

# Living Shorelines, Nature-Based Solutions, and Sand Management Feasibility Study

Focus Group Meeting 1  
August 27, 2024



*Artwork by Farallon Strategies*

# Agenda

- Introductions
- Meeting Considerations
- Focus Group Role
- Project Context
- Potential NBS for our Coast
- Intro to Evaluation Criteria
- Next Steps



An aerial photograph of a coastal town, likely Santa Cruz, California. The image shows a mix of residential buildings, some with solar panels, and a prominent white modern house. The town is built on a rocky cliffside that meets the ocean. Waves are breaking against the base of the cliff. The sky is clear and blue.

# Introductions

1. Name, Org and Pronouns

2. Any Relevant Experience you bring

3. What is your favorite way to spend a sunny day in Santa Cruz?

# Meeting Considerations + Chatham House Rules

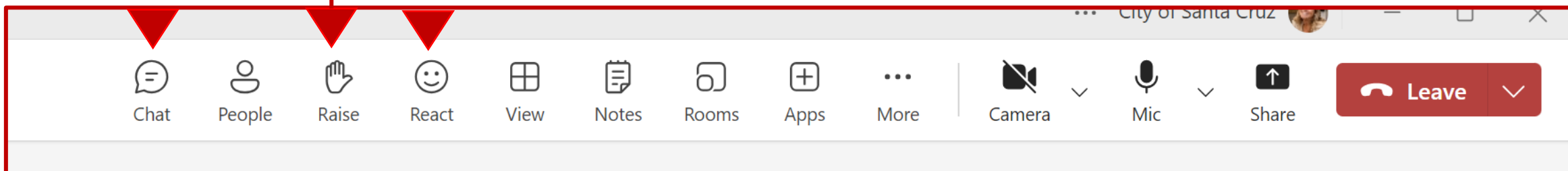
Stay present

Take space,  
make space

One person at a  
time

Use chat/  
hand raise

Question ideas,  
not people



# Focus Group Role



BUILD CAPACITY TO ENGAGE  
WITH SUBJECT MATTER



PROVIDE INPUT BEFORE  
ENGAGING BROADER COMMUNITY



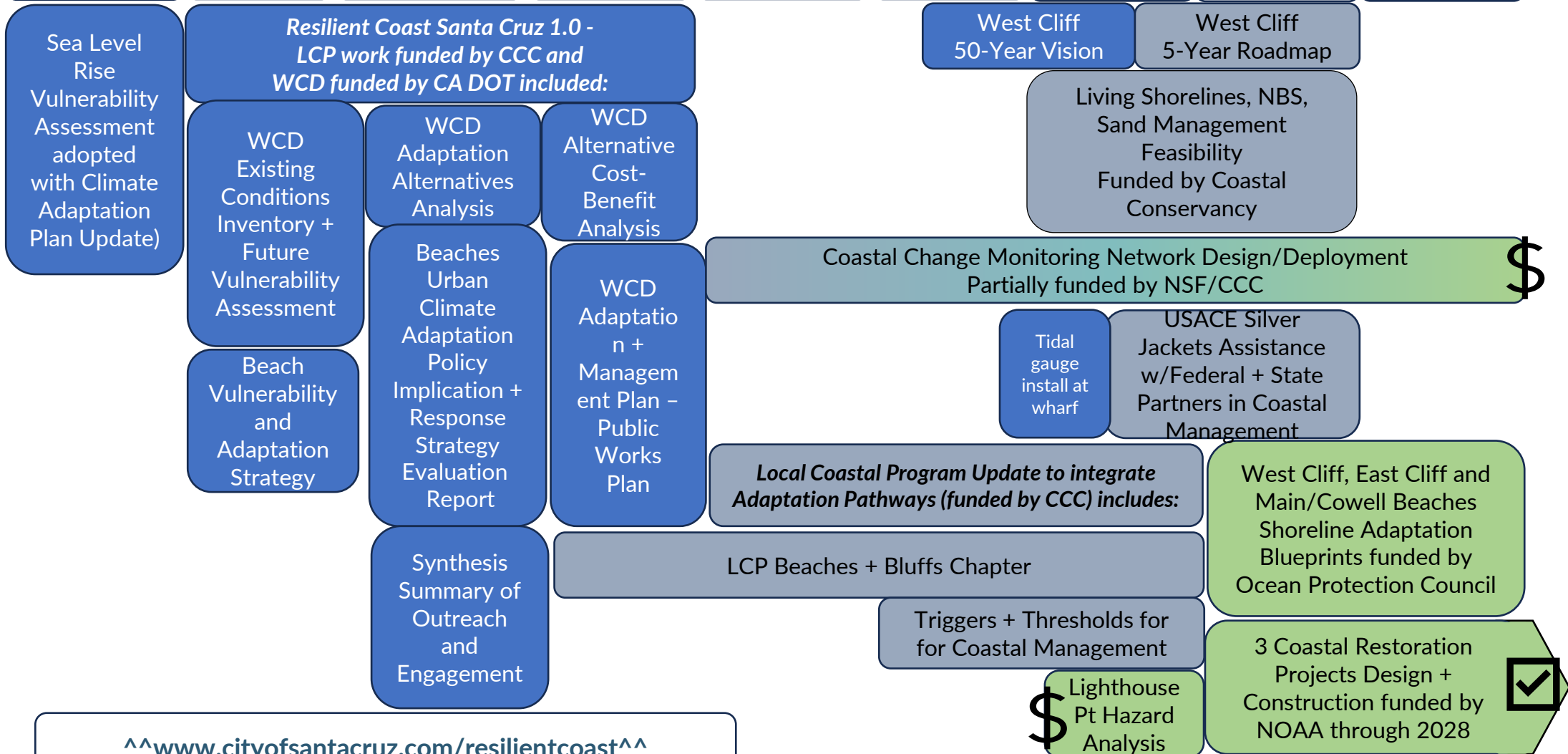
PROVIDE FEEDBACK AT SPECIFIC  
PROJECT MILESTONES

# Coastal Resilience Planning

**KEY**

- COMPLETED WORK
- CURRENT WORK
- FUTURE WORK
- PENDING GRANT ACCEPTANCE
- LACKS FUNDING

2018	2019	2020	2021	2022	2023	2024	2025	2026
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# Scope of Project

1. Assess Feasibility of Nature Based Solutions, Sand Management
2. Develop conceptual designs for up to 3 projects
3. Specify ecological monitoring
4. Conduct outreach

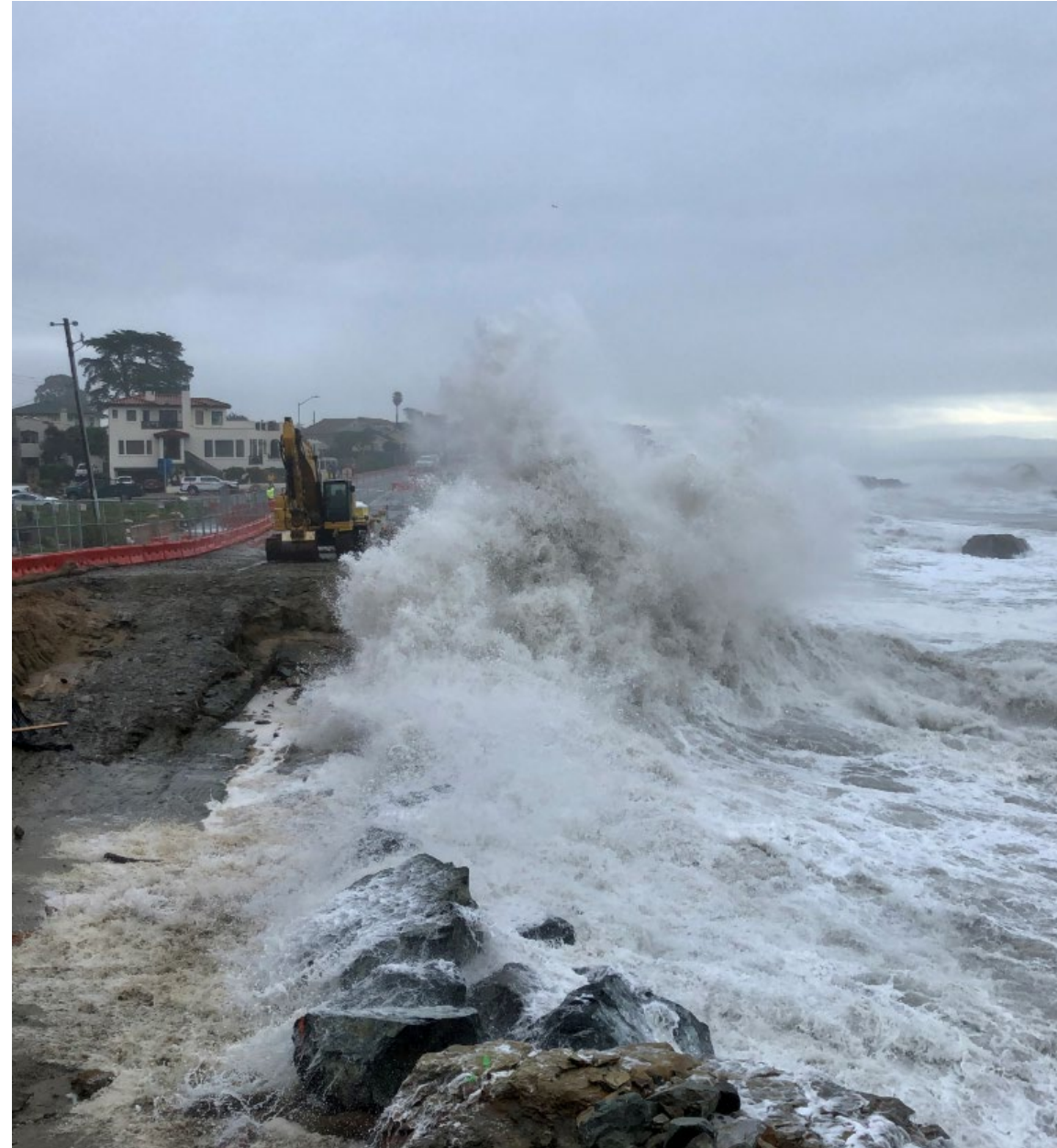


# Potential for Nature-Based Solutions for our Coast



# Challenges facing the Santa Cruz shoreline

- January 2023 storm was a 'once every 40 years' event
- December 2023 storm was a 'once every 15 years' event
- With climate change + sea-level rise, these events will become **more common**



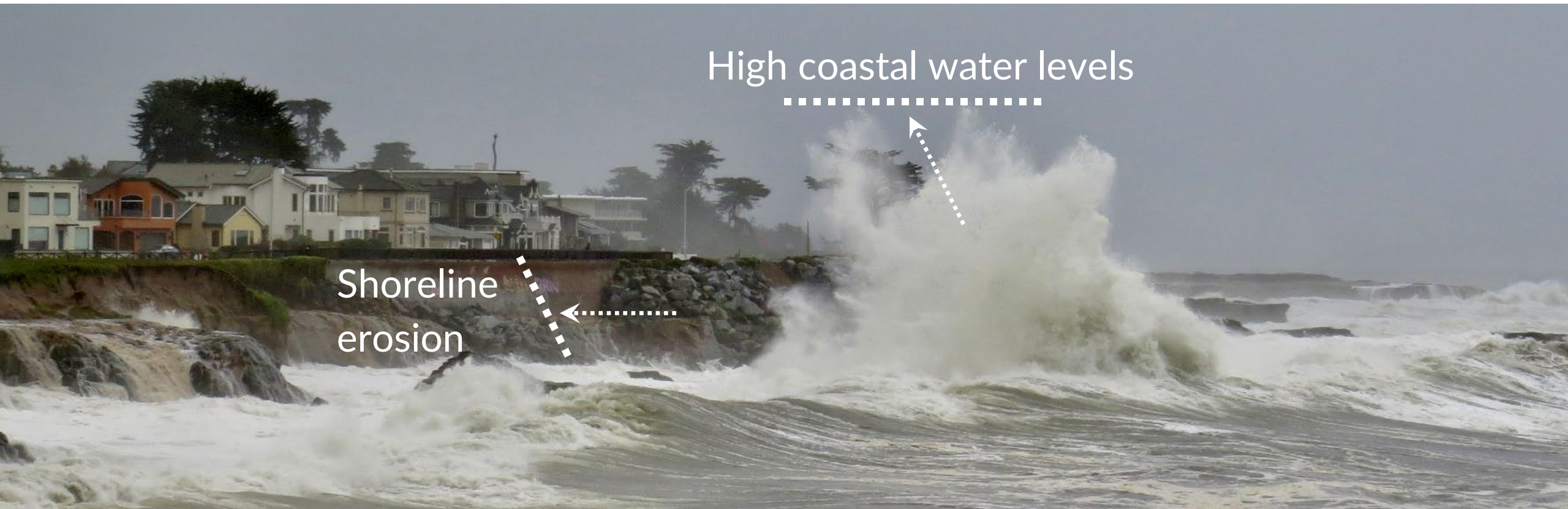
# What is a nature-based solution (aka NBS)?



Año Nuevo State Park (Kenneth and Gabrielle Adelman)

- Incorporates natural features + processes to protect, conserve, restore and manage coastline and its ecosystems
- Builds on lessons learned from nature

# What are nature-based solutions used for?



- Limiting flooding from high coastal water levels
- Limiting shoreline erosion
- Preserving and enhancing natural habitats

# Green to Gray Spectrum: Range of possible solutions



Source: US Army Corps of Engineers

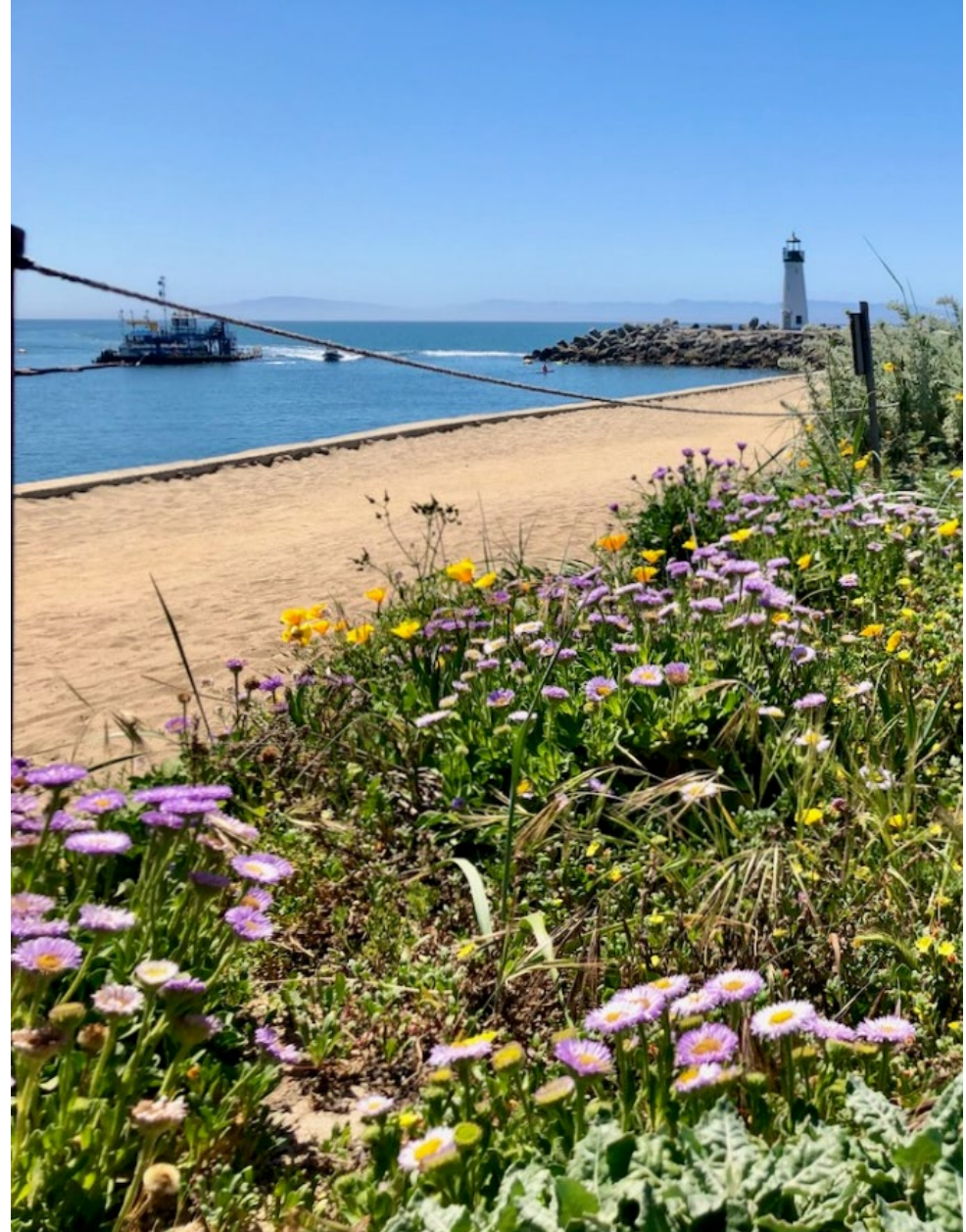
# Why are we considering nature-based solutions?



- Traditional (“grey”) shore protection methods have limitations
- Community identified a desire to work with nature
- Nature-based methods have additional benefits for recreation, habitat, aesthetics

# What types of actions are we considering?

- Native plant restoration
- Vegetated sand dunes
- Cobble berms
- Sand management
- Living breakwaters/artificial reefs
- Stormwater management
- Sand retention with headlands
- Green/grey options



# Native Plant Restoration



Iceplant slippage near Natural Bridges (source: Groundswell Ecology)



Pilkington Lagoon Habitat Restoration (source: Groundswell Ecology)

## Benefits:

- Limit erosion
- Improve habitat diversity
- Recruit sediment for dunes

## Feasibility:

- Low cost
- Requires maintenance
- Vulnerable to strong storms

# Vegetated Sand Dunes



Seabright vegetated sand dune (source: Ross Clark/Groundswell Ecology)

## Benefits:

- Limits erosion by absorbing wave energy
- Limit wave runup compared to walls and armor
- Co-exists with beach
- Increased habitat diversity

## Feasibility:

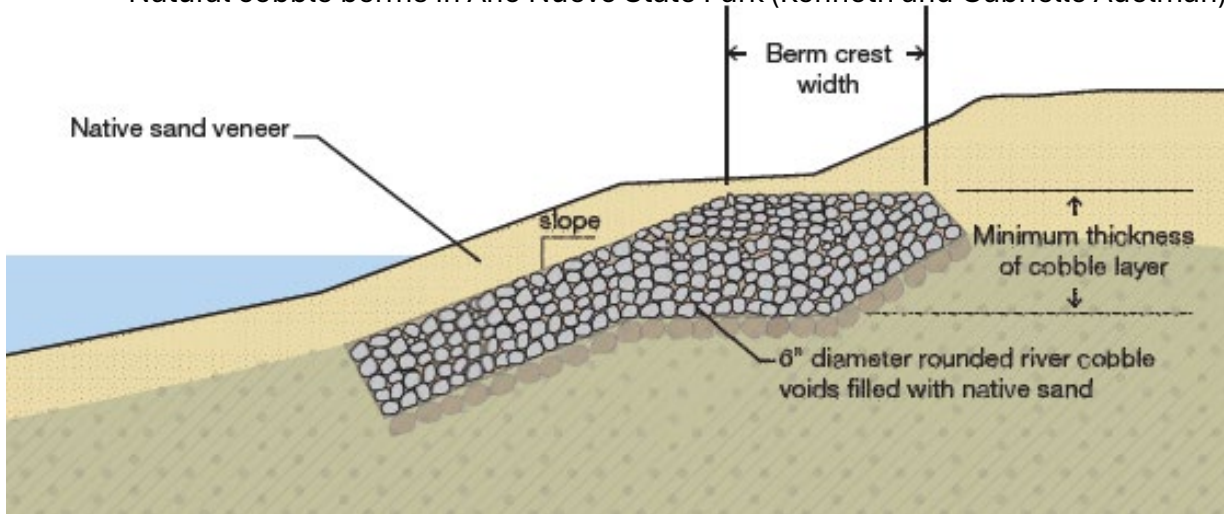
- Needs wide, existing beach
- Needs ongoing maintenance



# Cobble Berms



Natural cobble berms in Año Nuevo State Park (Kenneth and Gabrielle Adelman)



Profile view of cobble berm (source: Brad Evans/ESA)

## Benefits:

- Limits erosion by absorbing wave energy
- Less wave runup compared to walls and rock armor
- Can coexist with beach
- Potential increase in habitat diversity

## Feasibility:

- Minimum space requirements
- Less stable than rock armor

# Sand Management



Illustration of sand management within Project Area (Background Image: NOAA)



Example of sand contouring (City of Santa Cruz)

## Options:

- Beach nourishment
- Reuse of dredged sand
- Sand Bypass
- Sand Contouring

# Sand Management



Fall 2022 and winter 2023 images showing effect of Its Beach in limiting wave attack (Source: NOAA)

## Benefits:

- Can be paired with other treatments
- Maintain recreation and access
- Limit erosion during some events

## Feasibility:

- Moderate cost
- Nearby examples for permitting
- Sand alone cannot defend against all events
- Maintenance/replenishment

# Sand Retention With Headlands



## Benefits:

- Potential to retain more sand
- Wider beaches could reduce wave erosion for some events
- Headlands could be designed to improve habitat diversity

## Feasibility:

- High cost
- Uncertain permitting pathway
- May impact subtidal habitats
- Sand will still erode in winter

Examples of natural headlands at Getchell St (top) and Lighthouse Pt (bottom)

# Living Breakwaters/Artificial Reefs



Detached headlands acting like living breakwaters near Santa Cruz (source: NOAA)

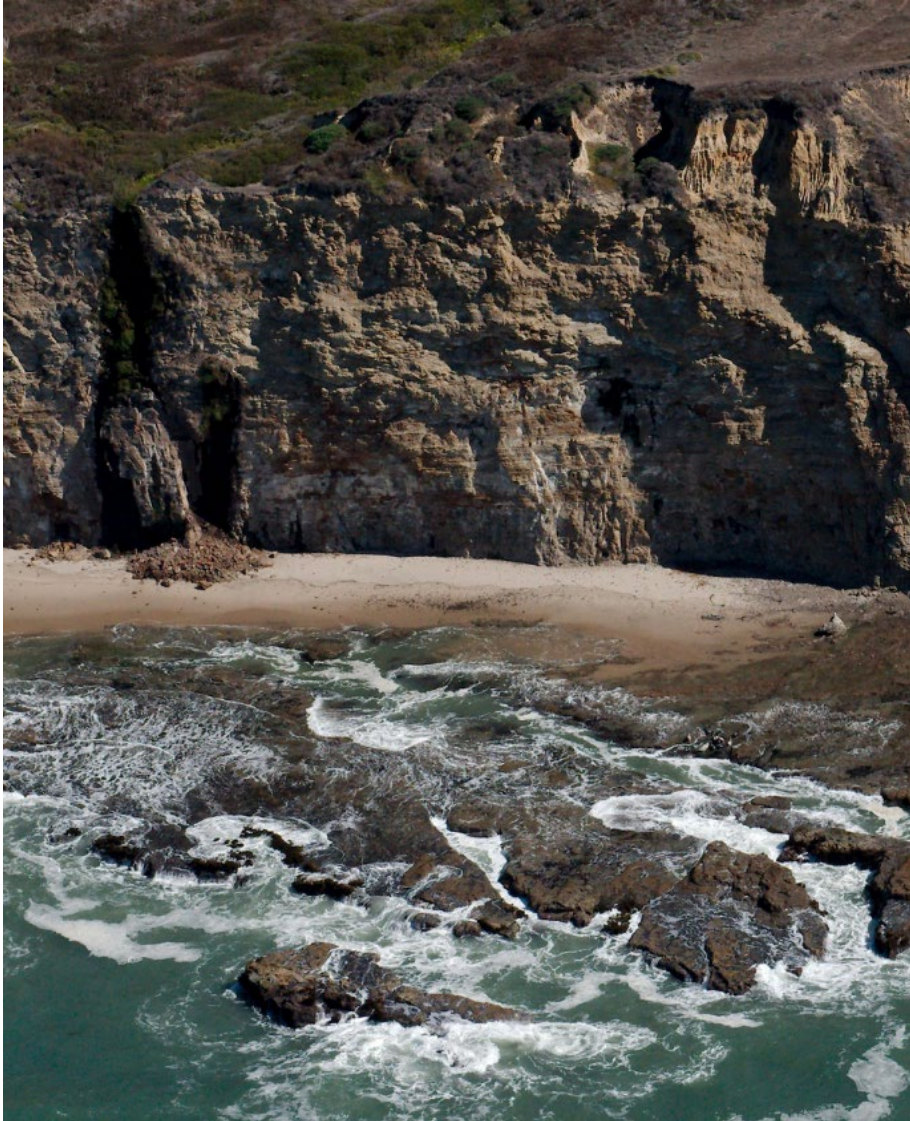
## Benefits:

- Limits erosion by 'tripping' waves offshore
- Can coexist with beach
- Potential increase in habitat diversity (shorebirds, marine mammals, reef, intertidal, surf)

## Feasibility:

- High cost
- Difficult to construct
- May impact kelp beds

# Living Breakwaters/Artificial Reefs



Natural bedrock 'breakwaters' (Kenneth and Gabrielle Adelman)



Example of constructed breakwaters

Example of natural  
'breakwaters' near  
Swanton Ranch

# Stormwater Management



Green stormwater infrastructure (source: City of Santa Cruz)



Example of stormwater outfall and proximity to erosion or seepage (source: City of Santa Cruz)

## Benefits:

- Address rising groundwater
- Limit potential flooding from stormwater
- Limit bluff erosion

## Feasibility:

- Relatively low cost (depends on extent of change)
- Low maintenance

**Questions about NBS?**



# Intro to Evaluation Criteria

## What are evaluation criteria and how do they play a role in this project?

- Evaluation criteria are a tool for evaluating the benefits and trade-offs of different adaptation strategies.
- Criteria typically focus on environmental, social, and economic goals.

### Example Priorities

Optimize  
Community Access

Maximize reduction  
of hazards

Cost

### Example Evaluation Criteria

How well does the strategy preserve existing community uses of the area?

How effective is the strategy in reducing erosion and/or flooding?

How cost effective is the strategy over time?

# Next Steps

Complete form indicating need for compensation

Doodle Poll to schedule September Focus Group

Optional deeper reading: Santa Cruz Case Study

**Second  
Focus  
Group  
Meeting**

- Mid  
September



**Community  
Workshop  
#1**

- October



**Third Focus  
Group  
Meeting**

- Early  
December



**Community  
Workshop  
#2**

- January

**Thank you!**