

Welcome!  
*¡Bienvenidos!*





## Why are we here tonight?

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- To **share information** about the *Recovery and Resilience at Seacliff and New Brighton State Beaches* study, including information about coastal processes and the results of the Vulnerability Assessment



## Why are we here tonight?

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- To introduce an **online survey** asking for feedback on potential adaptation landscape elements and how they may impact what people value about these beaches.
- To **answer questions** you may have about the study



# Agenda

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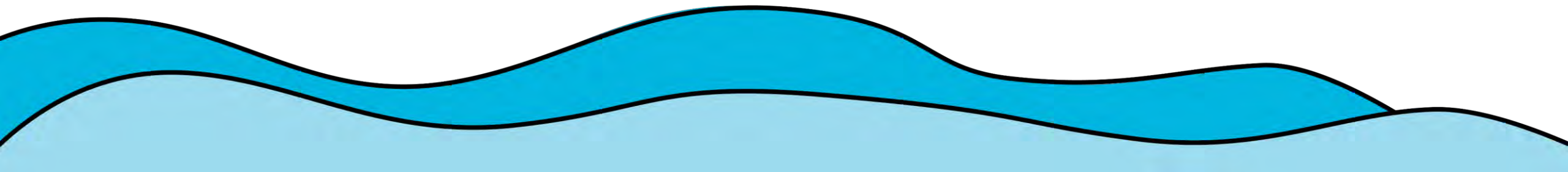
- Meeting Structure (*5 minutes*)
- Team Introductions and Welcome (*10 minutes*)
- Study Overview (*10 minutes*)
- What We've Heard (*10 minutes*)
- Vulnerability Assessment Summary (*20 minutes*)
- Landscape Elements (*20 minutes*)
- Online Survey (*5 minutes*)
- Additional Q&A (*10 minutes or as time allows*)



## Meeting Structure

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- Presentation of information related to the *Recovery and Resilience at Seacliff and New Brighton* study.
- Questions about the materials presented are welcome and should be sent using the Q&A function.
- We will pause periodically to answer questions received.





# Meeting Structure

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- All materials that we're sharing tonight are available on the project website: [SeacliffResilience.org](https://SeacliffResilience.org)
- The recording of tonight's meeting will be posted on the website in the coming days.
- Send additional questions or comments to [Seacliff.Resilience@parks.ca.gov](mailto:Seacliff.Resilience@parks.ca.gov)



## Meeting Structure

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- After the meeting concludes, please take the [online survey](#) to share your thoughts.
- Survey can be found on the project website: [SeacliffResilience.org](https://SeacliffResilience.org)



# Introductions

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- State Parks
- Friends of Santa Cruz State Parks
- Moffatt & Nichol
- Miller Maxfield
- PlaceWorks





# Welcome

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- **Bonny Hawley**

Executive Director, Friends of Santa Cruz State Parks

- **Chris Spohrer**

Santa Cruz District Superintendent





# Welcome

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- **Bonny Hawley**

Executive Director, Friends of Santa Cruz State Parks

- **Chris Spohrer**

Santa Cruz District Superintendent

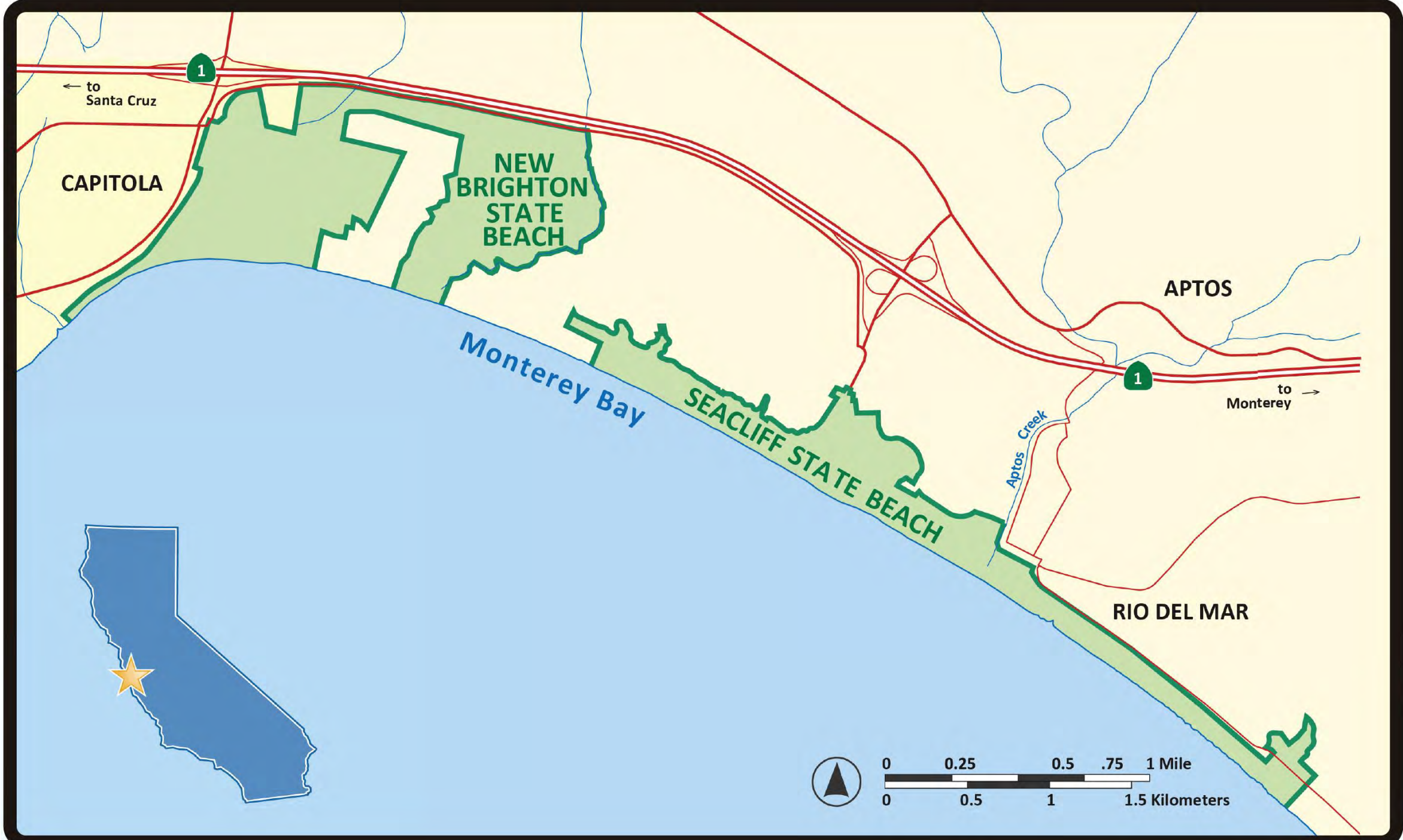




# Study Overview

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- Study Area
- Goals
- Coastal Processes and Vulnerabilities
- Timeline



# Project Goals

This study will identify pathways to increase resilience and reduce vulnerability to sea level rise at Seacliff and New Brighton State Beaches by:

- Understanding existing conditions and coastal processes.
- Completing a Vulnerability Assessment that evaluates park features and amenities.
- Identifying shoreline adaptation alternatives.
- Including public feedback.

## Coastal Processes and Vulnerabilities

Coastal Processes such as wave runup, beach erosion, and shoreline retreat shape our beautiful coast lines. As sea level rises, park assets that are vulnerable will experience greater and greater impacts.



### Cliff Retreat

Breaking waves and stormwater runoff erode cliffs, causing landward retreat.



### Groundwater Rise

Rising groundwater causes inland flooding and allows salt water into drinking water supplies.



### Wave Runup

High tides and waves runup on shore, causing flooding along the shoreline.



### Seasonal Beach Erosion

Waves move sand up and down the coast, and into deeper water, eroding the beach.



### Shoreline Retreat

Loss of sand causes the shoreline to move landward and the beach to become narrower.

## Sea Level Rise Vulnerability Assessment (SLR-VA)

The SLR-VA studies how rising ocean levels affect coastal processes and how changes to those processes may affect Seacliff and New Brighton State Beaches. It examines three scenarios: near-term sea level rise of one to two feet, mid-term sea level rise of two to four feet, and long-term sea level rise of four to six feet.

### Coastal Hazard

When a coastal process has the potential to impact and damage infrastructure and other assets.

### Vulnerability

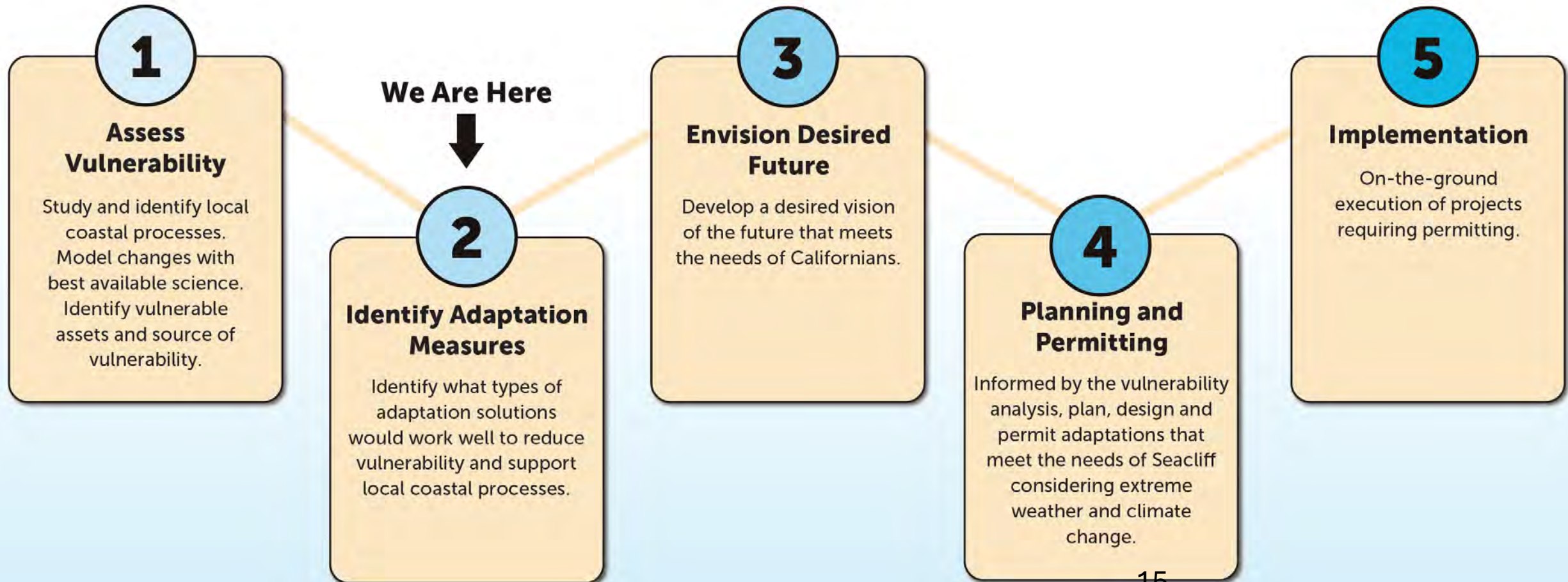
How much people, natural, or built systems are likely to be affected by sea level rise.

### Impact

How much park assets are affected by a hazard. Impacts are rated from low to severe, which is determined by how much an asset is damaged following exposure to a hazard.



# Seacliff and New Brighton State Beaches Recovery Process





# Study Overview

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- Additional Resources on [SeacliffResilience.org](https://SeacliffResilience.org)
  - Glossary of terms
  - State Parks Sea Level Rise Adaptation Strategy



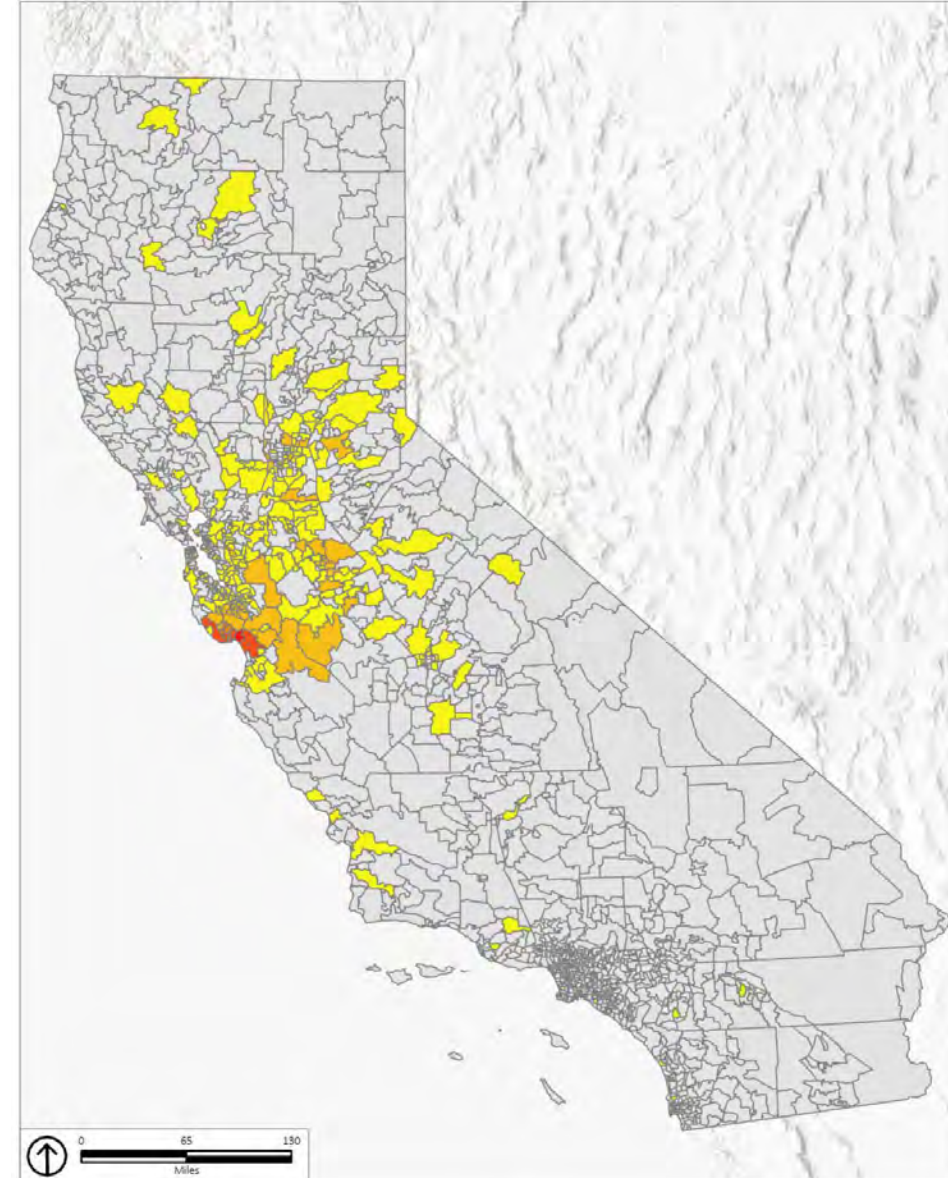
# Questions





# What We've Heard So Far

- Visitor Experience Survey conducted in September and October of 2023
- Gathered information about what people value at the park, the activities they enjoy, amenities they use, and how they'd like to experience the parks in the future
- 3,855 surveys completed across California

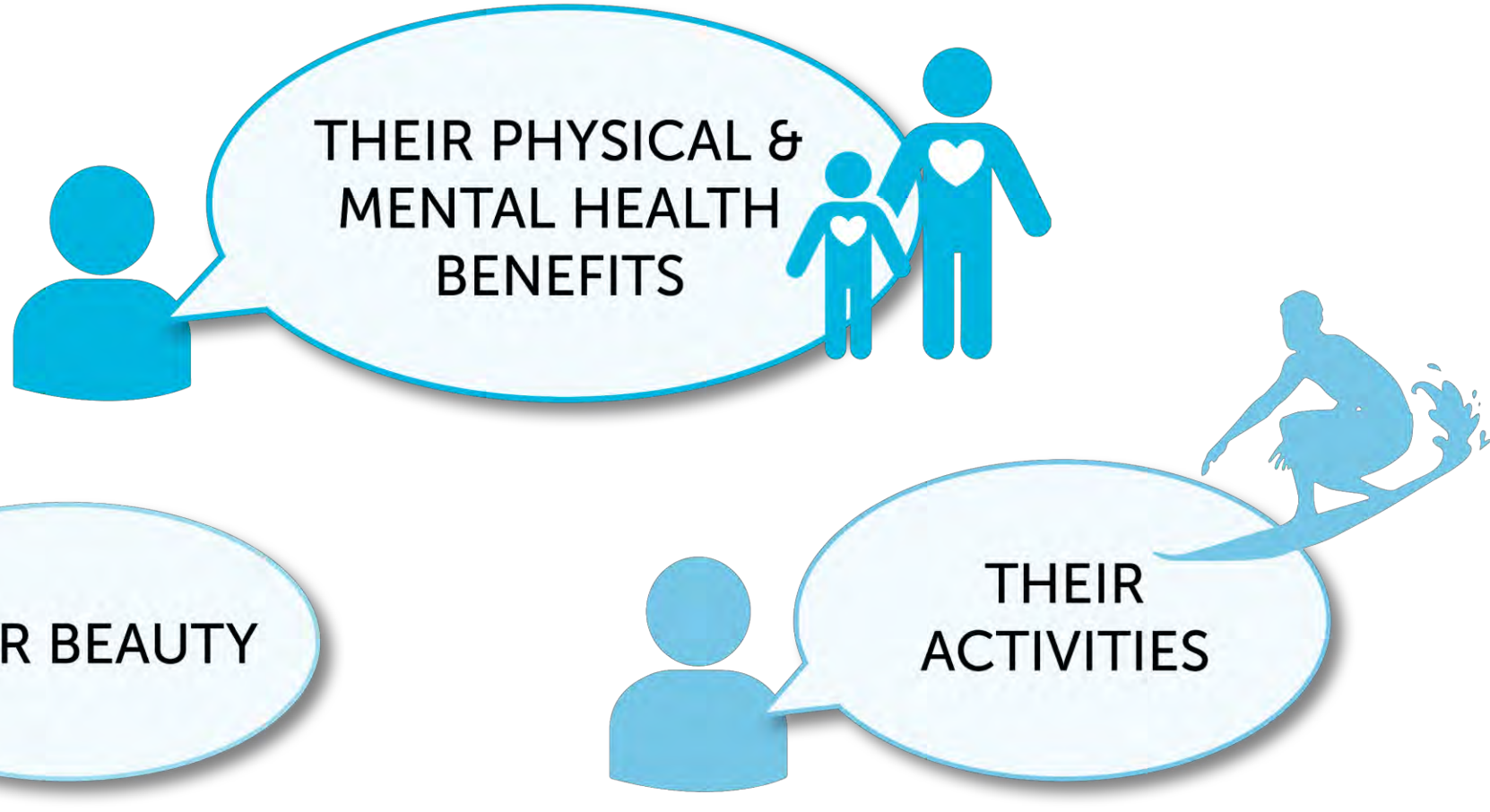




# What We've Heard So Far

## Top Responses

*What do you value and appreciate the most about Seacliff and New Brighton State Beaches?*





# What We've Heard So Far

## Top Responses

*If you were to visit Seacliff and New Brighton State Beaches in the future, which activities would you most like to engage in?*





# What We've Heard So Far

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- Additional feedback is being gathered:
  - September Open House
  - **Online Survey** available until November 30th
- Future phases of the Recovery Process will include additional opportunities to provide feedback.



# Online Survey

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First Section:

What are your three favorite activities to do at the beaches and what do you most appreciate about the beaches while you're doing these activities?



# Online Survey

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- Available at the link in chat
- Link also available on [SeacliffResilience.org](https://SeacliffResilience.org)
- Accepting responses until  
**November 30, 2024**

# Questions







# Vulnerability Assessment Summary

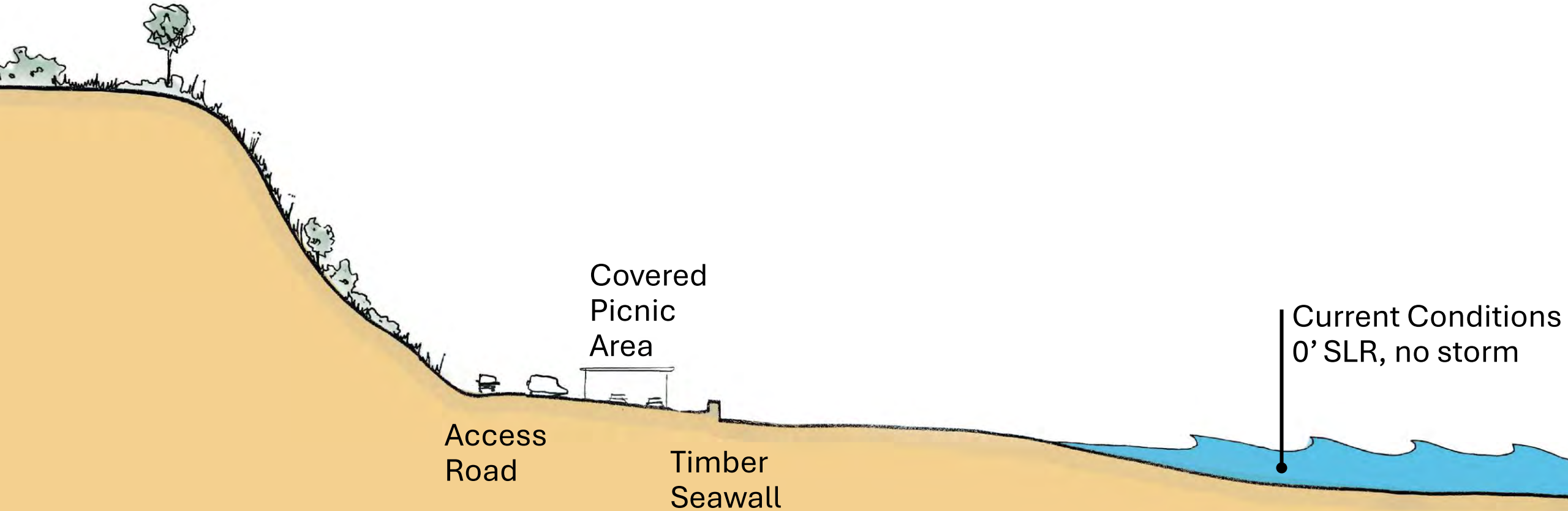
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- Vulnerability to Sea Level Rise and Storms
- Assets Exposed to Coastal Hazards
- Potential Impact Level to Assets Exposed to Coastal Hazards
- Maps



# Vulnerability Assessment Summary

## Vulnerability to Sea Level Rise and Storms

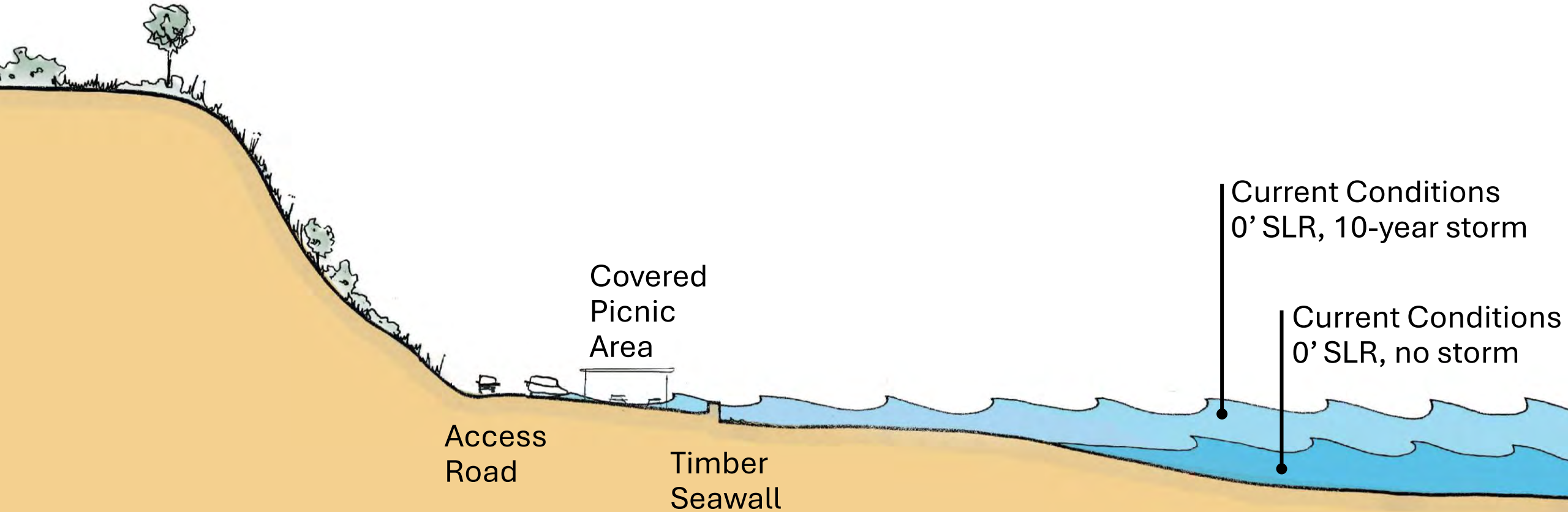


Current Conditions: 0' sea level rise, no storm



# Vulnerability Assessment Summary

## Vulnerability to Sea Level Rise and Storms

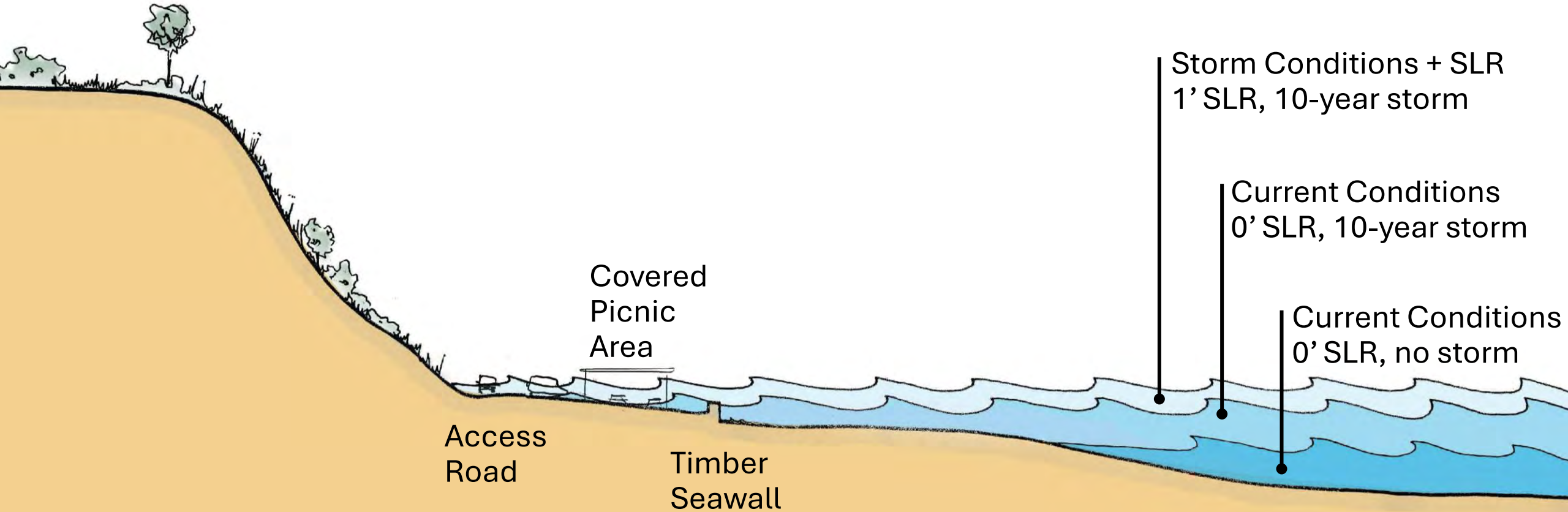


Storm Conditions: 0' sea level rise, with 10-year storm



# Vulnerability Assessment Summary

## Vulnerability to Sea Level Rise and Storms



Storm Conditions + 1' of sea level rise, with 10-year storm



# Vulnerability Assessment Summary

## Vulnerability to Sea Level Rise and Storms

Between June 2023  
and June 2024:

**7 overtopping  
events** flooded  
day-use areas and  
Las Olas Drive





# Vulnerability Assessment Summary

## Vulnerability to Sea Level Rise and Storms

Between June 2023  
and June 2024:

**6 cliff failures**  
damaged assets  
and  
blocked access





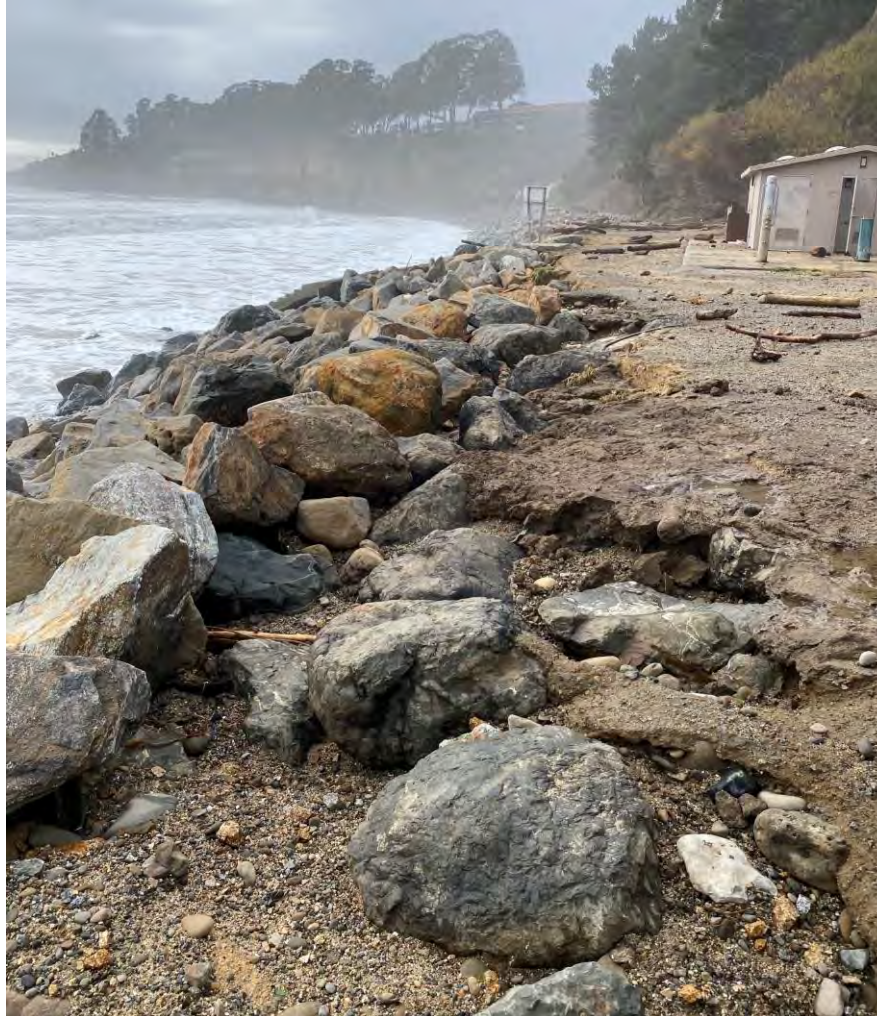
# Vulnerability Assessment Summary

## Vulnerability to Sea Level Rise and Storms

Between June 2023  
and June 2024:

**4 beach erosion  
events**

undermined  
park assets





# Vulnerability Assessment Summary

## Vulnerability to Sea Level Rise and Storms

Between June 2023  
and June 2024:

**3 driftwood  
deposits**  
damaged assets  
and  
blocked access







# Vulnerability Assessment Summary

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## Assets Exposed to Coastal Hazards

### Categories of Park Assets:



Park Facilities & Infrastructure



Recreation



Public Access



Natural Resources




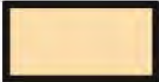
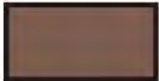
Cultural Resources

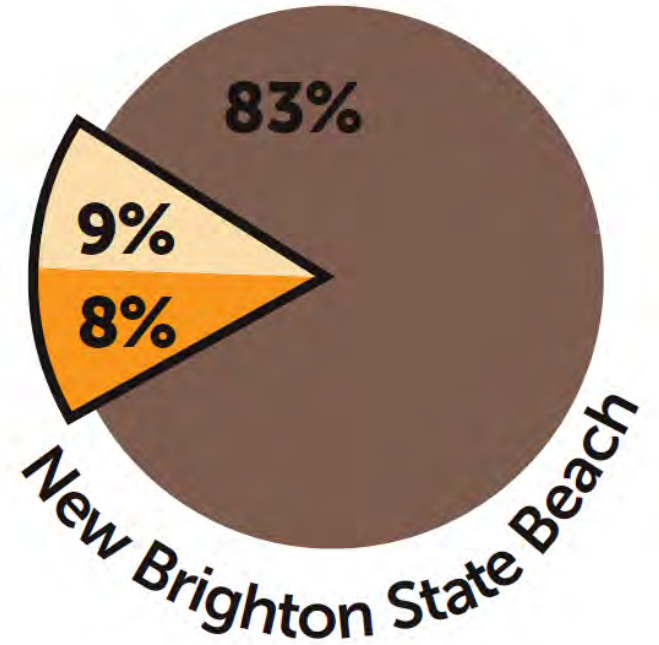
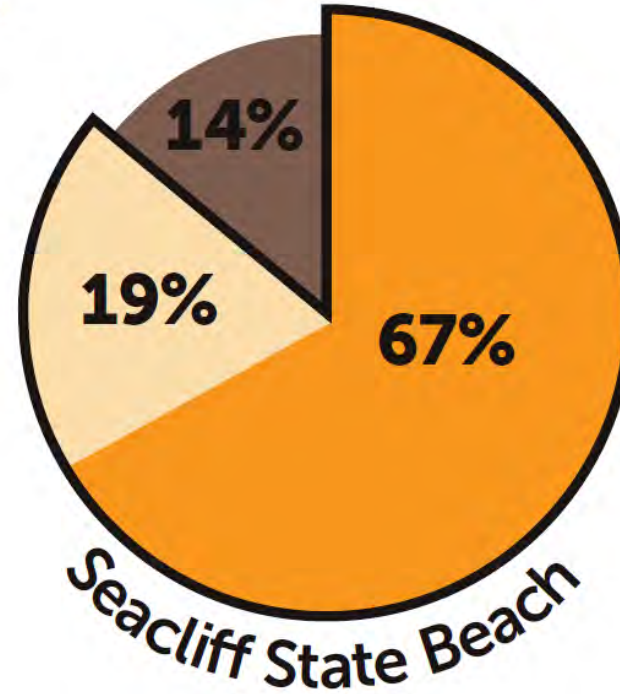


# Vulnerability Assessment Summary

## Assets Exposed to Coastal Hazards

### Assets Exposed to Coastal Hazards

-  Located on the beach and exposed to coastal hazards
-  Located near cliff edge and exposed to cliff retreat
-  Located inland and not exposed to coastal hazards

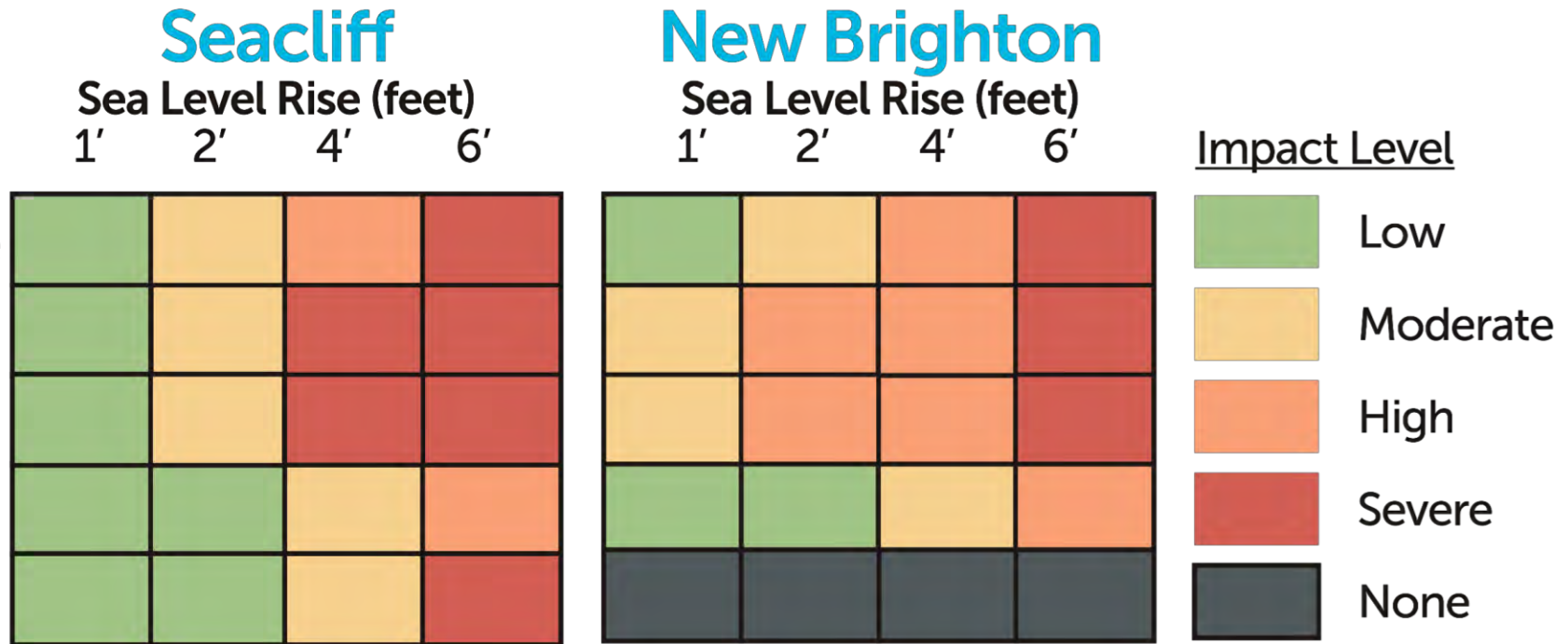




# Vulnerability Assessment Summary

## Potential Impact Level to Assets Exposed to Coastal Hazards

-  Park Facilities & Infrastructure
-  Recreation
-  Public Access
-  Natural Resources
-  Cultural Resources



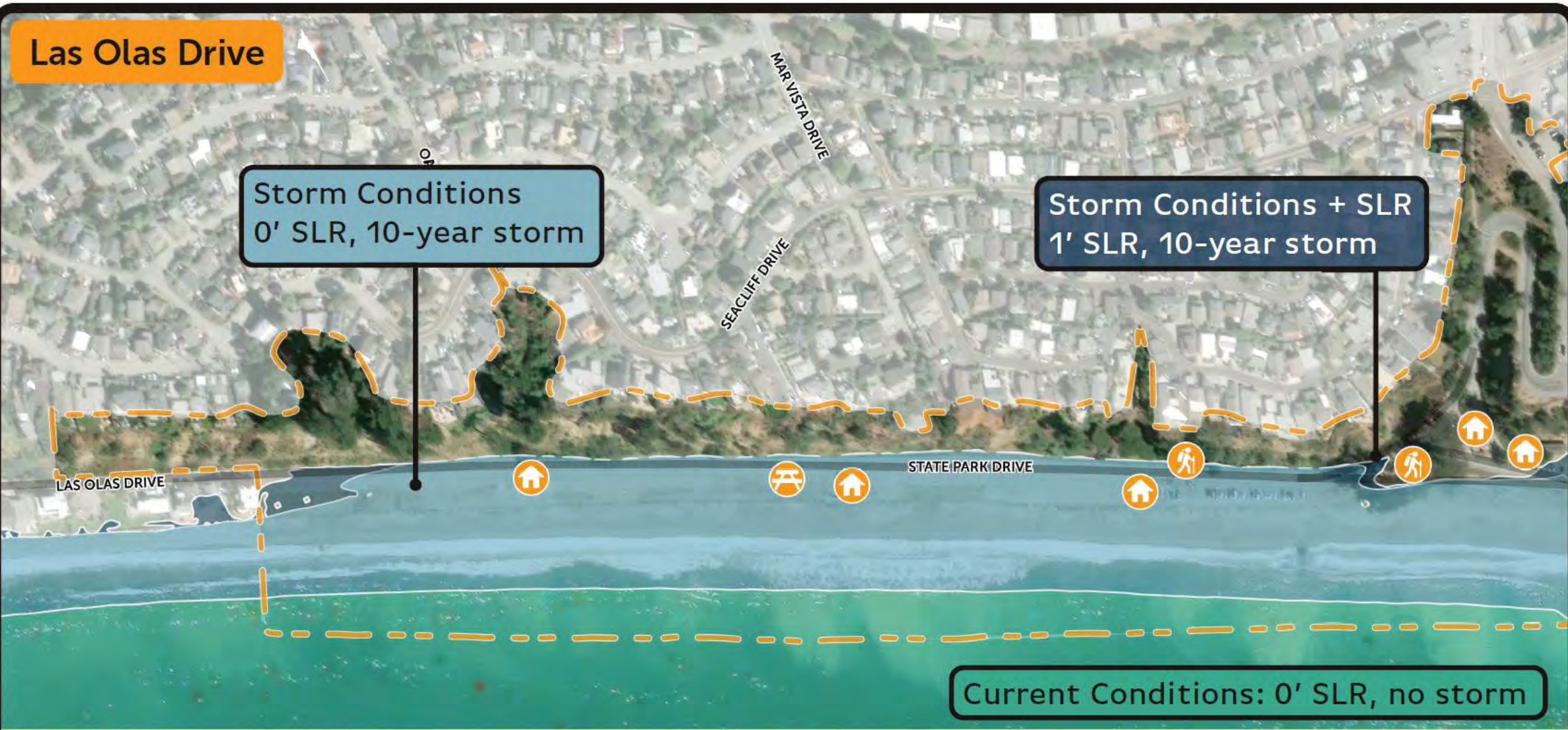
# Las Olas Drive

Storm Conditions  
0' SLR, 10-year storm

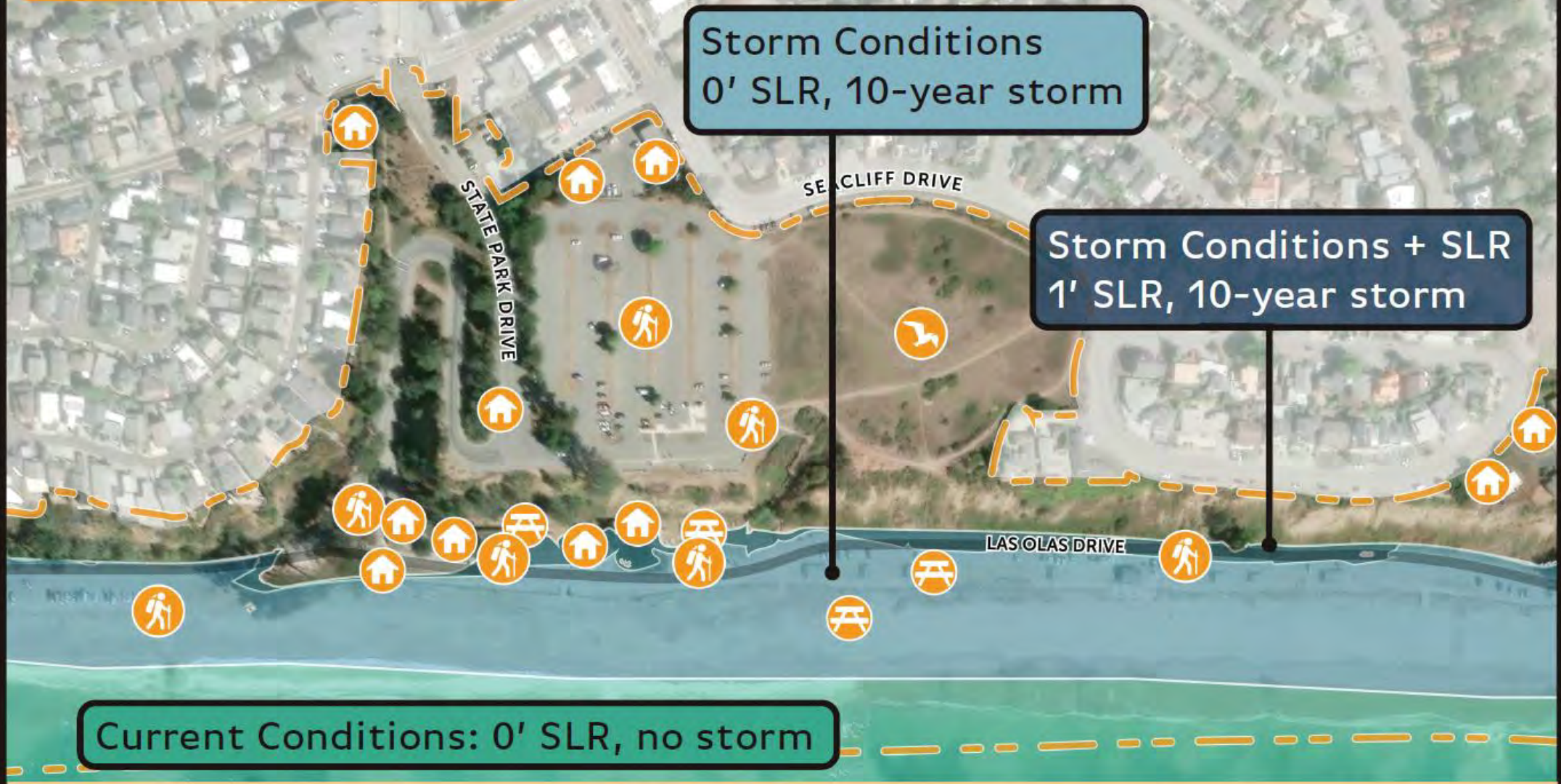
Storm Conditions + SLR  
1' SLR, 10-year storm

Current Conditions: 0' SLR, no storm

Area of predicted flooding for Current Conditions, Storm Conditions, and Storm Conditions + SLR



# Seacliff Day-Use Area



Area of predicted flooding for Current Conditions, Storm Conditions, and Storm Conditions + SLR

Rio Del Mar



Area of predicted flooding for Current Conditions, Storm Conditions, and Storm Conditions + SLR

New Brighton SB



Storm Conditions + SLR  
1' SLR, 10-year storm

Storm Conditions  
0' SLR, 10-year storm

Current Conditions  
0' SLR, no storm



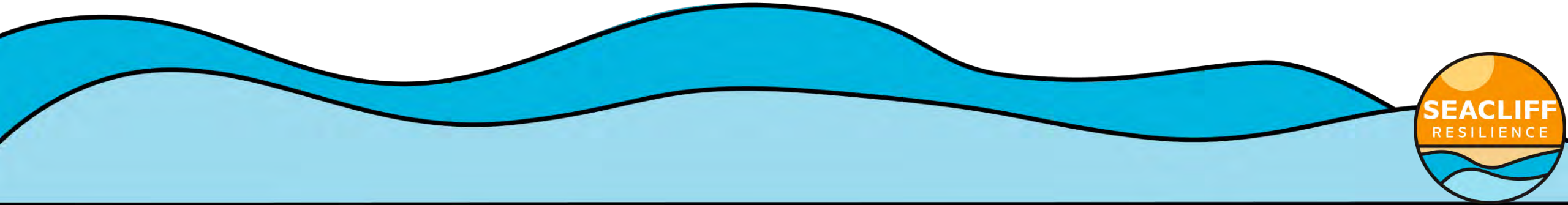
# Vulnerability Assessment Summary

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- Additional Resources on [SeacliffResilience.org](https://SeacliffResilience.org)
  - Sea Level Rise Vulnerability Assessment
  - Coastal Processes Appendix



# Questions





# Landscape Elements

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- Overview
- Landscape Elements
  - **Cliff top:** Habitat Enhancement, Setback
  - **Cliff Wall:** Erosion Control Planting, Cliff Stabilization
  - **Back Beach:** Vegetated Dune, Shore Platform Enhancement, Seawall, Raised Assets, Rock Revetment
  - **Front Beach:** Cobble Enhancement, Beach Nourishment
  - **Offshore:** Rocky Reef Habitat, Groins, Kelp Forest



# Online Survey

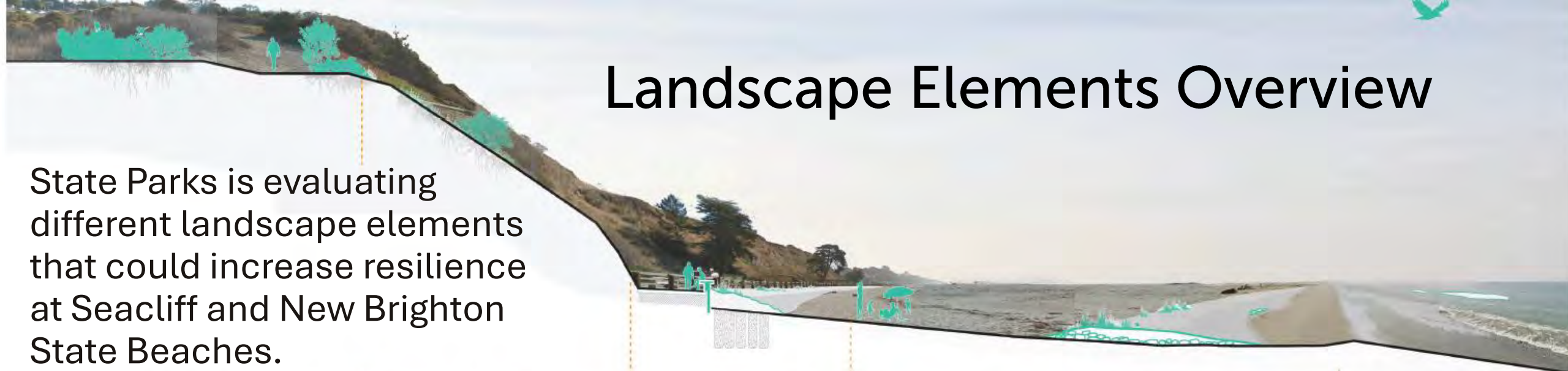
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Second Section:

For each landscape element, consider the question, “Do you think this element would allow you to continue enjoying your favorite activities and support what you value about Seacliff and New Brighton?”

# Landscape Elements Overview

State Parks is evaluating different landscape elements that could increase resilience at Seacliff and New Brighton State Beaches.



CLIFF TOP

CLIFF WALL

BACK BEACH

FRONT BEACH

OFFSHORE

## ADAPTATION LANDSCAPE ELEMENTS



Habitat Enhancement



Setback



Erosion Control Planting



Cliff Stabilization



Vegetated Dune



Shore Platform Enhancement



Seawall



Raised Assets



Rock Revetment



Cobble Enhancement



Beach Nourishment



Driftwood Staking\*

\*Driftwood Staking could be used as a component in habitat restorations. To avoid unnatural visual impacts, it would not be used in isolation.



Rocky Reef Habitat



Groins



Kelp Forest



Breakwater\*\*

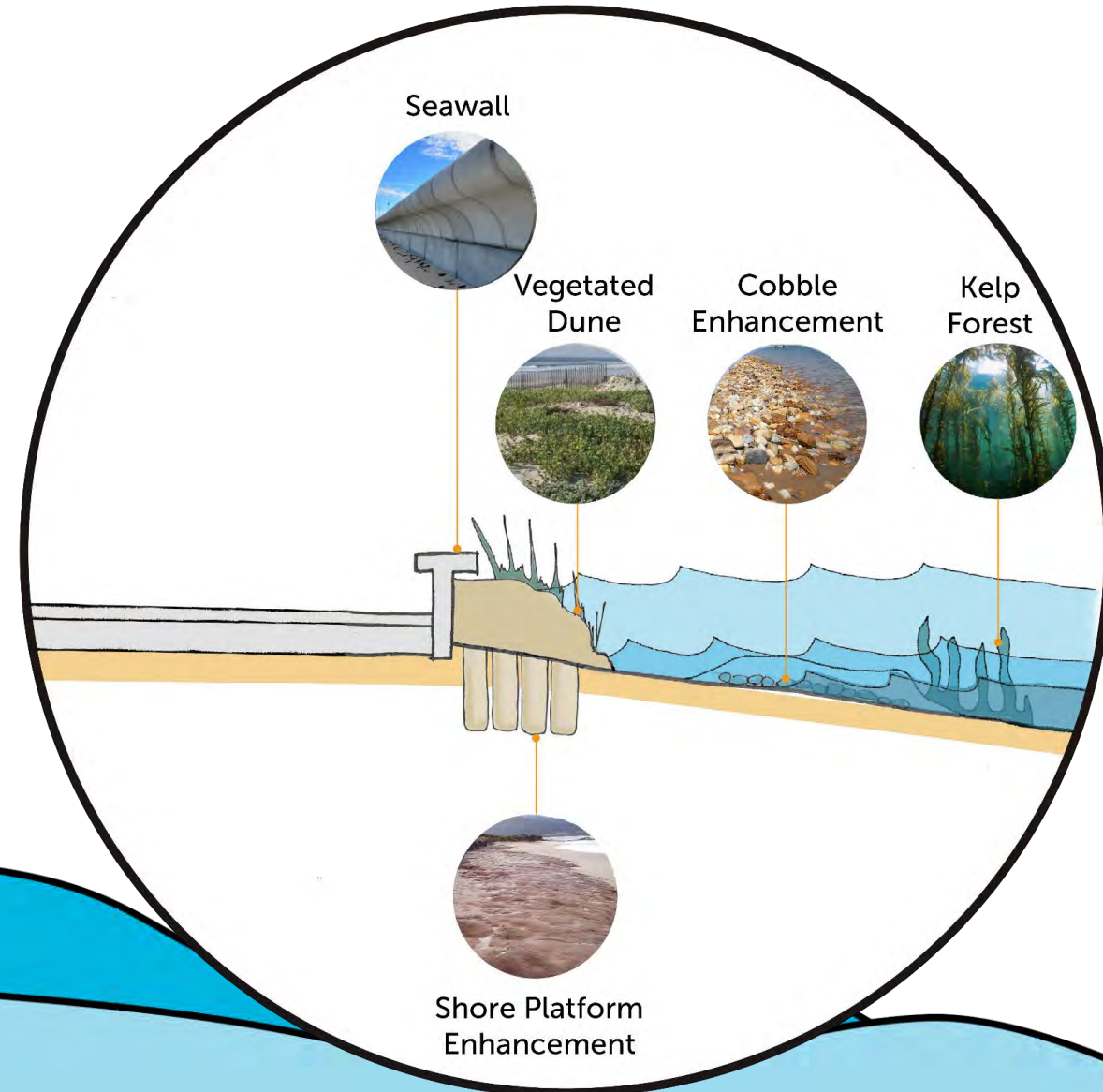
\*\*State Parks is not considering a breakwater as a potential landscape element due to cost, regulatory feasibility, visual impacts, impacts to coastal processes, and safety.



# Landscape Elements

## Hybrid Landscape Elements

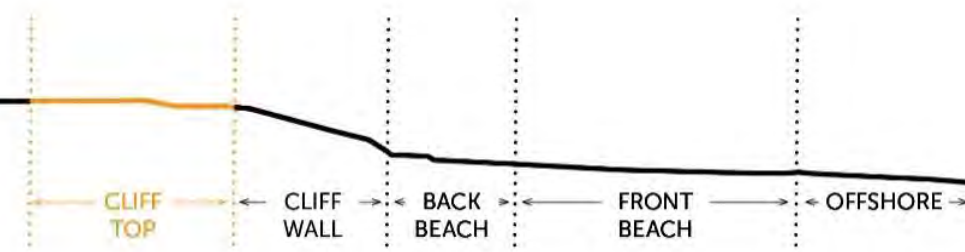
Several landscape elements are likely to be implemented together to better increase coastal resilience.





# Landscape Elements

## Cliff-top: Habitat Enhancement



A designated area vegetated with native plant species and designed to increase and enhance habitat for wildlife

### PURPOSE

Plant root systems can bind together and with substrates to strengthen cliff while adding native diversity

### ADVANTAGES

- Strengthens the cliff to reduce stormwater erosion
- Can improve the diversity in shoreline habitats
- Maintains the natural aesthetic of the cliff

### DISADVANTAGES

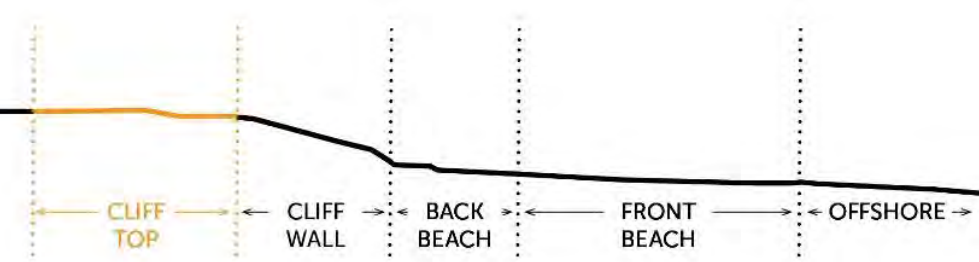
- Provides limited cliff protection because the root strength, especially of grasses, does provide some benefit
- Might need irrigation after initial construction to help vegetation set in





# Landscape Elements

## Cliff-top: Setback



An area along the edge of the cliff within which all or certain types of new development are prohibited

### PURPOSE

Setbacks provide a buffer between potentially hazardous bluff failures and the developed area

### ADVANTAGES

- Allows for natural erosion of the cliff edge
- Incorporates a measure of protection against slide activity
- Setback may be designated for habitat enhancement

### DISADVANTAGES

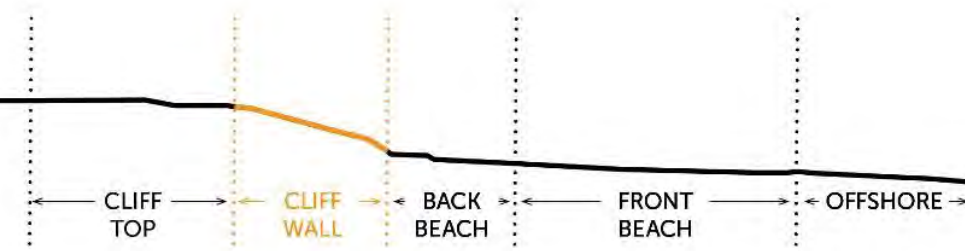
- Much of the cliff-top development is already close to the edge of the cliff
- A need to retrofit or remove vulnerable development may arise





# Landscape Elements

## Cliff Wall: Erosion Control Planting



Plantings on cliff wall selected for their ability to hold soil in place

### **PURPOSE**

Use native plants to hold soil and rock in place

### **ADVANTAGES**

- Creates wildlife habitat

### **DISADVANTAGES**

- Difficult access to cliff face
- Needs temporary soil stabilization

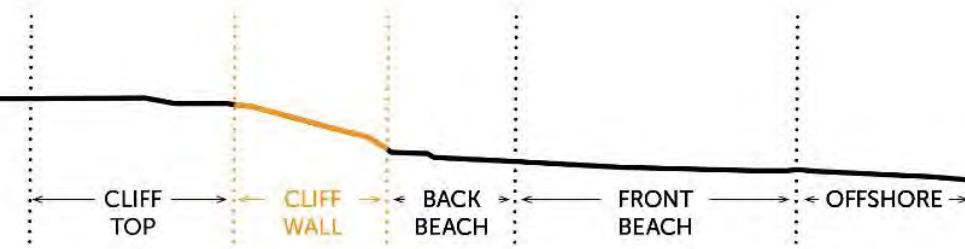






# Landscape Elements

## Cliff Wall: Cliff Stabilization



A sculpted concrete facing anchored to the cliff face and bedrock

### PURPOSE

Protect the cliff against erosion

### ADVANTAGES

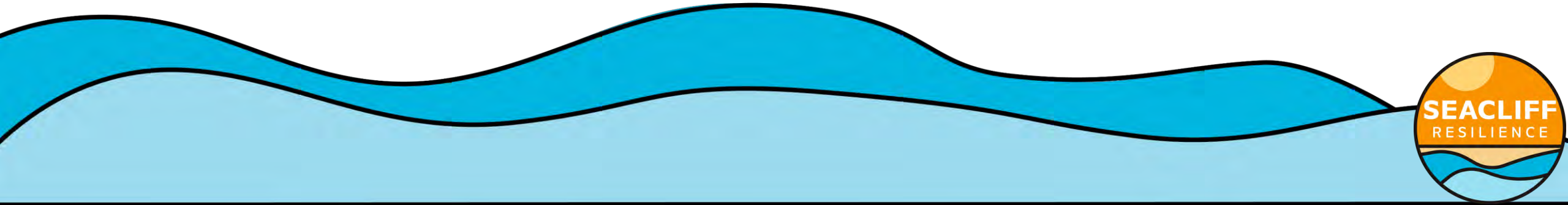
- Reduces cliff erosion from wave action
- Mimics the natural aesthetic of the cliff wall
- Reduces hazards from rock falls

### DISADVANTAGES

- Construction could potentially weaken cliff wall, as it relies on anchors drilled into the cliff face
- Removes sediment source from coastal processes
- The increased strength allows the cliff to act as a seawall and may therefore promote scouring



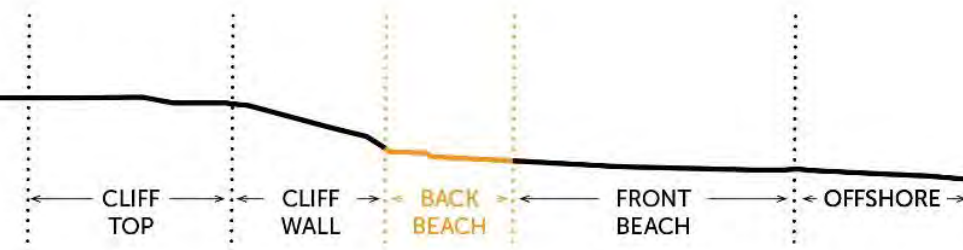
# Questions





# Landscape Elements

## Back Beach: Seawall



A concrete structure built along a portion of the coast, between the ocean and assets to be protected

### PURPOSE

Reduce the risk of coastal flooding and erosion

### ADVANTAGES

- Prevents shoreline and cliff erosion by wave action
- Provide protection of upland assets from wave action
- Has narrow footprint along shore

### DISADVANTAGES

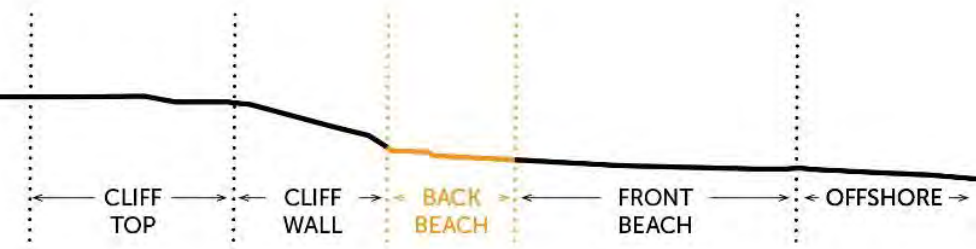
- Removes sediment source from coastal processes
- Scouring at the base of the wall can take place and eventually erode the remaining beach
- Alters patterns of sand movement along the shore
- Disrupts the natural ecosystem of the shoreline
- Fixes the shoreline location, eliminating natural variation over time





# Landscape Elements

## Back Beach: Vegetated Dune



An area with mounds of loose sand planted with dune vegetation

### PURPOSE

Incorporate a sand reserve and reduce coastal flood hazards

### ADVANTAGES

- Provides a measure of flood protection, based on the size of the dunes
- Can improve a diversity of shoreline habitats

### DISADVANTAGES

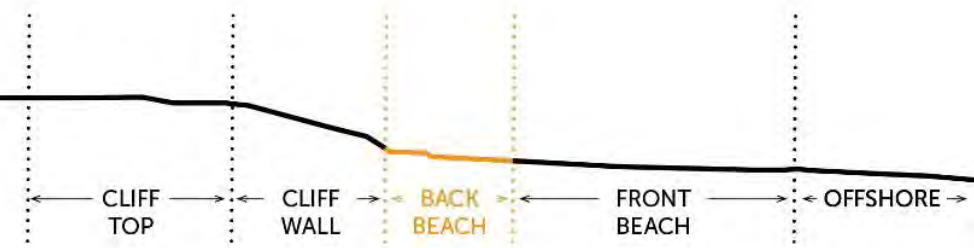
- Sand from dunes can be blown into public areas, creating a maintenance issue
- Needs maintenance and revitalization after storm events
- Requires a wide beach





# Landscape Elements

## Back Beach: Raised Assets



Elevation of infrastructure and assets above projected flood levels

### PURPOSE

Elevate infrastructure and assets above the level of wave action and wave runup

### ADVANTAGES

- Reduces impacts of wave runup and coastal flooding on infrastructure and assets
- Does not increase footprint of existing infrastructure and assets
- Facilitates public access

### DISADVANTAGES

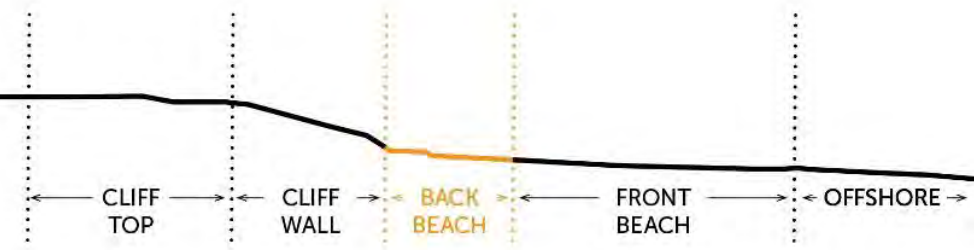
- Complex design and construction effort required to avoid impact to utilities
- Needs planned, phased construction to implement in relation to daily traffic





# Landscape Elements

## Back Beach: Shore Platform Enhancement



Enhancement of the bedrock with outcrops, mounds, or gradually rising features of cemented native material

### PURPOSE

Improve wave attenuation over the shore platform

### ADVANTAGES

- Strengthens the shore against erosion
- Consists of cemented native material and therefore retains the same color and material composition
- The features are erodible, with native material released back to the environment over time

### DISADVANTAGES

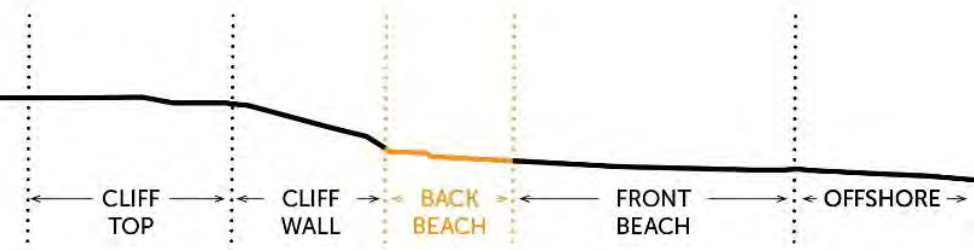
- Construction could harm sand-burrowing species





# Landscape Elements

## Back Beach: Rock Revetment



A layer of large stone boulders (riprap) placed over an embankment to protect against erosion by wave action and currents

### PURPOSE

Protect infrastructure from erosion and damage

### ADVANTAGES

- Retains protective quality even as rocks shift and settle over time

### DISADVANTAGES

- Occupies a significant footprint of what could otherwise be accessible beach space
- Fixes the shoreline location, eliminating natural variation over time
- Removes sediment source from coastal processes
- Disrupts natural systems



# Questions







# Landscape Elements

## Front Beach: Cobble Enhancement



A blanket, mound or berm of rounded stone (cobble) placed on the beach

### **PURPOSE**

Mitigate coastal erosion hazards

### **ADVANTAGES**

- Reduces or slows coastal erosion
- Dynamic feature that can be reshaped by wave action to protect the upland shoreline
- Maintains the shoreline's natural aesthetic

### **DISADVANTAGES**

- May need addition of more cobble over time
- Vegetation has a hard time establishing in this environment





# Landscape Elements

## Front Beach: Beach Nourishment



Imported sand placed on a beach, usually pumped via dredge or delivered by truck

### PURPOSE

Widen beach and mitigate erosion

### ADVANTAGES

- Replenishes eroding shoreline
- Provides a larger beach width for recreation and shoreline longevity
- Can provide habitat for marine mammals and shorebirds

### DISADVANTAGES

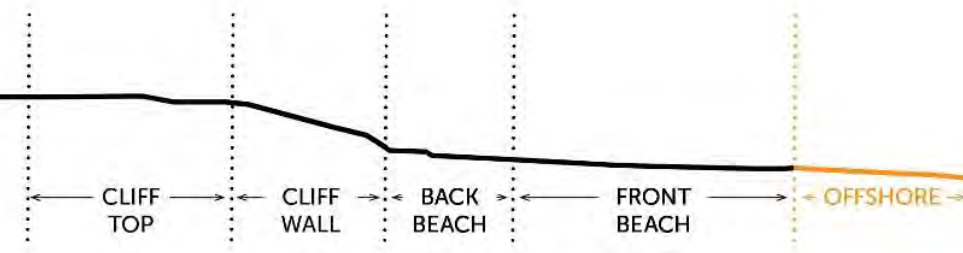
- Large volume of sand needed
- Unpredictable longevity
- Can be disruptive to wildlife at the dredge and placement site





# Landscape Elements

## Offshore: Rocky Reef Habitat



A underwater mound of stones that creates habitat for marine plants and animals

### **PURPOSE**

Create refuge for fish and invertebrates

### **ADVANTAGES**

- Can support a diversity of marine wildlife
- Stabilizes sediment and reduces wave energy

### **DISADVANTAGES**

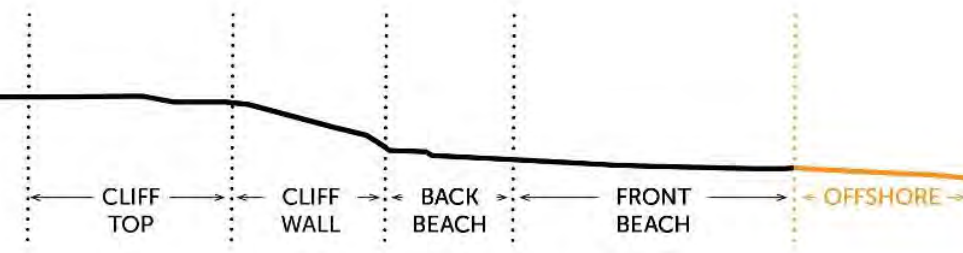
- Can increase scouring at the base of the reef
- Research on the effectiveness of reducing wave energy is inconclusive





# Landscape Elements

## Offshore: Kelp Forest



A forest-like underwater habitat capable of supporting a diversity of marine species

### **PURPOSE**

Create refuge for marine wildlife

### **ADVANTAGES**

- Reduce wave energy before it hits the shoreline
- Would not negatively impact user experience

### **DISADVANTAGES**

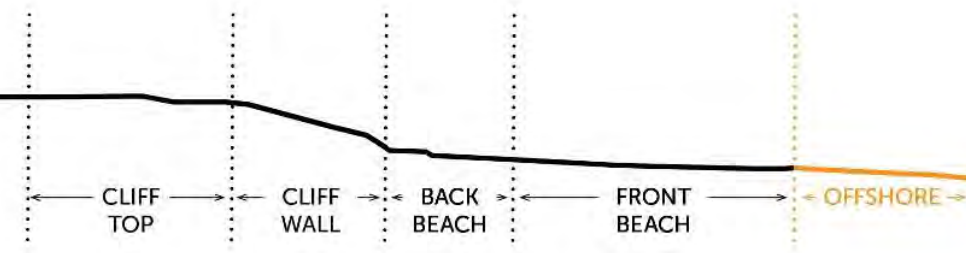
- May contribute to buildup of wrackline debris/organics
- Research on the effectiveness of kelp forests to reduce wave energy is limited





# Landscape Elements

## Offshore: Groins



A linear structure of large boulders built perpendicular to the shoreline

### PURPOSE

Stabilize a beach against erosion associated with longshore sand transport

### ADVANTAGES

- Helps retain sand on the shoreline by reducing longshore sand transport
- The addition of sand helps widen the beach and protect upland assets

### DISADVANTAGES

- Disrupts natural sand transport processes.
- Can increase erosion
- Can disrupt the user experience on the beach
- The disruption of sand transport processes can negatively impact wildlife





# Landscape Elements

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- Additional Resources on [SeacliffResilience.org](https://SeacliffResilience.org)
  - All information presented here, plus more, is in the Resources section of the website, so you can review it in more depth
  - The same information is also included in the survey, so you can review it again before responding to each survey question



# Online Survey

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- Available at the link in chat
- Link also available on [SeacliffResilience.org](https://SeacliffResilience.org)
- Accepting responses until  
**November 30, 2024**

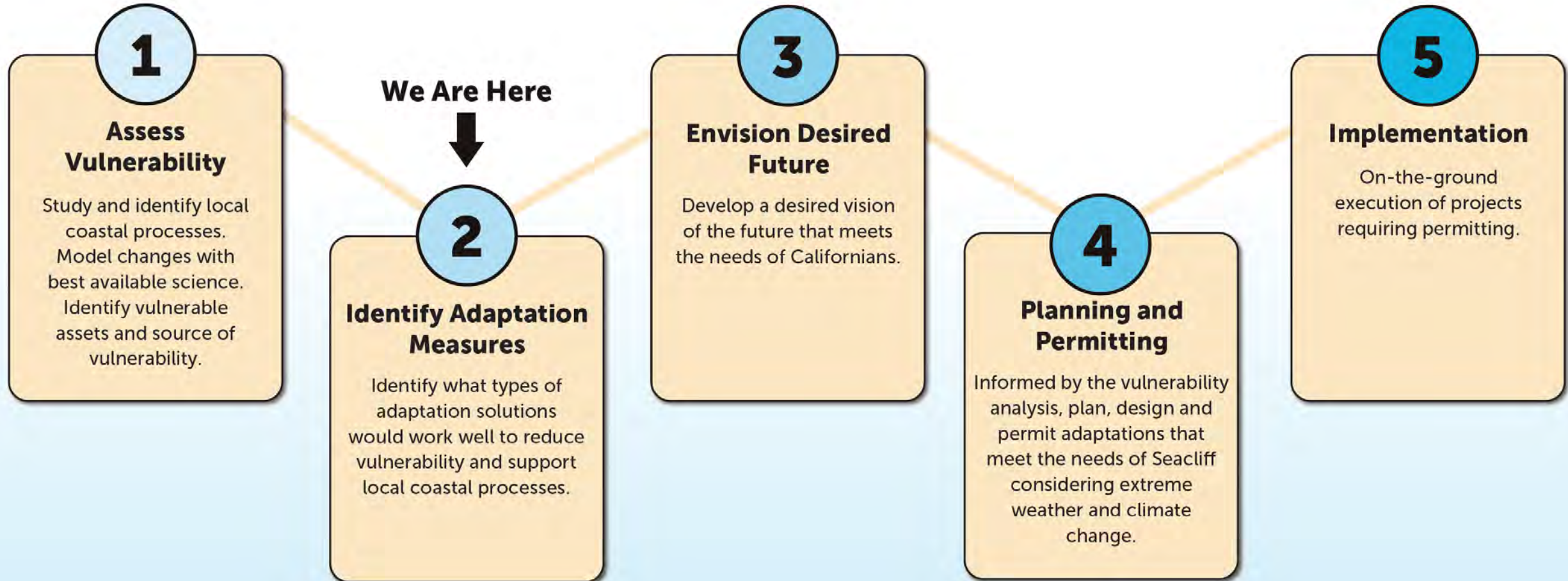
# Questions







# Seacliff and New Brighton State Beaches Recovery Process





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**Keep in touch!**

**[SeacliffResilience.org](https://SeacliffResilience.org)**

**[Seacliff.Resilience@parks.ca.gov](mailto:Seacliff.Resilience@parks.ca.gov)**

