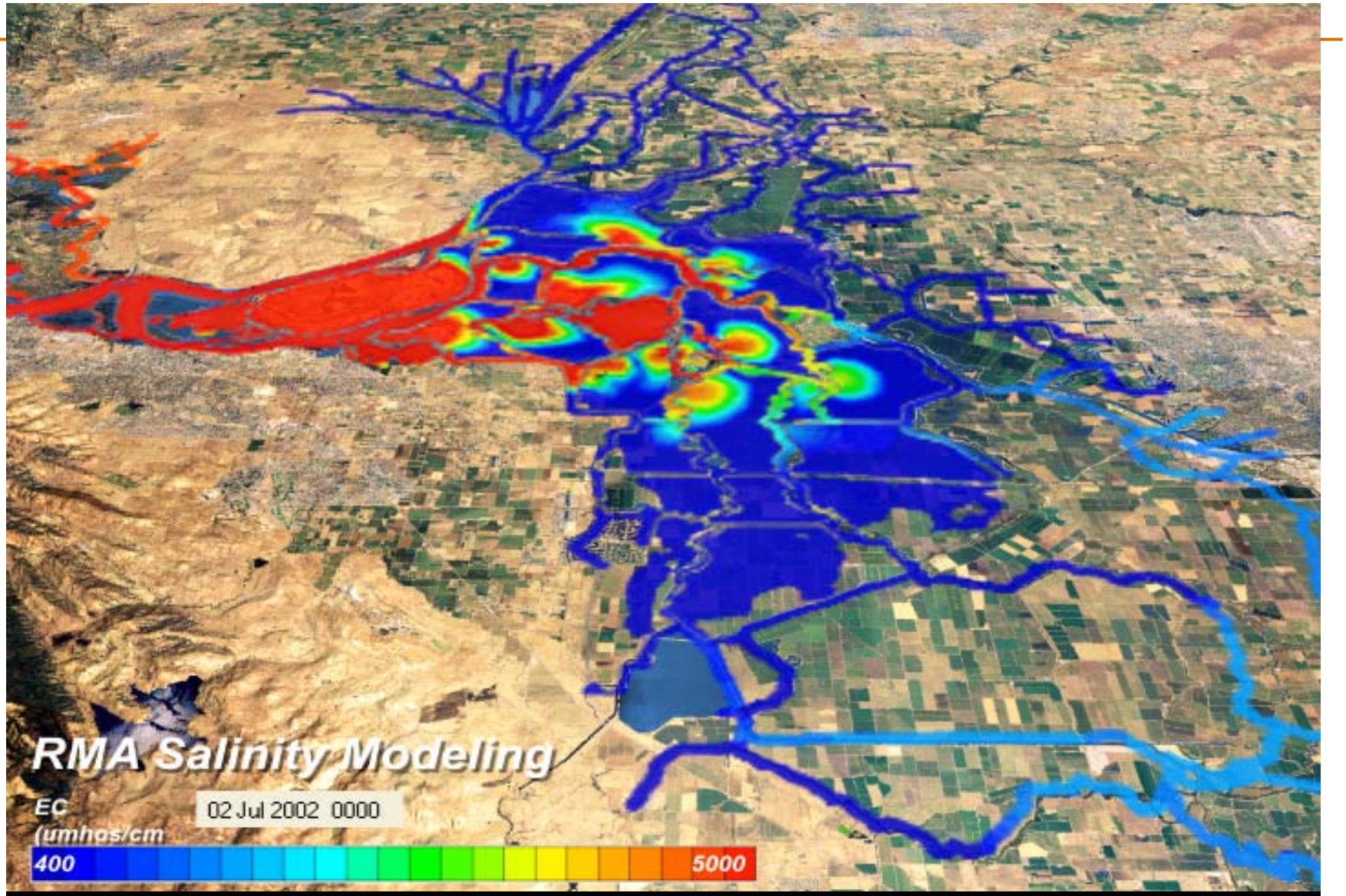
- 1950s - present
- Major water export projects
- 540,000 acres of farmland
- Continued land subsidence
- Worsening water quality and risks for export users
  - Drinking water treatment
  - Salinity and crop yields

The “Big Gulp”: 6.5 Magnitude Earthquake causing 20-Island Failure



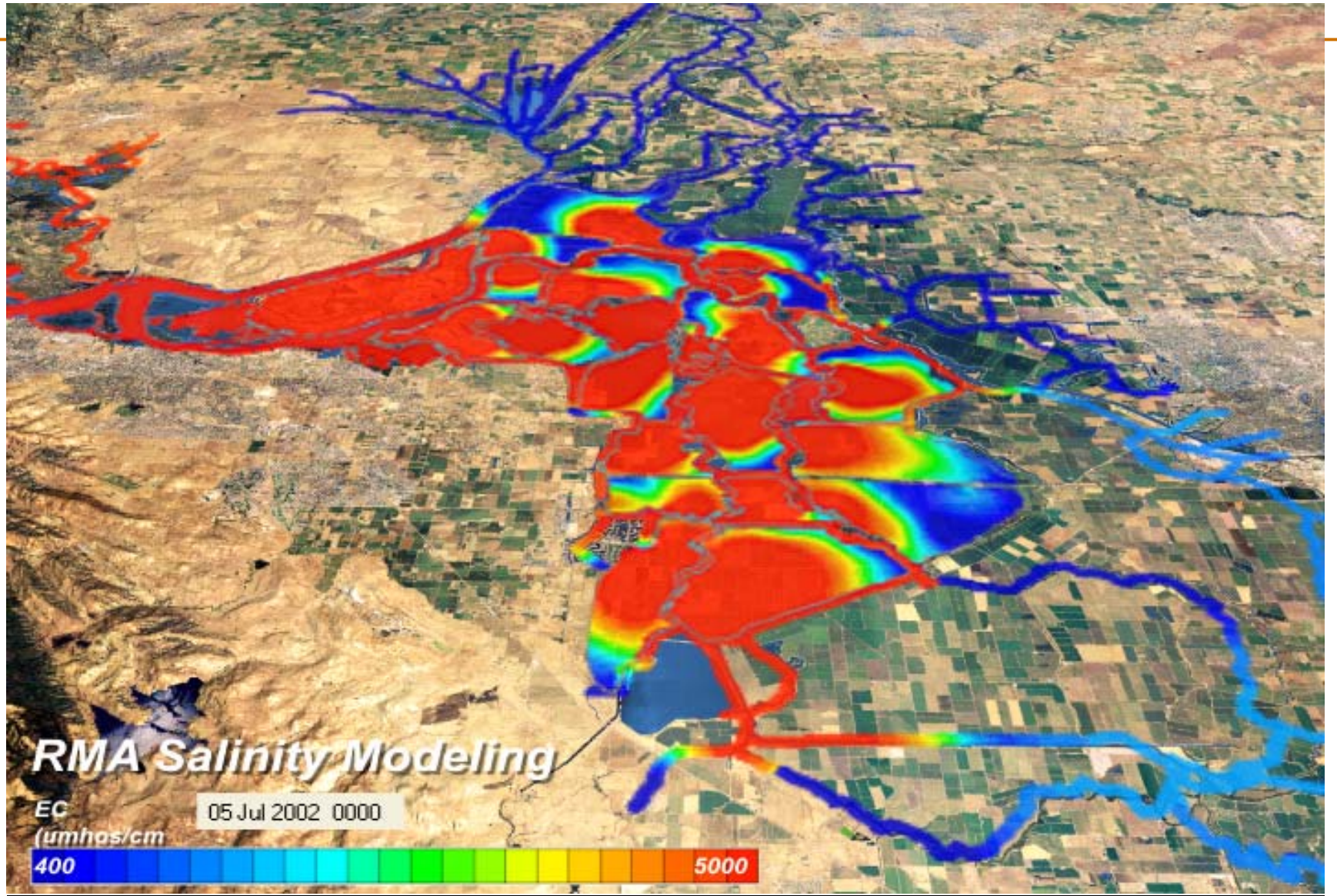
0 – 6 hours: Islands flood with fresh water

6.5 Magnitude Earthquake causing 20-Island failure



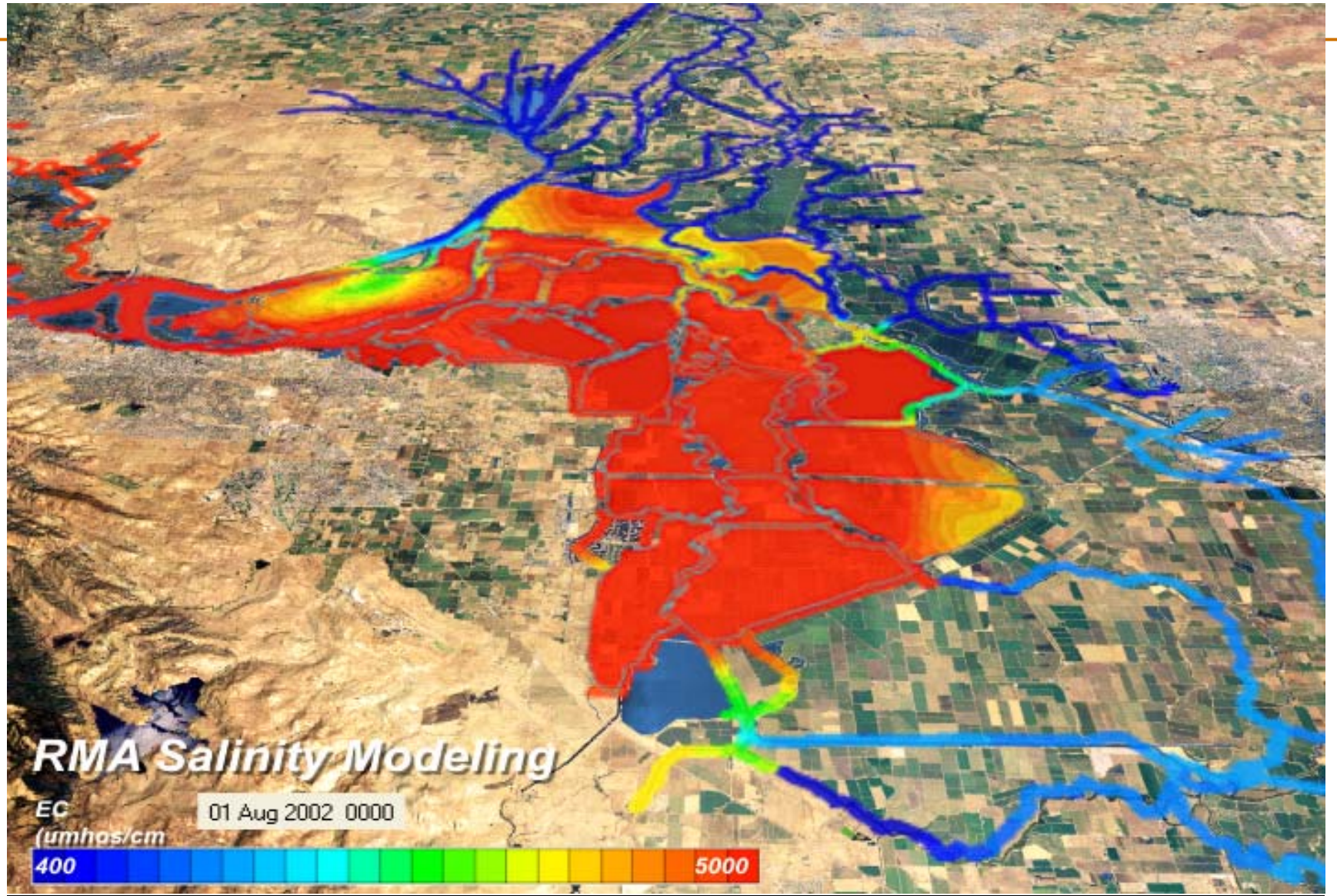
12 – 24 hours: Salt water intruding into Delta

6.5 Magnitude Earthquake causing 20-Island failure



1 – 7 days: Salt water throughout Delta

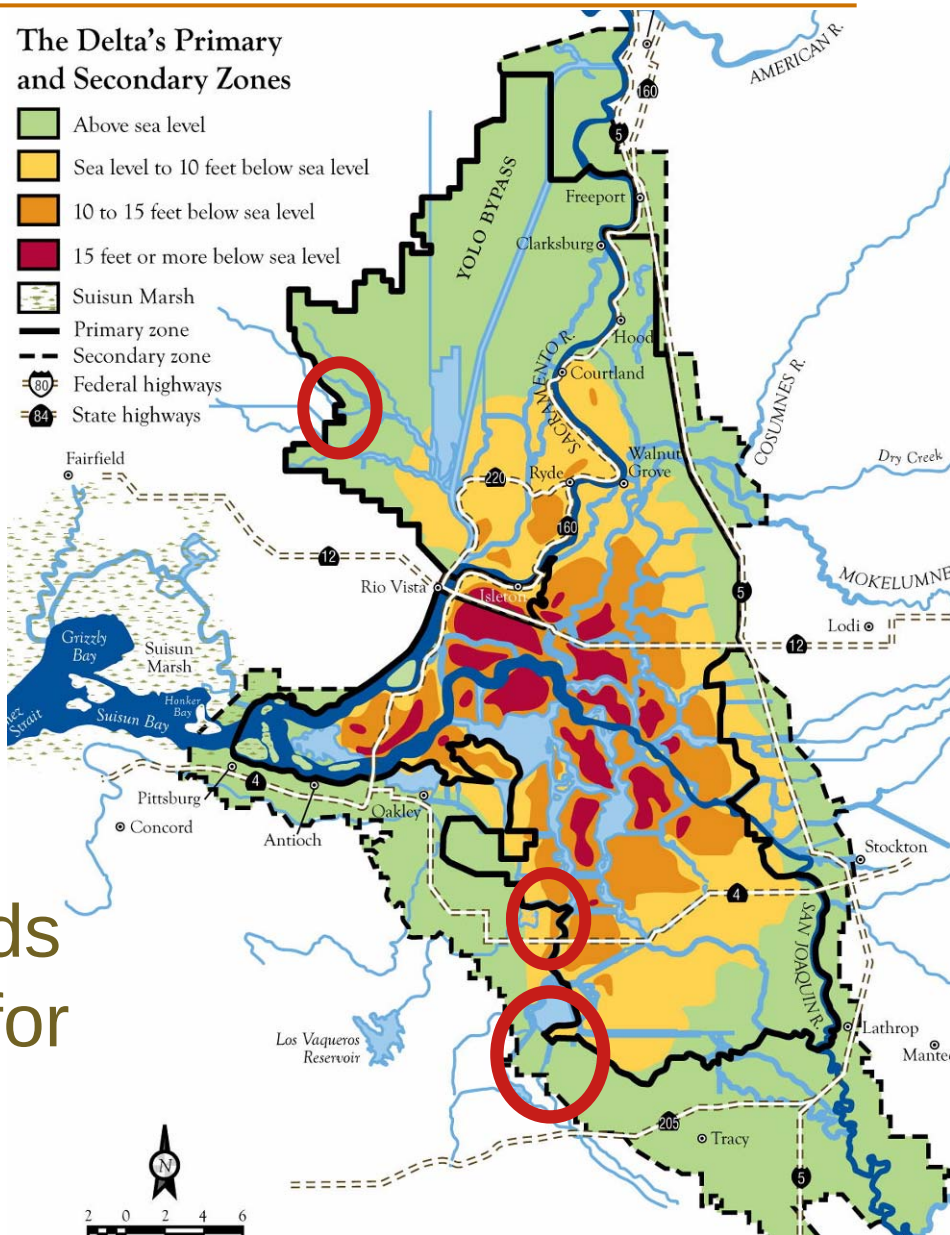
Months to years of saline Delta



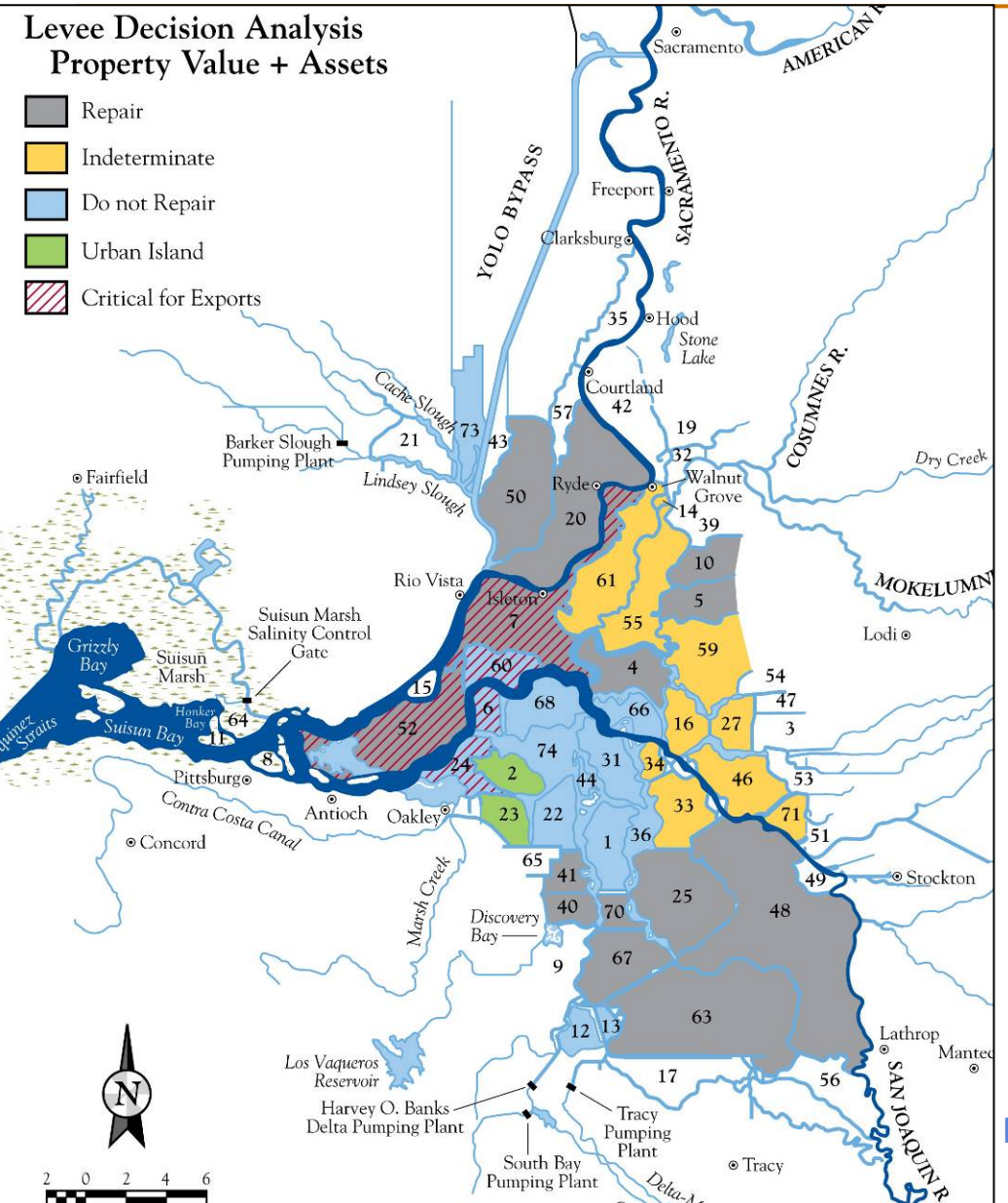
30 days: A saline estuary

Problems of California's Sacramento-San Joaquin Delta

- Physical instability
  - Land subsidence
  - Sea level rise
  - Floods
  - Earthquakes
- Ecosystem instability
  - Habitat alteration
  - Invasive species
- Economic instability
  - High costs to repair islands
  - Worsening water quality for agric. & urban users



Delta of Tomorrow Will be Different



- Large bodies of open water and higher sea level
- Increased salinity, habitat variability
- Higher water quality costs – even if all islands remain intact

Based on economic value of land and assets, many islands not worth repairing after flooding (blue)

Transition Problems and Options

- Re-flooding some islands, habitat, and the Delta's economy
- Fish habitat and water operations
- Water supplies
  - Southern Delta exports
  - CCWD
  - Delta farmers
  - North Bay Aqueduct

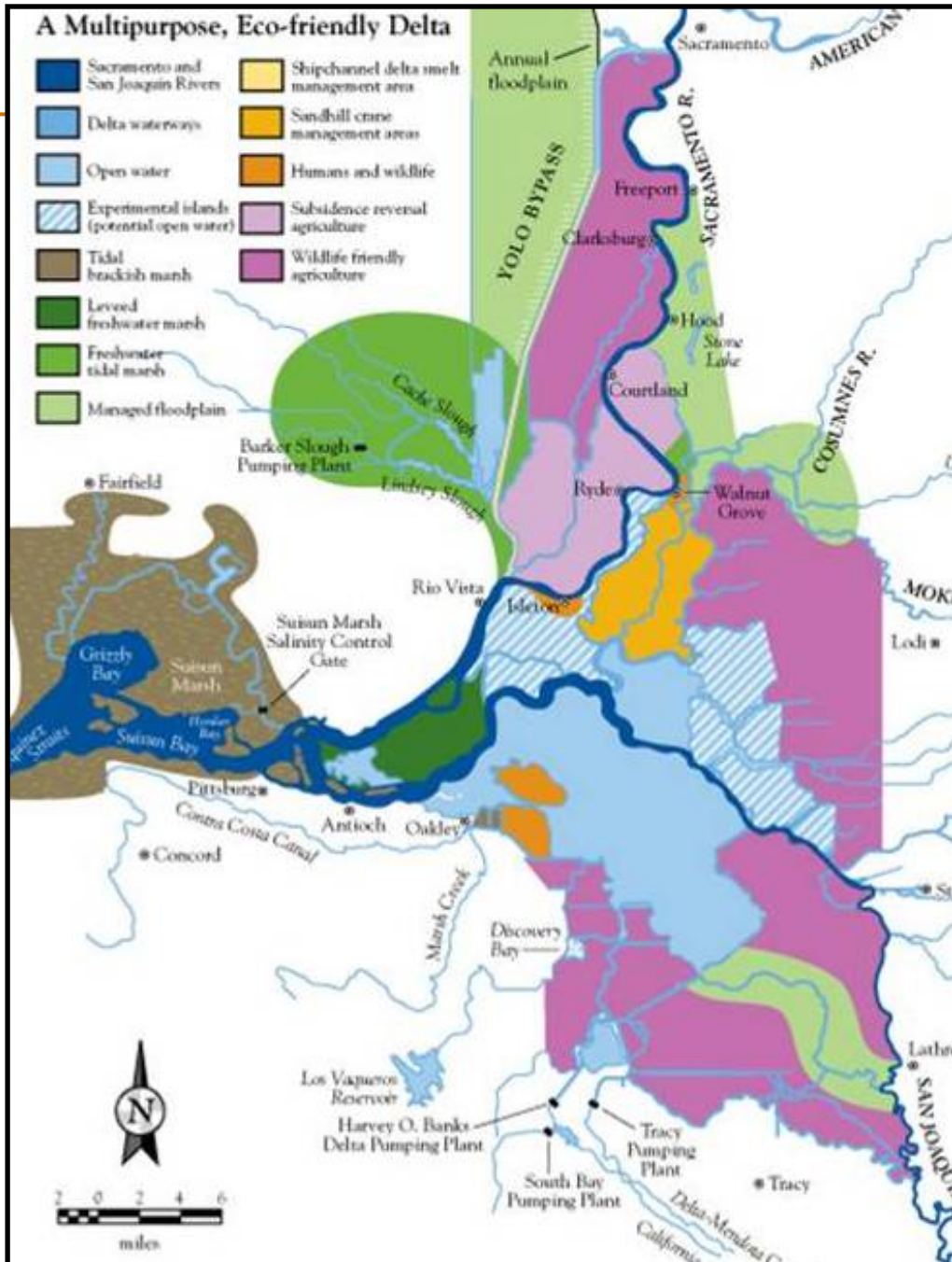
Jones Tract 2004 (above) and Liberty Island since 1998

Land use with Permanently Re-flooded Islands

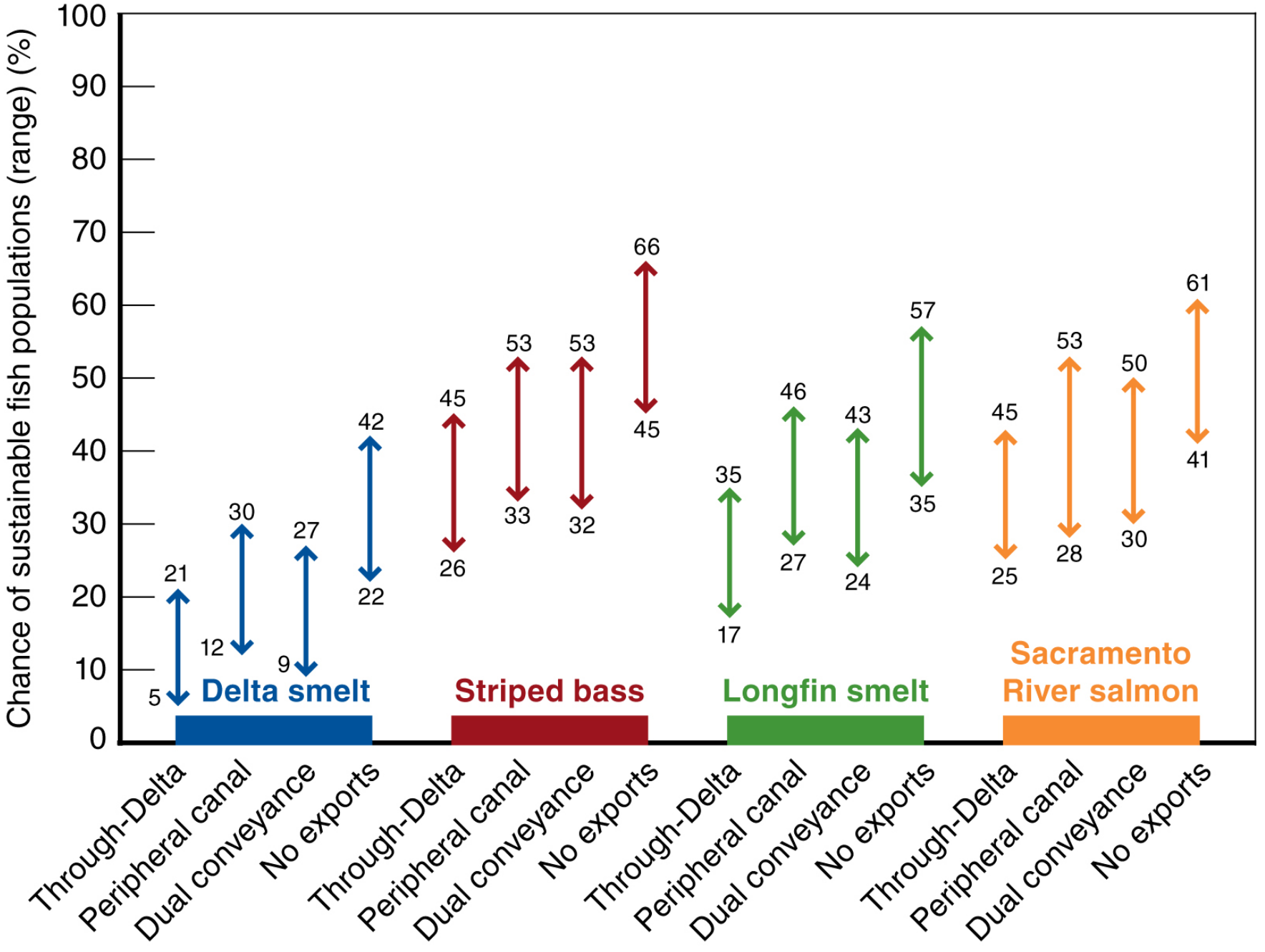
- Island repair funding and policies
- Identifying islands lacking compelling state interest
- Aid and incentives for transition
- Urbanization in Delta

A Changing Delta Ecosystem

- Habitat plans for
  - Climate change
  - Sea level rise
  - Permanent levee failures
  - New invasive species
- Favor diverse habitat and flow for multiple species
- Plan to make mistakes; they will happen.
- Experimentation and detailed modeling needed
  - Include flooding at least one island

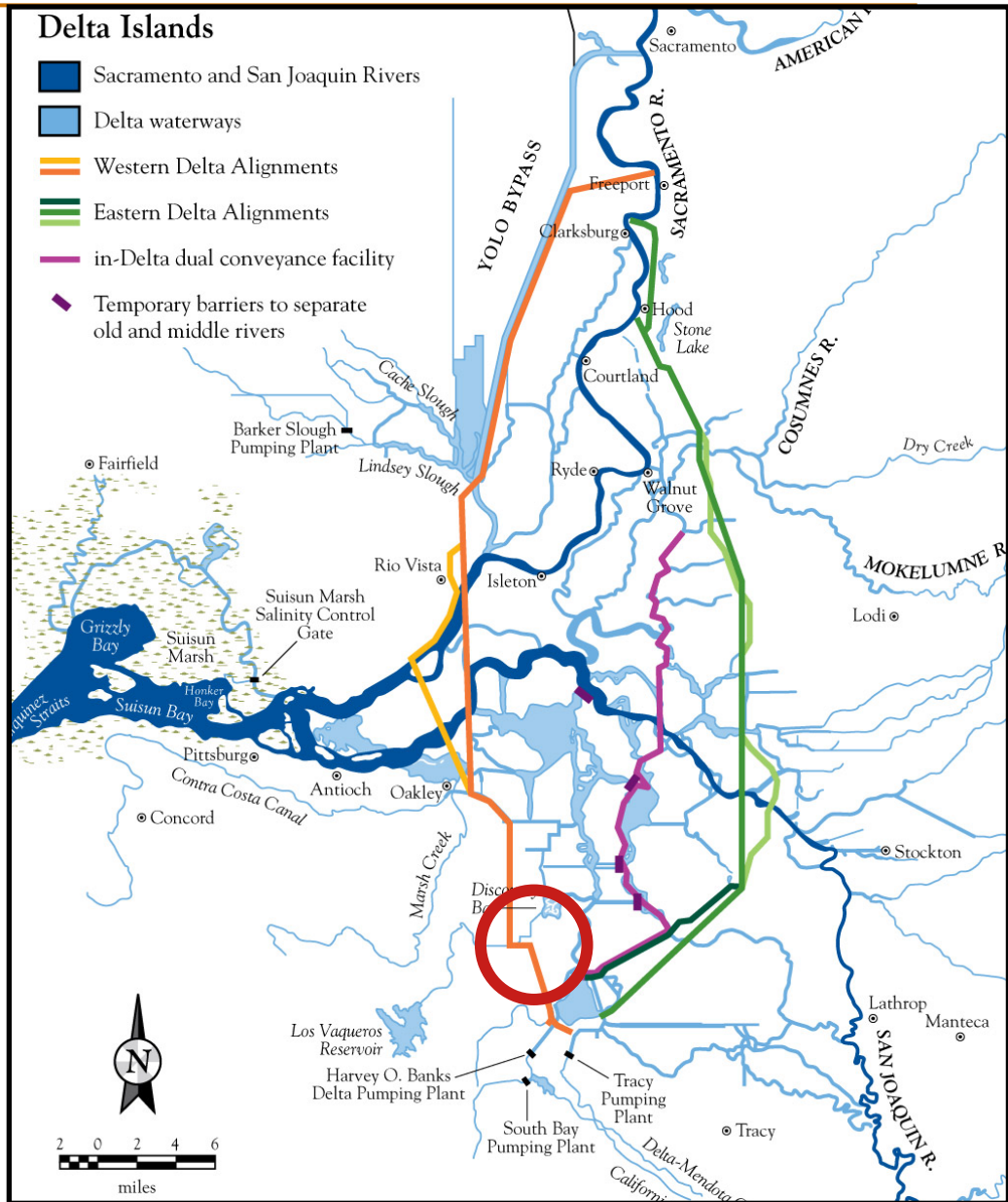


Fish Population Viability Estimates

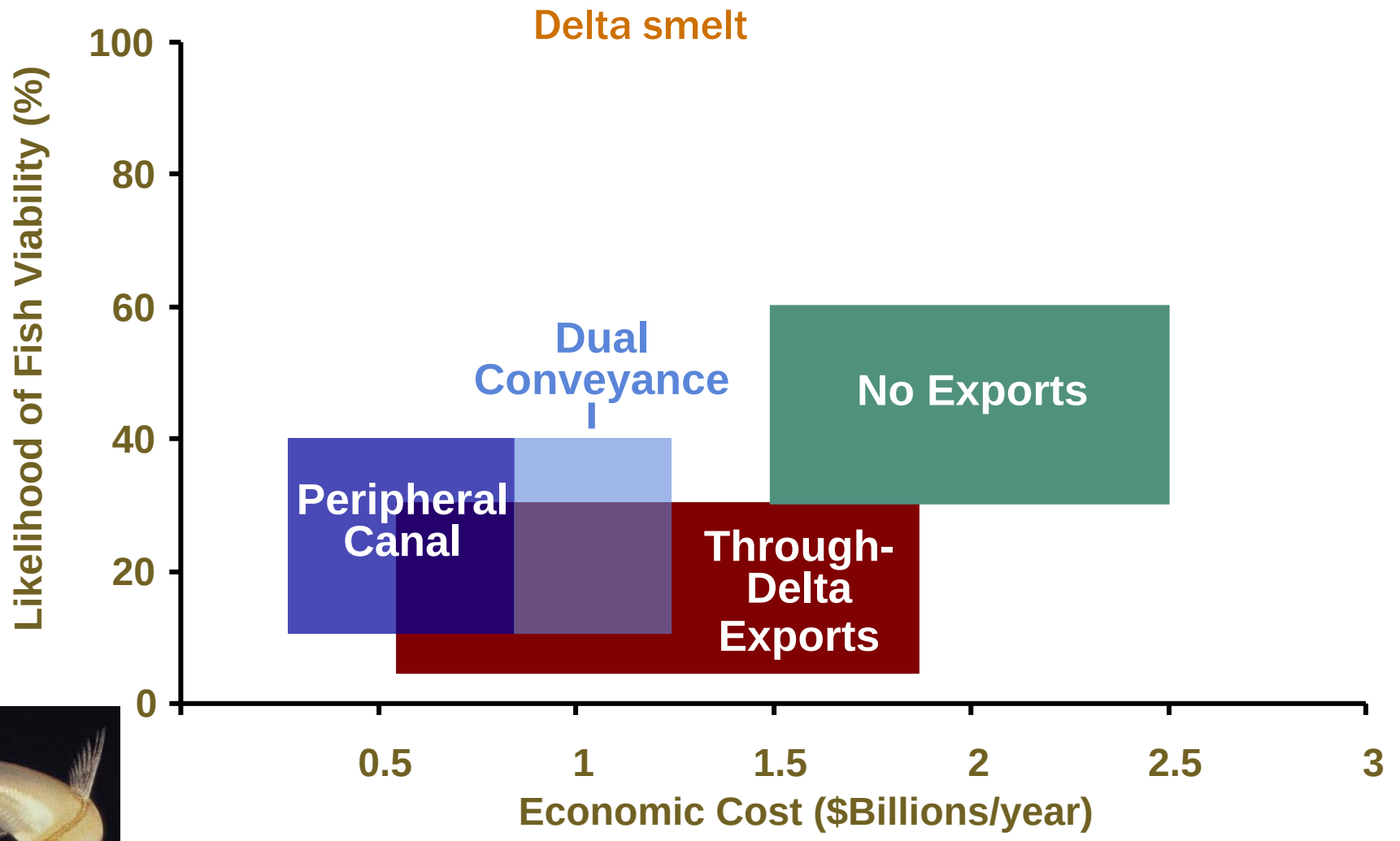


Long-Term Water Export Alternatives

- Current Strategy: through the Delta
- Peripheral Canal: around the Delta
- Dual Conveyance: both through and around the Delta
- No Exports: use other water sources and use less



Likely performance of each long-term water export strategy



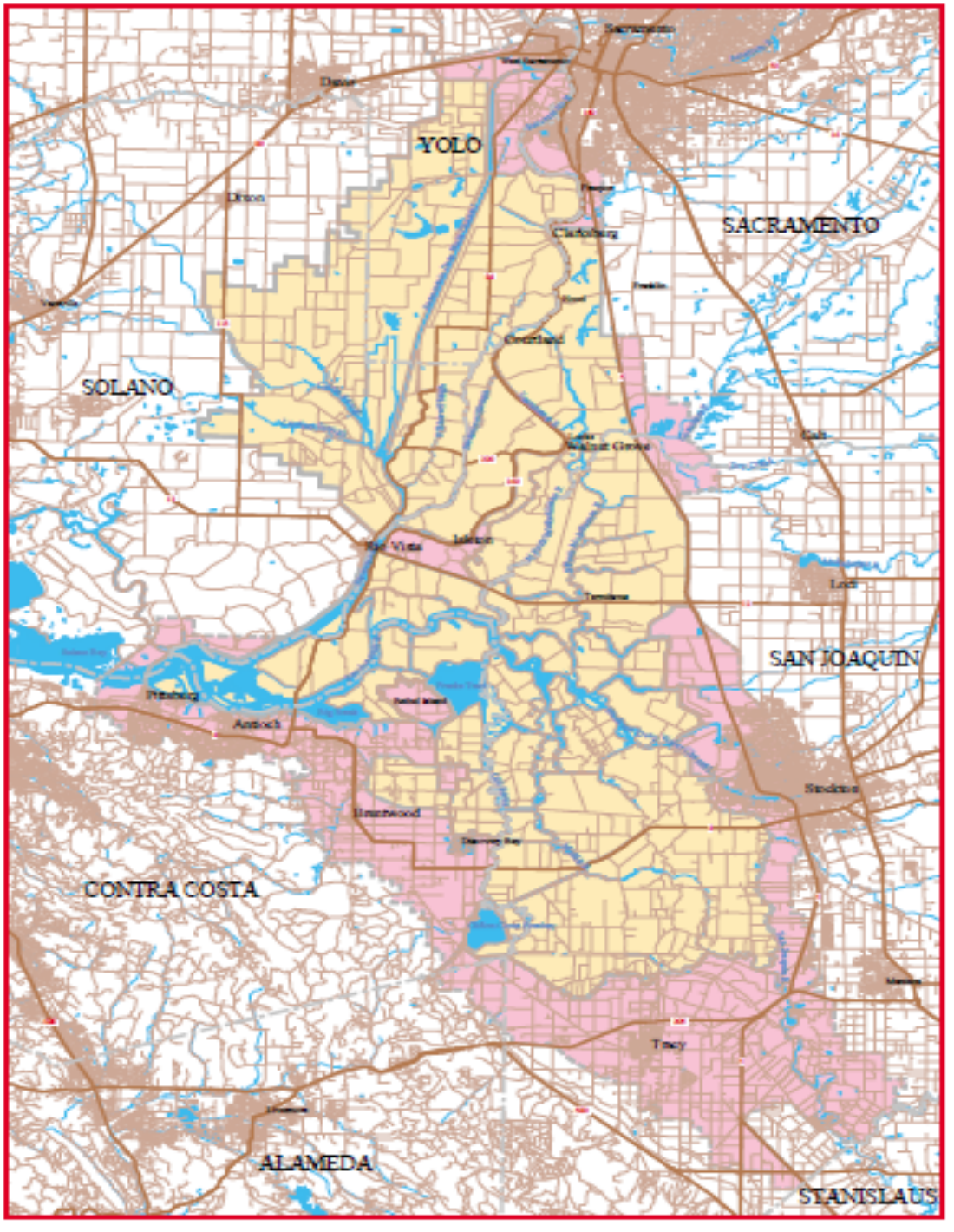
The Delta: A Legal History

- 1850/1861: Swamp Land Act
- 1933: California Water Plan
- 1959: State Water Project – Delta Protection
- 1978: SWRCB Water Quality Control Plan
- 1982: Peripheral Canal Referendum
- 1986: SWRCB v US – “Racanelli Decision”
- 1992 Delta Protection Act & CVPIA (federal)
- 1994: Bay-Delta Accord
- 2000: CALFED Bay-Delta Program ROD
- 2005: ESA Biological Opinions
- 2007: Judge Wanger ESA Decision

The Delta: What's Changed?

- 2004: Jones Tract Levee Failure
- 2005: Reviewing Delta Programs
  - CALFED Finance Plan & Budget Cuts
  - Governance, Budget & Policy Reviews
  - Ecosystem Crisis/Pelagic Organism Decline
  - Hurricane Katrina – Levee Failure Risk
- 2006: Changing Course
  - California Bay-Delta Authority – Zero Budget
  - Delta Vision – SB 1574 & Executive Order
  - Delta Levee Program/DRMS
  - Delta Land-Use Decisions
- 2007-08: Creating Delta Vision & Strategic Plan

Legal Delta and Zones



Source: Department of Water Resources 1995

Delta Protection Commission

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