SANTA CRUZ COUNTY
COMMUNITY DEVELOPMENT
AND INFRASTRUCTURE

Community Group Meeting

Sea Level Rise Vulnerability Assessment + Local Coastal Program Amendment

Coastal Property Owners Association

Fall 2025

integral consulting inc.

Blue Point planning

SANTA CRUZ COUNTY
COMMUNITY DEVELOPMENT
AND INFRASTRUCTURE

Meeting Agenda

- CPOA Questions
- The Local Coastal Program
- The Coastal Zone
- Project Background
- Project Status
- Vulnerability Assessment
- Adaptation Pathways
- Community Engagement
- LCP Amendment
- Q & A

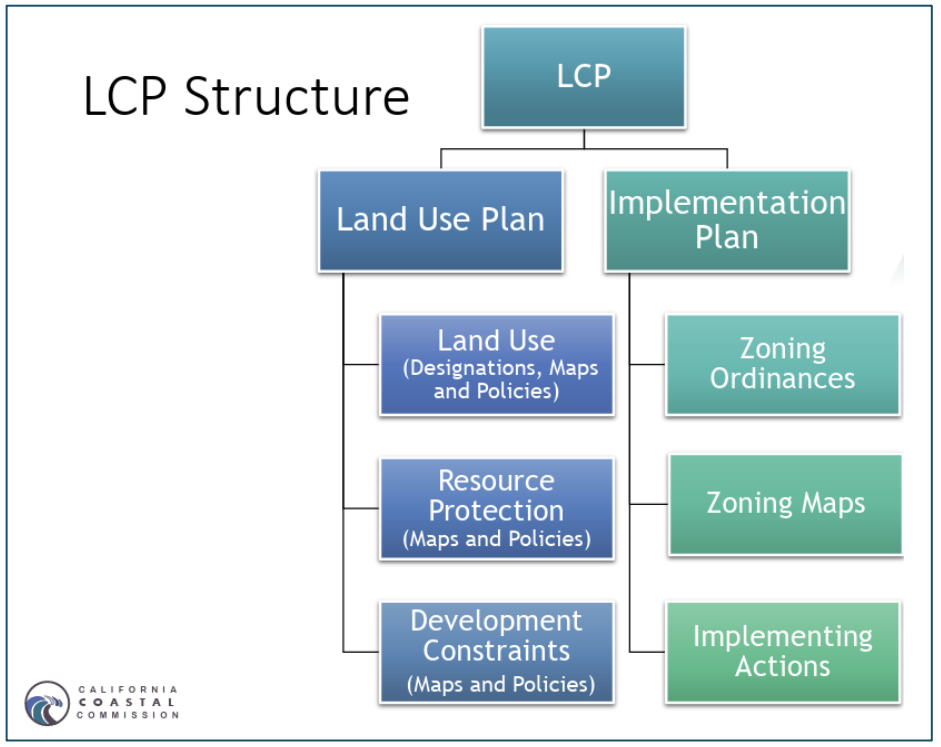
SANTA CRUZ COUNTY
COMMUNITY DEVELOPMENT
AND INFRASTRUCTURE

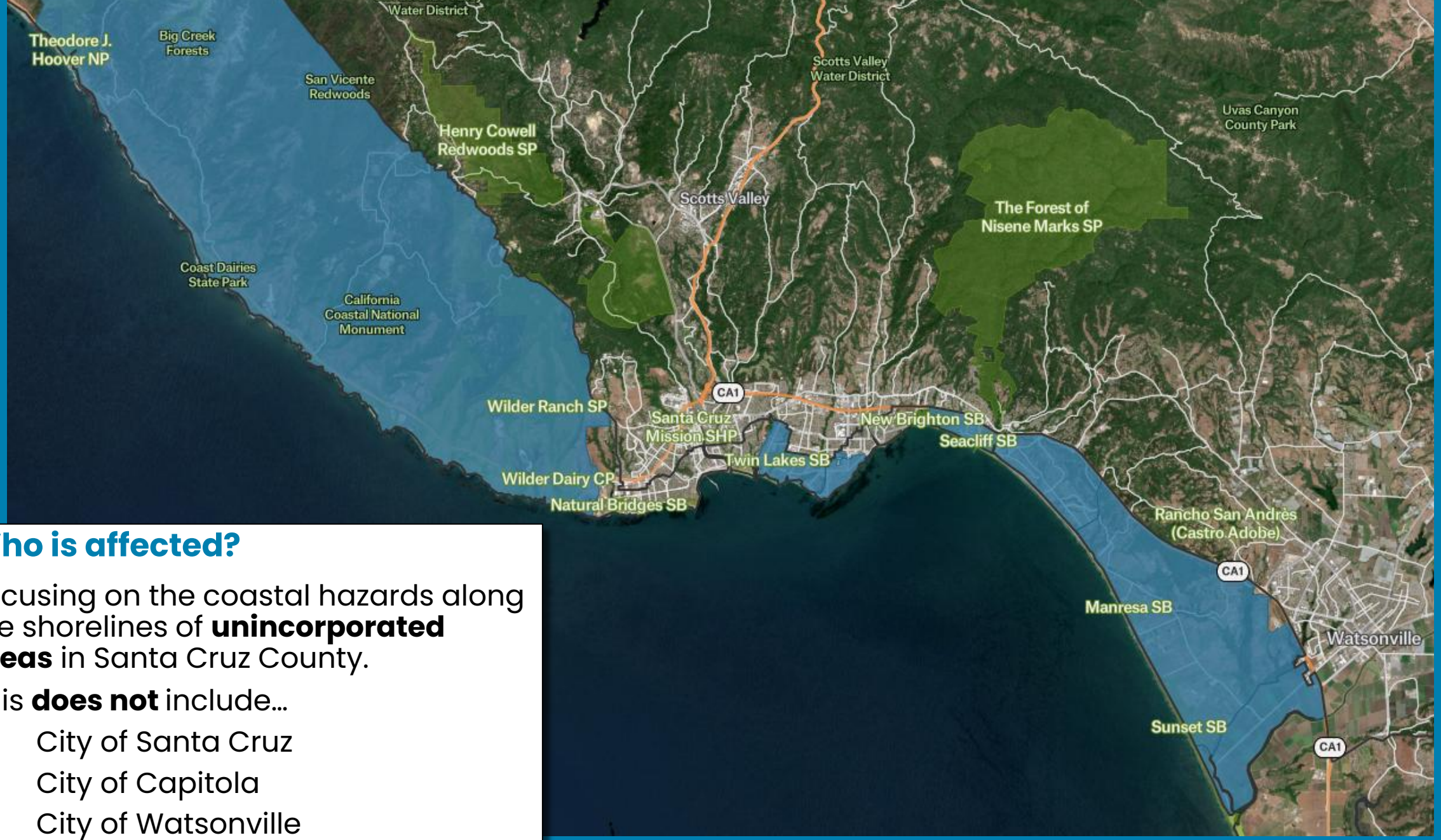
CPOA Questions Summary

1. Planning horizon(s)
2. Science/vulnerability assessment
3. Armoring sustainability
4. Development regulations
5. Private property considerations
6. Adaptation strategies
7. Economic considerations

What is a Local Coastal Program (LCP)?

- Provides a framework for development and coastal resource protection within a jurisdiction's coastal zone area
- Prepared by the local jurisdiction and submitted to the Coastal Commission for certification
- Must address and balance challenges such as:
  - sea-level rise
  - property rights
  - sustainable growth
  - coastal resource protection
  - community interests





Who is affected?

Focusing on the coastal hazards along the shorelines of **unincorporated areas** in Santa Cruz County.

This **does not** include...

1. City of Santa Cruz
2. City of Capitola
3. City of Watsonville

Background

Sea Level Rise Adaptation Challenge: Coastal Development + Coastal Erosion

Santa Cruz Co, Opal Cliffs — 1943

Santa Cruz Co, Opal Cliffs — 1967

Source: http://library.ucsc.edu/maps/view-digitized-aerial-flight-photos-by-county

Most urban footprints were established before the Coastal Act.

Background

September 2020
Board of Supervisors approves LCP Amendments of Safety Element, Coastal Hazards Chapter

October 2020
LCP Amendments submitted to Coastal Commission Central Coast Office

October 2022
Coastal Commission denies the County's LCP Amendments related to coastal hazards

August 2023
County receives grant funds from Coastal Commission for Sea Level Rise Vulnerability Assessment and LCP Amendment Project

February 2024

Board of Supervisors approves contract with Integral Consulting

2024-present
Vulnerability Assessment project

2022 Coastal Hazards LCP Amendment

Key Takeaways from Coastal Commission Denial

Staff Report

- Too much reliance on armoring
- Coastal Act policy conflicts
- Overly complicated policies

Commissioners

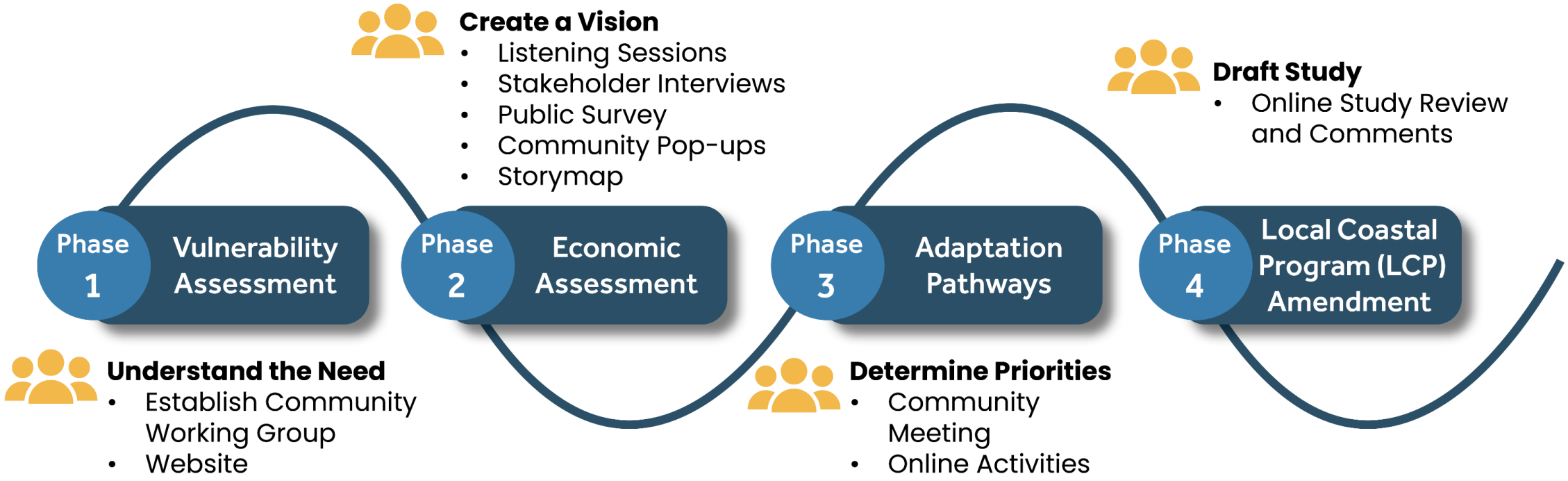
- Too much reliance on armoring
- Respect definition of existing development
- Updated vulnerability assessment

Executive Director

- Suggest neighborhood scale approach
- Be creative, push boundaries of status quo
- Robust guardrails:
  - mitigation
  - development restrictions
  - adaptation planning

Project Status

Ways to Get Engaged!



Ongoing Coastal Commission Coordination

Vulnerability Assessment

Overall Goals of the Study

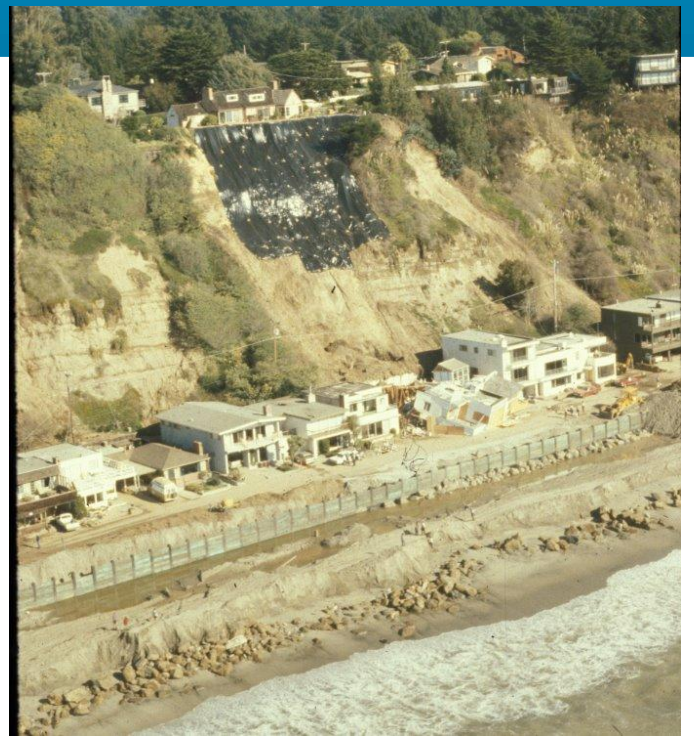
Address climate change, sea-level rise, and erosion while protecting property values and preserving the coastline's natural beauty for future generations.

Build adaptation pathways at the County Level and Neighborhood Level

Develop policies to protect both the environment and public interests in preparation for coastal impacts.

Coastal Hazard Types

Storm Wave Flooding



Coastal Erosion

Rising Tides

Fluvial Flooding along Coastal Waterways

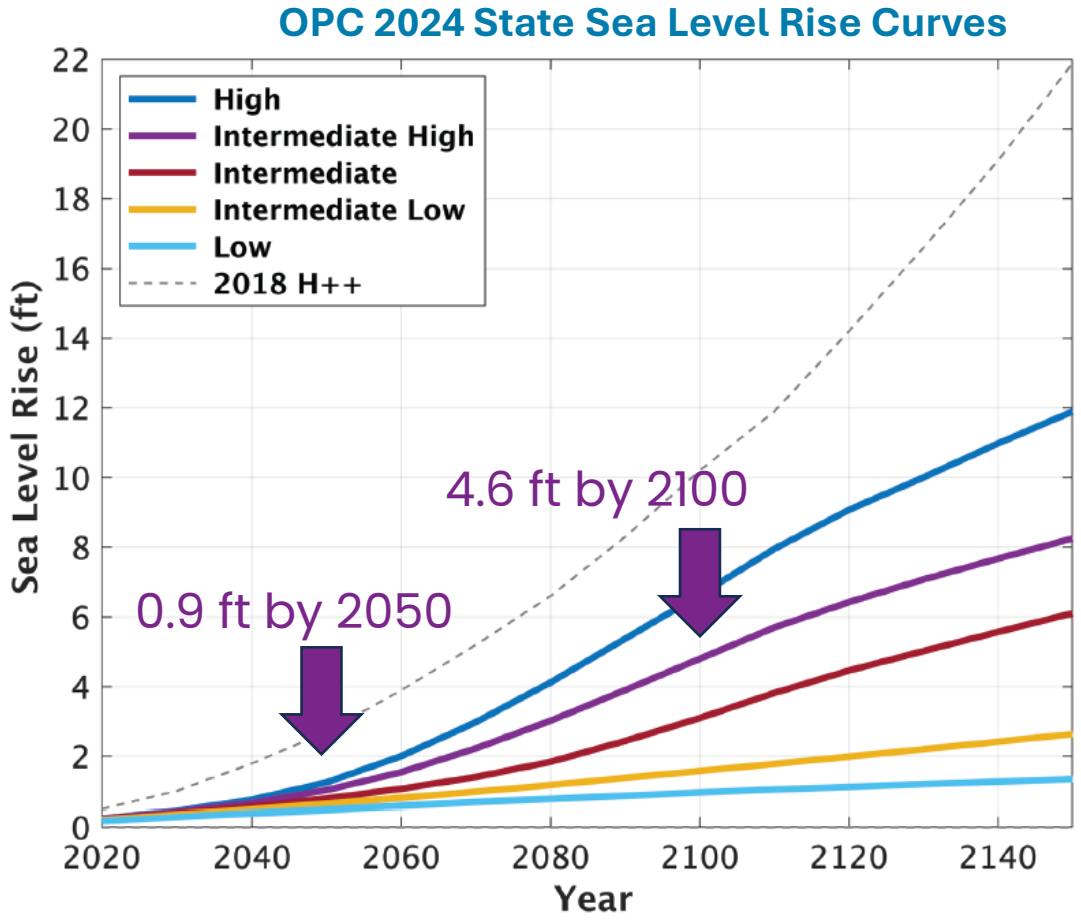
Sea Level Rise Science

Future sea level rise is uncertain, but the state recommends evaluating an **'Intermediate-High'** sea level rise scenario for residential and commercial development.

Five Sea Level Rise Scenarios were developed by the California OPC in 2024.

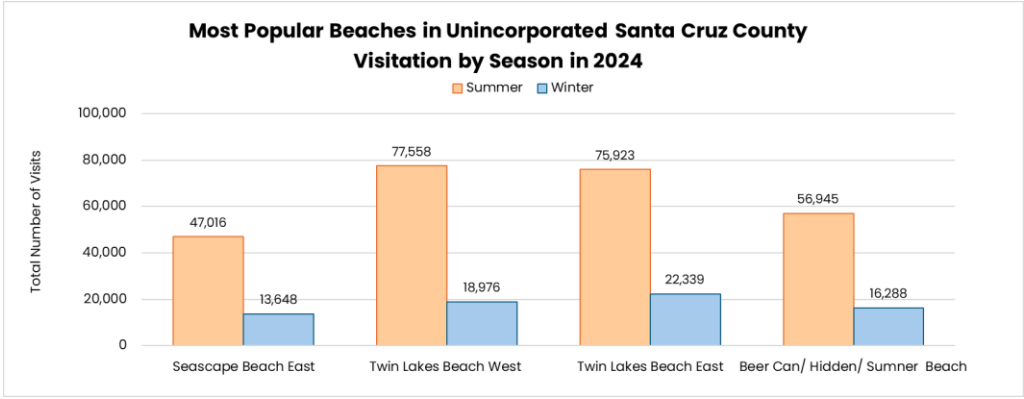
Each scenario is labeled according to the value of sea level rise by 2100 at Monterey tide gauge:

- **Low** : 0.8 ft by 2100
- **Intermediate-Low:** 1.4 ft by 2100
- **Intermediate:** 2.9 ft by 2100
- **Intermediate-High:** 4.6 ft by 2100
- **High:** 6.4 ft by 2100



Vulnerability Analyses

- **With and Without Coastal Armoring by Sea Level Rise and Hazards**
- **Vulnerabilities to Land Use and Structures**
  - Probability of impact to structures (maps)
  - Number and value of structures
  - Area and value of parcels
- **Vulnerabilities to Transportation and Utilities**
  - Length of road
  - number of critical utilities
  - Estimates of cleanup and replacement costs.
- **Recreation and Coastal Use**
  - Beach visitation
  - Beach width projections for summer and winter
  - Surf break performance



Economic Analysis that will be included

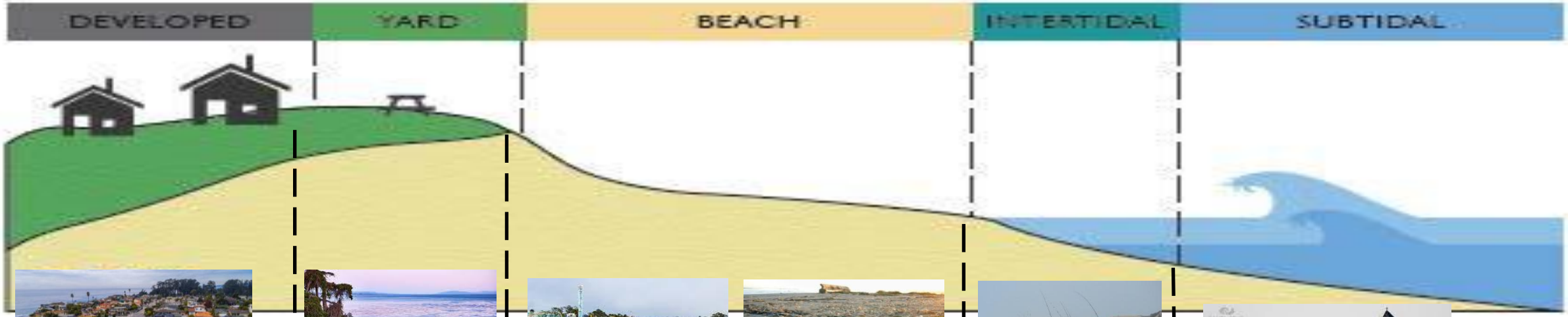
- Damages estimates to land use, structures, and infrastructure
- Convert future damage estimates to present values
- Estimate lost property tax revenues to the County
- Estimate value of coastal recreational resources
- Estimate economic impacts of future changes to recreational resources
- Apply the analysis to different adaptation pathways allowing estimated economic impacts to inform decision-making

What to Balance

Upland Development, and Infrastructure

balanced with

Coastal Resources and Recreation















Sectors Evaluated in the Vulnerability Assessment

Land use and structures

- Parcels and buildings including residences, hotels, commercial, farms, and critical facilities

Utilities and infrastructure

- Wastewater, water, stormwater, and major gas lines

Recreation & coastal access

- Parks, coastal vertical access, lateral access coastal parking areas, bike trails, and restrooms

Sectors Evaluated in the Vulnerability Assessment

Transportation

- Roads, rail, bridges, and bus lines

Natural resources

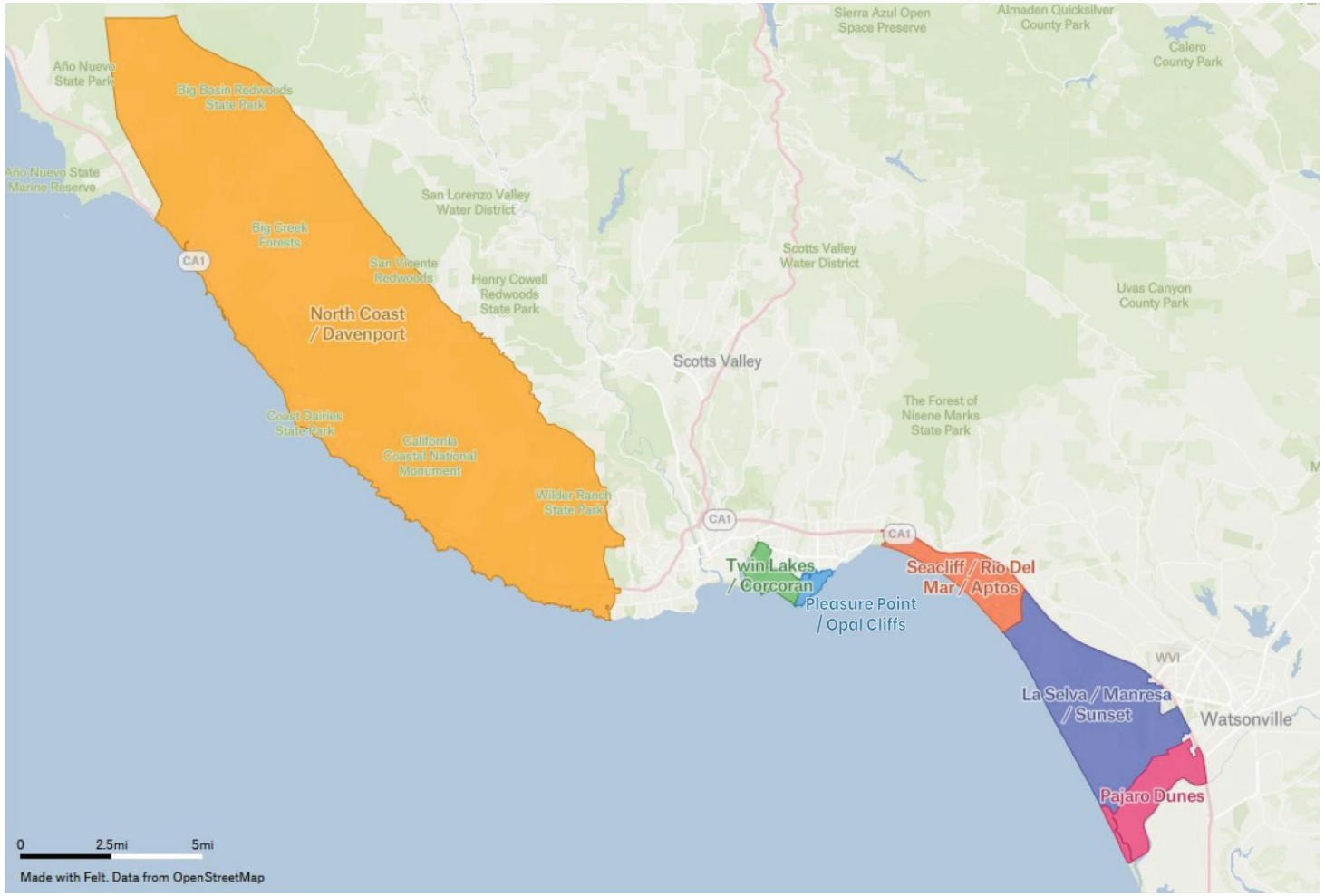
- Beaches
- Dunes
- Surf Breaks

Others considered

- Demographics, social vulnerability, and visitation

Neighborhoods

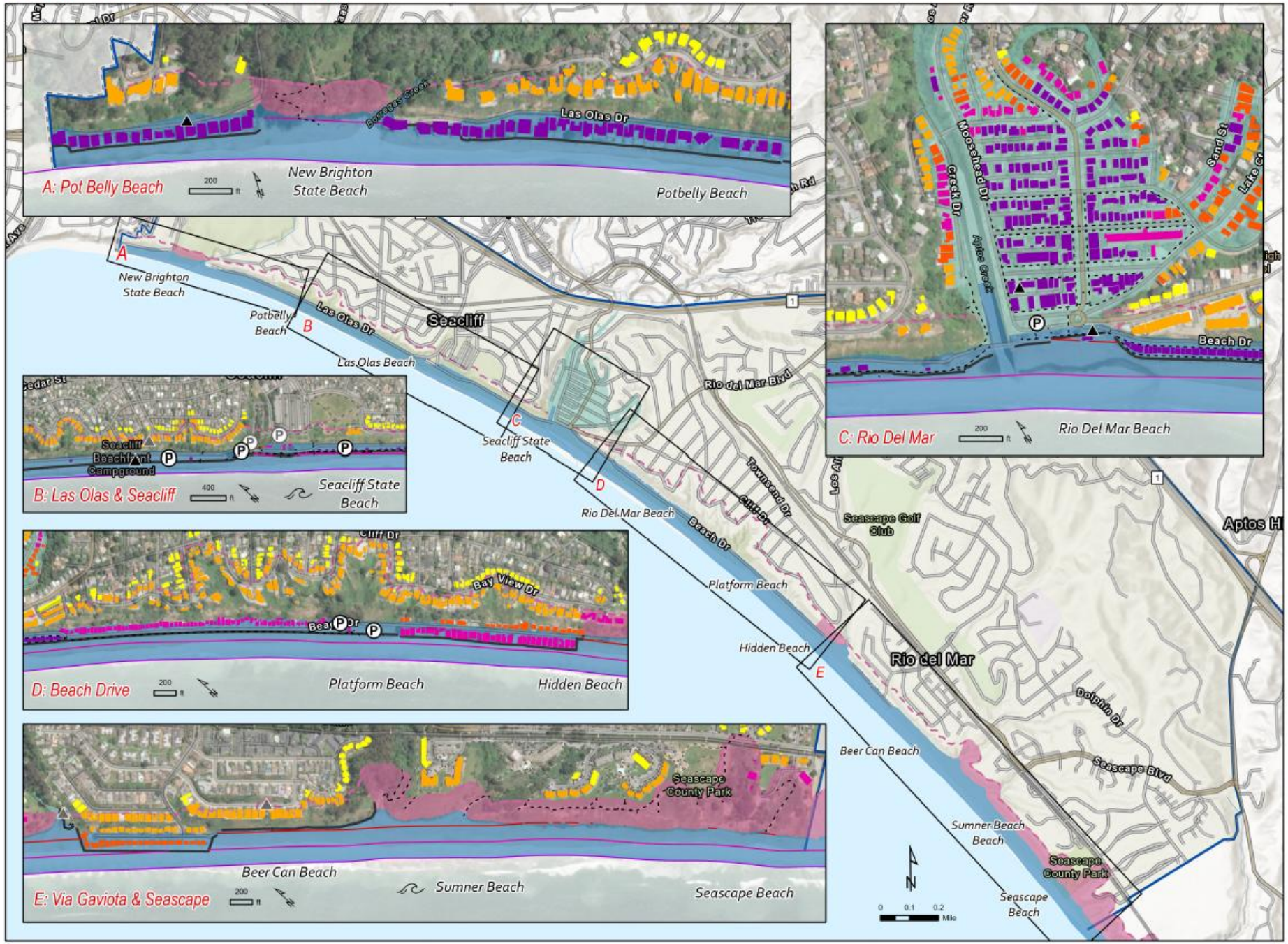
1. North Coast / Davenport
2. Twin Lakes / Corcoran
3. Pleasure Point / Opal Cliffs
4. Seacliff / Rio Del Mar / Aptos
5. La Selva / Manresa / Sunset
6. Pajaro Dunes



Vulnerability Assessment
Hazard Maps

DRAFT - NOT FOR DISTRIBUTION

Seacliff / Rio Del Mar / Aptos - Coastal Hazard Areas: 2 ft SLR with Existing Armoring



Boundaries

- Neighborhood Boundary
- County Boundary

Coastal Hazard Areas & Features: 2' SLR

- Storm Flooding (1% annual chance)
- Low Lying Flooding
- Cliff Erosion (with Armoring)
- Dune Erosion (with Armoring)
- Erosion Extent without Armoring
- Coastal Armoring

Winter Beach Width (ft of SLR)

0 ft 1 ft 2 ft 3 ft 4 ft 5 ft

Structures

Probability of Impact

Very Low | Low | Medium | High | Very High

Critical Infrastructure

black=vulnerable, grey= not vulnerable

- Parking Lots
- Key Stormwater Structures
- Key Sanitation Structures
- Railroads
- Trails

Disclaimer: These maps are intended for planning and informational purposes only. They do not depict parcel level, regulatory, or legal boundaries, nor should they be used for permitting, engineering, navigation, emergency response, actuarial assessments, or property insurance determinations. The mapped hazard zones reflect broad scale modeling and are subject to uncertainties, including data limitations and evolving conditions.

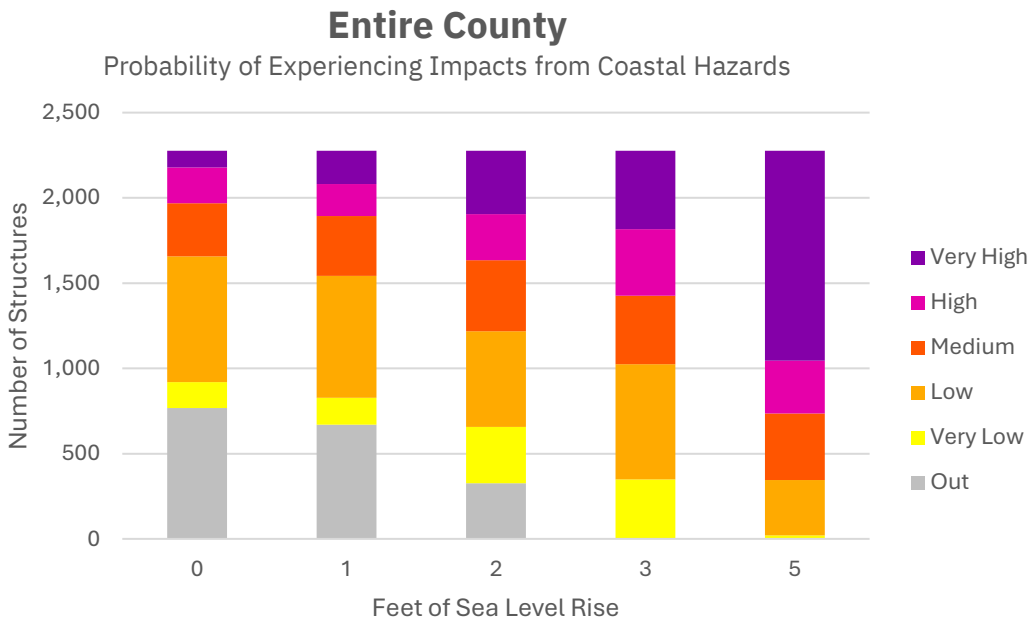
Data Sources: Coastal hazards TNC Coastal Resilience (2014). Coastal Wave Flooding FEMA (2018). Long-term beach widths from Integral Consulting (2025).

Structural Damage Probabilities

Flooding

Recurrence intervals of flooding, and a comparison between **flood elevations** and the base **floor elevations** of structures

Probability Structures at Risk from Flood Hazards	**Recurrence Interval (Storm Frequency)**
Very Low	**1 in 100 to 1 in 500**
Low	**1 in 20 to 1 in 100**
Medium	**1 in 10 to 1 in 20**
High	**1 in 5 to 1 in 10**
Very High	**< 1 in 5**

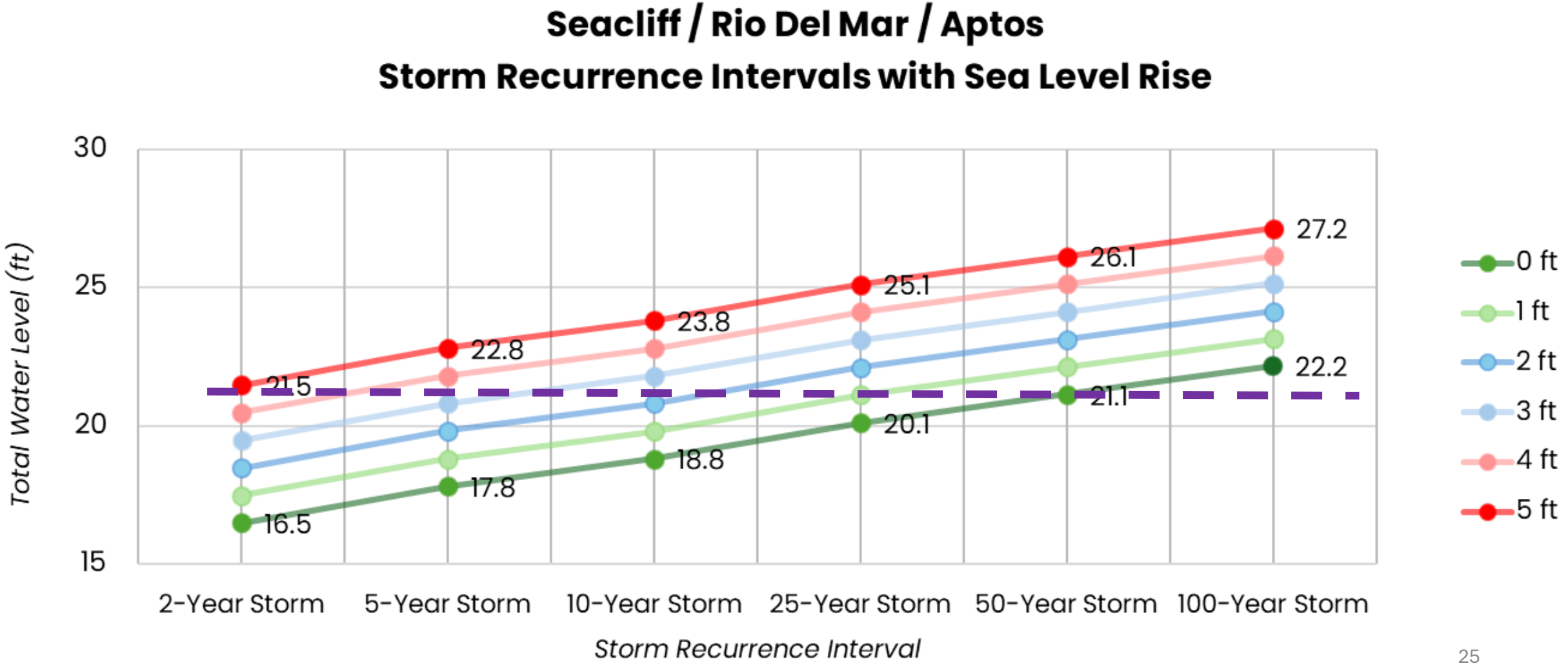


Erosion

Armoring condition, **distance** from the bluff top edge, **length of time** a structure is in a mapped hazard zone (each horizon elevates the risk by one level)

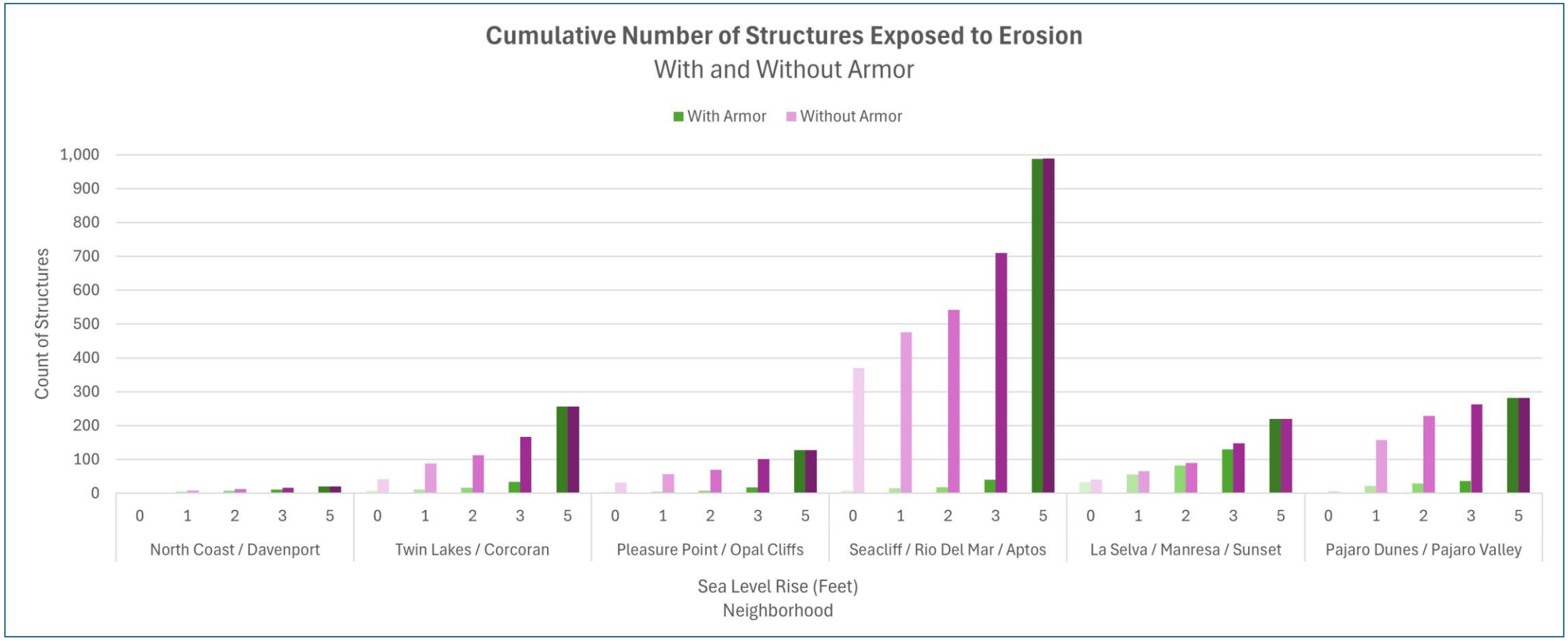
Probability Structures at Risk from Erosion Hazards	**Description of Hazard Conditions** The Structure is…
Very Low	either **protected** by coastal armoring or **further** from the bluff top edge
Low	either **protected** by coastal armoring or is at a **moderate** distance from the bluff top edge
Medium	either **not protected** by coastal armoring or located **close** to the bluff top edge
High	either **not protected** by coastal armoring **and located close** to the bluff top edge, or located **very close** to the bluff top edge
Very High	at imminent risk of being threatened by erosion

Storm Wave Frequency



Countywide All Hazards Buildings Synopsis

- Most vulnerabilities are caused by erosion to residential buildings
- Seacliff/Rio Del Mar/ Aptos neighborhood has the highest number of structures at risk



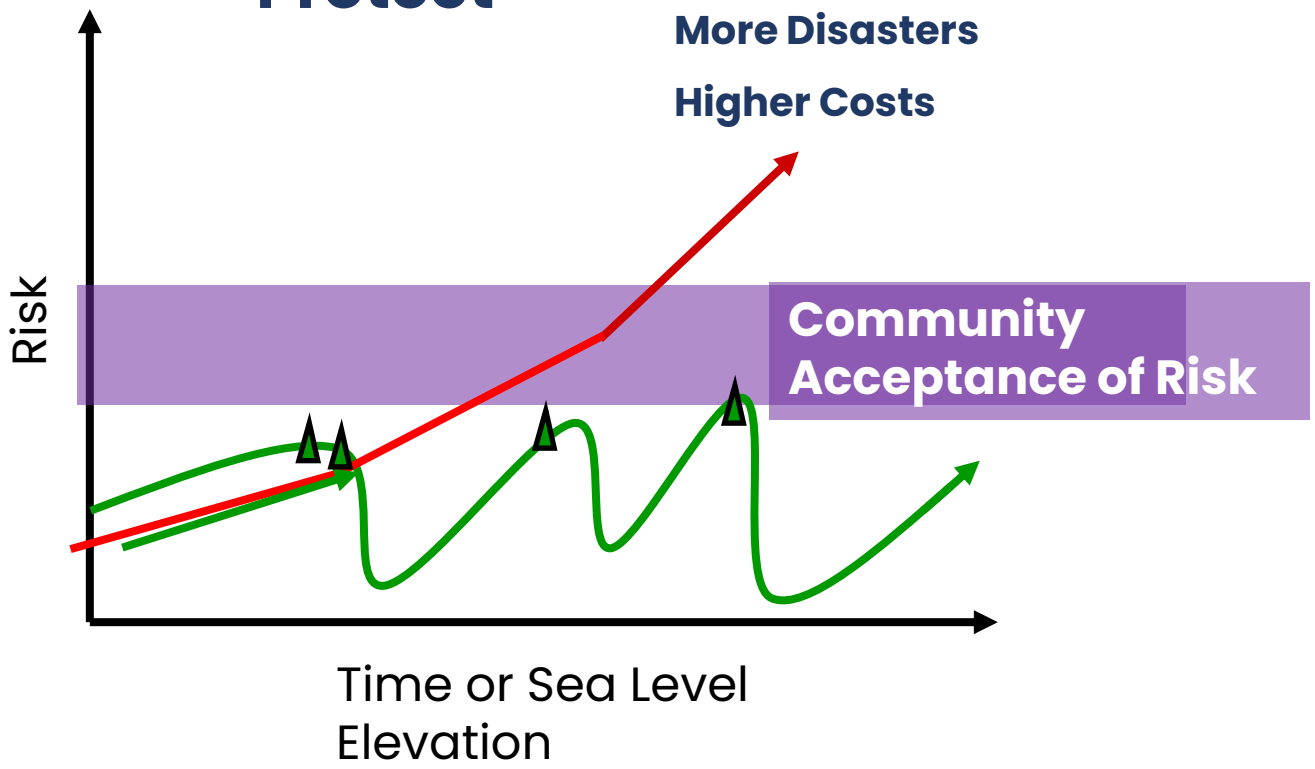
Summary of Vulnerability Findings

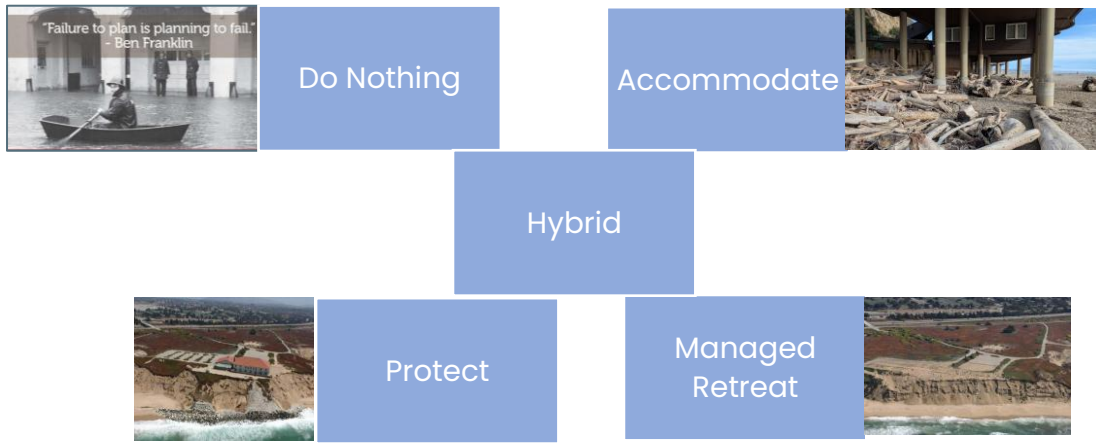
- **Primary Threat**: Storm-driven erosion damages development and weakens coastal armoring - will intensify with rising seas
- **Key Hazard**: Cliff erosion
- **Low-lying Areas**: Currently experience occasional wave flooding; then routine tidal inundation with rising seas
- **Current Armoring**: 21% is armored, protecting 72% of buildings
- **At Risk with 5 feet of SLR**: 1,996 buildings in combined hazard damages to land and buildings with cleanup
- **Natural Beaches**: Average 75ft wider than armored beaches
- **Surf Breaks:** By 2' of SLR, most breaks work less than 25%. By 3' of SLR, many are gone

Adaptation Pathways

Adaptation

- **Do Nothing**
- **Retreat**
- **Accommodate**
- **Protect**





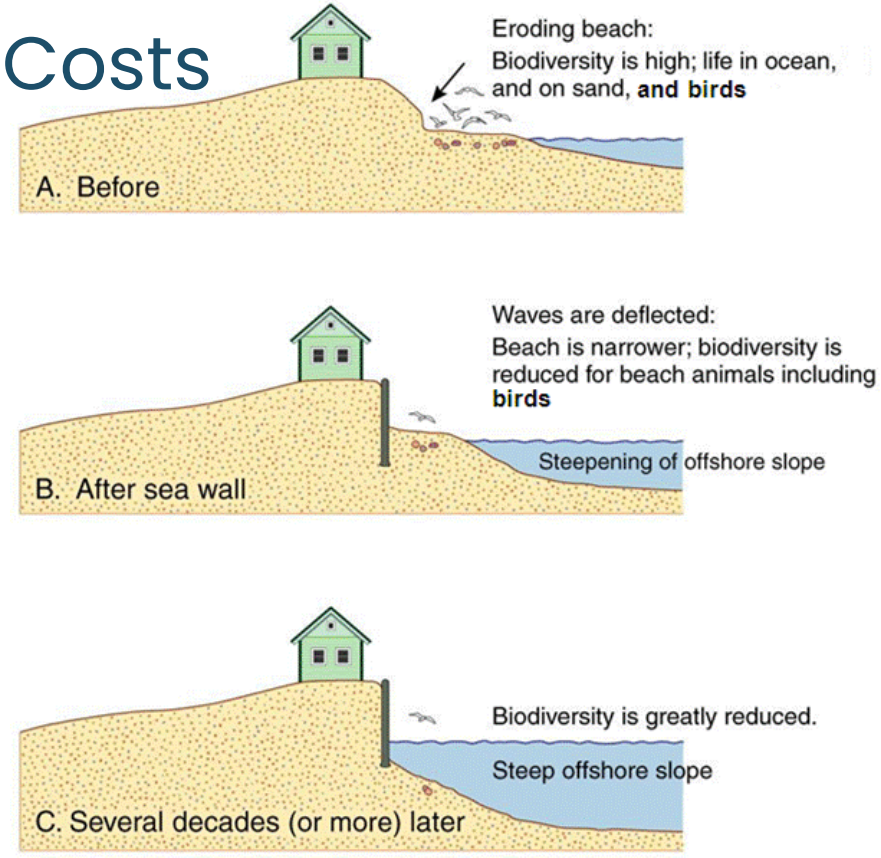
Green vs. Grey | Projects vs. Policies | Increasing Costs and Risk Without Action

Areas for Adaptation

Stop = loss of beach protect upland – increasing costs
Reduce = balance beach and recreation – routine costs
Avoid = maintain beach, realign upland – high upfront costs

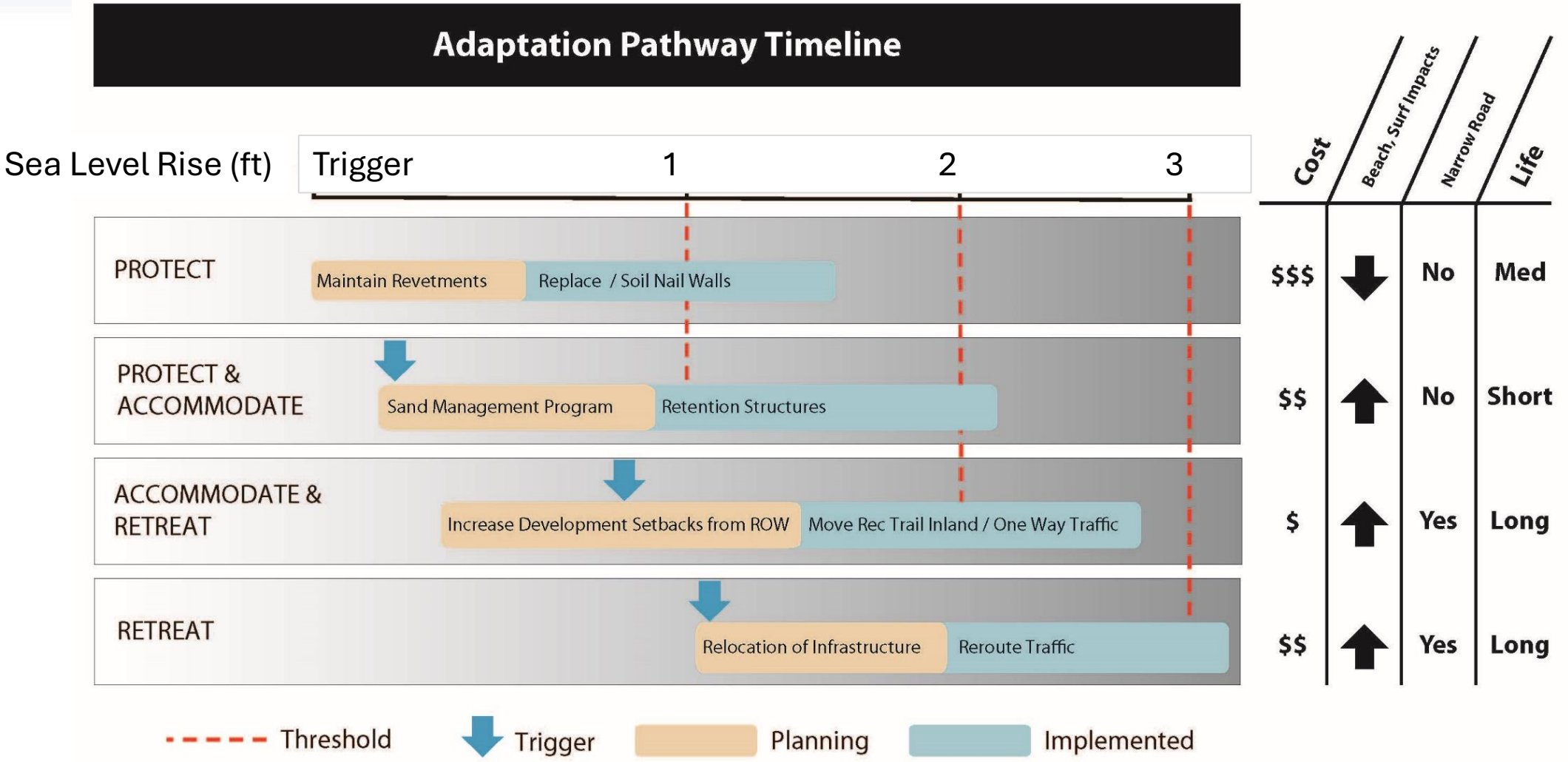
Secondary Consequences

- Damages
- Implementation and Maintenance Costs
- Ecology
- Recreation
- Access – Vertical / Lateral
- Views / Aesthetics
- Loss of low cost recreation
- Loss of tourism related revenues
- Loss of property tax base



Source: Pilkey, O.H. and Dixon, K. L. 1996
(modified) *The Corps and the Shore*. Island Press, Washington, D.C.

Sea Level Rise Adaptation Pathways



Example Triggers

Easily monitored and ideally integrated into day to day or seasonal maintenance actions

Community agreed upon when a trigger is reached there is acceptance about next steps

By sea level rise elevation or rate –after a certain elevation or rate, cliff erosion will not keep up with sea level rise and beaches will be lost without further adaptation

By beach width – when the beach in front of armoring is not passable for 3 months a year

By armoring failure – when coastal armoring fails or becomes a nuisance on the beach

By time – specify a time when a lease ends or a study must be complete

By exposure –frequency Rio del Mar requires clean up from storm waves, or East Cliff Drive is closed

By distance – what is the distance between a structure and the cliff edge

By damages – building removed when damaged by 50% or multiple damage claims

By cost – once the County or homeowner spends $XX to clean up damages in a 5-year period

Community Engagement

Community Working Group (CWG)

Members offer diverse knowledge and experience on coastal issues and represent the broader community working together to help shape a vision for the county's coastline.

Meetings

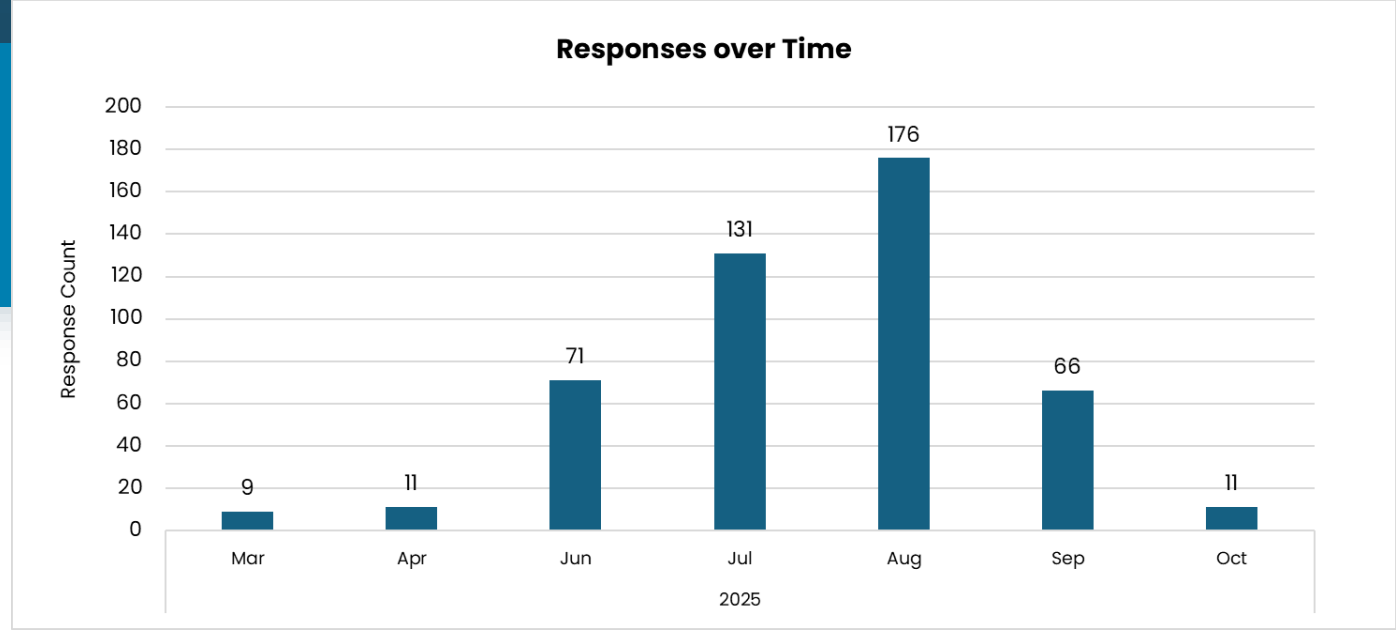
- Project information and background
- Vulnerability assessment updates
- Outreach updates
- Sea level rise adaptation planning and exercises
- Policy approaches and concerns

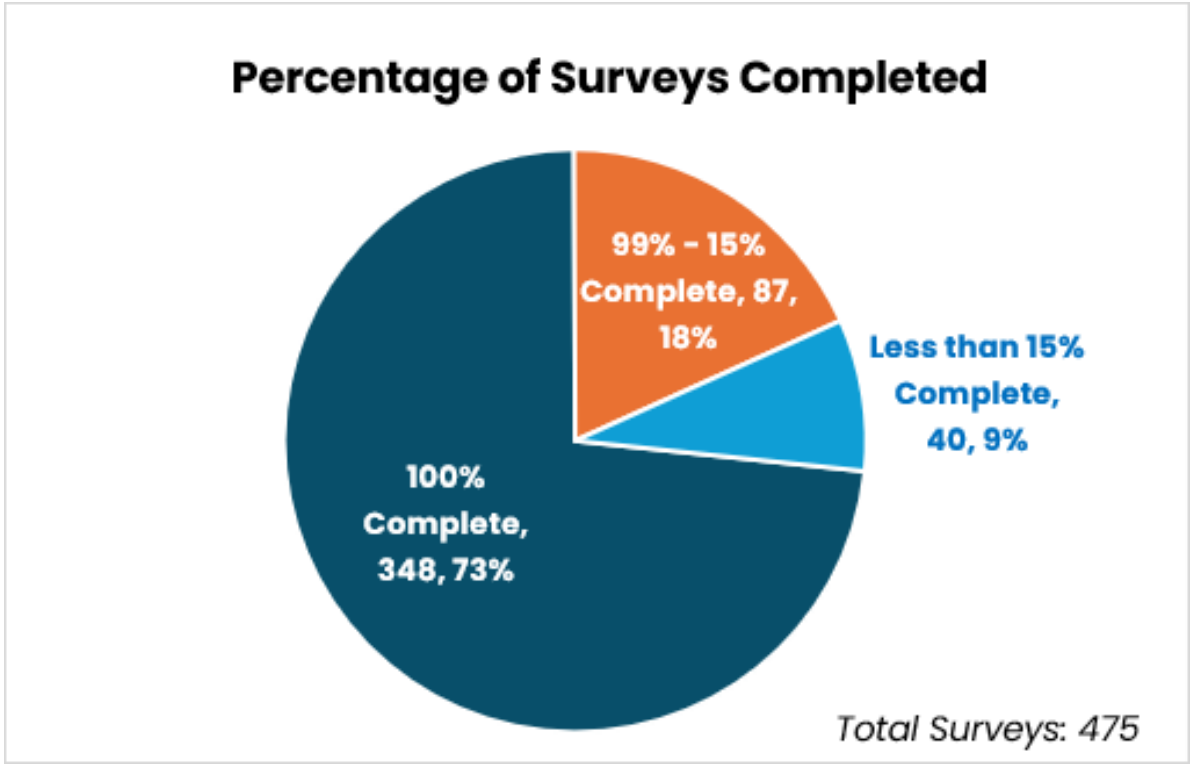
Feedback

- Neighborhoods
- Armoring considerations
- Hazard maps feedback
- Adaptation strategies brainstorming
- Strategy triggers brainstorming
- Community engagement feedback

Survey Results

Take the Survey





Public Listening Session Vision

Stakeholder Interview Key Takeaways

Trust and Cooperation Challenges

- Lack of trust for the Coastal Commission and media channels
- Frustration with slow and confusing processes for costly permits and stricter regulation

Partnership priorities

- Work with private property owners to protect the coastline while offering public access
- Actively engage the community and ensure a transparent process while emphasizing jurisdictional boundaries to reduce confusion

Solution Ideas

- Prioritize nature-based approaches when viable, especially in lagoons and wetlands
- Identify trigger-based approaches to address uncertainty and if then statements to allow a range of responses to coastal hazards

Public Listening Session – Concerns

Protection of private property rights

Loss of private property rights

Sea level rise. Loss of beaches. Surfing at high tide always.

Loss of habitat -

Protection of my home

Impacts to coastal resources caused by damaged public infrastructure and loss of public shoreline access

The LCP is limiting the right of private property owners to protect their private property at this own expense.

Habitat loss for shorebirds

Loss of camping opportunities along the coast

Protecting sea life and property.

Loss of private property rights.

Public Listening Session- Communication

Cross jurisdictional Collaboration

Set up a committee

Full transparency during the entire process.

Who is the committee?

Search for diverse perspectives and include a wide range of voices during the public process

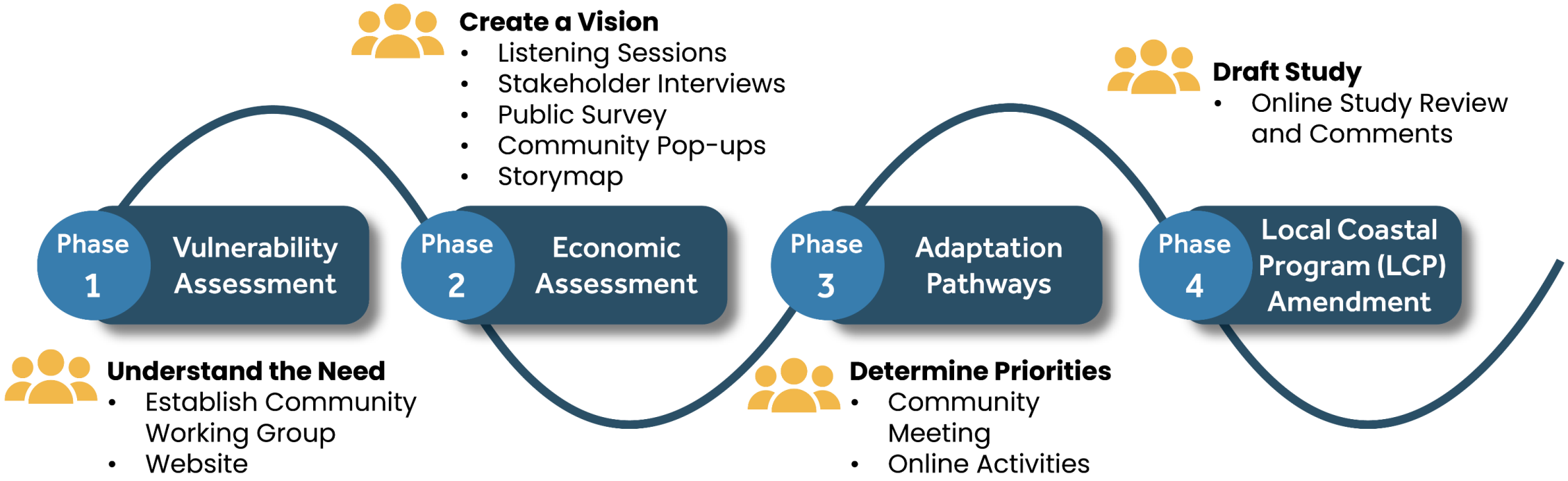
Share all committee information as it's presented

Meet with property owners who are currently trying to get permits to repair their private property so you can see the challenges they are facing

Have local neighborhood meetings.

Meet with major stakeholder groups such as CPOA and other property owner groups

Ways to Get Engaged!



Ongoing Coastal Commission Coordination

Sea Level Rise Vulnerability Assessment Project

Get Involved:

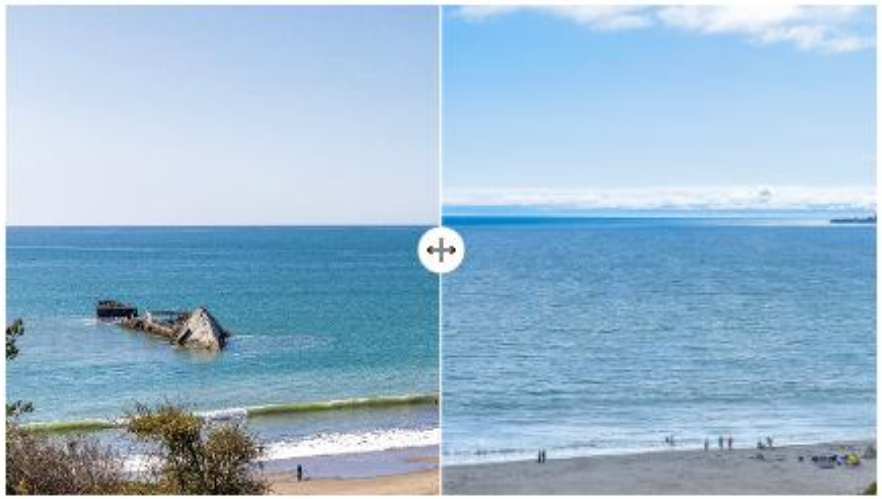
- Take our survey!
- Explore our Story Map English | Spanish
- Sign up for our email list
- Share your comments or concerns
- Questions? Email us at sealevelriseproject@santacruzcountyca.gov

Quick Links

- Community Working Group
- Project Overview Flyer
- News
- Santa Cruz Vibes Magazine Article
- Project FAQs
- Project Facts: Addressing Misinformation

Welcome to the Santa Cruz County Sea Level Rise Vulnerability Assessment Project

The County of Santa Cruz is conducting a Sea Level Rise Vulnerability Assessment as part of its Local Coastal Program (LCP) specifically focused on addressing coastal hazards. The LCP is a state-mandated plan that guides land use and development along the coast to balance environmental protection, public access, and sustainable growth, and is a community driven effort. We want to hear from you—your input will help shape the outcome of this effort. Community feedback will play a key role in guiding decisions.



Our Project

The Santa Cruz County Sea Level Rise Vulnerability Assessment Project (SLRVA Project) represents a comprehensive planning effort by identifying potential risks and adaptation strategies; the assessment will

LCP Amendment

LCP Amendment

Background

- Senate Bill 1 (Atkins, 2021)
  - Requires the Coastal Commission to plan for sea level rise
- Senate Bill 272 (Laird, 2023)
  - Requires local governments to plan for sea level rise
  - Use best available science
  - Vulnerability assessment
  - Adaptation strategies
  - Timeline for updates
  - Requires the Coastal Commission to establish guidelines for sea level rise plans
- Ocean Protection Council
  - State Sea Level Rise Guidance 2024 Science and Policy Update
- Coastal Commission Guidance
  - 2024 Update
  - Advice on Applying the Coastal Act to sea level rise planning
- Planning horizon
  - Mid-century vs 2100
- Existing / new development
  - Casa Mira decision

LCP Amendment

Existing Conditions

- Development/Redevelopment on existing lot
  - Coastal bluff structure setback
  - Beach level structure elevation
  - Storm damage repair
- Shoreline armoring
  - Allowed for existing development
  - No plans for removal/modification of shoreline armoring
  - Maintenance and repair
  - Neighborhood armoring
- Density (# of primary dwelling units/area)
  - SFD on existing lot vs lot split/new building site
  - Density determinations
- Private vs public areas
  - Public trust lands
  - Armoring and encroachment
  - Public access
- West Cliff Drive vs East Cliff Drive
- Public process

LCP Amendment

Sea Level Rise Update

- Add baseline sea level rise policies
  - Best available science
  - Disclosure/assumption of risk
- Update siting and design standards
  - Hazards: Policies to avoid, minimize, mitigate
  - Shoreline armoring standards
- Adaption planning
  - Policies reflecting identified adaptation strategies
- Planning horizon
  - Identify a timeline for updates
- Programmatic policies
  - Monitoring of sea level rise
  - Partnerships (Cities, State Parks)
  - Continued adaptation planning

Questions
Comments

Thank You

Take the Survey

https://cdi.santacruzcountyca.gov/slrva