

A photograph of the Golden Gate Bridge in San Francisco, California, taken from a low angle. The bridge's iconic orange-red towers and suspension cables are prominent on the left side, extending towards the right. The sky is filled with soft, colorful clouds in shades of pink, orange, and purple, suggesting a sunset or sunrise. A thick layer of white fog or low clouds obscures the lower part of the bridge and the water below, creating a dramatic and atmospheric scene. The overall mood is serene and majestic.

SFEI

**AQUATIC
SCIENCE
CENTER**

SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER

**Climate Change =
Opportunities for Leadership**

- 
- **Clean Water**
 - **Resilient Landscapes**
 - **Environmental Informatics**

Clean Water

A close-up photograph of water rippling on a sandy beach at sunset or sunrise. The water is a deep blue color, and the sand is a warm, golden-brown color. The text "Clean Water" is overlaid in a bold, blue font.

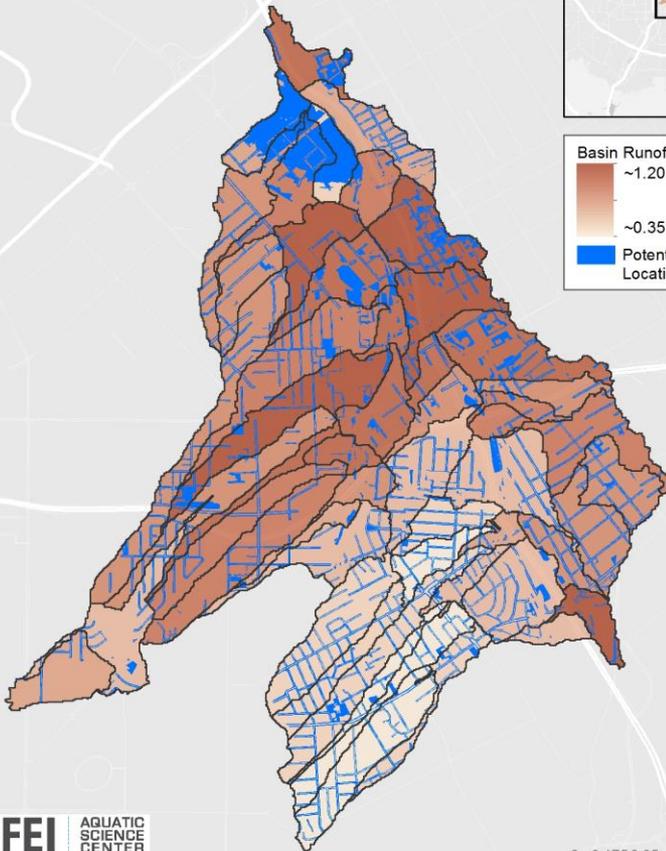


RMP UPDATE 2014

A Report of the Regional Monitoring Program for Water Quality in San Francisco Bay

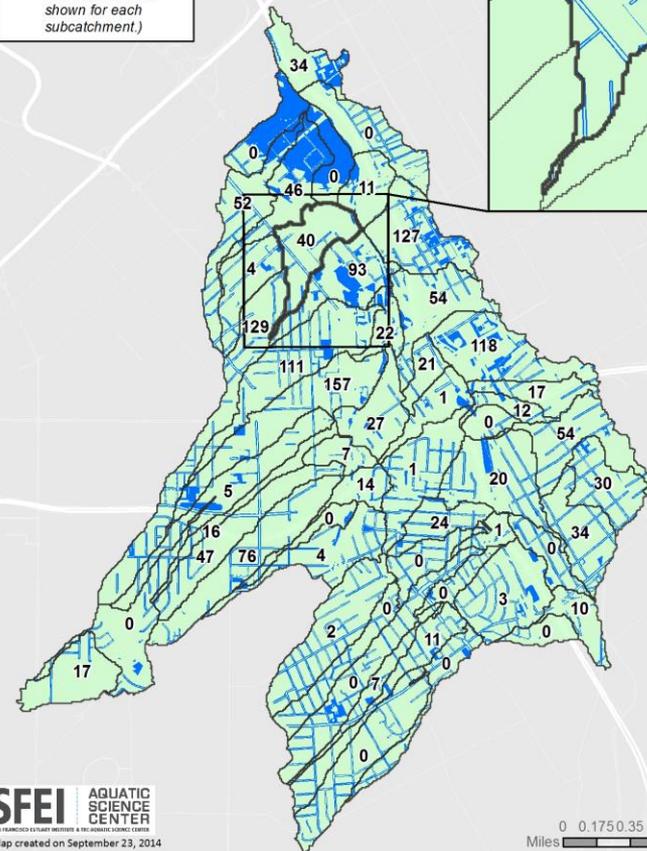
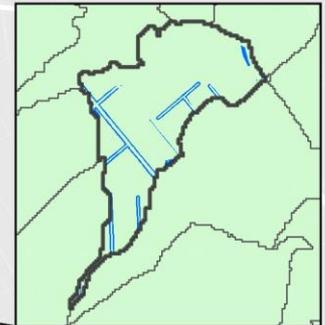
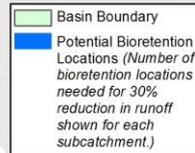
Green Plan-IT Tool Kit

San Jose Development Area
Runoff and Potential
Bioretention Locations



San Jose Development Area
Optimal Bioretention Scenario
for 30% Runoff Reduction

Subcatchment 50



Resilient Landscapes



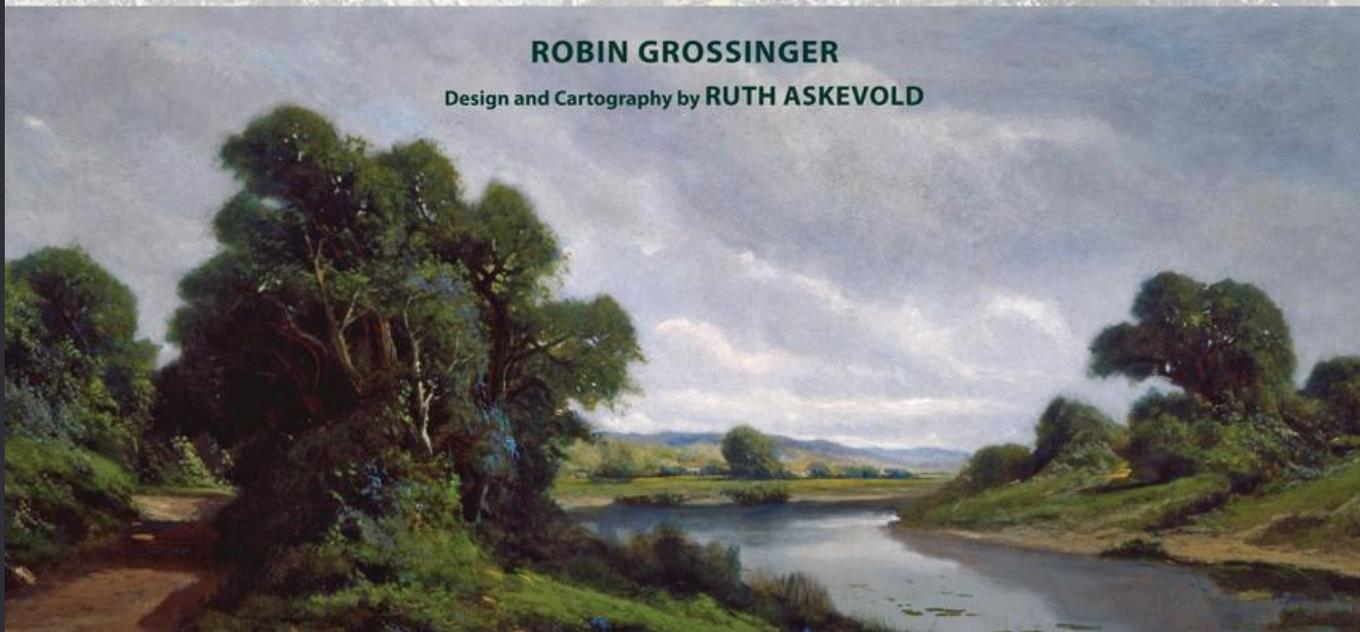


NAPA VALLEY HISTORICAL ECOLOGY ATLAS

EXPLORING A HIDDEN LANDSCAPE OF TRANSFORMATION AND RESILIENCE

ROBIN GROSSINGER

Design and Cartography by **RUTH ASKEVOLD**



Environmental Informatics





Where are the aquatic resources and how are they doing?

EcoAtlas

[About EcoAtlas](#) →

California EcoAtlas provides access to information for effective wetland management. The maps and tools can be used to create a complete picture of aquatic resources in the landscape by integrating stream and wetland maps, restoration information, and monitoring results with land use, transportation, and other information important to the state's wetlands.

- **Projects:** Restoration project maps, plans, contact information, and a library of project files.
- **Resource Extent:** Maps of aquatic resource extent and special habitats of interest.
- **Condition:** Assessment and monitoring data including relevant water quality and California Rapid Assessment Method (CRAM) data.



Statewide

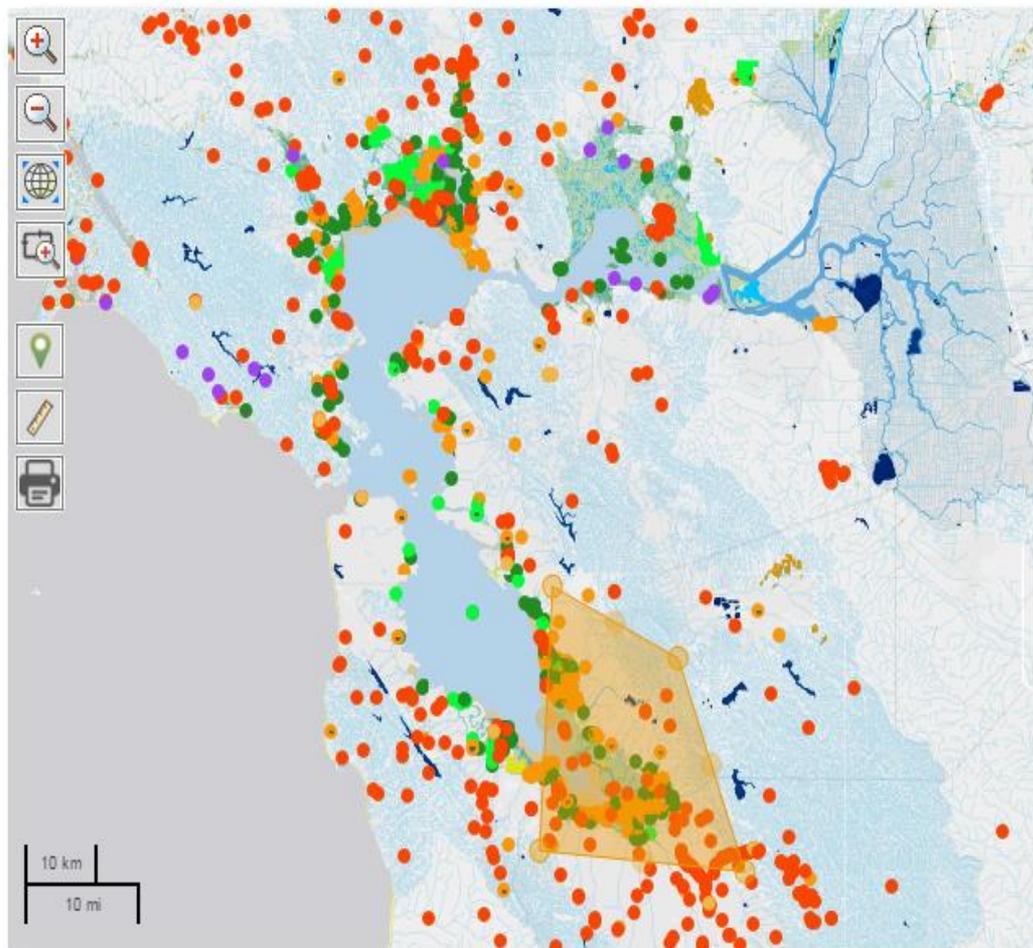
[Map](#)[Projects](#)[Summaries](#)[Ecoregions](#)[Water Board Regions](#)

- Klamath/North Coast**
- Bay/Delta**
- Central Coast**
- Modoc**
- South Coast**
- Sierra**
- Sacramento Valley**
- Mojave**
- San Joaquin Valley**
- Colorado Desert**

Statewide : **Map** | Projects | Summaries

Layers ▾ | Legends ▾ | Basemap ▾ | Overlays ▾

Tools



Landscape Profile

User Defined Region

Print Report

Total Profile Area: 180,389.5 acres or 281.9 miles²

+ Abundance and Diversity of Existing Aquatic Resources based on California Aquatic Resource Inventory (CARI)

+ Historical Aquatic Resources

+ Ecological Restoration based on Wetland Projects within Profile – Total Records: (47)

+ Aquatic Resource Condition based on California Rapid Assessment Method for Wetlands (CRAM) within Profile – Total Records: (50)

+ Human Population based on 2010 Census

+ Developed Land Cover by NLCD 2011 Category

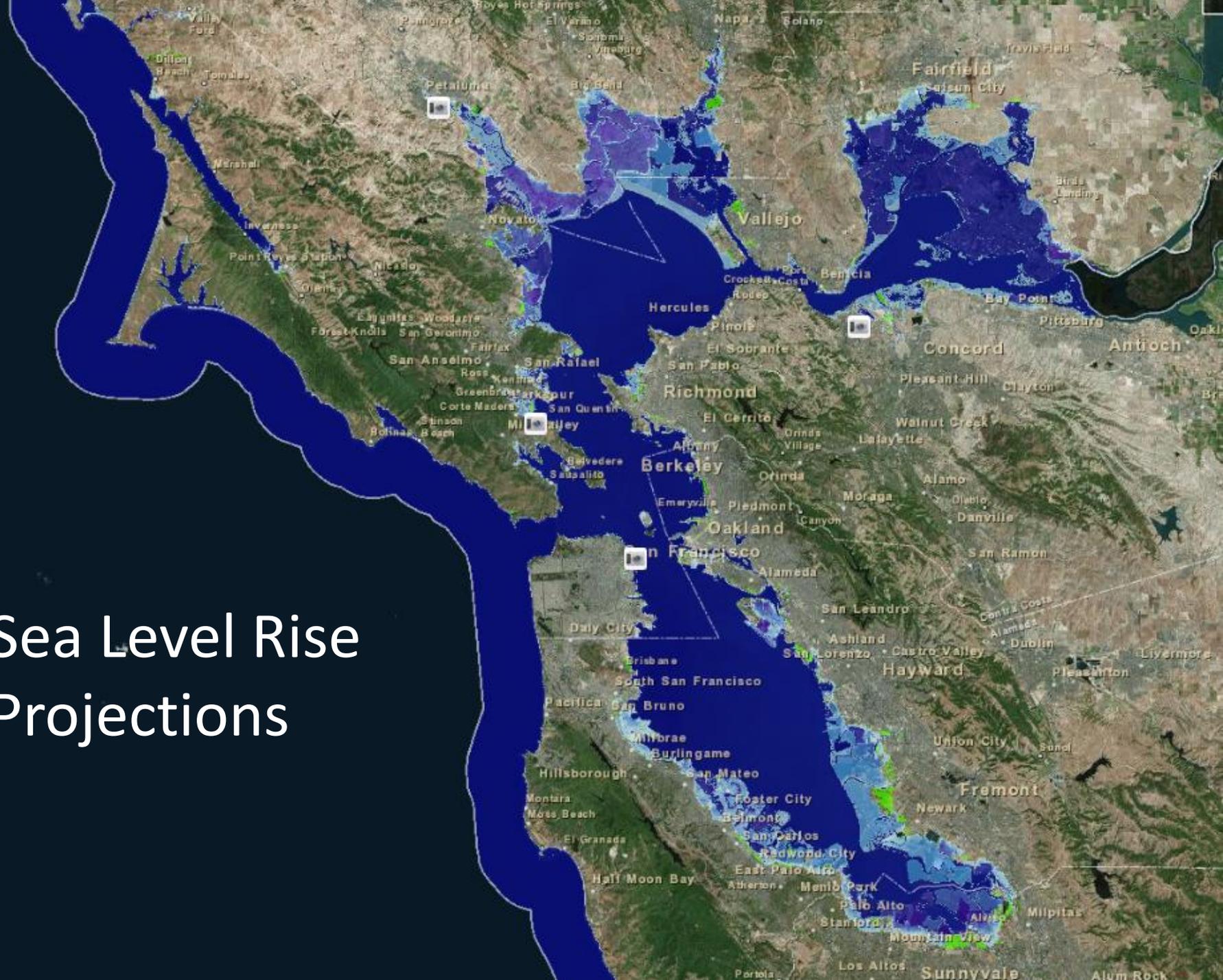
Resilient Silicon Valley



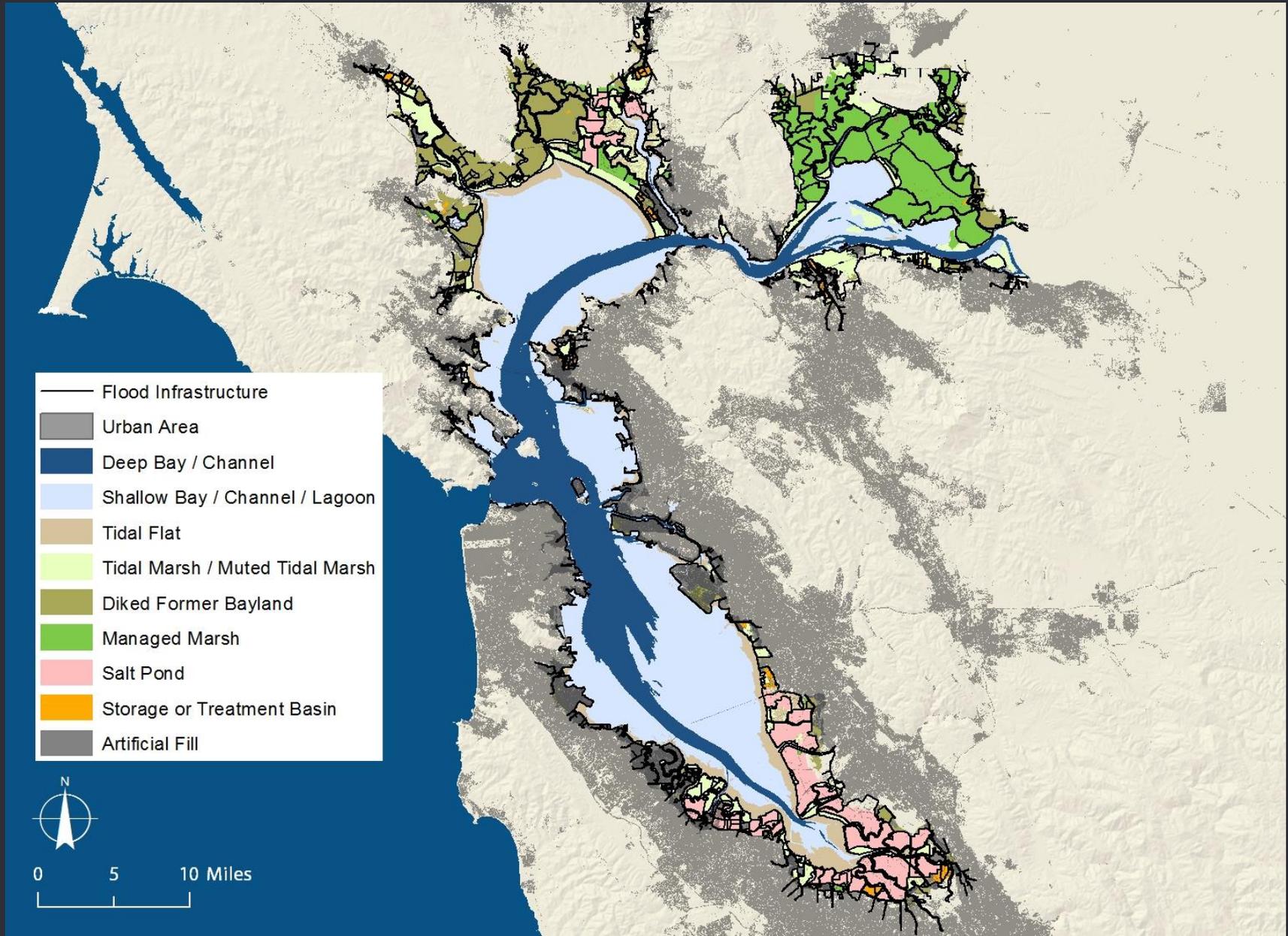


- **Drought/Water Supply**
- **Sea Level Rise**
- **Sediment Loss**
- **Extreme Weather**
- **Increased Flood Risk**

Sea Level Rise Projections



SF Bay – 200 Years of Change







Robert David Paulson
Administrator
Federal Emergency Management Agency

ROBERT DAVID PAULSON
ADMINISTRATOR
FEDERAL EMERGENCY MANAGEMENT AGENCY
DEPARTMENT OF HOMELAND SECURITY
MAY 14, 2002



Big Plans

Year-Long Learning
or Student Work

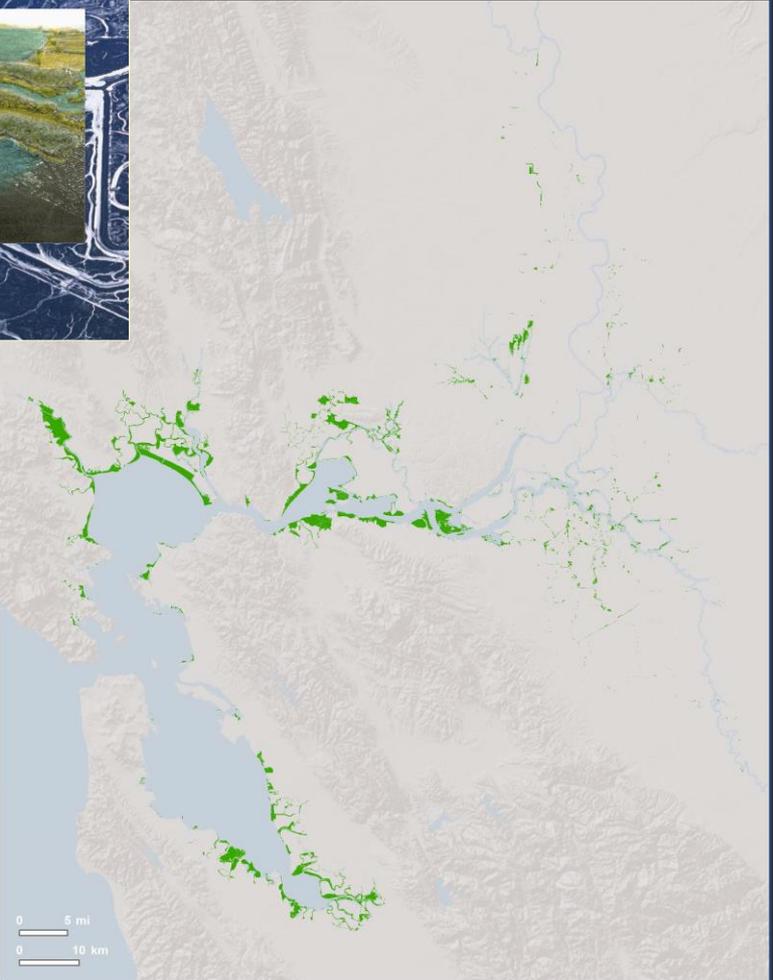
2011
2012

Baylands Ecosystem

Habitat Goals



A Report of Habitat Recommendations
Prepared by the San Francisco Bay Area
Wetlands Ecosystem Goals Project





RMP
2015

THE PULSE OF THE BAY



STATE OF THE ESTUARY



PROCESSES

HABITAT

WILDLIFE

PEOPLE



WATER

SAN FRANCISCO BAY & DELTA

Baylands Goals Update - 2015





- **Sea Level Rise Challenge**
- **Restore Processes not just Habitat Acreage**
- **2030 Deadline for Action**
- **Restore Complete Systems -Habitats & Processes**
- **Restore Natural Stream Connections**

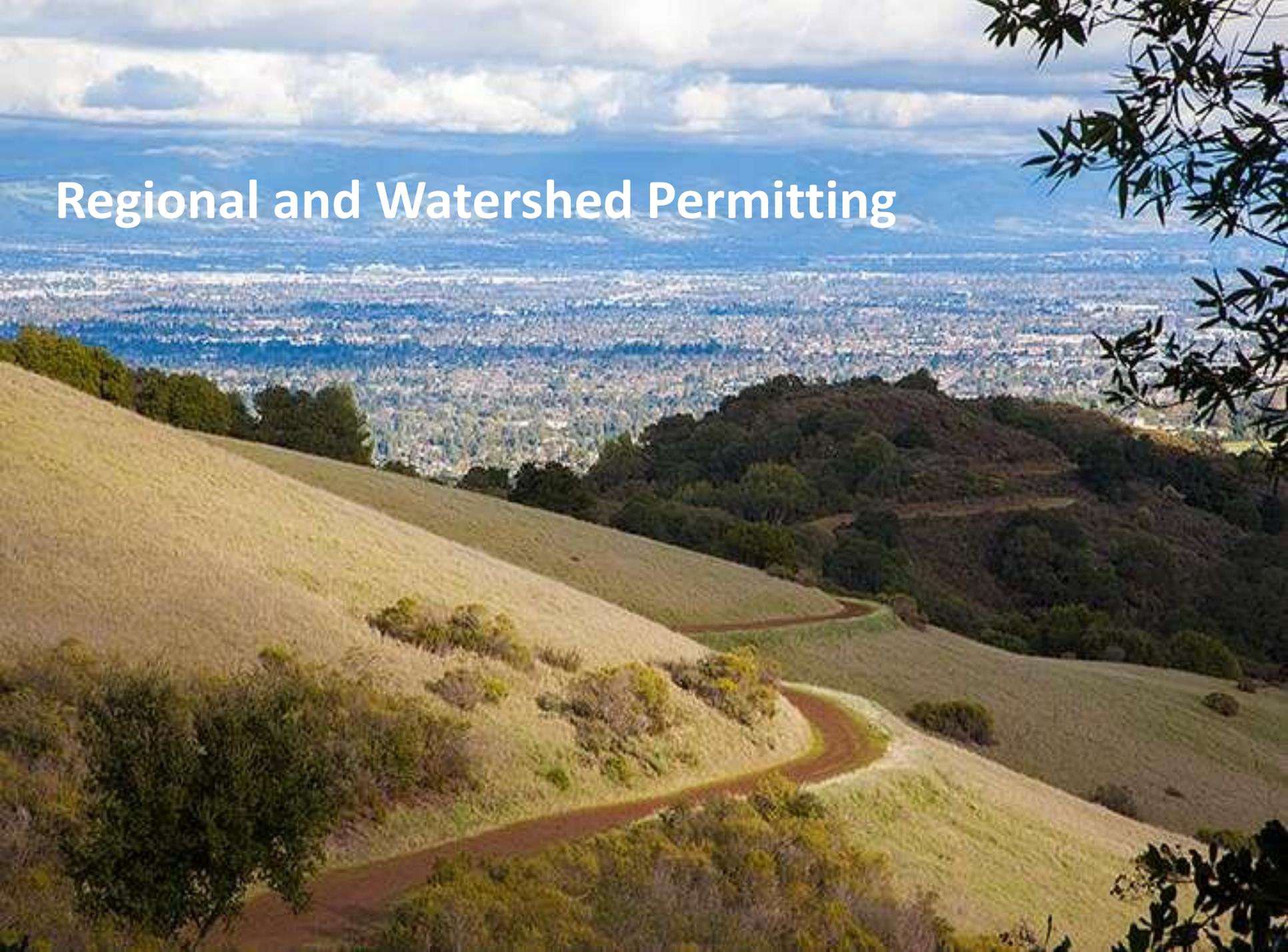


Cost of Failure



Rethink Water Quality & Sea Level Rise Policy

Regional and Watershed Permitting

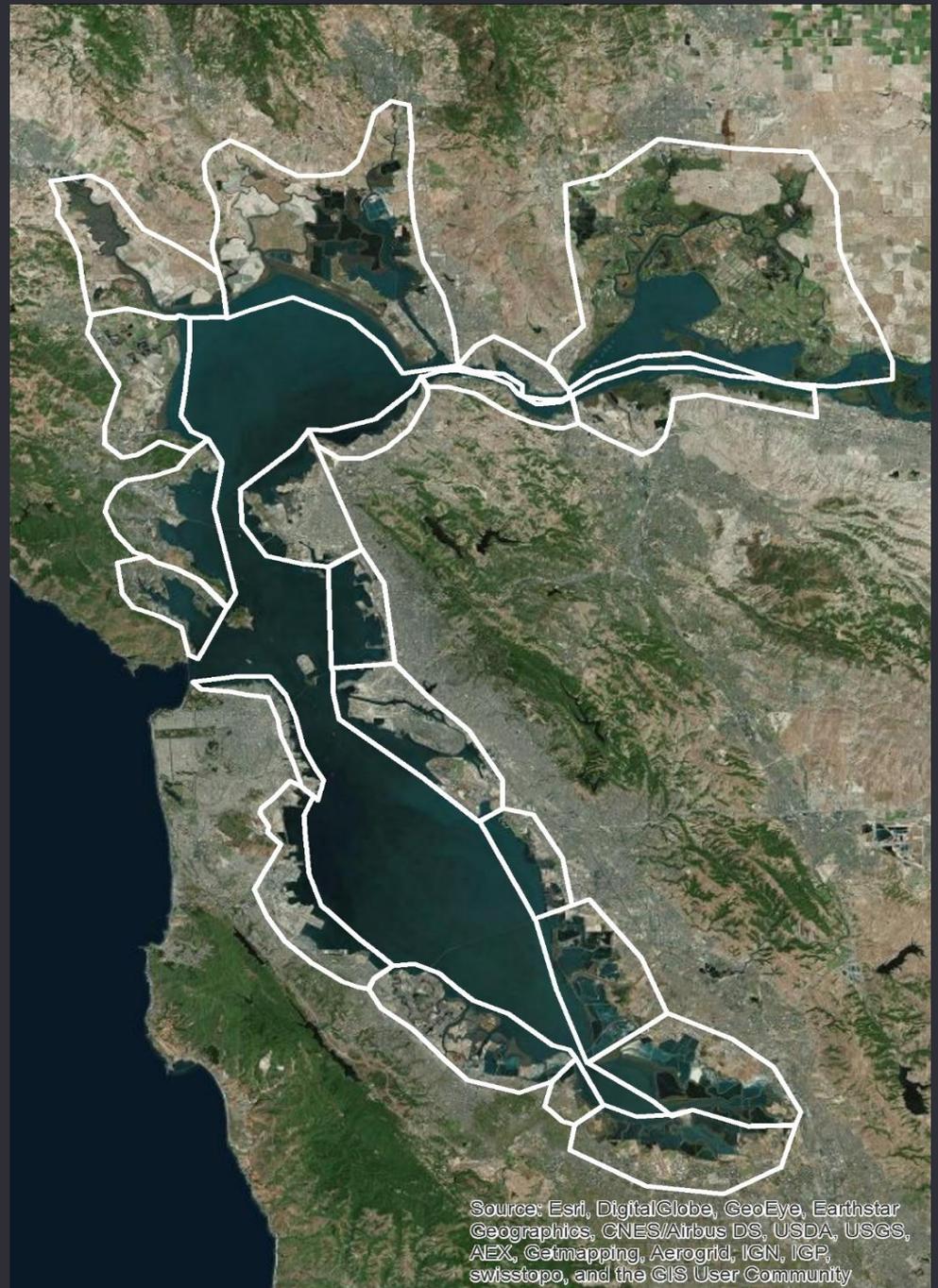


Flood Control 2.0



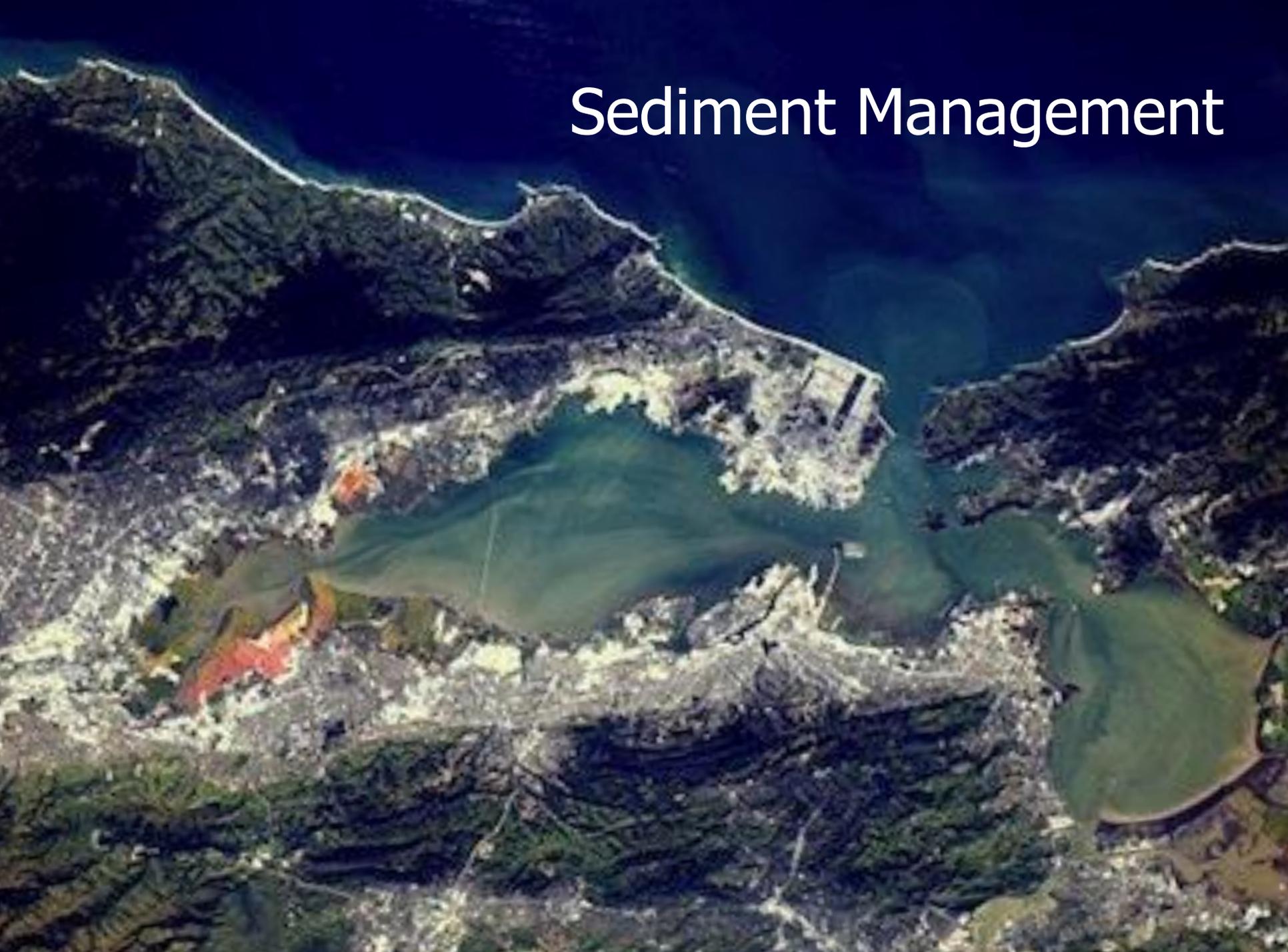
**Meet future flood control needs
AND restore ecosystem functions**

Operational Landscape Units



Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS,
AEX, Getmapping, Aerogrid, IGN, IGP,
swisstopo, and the GIS User Community

Sediment Management





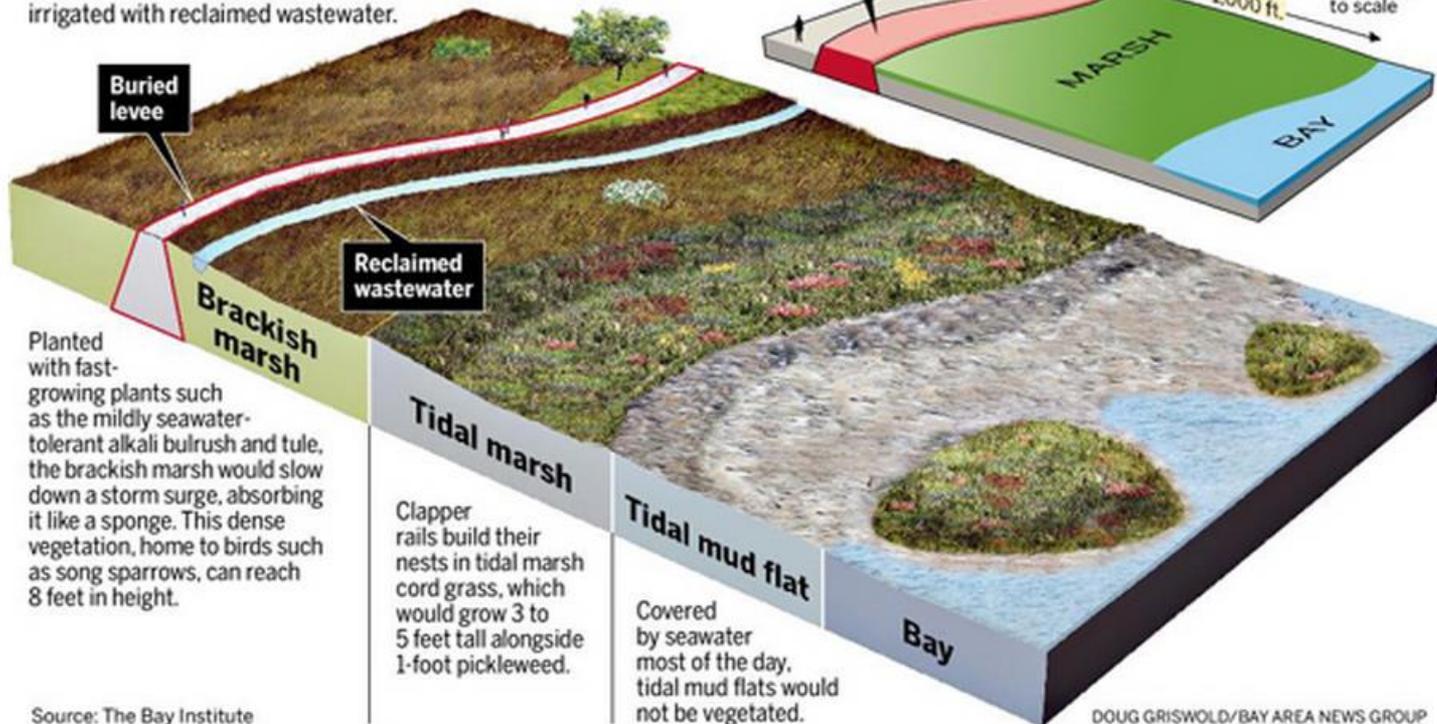
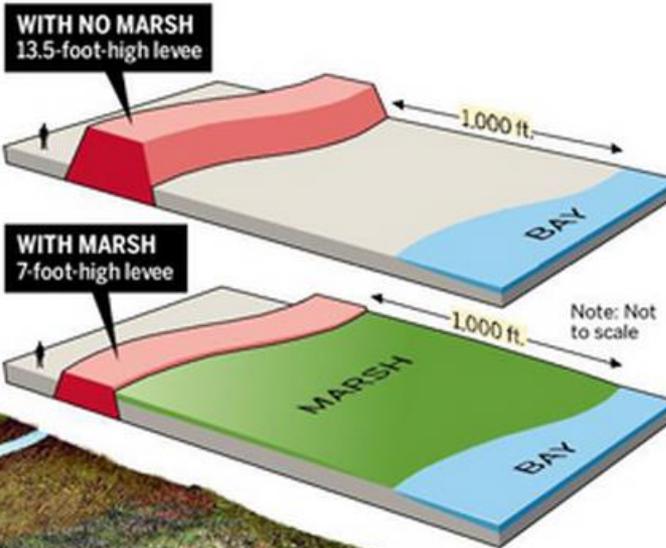
Dikes and Levee Policy

A new kind of levee

The Bay Institute, an environmental group, has proposed a number of "horizontal levees" for San Francisco Bay that blend a traditional earthen levee with restored tidal marshes. The marshes would be built up with sediment from local flood control channels. Marsh vegetation would be irrigated with reclaimed wastewater.

Marshes as barriers

Tidal marshes can slow down storm surges, meaning levees fronted by marshes can be built half as tall, and at half the cost, as traditional levees made of earth and clay.

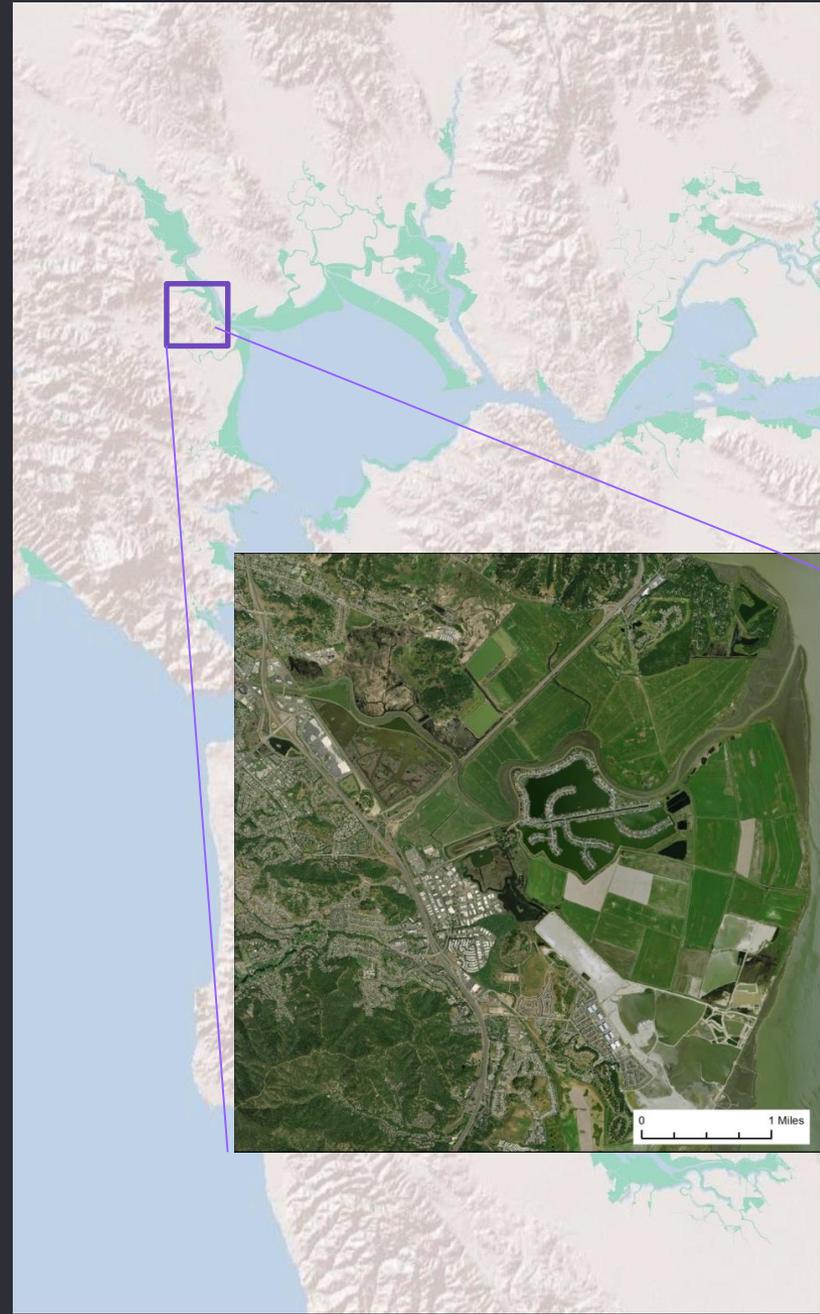


Planted with fast-growing plants such as the mildly seawater-tolerant alkali bulrush and tule, the brackish marsh would slow down a storm surge, absorbing it like a sponge. This dense vegetation, home to birds such as song sparrows, can reach 8 feet in height.

Clapper rails build their nests in tidal marsh cord grass, which would grow 3 to 5 feet tall alongside 1-foot pickleweed.

Covered by seawater most of the day, tidal mud flats would not be vegetated.

Wetlands Monitoring





- **Sea Level Rise**
- **2030 Deadline**
- **Restore Complete Systems - Habitats & Processes**
- **Restored Natural Stream Connections**











Welcome To
The Future