OAAC Adapt
Oakland Alameda Adaptation Projects

Bay Farm Island Community Engagement Workshop

December 4th, 2024

Survey #1

- Have you ever been to an OAAC workshop before?
- What city do you live in?
- How close do you live to the Bay or Estuary?

Agenda
Bay Farm Island

01 **Welcome! Oakland Alameda Adaptation Projects Introduction**
Corbett Belcher, CMG Landscape Architecture; Keta Price, The Hood Planner; Danielle Mieler, City of Alameda

02 **Regional Overview, Climate Science & Adaptation Planning**
Dr. Kris May, Pathways Climate Institute

03 **Q&A – Add your questions to the chat at any time!**
Dr. Kris May, Pathways Climate Institute; Corbett Belcher, CMG

04 **Site Analysis**
Dilip Trivedi, Moffatt and Nichol

05 **Development of Adaptation Alternatives & Design Concepts**
Delaney McGuinness, Moffatt and Nichol

06 **Q&A – Add your questions to the chat at any time!**
Dilip Trivedi, Moffatt and Nichol; Corbett Belcher, CMG

07 **Next Steps & Survey**
Lauren Eisele, CASA

OAAC Adapt: Project Partners

Agency Partners

CITY OF Oakland

ALAMEDA

East Bay Regional Park District

Alameda County Flood Control & Water Conservation District

Caltrans

California Water Boards San Francisco Bay - R2

Port of Oakland
Seaport. Airport. Everyone's Port.

Community Partners

SOGOREA TE' LAND TRUST
LED BY URBAN INDIGENOUS WOMEN

CASA
Community Action for a Sustainable Alameda

SFEI Aquatic Science Center
San Francisco Estuary Institute & the Aquatic Science Center

REAP Climate Center

Greenbelt Alliance

Ninth Root

Hood Planning Group

Consultants

cmg Landscape Architecture

ESA

moffatt & nichol

Schaaf & Wheeler
Consulting Civil Engineers

NHA | Advisors
Financial & Policy Strategies. Delivered.

Earth Mechanics, Inc.
Geotechnical and Earthquake Engineering

pathways
Climate Institute

Bay Farm Island Workshop Purpose

- Share information on what **sea level rise means for the Oakland and Alameda sub-region**
- Tools we can use make our **communities more resilient and transformative**
- Share development of **design concepts for near-term adaptation** of the Bay Farm Island northern shoreline
- Answer your **questions** and get your feedback on your **concerns and aspirations for your community**

OAAC Adapt Overview

Oakland Alameda Adaptation Committee (OAAC):

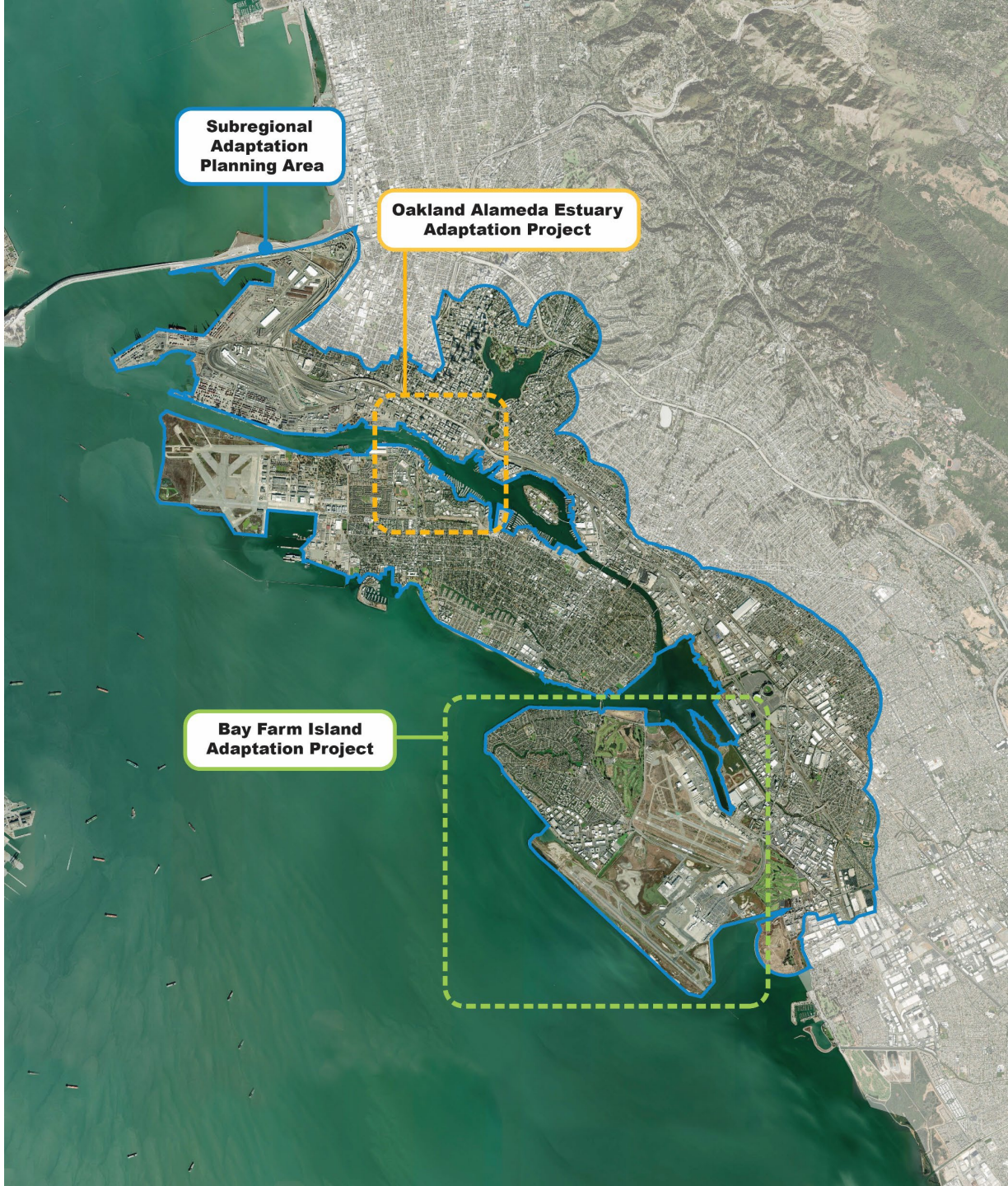
A coalition of shoreline community and agency partners working to coordinate the Oakland Alameda sub-region flood and adaptation projects to protect and restore water quality, habitat, recreation and community resilience.

OAAC ADAPT Projects

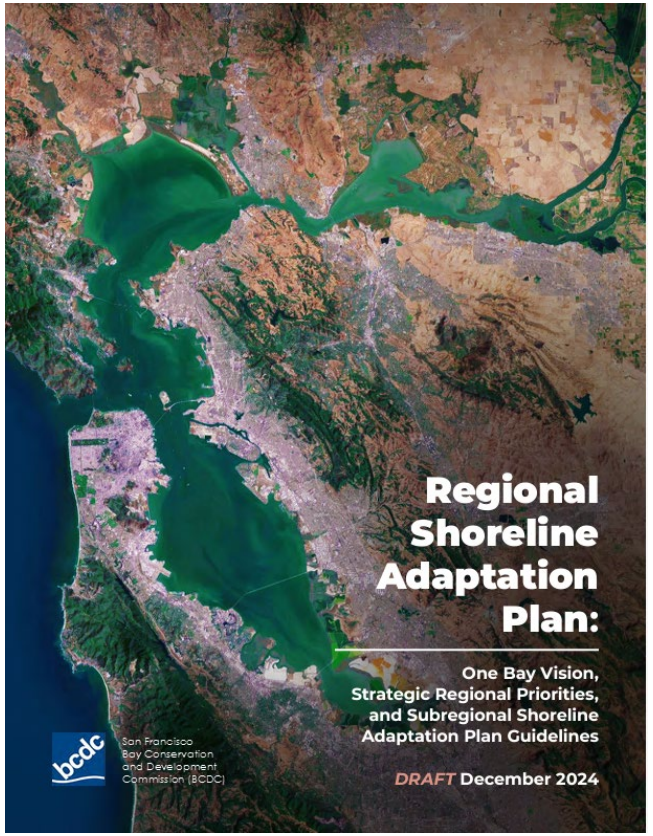
- The **Subregional Adaptation Plan** is a long-term plan that details preliminary strategies and pathways for shoreline communities to take as the climate and shorelines change over time

- The **Oakland Alameda Estuary Project** is a near-term sea level rise adaptation design concept to address increased coastal, stormwater, and groundwater flooding for up to two feet of sea level rise over the coming decades

- The **Bay Farm Island Adaptation Project** is a near-term sea level rise adaptation design project to address compound flooding and up to two feet of sea level rise and long-term planning coordination.



Other Adaptation Partner Projects in the Sub-Region



OAAC Subregional Goals

1. **Protect** Oakland-Alameda sub-region from the negative effects of expected sea level, inland flooding, and groundwater rise and liquefaction

2. Identify and develop opportunities for **multi-benefit** adaptations strategies

3. Avoid negatively affecting **neighboring subregions** through protection and adaptation measures

4. Utilize an **adaptation pathways** approach to address different SLR thresholds and time horizons. Identify near, mid, and long-term adaptation strategies

5. Enhance **transportation**, **recreation** corridors, **bay access**, and the San Francisco **Bay Trail**

6. Preserve and increase **open space** where possible

7. Improve subtidal, intertidal, transitional, and upland habitat with **nature-based solutions**

8. Improve **air quality**

Ground Rules

- Engage in **active** listening
- Seek first to **understand**, not to be understood
- No one or two individuals should dominate the **conversation**
- Engage in your realm of experience and expertise, and **respect** and engage others in theirs
- Take **ownership** for positive outcomes
- No bad ideas – let's make this a "**yes, and…**" space

Project Schedule

2023 FALL | 2024 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC | 2025 JAN FEB MAR APR MAY JUNE JULY AUG SEPT

Long-Term Subregional Adaptation Plan

- Planning Principles, Analysis and Criteria
- Strategy Foundation
- Strategy Development & Stakeholder Input
- Strategy Refinement
- Plan Completion & Council Hearings

Near-Term Bay Farm Island Adaptation

- Existing Conditions & Analysis
- Develop Alternatives
- Alternative Refinement & Stakeholder Input
- Preferred Concept
- 30% Design Development of Preferred Concept
- 30% Design Completion & Council Hearings

We are here!

Near-Term Oakland Alameda Estuary Adaptation

- Existing Conditions & Analysis
- Develop Alternatives
- Altenative Refinement & Stakeholder Input
- Final Concept Development
- Final Concept & Council Hearings

Project Grant Deadline Feb 2025

Community Engagement Event

Oakland Alameda Estuary
REAP Climate Center 8/3/24

Bay Farm Island
Leydecker Park 8/12/24

Oakland Alameda Estuary
Jack London Square 8/15/24

Next Steps & Call to Action

Stay engaged! Bring your voice (and your friends) to the table. We will need community involvement and input to advance this work. **Please join us at the following events:**

City of Alameda (attend virtually or in person)

- Commission on Persons with Disabilities - December 11th at 6:30pm
- Planning Board - Dec 16th at 7 pm
- City Council - Jan 21st at 7 pm

Community Groups

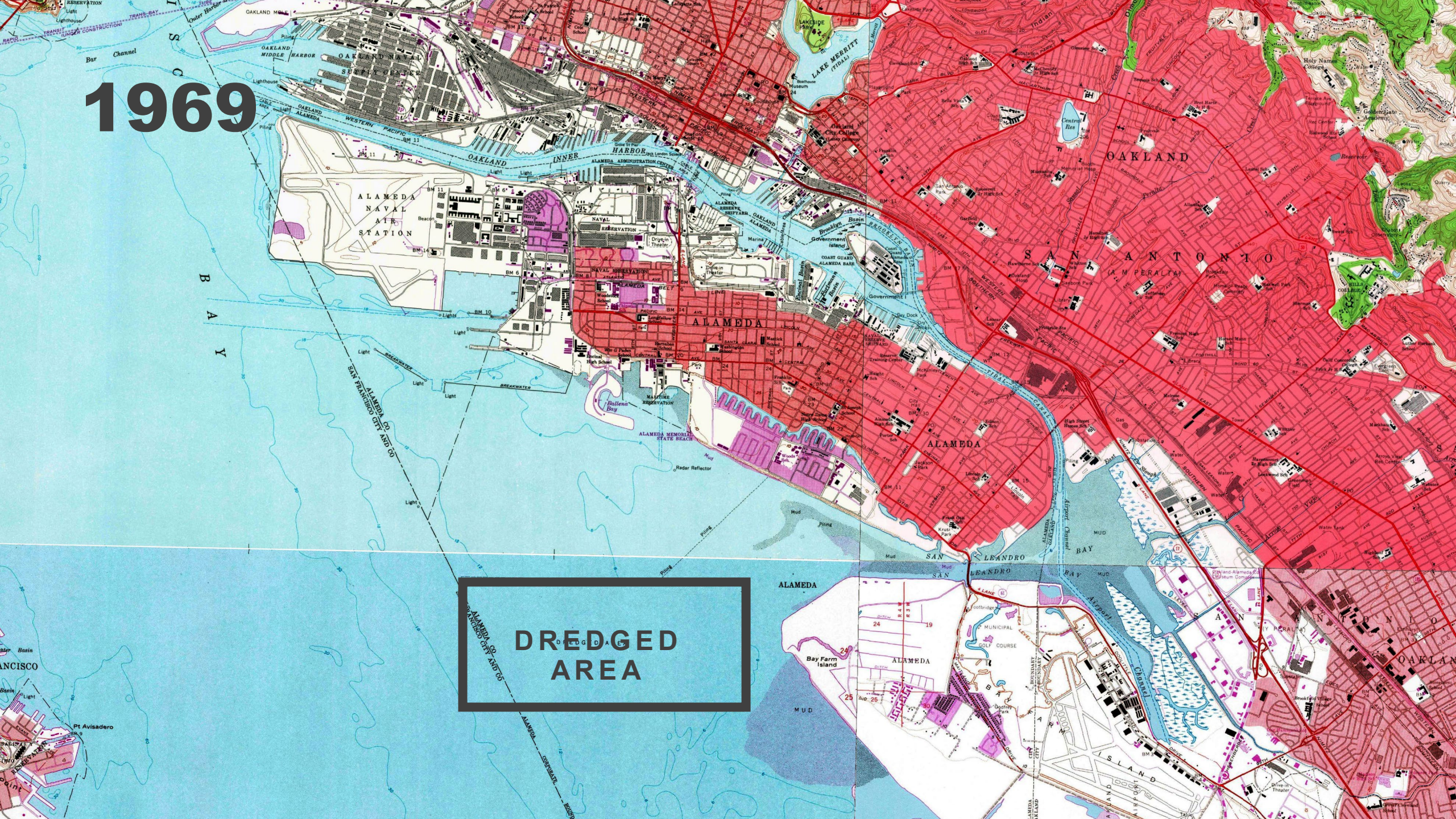
- King Tides Walk with CASA – December 14, 2024 / Crab Cove
- Ninth Root and Sacred Spaces engagement events

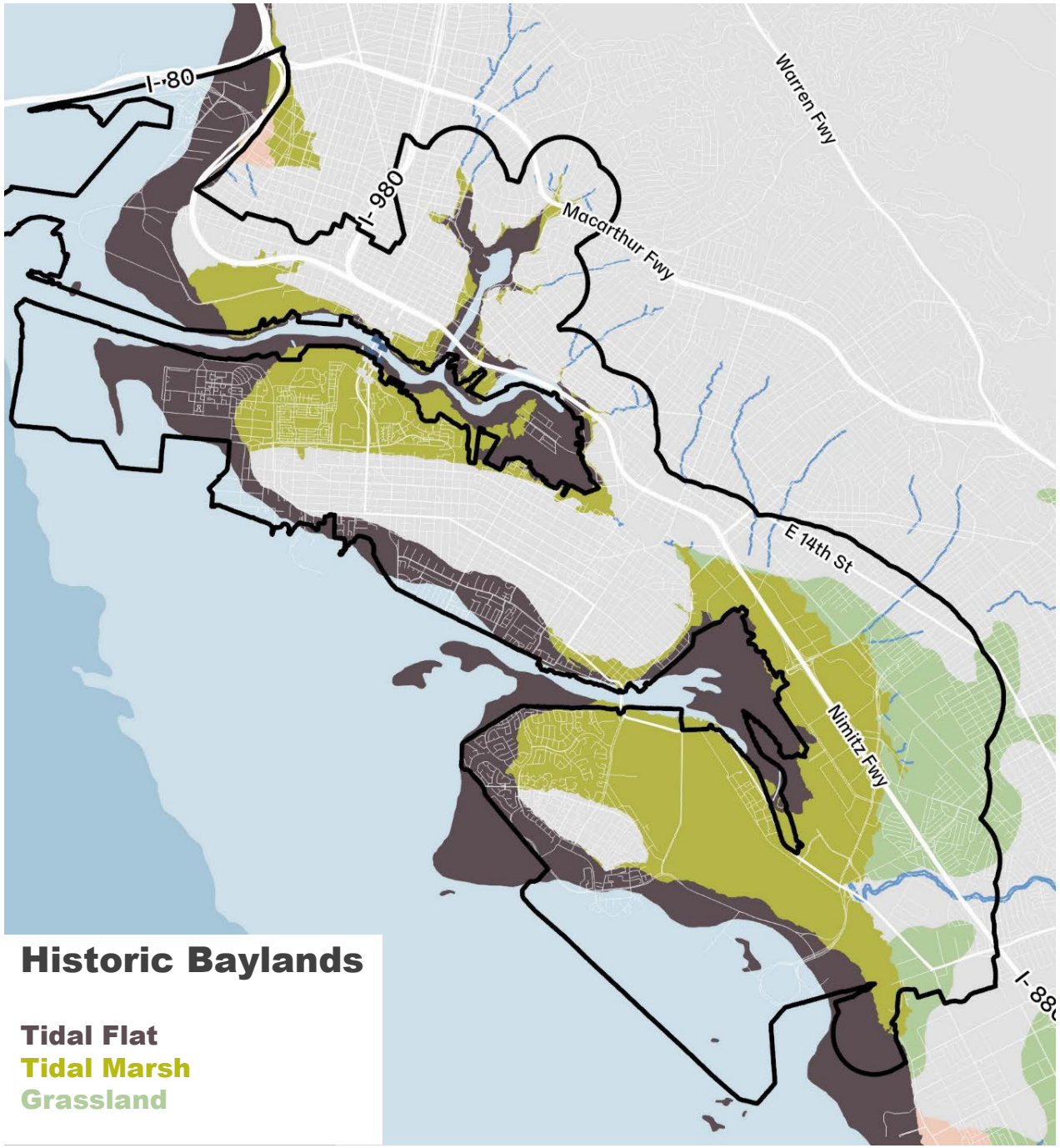
Future OAAC ADAPT Events

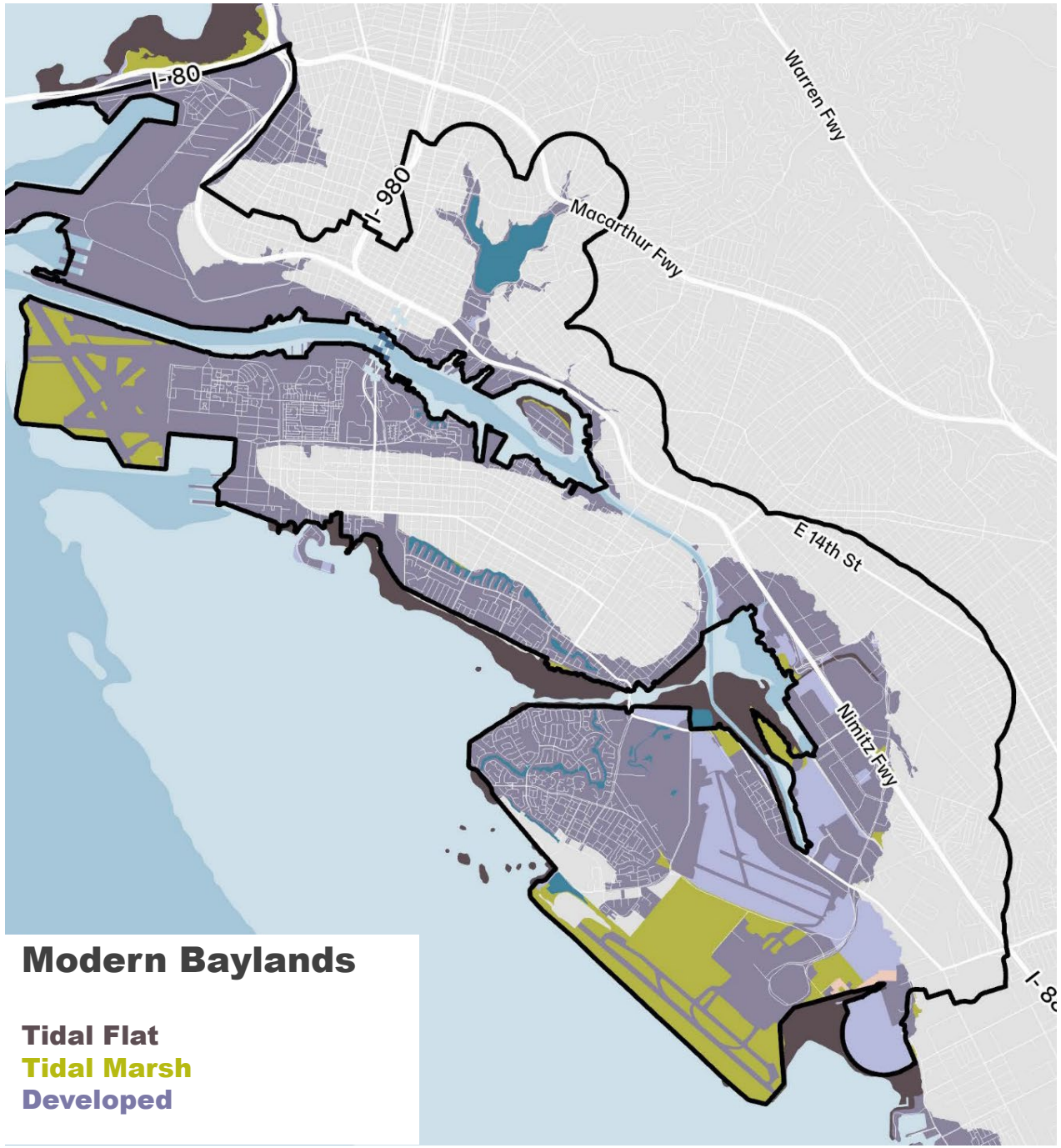
- Join us in Spring 2025 for community workshops on the long-term plan! Check out the OAAC Adapt website for more information: https://www.oaacadapt.org/

Past Change


1895
LIGHT
Gibbon Pt.
LIGHT
Deep Water Channel
S.P.R.R. (NARROW GAUGE)
San Antonio Creek
BOUNDARY LINE
Rincon Pt.
Steamboat Pt.
Mission Rock
Potrero Pt.
Hunter Point
Avisadero Pt.
OAKLAND
Lake Merritt
Indian Gulch
S.P.R.R. (LIVERMORE LINE)
Oakland Harbor
ALAMEDA
Fruitvale
Elmhurst
CALIFORNIA
East Creek
Fitchburg
San Leandro Bay
SAN LEANDRO BAY
Bay Farm Island
SOUTHERN
San Leandro


1969
DREDGED AREA
ALAMEDA
OAKLAND
SAN ANTONIO
ALAMEDA NAVAL AIR STATION
SAN LEANDRO BAY
Bay Farm Island
Pt Avisadero


I-80
I-980
Warren Fwy
Macarthur Fwy
E 14th St
Nimitz Fwy
I-88
Historic Baylands
Tidal Flat
Tidal Marsh
Grassland

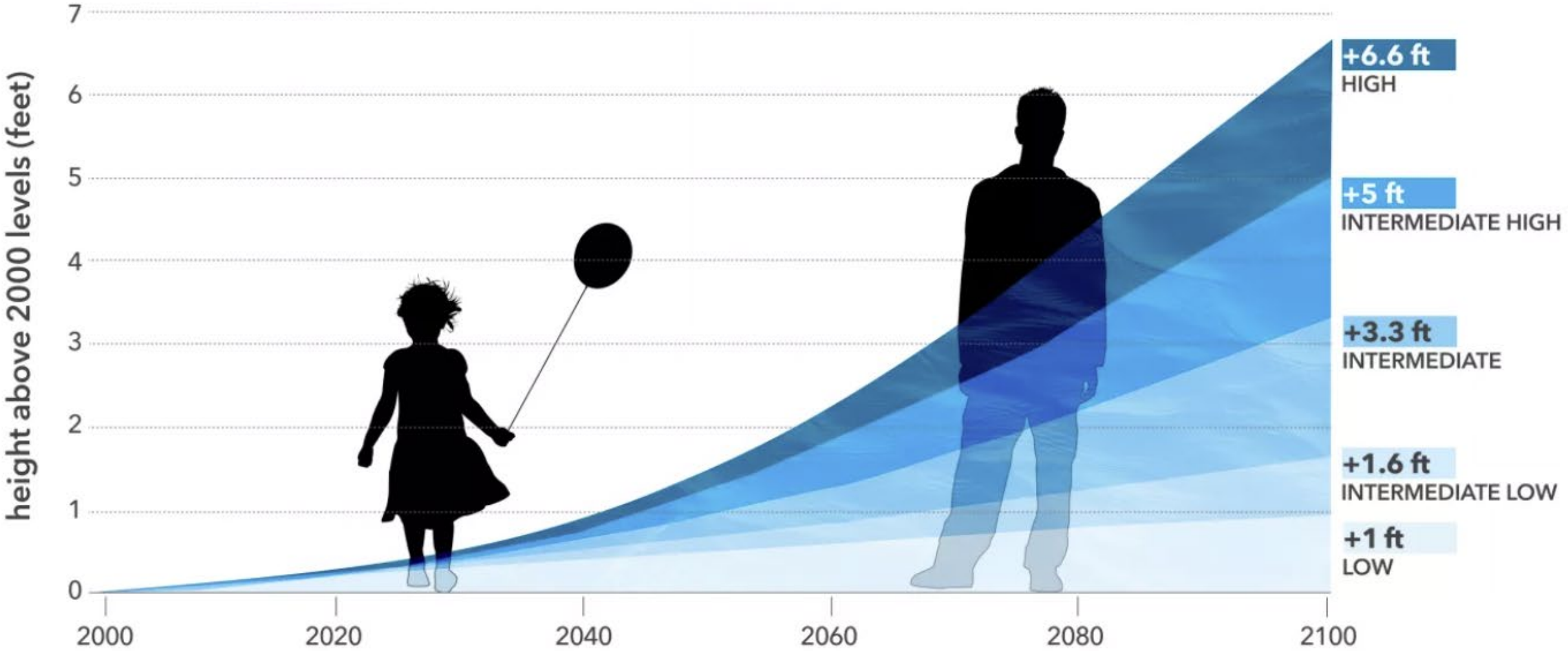

I-80
I-980
Warren Fwy
Macarthur Fwy
E 14th St
Nimitz Fwy
I-8
Modern Baylands
Tidal Flat
Tidal Marsh
Developed

Future Change

Our Climate is Changing

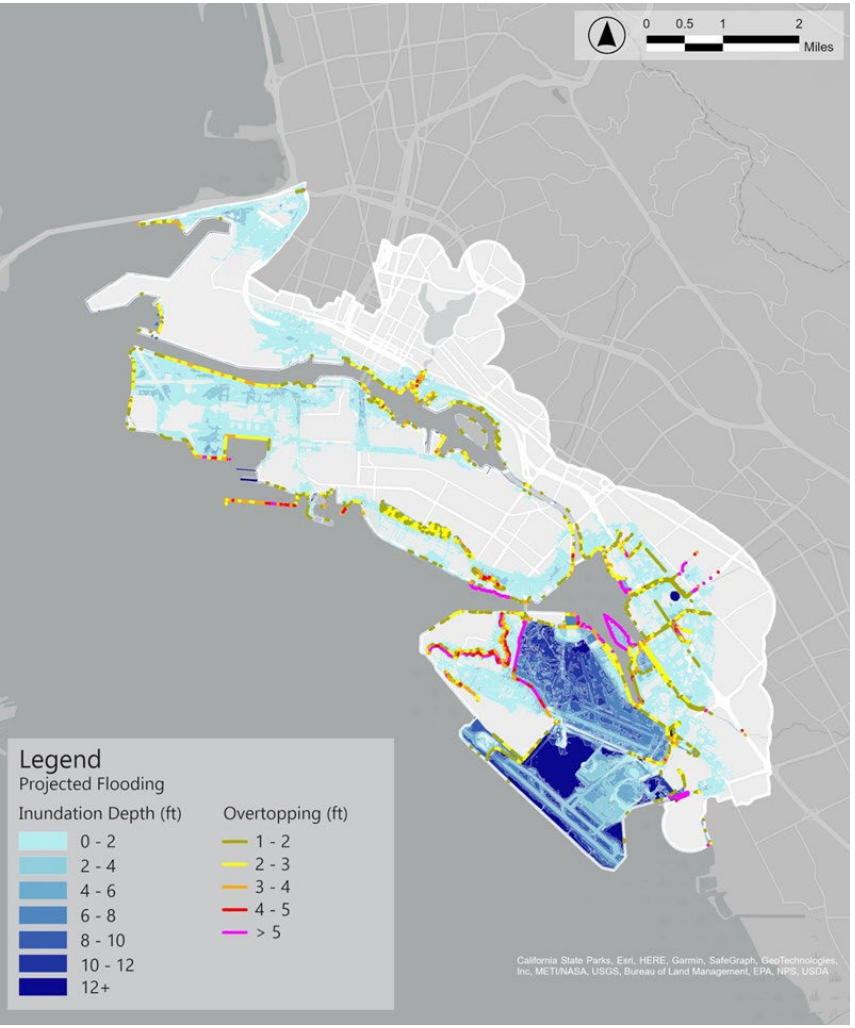
North of the Bay Bridge Touchdown

Projected Global Sea Level Rise to the Year 2100

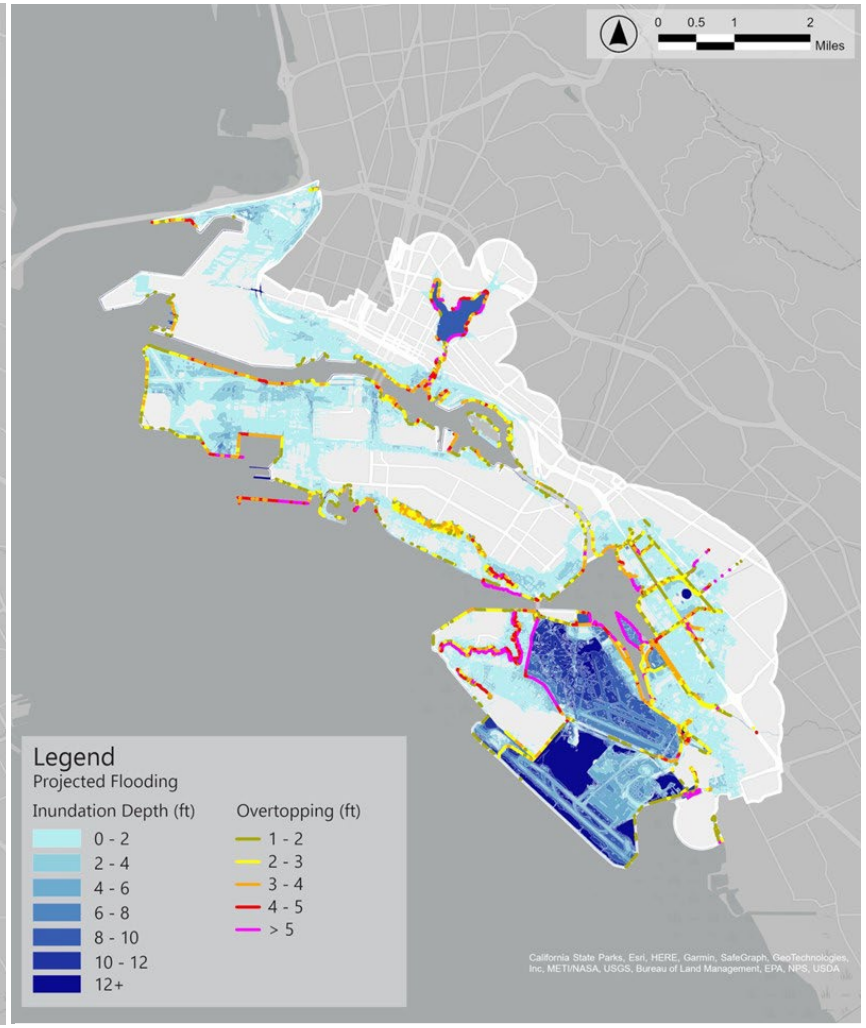


Source: climate.gov

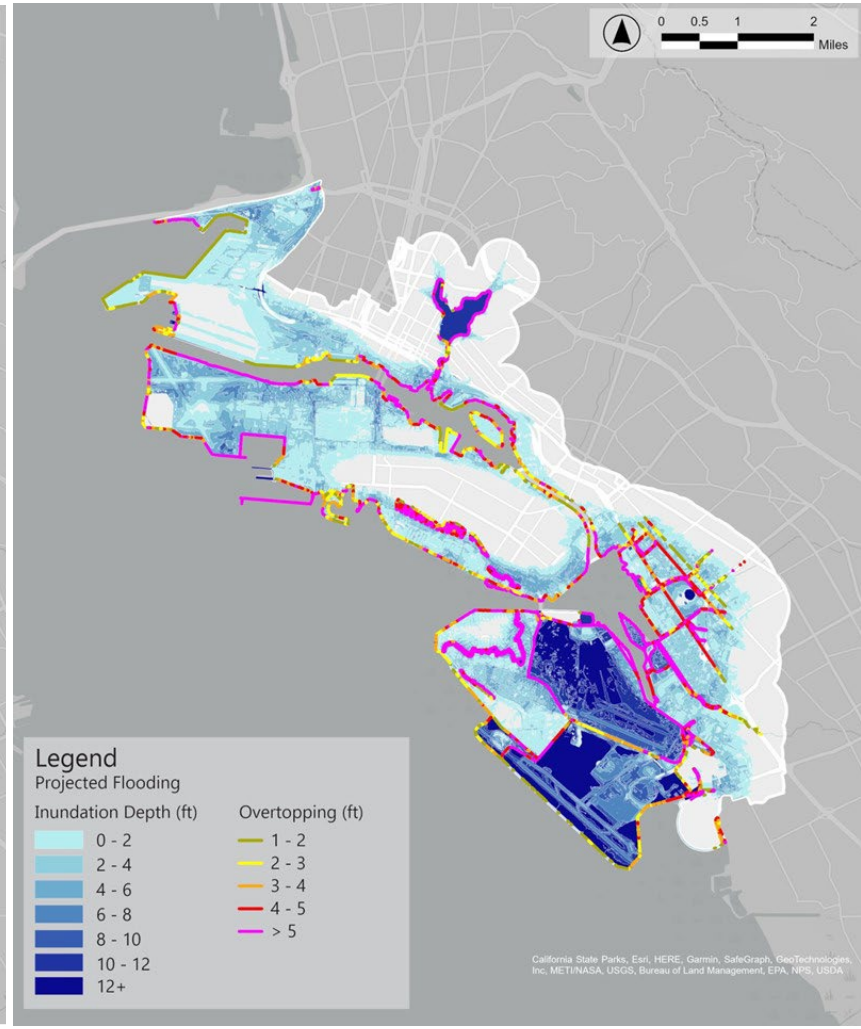
Coastal Flooding



2 ft of sea level rise +
100-year event



3 ft of sea level rise +
100-year event



5½ ft of sea level rise +
100-year event

High tides are already getting higher, groundwater is rising, and rainfall intensity is increasing.

Bay Farm Island near Veterans Court and the Harbor Bay Club

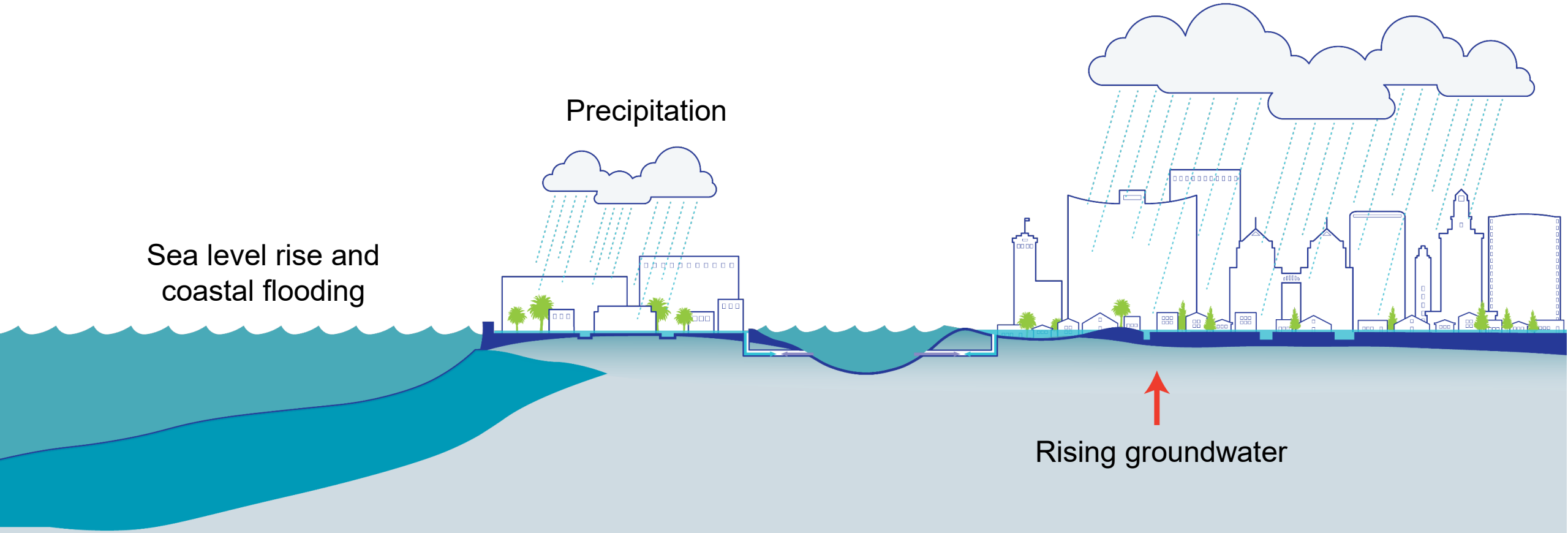
Embarcadero West Bridge over Lake Merritt Channel

Fernside Road, Alameda (Jan 1, 2023)

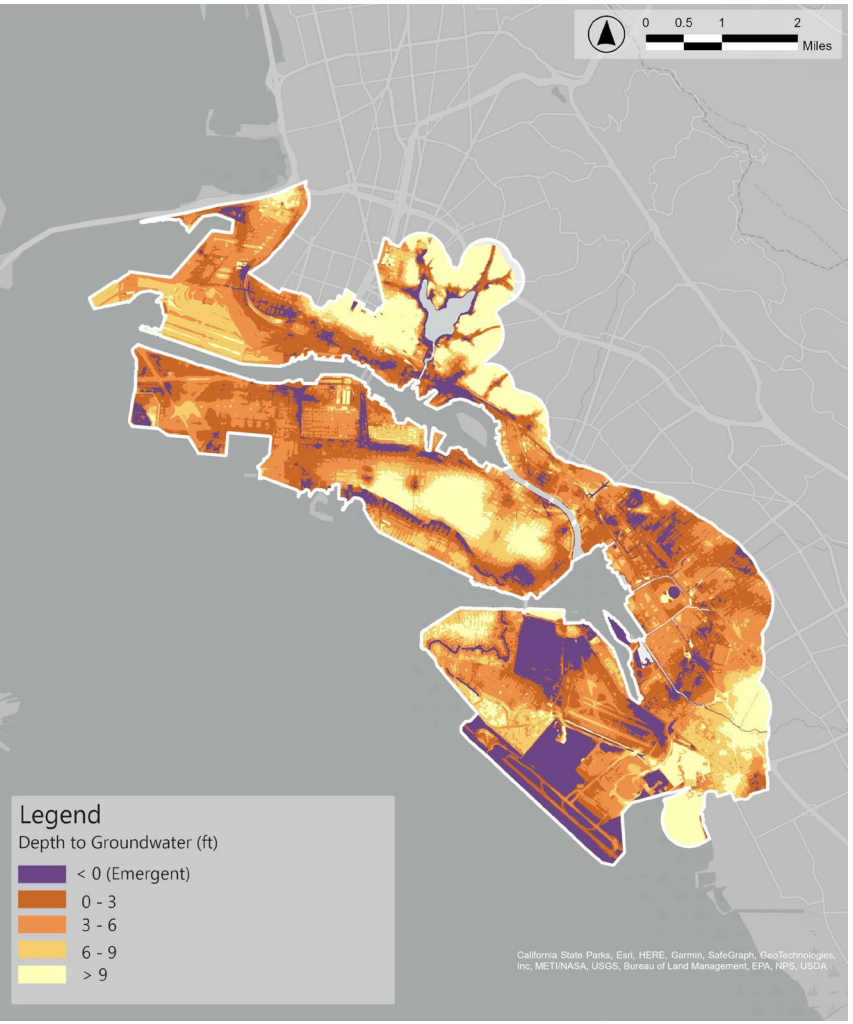
Sea View Park, Bay Farm Island

Low-lying coastal areas built on fill are at the greatest risk.

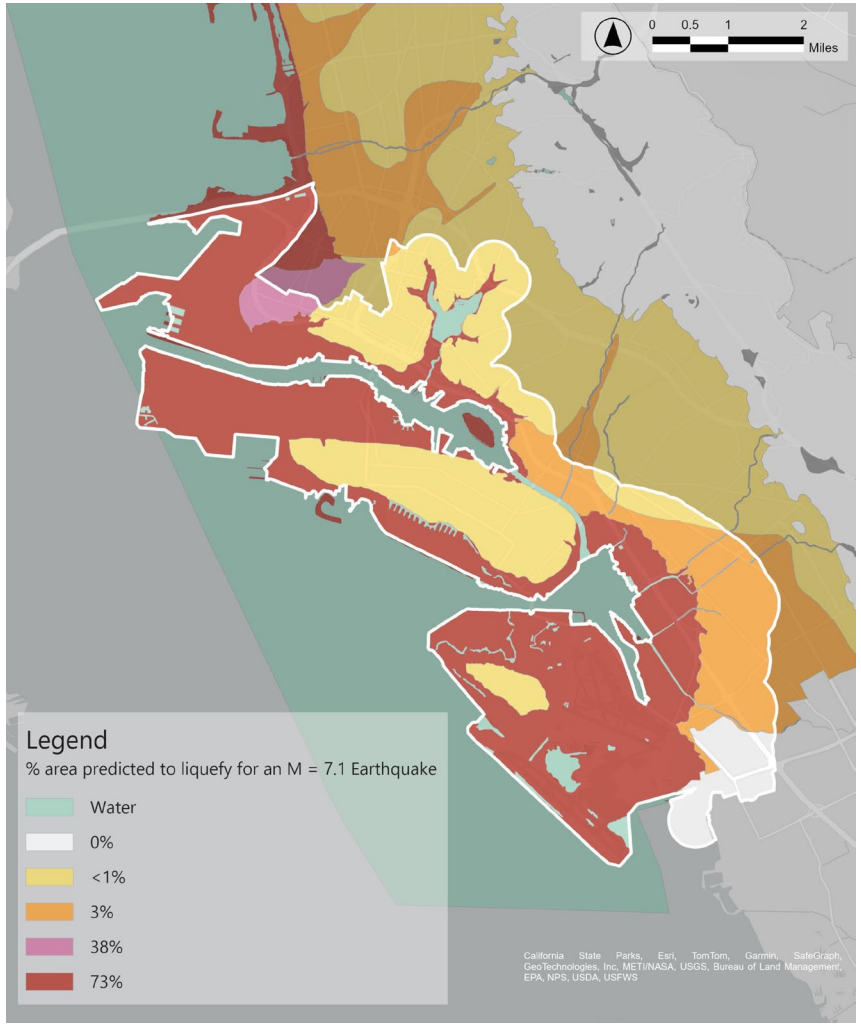
Combined Flooding:
A complex problem for adaptation



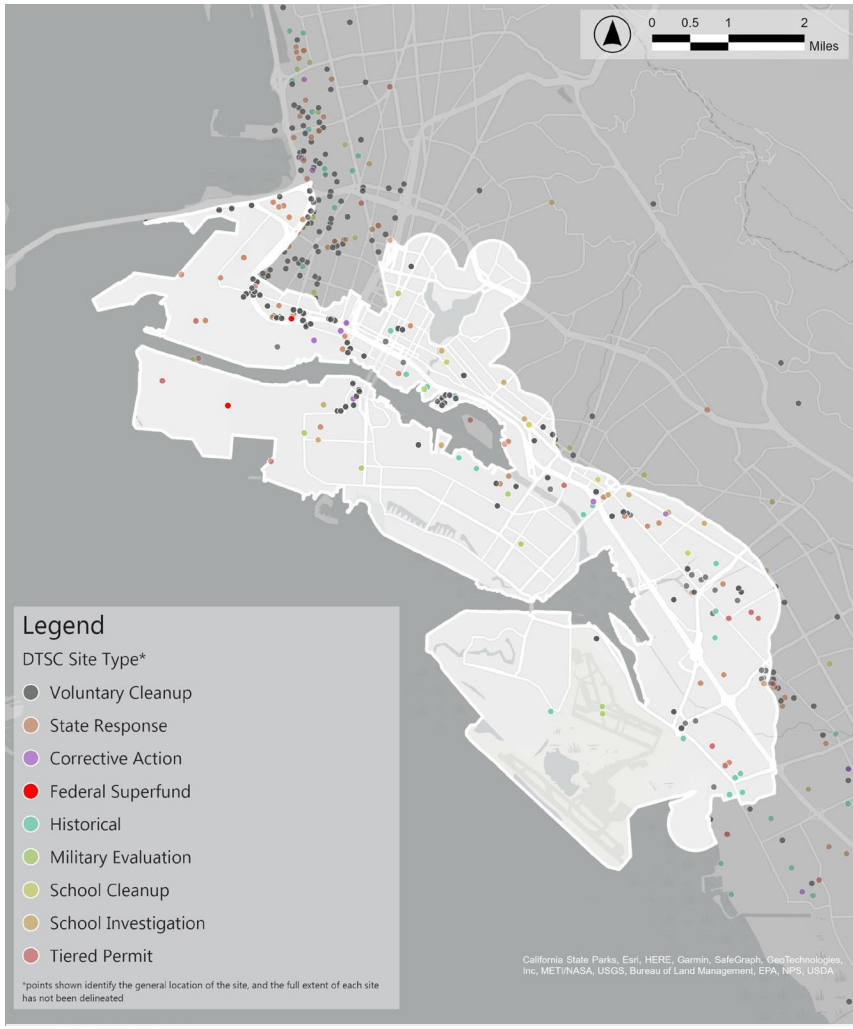
Rising Groundwater, Liquefaction, Contamination



Depth to Groundwater with 3 ft of Sea Level Rise



Liquefaction



Potentially Contaminated Sites (DTSC)

Sea Level Rise Project Criteria

Near Term

2060 - 2080
35 to 50-year adaptation project lifespan

2' of sea level rise

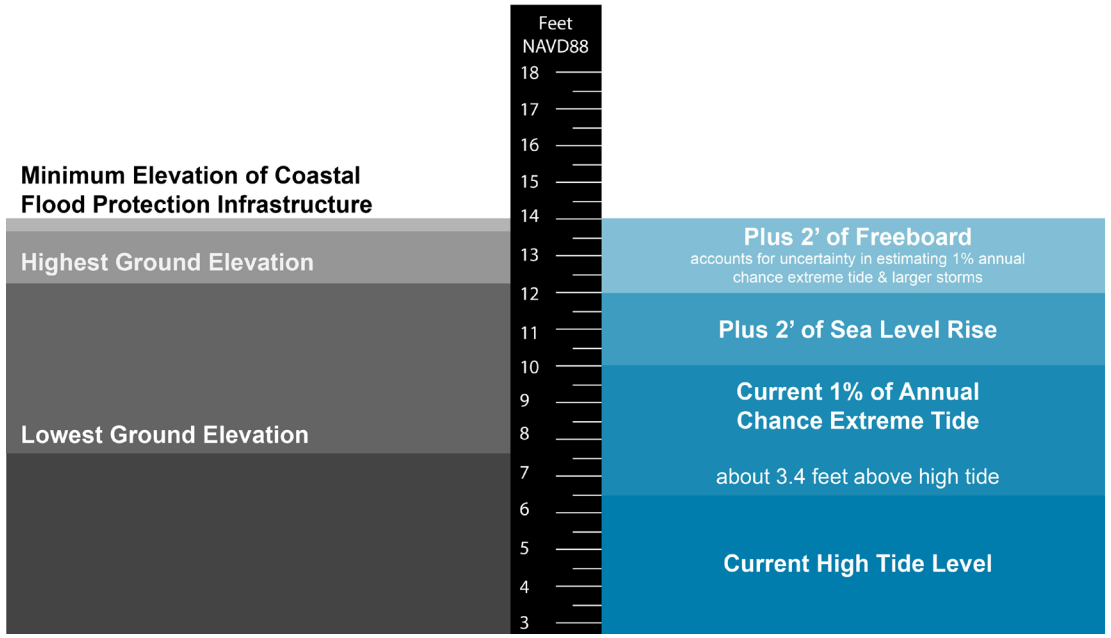
Protect to elevation +14’

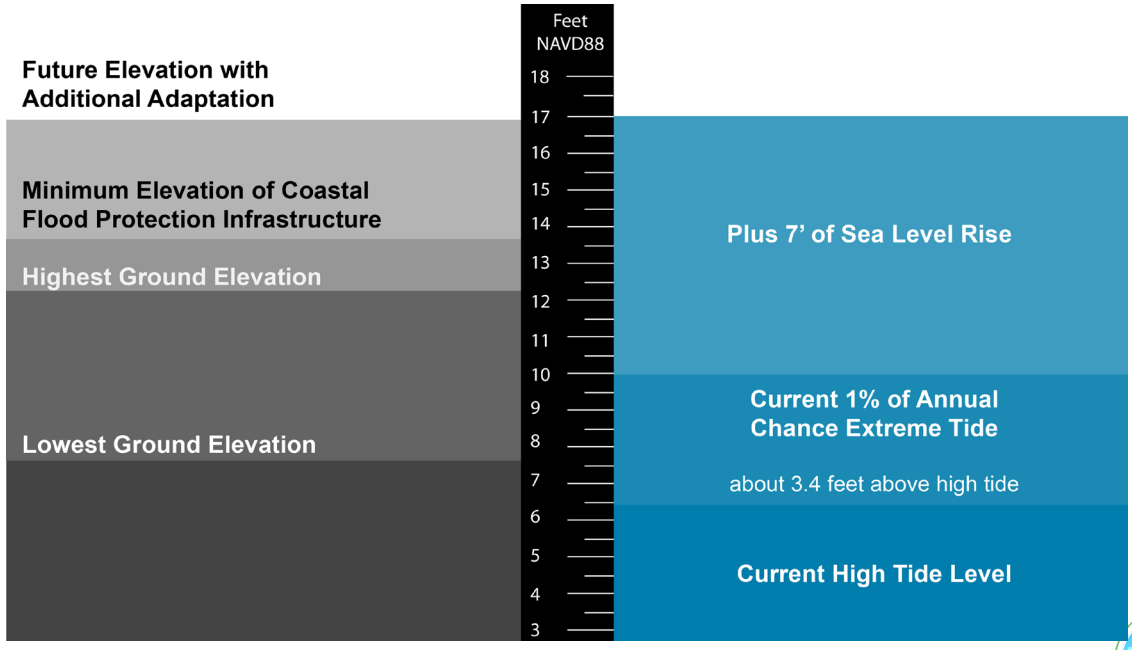
Long Term

2100+
Build upon near term projects

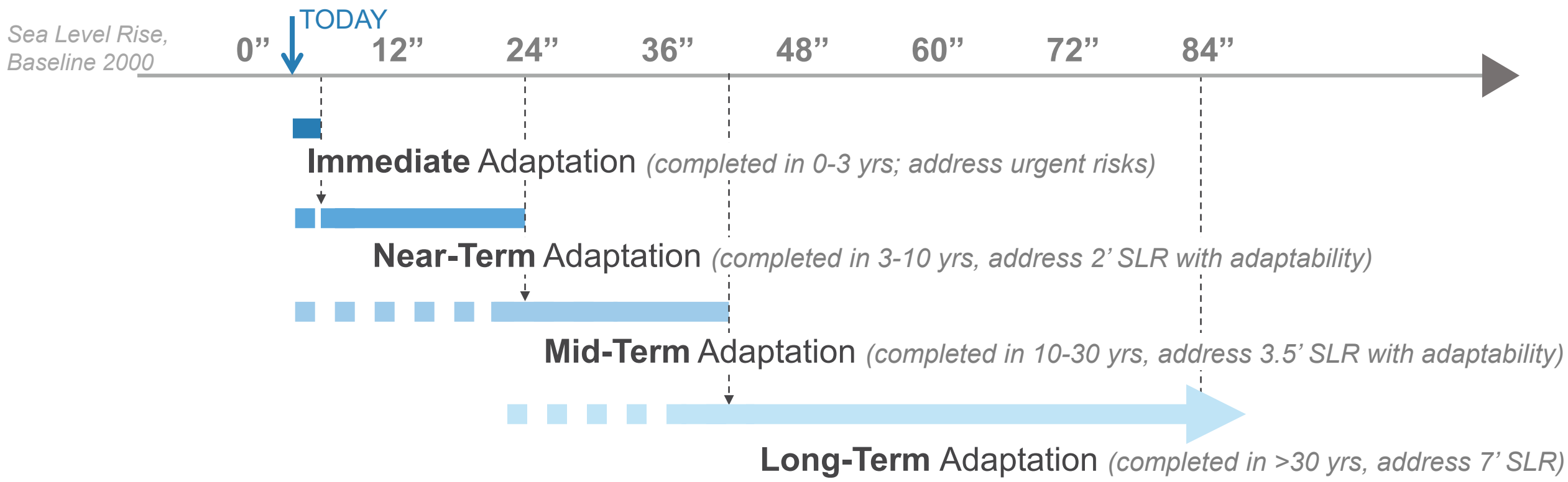
3.5 - 7' of sea level rise

Protect to elevation +17’



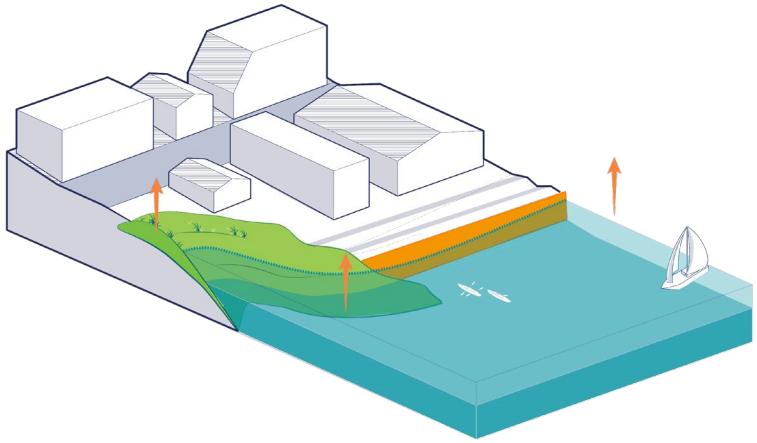


WHEN do we need to act – in terms of sea level rise?

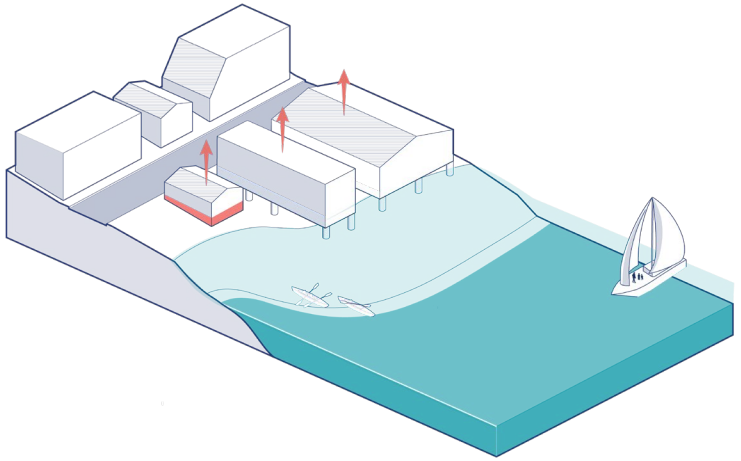


What Can We Do?

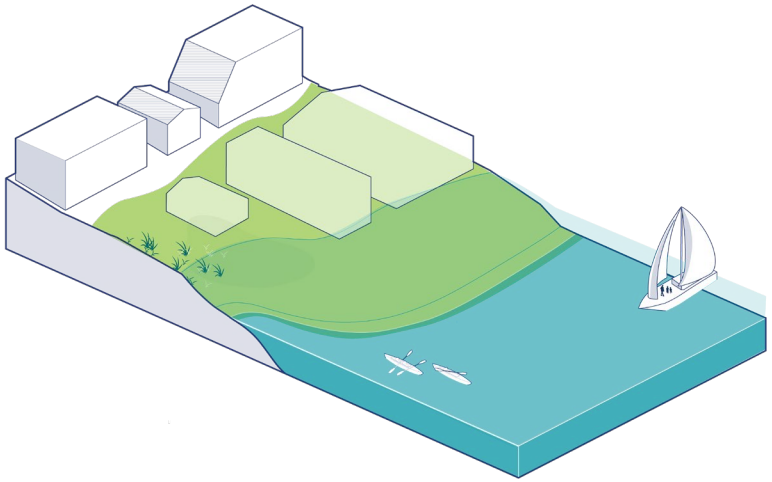
Adaptation Approaches



Protect: Elevate the shoreline to keep the coastal water out

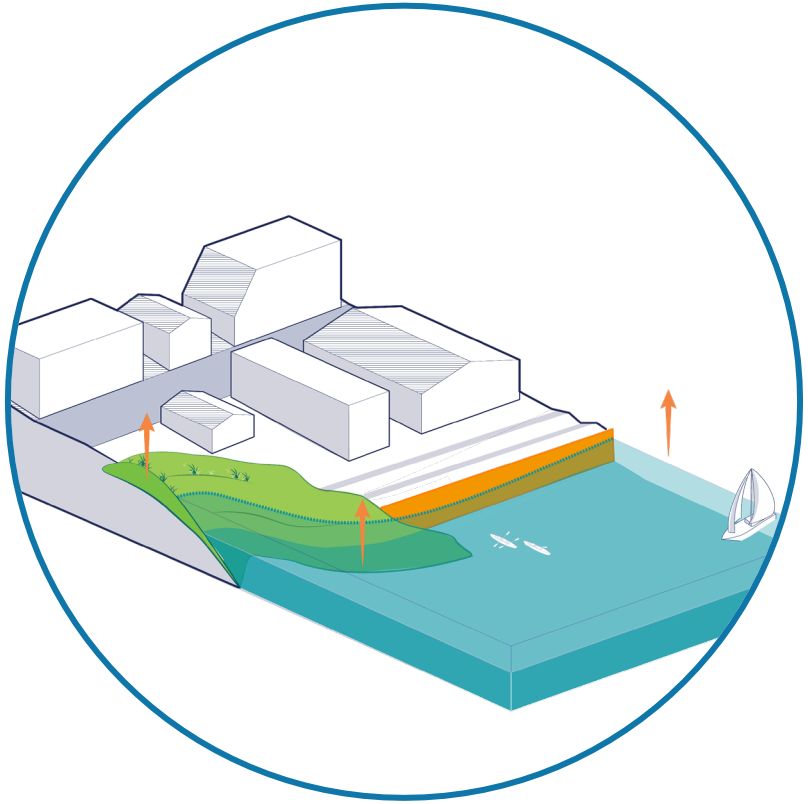


Accommodate: Let coastal water in, adapt buildings and infrastructure (elevate or flood proof)



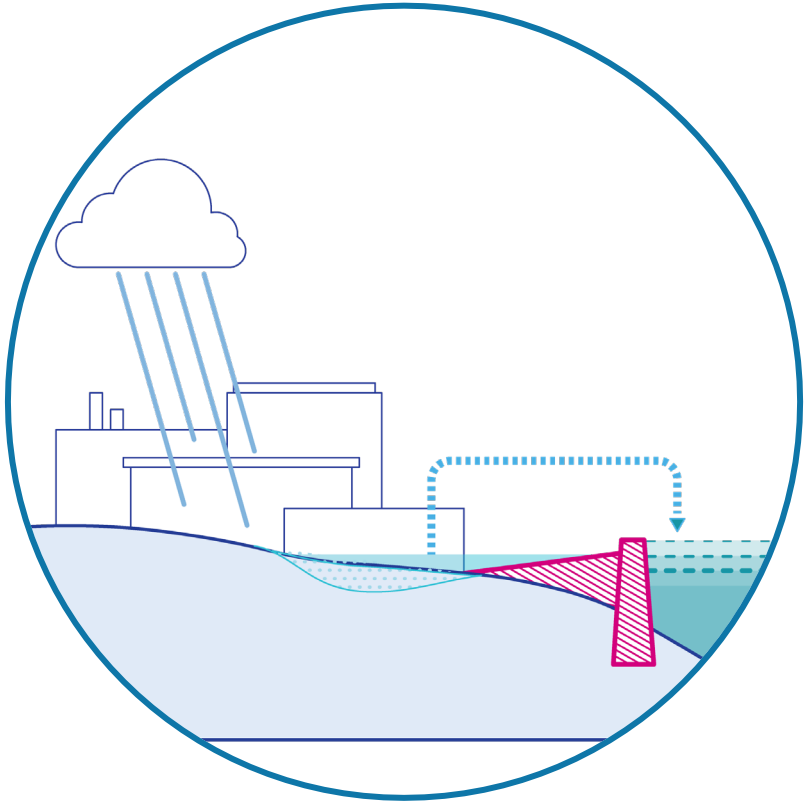
Retreat or Avoid: Move out of the area over time

Combined Adaptation



Shoreline elevation to prevent coastal flooding from sea level rise and storm surges

+



Inland adaptation (green and grey infrastructure) to manage stormwater and groundwater

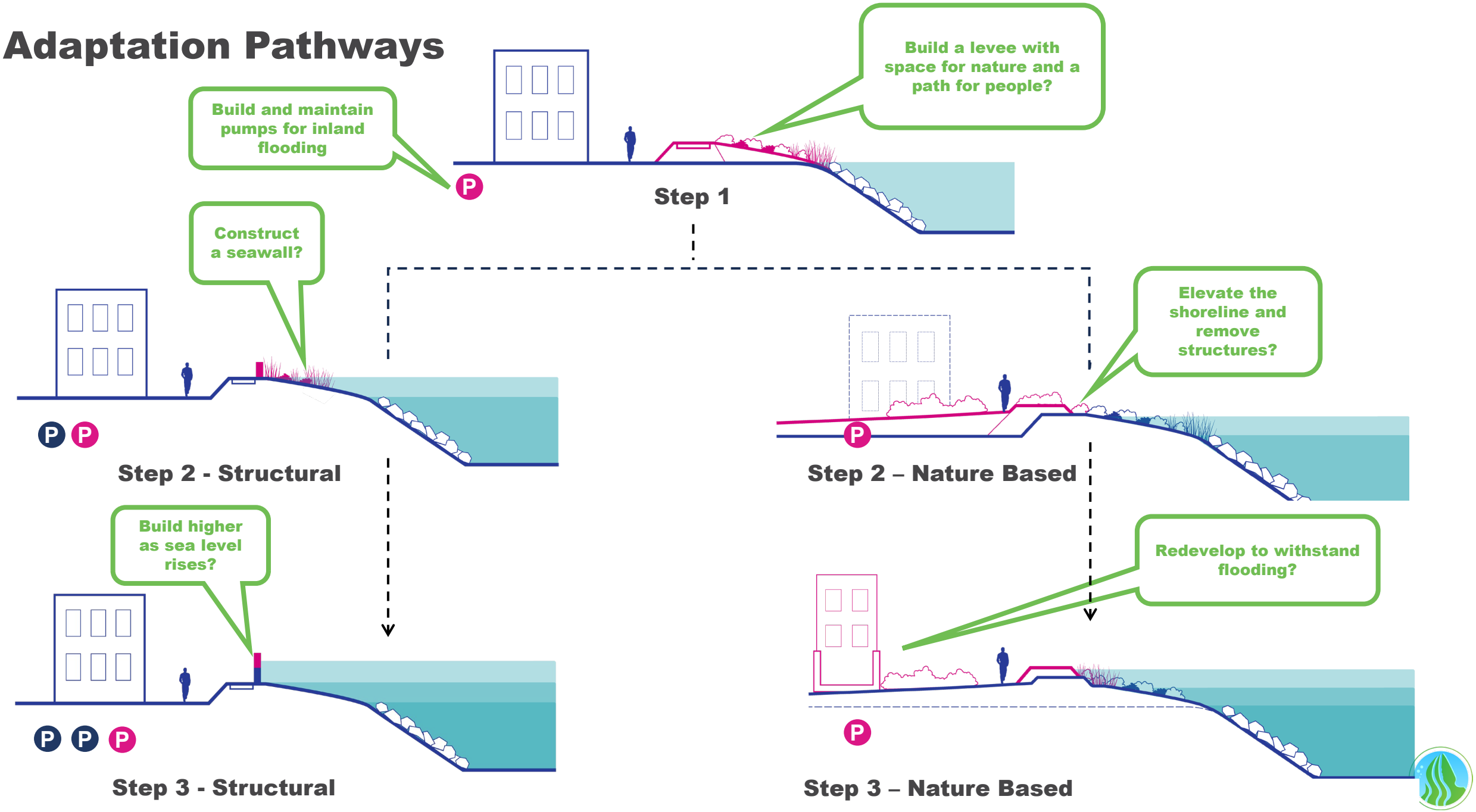
How open are we to people and places changing?

Resistance — Transformation

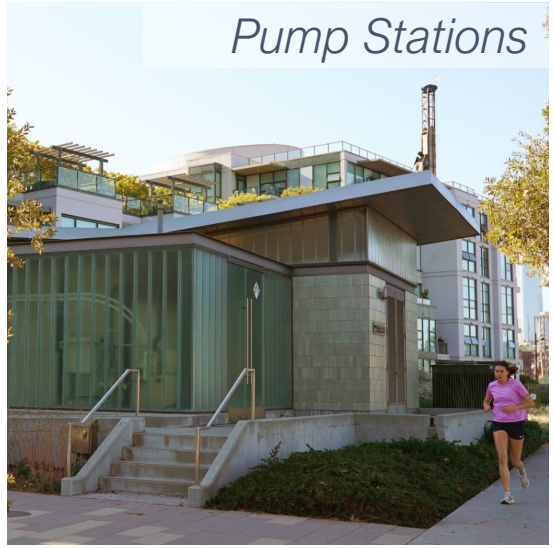
“We cannot solve our problems with the same thinking we used when we created them.”

Often attributed to Albert Einstein (no direct source)

Adaptation Pathways



Potential Adaptation Measures



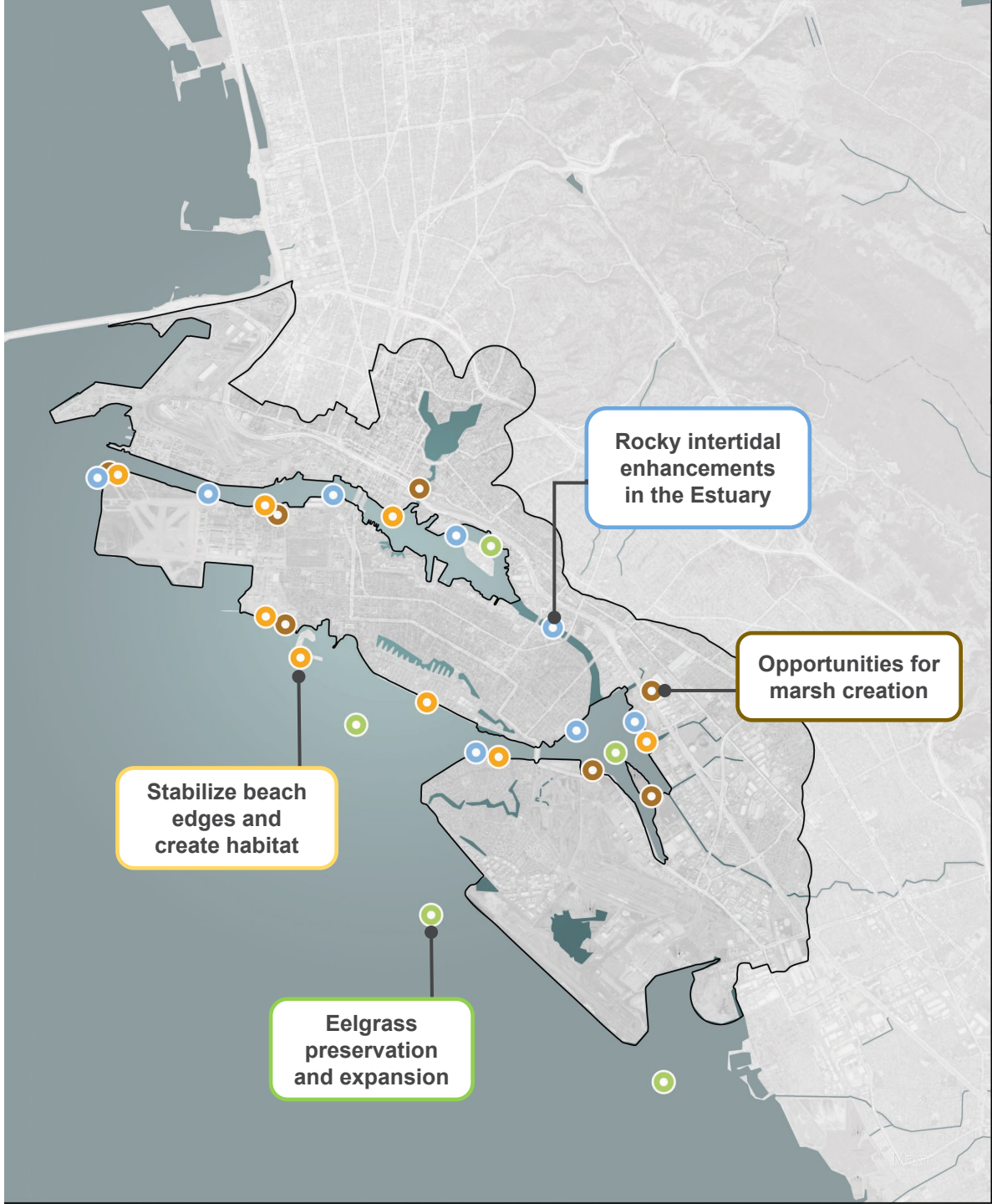
Opportunities to Grow Ecological Health & Habitat

Building on existing and historical habitat conditions in the near term

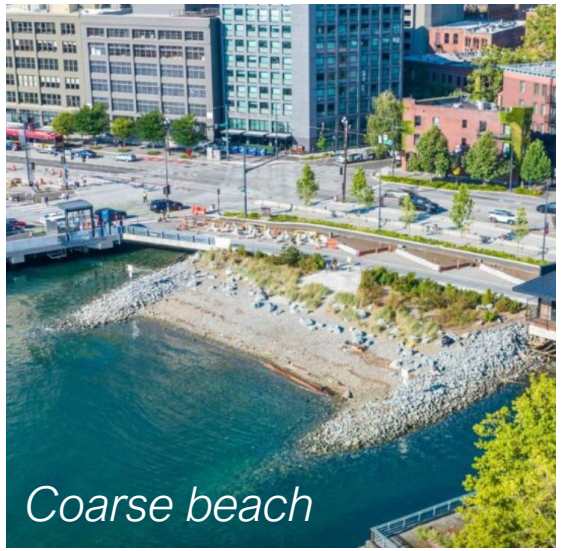
- Marsh and uplands transitions including marsh construction and preservation of existing marsh edge
- Beach stabilization and habitat improvements
- Eelgrass preservation and expansion
- Rocky intertidal enhancements such as living seawalls, enhanced riprap planting, tidepool and oyster bed creation

Existing eroding marsh edge along north shore of Bay Farm Island

Sand beach and debris preserving marsh edge and pond habitats within Elsie Roemer preserve.

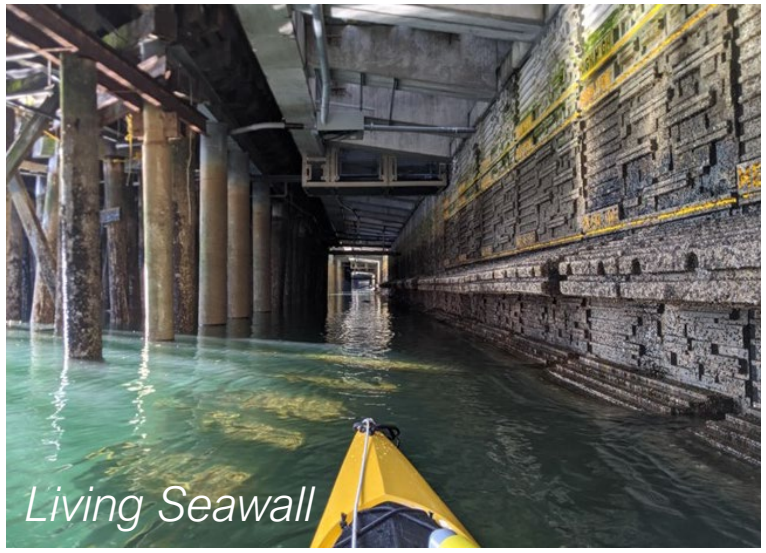


Natural & Nature-Based Features


Coarse beach


Gravel Beach and Rocky Intertidal Habitat


Cobble Marsh


Living Seawall


Habitat Panels


Rock and Log Groynes and Beach Protection

Q&A

Add your questions to the chat!

Bay Farm Island
Existing Conditions

Near-Term Project Area

NORTHERN SHORELINE	LAGOON OUTFALL	VETERANS COURT

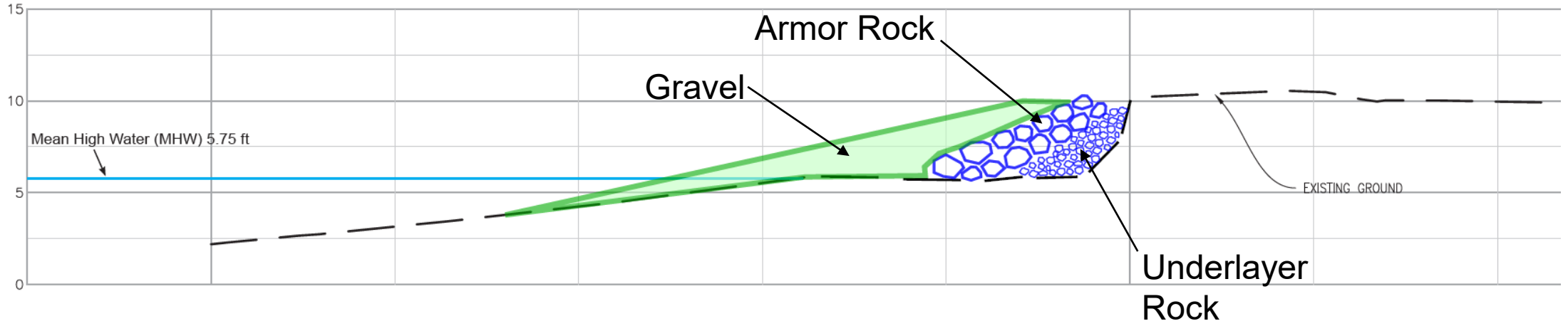
Erosion Hot Spots

Immediate Term Shoreline Protection

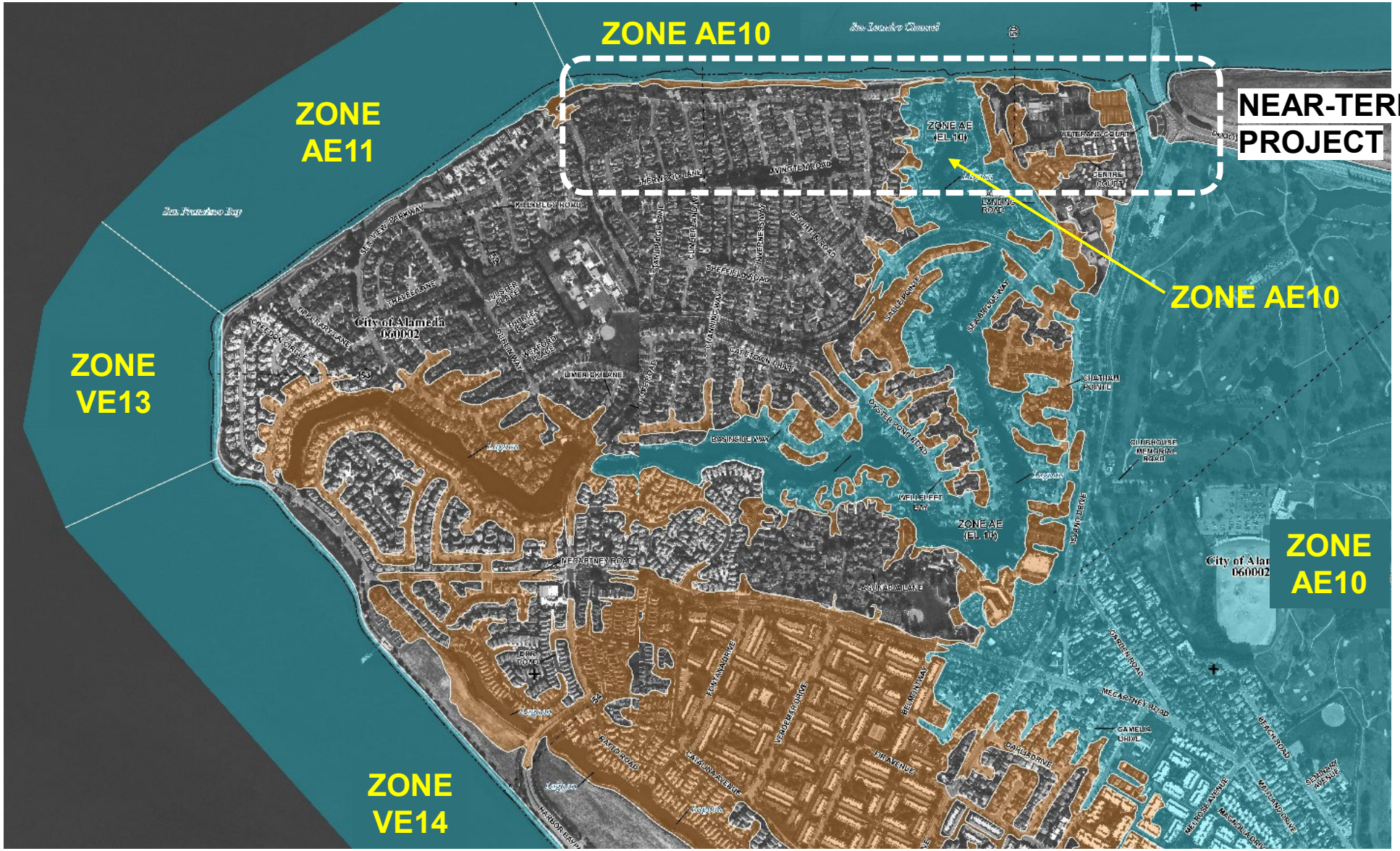
Temporary Soft Armor Option – Large (1 cubic yard) Sandbags in lieu of armor rock

- Temporary soft armor to be replaced with permanent armor rock as part of the Near-Term Project.
- Sandbags conform to existing ground – minimal site preparation required.
- Sandbags can be removed entirely or cut open to allow sand to remain.

Immediate Term Shoreline Protection



Current Flood Conditions



Project Reaches: Lagoon Outfall & Veterans Court

King Tide: November 15, 2024

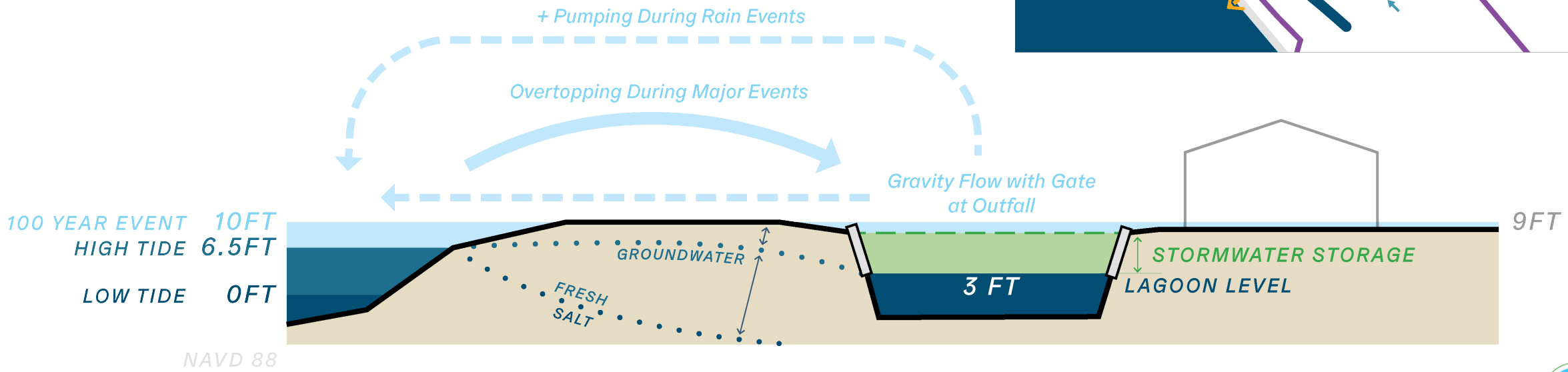
Flooding Today at Veterans Court

Photos: City of Alameda

Lagoon Outfall Reach

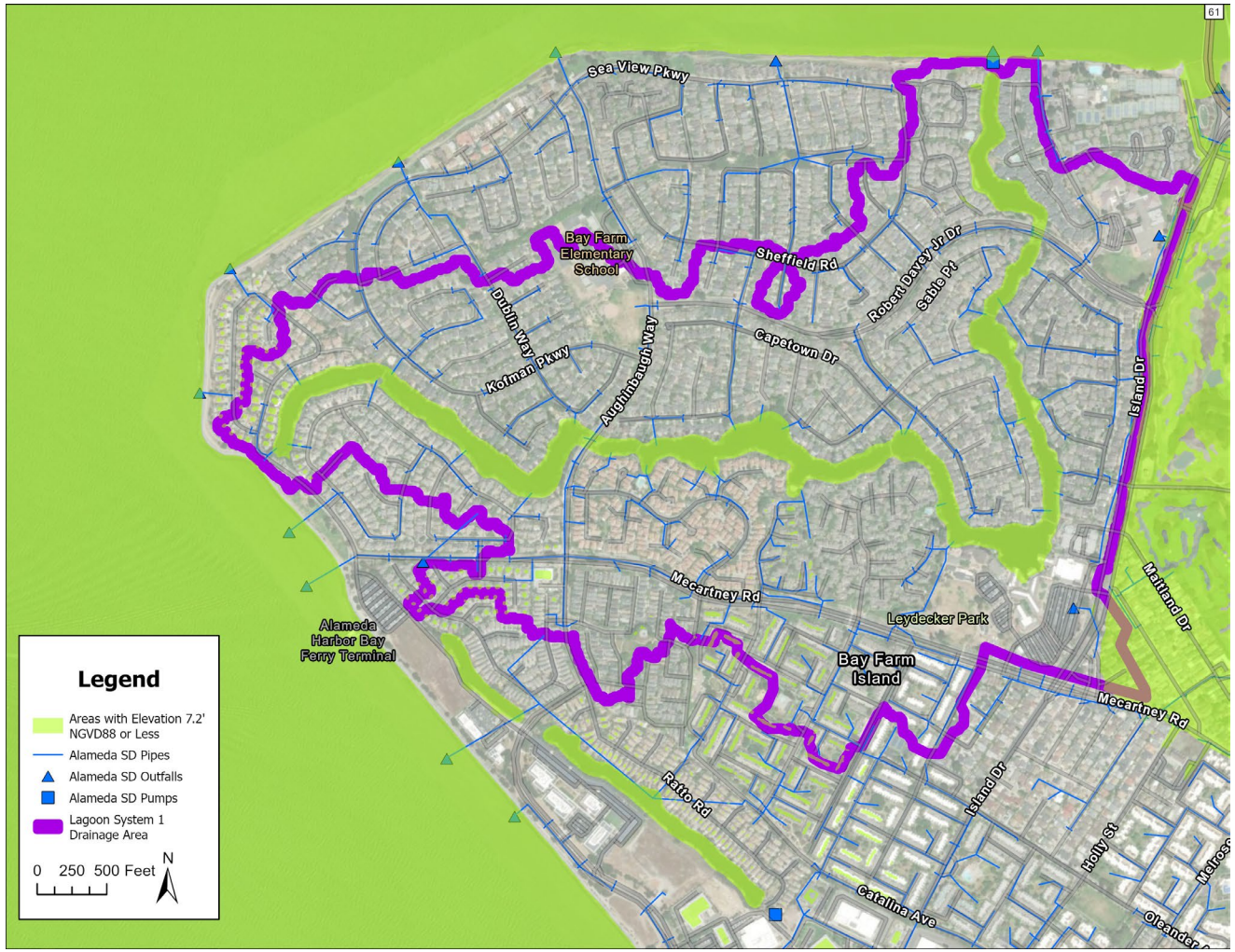
Existing Storm Drain System

- Management for water quality & quantity
- Privately-owned – partnership between HOA & City
- Managed by City
- Lagoon outfall is operated by gravity flow with a gate
- Augmented by a pump system
- Try to maintain at 2.6’ – observed at a location
- Automatic operation per water level sensor
- Requires proactive decision to draw down in advance of storm
- No backup power



Lagoon Capacity

Lagoon has capacity for all runoff generated in lagoon sub-basin by 100-yr, 24hr storm



Lagoon baseline elevation: 3.11’ (pumped)

Volume of water generated by 100-yr, 24-hr storm: 198 acre-feet

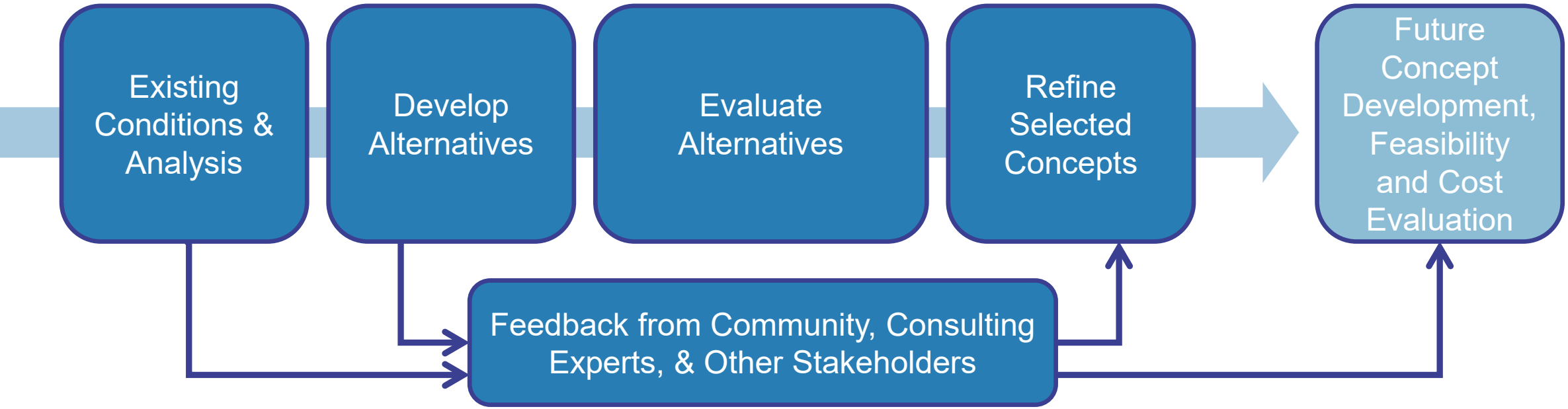
Lagoon elevation at peak of storm (no pumping): 7.2’

Lagoon maximum elevation: 8.4’

(NAVD88)

Developing & Evaluating Alternatives

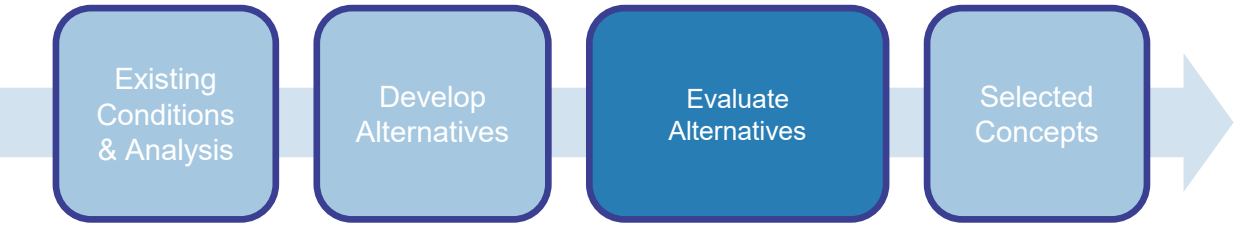
Developing Alternatives into Design Concepts



Existing Conditions & Analysis | Develop Alternatives | **Evaluate Alternatives** | Selected Concepts

The Alternatives were assessed relative to the Project Planning Principles

- Pathways Approach
- Community Health & Wellbeing
- Critical Infrastructure & Services
- Housing, Development, & Land Use
- Multi-benefit
- Governance, Collaboration, & Finance
- Public Access, Recreation, & Urban Design
- Transportation & Transit
- Groundwater & Shoreline Contamination
- Equity & Environmental Justice
- Ecosystem Health & Resilience



The Alternatives were assessed relative to each other using the Primary Evaluation Criteria developed by the project consultants, community members and agency partners

COASTAL FLOOD PROTECTION: Does the Measure provide FEMA Accredited Coastal Flood Protection

ENVIRONMENTAL IMPACT: What is the Relative Value of the Environmental Impact of the Measure

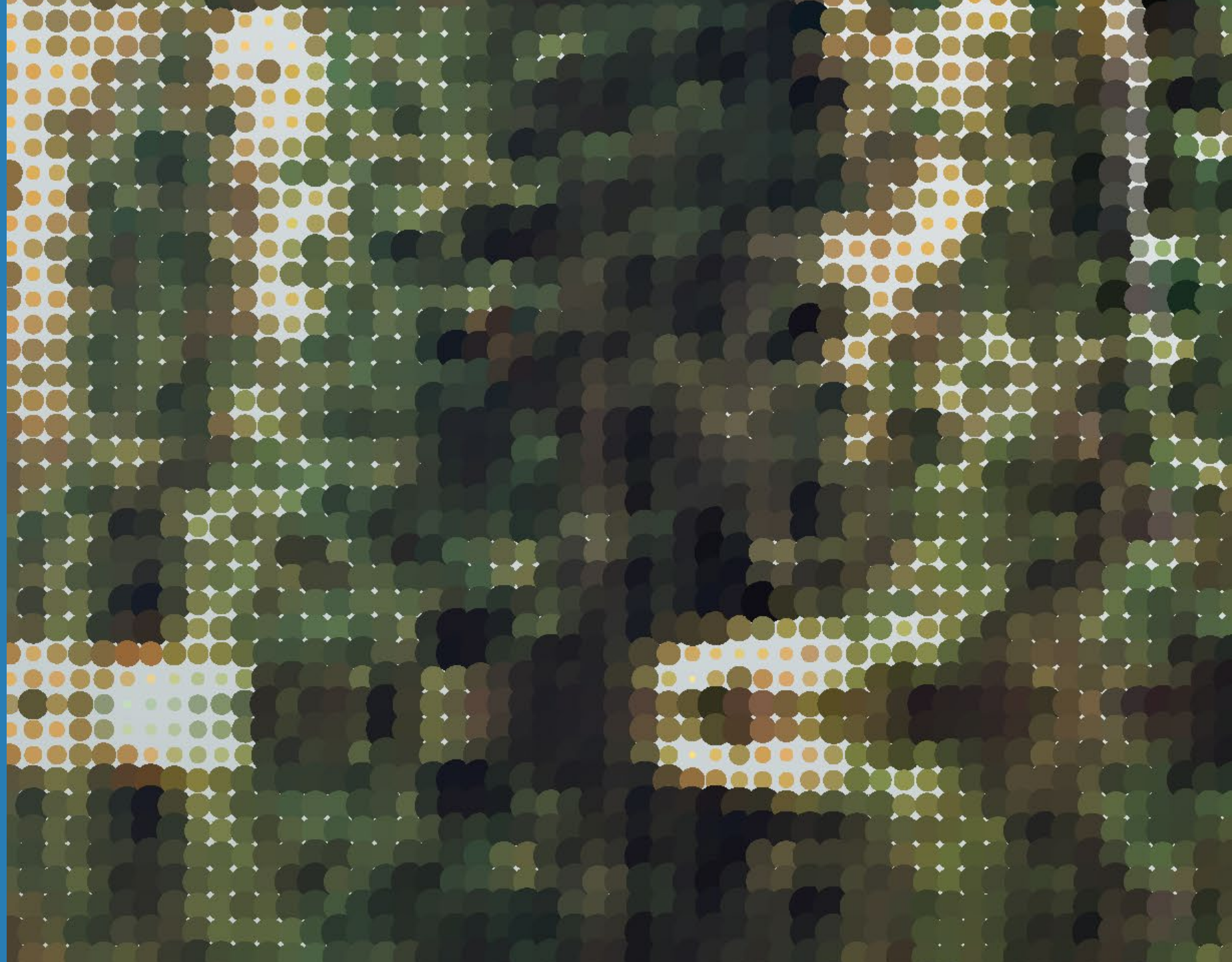
ADAPTABILITY: Is the Measure Adaptable in the future for Long-Term Flood Protection? (Elev. 17 or greater)

COST: What is the Cost of the Measure Relative to other Measures

PUBLIC REALM: What is the Relative Quality Public Access and Public Space Provided by the Measure

TIMELINE: Can the measure be implemented (within 10 years)

Preferred Adaptation Alternative Development



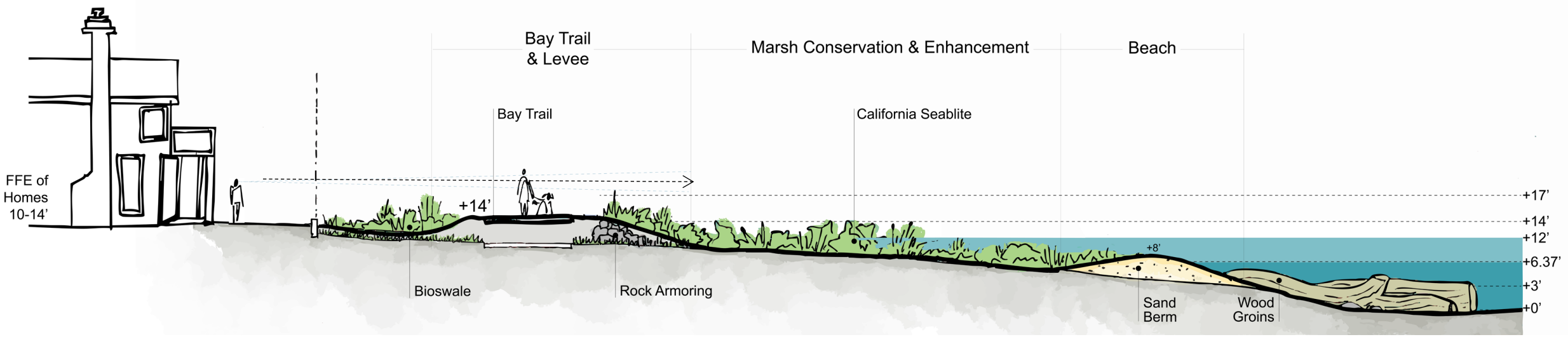
Preferred Near-Term Alternative

- Levee improvements from lagoon outfall to Veterans Court
- Lagoon management: Tide gate & pump station replacement
- Storm drain system modifications to remove penetrations
- Nature-based solutions

Nature-Based Solutions | Levee & Floodwall & Nature-Based Solutions

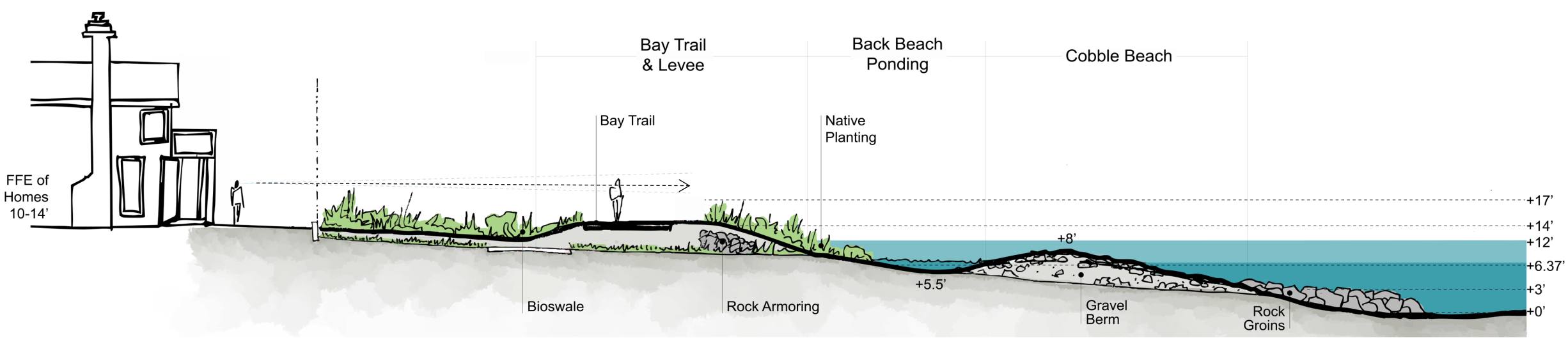
1. Adaptation Alternative - Lagoon Outfall to Veterans Court

Levee, Bay Trail & Marsh Creation



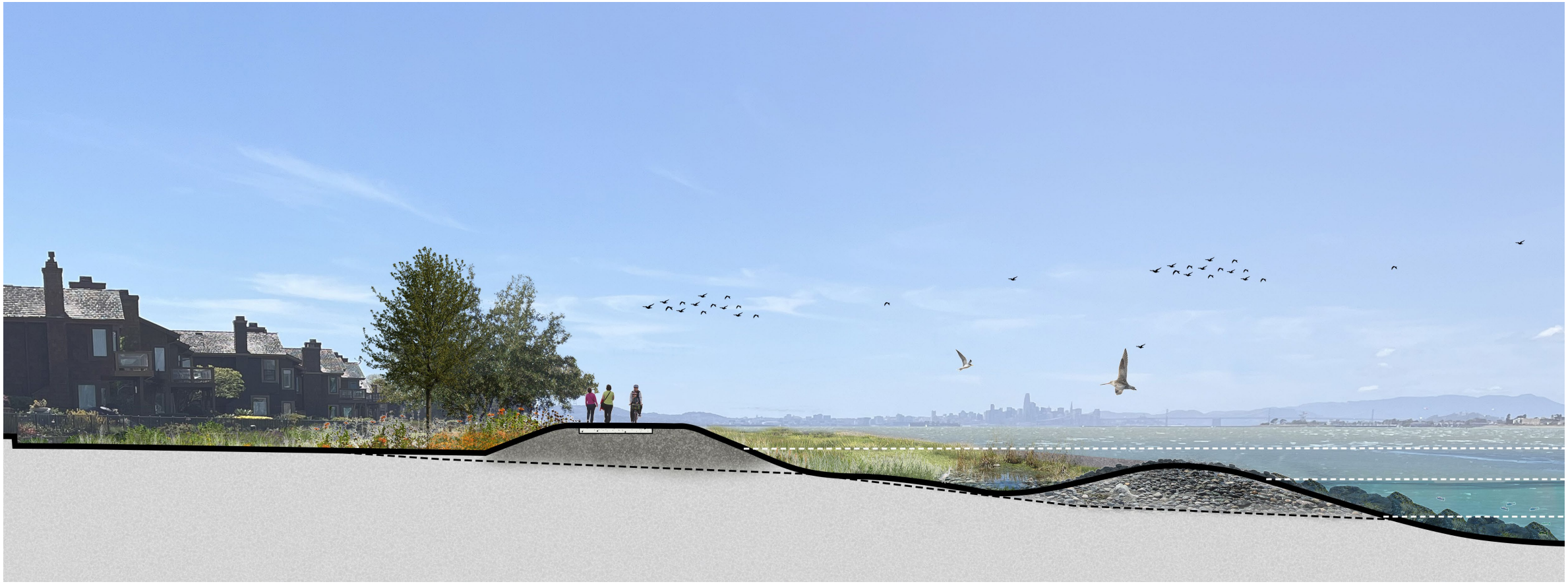
- Levee – 12' Bay Trail, 18' crest, 3:1 side slope
- Inland bioswale
- Native planting, marsh conservation & enhancement – restoration of California Seablite
- Sand beach
- Wood groins

Levee, Bay Trail, NBS & Inland Stormwater Management



- Levee & Bay trail meander between properties & water
  - Offset from properties, not in water past MHHW
- Back beach ponding
- Gravel beach
- Rock groins at 10:1

Levee, Bay Trail, NBS & Inland Stormwater Management



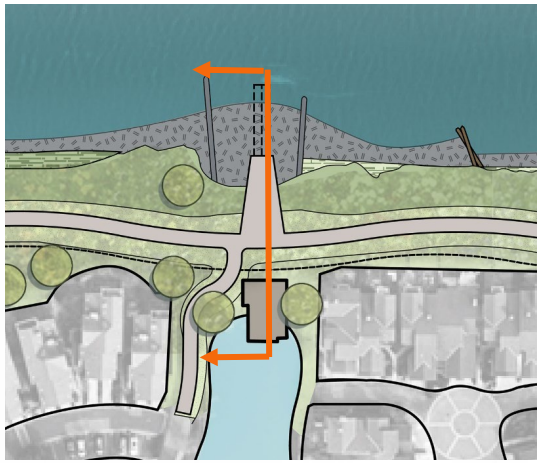
Perspective View of Typical Bay Trail condition

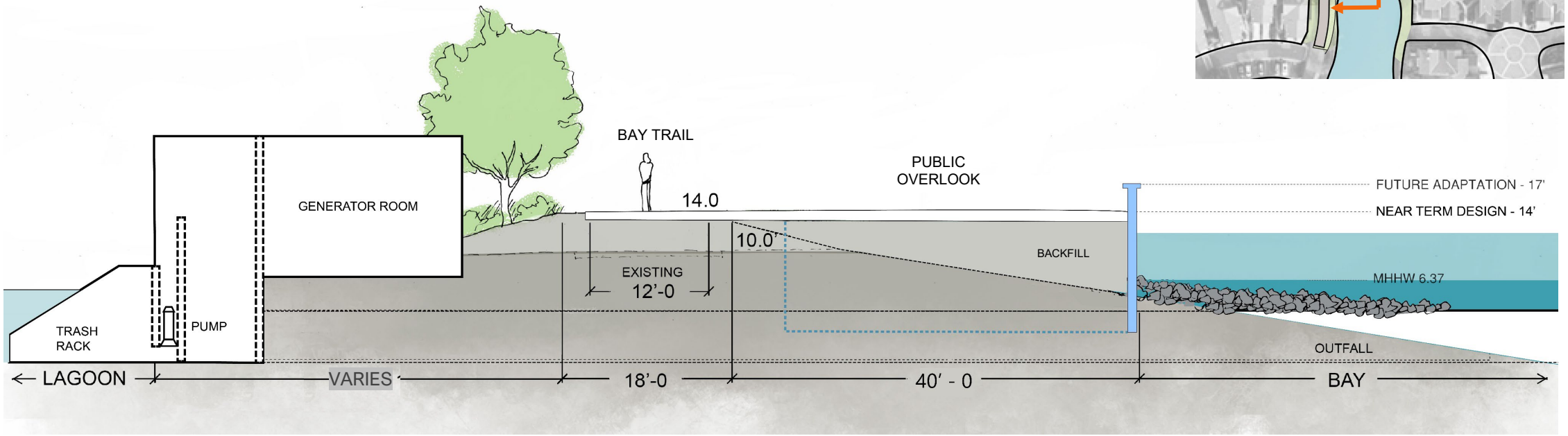
Nature-Based Solutions

- Rock & wood groins
- New tidal marsh
- Gravel placement
- Sand + gravel placement

Nature-Based Solutions: Elsie Roemer Precedent

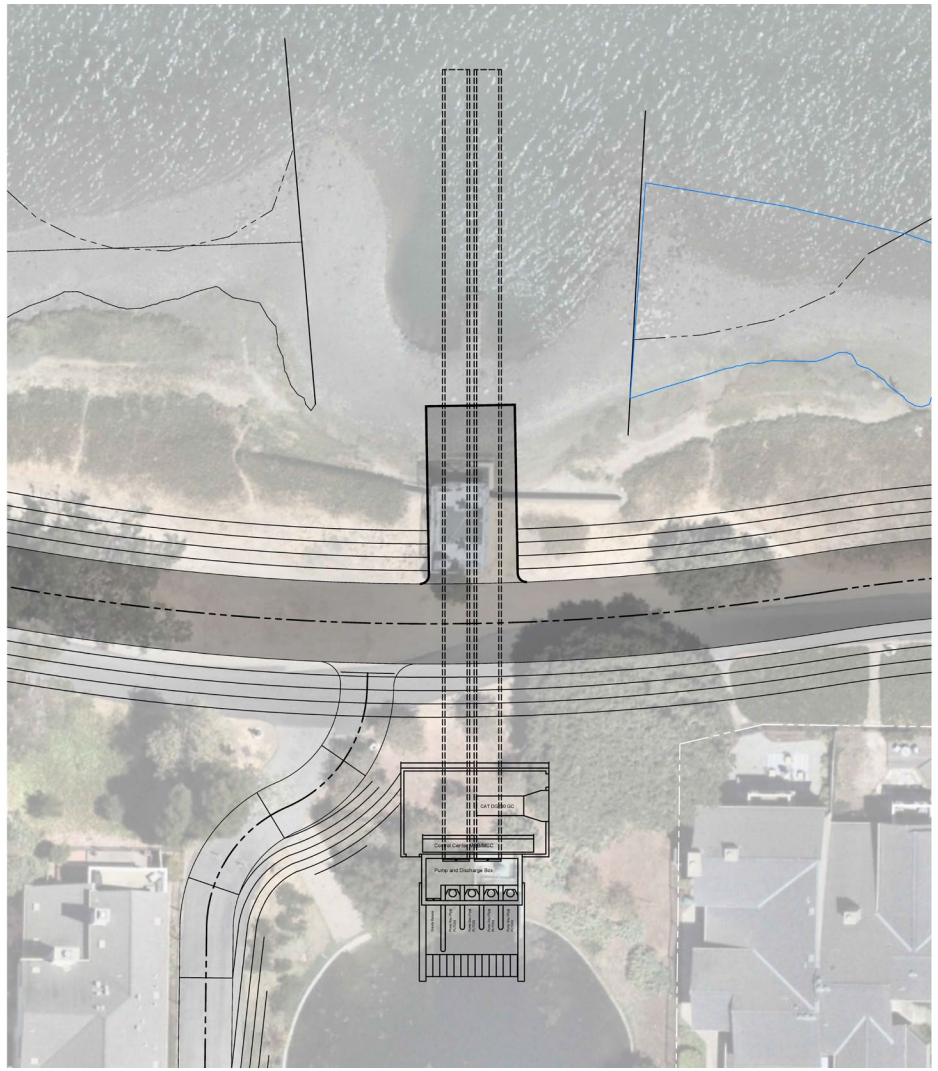
Pump Station & Tide Gate Replacement

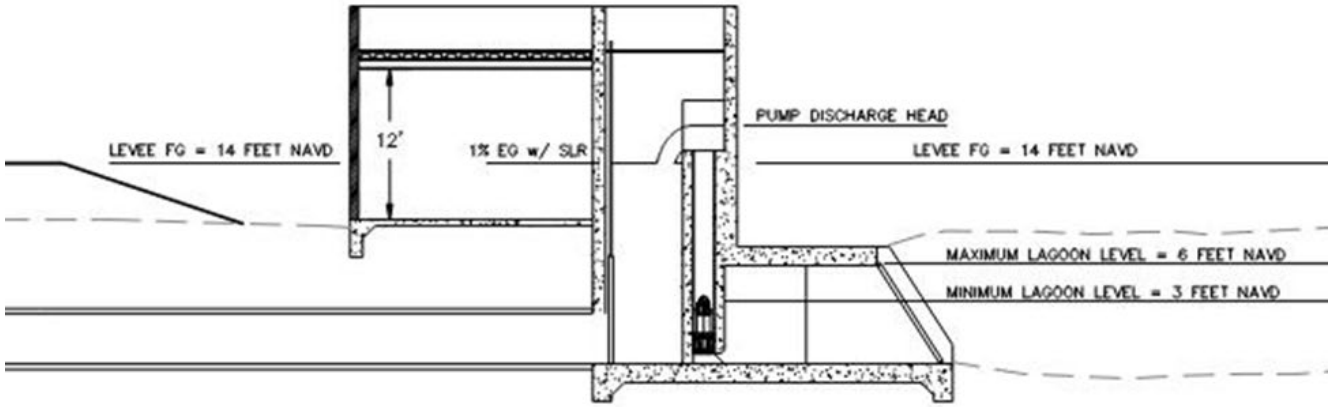




- Interior drainage analysis/improvements to comply with FEMA 65.10
- Maintain existing lagoon circulation & stormwater management goals

Pump Station & Tide Gate - Profile





Pump Station
Building Precedent

Remove Levee Penetration

(Redirect Gravity System Outfall to Lagoon)

- New gravity pipe to be constructed as part of levee construction
- New pipe to follow levee toe rather than go through Palm Beach Ln
- Construction implications through private property
- Assumption of new lagoon operations plan

Preliminary Hydrology Evaluation				
	100-yr, 24-hr (2024)		100-yr, 24-hr (2060)	
Design Parameter	Lagoon Only	Lagoon + Waterfront	Lagoon Only	Lagoon + Waterfront
Drainage Area (acres)	433	442	433	442
Pump Rate (cfs)	22.28	22.28	80	80
Inflow Volume (acre-ft)	129	131	170	174
Peak Storage (acre-ft)	170	173	153	155
Peak Elevation (ft)	5.7	5.8	5.2	5.2

Adaptation Alternative - Veterans Court

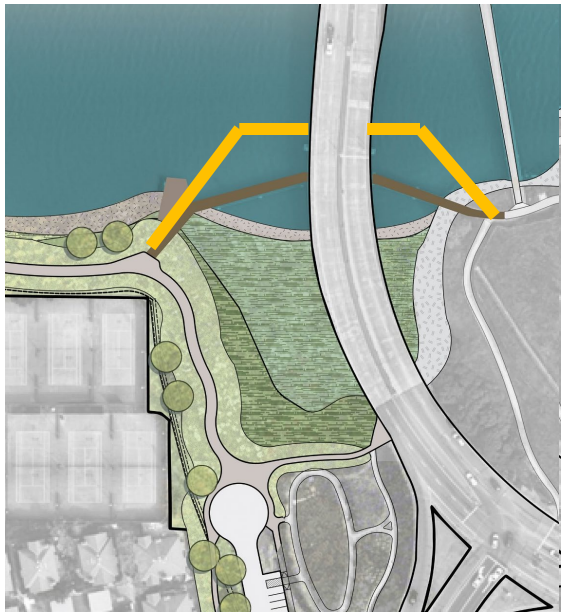
- Reduce length of drive and move turn around to accommodate a new levee.
- Replace approximately 40 on-street parking spaces, with 20-25 formal spaces, including ADA spaces.
- Provide EVA and Maintenance access as part of Bay Trail replacement.
- Protect and expand existing fringe marsh.

Bay Trail Bridge

WEST SIDE (looking east)

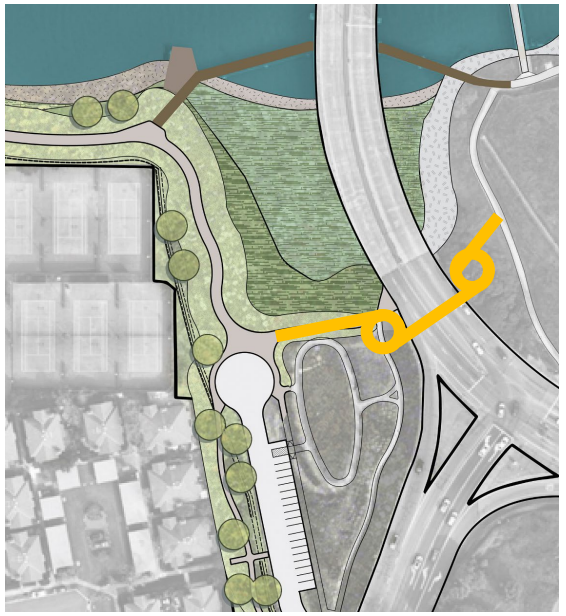
EAST SIDE (looking west)

Bay Trail Bridge Long Term Adaptation Alternatives



Alternative 1
Bridge Relocation Outboard

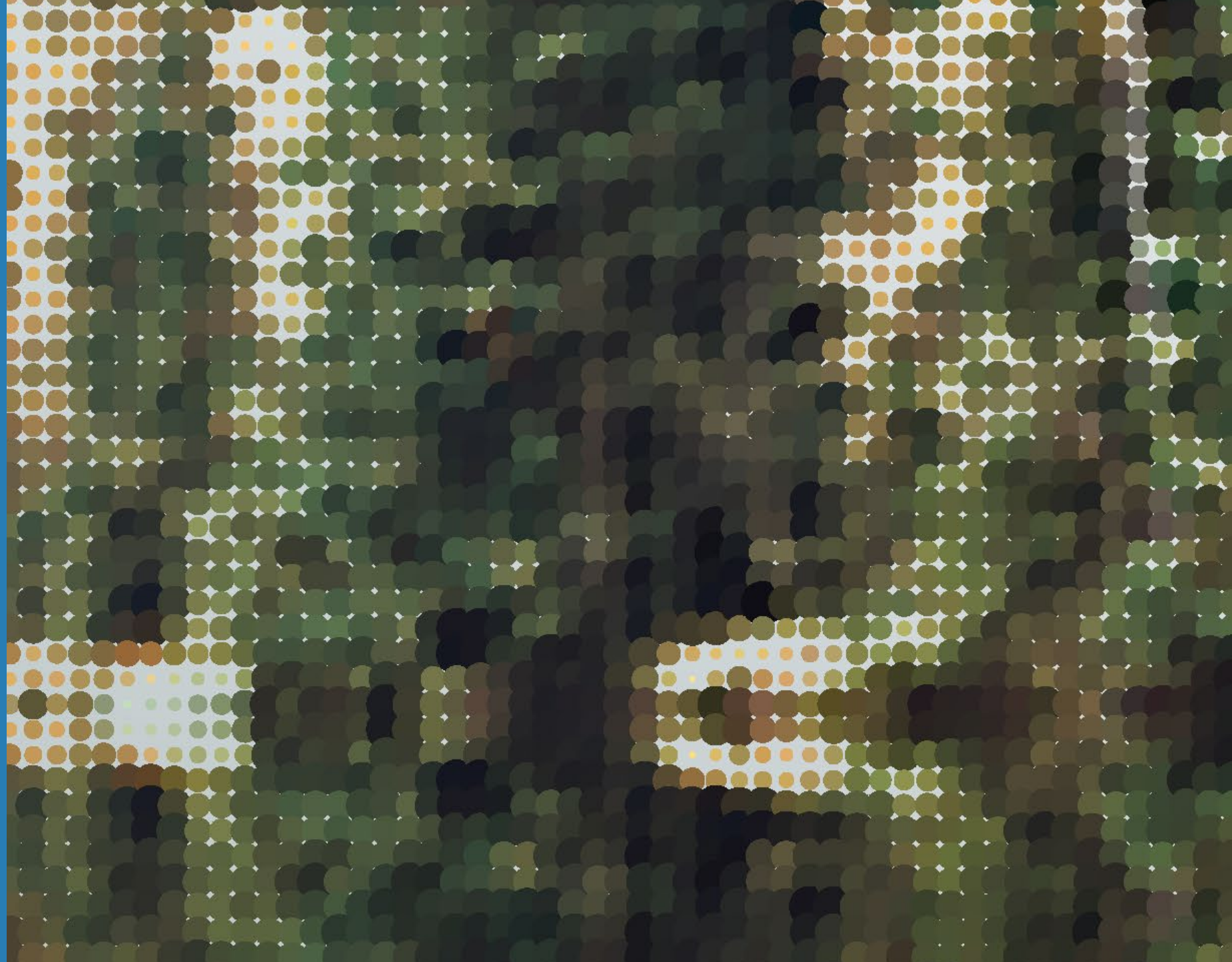
Alternative 2
Underpass Crossing



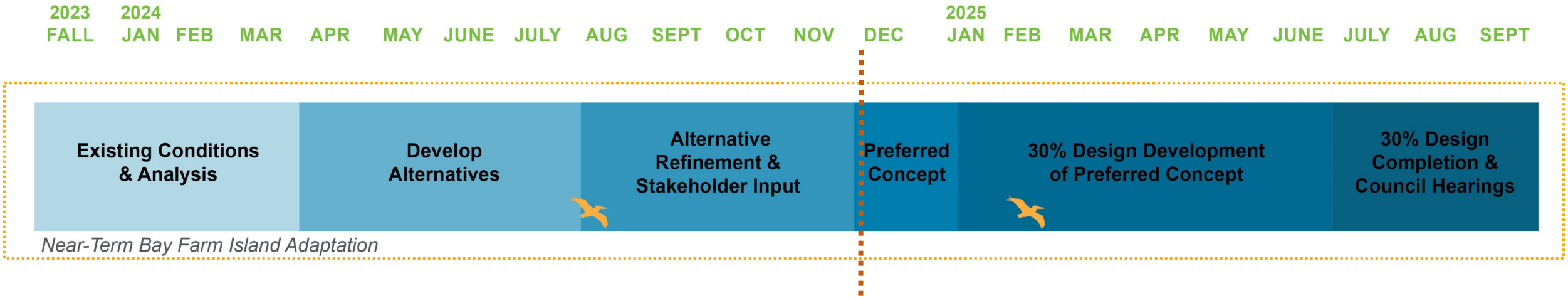
Alternative 3
Bridge Over Land

Alternative 4
At Grade Crossing

Next Steps



Next Steps



December - Preferred Concept
January - City Council Presentation
Jan-June 2025 - Near Term 30% Design Development

FEMA BRIC Grant

FEMA BRIC (federal)
$50M (90%)

Non-federal $5.5M

Total $55.5M

Recommended for further review by FEMA

Design Start: 2027
(soonest possible)

Construction: 2030+

Next Steps: Design, Permitting, Funding

1. Need continued Community support for future projects & funding opportunities
2. City to proceed with immediate erosion control projects (independent effort)
3. City of Alameda RFP out now for stormwater modeling – will address Maitland Drive neighborhood
4. FEMA BRIC Grant pursuit
    - $55 million
    - Covers design, engineering, permitting, construction
    - Additional funding may be needed for near-term projects

Survey #2

Q&A

Add your questions to the chat!

Next Steps & Call to Action

Stay engaged! Bring your voice (and your friends) to the table. We will need community involvement and input to advance this work. **Please join us at the following events:**

City of Alameda (attend virtually or in person)

- Commission on Persons with Disabilities - December 11th at 6:30pm
- Planning Board - Dec 16th at 7 pm
- City Council - Jan 21st at 7 pm

Community Groups

- King Tides Walk with CASA – December 14, 2024 / Crab Cove
- Ninth Root and Sacred Spaces engagement events

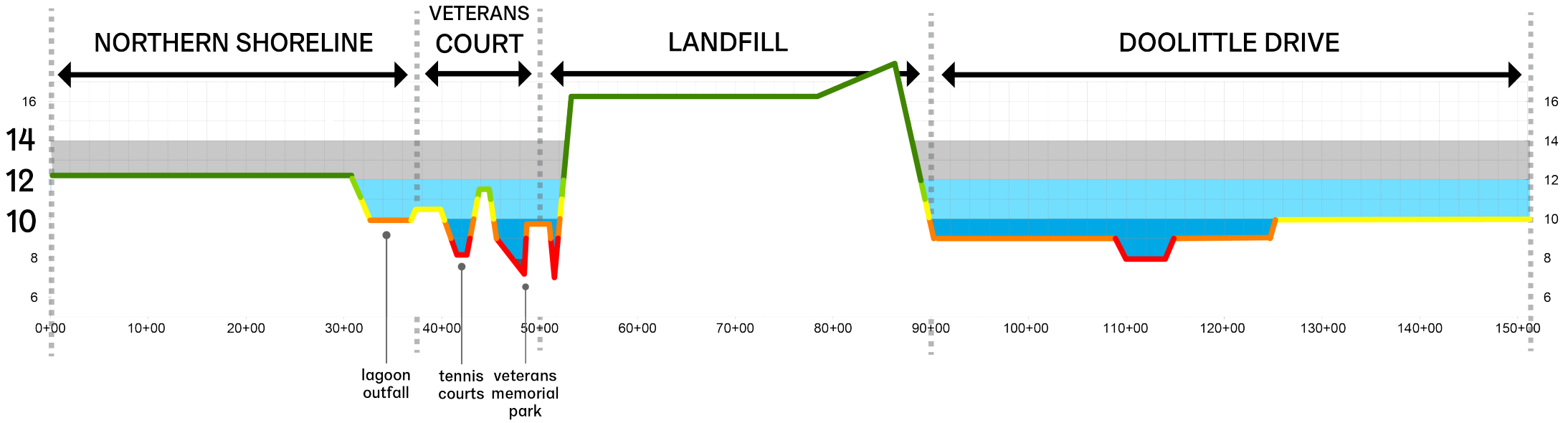
Future OAAC ADAPT Events

- Join us in Spring 2025 for community workshops on the long-term plan! Check out the OAAC Adapt website for more information: https://www.oaacadapt.org/

Thank you!

https://www.oaacadapt.org/

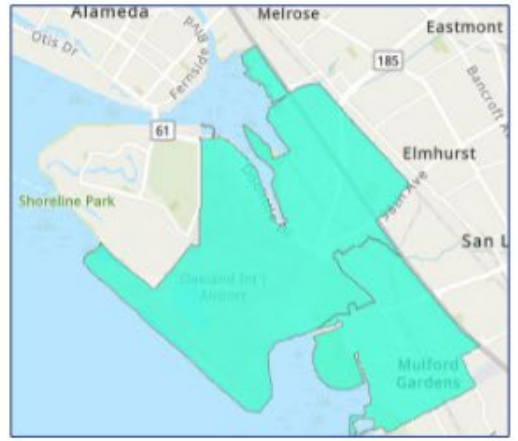
Elevation Deficiencies



BRIC Grant & Long-Term Planning

Overview

Coastal flooding on Bay Farm Island is complex. During a 1% annual chance event (e.g., 100-year coastal flood event), floodwaters can overtop the shoreline at numerous locations as shown by the arrows on the map adjacent. To reduce the risk of flooding in the airport's North Field and in the residential areas of Bay Farm Island, actions must be taken at all the overtopping locations. OAAC collaborated on a $55.5 million FEMA Building Resilient Infrastructure and Communities (BRIC) grant application to cover the design and implementation costs of strategies to reduce this flood risk.



Area designated as a FEMA CDRZ