

# Policy and Regulatory Challenges for the Delta of the Future

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# Our Focus

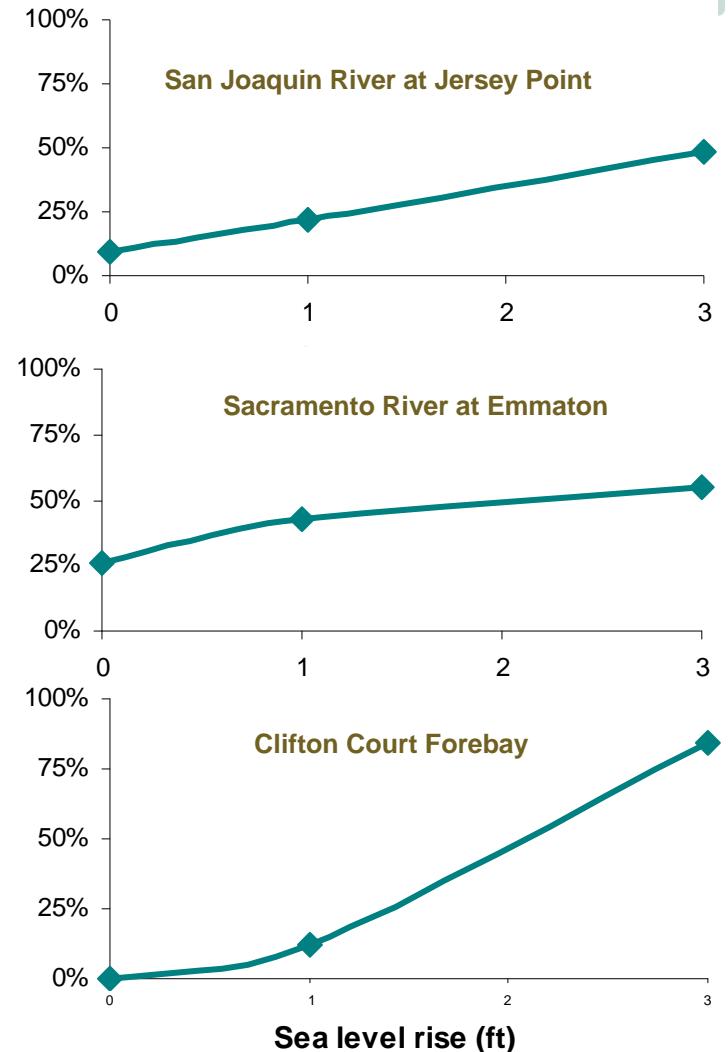
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- Regulating water quality
- Anticipating levee failures
- Including upstream diverters
- Protecting endangered species
- Governance & finance for a peripheral canal
- Conclusions



# Water quality management and the Clean Water Act

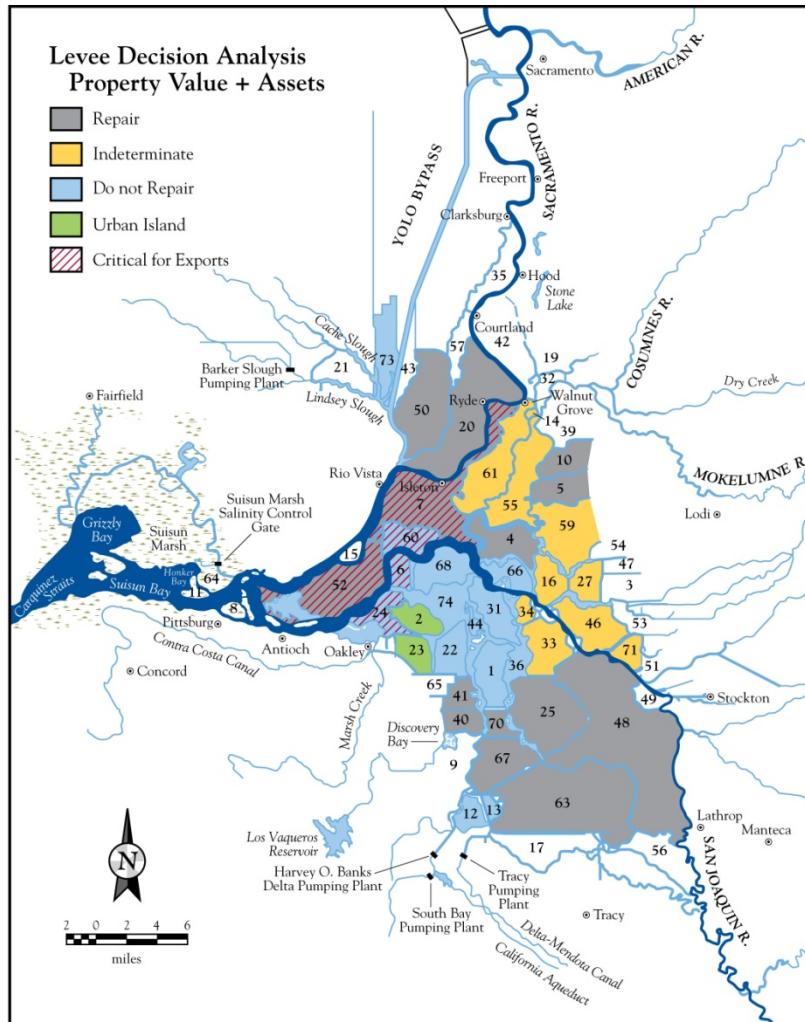
- **Biology:** greater variability better for desirable species
- **Hydrodynamics:** future Delta farming compromised by sea level rise, weak levees
- **Legal/regulatory:** can CWA enforcement accommodate greater variability sooner?
  - Experimental islands



Days exceeding irrigation standards (%)



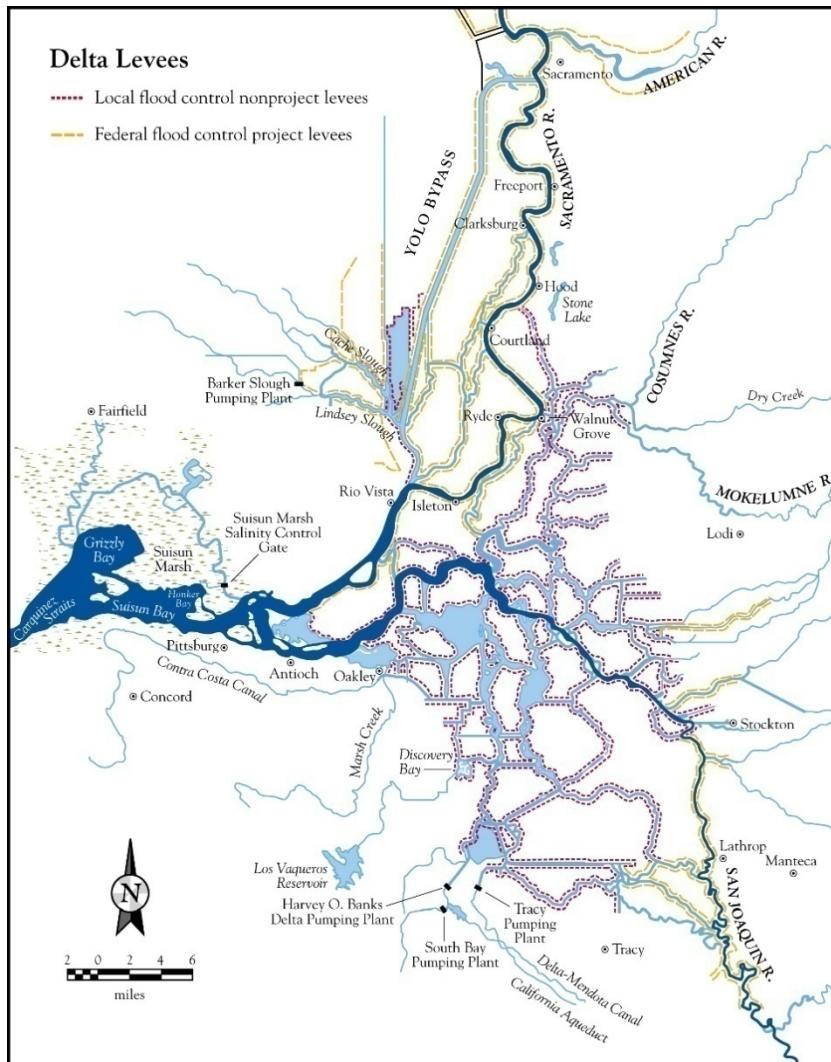
# Delta levees and liability



- Geophysics: high levee failure probabilities
- Economics: not all islands worth saving
- Hydrodynamics: not all islands needed for water quality, pre-flooding may make sense
- Legal/regulatory: liability with island failures



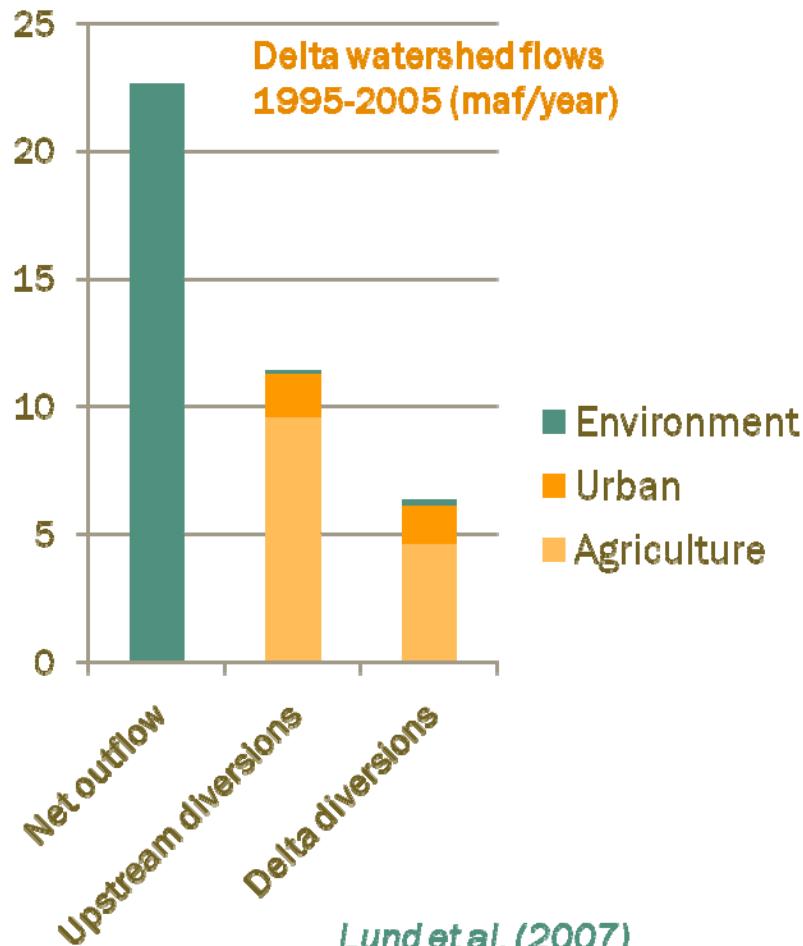
# Different issues for project and non-project levees



- For non-project levees:
  - Private owners unlikely to pay
  - State exposure high, especially for pre-flooding
- For project levees:
  - State must repair unless USACE agrees
- Need to sort out legal issues *in advance*



# Upstream diverters and Delta outflows



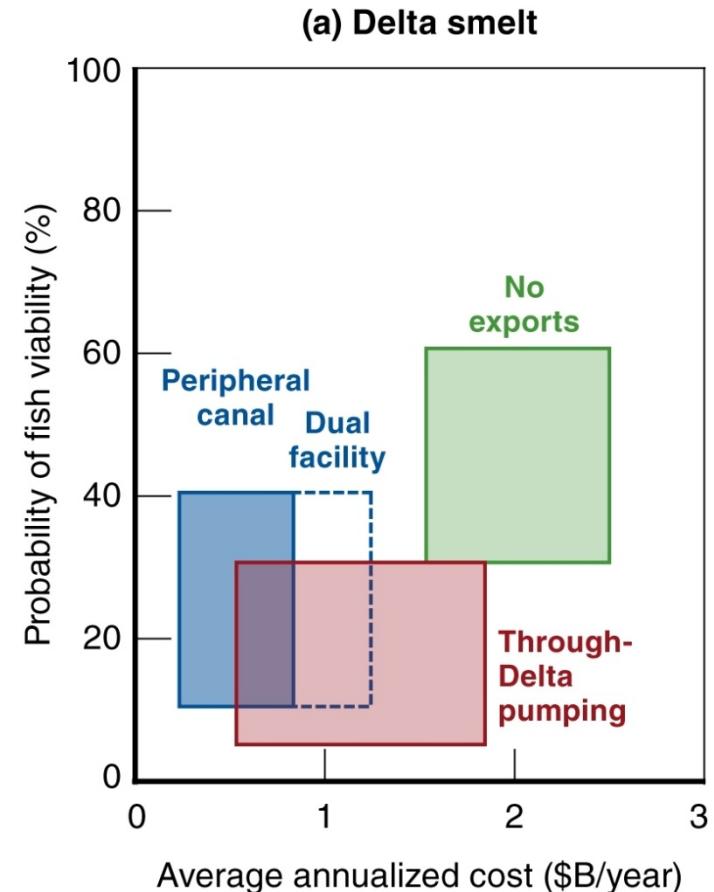
Lund et al. (2007)

- **Ecology:** Without pumps, key fish problem is outflows
- **Economics:** much more costly to only restrict exports
- **Legal/regulatory options:**
  - Priority basis
  - Proportional
  - Markets
  - But GW/SW links?

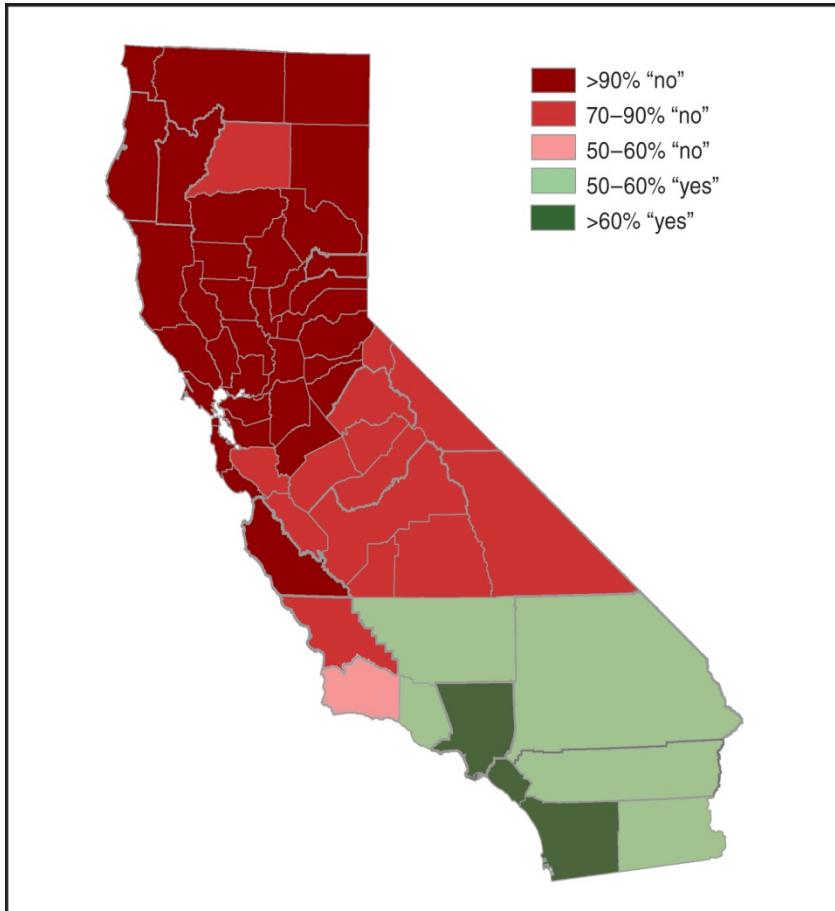


# Habitat conservation plans and the Endangered Species Act

- **Biology:** fish prospects best with no exports, but still high risks of species loss
- **Legal/regulatory:**
  - Hard to disentangle exports from other harmful factors
  - HCPs allow multi-species focus, but ESA risks shutting down projects with single species loss



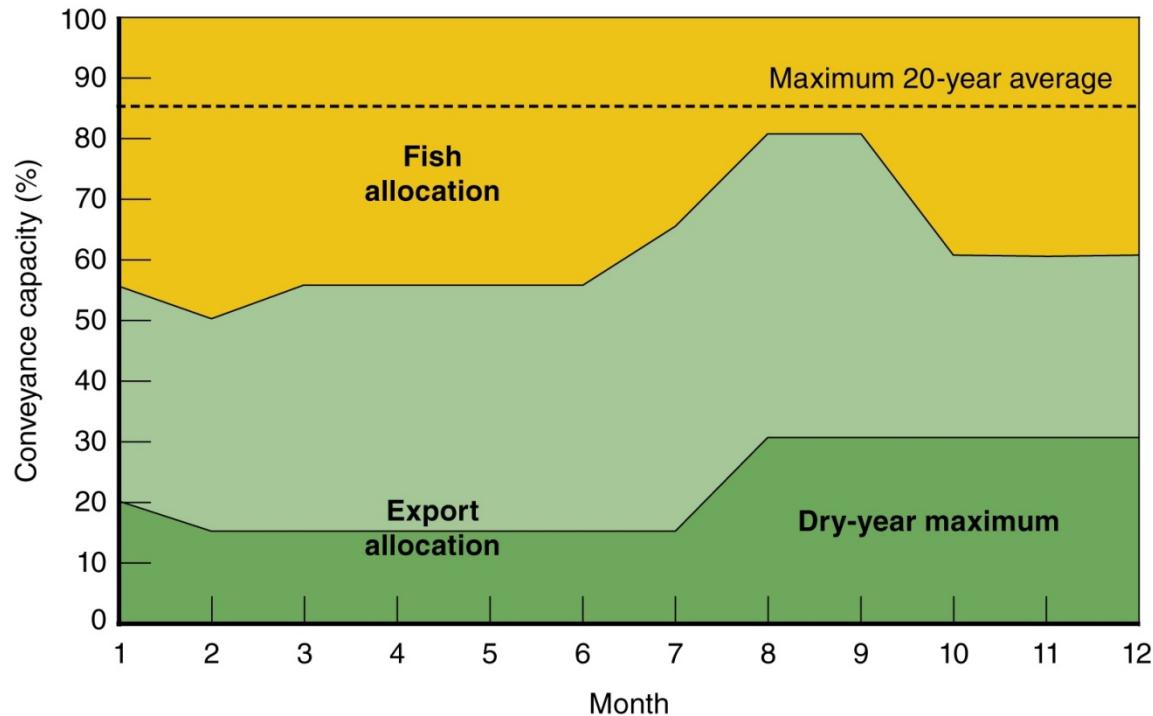
# Peripheral canal will require safeguards



June 1982 vote on Prop 9

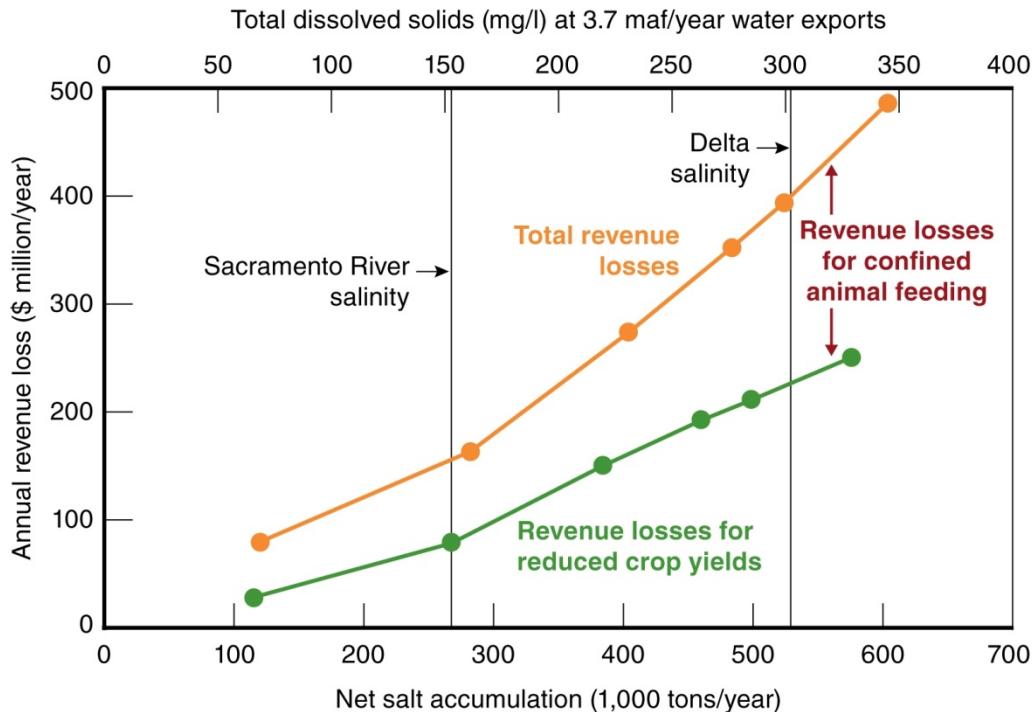
- Key concerns:
  - Environmental
  - Northern CA (Sac Valley)
- Hydrodynamics: larger canal better for fish
- Geophysics: dual conveyance temporary
- Economics:
  - Major cuts costly
  - Economies of scale

# Governance safeguards preferable to small canal



- Minimum Delta flows
- Capacity share for fish
  - Truckee River precedent
- Maximum long-term average exports

# Financing Principles



- Users pay for canal
- All diverters contribute to flows/ecofunds
  - Use water quality windfall
- Public funds:
  - Ecosystem
  - Delta landowners?



# Policy Needs for a Delta Solution

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- Address impending regulatory issues:
  - New Delta water quality control plan (CWA)
  - Species regulation conflicts (NCCCP/HCP vs CESA/ESA)
- Develop a levee policy
  - Mitigation: flooded and neighboring islands
  - Pre-flooding policy
  - USACE coordination
- Develop governance & finance rules for canal
  - Minimum flows and environmental share

