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

Community Meeting 2
December 12, 2024

CITY OF SANTA CRUZ

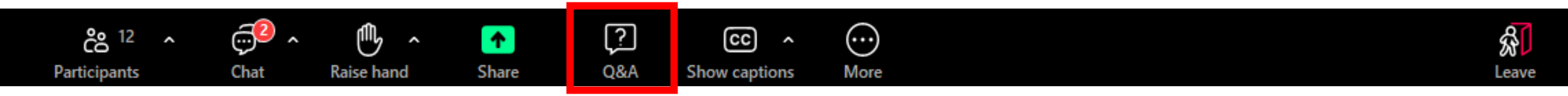
Artwork by Farallon Strategies

Agenda

- Meeting Considerations
- Project Scope and Extent
- What are Nature Based Solutions?
- Selected Sites
- Draft Concepts per Site
- Next Steps

Meeting Considerations

Ask questions and leave comments using Q&A feature



Project Team

ESA

pathways CLIMATE INSTITUTE

Farallon Strategies

Smithsonian Environmental Research Center

UC SANTA CRUZ

restoring our coast
groundswell
coastal ecology

Scope of Project

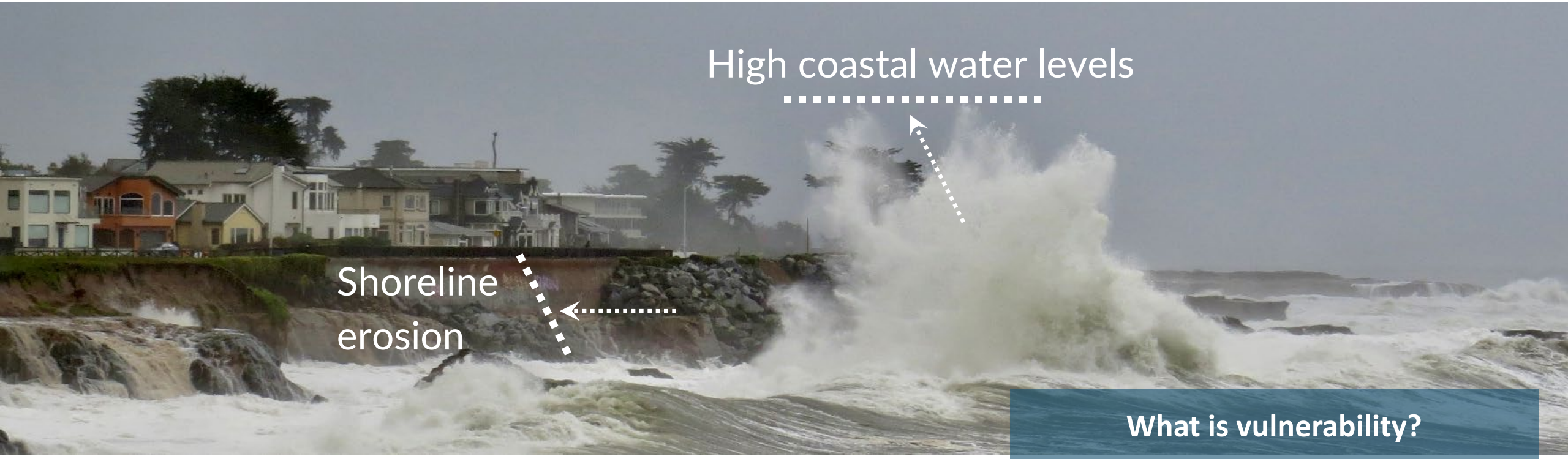
- Assess feasibility of Nature Based Solutions
- Develop conceptual 30% designs for up to 3 sites
- Work with a 20-person focus group through 4 meetings and engage in 3 community conversations

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

Año Nuevo State Park (Kenneth and Gabrielle Adelman)

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

What are nature-based solutions used for?



- Reduces vulnerability from shoreline erosion and flooding from high coastal water levels
- Preserves and enhances natural habitats

What is vulnerability?

How exposed or susceptible an asset is to hazard(s) and damage.

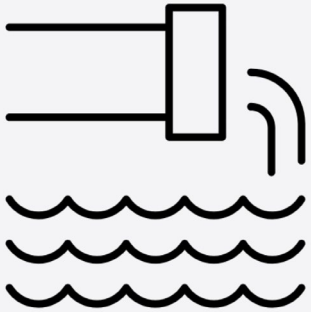
Vulnerability depends on an asset's construction, contents, and the economic value of its functions.

Green to Gray Spectrum: Range of possible solutions

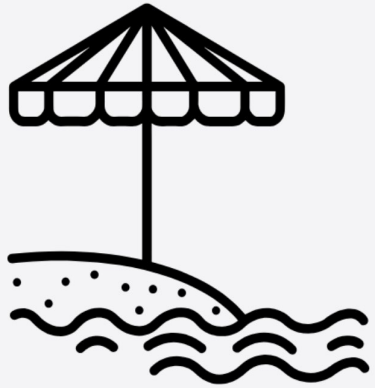
Source: US Army Corps of Engineers

What types of actions are we considering?

Vegetated Sand Dunes

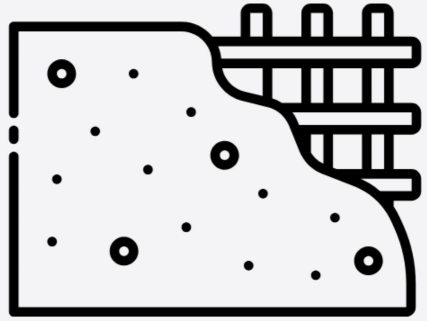


Green Stormwater Infrastructure



Sand Management

Artificial Reefs



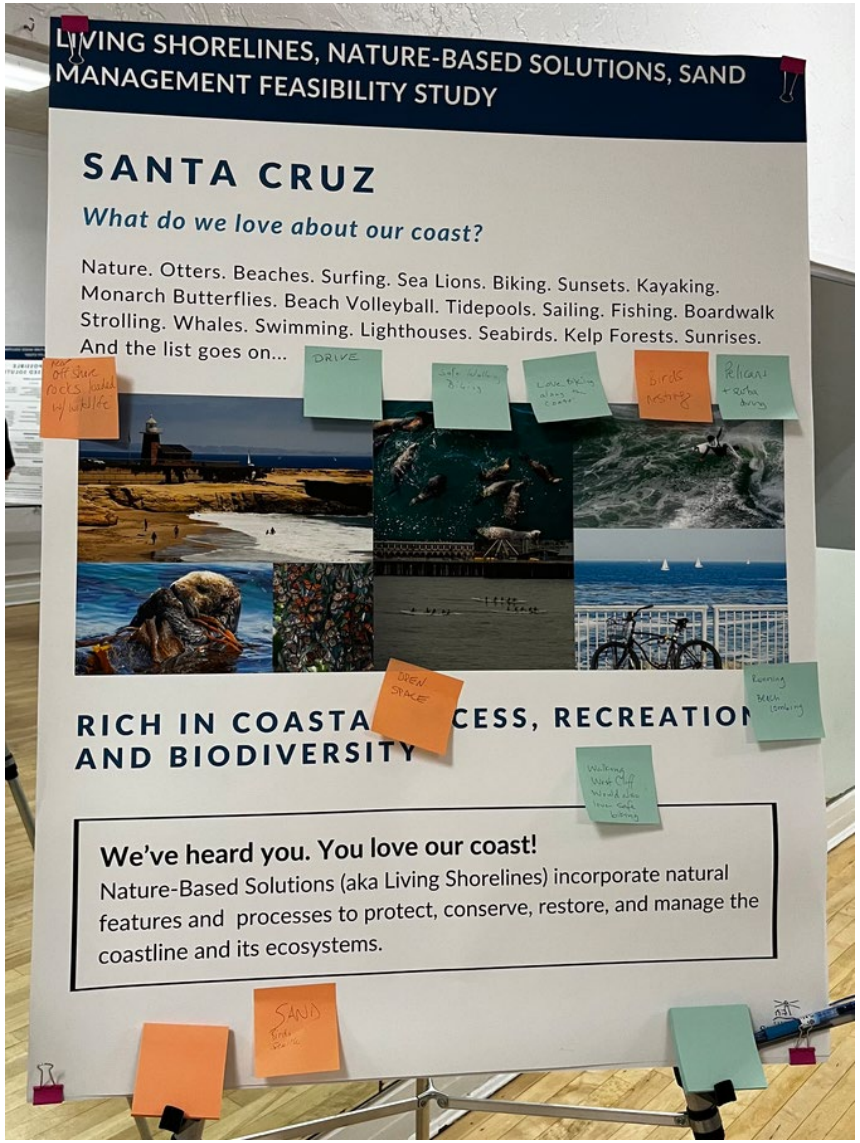
Green-Grey Options

How does this project relate to other current projects?

- West Cliff 5-Year Roadmap
- Local Coastal Program Beaches and Bluffs Chapter
- Lighthouse Pt Hazard Analysis project
- NOAA funding for Main Beach Living Shoreline

Selected Sites and Concept Evaluation Criteria

Big Picture Approach



Develop
Diverse set of NBS concepts

Reduce
Vulnerability to coastal storms

Prioritize
Concepts that benefit habitats, public access and recreation

Include
Feedback from a wide array of shoreline users, regulators, ecologists

What are the sites where NBS are being considered?

1. Main Beach
2. West of Its Beach
3. Mitchell's Cove

Why these sites?

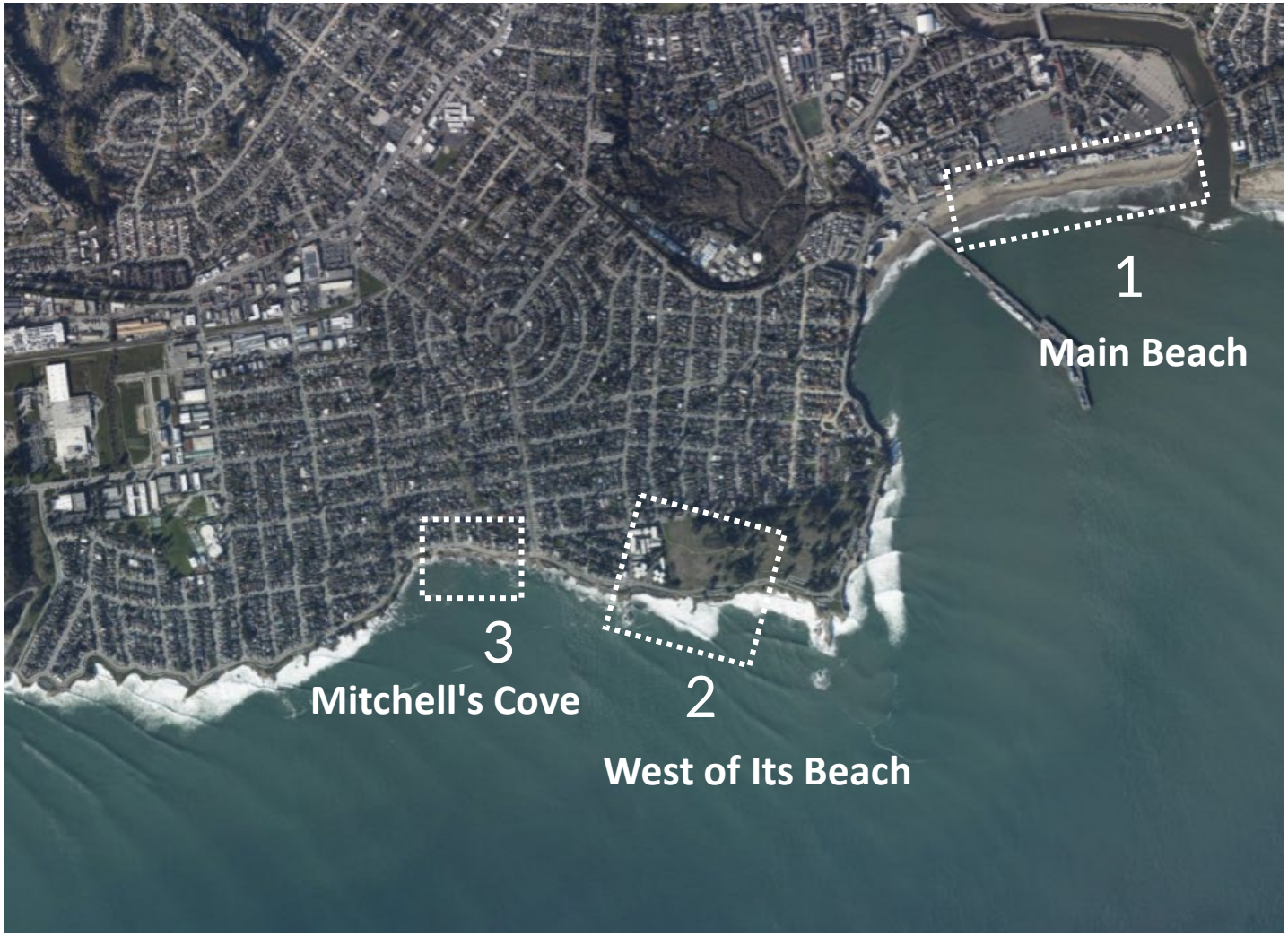
Vulnerability

- Flooding and erosion
- Protection for underserved communities

Number of viable NBS options

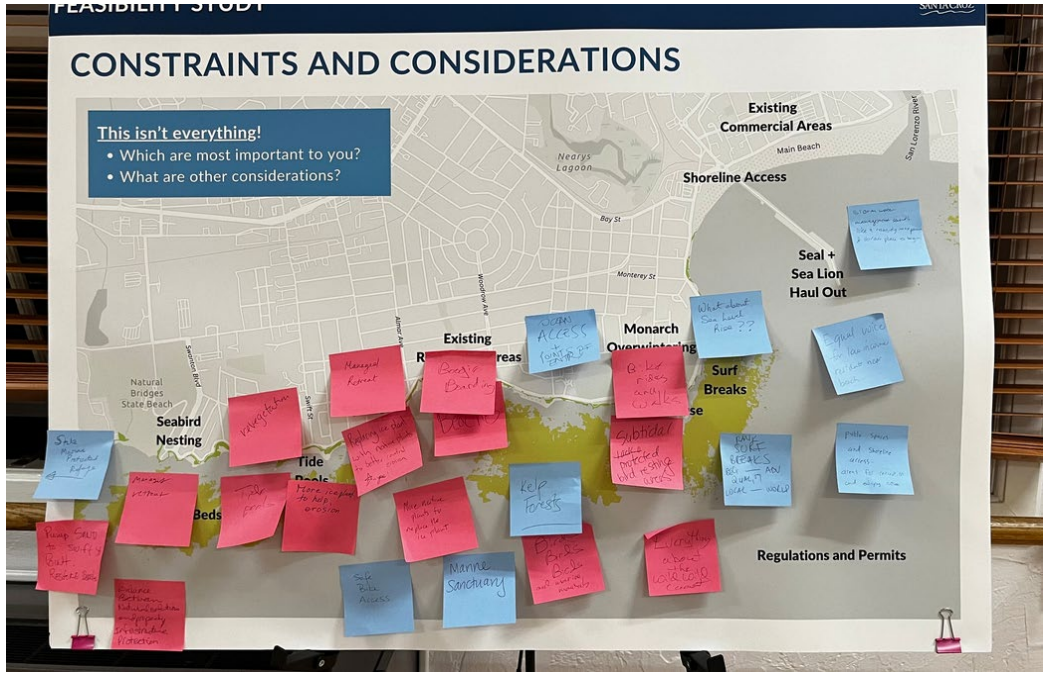
Likelihood for Project Success

- Relative likelihood for near-term project construction
- Economic benefit
- Potential for reducing vulnerabilities



Evaluation Criteria applied to the NBS concepts

- Compare benefits and trade-offs of different NBS adaptation concepts
- Key project priorities: protect from coastal hazards, and improve habitat
- Engagement indicated other priorities such as recreation and access
- Using criteria to assess initial concepts



Evaluation Criteria to be applied to NBS concepts

What will the outcomes be?

- **Coastal Management and Resources –** incl. flooding, erosion
- **Ecosystems and Habitats –** incl. marine and terrestrial
- **Access and Recreation** – incl. pedestrian and bike access, surf, beaches, marine harvest

Can we do it?

- **Technical and Costs** – incl. capital cost, operations and management costs
- **Policy and Equity** – incl. regulation and permitting, tribal priorities

Comparison to present-day conditions: 1 = worse; 2 = similar; 3 = better

Draft Concepts by Site

Site 1: Main Beach Conditions

USGS
science for a changing world

Site 1: Main Beach Conditions

Site 1: Main Beach Conditions

Site 1: Main Beach

Vegetated Dune and Beach Nourishment

Questions about Main Beach concepts?

Use the Q&A button in zoom

Site 2 and 3: West Cliff Conditions

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Current conditions

Coastal storms cause high water levels. Overtopping and erosion in vulnerable areas.

Low tide, high tide and seasonal beaches.

Kelp forests reduce energy of smaller wind-driven waves.

Site 2 and 3: West Cliff Conditions

Future conditions with climate change

Flooding and overtopping worsens.

Headlands and rocky habitats slowly erode. Loss of beaches.

Offshore habitats move toward shore. Limited transition areas.

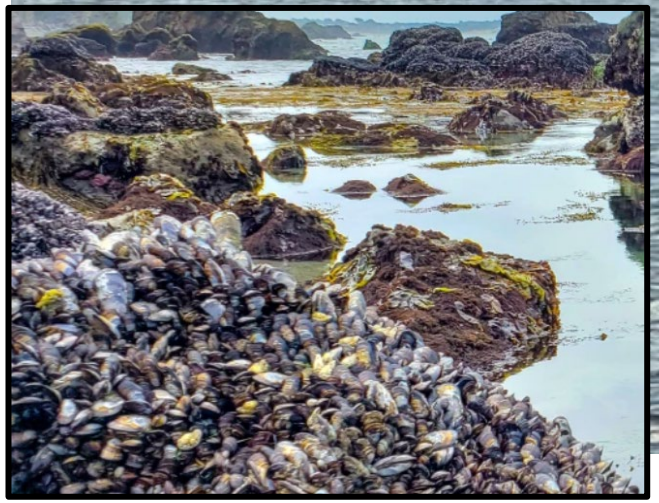
Site 2: West of Its Beach

Green Stormwater Infrastructure

Site 2: West of Its Beach

Green-Grey Option

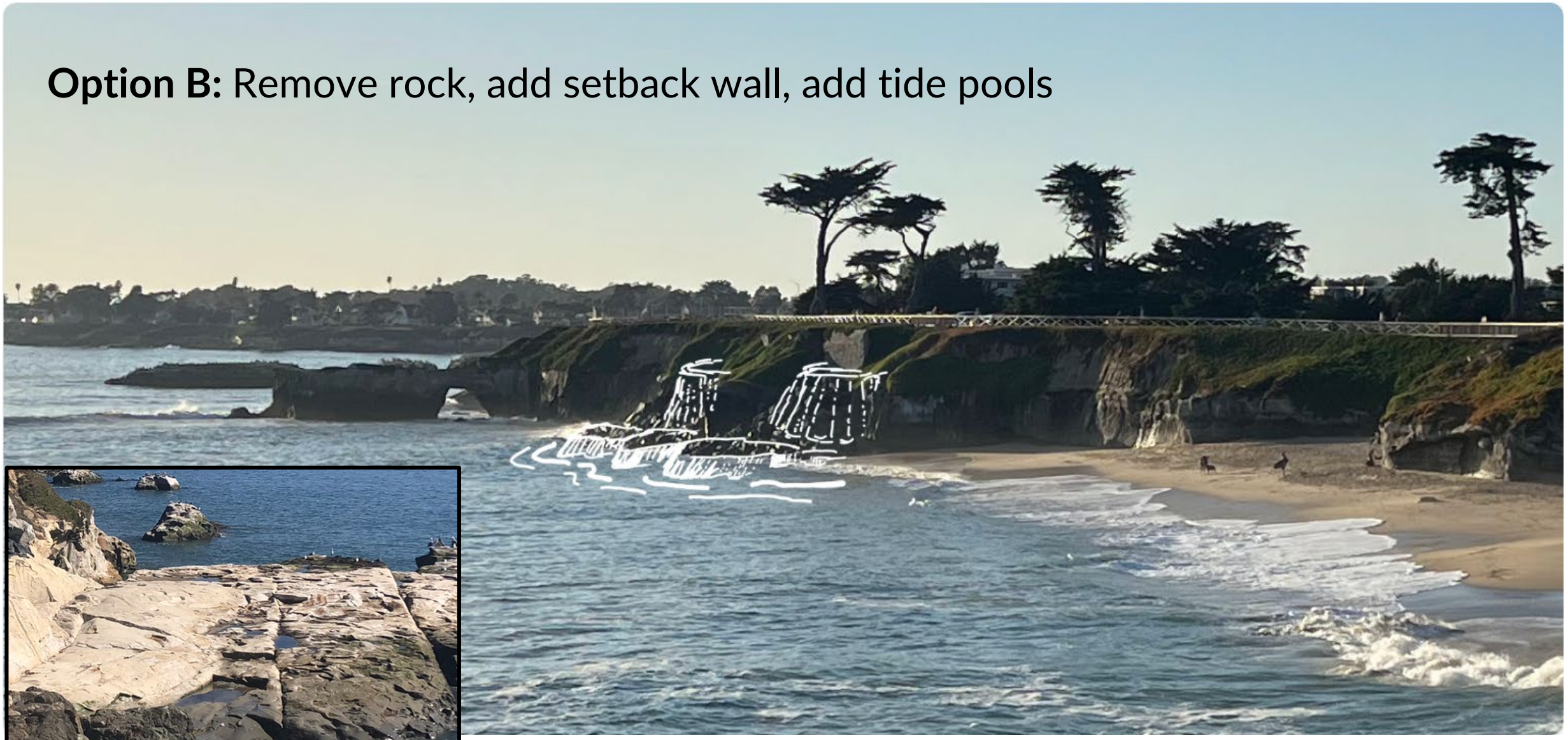
Option A: Modify existing rock



Site 2: West of Its Beach

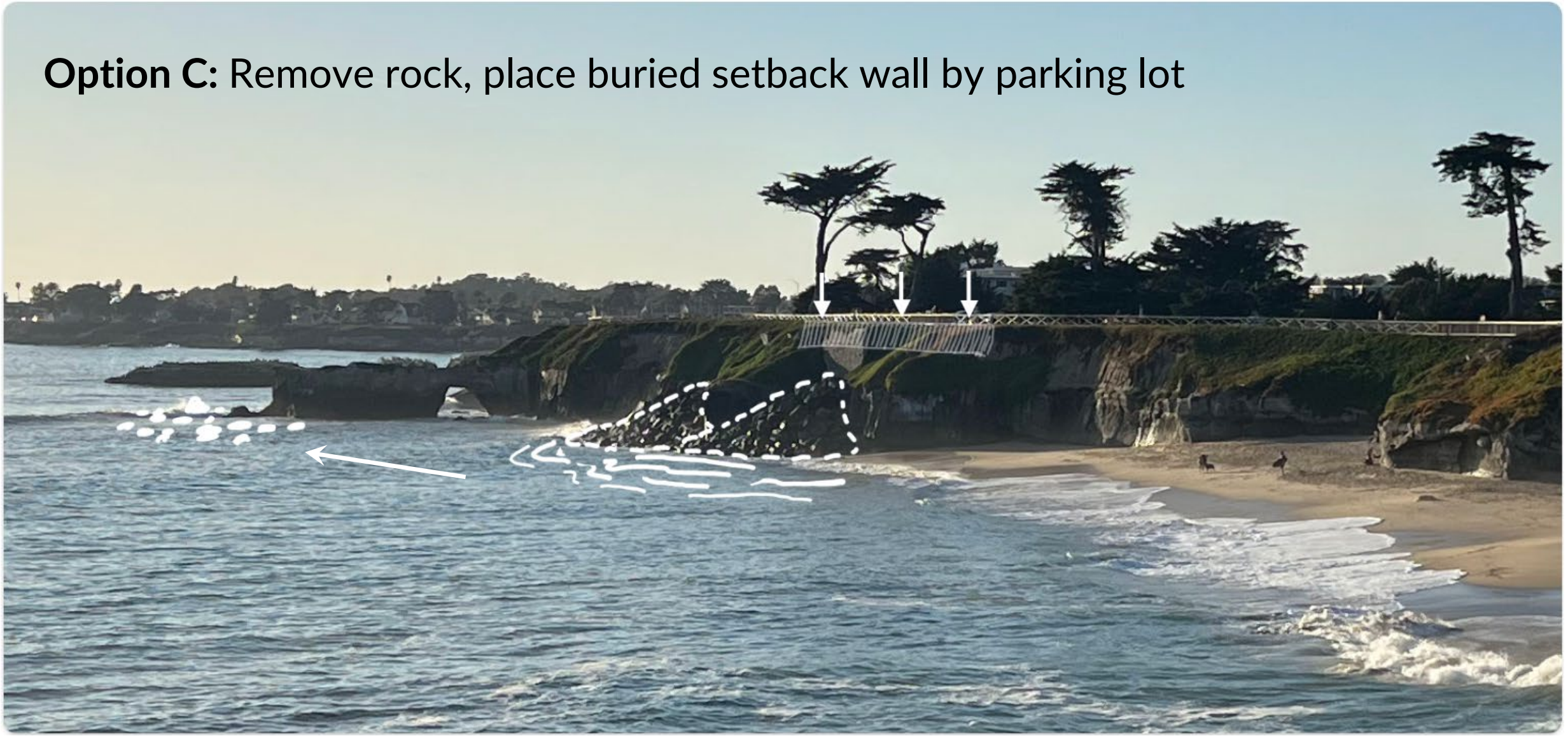
Green-Grey Option

Option B: Remove rock, add setback wall, add tide pools



Site 2: West of Its Beach

Green-Grey Option



Questions about West of Its Beach concepts?

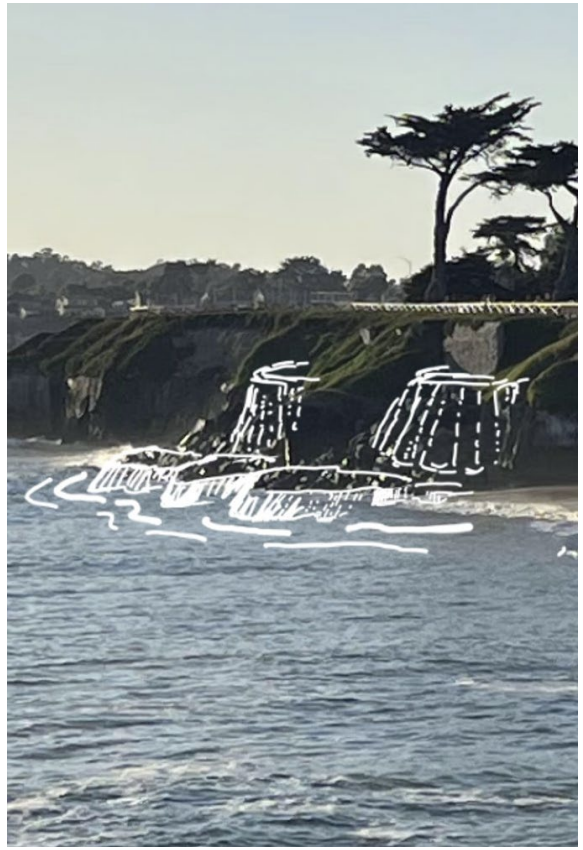
Use the Q&A button in zoom

Site 2: West of Its Beach Draft Concepts

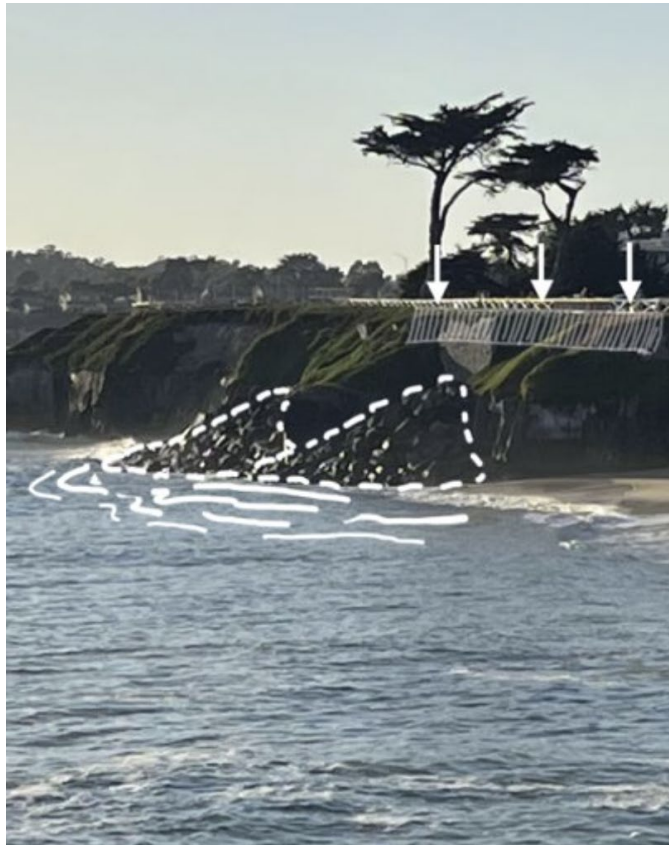
Green stormwater infrastructure:
Improve outfalls and use ponds to slow runoff

Green-Grey Option A:
Modify existing rock

Green-Grey Option B:
Remove rock, add setback wall, add tide pools



Green-Grey Option C:
Remove rock, place buried setback wall by parking lot



These concepts can be combined for this site. Beach nourishment is also being considered as a long-term option.

Site 3: Mitchell's Cove

Green-Grey Options

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Green-Grey Options

Option C: Remove rock, place buried setback wall

Site 3: Mitchell's Cove

Intertidal Reef

Example from recent project in Half Moon Bay

Questions about Mitchell's Cove concepts?

Use the Q&A button in zoom

Site 3: Mitchell's Cove Draft Concepts

Green-Grey Option A:
Modify existing rock

Green-Grey Option B:
Remove rock, add setback wall, add tide pools

Green-Grey Option C: Remove rock, place buried setback wall by parking lot

Intertidal Reef:
Improve outfalls and use ponds to slow runoff

All of these concepts can be combined for this site. Beach nourishment is also being considered as a long-term option.

Next Steps

- FAQ
- Finalize which concepts to take to 30% design
- Develop draft designs
- Review draft designs with focus group
- Share final designs with community

Thank you!