



SAN FRANCISCO BAY

RESTORATION AUTHORITY

REGIONALLY ADVANCING LIVING SHORELINES IN SAN FRANCISCO BAY PROJECT

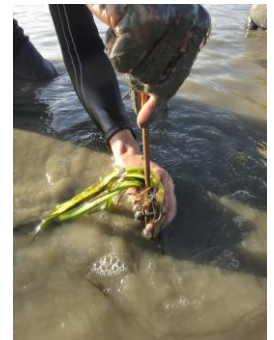
**Contributing to SFBRA targets: Shellfish and
Submerged Aquatic Vegetation**



Marilyn Latta, Project Manager
Oversight Committee Meeting
March 26, 2025

Campaign Goals

- Progress in all categories
- Excellent focus on multiple habitats and approaches
- But slower start to two goals
- **Restore 500 acres of shellfish habitat**
- Progress to date: 12 acres, 2%
- Heron's Head Park Shoreline Resilience Project: 11 acres
- Terminal Four Wharf Removal Project: 1 acre
- **Restore 150 acres of submerged aquatic vegetation habitat**
- Progress to date: 3 acres, 2%
- Terminal Four Wharf Removal Project: 3 acres



Regionally Advancing Living Shorelines in San Francisco Bay Project

- Current grant: \$500,000 to the San Francisco Estuary Institute for
 - Monitoring of previous pilot living shoreline sites
 - Preparation of guidance on programmatic permitting
 - Establishment of a framework for collaboration on development of living shoreline projects

These tasks will support the \$6M total project effort to develop new living shorelines projects at 10 locations in the Central Bay.



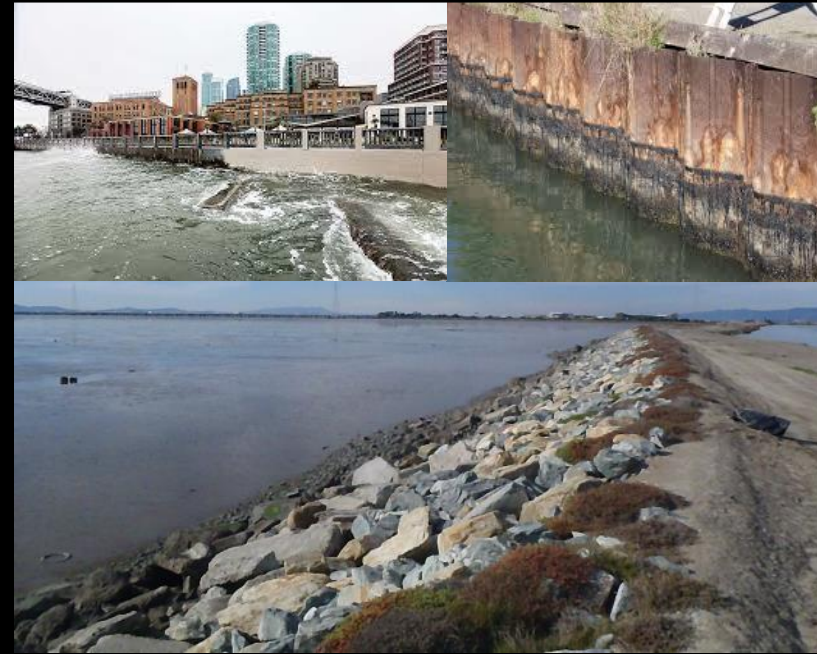
Challenges with Subtidal Habitat Projects

- **First of their kind projects**
- **Difficult conditions- temperature, waves, currents, tides**
- **Data gaps- existing/future habitats and conditions**
- **Materials/methods- beneficial fill & plantings**
- **Limited Contractors and Equipment**
- **Construction Approaches and Access**



Hard Infrastructure

Necessary in certain locations
Impacts to shorelines, wetlands
and submerged habitats



Nature-Based Infrastructure

Biological and Physical Benefits

Habitat Connectivity

Climate Adaptation

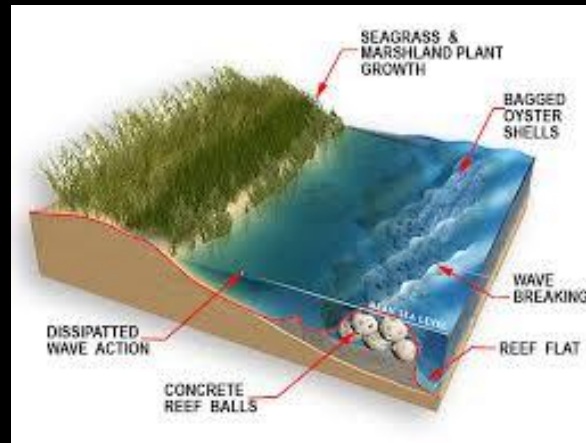


Living Shorelines

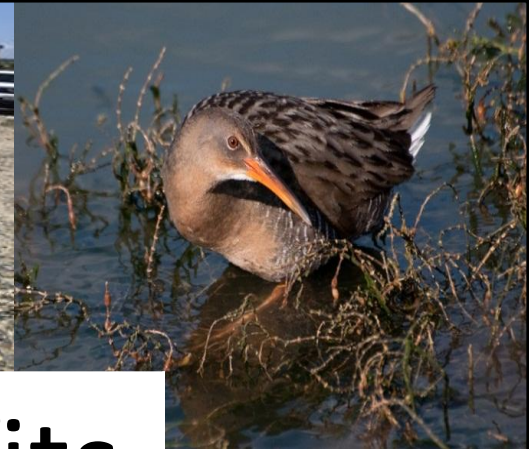
- Shoreline protection via restoration design
- Diverse suite of techniques/habitat types
- Minimize coastal erosion
- Maintain coastal processes
- Natural habitat for plants, wildlife, and people



Learning from East, Gulf, Pacific Northwest Projects

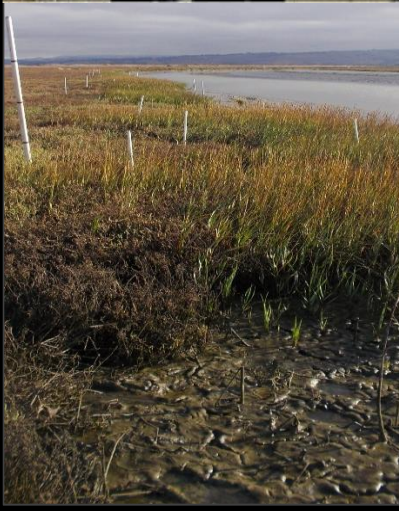


Maryland Living Shorelines Protection Act of 2008
New York Waterfront Alliance Waterfront Edge Design Guidance



Multiple Co-Benefits

- Create Fish and Wildlife Habitat
- Attenuate Wave Energy
- Accrete Sediment
- Reduce Erosion
- Can Provide Outdoor Recreation
- May Sequester Carbon
- May Buffer Ocean Acidification



One Size Does Not Fit All

Existing Uses and Community Input

Parcel Ownership

Bathymetry

Depths for Habitat Restoration

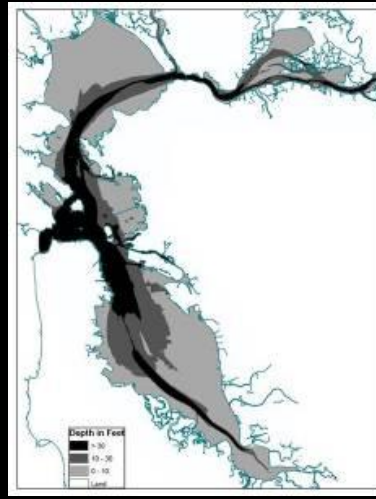
Depths for Access

Orientation to Wind/Waves

Existing Species and Habitats

Sea Level Rise Modeling

Physical Space Required



Threading the Needle

Innovation and Feasibility

Barriers to Innovation:

- Science and data gaps
- Institutional Inertia
- Lack of broader context
- Lack of an advocate



Importance of Demonstrating Feasibility:

- Habitat and species
- Pilot projects – test
- Develop Best Management Practices
- Document success before scaling up
- Monitor long-term benefits and impacts



Regionally Advancing Living Shorelines

Goals:

COLLABORATE

DESIGN ACROSS REGIONS

SCALE UP AND BUILD ADAPTATION FASTER

TRANSFER AND SHARE KNOWLEDGE

Tasks:

Pilot Site and Baseline Data Collection

Programmatic Permit Approach

Living Shorelines Collaborative

Regional Design/Constructability Guidance

Develop 30-60% Designs at 10 sites

Local Engagement/ Workforce Trainings

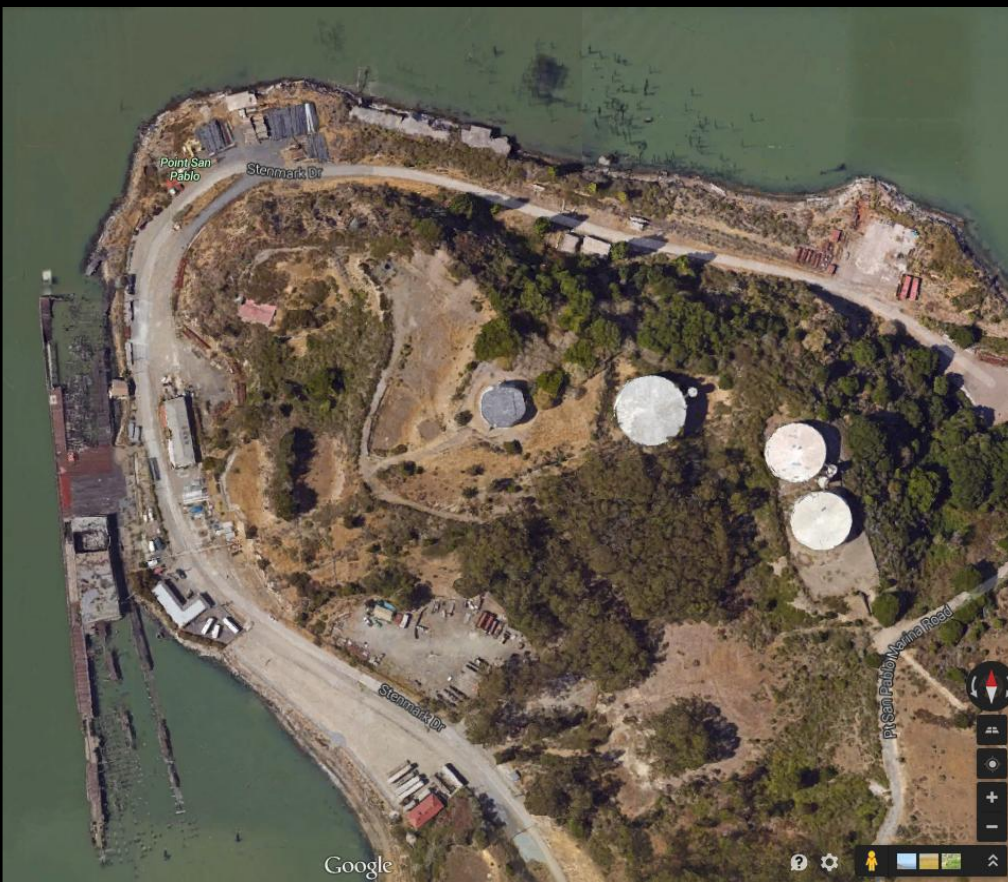


San Rafael - Benefits to Birds, Fish, Wildlife

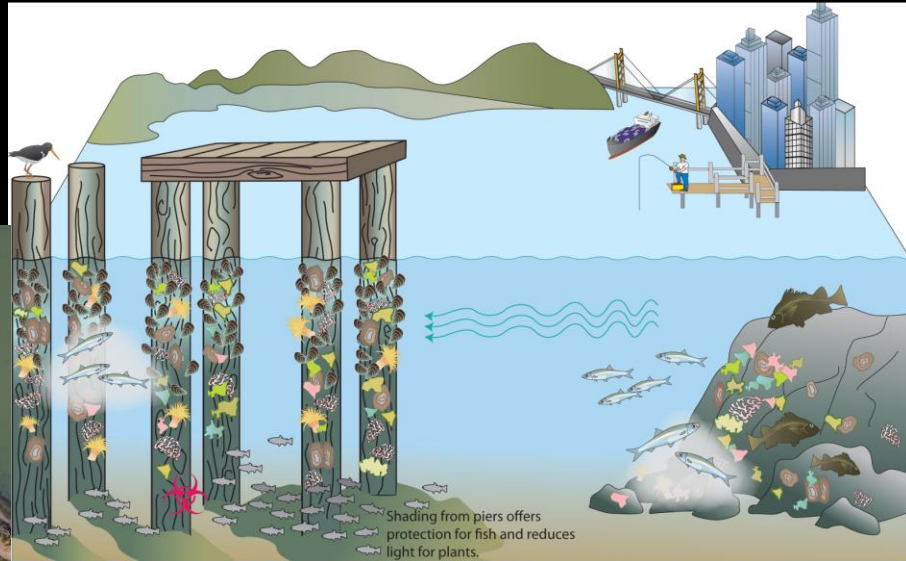


Physical Shoreline Benefits
30% Reduction in Wave Energy

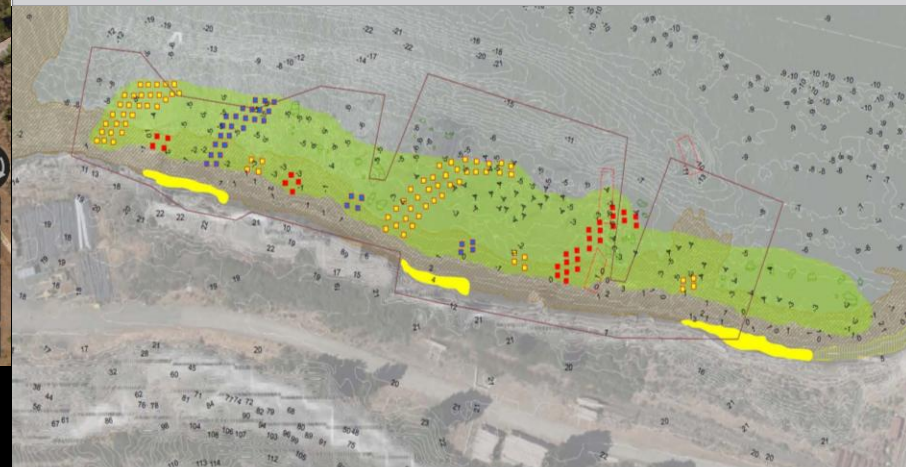
Red Rocks Wharf Removal and Reefs



- Pacific herring substrate
- Eelgrass Beds- main focus
- Oyster Reefs- protection
- Rockweed- experimental



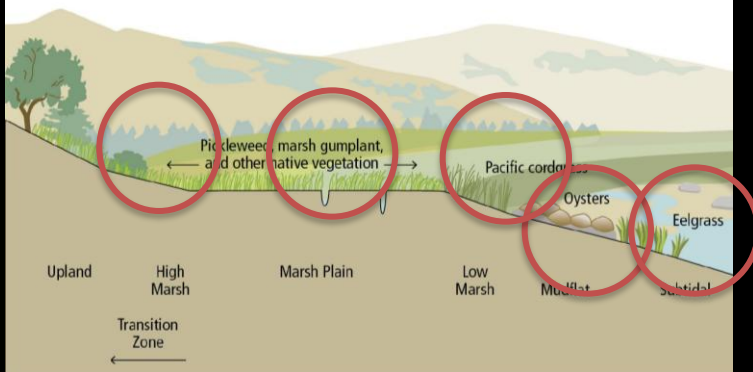
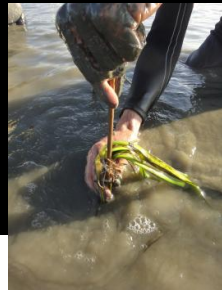
- Invertebrates, mostly introduced, such as bryozoans, tunicates, anemones, and sponges use rock outcrops and pier pilings, rip rap, and other artificial structures as habitat.
- Herring spawn on rock outcrops and artificial structures.
- Active piers used for shipping.
- Toxic creosote present in pier pilings
- Current speeds are reduced by artificial structures.
- Rock outcrops used as habitat by rockfish and other fishes.



- Oyster treatments in multiple rows of 3
- Eelgrass plantings opportunistically throughout
- Fucus on shoreline
- Oriented to dampen wave and wake energy from vessels

Giant Marsh Living Shorelines Project – Point Pinole

- Tidal marsh habitat
- Endangered Species
- High Marsh/ Ecotone
- High Tide Refugia



Collaborative Partnerships

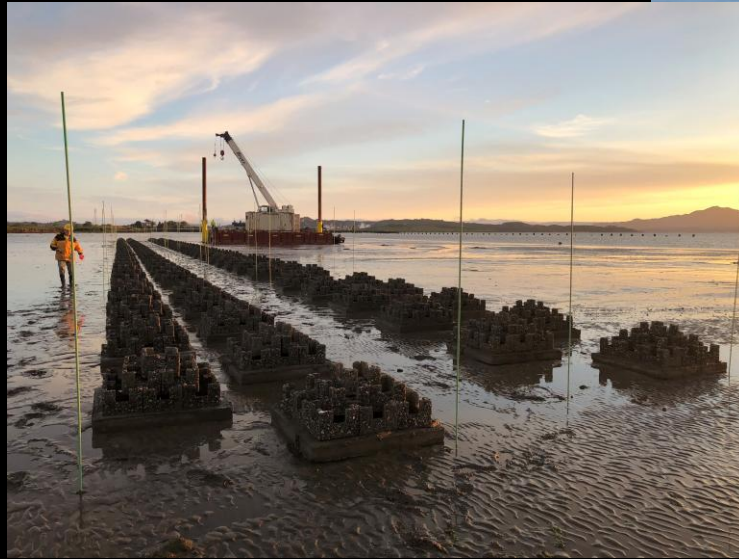
Communities, Technology, and Science



Green Jobs and Job Training



Local Contractors and Equipment

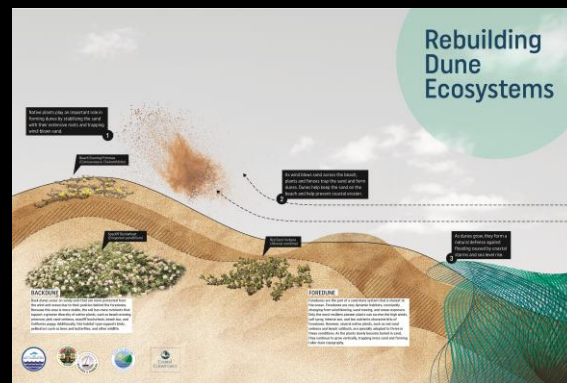
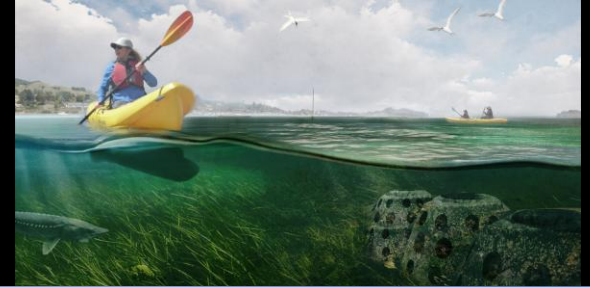


More Efficient Permitting of Multi-Habitat Projects



Scale Up and Normalize Approaches

- Build Regional Capacity through Knowledge Transfer
- Advance Nature-based Adaptation and Design Guidance
- Pilot Multi-Objective Designs in Different Settings
- Encourage Local Labor and Involvement





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Thank you and Questions

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