San Francisco Estuary Pilot Study

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San Francisco Estuary Institute

San Francisco Bay Pilot

1. Pilot overview & inventory

   Katie Harrold, SFEI

2. Suspended-sediment flux study

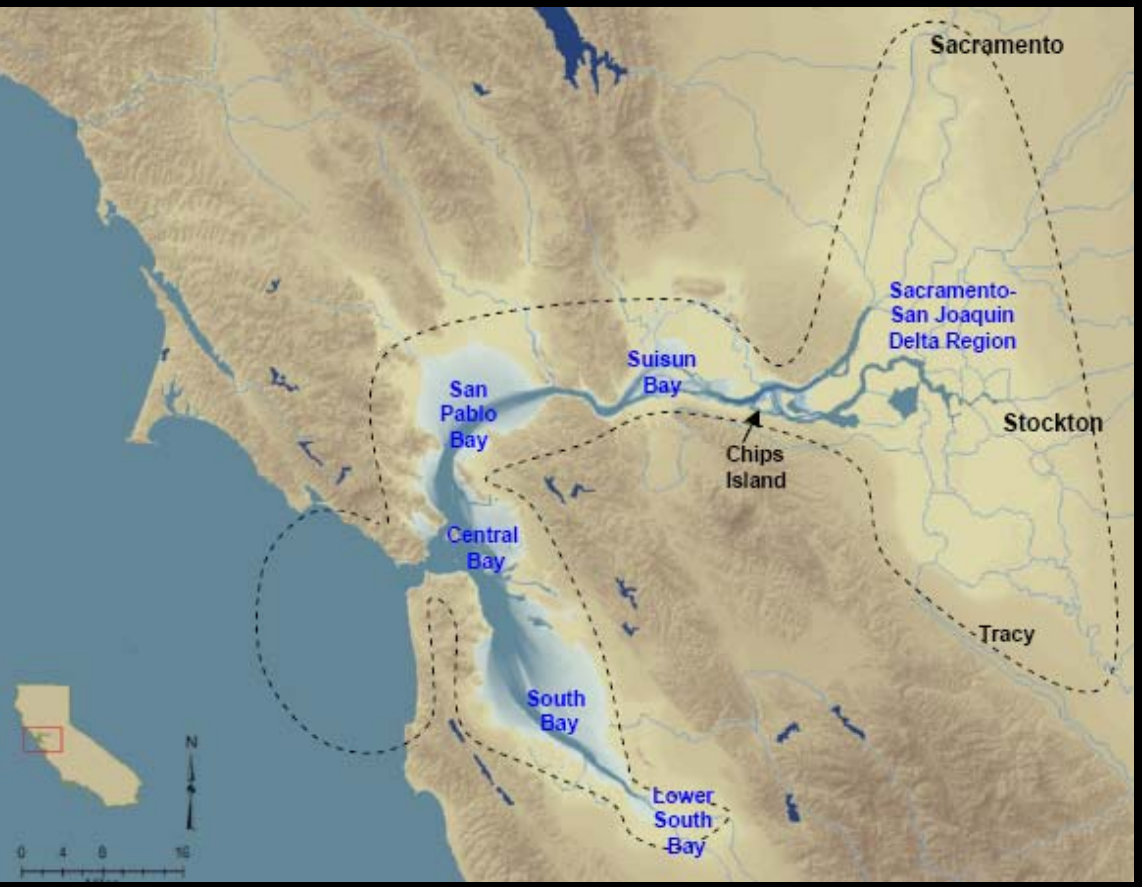
   David Schoellhamer, USGS

3. Nutrient study

   Pilot goals, needs, & next steps

   Katie Harrold, SFEI

Study Area – San Francisco Bay



- Largest w. coast estuary
- Watershed >40% CA
- Pop. ~11 million
- 47 monitoring programs/projects

San Francisco Estuary Institute

- Non-profit
- 50 research scientists
- Funding ~50% RMP & remaining from state & counties
- SFEI administers the RMP

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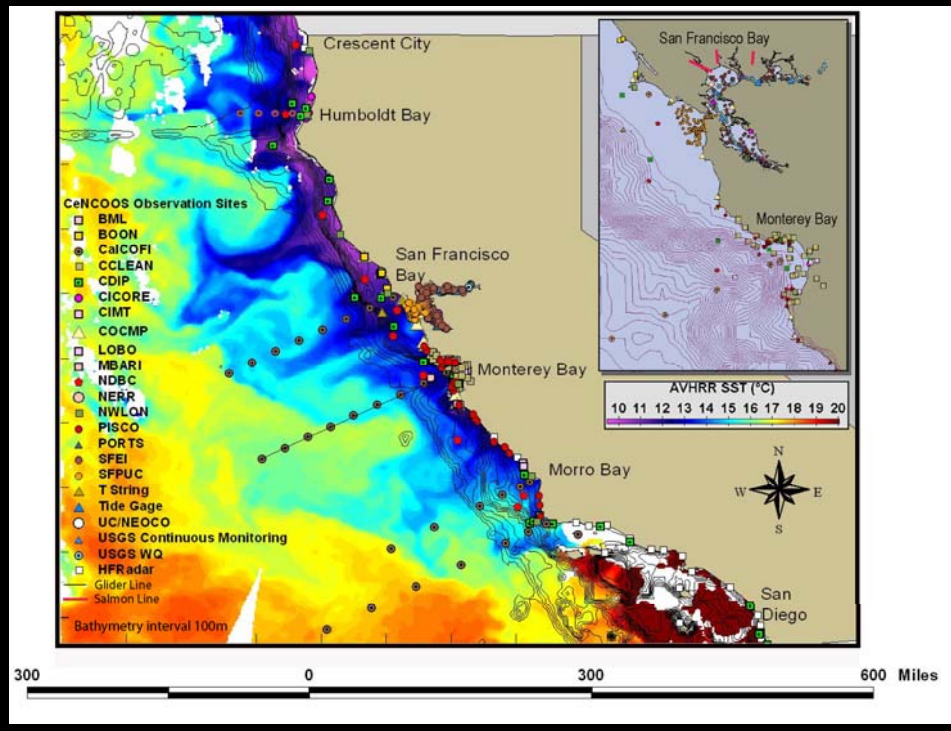
- [We] provide a holistic integration of information from many disciplines that supports management activities or demonstrates the potential implications of different management scenarios to environmental management agencies and other stakeholders.

Stakeholders

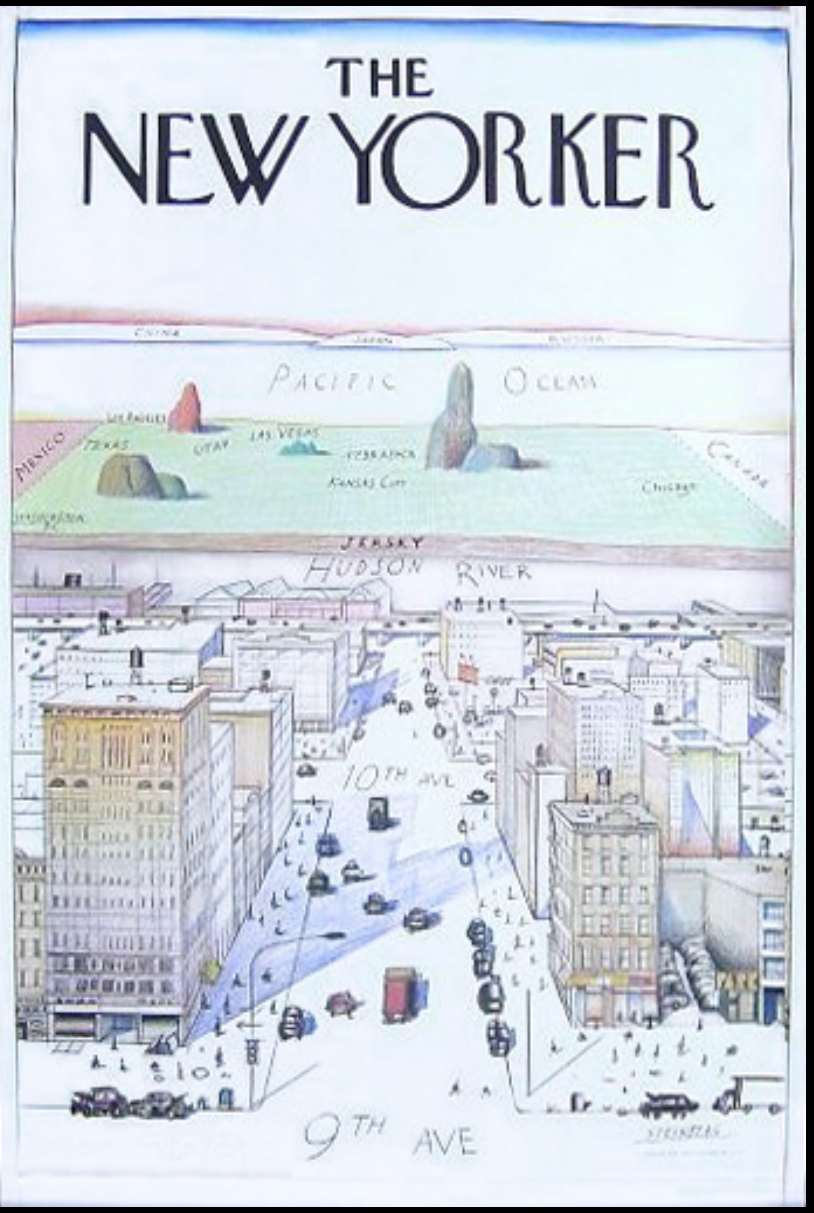
- 47 monitoring programs/projects & 22 monitoring groups
  - CA Air Resources Board & Bay Area Air Quality Management District
  - CA Coop. Oceanic Fisheries Investigations
  - CA Dept. Fish & Game
  - CA Dept. Water Resources
  - East Bay Regional Parks
  - NOAA
  - Partnership for Interdisciplinary Studies of Coastal Oceans
  - Scripps
  - SFEI
  - SF Public Utilities Commission
  - UC Davis
  - US FWS
  - USGS
  - County and municipal beach monitoring programs
- Regulatory agencies:
  - US EPA
  - State & Regional Water Quality Control Boards

CeNCOOS

- Technical committee
- Remote sensing needs of coastal environments
- Scoping of Bay observation needs
- Models of Bay



Gap Analysis – What did we learn?



- West coast is different
  - Climate
  - Contaminants
  - Biology

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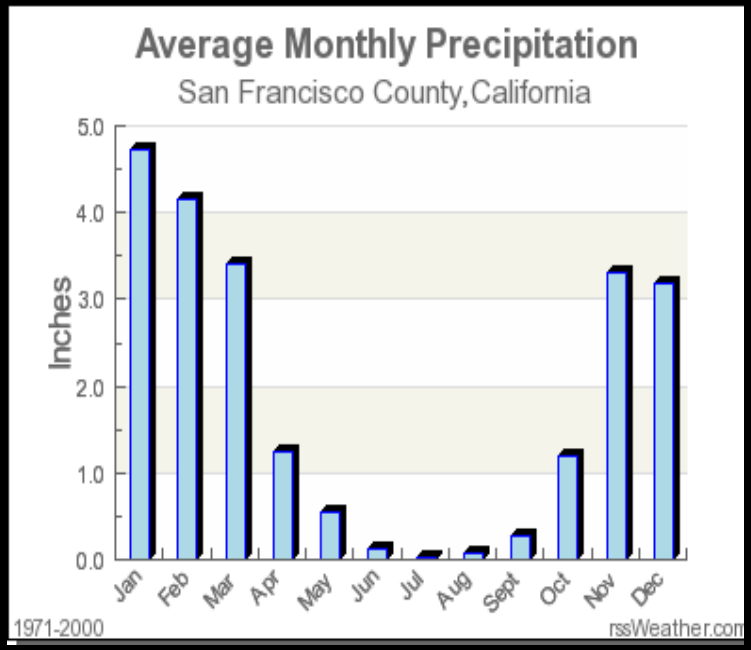

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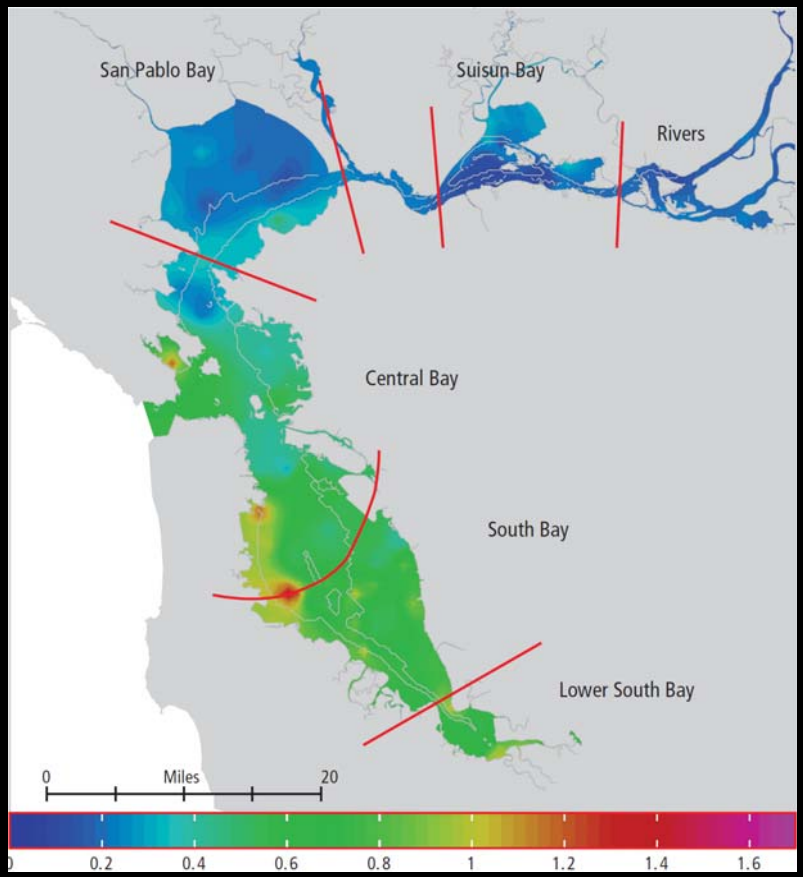

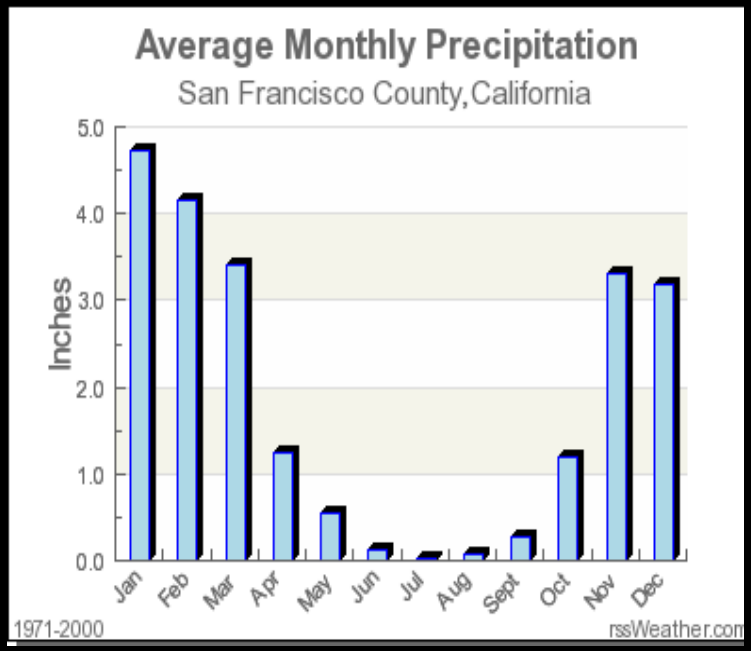

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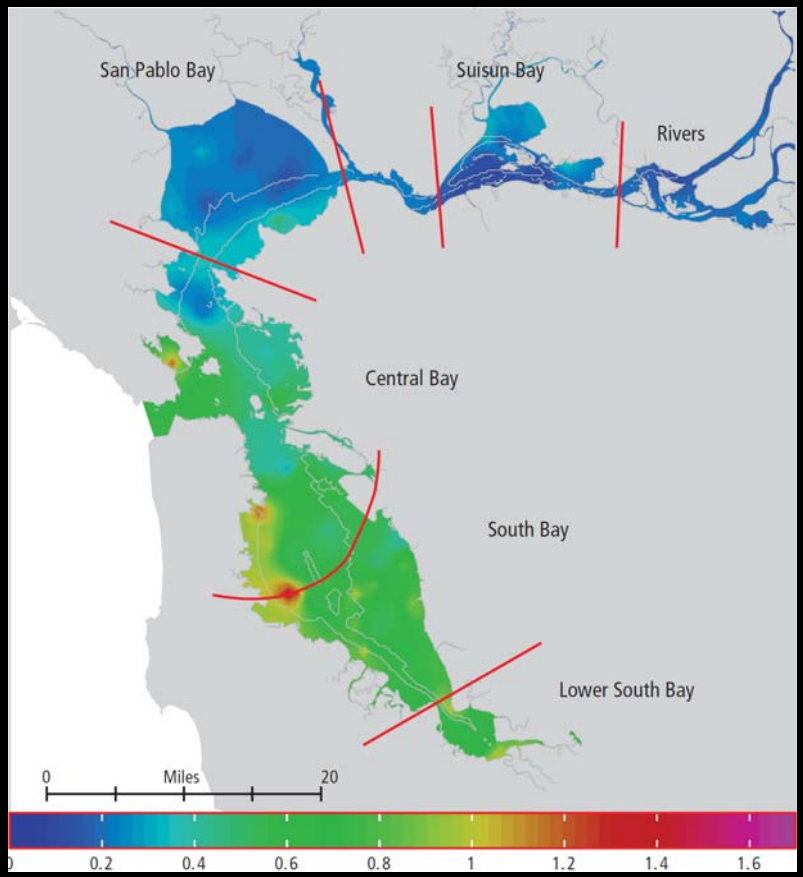

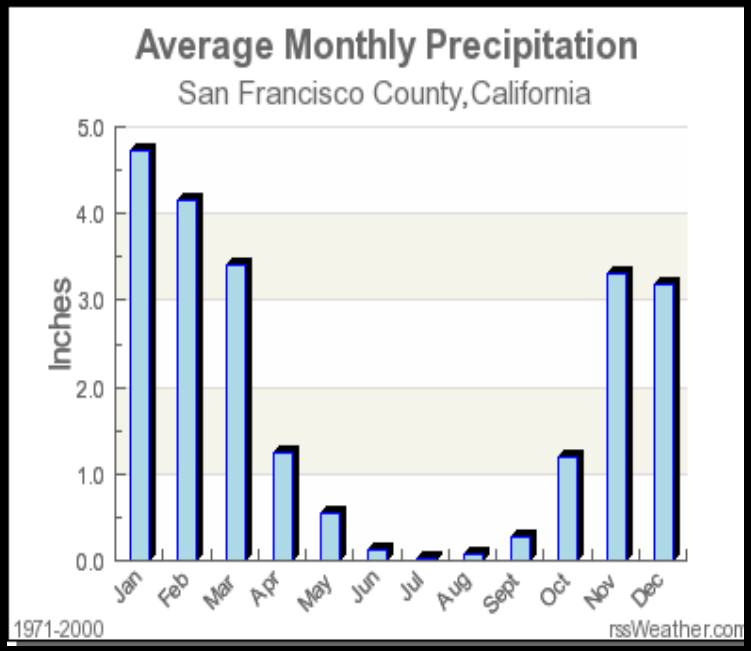

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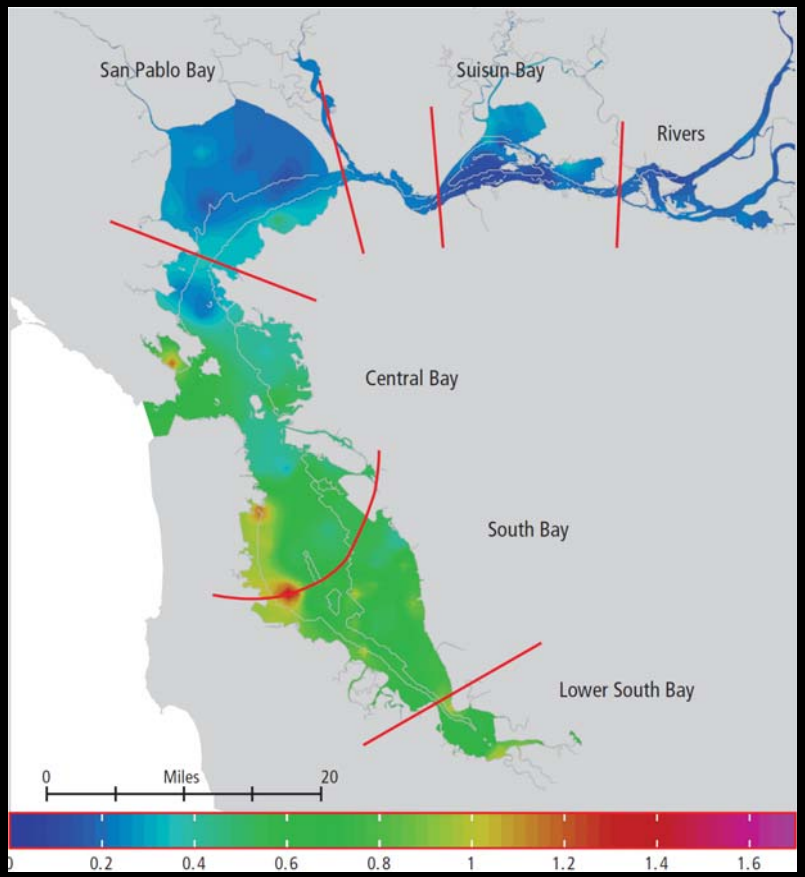
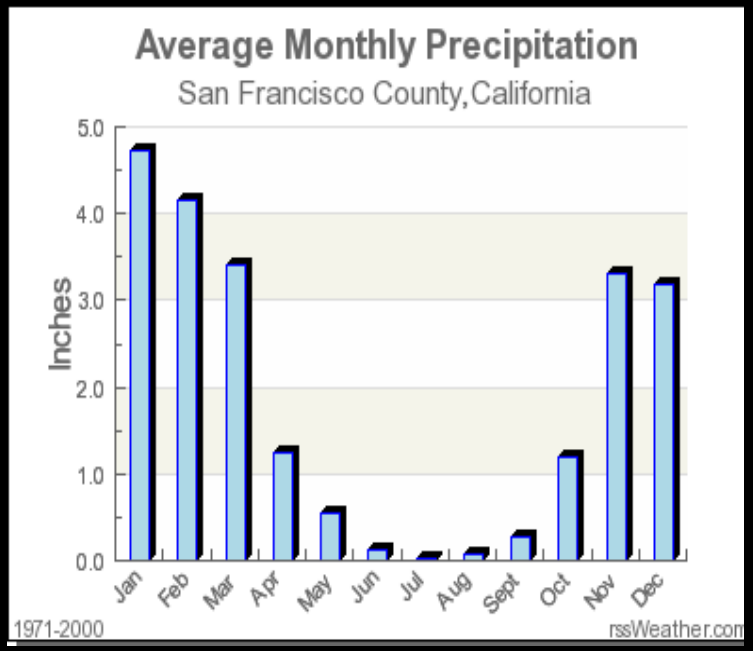


- West coast is different
- Affects how we monitor
- Common strategies
  - Wetland assessment
  - Data management



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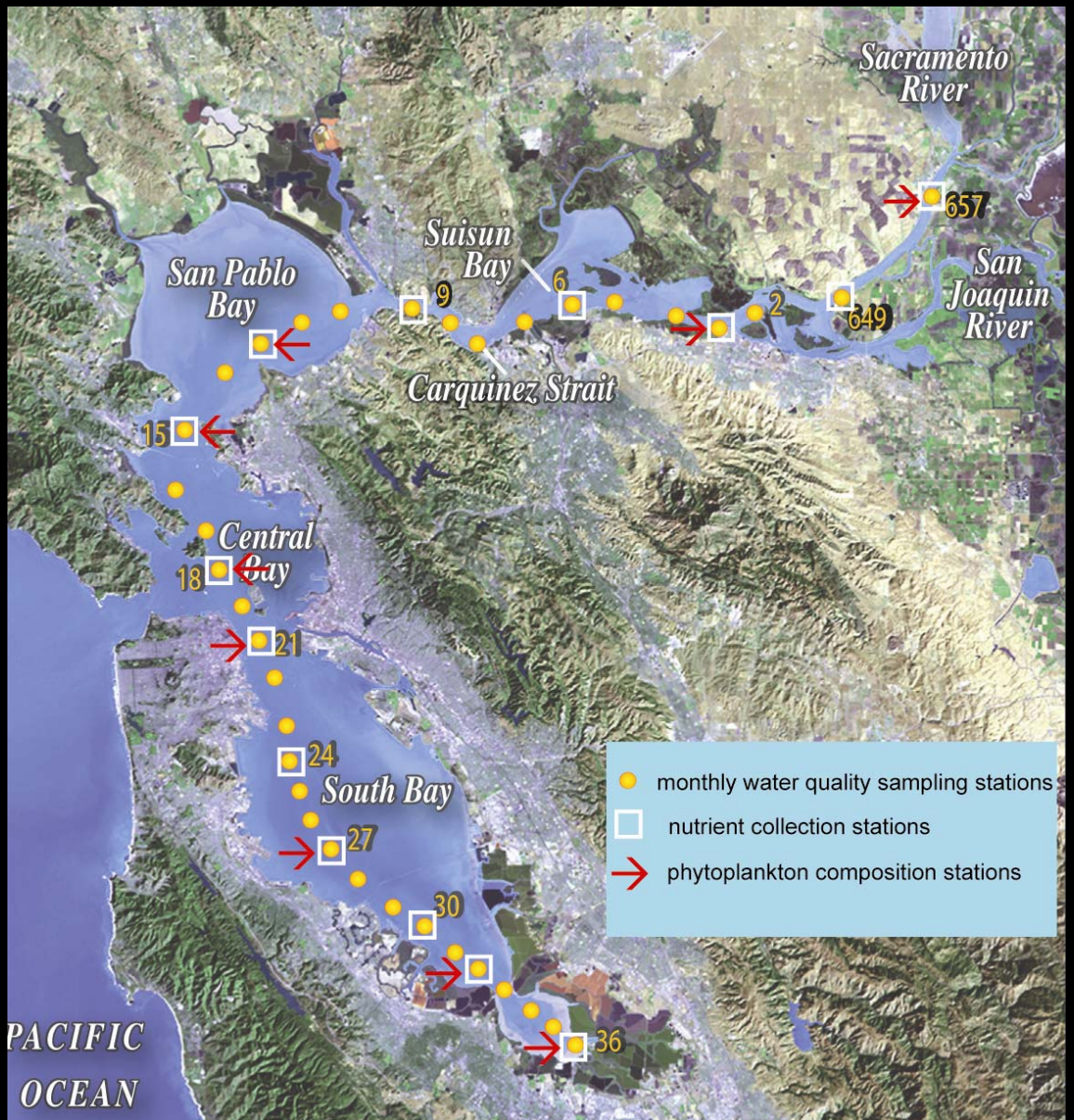
Current Progress

- Water Quality of SF Bay – USGS Dr. Cloern
- SF Bay Sediment group – USGS Dr. Schoellhamer

- Bay-Delta Program
- Delta RMP

Water Quality of SF Bay

Enhancement of SF Bay water quality research & monitoring

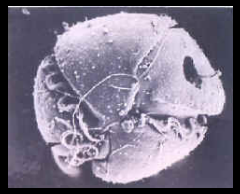


- Dissolved inorganic nutrients
- Phytoplankton community identification

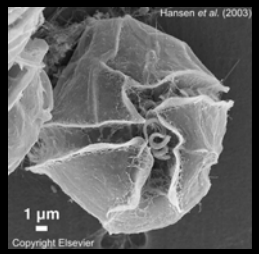
Water Quality of SF Bay

Pilot sampling of South Bay salt ponds

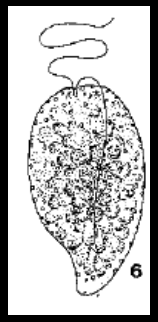
- Capacity of ponds to grow & retain toxic algae
- Assessing effect of ponds on water quality of SF Bay



Karenia mikimotoi



Alexandrium sp.



Chattonella marina

Water Quality of SF Bay

FY09

- Nutrient & phytoplankton comp.
- Pond sampling in Oct & Nov
- DOC & chlorophyll analyses
- Phytoplankton comp., nutrients, & phycotoxins results
- Analysis & interp. Pond data

Water Quality of SF Bay

Future Options

- Trends & patterns in coastal water quality time-series
- Salt ponds – toxic phytoplankton occurrence & habitat
- Add organic forms of C, N, & P and/or algal toxins
- Test sediments – toxin-producing phytoplankton resting stages & risk of HAB formation
- Analyze/synthesize 30-year record of water quality monitoring in SF Bay

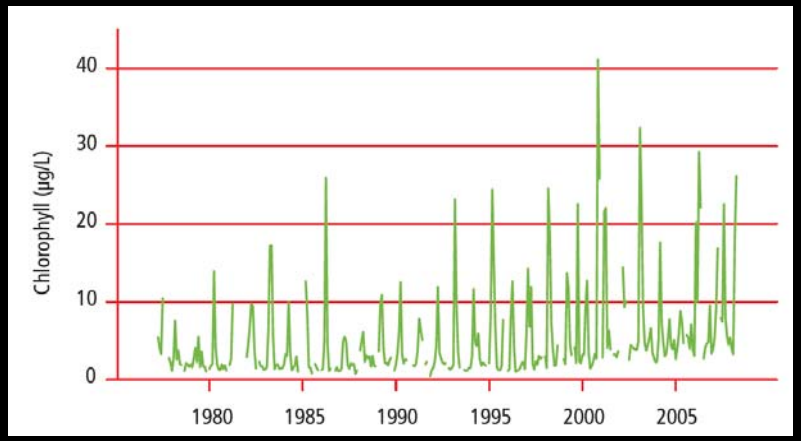
Issues

- Strategies for specific contaminants
  - Mercury
- Modeling
- Emerging contaminants
  - Next generation BFRs

Needs

- Additional biological monitoring
- Resources to assure data integration & access
- Mercury atmospheric monitoring
- Specimen banking
- Emerging contaminants

- Nutrient monitoring
- Phyto & zooplankton mo collection & analysis
- Harmful algae



Lessons Learned

- West coast is different
- SF Bay monitoring emphasizes Bay issues
  - Water flow
  - Mercury
  - Fish & bird contaminant monitoring
  - Wetlands restoration