Implementing a large-scale, multi-benefit wetland restoration project: The South San Francisco Bay Shoreline Project Phase 1

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Bay Program

Coastal Conservancy
STATE of CALIFORNIA

Saltscapes
Chris Benton

South Bay Salt Pond Restoration Project

Project Areas
Lands Sold to Local Government

Reference Features

- Highway
- Railroad
- Power transmission
- Potential limit of 100-year high tide (USACE 1988)
- Aqueduct (above and below ground)
- Stormwater pump, outfall, gate
- Municipal wastewater discharge and pipeline
- City of Fremont Ownership (open space)
- The Bay Trail
- Trails, other

Habitats

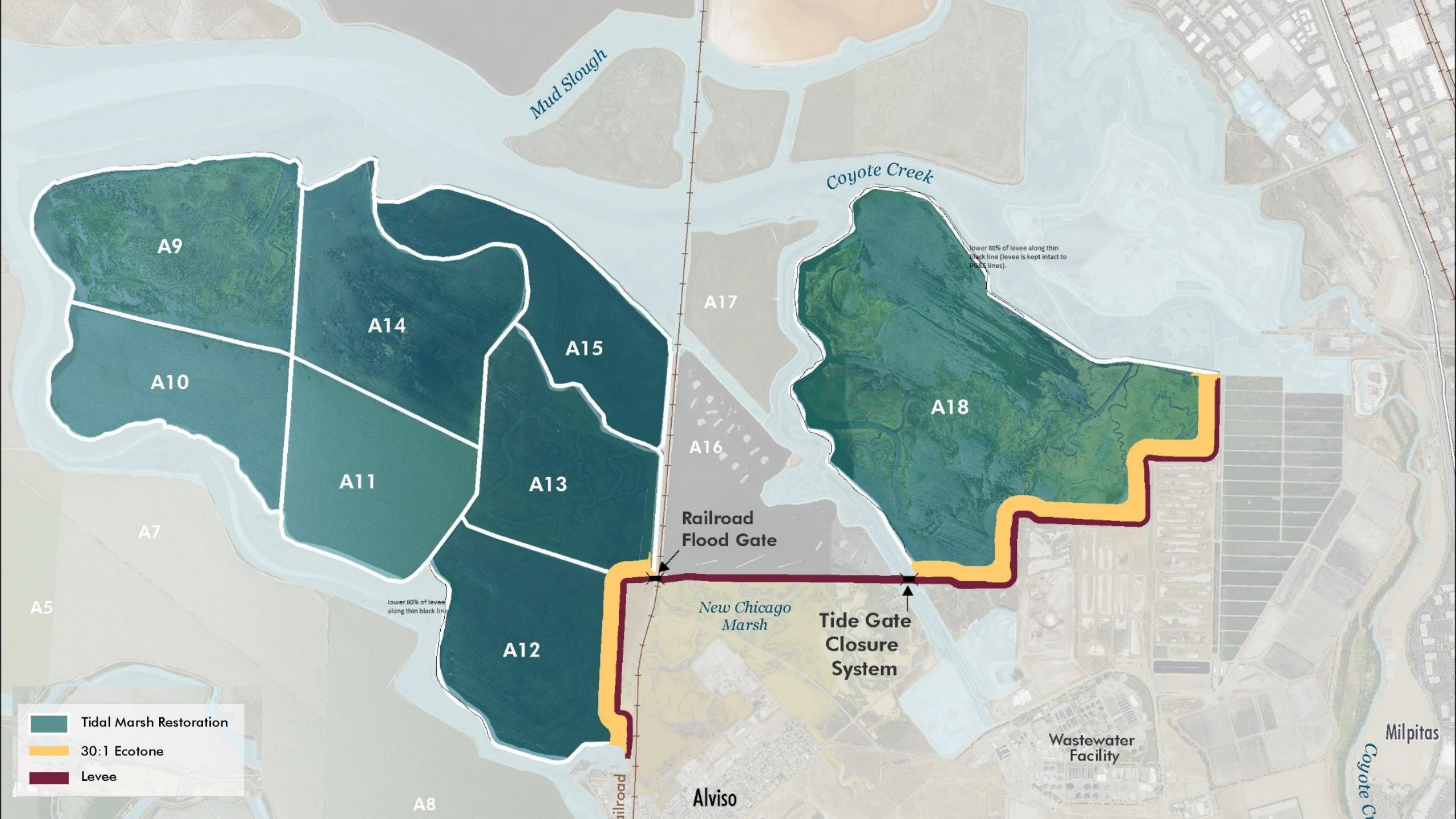
- Former Salt Pond
- Active Salt Pond
- Tidal Marsh
- Diked Marsh
- Mudflat
- Lagoon
- Farmed or Grazed Bayland
- Ruderal Bayland
- Storage or Treatment Basin
- Upland open space (selected)

Kilometers 0 2 4
Miles 0 2 4

Map datum and projection: NAD 83, UTM Zone 10
Map data: San Francisco Estuary Institute (habitats [adapted], pond boundaries, bay shoreline, aqueduct). Moffatt-Nichol Engineers (stormwater facilities); US Army Corps of Engineers (100-yr tide line); US Geological Survey (aerial photography); GreenInfo Network (upland open space [adapted], ownership [adapted]); EDAW, Association of Bay Area Governments, and Bay Area Open Space Council (trails [adapted]).
Map by: Michael Moy, Ruth Askevold, and Eric Witmer, San Francisco Estuary Institute.
Map date: May 30, 2006.

Eden Landing (Baumberg)
Ravenswood (West Bay)
Alviso
South San Francisco Bay
Hayward
Union City
Fremont
Newark
Redwood City
Menlo Park
Atherton
East Palo Alto
Palo Alto
Mountain View
Sunnyvale
Santa Clara
San Jose
Milpitas
San Mateo Bridge
Dumbarton Bridge


Alviso, 1983


Mud Slough
Coyote Creek
A9
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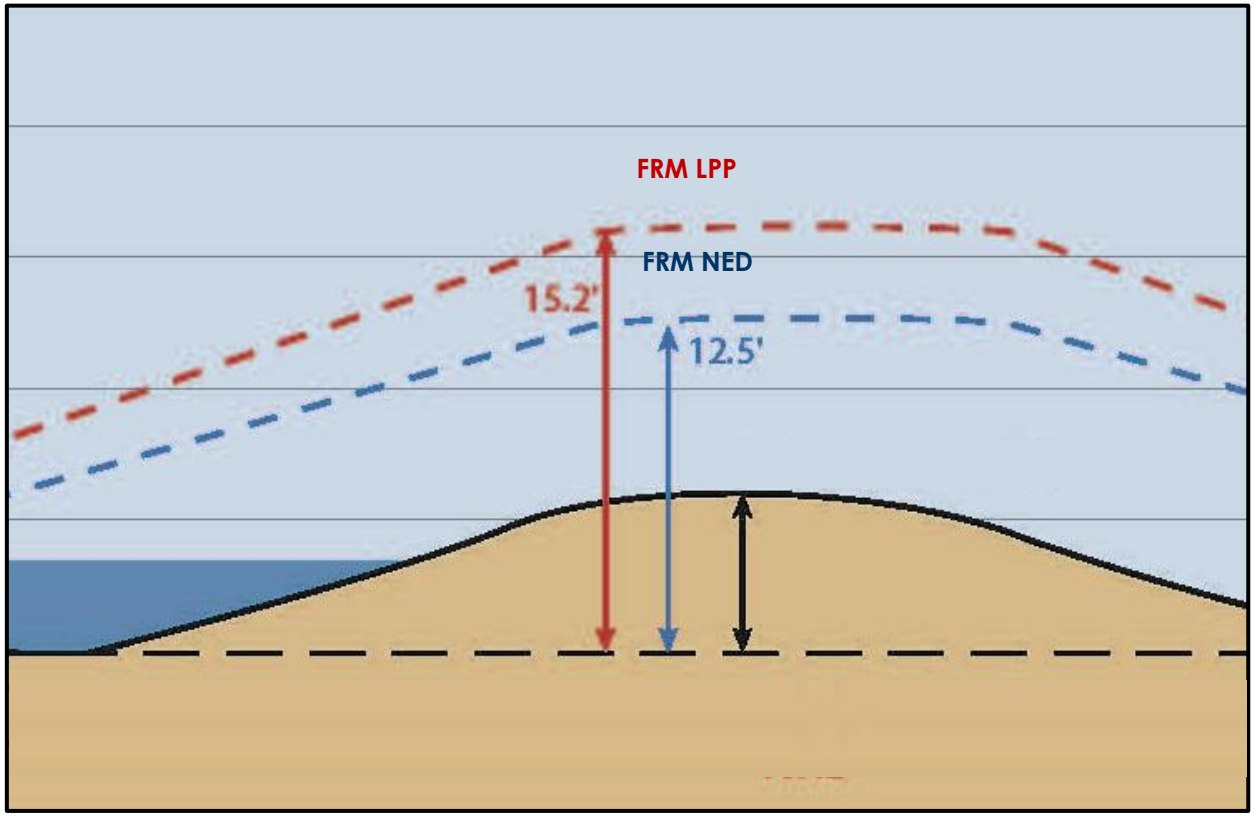
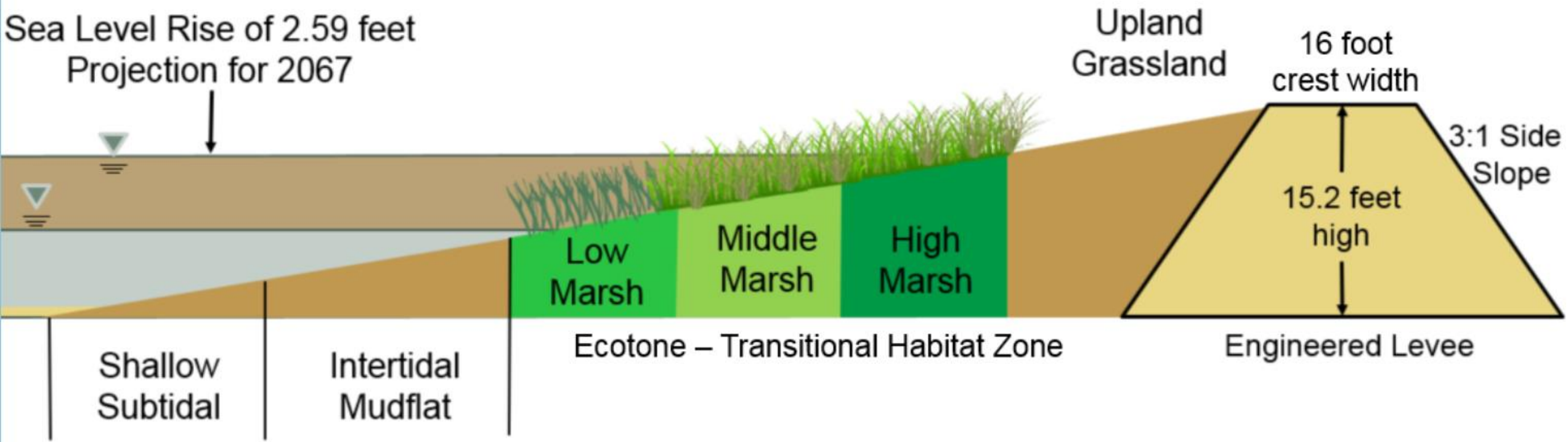
lower 80% of levee along thin black line (levee is kept intact to PG&E lines).
lower 80% of levee along thin black line
Railroad Flood Gate
Tide Gate Closure System
New Chicago Marsh
Wastewater Facility
Alviso
Milpitas
Tidal Marsh Restoration
30:1 Ecotone
Levee

FLOOD RISK MANAGEMENT

Existing Unengineered Pond Dikes

Construct Engineered Levees





US Army Corps of Engineers.

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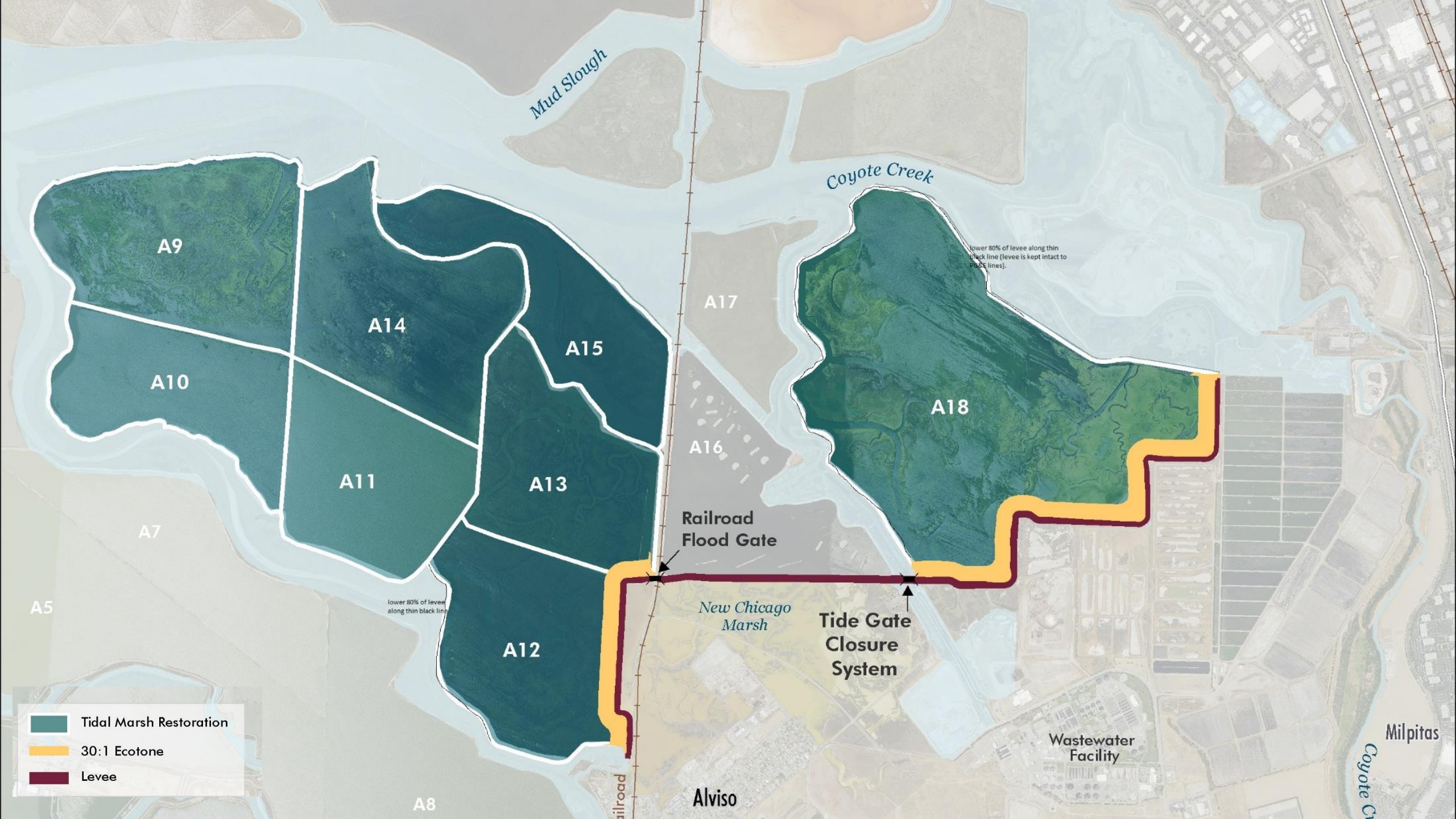
Santa Clara Valley Water District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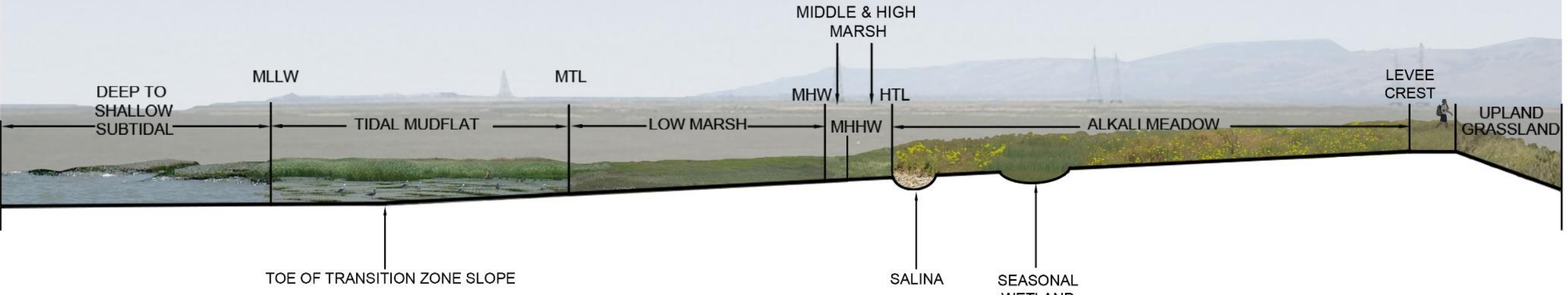
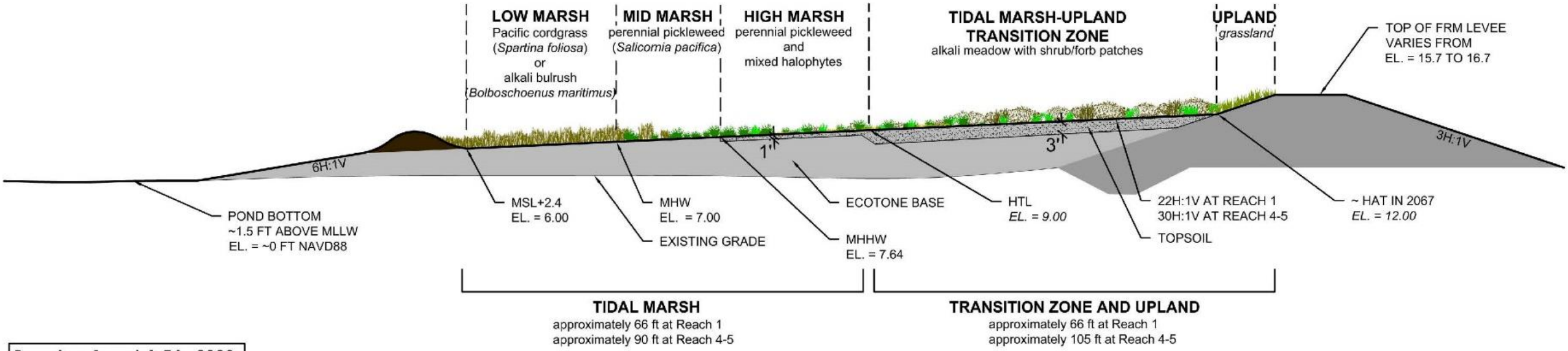
Encourage Tidal Marsh Development





Reaches 1 and 4-5 in 2023

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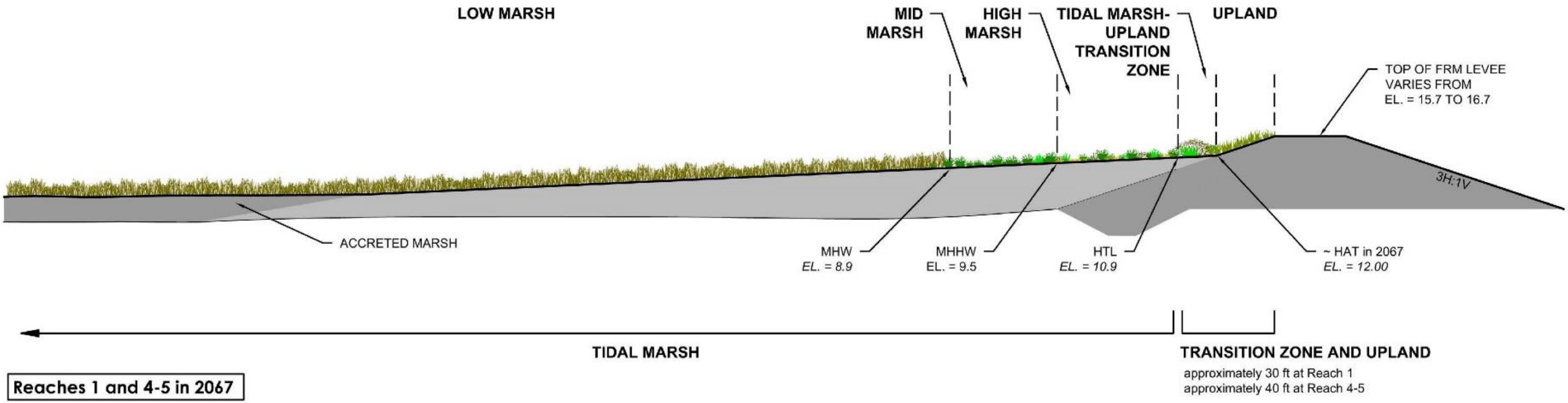

Reaches 1 and 4-5 in 2067

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ECOTONE

Elevation Range	Plant Species	Revegetation Method
MSL + 1 to MHW	Pacific cordgrass & alkali bulrush	Planting
MHW to HTL	Perennial pickleweed	Natural recruitment
MHHW to HTL	Saltgrass, gumplant, and other halophytes	Planting & Natural recruitment
High Marsh along tidal channels	Saltgrass, gumplant, Fleshy jamea, & Marsh rosemary	Planting
High Marsh on marsh plain	Alkali heath, gumplant, saltgrass	Planting
Lower & upper ecotone	Yarrow, mugwort, red maids, Menzie's fiddleneck, soap plant, Ca brome, coastal tarweed, blue dicks, & dense flower owl clover	Seeding & Planting






- Existing Bench
- Existing Observation Platform
- Proposed Location for Observation Platform or Interpretive Signs
- Phase I Shoreline Study Area

Trails

- SF Bay Trail
- Guadalupe Trail
- Other Existing Trails in Study
- *Proposed Bay Trail Future Reaches 9, 9B, and 7A
- Alviso North WPCP South Levee Alignment
- Proposed Shoreline Phase I Trails
- Counties

N

0 500 1,000 Meters

0 3,000 Feet

Sources: *San José Alviso Slough Pedestrian Bridge Feasibility Study; NAIP 2010; Bay Trails - http://www.baytrail.org/ (Accessed 2014)

A6 A8 A8S A9 A10 A11 A12 A13 A14 A15 A16 A17 A18

Santa Clara County

Coyote Creek

Mallard Slough Trail

Coyote Creek Trail

NCM Trail

San Jose

New Chicago Marsh

Wastewater Facility

Union Pacific Railroad

Artesian Slough

Alviso

Alviso Slough

Guadalupe River

Los Esteros Rd

Disk Dr

N 1st St

Nortech Pkwy

Zanker Rd

Mountain View Alviso Rd

237

880

Milpitas

Santa Clara

Renaissance

Baylands Park

San Francisco

Sacramento

San Jose

Fresno

Los Angeles

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Project Benefits

FLOOD RISK MANAGEMENT

- 4-mile long levee, 15.2' NAVD 88, with 2 closure structures
- Manages risk for population of ~6,000, ~1,100 structures, and regional wastewater facility

ECOSYSTEM RESTORATION

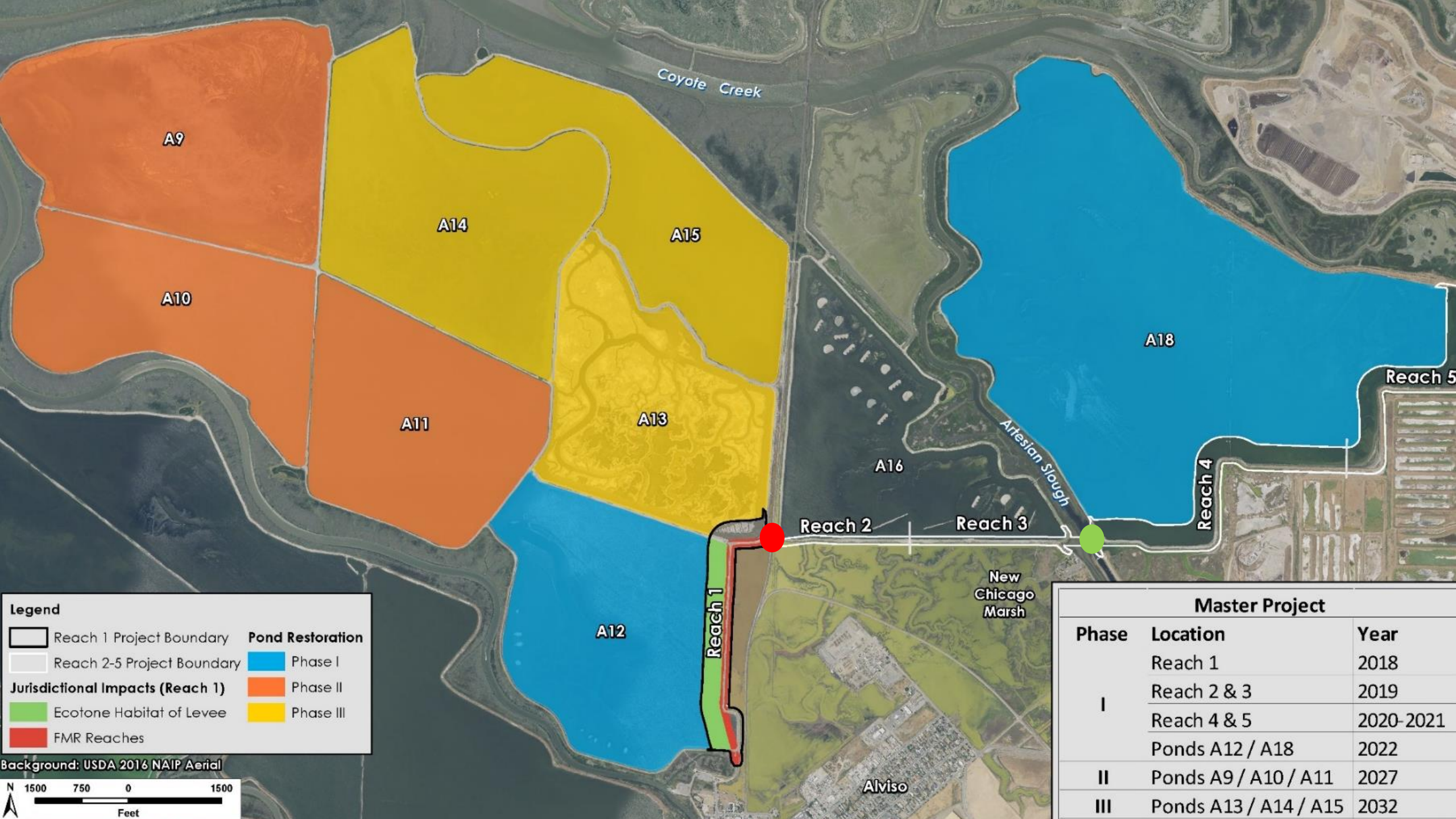
- Restore 2,900 acres of tidal marsh habitat using ponds A9 through A15 & A18
- Locally preferred plan (LPP) element is ecotone to expedite low, middle and high tidal marsh habitat

SEA LEVEL RISE RESILIENCE

- LPP element is 15.2' height vs. 12.5' height per National Economic Development (NED) plan
- 2.6 ft of sea level rise up to 2067
- Ecotone for marsh migration upland

RECREATION

- Trails on top of new levees and pedestrian bridges over closure structure locations
- New connections to SF Bay Trail



Master Project		
Phase	**Location**	**Year**
I	Reach 1	2018
	Reach 2 & 3	2019
	Reach 4 & 5	2020-2021
	Ponds A12 / A18	2022
II	Ponds A9 / A10 / A11	2027
III	Ponds A13 / A14 / A15	2032

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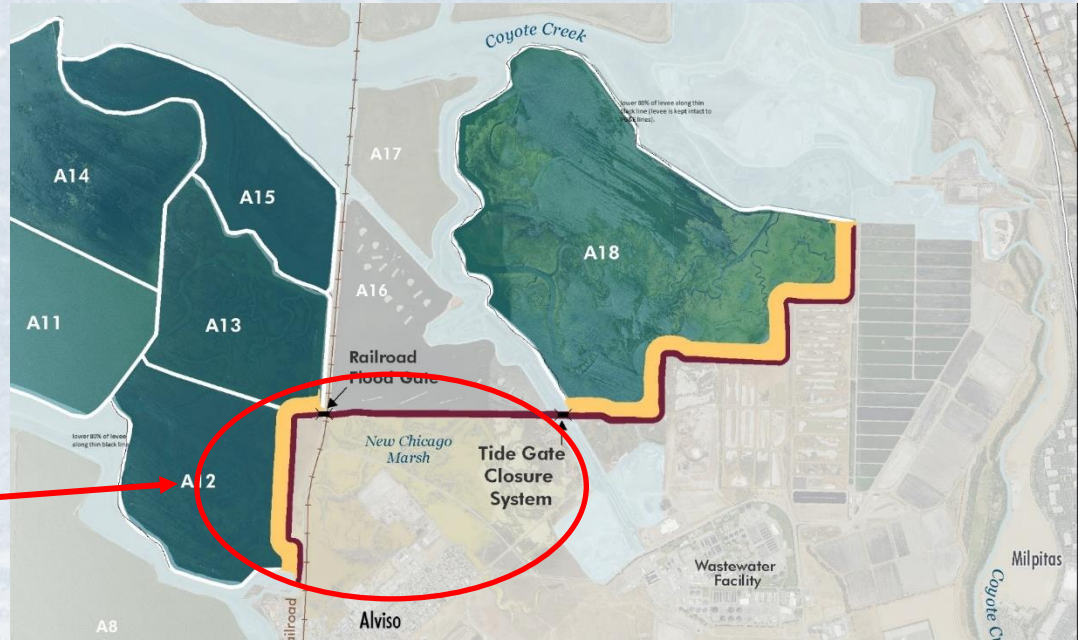
Project Milestones

- Feasibility Study completed 2015
- Reaches 1-3 FRM levee construction contract awarded to Maloney-Odin Joint Venture on August 9, 2021
- Total award of $129,801,500
- Construction started December 2021

Reaches 1-3



Construction has begun!

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Construction has begun!

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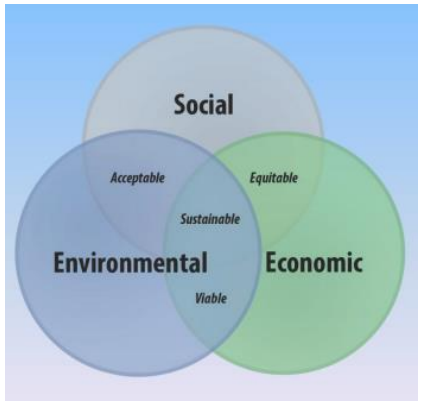
Adaptive Mgmt Plan

- Monitoring and Adaptive Management Plan has been developed for the ecosystem restoration components
- Consistent with the SBSP Adaptive Management Plan, but reflects Shoreline Project's specific goals, objectives, and geography

Monitoring Topic	Category	Metric
Sediment dynamics	Sedimentation inside ponds	Water levels; sedimentation rates; suspended sediment concentrations
Bird use of changing habitat	Ridgway's rail	Tidal marsh acreage in ponds
Non-avian species	Salt marsh harvest mouse	Tidal marsh acreage in ponds
Non-native & nuisance species	Non-native plants	Abundance of non-native species
Ecotones	Transition zone	Plant species composition

Engineering With Nature uses natural and engineering processes to deliver economic, environmental, and social benefits, including:

- Flood, coastal storm, and erosion risk mitigation
- Ecosystem restoration
- Equitable outcomes
- Recreation
- Climate resilience



Nature-based solutions referred to as Natural and Nature-based Features (NNBF) in EWN context.

NATURAL AND NATURE-BASED FEATURES

- Use natural physical and biological processes
- Provide multiple benefits
- Can be used in combination with other approaches (green-hybrid-grey, policy)
- Can be cost effective
- Can be more adaptable over time
- Are less well understood by engineers in terms of their performance
- Need to be prioritized to where they match appropriate environmental conditions

Photo by
Shira Bezalel

Thank you!

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Back up slides

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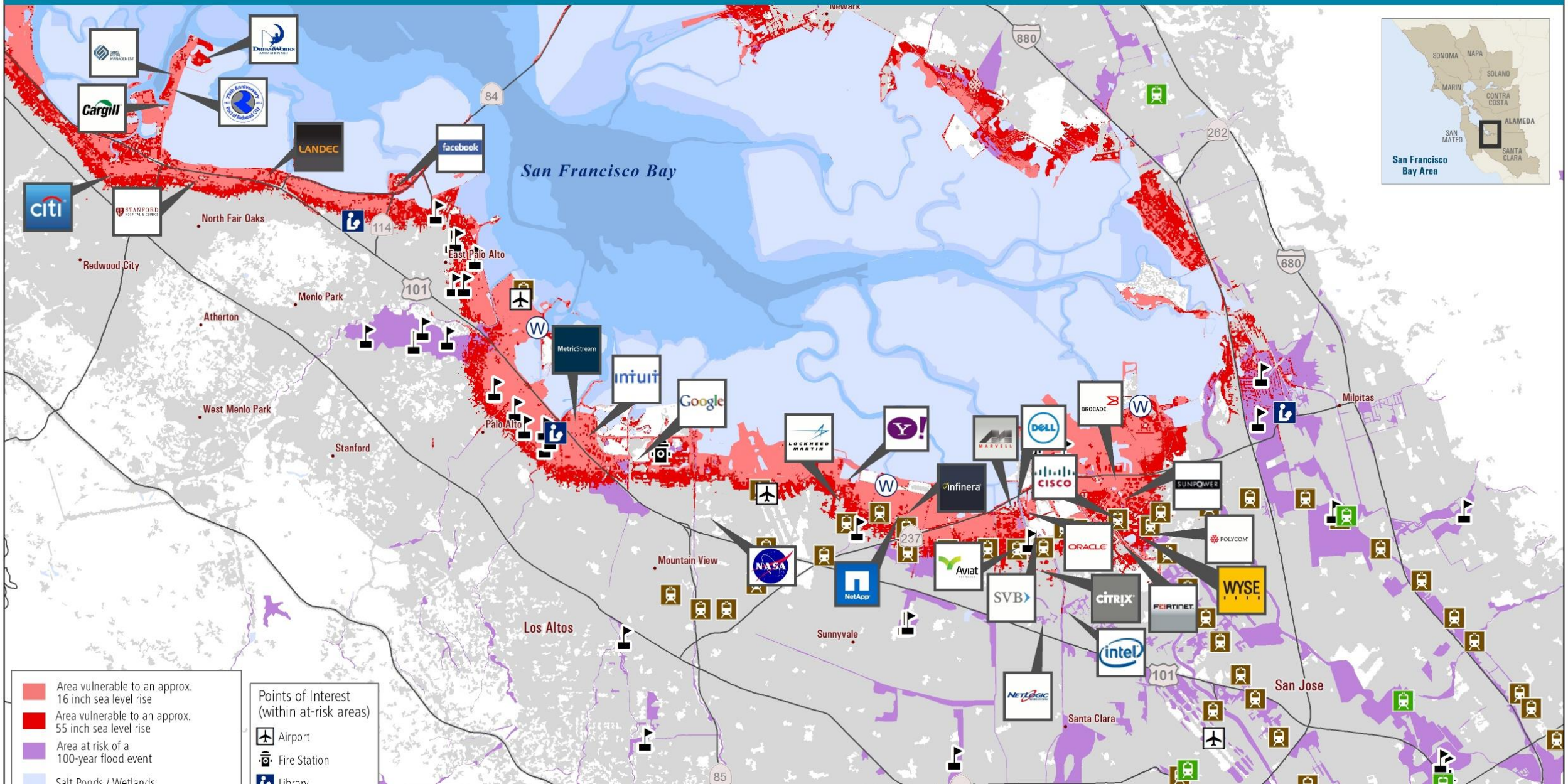
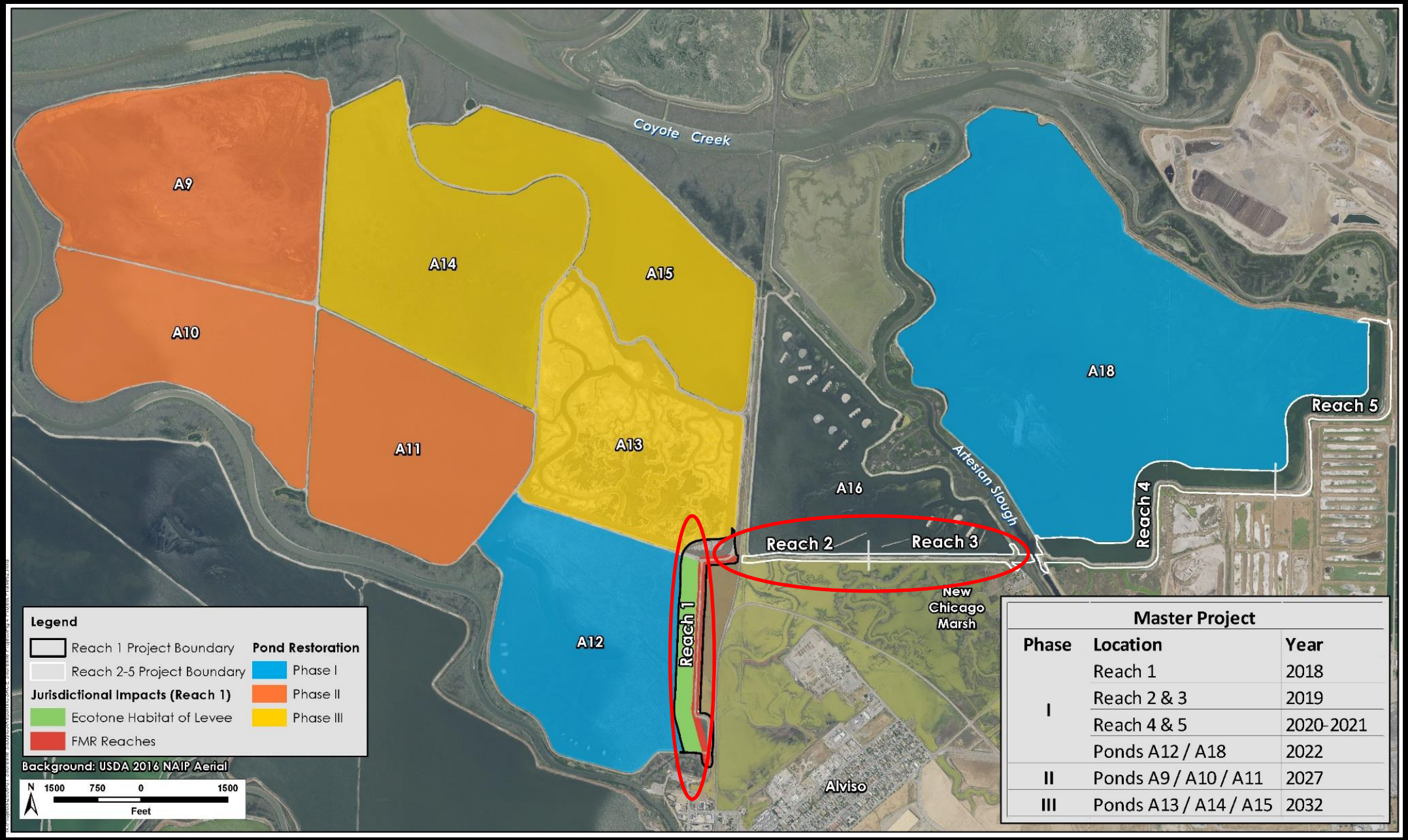
Flood Risk and Sea Level Rise – South Bay

Economic Impact, San Francisco Bay Area





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A9
US FWS ponds
A14
A15
A10
A11
A13
A12
A18
City of San Jose
SJ-SC
Regional
Wastewater
Facility
Alviso
Gold St
Lafayette St
N 1st St
237
680
880
Dixon Landing Rd
N McCarthy Blvd
©2015 Google
Google earth
1993
Imagery Date: 6/9/2014 37°26'35.52" N 121°58'10.88" W elev 4 ft eye alt 20151 ft