South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay

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2021 Adaptive Management Forum

February 4, 2021

SFEI AQUATIC SCIENCE CENTER

SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER

2003 Transfer:
A Public/Private Partnership

- 15,100 in South Bay
- 1,400 along Napa River

South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay

Coastal Conservancy

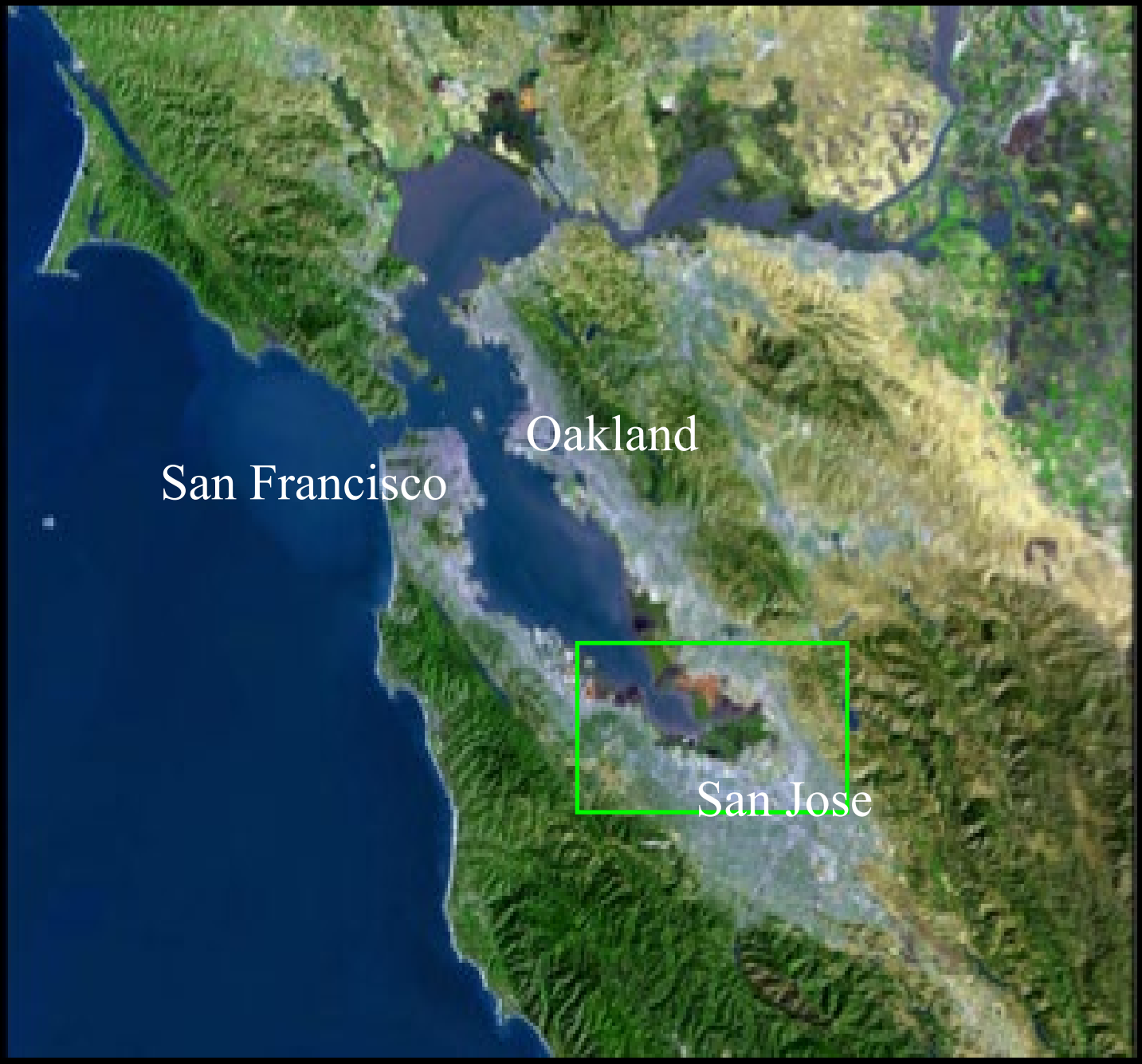
U.S. Fish & Wildlife Service

Resources Agency California Department Fish & Game

Cargill

Funding

- **Federal, state, and regional grants**
- **Many from Proposition 1, Measure AA, and other ballot measures**
  - **U.S. EPA**
  - **California DWR, CDFW**
  - **SF Bay Restoration Authority**
- **Foundation grants**
- **Private or corporate donations (e.g. Cargill)**
- **Agency budgets**
- **Dirt broker fees**


Oakland
San Francisco
San Jose


Silicon Valley

South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay


415 788 3100
SLIPPERY WHEN WET


INTERPRETI
CENTER
For Wetland Education

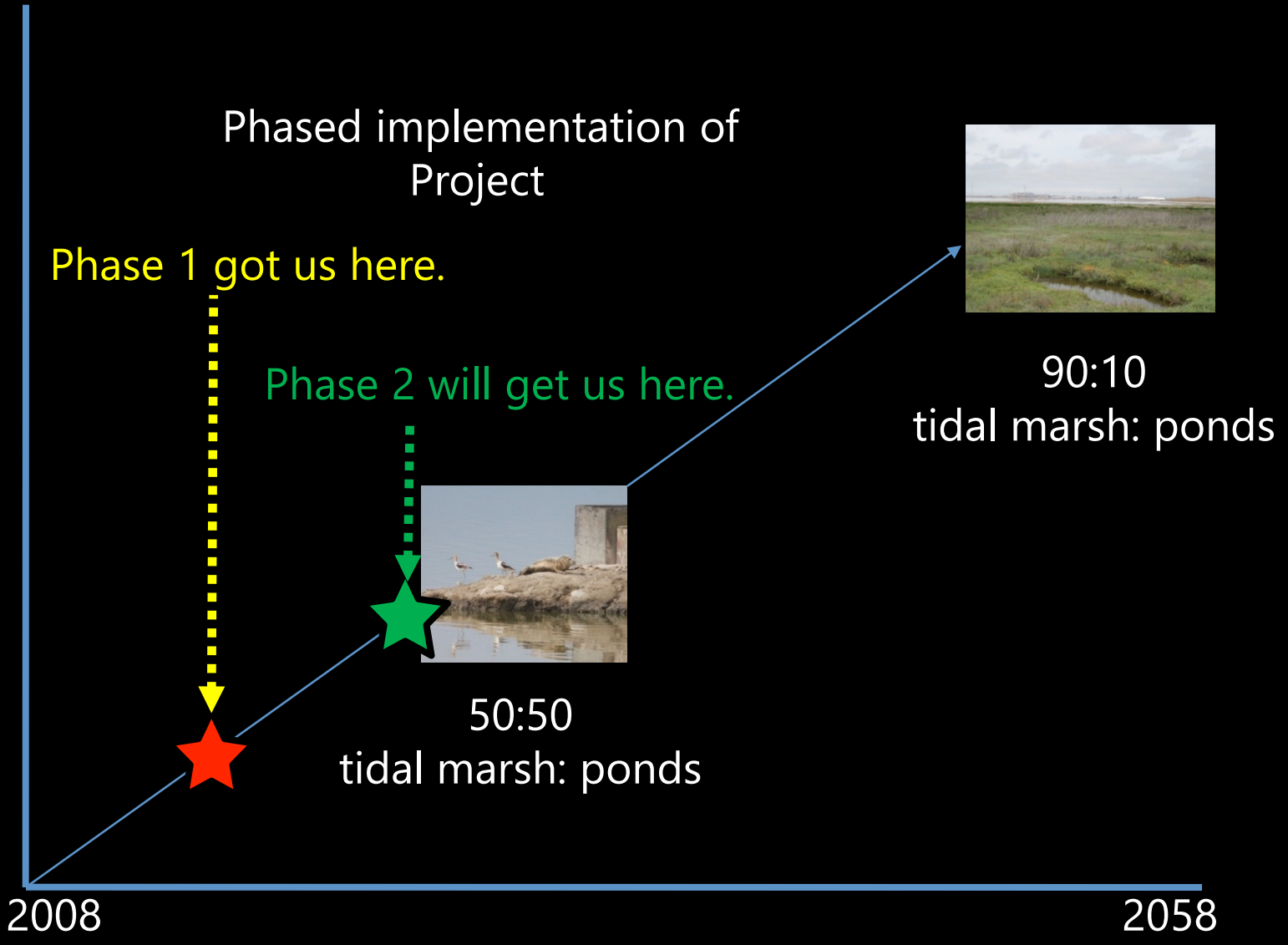
Ecological Trade-offs

Tidal marsh species vs. salt pond species

Key Uncertainties

Wildlife use of changing habitats
Habitat evolution and sediment dynamics
Mercury methylation
Water quality
Invasive species
Public access
Sea level rise and climate change

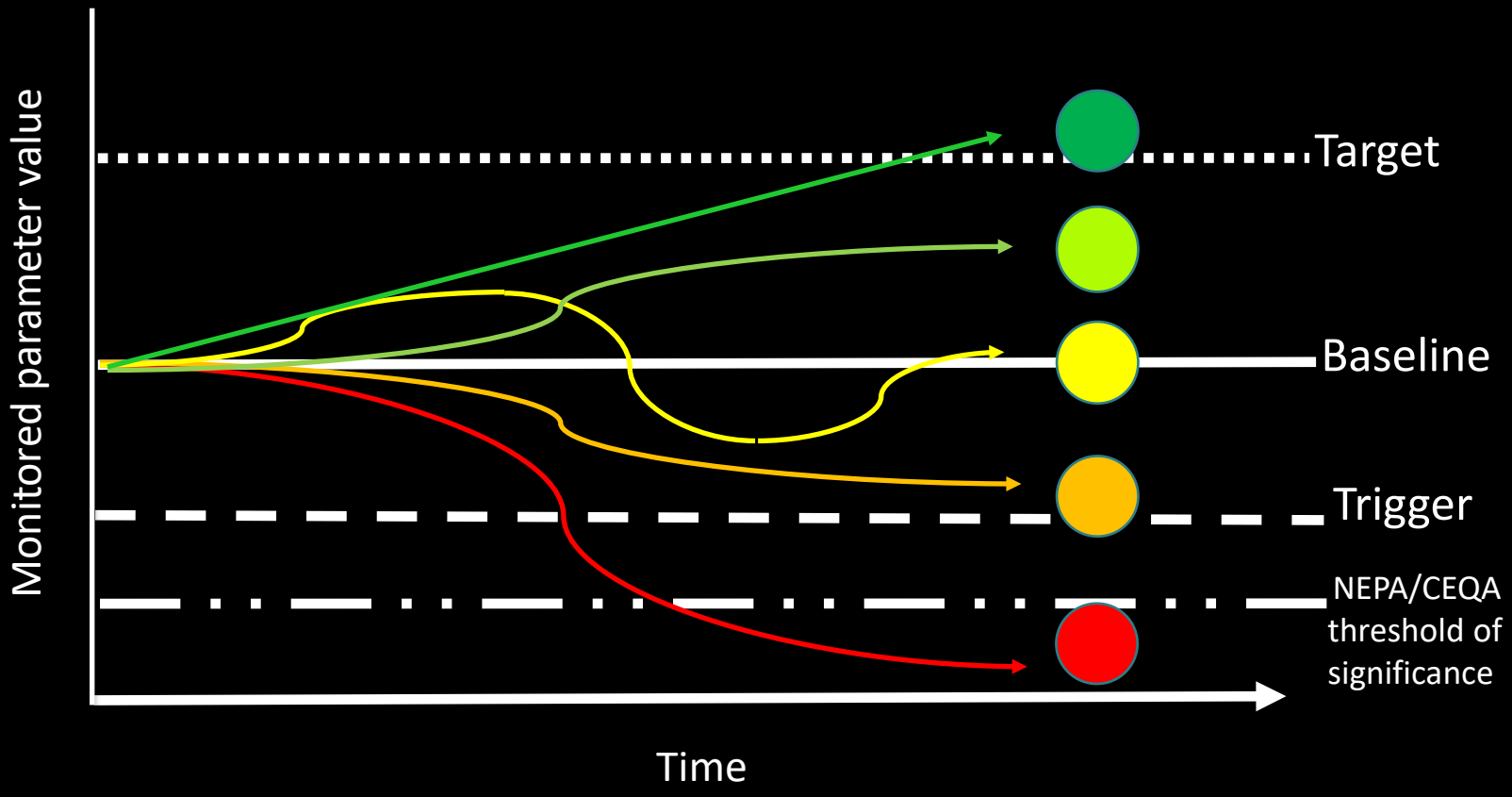
AMP & Science Planning



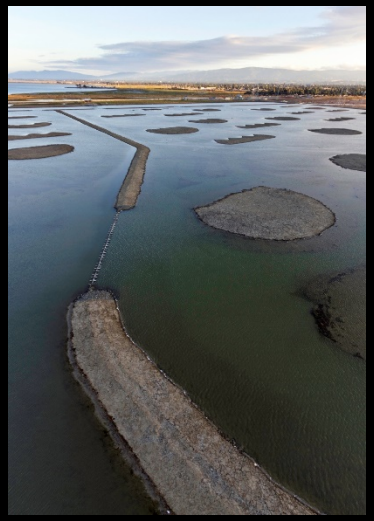
CATEGORY/ PO	RESTORATION TARGET	MONITORING PARAMETER (METHOD)	SPATIAL SCALE FOR MONITORING RESULTS
Sediment Dynamics Project Objective 1 (Preserve existing estuarine habitat areas)	No significant decrease in South Bay intertidal and subtidal habitats (south of San Bruno shoal), including restored pond mudflat, intertidal mudflat, subtidal shallow and subtidal channel areas.	▪ Area of restored mudflat. ▪ Area of outboard mudflat. ▪ Area of subtidal shallows and channel. Methods: Bathymetry and LiDAR surveys will be performed periodically, initially every 3–5 years and then less frequently if data suggest slower rates of changes over time.	▪ Change in tidal mudflat and subtidal shallows expected to vary at the pond complex scales. Areas will be estimated and reported on the pond complex scale. ▪ Changes in South Bay need to be placed within system-wide (San Francisco Estuary) context to assess influence of external factors.

EXPECTED TIME FRAME FOR DECISION-MAKING	MANAGEMENT TRIGGER	APPLIED STUDIES	POTENTIAL MANAGEMENT ACTION
▪ Change in tidal mudflat & subtidal shallow: 10–20 years, assuming significant tidal habitat restoration continues beyond Phase 1. ▪ Subtidal channel change: 0–5 years.	▪ Outboard mudflat decreases greater than the range of natural variability + observational variability/error.	▪ Will sediment movement into restored tidal areas significantly reduce habitat area and/or ecological functioning (such as plankton, benthic, fish or bird diversity or abundance) in the South Bay? ▪ Development of a 2- and 3-D South Bay tidal habitats evolution model.	▪ Convene study session to review and interpret findings to assess if observed changes are due to restoration actions or system-wide changes in the sediment budget (*e.g.*, effects of sea level rise). ▪ Study biological effects of loss of mudflat, subtidal shallows, and/or subtidal channel habitat. ▪ Adjust restoration phasing and design to reduce net loss of tidal mudflats. Potential actions include remove bayfront levees to increase wind fetch and sustain tidal mudflat, phase breaching to match demand and supply, and/or breach only high-elevation ponds to limit sediment demand ▪ Reconsider movement up staircase

Targets and Triggers



Phase 1 Outcomes



3,000 acres of tidal & muted tidal restoration; 700 acres enhanced managed ponds

Phase 1 Outcomes

7 miles of new trails
- Levee-top & boardwalk

Viewing platforms

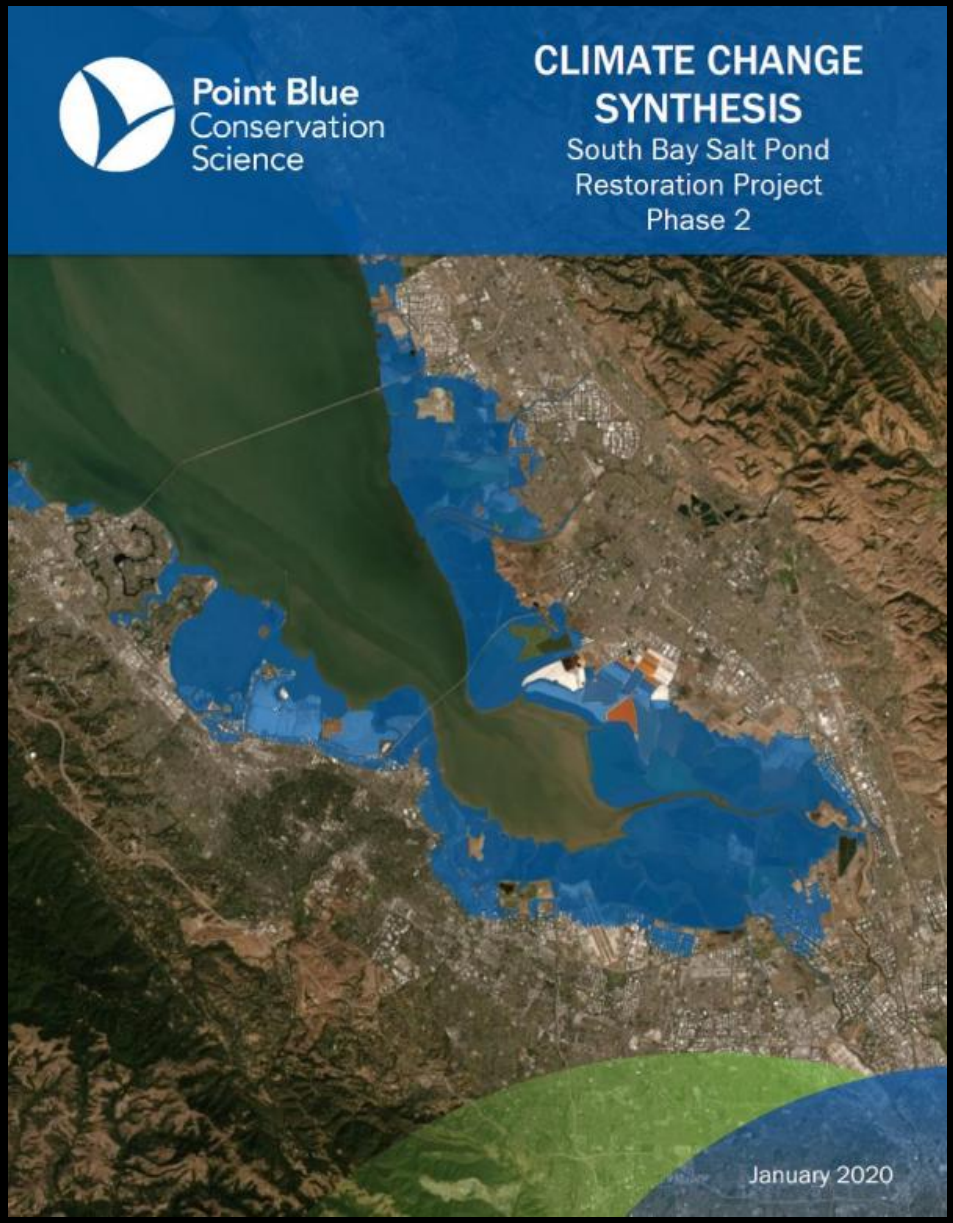
Kayak launch

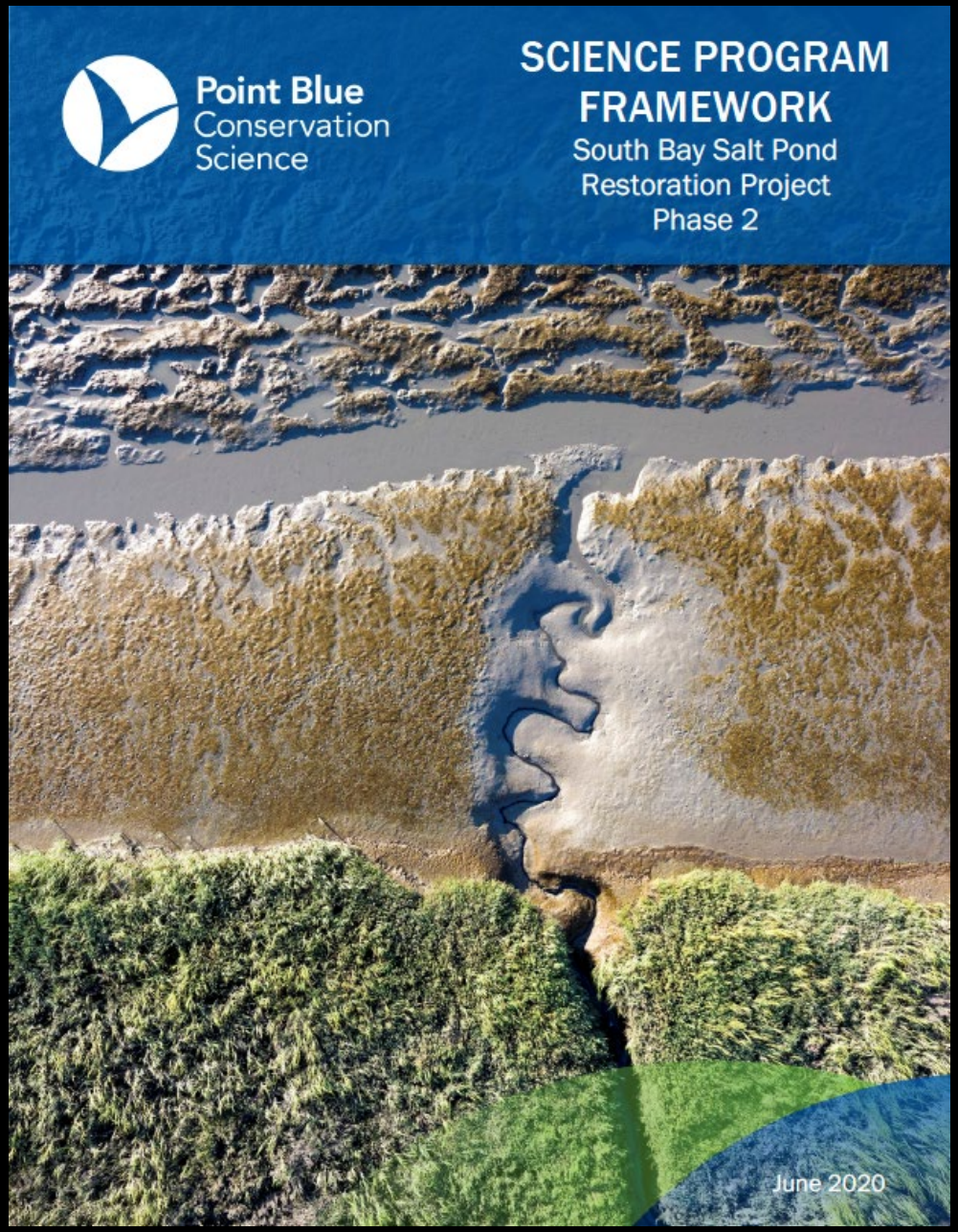
Key Uncertainties

- Habitat evolution and sediment dynamics
- Wildlife use of changing habitats
- ~~Mercury methylation~~
- Water quality
- Invasive species
- ~~Public access~~
- ~~Infrastructure support~~
- Sea level rise and climate change

Stop and Assess

- Phase 1 Science Synthesis
  - New/emerging technologies
  - Opportunities for collaboration
- Climate Synthesis

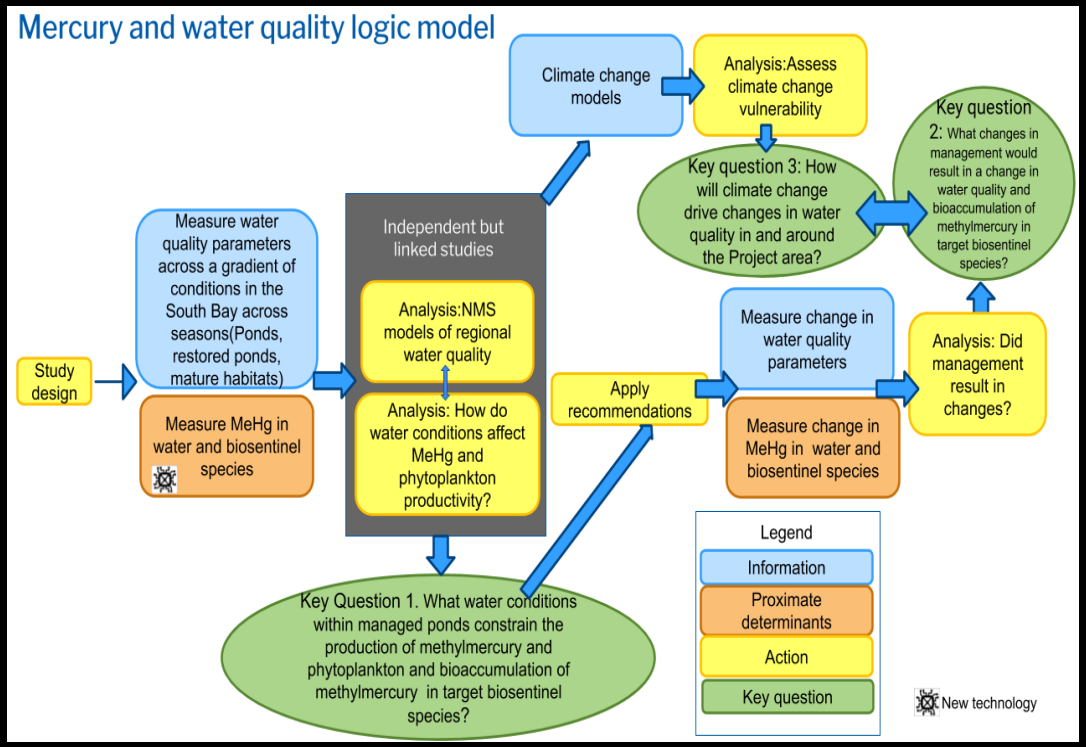




- Science Framework
- Science Program

Case Studies

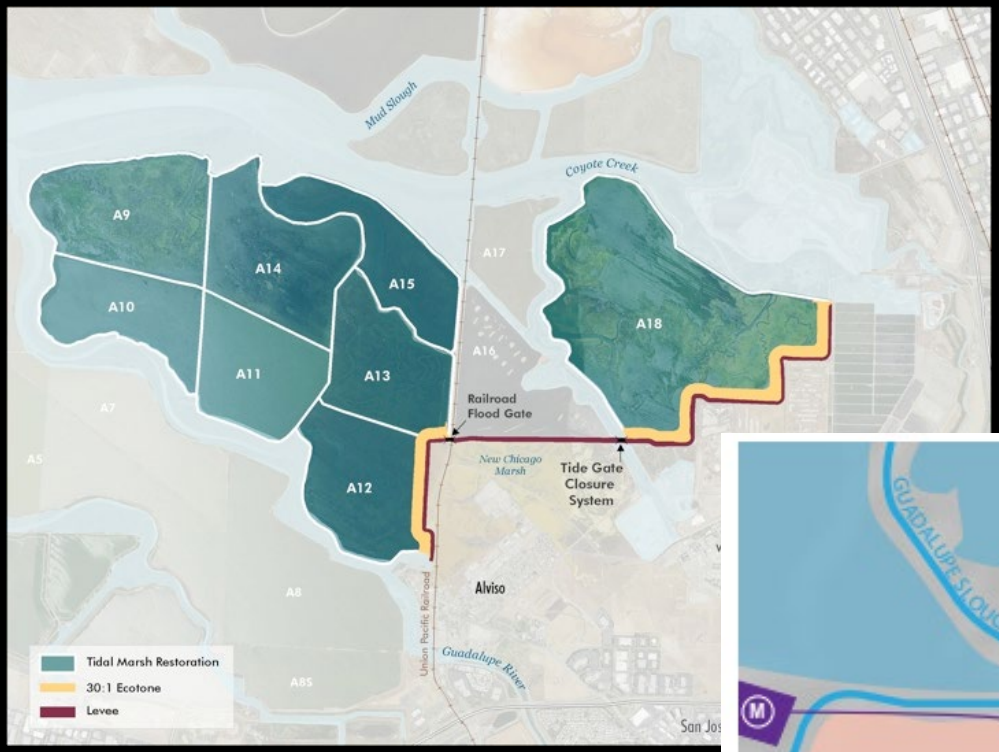
- Mercury/Water Quality
- Snowy Plovers
- Breeding Waterbirds
- Sediment



Collaboration

- Shoreline Project
- SAFER Bay
- Dumbarton Rail Corridor
- Dumbarton Area SLR Adaptation
- Capitol Corridor JPA
- Sunnyvale Shoreline Adaptation
- Mountain View SLR Adaptation
- Alameda County Flood Control District (CHARG)
- S.F. Bay Conservation and Development Commission (BCDC) Adapting to Rising Tides

Shoreline Project



Pond A8 – Calabazas/STA Creeks Project

Regional Science

Baylands Goals Habitat Update 2015

https://www.sfei.org/sites/default/files/biblio_files/Baylands_Complete_Report.pdf

Adaptation Atlas https://www.sfei.org/documents/adaptationatlas

Bay Regional Monitoring Program – focused on water quality and related sediment issues

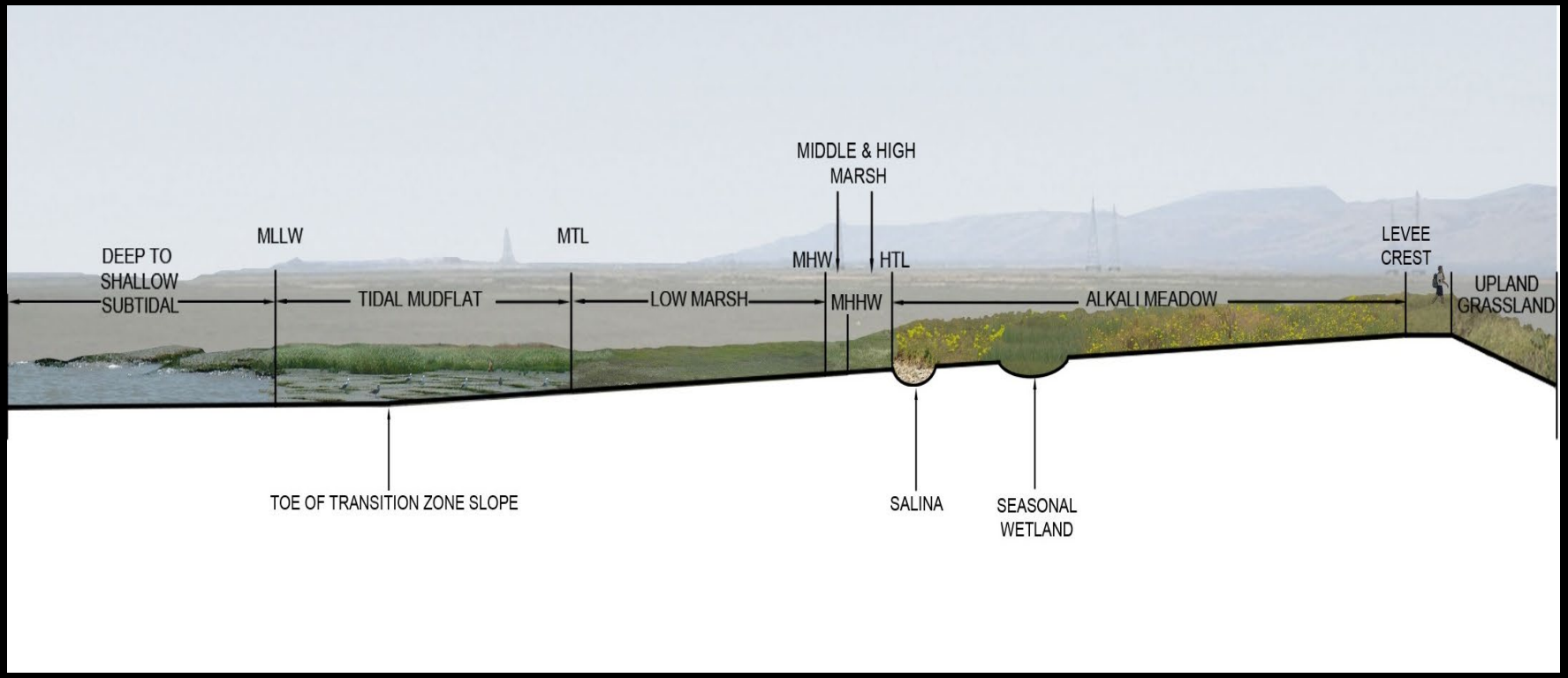
Bay Adapt – focused on regional SLR strategies

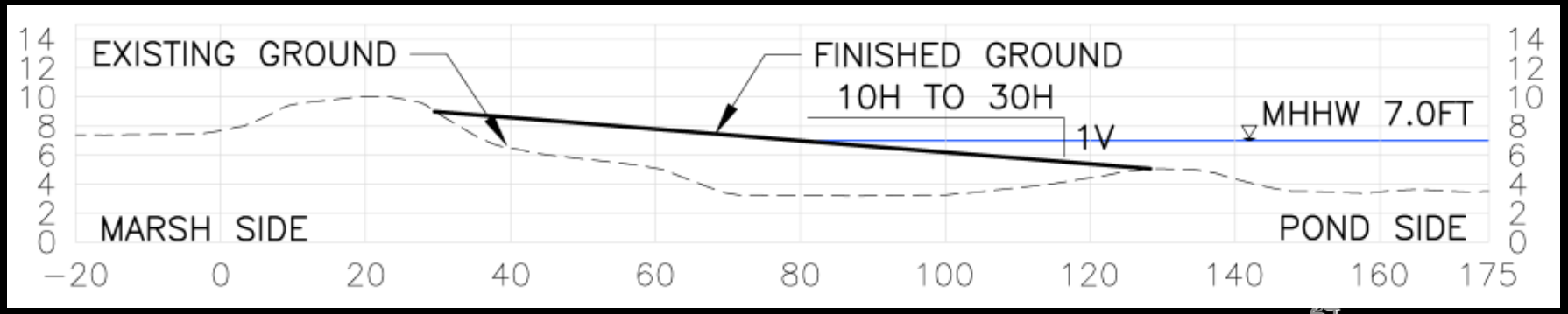
https://www.bayadapt.org/

Wetlands Regional Monitoring Program (WRMP)

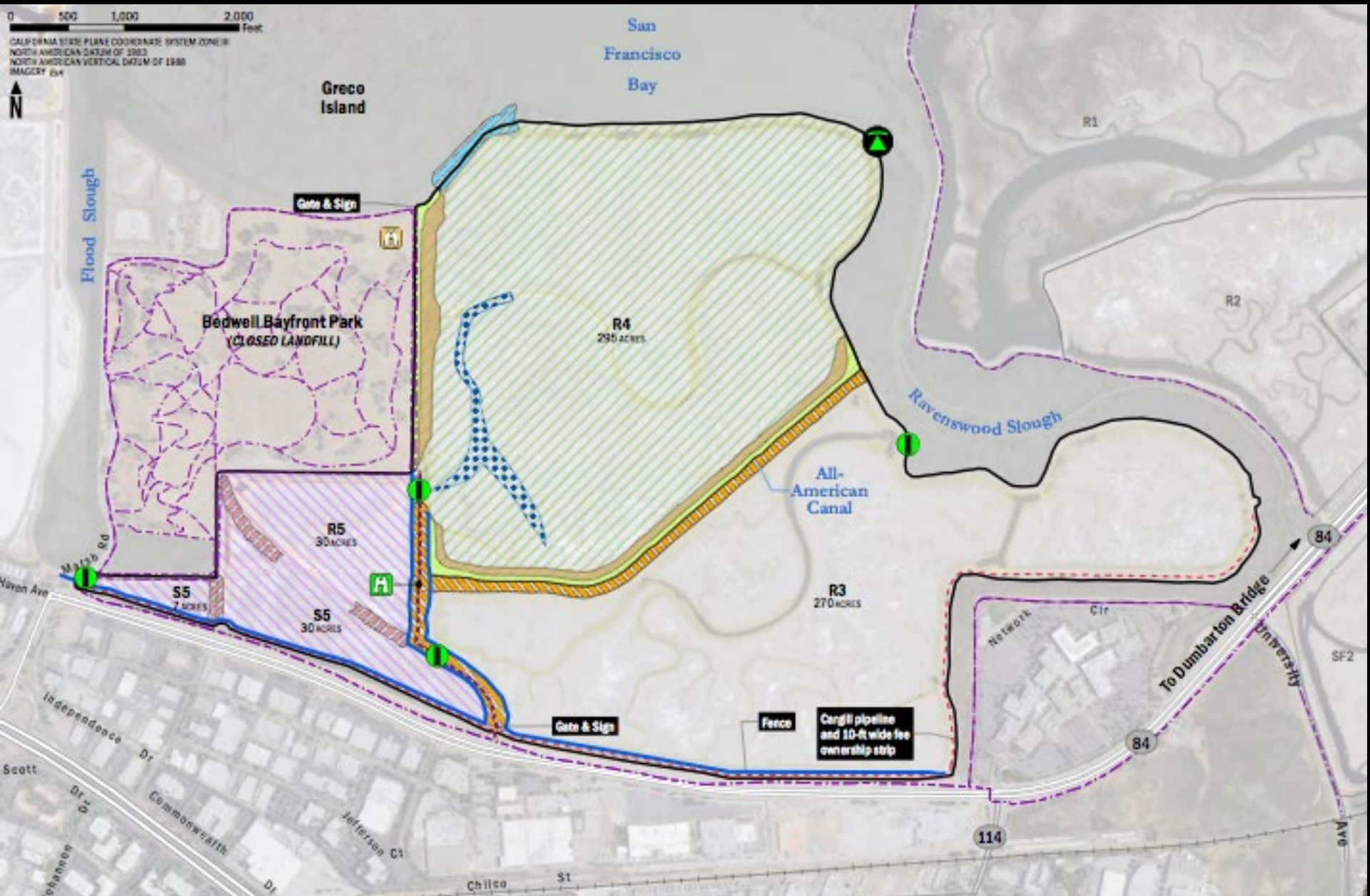
https://www.sfestuary.org/wrmp/

Adaptation


DEEP TO SHALLOW SUBTIDAL
MLLW
TIDAL MUDFLAT
MTL
LOW MARSH
MIDDLE & HIGH MARSH
MHW
MHHW
HTL
ALKALI MEADOW
LEVEE CREST
UPLAND GRASSLAND
TOE OF TRANSITION ZONE SLOPE
SALINA
SEASONAL WETLAND


EXISTING GROUND
FINISHED GROUND
10H TO 30H
1V
MHHW 7.0FT
MARSH SIDE
POND SIDE
14
12
10
8
6
4
2
0
−20
0
20
40
60
80
100
120
140
160
175

Ravenswood


San Francisco Bay
Greco Island
Flood Slough
Gate & Sign
Bedwell Bayfront Park
(CLOSED LANDFILL)
R4
295 ACRES
R5
30 ACRES
S5
7 ACRES
S5
30 ACRES
R3
270 ACRES
R1
R2
Ravenswood Slough
All-American Canal
Marsh Rd
Haven Ave
Gate & Sign
Fence
Cargill pipeline and 10-ft wide fee ownership strip
To Dumbarton Bridge
84
114
Newark
Cir
University
Ave
SF2
Independence Dr
Scott
Commonwealth
Jefferson Ct
Chilco St

Phase 2 Science

Phase 1 Science

Climate Synthesis

Regional Science and Collaboration

Adaptation and Resilience

Lessons Learned

- Rely on robust Adaptive Management Plan
- Applied studies/iterative learning
- Monitoring and evaluation
- Respond to changes in the system
- Respond to external changes
- Respond to new understanding, new science

Thank You!

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