



COMMUNITY DEVELOPMENT DEPARTMENT

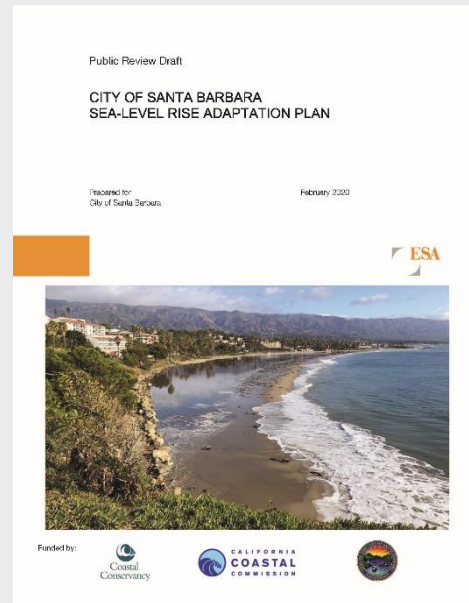
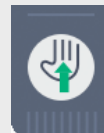
CITY OF SANTA BARBARA

DRAFT SEA-LEVEL RISE ADAPTATION PLAN

www.SantaBarbaraCA.gov/SLR

Purpose of Webinar

- Presentation on the Draft Sea-Level Rise Adaptation Plan
 - Background
 - Vulnerability
 - Adaptation
- Questions
 - Type in chat or click on “raise your hand” icon to speak



BACKGROUND

Sea-Level Rise Planning: Why Now?

- Sea-level rise expected to accelerate.
- Increased erosion and flood events like those seen in previous El Niño's
- General Plan and Coastal Plan direct preparation of a sea-level rise plan.
- Sea-level rise analysis required for coastal and other permitting.



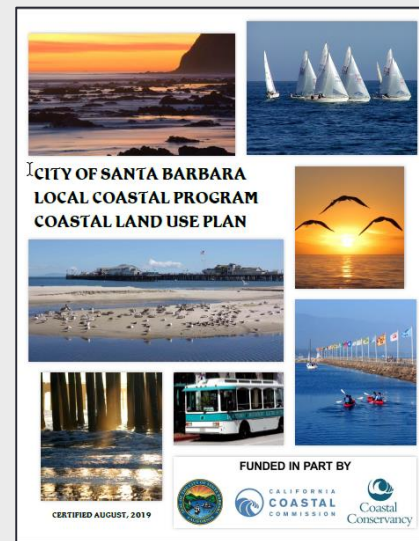
March 1983



Source: Santa Barbara Newspress

Previous SLR Work

- 2011 General Plan Update
- 2012 Griggs/Russell Vulnerability Assessment
- 2013 Climate Action Plan
- 2015 S.B. County/ESA Coastal Resiliency Model
- 2015 UCSB Bren Vulnerability Assessment
- 2015 Goleta Slough Area SLR Plan
- 2017 Hazard Mitigation Plan Update
- 2018 U.S.G.S. CoSMoS 3.0 model
- 2019 Updated Coastal Land Use Plan:



Sea-Level Rise Planning Process

- City Staff Interdepartmental Team
- Consultants (*ESA and AECOM*)
- SLR Adaptation Plan Subcommittee
- Consultations with Coastal Commission (CCC), County, and other agencies
- Meetings with public stakeholders
- Website (www.SantaBarbaraca.gov/SLR)



Plan Components

- **Vulnerability Assessment (2018)**

- Diagnoses the problem
- What would happen if no action taken

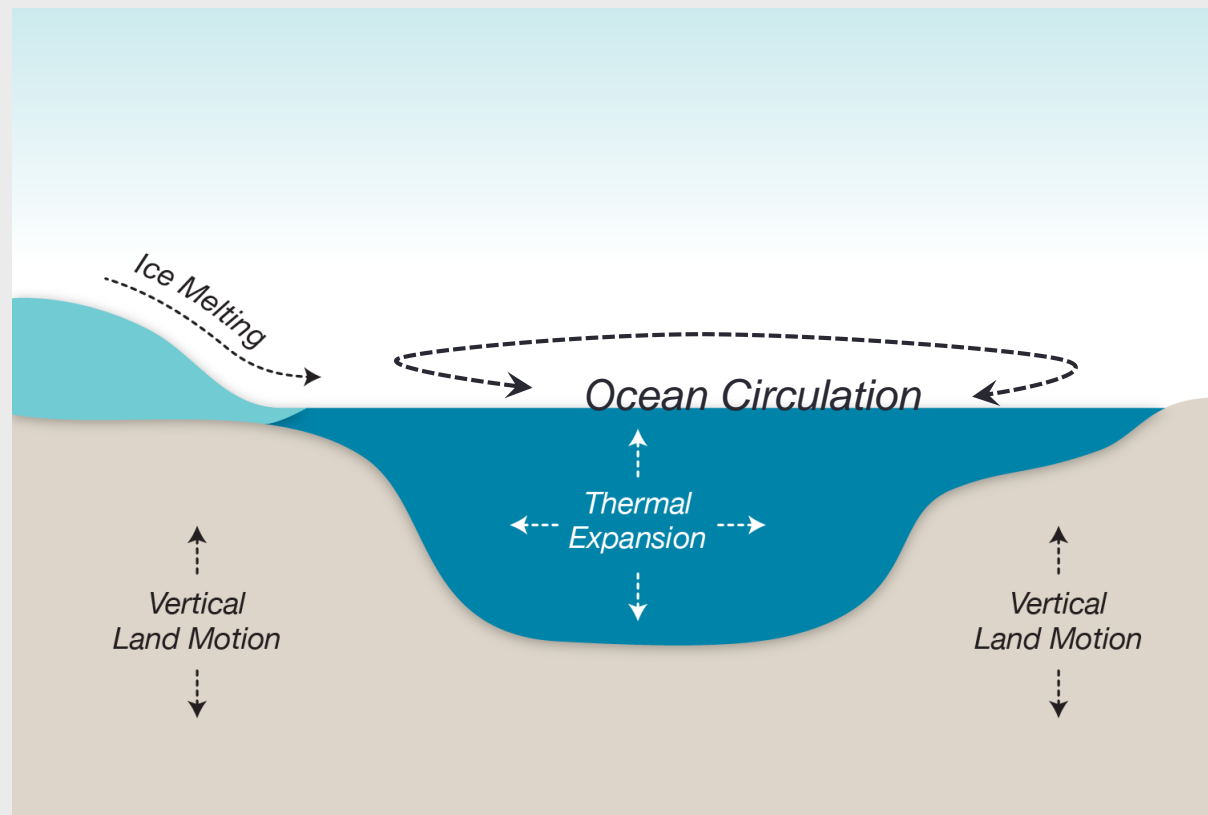
- **Adaptation Plan (2020)**

- Provides framework for future planning
- Includes guiding principles for prioritization of actions
- Analyzes adaptation options (protect, accommodate, retreat)
- Considers economic and fiscal impacts

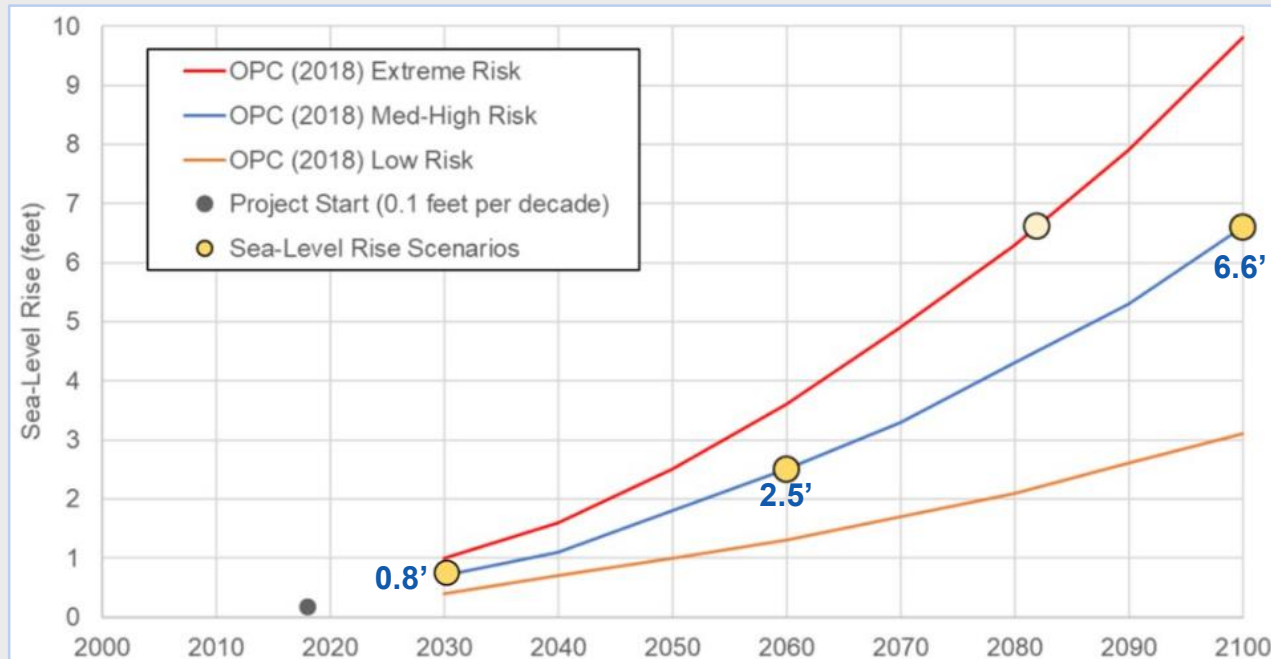


VULNERABILITY

Factors Affecting Rates of Sea-Level Rise



2018 State of California Sea-Level Rise Guidance

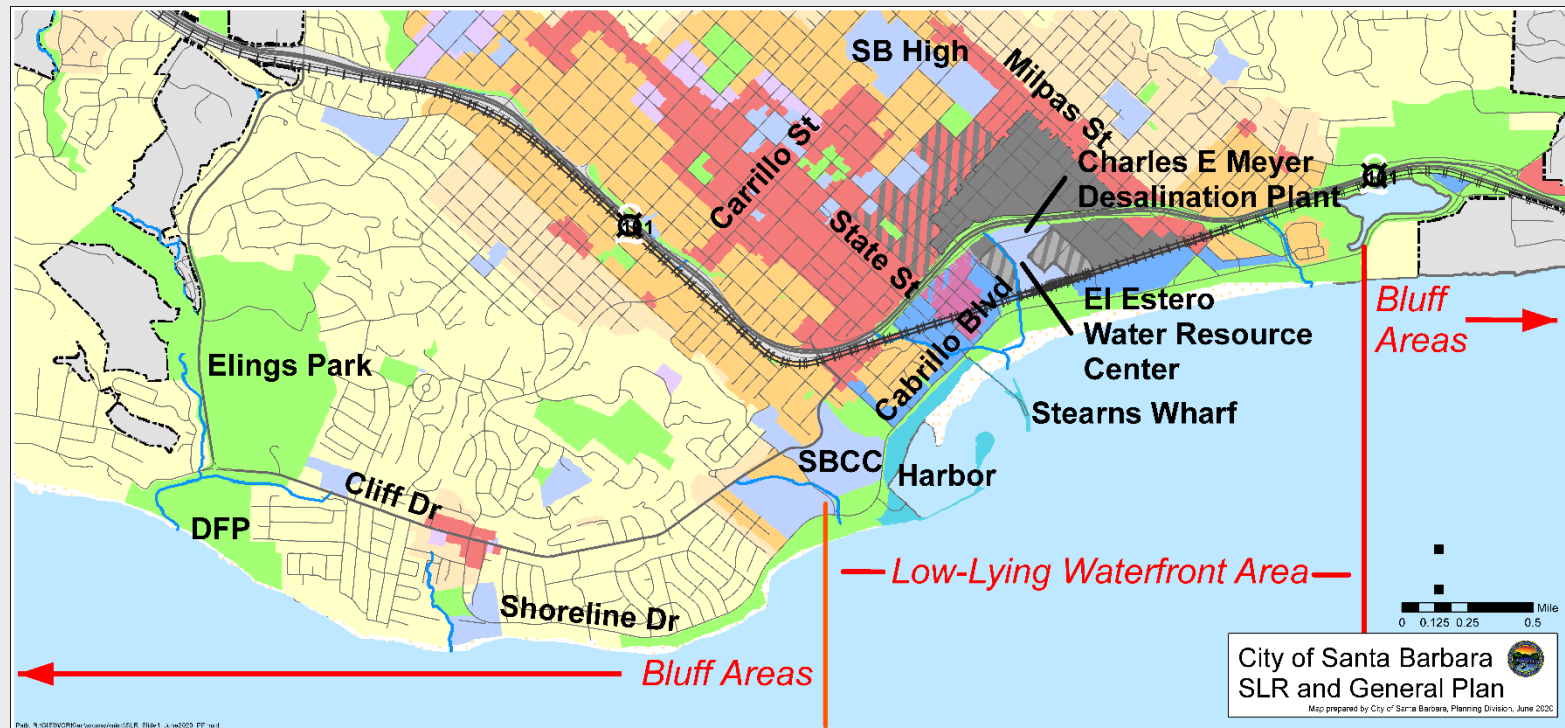


Source: ESA 2018; 2018 State of California Sea-Level Rise Guidance

Sea-Level Rise Planning Definitions

Planning Timeframes	Sea-Level Rise	Projected Year
————— Near-Term	0.0 ft. —	Now
————— Mid-Term	0.8 ft. —	±2030
————— Long-Term	2.5 ft. —	±2060
—————	6.6 ft. —	±2100

The Santa Barbara Shoreline



Coastal Hazard Types

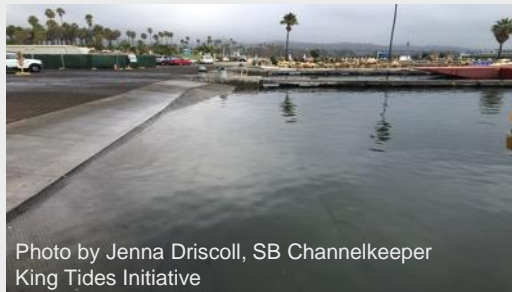


Photo by Jenna Driscoll, SB Channelkeeper
King Tides Initiative

Tidal Inundation



Photo by California Coastal Commission

Bluff Erosion



Shoreline Erosion



Storm Waves



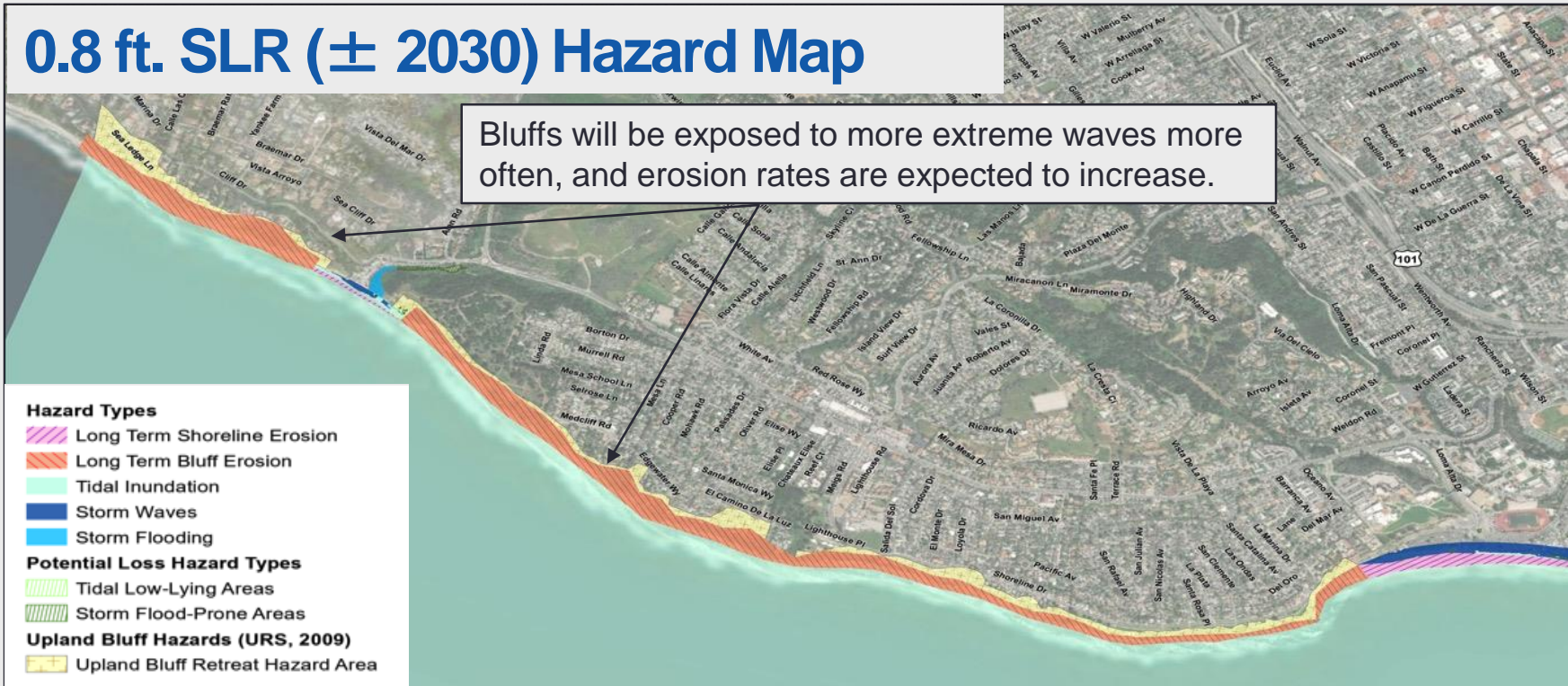
Storm Flooding



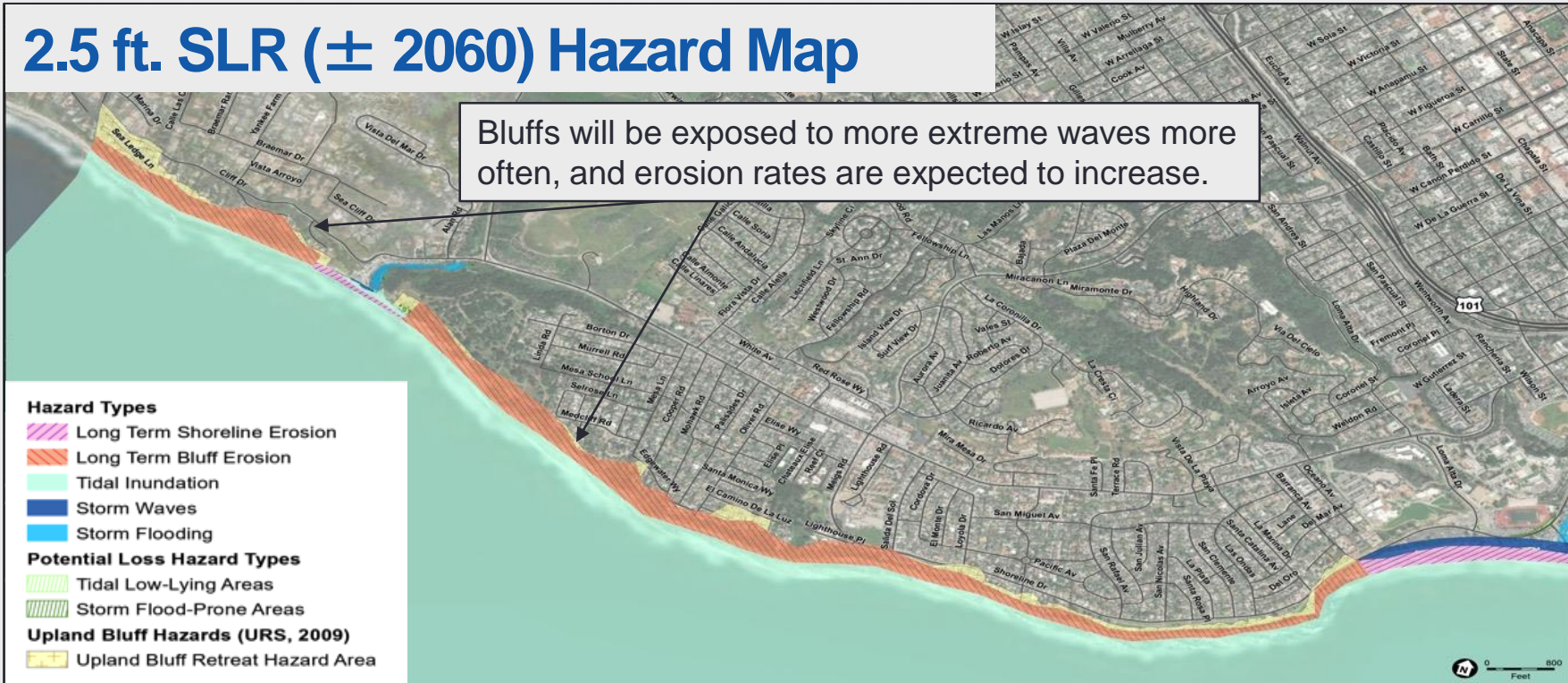
Flood Prone/Low-Lying
SantaBarbaraCA.gov

0.8 ft. SLR (\pm 2030) Hazard Map

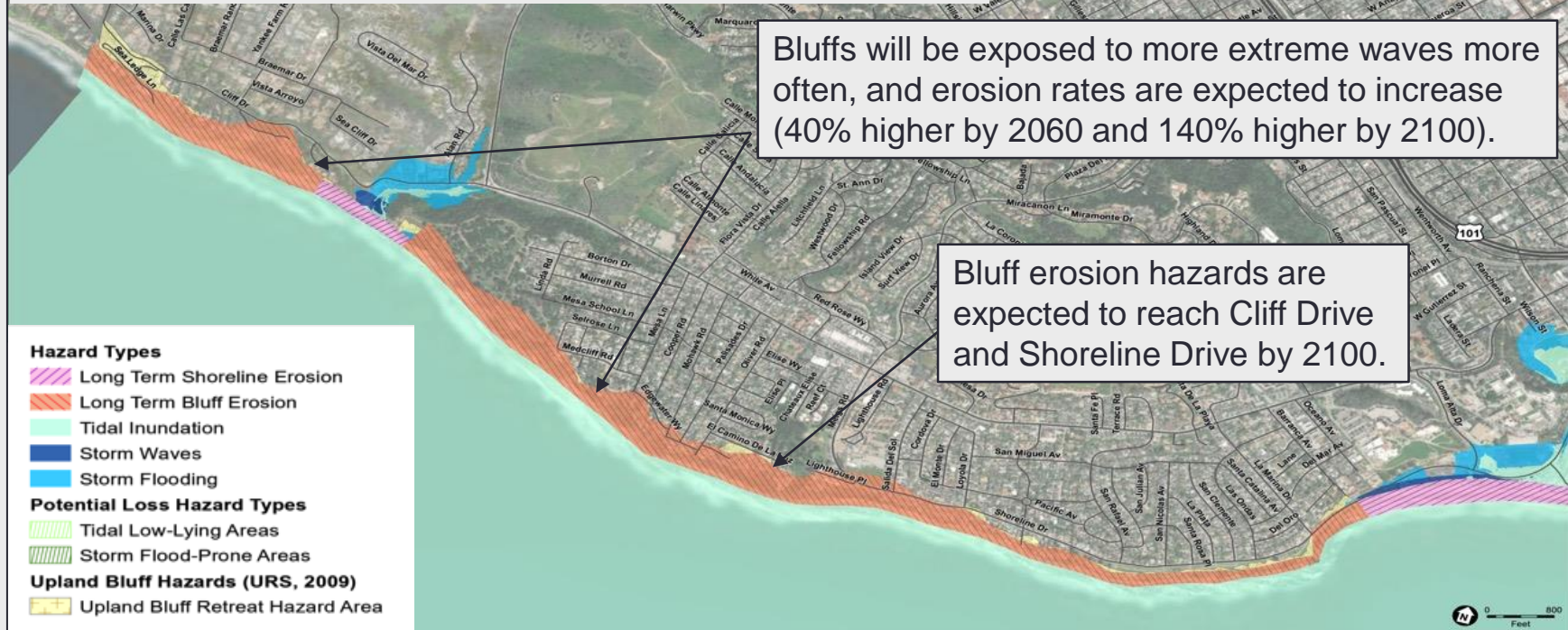
Bluffs will be exposed to more extreme waves more often, and erosion rates are expected to increase.



2.5 ft. SLR (\pm 2060) Hazard Map



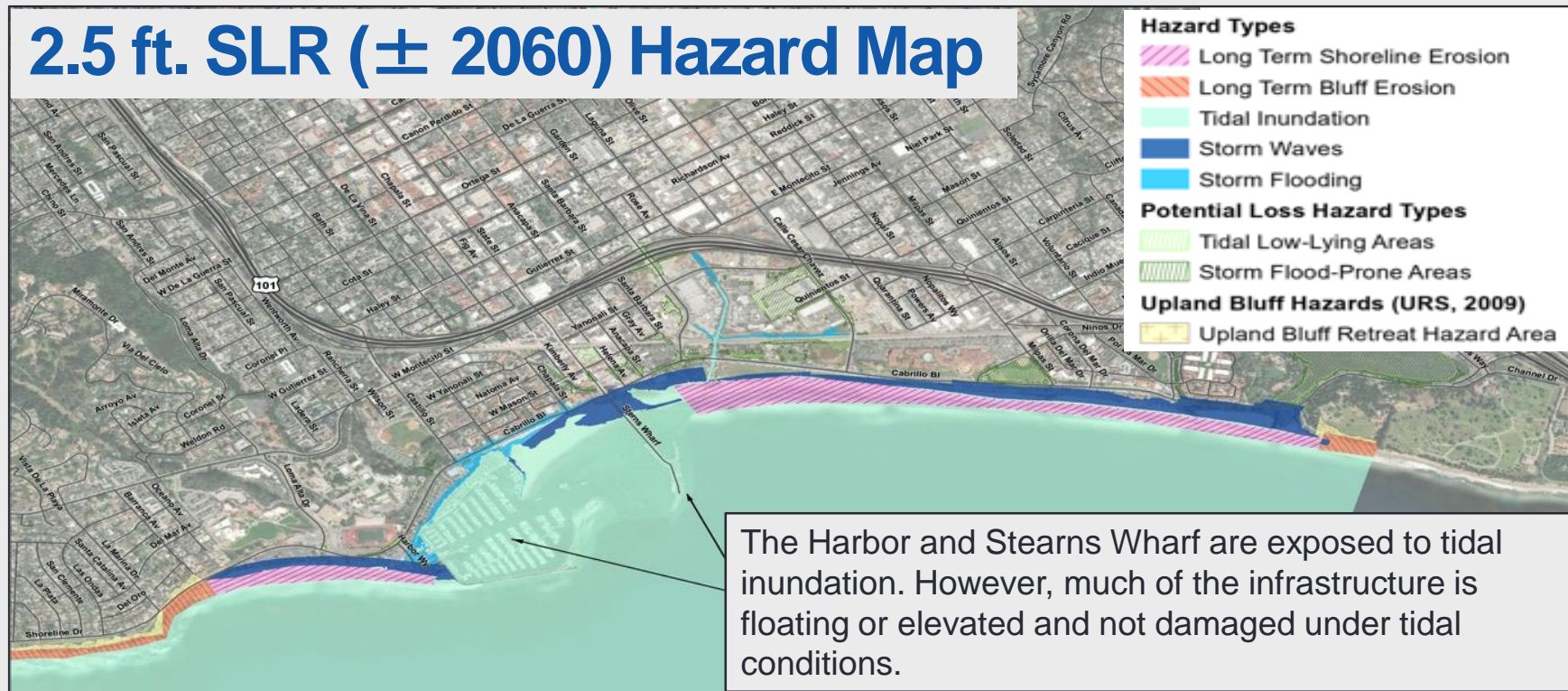
6.6 ft. SLR (± 2100) Hazard Map



0.8 ft. SLR (\pm 2030) Hazard Map



2.5 ft. SLR (\pm 2060) Hazard Map



6.6 ft. SLR (± 2100) Hazard Map

North of 101

- More frequent flooding
- Future coastal flooding in areas already flooded during heavy rains

South of 101

- Regular tidal inundation
- More frequent and severe coastal flooding
- Shoreline erosion

Hazard Types

- Long Term Shoreline Erosion
- Long Term Bluff Erosion
- Tidal Inundation
- Storm Waves
- Storm Flooding

Potential Loss Hazard Types

- Tidal Low-Lying Areas
- Storm Flood-Prone Areas
- Upland Bluff Hazards (URS, 2009)
- Upland Bluff Retreat Hazard Area

The Harbor and Stearns Wharf are exposed to tidal inundation. However, much of the infrastructure is floating or elevated and not damaged under tidal conditions.

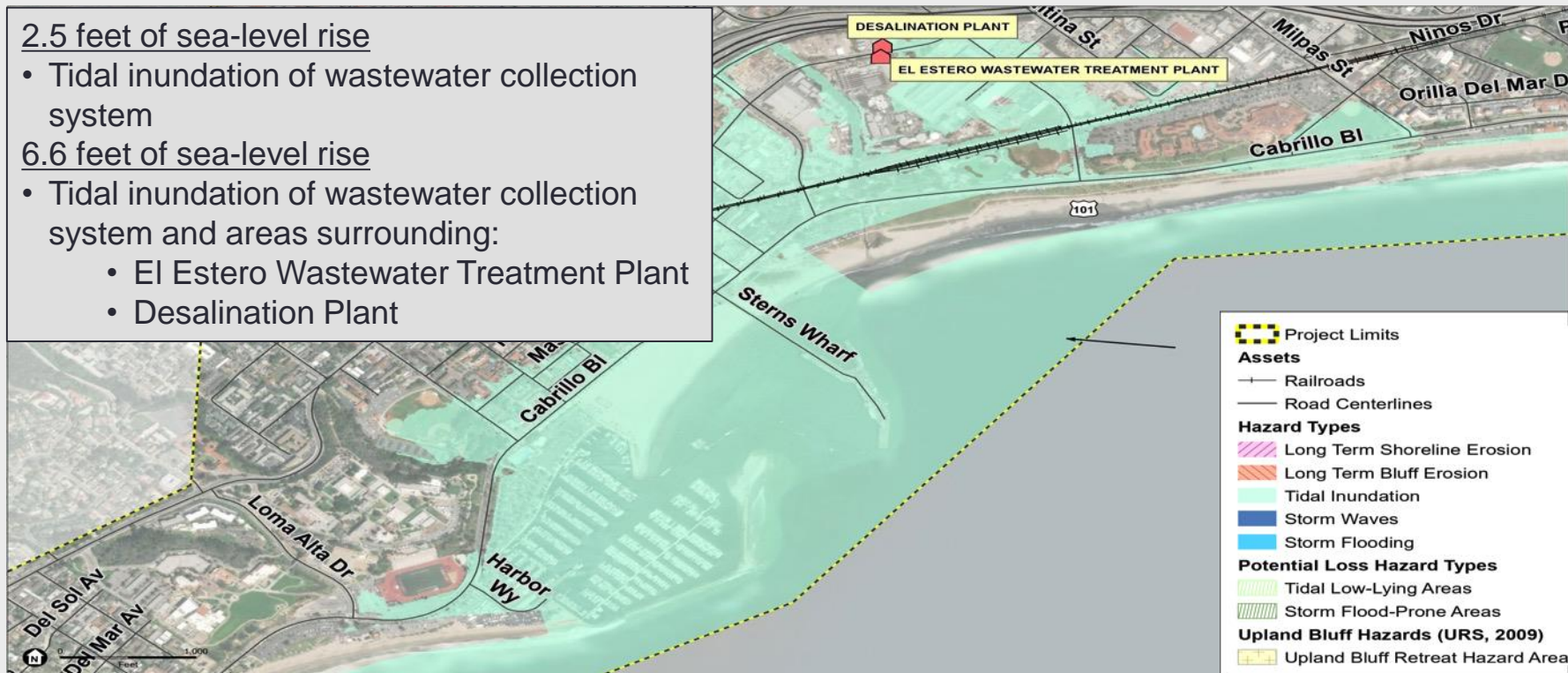
Water and Wastewater Infrastructure

2.5 feet of sea-level rise

- Tidal inundation of wastewater collection system

6.6 feet of sea-level rise

- Tidal inundation of wastewater collection system and areas surrounding:
 - El Estero Wastewater Treatment Plant
 - Desalination Plant



ADAPTATION

Adaptation Planning Approach

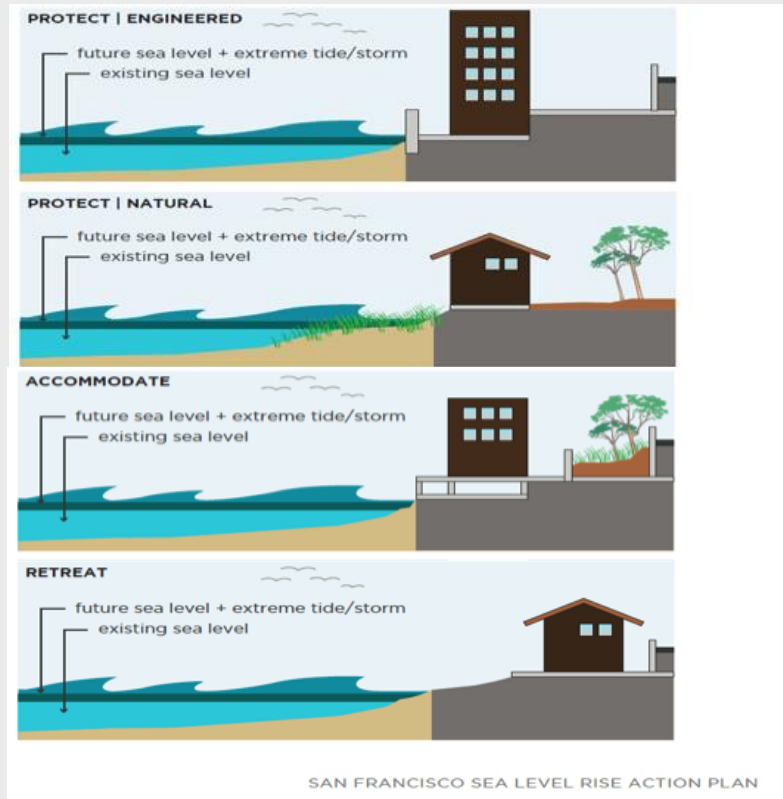
- Sea-Level Rise Adaptation Plan
 - Phased approach: monitoring of conditions and trigger-based actions
 - Recommends specific near-term (ten-year) actions
 - Proposes structure for decision making in mid- and long-term
- Five-year Implementation Plan
 - Further prioritizes near-term actions and Identifies costs, funding, timelines, and required resources
- Shoreline Monitoring Program
- Re-evaluation of adaptation plan every 10 years

Guiding Principles for Adaptation

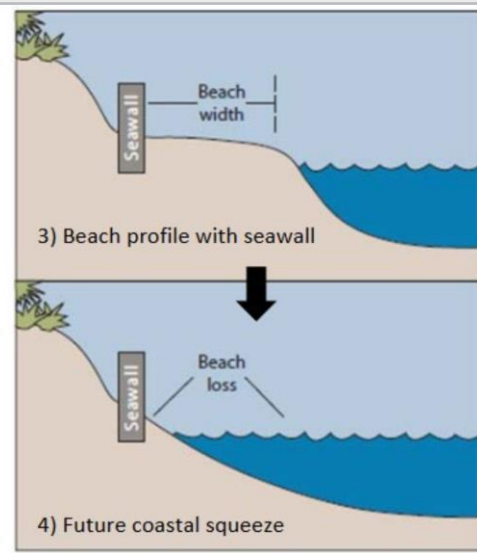
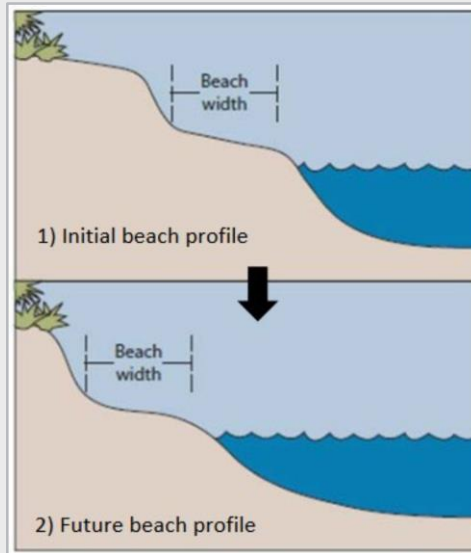
- Prioritize:
 - Protection of human life, health, and safety
 - Critical facilities, public transportation systems, and public services for basic city functions
- Minimize impacts to public access, coastal resources, existing development, and economy
- Encourage actions that broadly benefit community
- Provide equitable sharing of costs and benefits

Adaptation Options

- **Protection** of development in place through measures such as seawalls, groins, tide gates, and beach nourishment
- **Accommodation** of development in place through measures such as elevation or modifications of structures
- **Retreat** through measures such as relocation of structures and development limitations

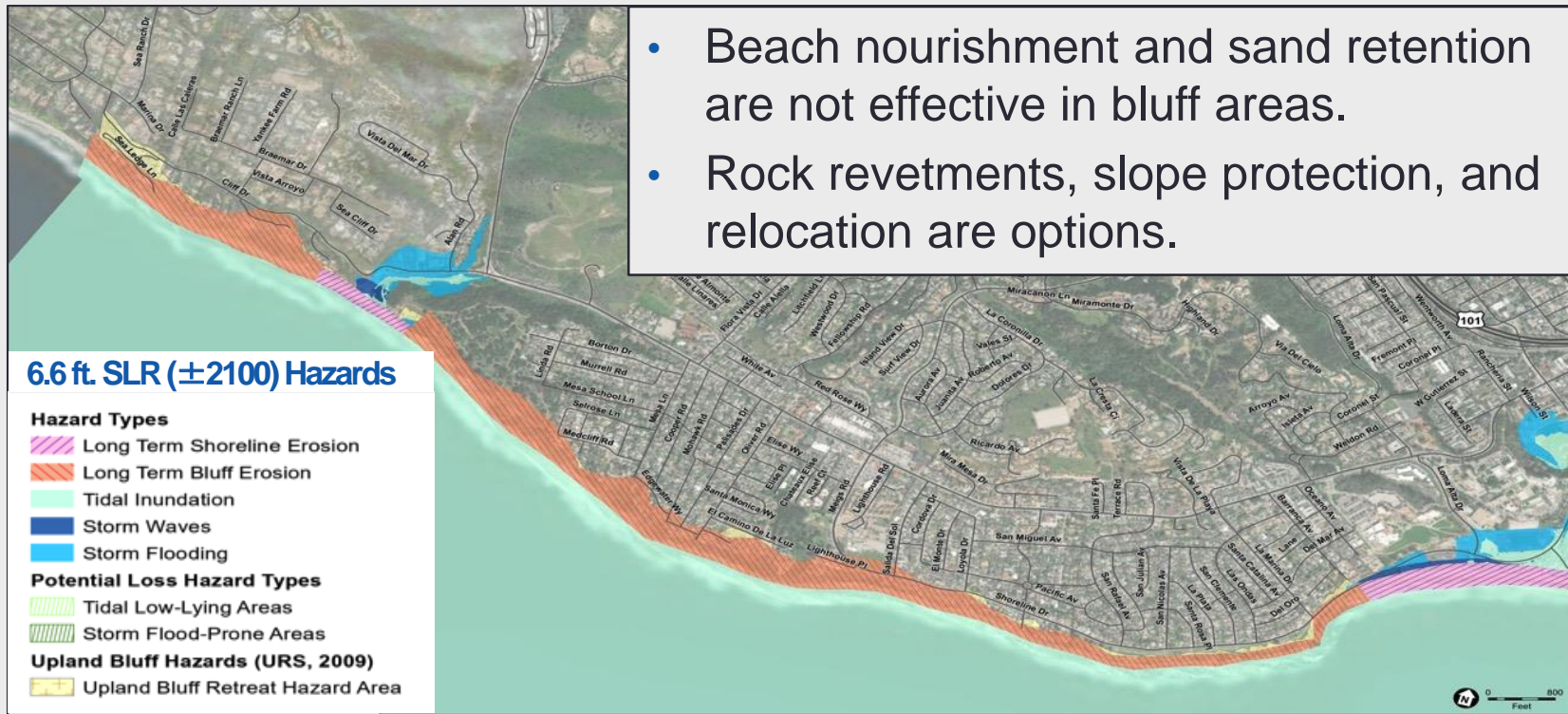


Revetments and Seawalls



Coastal Bluff Areas

- Beach nourishment and sand retention are not effective in bluff areas.
- Rock revetments, slope protection, and relocation are options.



Coastal Bluff Areas

- Recommended Near-Term Actions
 - Continue to require bluff setbacks factoring in sea-level rise
 - Continue to limit revetments, prioritizing major public roads
 - Plan to relocate and remove assets in Shoreline Park
- Decisions in the Mid- and Long-Term
 - Consider either:
 - Use of revetments and slope stabilization to protect Shoreline Drive in place; or
 - Alternate circulation routes and relocation of infrastructure

Low-Lying and Waterfront Areas

6.6 ft SLR (± 2100) Hazards

Hazard Types

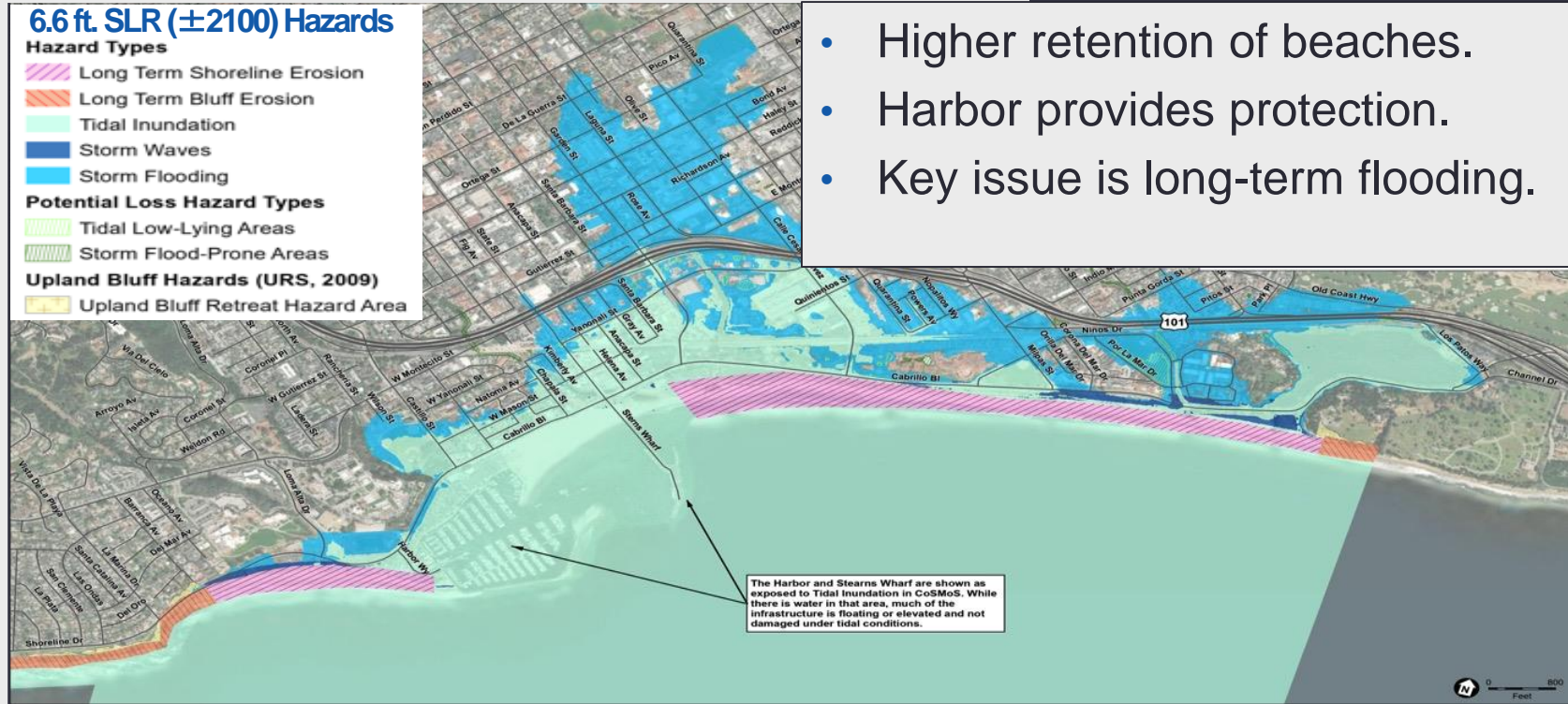
- Long Term Shoreline Erosion
- Long Term Bluff Erosion
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- Storm Flooding

Potential Loss Hazard Types

- Tidal Low-Lying Areas
- Storm Flood-Prone Areas

Upland Bluff Hazards (URS, 2009)

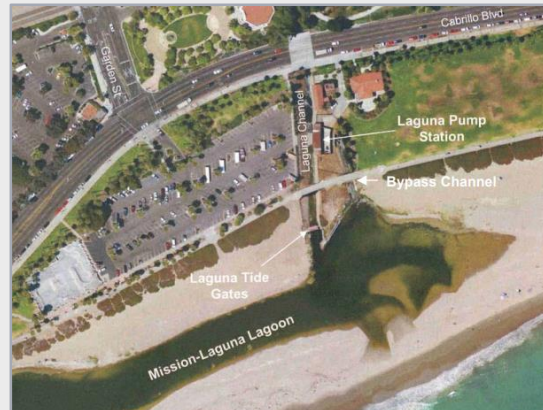
- Upland Bluff Retreat Hazard Area



- Higher retention of beaches.
- Harbor provides protection.
- Key issue is long-term flooding.

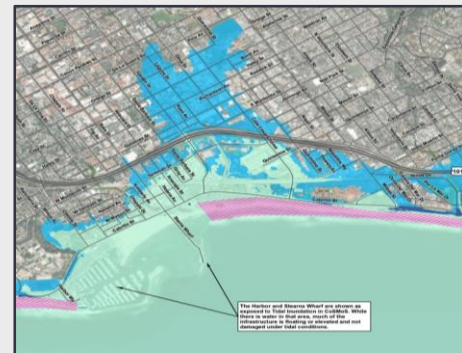
Low-Lying and Waterfront Areas

- Recommended Near-Term Actions
 - Introduce additional beach nourishment, beach berms, or dunes
 - Redesign Laguna Tide Gate
 - Relocate or flood proof sewer mains and utilities under beach



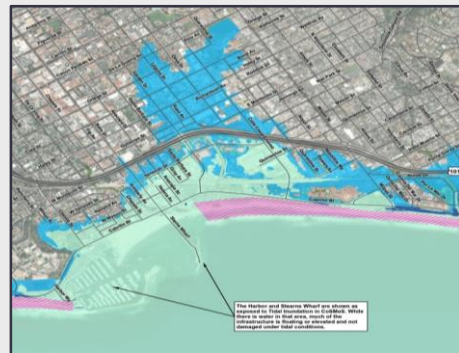
Low-Lying and Waterfront Areas

- Recommended Near-Term Actions
 - Revise floodplain regulations for development south of Highway 101
 - Continue existing development requirements south of Cabrillo Blvd. that factor in erosion and flooding from SLR
 - Initiate studies of mid- and long-term options for wastewater, stormwater, and water systems

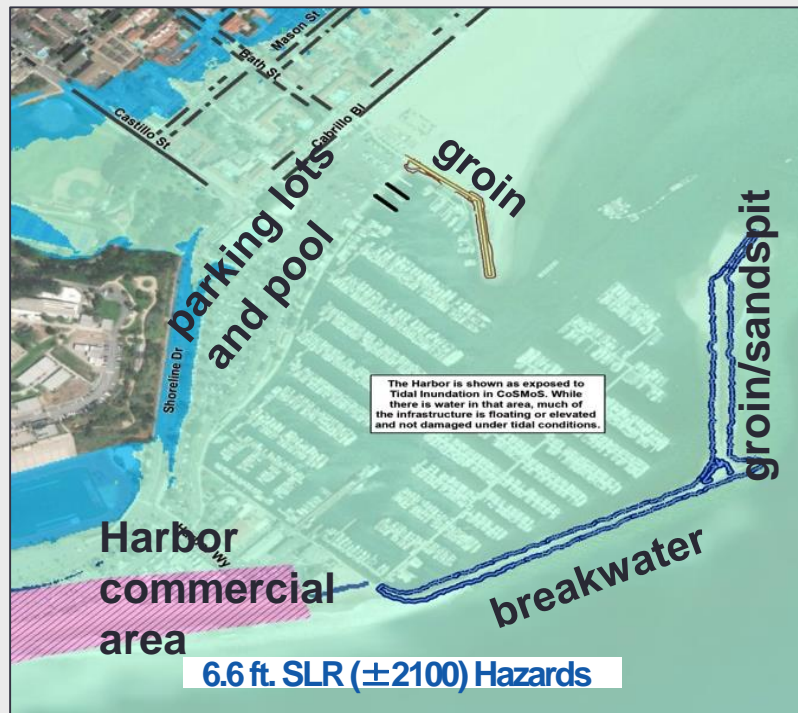


Low-Lying and Waterfront Areas

- Decisions in the Mid- and Long-Term
 - Consider flood protection measures:
 - Seawalls or levees along the Waterfront
 - Levees or floodwalls along lower portions of major creeks
 - Groundwater dewatering wells and stormwater pumps
 - Relocation and flood proofing of facilities



Harbor



Recommended Near-Term Actions:

- Raise breakwater and groins.
- Raise sidewalk around commercial area and parking.
- Renovate marinas and pier with higher piles.
- Seawall for commercial area
- Flood proof buildings

Harbor and Stearns Wharf

- Decisions in the Mid- and Long-Term
 - Consider raising the Harbor commercial area, relocating or removing some facilities, or other options
 - Choose to raise, redesign, or remove Stearns Wharf



Other City-Wide Recommendations

- Amend City policies, procedures, and adjust staffing
- Amend the Local Coastal Program, Hazard Mitigation Plan, Municipal Code, Capital Improvement Program
- Consider hazard disclosures and risk indemnifications
- Coordinate with regional, state, and federal agencies
- Additional public engagement
- Retain SLR Subcommittee and Interdepartmental Team
- Pursue funding opportunities and follow emerging information

ADAPTATION PLAN SCHEDULE

Public outreach and comment period	August 11 – September 30
Revisions to Draft Plan	October 2020
Subcommittee recommendation	October/November 2020
Council consideration of Final Plan	November/December 2020
Implementation, including LCP Amendment	2021 onward

- Webpage: [**www.SantaBarbaraCA.gov/SLR**](http://www.SantaBarbaraCA.gov/SLR)
- Comments by September 30th:
[**SLRPlan@SantaBarbaraCA.gov**](mailto:SLRPlan@SantaBarbaraCA.gov)
- Contact: Melissa Hetrick, Project Planner
SLRPlan@SantabarbaraCA.gov; 805-564-5470 ext. 4556

QUESTIONS

- Type question in chat box or
- Click “raise your hand” icon  to speak