

Science Symposium 2022

CELEBRATING OUR SCIENCE - #SBSymposium22

A Virtual Symposium • Open to Everyone • May 11-12

Day 1: Wednesday, May 11

9:00	Welcome
9:20	Session 1: Project Overview
9:50	Session 2A: Pond-Dependent Birds
10:50	Break
11:10	Session 2B: Pond-Dependent Birds
12:10	Session 3: Wildlife



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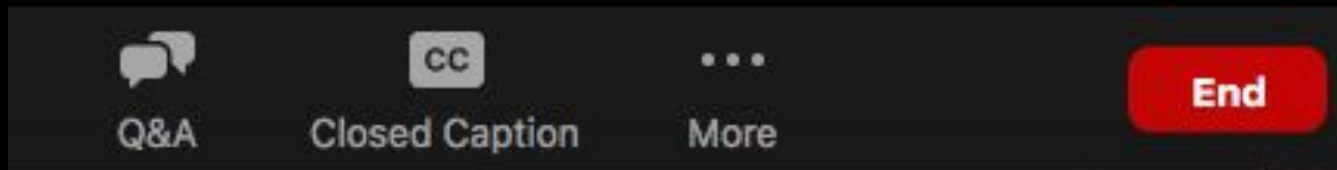
Day 2: Thursday, May 12

- 9:00 | Welcome
- 9:10 | Session 4: Habitat
- 10:10 | Session 5: Mercury and Water Quality
- 11:10 | Break
- 11:30 | Session 6: Sediment
- 12:10 | Session 7: Science Collaboration
- 1:30 | Open House



Zoom Webinar Overview

- If audio is not working, close application and join again; or restart computer and rejoin
- Meeting is being recorded and most talks will be posted to the SBSRP Website after the Symposium
- Use the Q&A function to send questions to speakers



- **Closed Captioning is enabled**
- **Contact Biruk at tech@sfei.org with technical questions**
- **Thanks to Biruk Imagnu and Ellen Plane from SFEI who are helping with for both days!!**
- **#SFSymposium22 - please share with your social media networks!**

Land Acknowledgment



Whitney and Hoffman CA Geological Survey
1873; Courtesy of David Rumsey

Team intro slides (Dave) - DB to introduce DH here

Dave's presentation



South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay

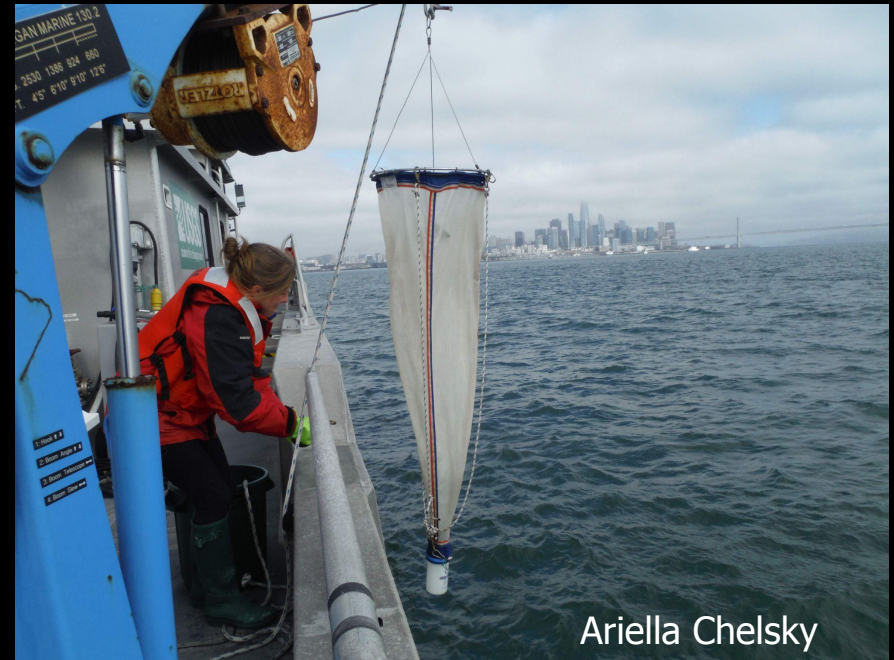
Science Program Update

Donna Ball, Lead Scientist

Celebrating Our Science, May 11, 2022



Laura Coatney



Ariella Chelsky

Key Uncertainties

Habitat evolution and sediment dynamics

Wildlife use of changing habitats

Mercury methylation

Water quality

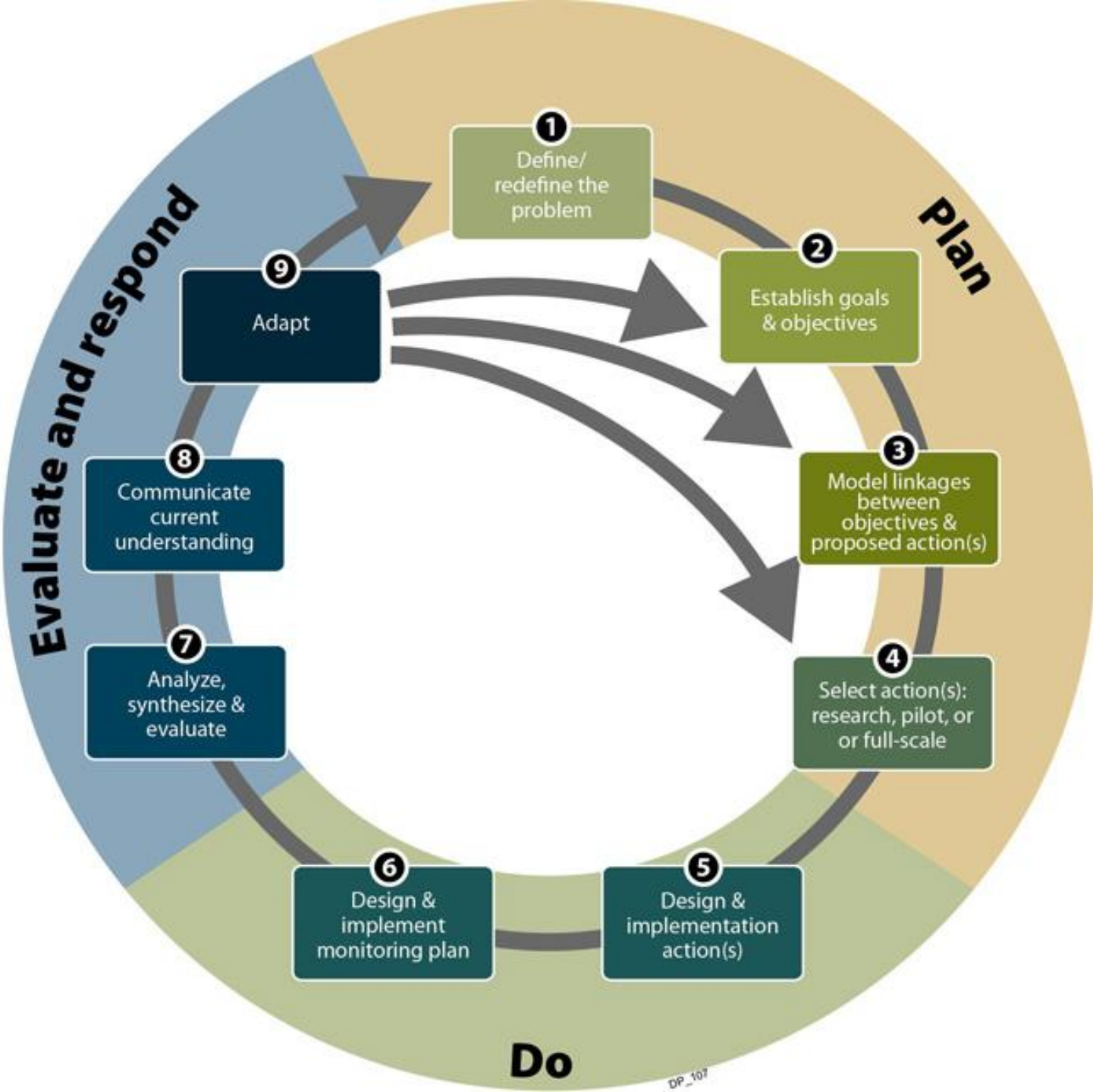
Invasive and nuisance species

Public access

Sea level rise and climate change

Public access and wildlife





Adaptive Management and Restoration

Phased implementation of Project

Phase 1 got us here.

Phase 2 will get us here.

Amount of tidal marsh restored

2008

2058

Time



90:10
tidal marsh:
ponds



50:50
tidal marsh:
ponds

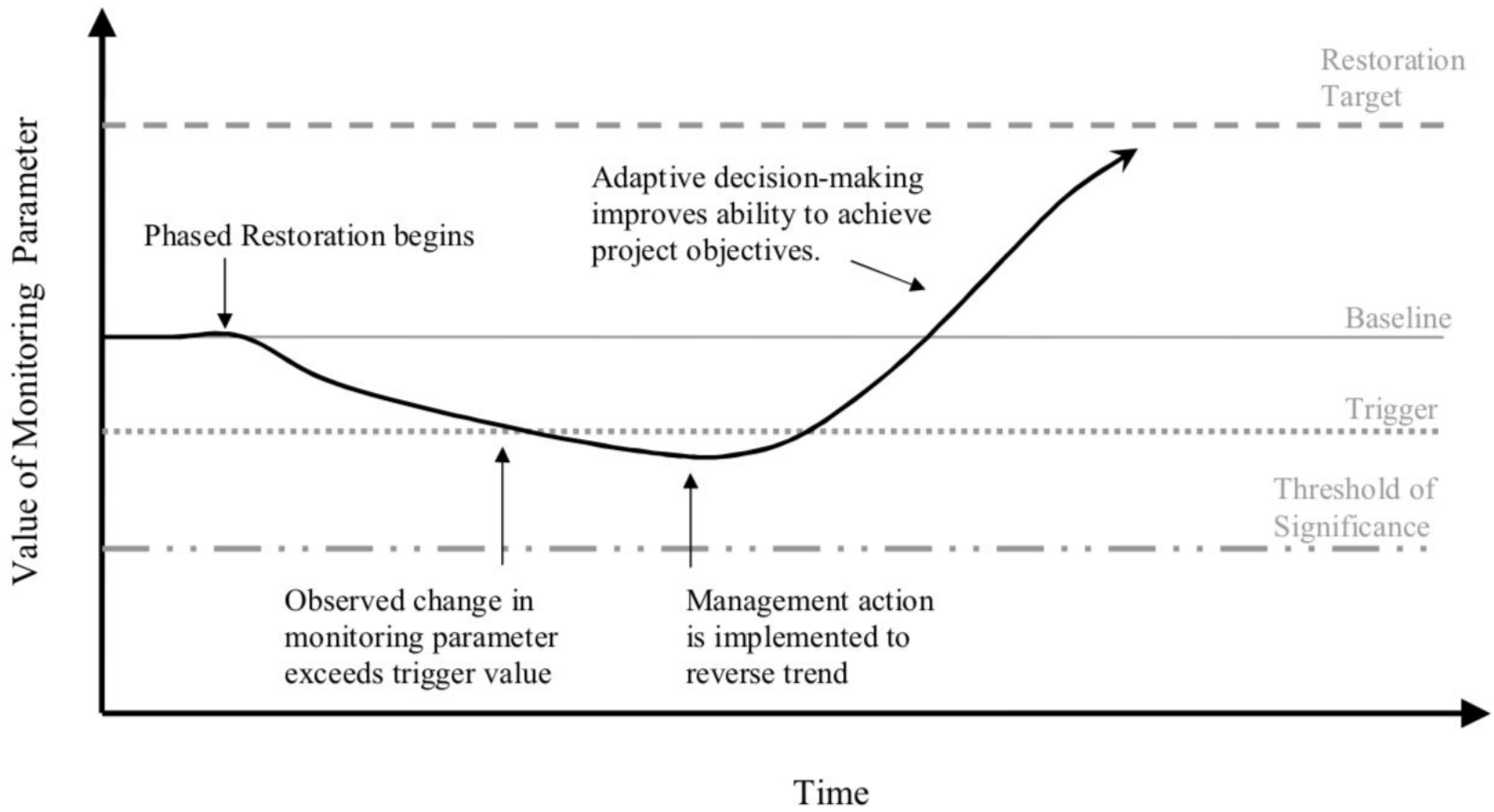


“Big Table” Elements

CATEGORY/ PO	RESTORATION TARGET	MONITORING PARAMETER (METHOD)	SPATIAL SCALE FOR MONITORING RESULTS
<p>Sediment Dynamics Project Objective 1 (Preserve existing estuarine habitat areas)</p>	<p>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.</p>	<ul style="list-style-type: none"> ▪ Area of restored mudflat. ▪ Area of outboard mudflat. ▪ Area of subtidal shallows and channel. <p>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.</p>	<ul style="list-style-type: none"> ▪ 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.

“Big Table” Elements

EXPECTED TIME FRAME FOR DECISION-MAKING	MANAGEMENT TRIGGER	APPLIED STUDIES	POTENTIAL MANAGEMENT ACTION
<ul style="list-style-type: none"> ▪ Change in tidal mudflat & subtidal shallow: 10–20 years, assuming significant tidal habitat restoration continues beyond Phase 1. ▪ Subtidal channel change: 0–5 years. 	<ul style="list-style-type: none"> ▪ Outboard mudflat decreases greater than the range of natural variability + observational variability/error. 	<ul style="list-style-type: none"> ▪ 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. 	<ul style="list-style-type: none"> ▪ 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 (<i>e.g.</i>, 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

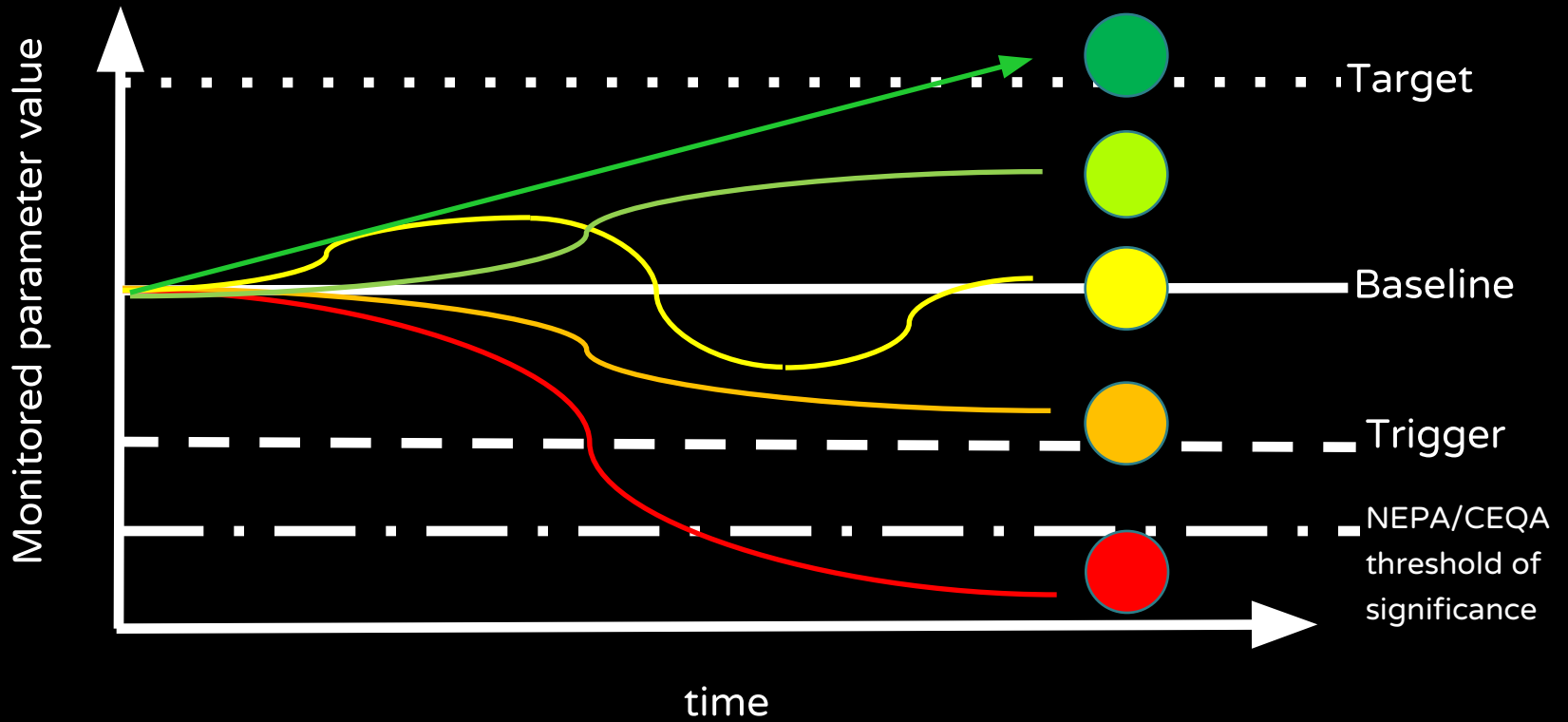


Adaptive Management



Using a Stoplight Approach



Expanded stoplight and triggers/targets



Sediment & Sea-Level Rise



Scientific Question	Score
Is current vegetated marsh maintained or increased?	
Will sediment accretion rate in restored tidal areas be adequate to create and support emergent tidal habitat ecosystems within the projected 50-year timeframe?	




Successful so far....



Bird Use of Ponds

Scientific Questions	Score
To what extent will the creation of large isolated pond islands maintain numbers and reproductive success of terns, avocet and stilts ?	
<ul style="list-style-type: none"> • Will California gulls adversely affect nesting birds in managed ponds? • Is the number of California least terns maintained? 	



Scientific Questions	Score
Will managed ponds provide breeding habitat to support sustainable densities of snowy plovers ?	

- **What else can we do?**
- **How can we effectively control predators?**

Phase 2 Science

- Phase 1 → Phase 2
- Climate Synthesis
- Science Framework
 - Regional Science and Collaboration
 - Adaptation and Resilience
- Science Program and Funding Strategy



Point Blue
Conservation
Science

CLIMATE CHANGE SYNTHESIS

South Bay Salt Pond
Restoration Project
Phase 2



Point Blue
Conservation
Science

SCIENCE PROGRAM FRAMEWORK

South Bay Salt Pond
Restoration Project
Phase 2

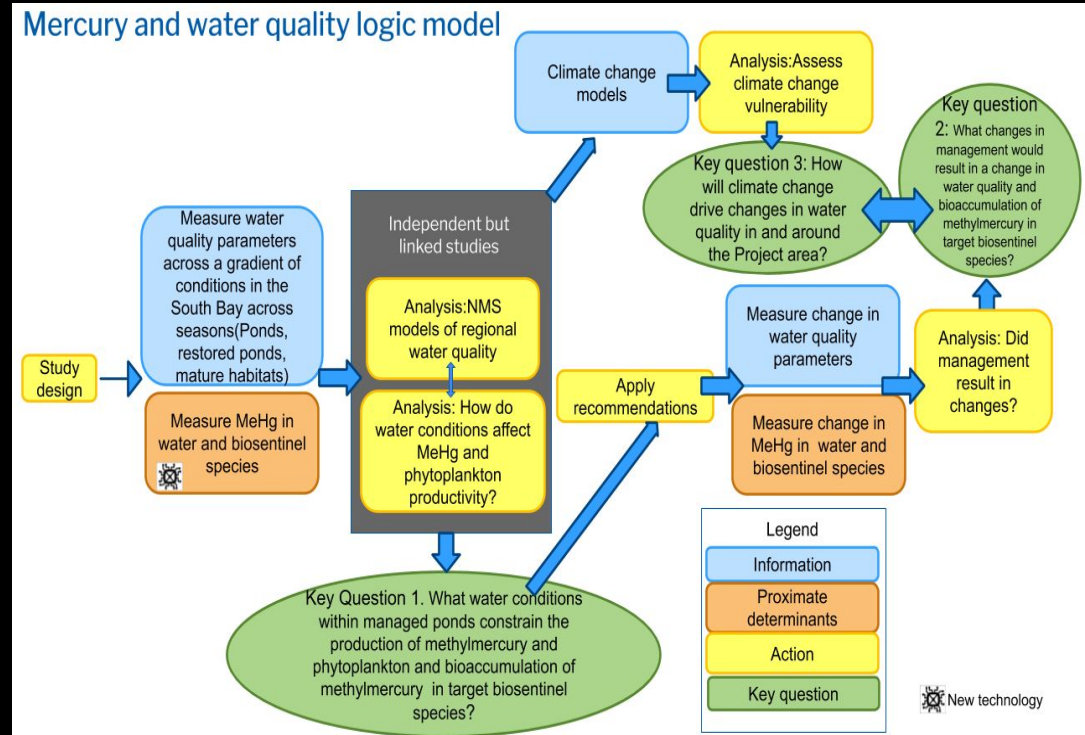


2020

June 2020

Framework Case Studies

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



Sediment



Uncertainties

- **Phase 1**
 - Accretion and marsh development?
 - Impacts to mudflats?
- **Phase 2**
 - Sufficient sediment?
 - Restore in time for SLR?
- **Phase 2 and Beyond**
 - Staircase implications?

Sediment - Phase 2



- Phase 2 Studies
 - HEMP
 - Sediment Accretion
- Collaborations / External Studies
 - LSB Sediment Flux (partner with SFEI/ Sediment Workgroup - RMP)
 - Lacy and Thorne study at Eden (Sediment Workgroup - RMP)

Waterbirds

Uncertainties



- Phase 1
 - Maintain habitat value and carrying capacity
 - Effects of pond management
 - Reconfigured ponds
- Phase 2
 - Predation
 - External factors / Flyway trends

Waterbirds - Phase 2



- Phase 2 Studies
 - Breeding waterbird surveys in 2022
 - Migrating Waterbirds
 - Fall, Winter, Spring Surveys in 2021-22
 - Phalaropes
 - SF Bay and Range-wide study
 - Motus Towers

Western Snowy Plover

Uncertainties

- Phase 1
 - Maintaining diversity and abundance
 - Contribute to recovery goal
- Phase 2
 - Predation
 - Habitat enhancements, predator management
 - Regional habitat availability



Ben Pearl, SFBBO

Western Snowy Plover - Phase 2

- Phase 2 Studies
 - Breeding Surveys
 - Banding
 - Predation Study
 - UCB/SFBBO partnership
 - Habitat enhancements



Ben Pearl, SFBBO

Water Quality

Uncertainties

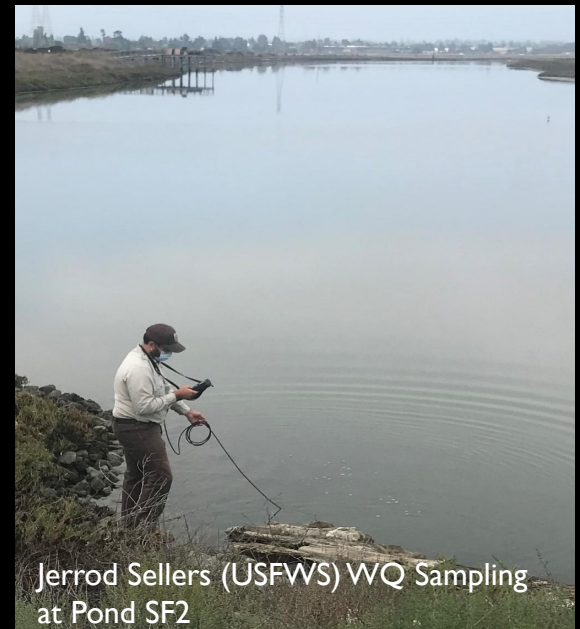
- Phase 1
 - Adverse effects of restoration?
 - Water quality and productivity?
 - Effects of pond management?
- Phase 2
 - Climate change/increased temps?
 - Pond water effects on sloughs?



Jerrold Sellers (USFWS) WQ Sampling at Pond SF2

Water Quality

- Phase 2 Monitoring/Studies
 - Fish and Water
 - Water quality monitoring near restored ponds
 - Ongoing O&M monitoring
 - Regional Collaboration Opportunities
 - NMS Moored Sensor Monitoring (SFEI)



Let's hear from the scientists!



Break rotating photo slides,

Break

11:10 - 11:30



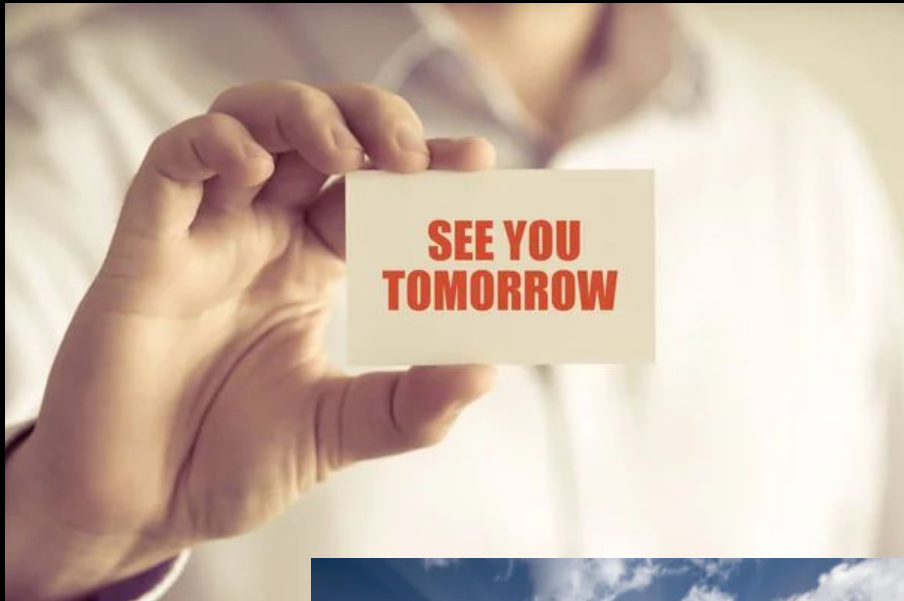
Welcome Back!



Jim Ervin



Levi Souza



Virtual Open House: 1:30 - 2:00

Your chance to ask questions of the Project team!





Contact:

Dave Halsing, Executive Project Manager

Dave.Halsing@scc.ca.gov

Donna Ball, Lead Scientist

Dball@sfei.org



Contact:

Dave.Halsing@scc.ca.gov

Dball@sfei.org

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Los subtítulos en español están disponibles para este seminario.

Haga clic en el botón de subtítulos en su pantalla.