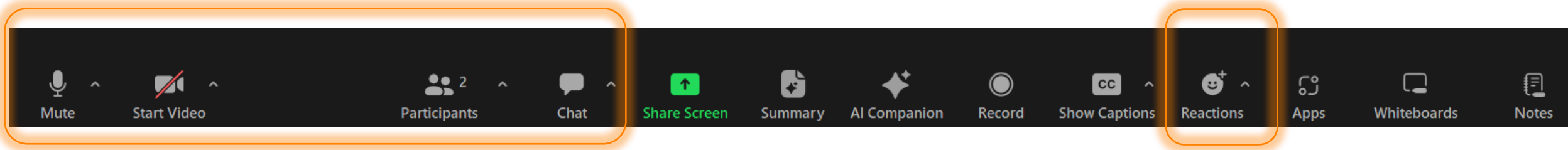


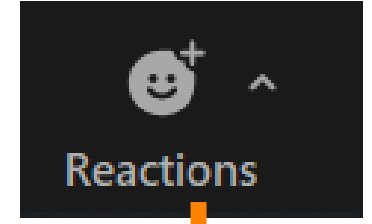
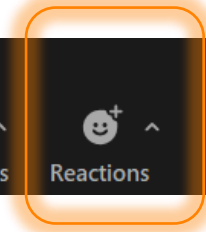
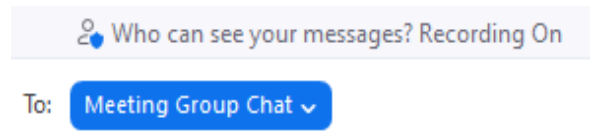
# HOUSEKEEPING- ZOOM MEETING DASHBOARD



Click to mute and unmute yourself

Click to turn your camera on when speaking (optional)

Click to enter chat –respond to questions and ask questions



Raise your hand if you have a question or to respond to a question/vote



# Captiva Bayside Adaptation Plan

Captiva Island, Florida

Public Outreach Meeting 4

January 9, 2025

# AGENDA

- ▶ Project Overview
  - ▶ Adaptation Plan Highlights
  - ▶ Resources
- ▶ Adaptation Options
  - ▶ For Individuals
  - ▶ Collective Projects, CEPD
- ▶ Site-Specific Conceptual Designs
- ▶ Next Steps and Feedback



# CAPTIVA EROSION PREVENTION DISTRICT (CEPD)



## STEERING COMMITTEE

**JOHN WADE**

Chairman

**RENE MIVILLE**

Vice Chairman

**MIKE CAMPBELL**

Lee County Public Works

**MATT DEPAOLIS**

SCCF Policy Director

## CEPD STAFF

**JOHN RIEGERT**

CEPD Deputy Director

**PAUL TRITAIK**

Project Reviewer

*The Captiva Erosion Prevention District (CEPD) is an independent special beach and shore preservation district... possessed of broad powers to do as necessary or desirable to carry out the CEPD comprehensive beach and shore preservation program.*



# INTRODUCTIONS



**NICOLE SHARP**  
Project Manager



**SAMANTHA DANCHUK**  
Outreach Coordinator and  
Resilience Expert



**CIGDEM OZKAN**  
Climate & Resilience  
Engineer



**CAROLINE LINDQUIST**  
Landscape Architecture & Conceptual  
Plan Designer



**LEIGH GEVELINGER**  
Landscape Architecture



**JAMIE WILSON**  
Flood Mitigation Expert



# PROJECT OVERVIEW



## Strategy Options

- ▶ Analysis of options and implementation
- ▶ Identified strategies for administrative action, engineered solutions and protection of critical assets
- ▶ Identified **20+** optional engineered strategies to address needs for three prominent shoreline types



## Resident and Stakeholder Involvement

- ▶ Discussed experiences and needs
  - ▶ Prioritized properties based on **needs, cost, ease of implementation, and composition of properties**
    - ▶ Established buy-in
  - ▶ Ground-truthing and direction
    - ▶ **Four** public meetings
- ▶ Interactive storymap and survey



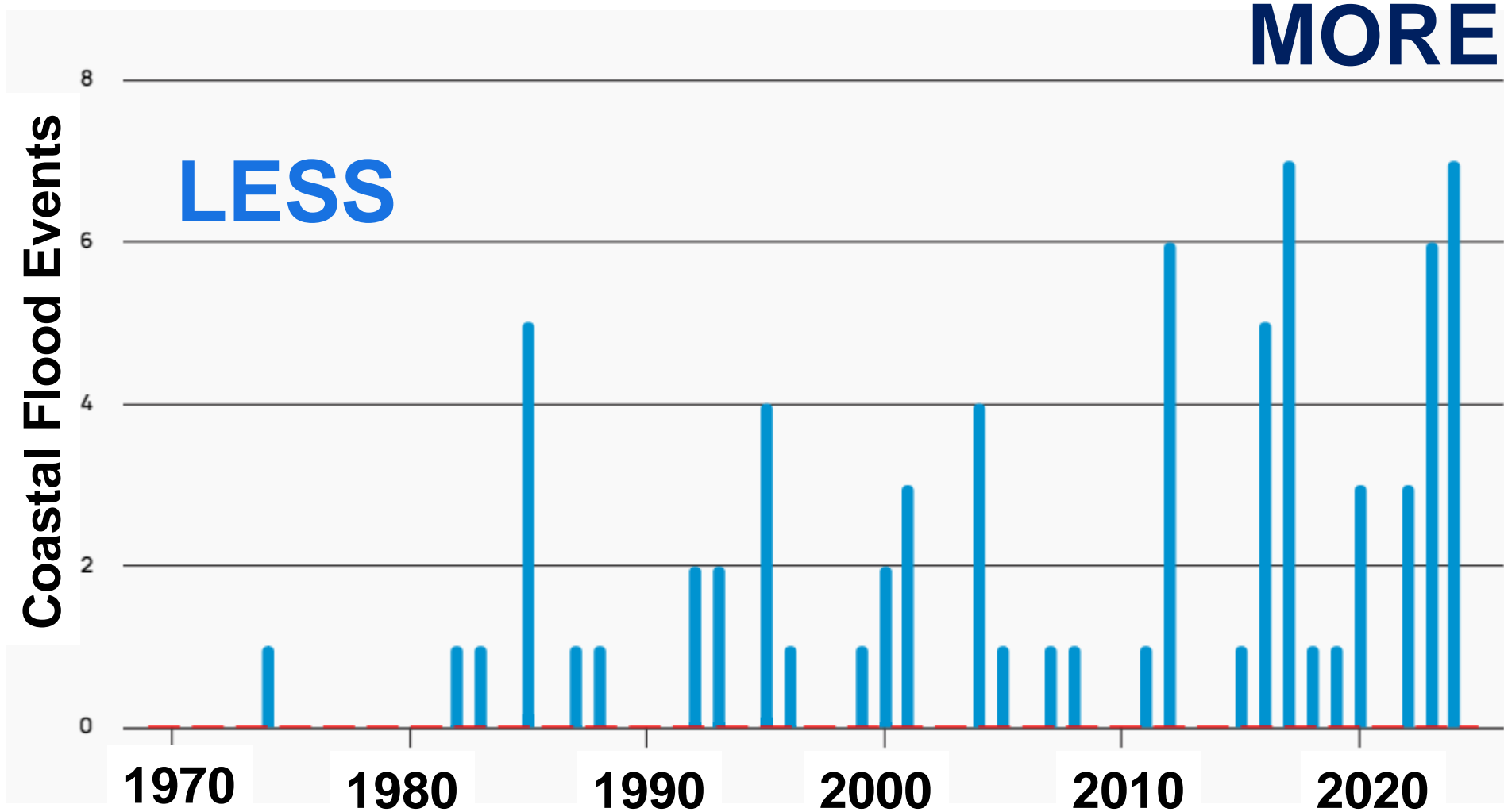
## Prioritized Optional Projects

- ▶ Focus on nature-based and hybrid solutions
- ▶ Identified **five** concept design sites with visuals
- ▶ Adapt shoreline to complement island wide flood mitigation
  - ▶ Funding application

# ADAPTATION PLAN HIGHLIGHTS



# FLOODING IS MORE FREQUENT



Most buildings were built pre- 1980s

NOAA Sea Level Calculator

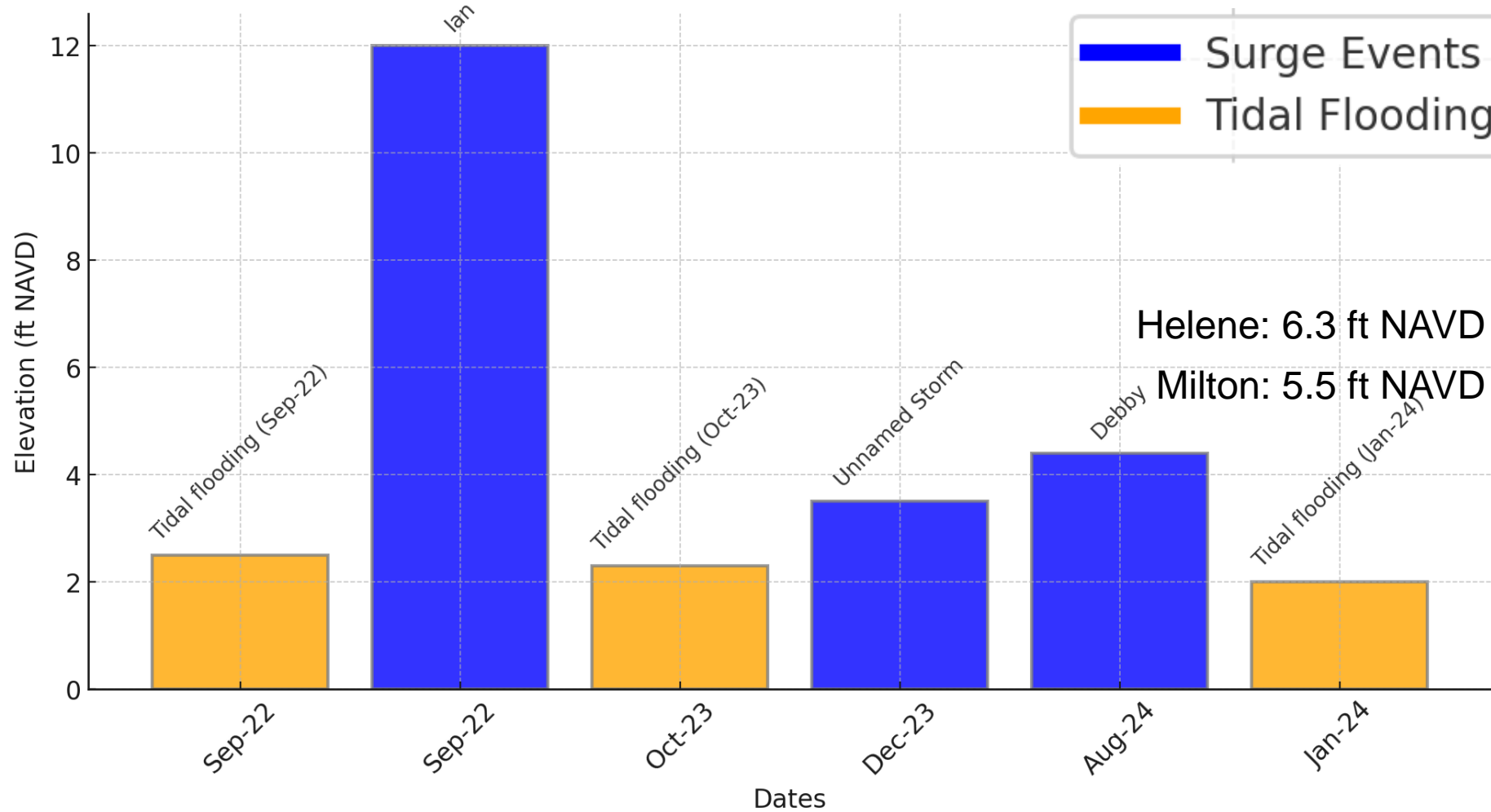




# TIDES AND SURGE ARE REACHING SOME BUILDINGS



Recent Surge and Tidal Flooding Events in Captiva



100 Year Flood

Helene: 6.3 ft NAVD

Milton: 5.5 ft NAVD

2070 High Tide

2040 High Tide

Typical First Floor  
(2-4 ft NAVD)

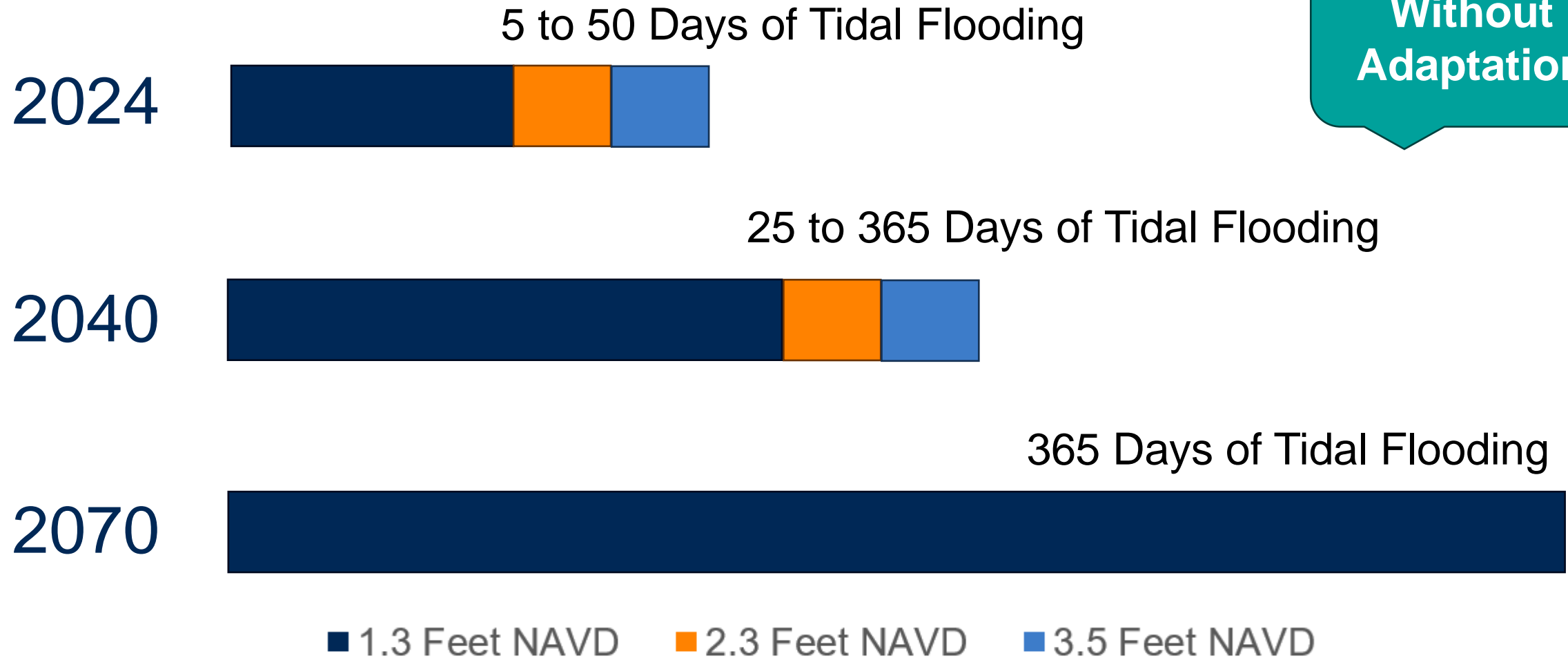
Typical Shoreline  
(1.8 ft NAVD)



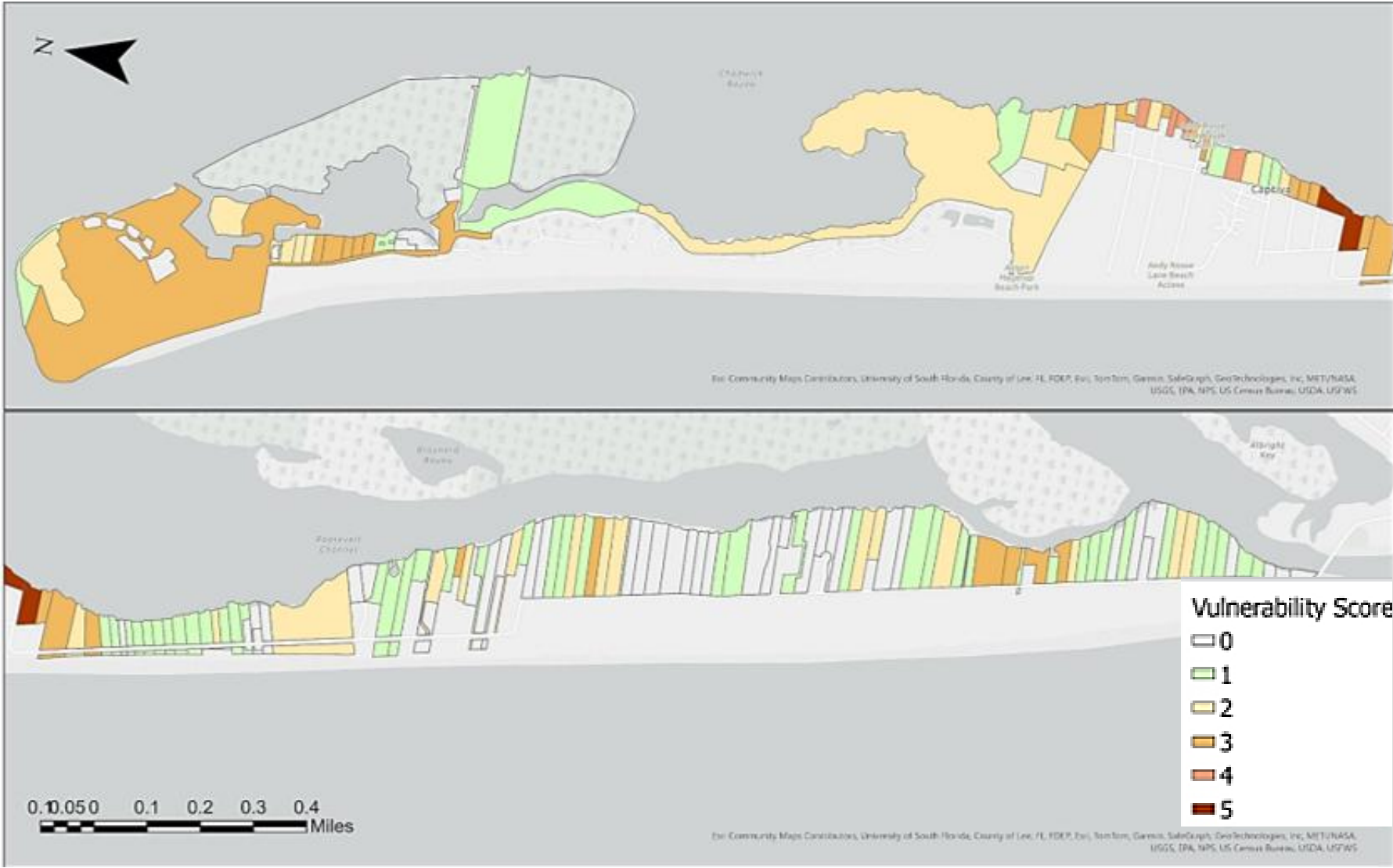
# TIDAL FLOODING IS PREDICTED TO BE MORE FREQUENT



**Without  
Adaptation**



# PROPERTY VULNERABILITY VARIES ALONG BAYSIDE



Property Considerations (vulnerability factors)	Number of parcels
Flood trespassing	27
Adjacent to 2040 roadway flooding	6
Without mangroves	64
With buildings below 3.5 ft NAVD	62
With buildings near MHW	54
With shorelines below 3.5 ft NAVD	150



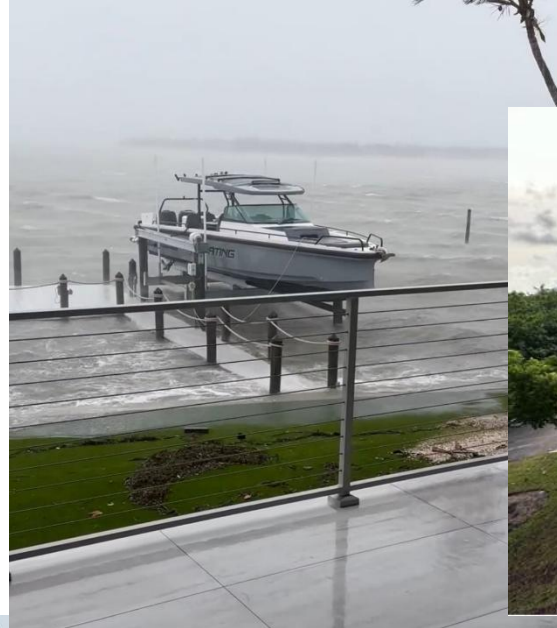
# ADAPTATION NEEDS



Hurricane Helene. Source: CEPD



# ADAPTATION NEEDS BY SECTOR



- **Communication** (such as Comcast) and **power** assets experienced widespread damage
- **Residential:** 1-3 ft of flooding reported in residential areas
- **Transportation:** Local roads were flooded. Blind Pass was closed for 2 days
- **Critical Facilities:** Island Store opened after 2 days

Hurricane Helene - Source: Captiva Facebook Group



# ADAPTATION PLAN SUMMARY

- ▶ There is time to plan for a sustainable future but
  - ▶ 20+ tidal floods and 9 surge events since 2017
  - ▶ 30% parcels very vulnerable, 80% are flooding
- ▶ CEPD is enabled to plan, fund and execute projects to enhance resilience
  - ▶ Supporting **new policy** may encourage private adaptation
  - ▶ With consent, coordinating a project along **Central Captiva** would **protect critical public assets**
- ▶ **20+ strategies** for different shoreline types to inspire adaptation since new seawalls are not allowed



# Captiva Bayside Adaptation Plan

August 2024



# STRATEGIES IN PLAN



## Administrative

- ▶ Shoreline Elevation Policy
- ▶ Shoreline Design Criteria
- ▶ Living Shoreline Criteria
- ▶ CEPD Easement for Submerged Lands
- ▶ Planning & Coordination
- ▶ Funding

## Engineered

- ▶ Existing Seawall Improvements
- ▶ Mangrove Shoreline Enhancement
- ▶ Bayside Beach Shoreline Maintenance
- ▶ Wave Impact Reduction

## Community Protection

- ▶ Captiva Dr, Binder Dr elevation
- ▶ Wastewater Plant and Fire Station Floodproofing
- ▶ *Central Captiva Shoreline and Drainage Improvement Project*

# RECOMMENDATIONS



**START HERE**

- ▶ Request Resilient Florida funding for permitting and design of Central Captiva project
- ▶ Meet with County to advance minimum shoreline elevation policy
- ▶ Meet with Lee County DOT for resilience review of Blind Pass bridge
- ▶ Add sea level rise considerations to County drainage study
- ▶ Communicate tidal flooding risk to property owners
- ▶ Conduct workshops to assist residents in implementing adaptation strategies



# RESOURCES AVAILABLE TO YOU: CEPD WEBPAGE



- ▶ Captiva Vulnerability Assessment
- ▶ Bayside Adaptation Plan
- ▶ Design Concepts (Storymap)

**Captiva**  
Erosion Prevention District

Home Governance ▾ Meeting Schedule ▾ Projects ▾ Permits/Forms ▾ News and Reports ▾ Beach

**PROJECTS**

- BEACH PROJECTS
- 2021 BEACH NOURISHMENT PROJECT
- RESILIENCY
  - BAYSIDE ADAPTATION

## Bayside Adaptation

### Introducing the Captiva Bayside Adaptation Plan

The Captiva Erosion Prevention District is developing a plan to support erosion control along the bayside shorelines of Captiva. The Captiva Bayside Adaptation Plan will be a proactive strategy designed to identify and implement nature-based solutions, infrastructure projects, and policy measures to adapt to and mitigate the impacts of erosion caused by recurrent flooding. The plan intends to protect homes, natural habitats, and community assets while promoting long-term resilience and sustainability.

Public engagement is a fundamental aspect of the Captiva Bayside Adaptation Plan, and the input and perspectives of Captiva's residents is essential to developing a feasible plan. To kick off this process, residents and stakeholders are invited to **participate in a survey** to share experiences, concerns, and ideas related to flooding on Captiva Island's bayside. Feedback will inform the development of the adaptation plan and help shape future initiatives to address vulnerabilities in our community. This survey will be open

<https://mycepd.specialdistrict.org/bayside-adaptation>



# RESOURCES AVAILABLE TO YOU: RESIDENT STORYMAP



species. 97% of Bayfront shorelines are a Mangrove Dominant Shoreline Type.

Mangrove shorelines help to build and maintain land over time, however, small areas of mangroves have been lost due to construction activities.

Click the Button below to view where these shorelines exist on Captiva.

Mangrove Bayfront Shorelines on Captiva

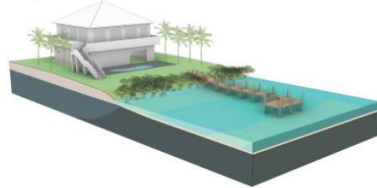
What strategies exist to prevent flooding?

Click the Mangrove Shoreline Strategy to view applicable solutions for the Mangrove Dominant Shoreline Type:

Strategies for Mangrove Shoreline

## DOMINANT SHORELINE TYPE - MANGROVES

Existing Shoreline



Shoreline with Proposed Strategies (Example)



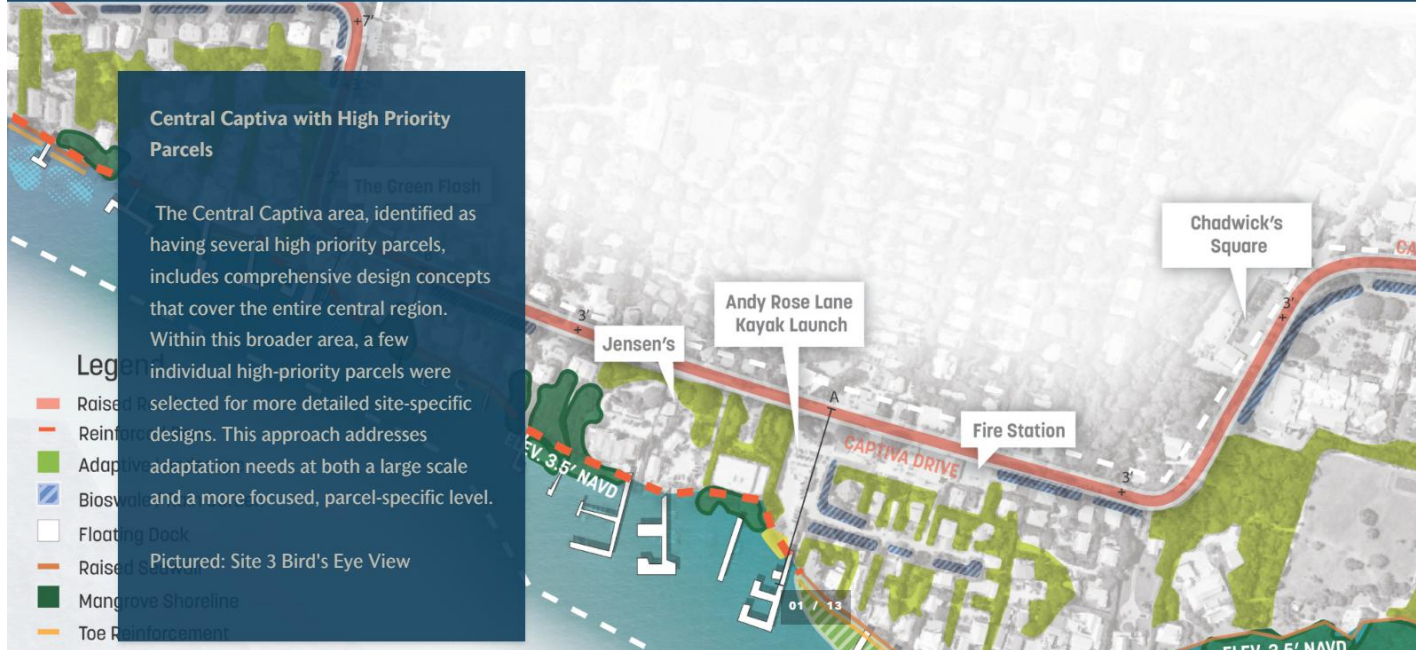
## ADDITIONAL STRATEGIES

- Relocate Docks or Replace with Floating Docks
- Shoreline Re-nourishment

## FLOOD MITIGATION STRATEGIES



## WAVE MITIGATION STRATEGIES



[Captiva Resident Story Map \(arcgis.com\)](#)



bitly



## AUDIENCE INTRODUCTIONS

- ▶ Your interest in attending today?
- ▶ Shoreline type at your property?
- ▶ Thoughts on urgency, priorities or level of protection needed?

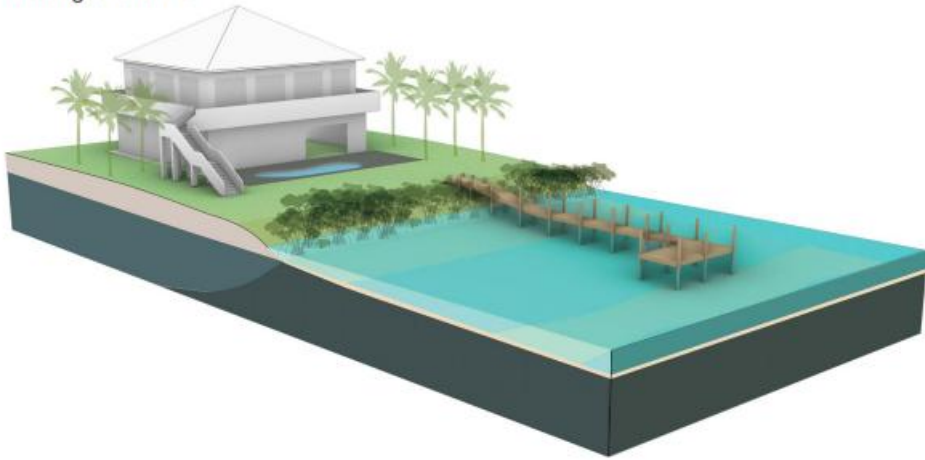


# **ADAPTATION OPTIONS FOR INDIVIDUALS**

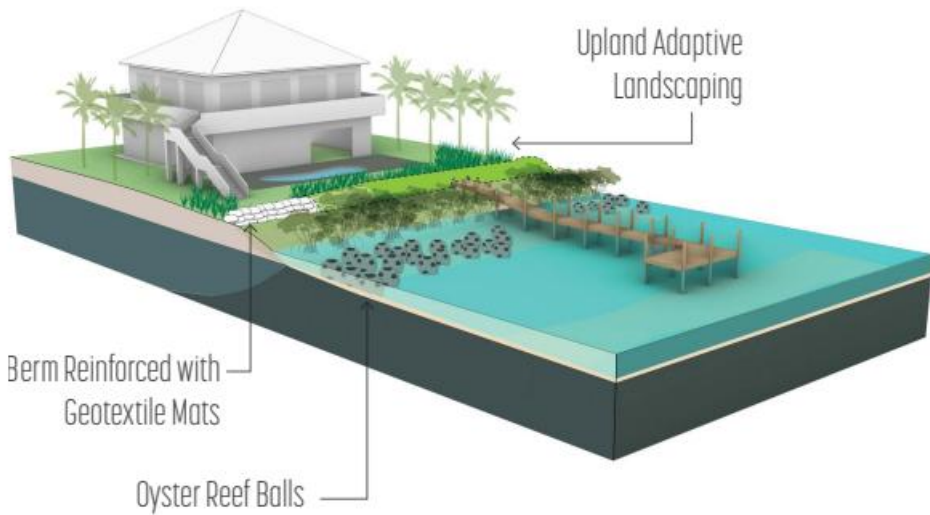


# DOMINANT SHORELINE TYPE - MANGROVES

Existing Shoreline



Shoreline with Proposed Strategies (Example)



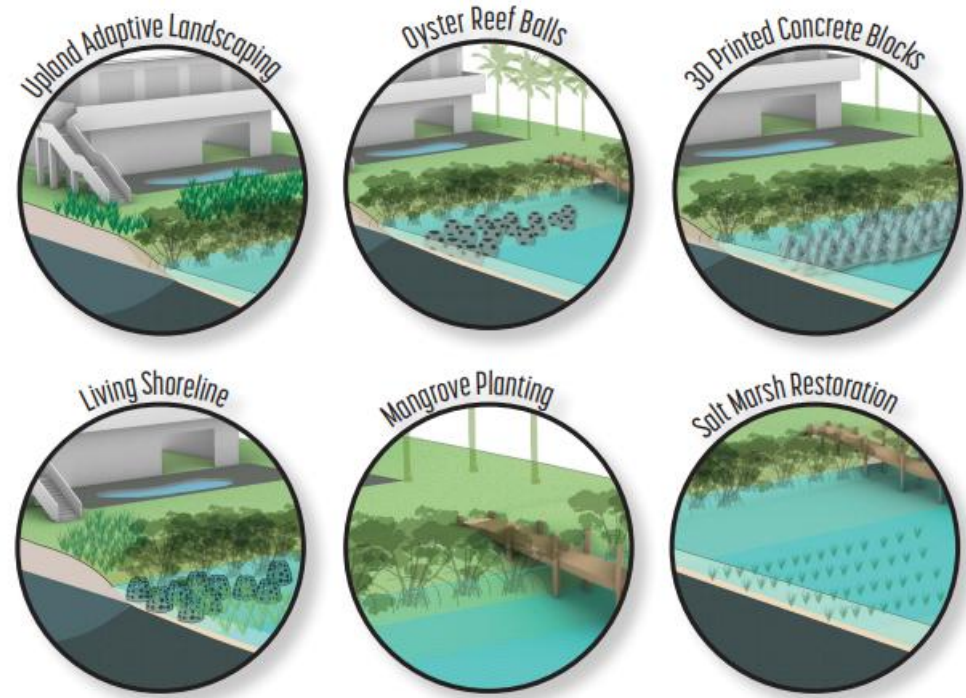
## ADDITIONAL STRATEGIES

- Relocate Docks or Replace with Floating Docks
- Shoreline Re-nourishment

## FLOOD MITIGATION STRATEGIES



## WAVE MITIGATION STRATEGIES







## DOMINANT SHORELINE TYPE - BEACH

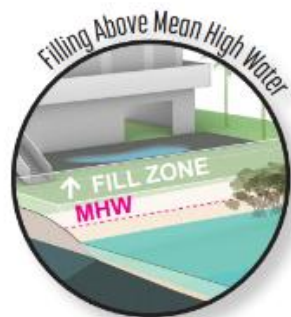
Existing Shoreline



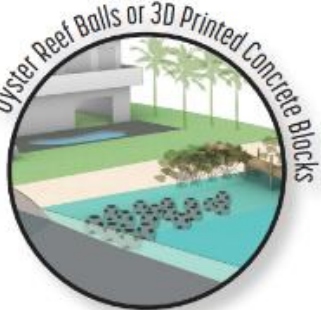
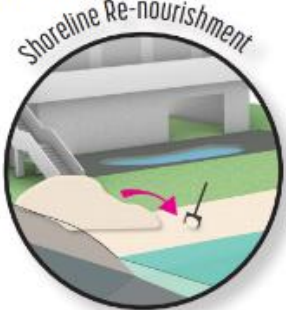
Shoreline with Proposed Strategies  
(Example)



## FLOOD MITIGATION STRATEGIES



## WAVE MITIGATION STRATEGIES



## ADDITIONAL WAVE MITIGATION STRATEGIES

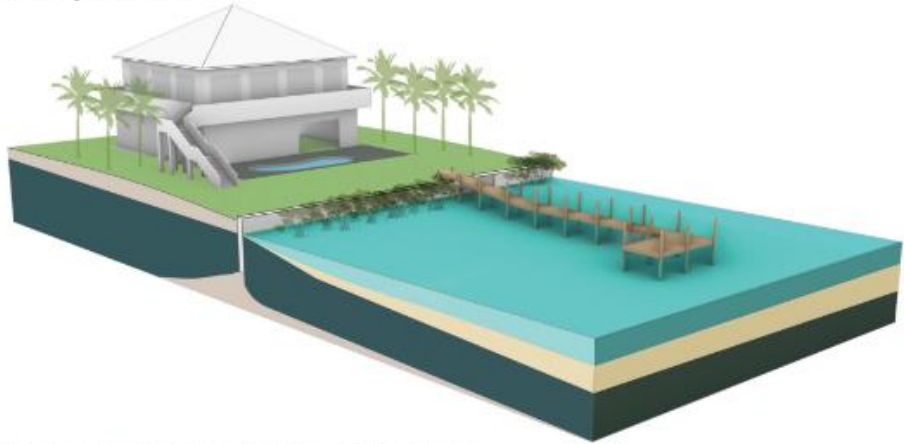






# DOMINANT SHORELINE TYPE - SEAWALL

Existing Shoreline



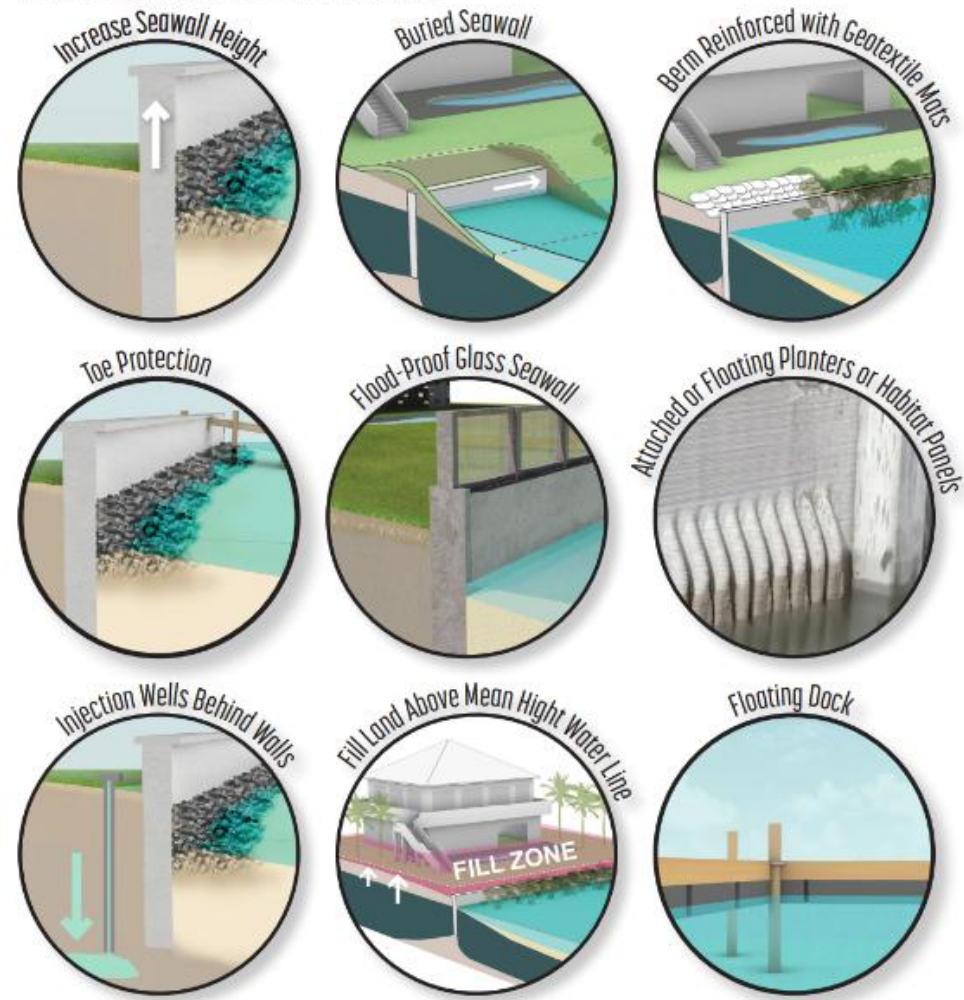
Shoreline with Proposed Strategies (Example)



## WAVE MITIGATION STRATEGIES

- Upland Adaptive Landscaping
- Living Shoreline
- Oyster Reef Balls
- Salt Marsh Restoration
- Mangrove Planting
- 3D Printed Concrete Blocks

# FLOOD MITIGATION STRATEGIES



## ADDITIONAL STRATEGIES

- Replace with low-carbon concrete wall
- Landscape Retaining Wall
- Automated flood barriers



**ADAPTATION OPTIONS  
IF WORK  
COLLECTIVELY (CEPD)**



# CAPTIVA TODAY



# SHORT-TO-MID-TERM ADAPTATION STRATEGIES



BAYFRONT BUILDINGS LIFTED TO FFE 8'

FIRE STATION ELEVATED ON FILL

SOUTH SEAS PLANTATION DRIVE RAISED TO 3.5' NAVD

CAPTIVA DRIVE RAISED TO 3.5' NAVD

CHADWICK BAYOU

RAISED SEAWALL

RESTORED BEACH WITH BERM

LIVING SHORELINE WITH FILL

FLOATING DOCKS

EXTENDED MANGROVE PLANTING SHORELINE 2025

OYSTER REEF BALLS



**BREAK**



# SITE-SPECIFIC CONCEPTUAL DESIGNS



# CONCEPT DESIGN SITES

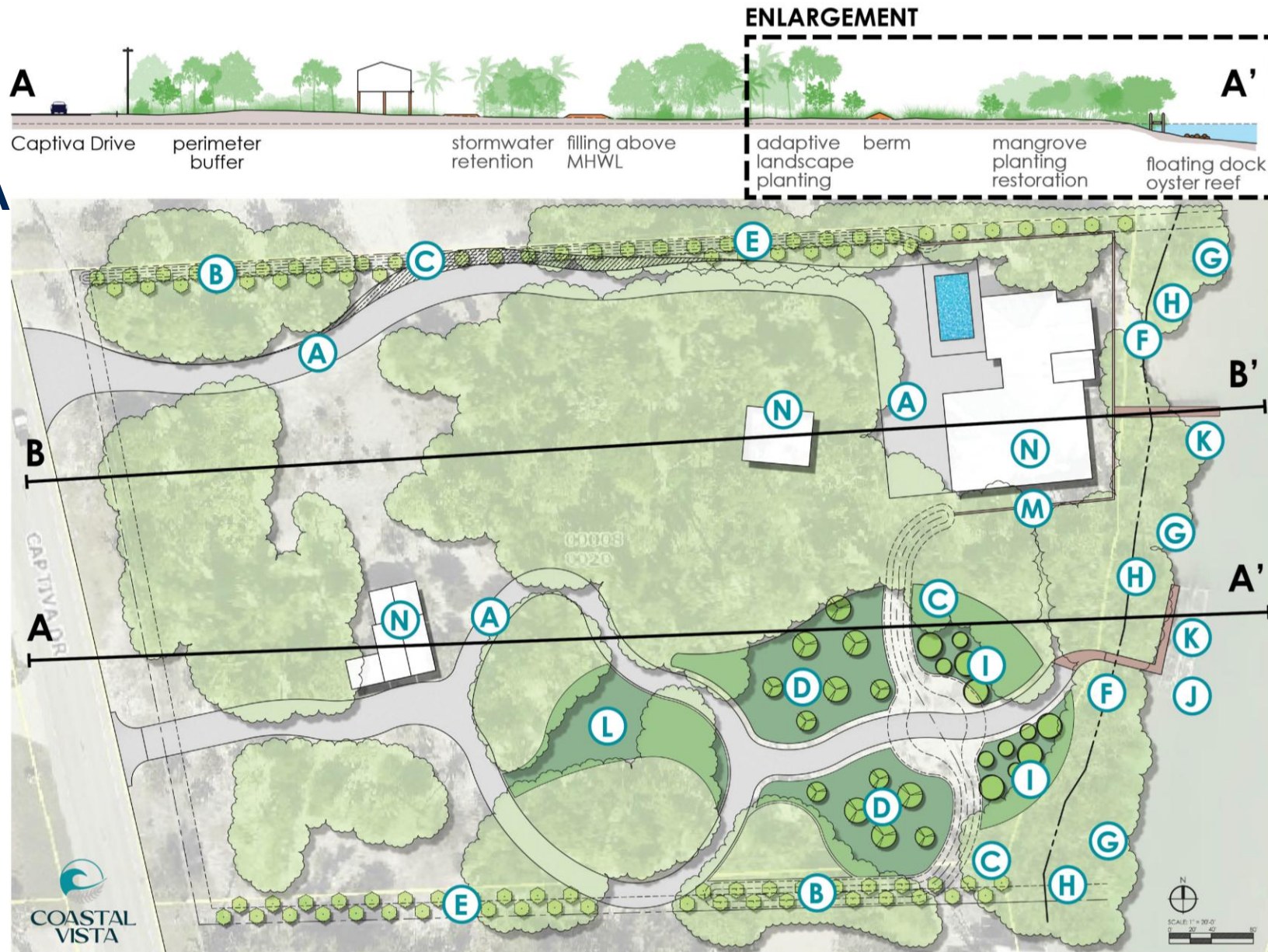




# SITE 1

## 16737 CAPTIVA DRIVE

### PLAN VIEW





# SITE 1 16737 CAPTIVA DRIVE

## CROSS SECTION A

16737 CAPTIVA



existing condition:  
residence proximity to water



proposed intervention:  
adaptive landscaping planting



proposed intervention:  
salt marsh restoration



proposed intervention:  
perimeter berms with geotube

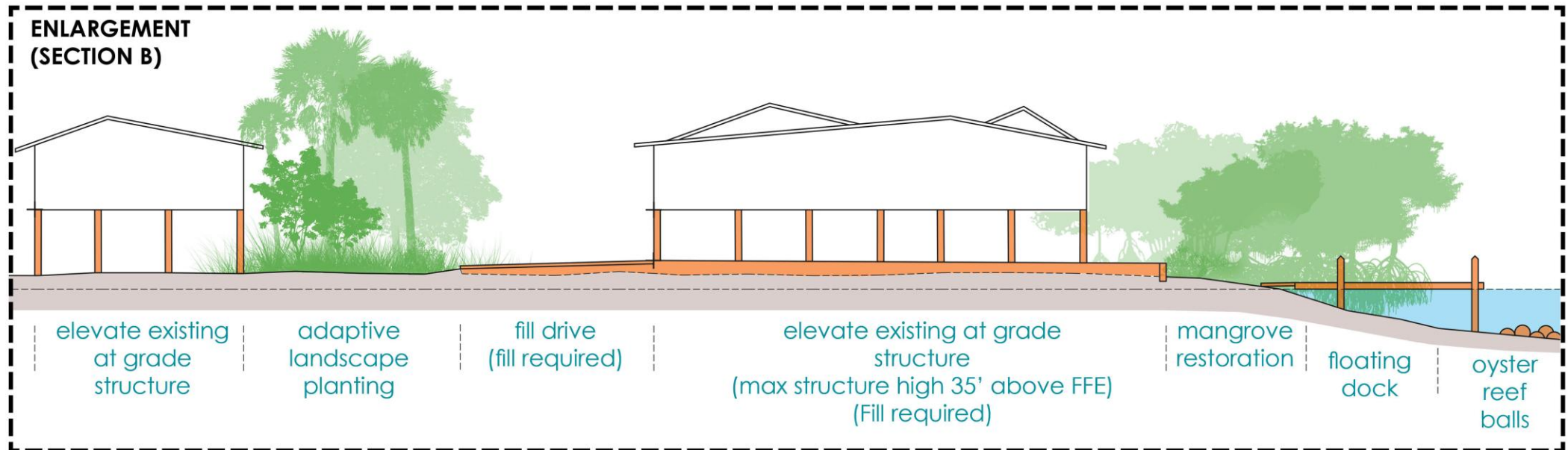
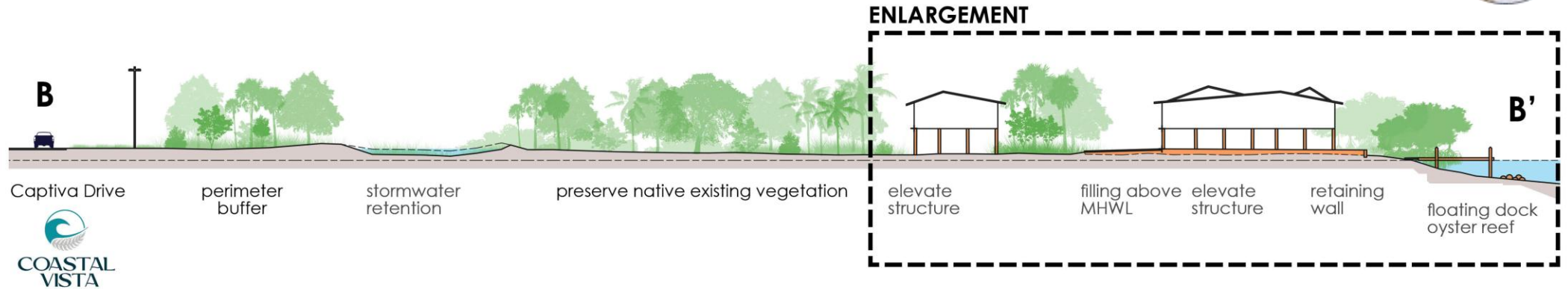


# SITE 1

## 16737

### CAPTIVA DRIVE

## CROSS SECTION B





16737 CAPTIVA

# SITE 1 16737 CAPTIVA DRIVE

## PLAN VIEW



### ① FREQUENTLY INUNDATED:



Red mangrove



Green buttonwood



Spartina grass



Sea oxeye daisy

### ② OCCASIONALLY INUNDATED:



Silver buttonwood



Jamaica caper



Saw palmetto



Muhly grass

### ③ RARELY INUNDATED:



Gumbo limbo



Wild tamarind



Seagrape



Golden creeper



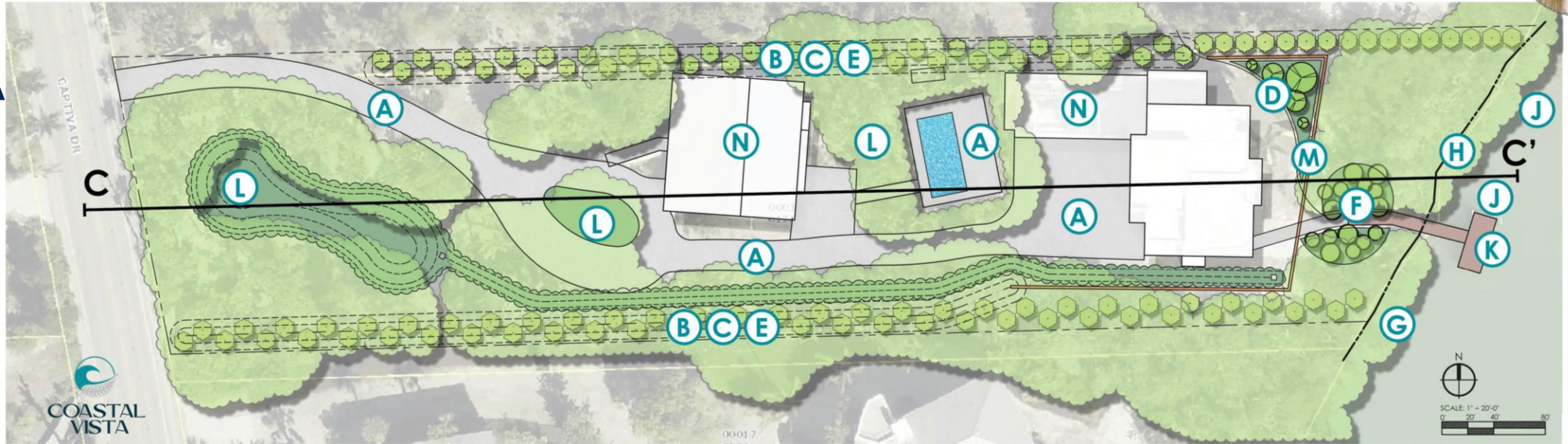
# SITE 2

## 17081 CAPTIVA DRIVE

17081 CAPTIVA DR



### PLAN VIEW



existing condition:  
residence proximity to water



existing condition:  
tidal flooding



existing condition:  
low driveways prone to flooding

#### PROPOSED INTERVENTION

A	Filling Above Mean High Water Line
B	Perimeter berm
C	Berm Reinforced with Geotube
D	Adaptive Landscape Planting Design
E	Vegetative buffer
F	Mangrove Planting & Restoration
G	Mangrove Management/Trimming
H	Living Shorelines
I	Salt Marsh Restoration
J	Oyster Reef Balls
K	Floating Dock
L	Stormwater Retention
M	Retaining Wall
N	Elevate Existing Structure



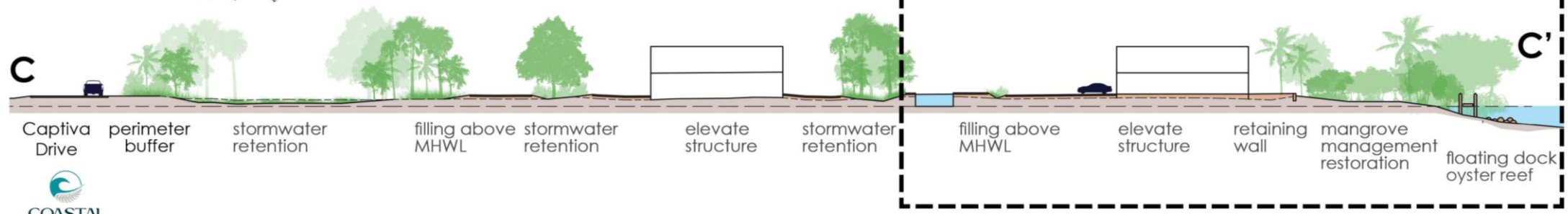
# SITE 2 17081 CAPTIVA DRIVE

## CROSS SECTION C

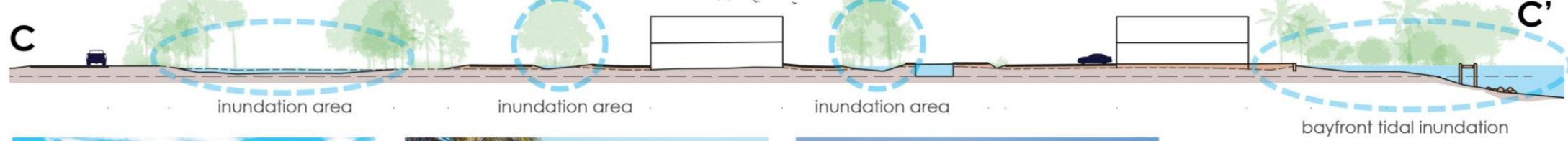
17081 CAPTIVA DRIVE



DRY CONDITION



WET CONDITION



proposed intervention:  
mangrove planting



proposed intervention:  
salt marsh / mangrove  
restoration



proposed intervention:  
vegetative buffer

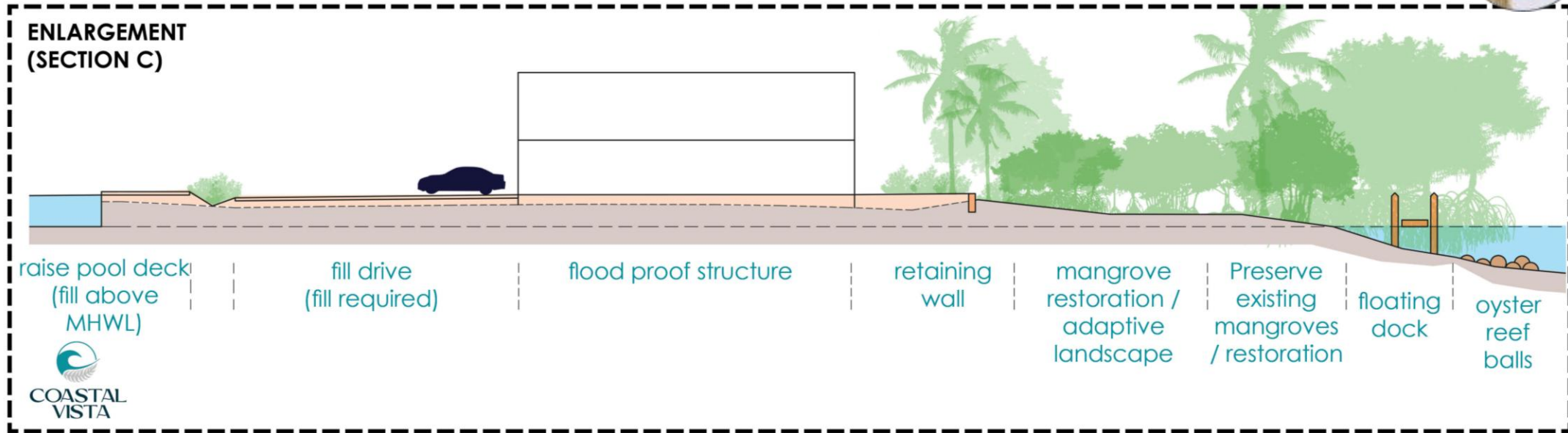


# SITE 2 17081 CAPTIVA DRIVE

17081 CAPTIVA



## CROSS SECTION C ENLARGED



proposed intervention:  
retaining wall



proposed intervention:  
raise driveway



proposed intervention:  
floating dock



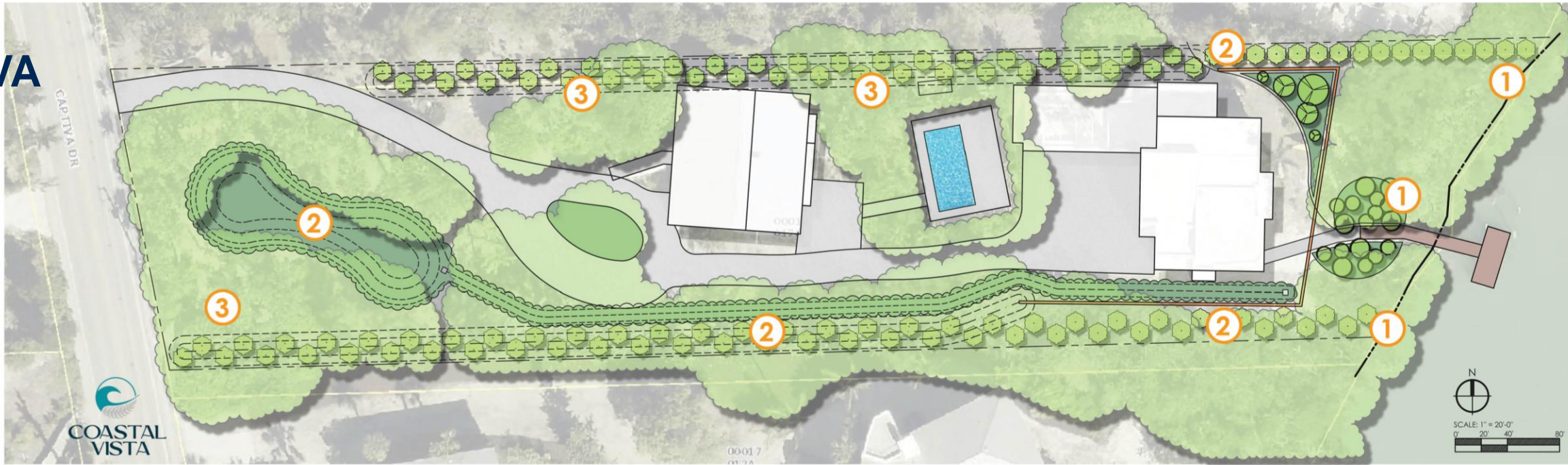
proposed intervention:  
Oyster reef balls





# SITE 2

## 17081 CAPTIVA DRIVE



### ① FREQUENTLY INDUNDATED:



Red mangrove



Green buttonwood



Spartina grass



Sea oxeye daisy

### ② OCCASIONALLY INDUNDATED:



Silver buttonwood



Jamaica caper



Saw palmetto



Muhly grass

### ③ RARELY INDUNDATED:



Gumbo limbo



Wild tamarind



Seagrape



Golden creeper



# SITE 3 CENTRAL CAPTIVA

## PLAN VIEW





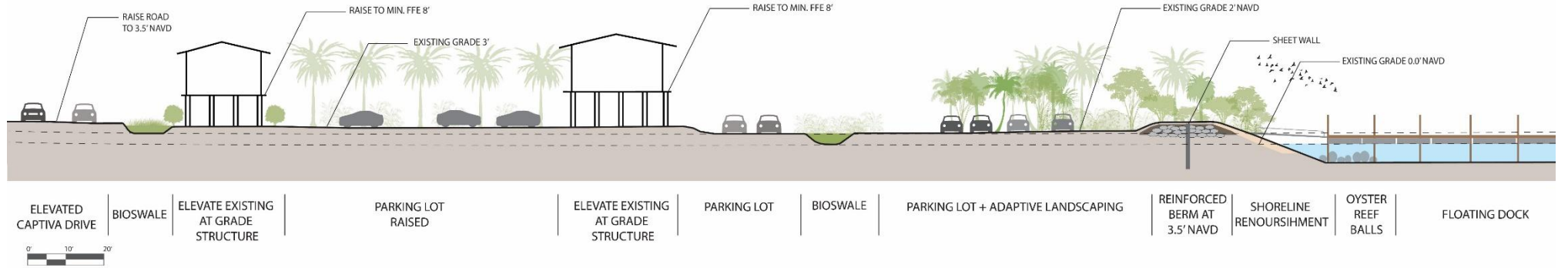
# SITE 3 CENTRAL CAPTIVA

## CROSS SECTION VIEW



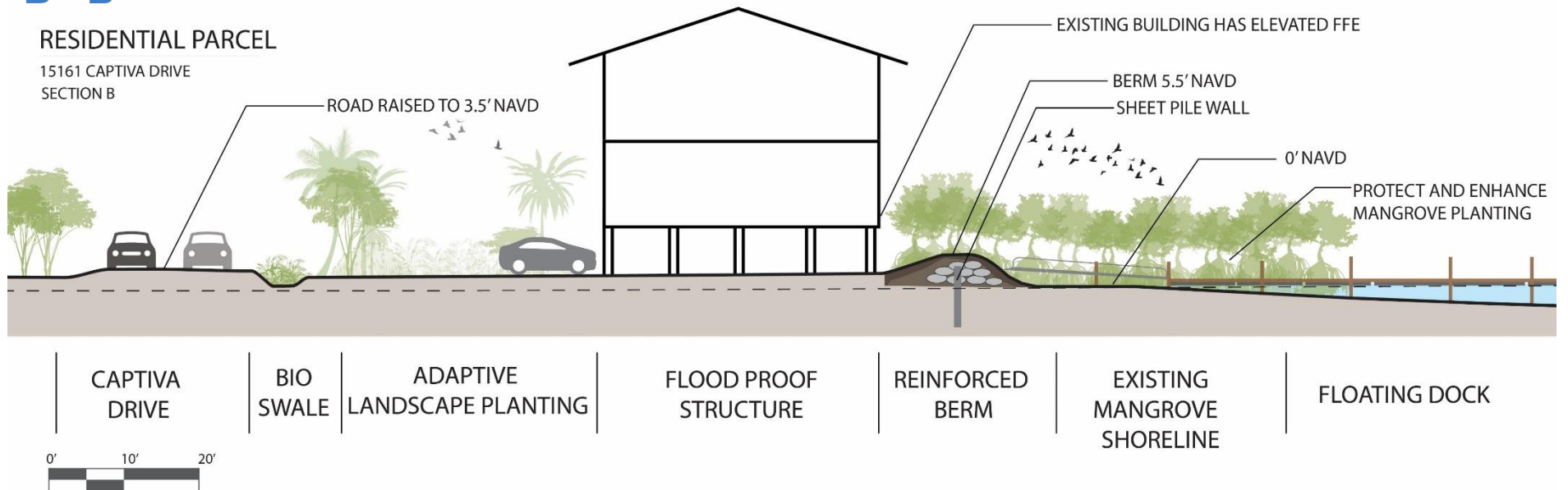
### A - A'

THE ANDY ROSE KAYAK LAUNCH  
11401 ANDY ROSSE LANE  
SECTION A



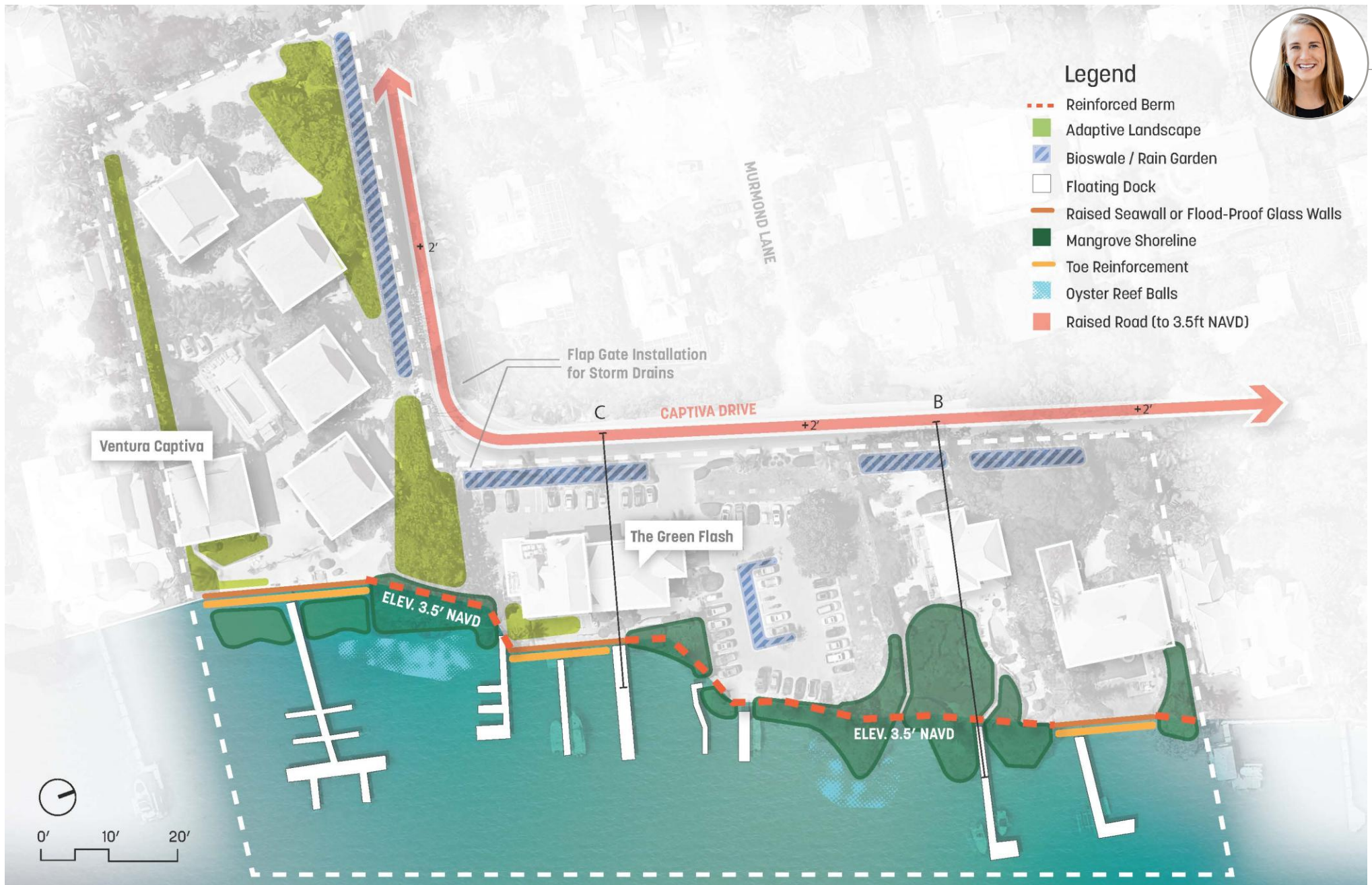
### B - B'

RESIDENTIAL PARCEL  
15161 CAPTIVA DRIVE  
SECTION B



# SITE 4 CENTRAL CAPTIVA HIGH PRIORITY PARCELS

## PLAN VIEW

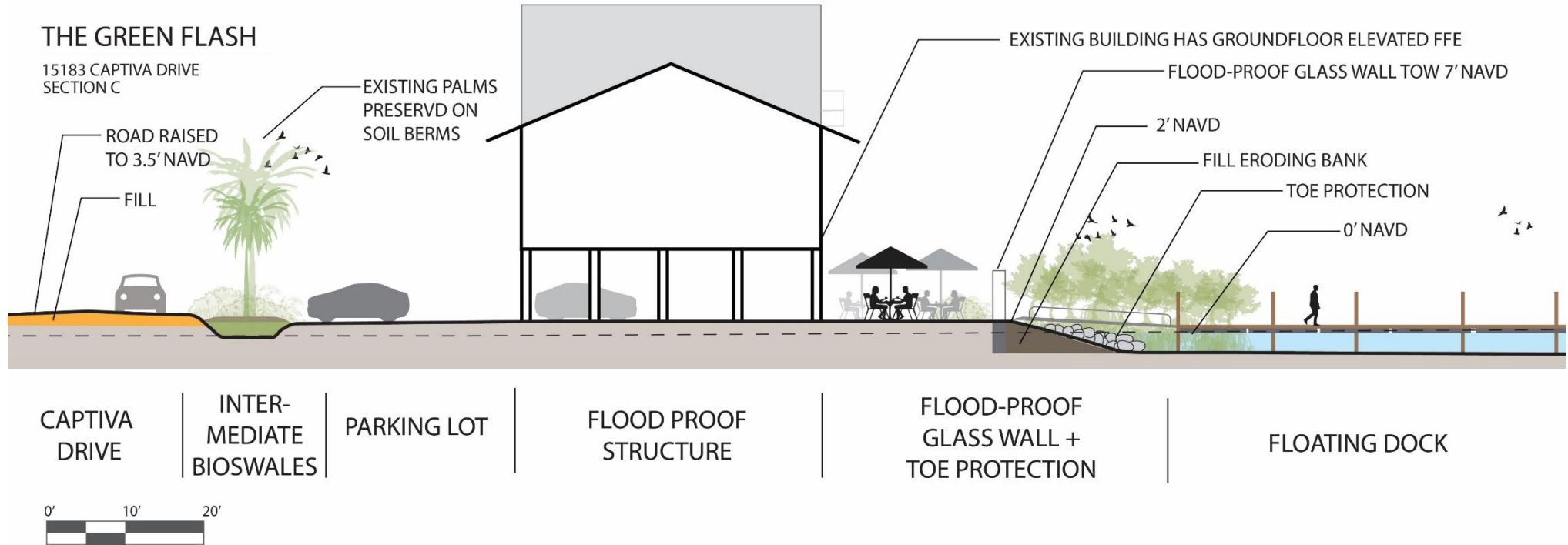


# SITE 4 CENTRAL CAPTIVA HIGH PRIORITY PARCELS



## CROSS SECTION VIEW

C - C'

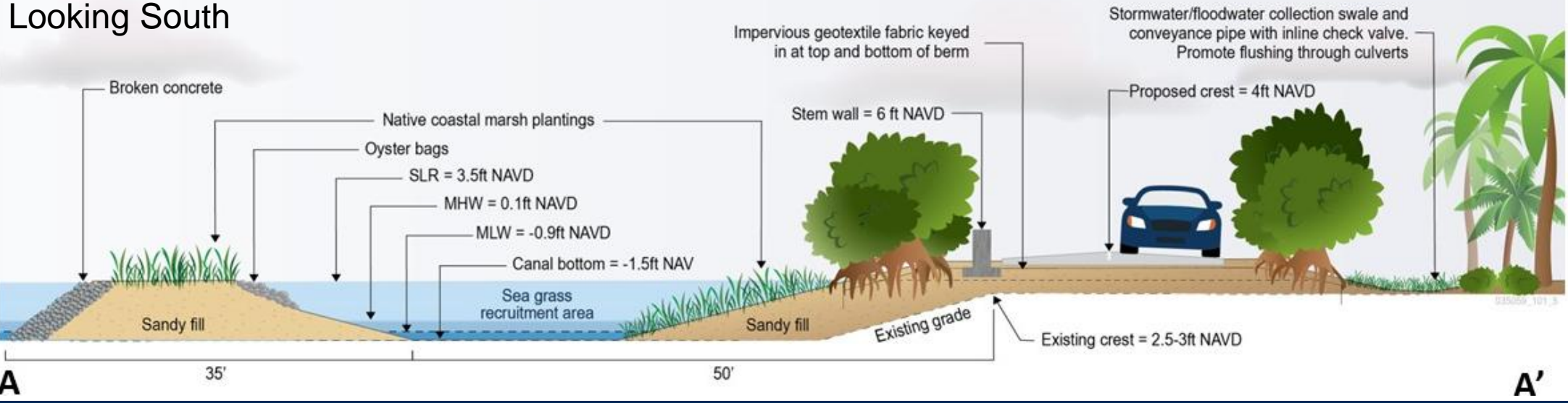




# SITE 5 SOUTH SEAS PLANTATION ROAD



Looking South



# DISCUSSIONS



# POTENTIAL LONG-TERM ADAPTATION STRATEGIES CAPTIVA IN THE FUTURE - 2100



# CASE STUDY SARASOTA BAYFRONT MASTER PLAN



BIOSWALES

ADAPTIVE  
VEGETATION

BEACH  
NOURISHMENT

FLOATING  
DOCKS

ELEVATED  
WALKS

RIPRAP EDGE



# IMPLEMENTATION & NEXT STEPS







# HOW DO WE BRING THIS VISION TO LIFE?

## County Coordination to Regulate Seawall Replacement and Living Shoreline Projects in Upland Areas

### Private Property Owner Adaptation

1. Share engineering concepts and adaptation plan with residents.
2. Track individual permits for shoreline adaptation and update plan.
3. Document flood trespassing onto roads.
4. Pursue grant funds for owners to incentivize adaptation if available.

### CEPD- led Adaptation

1. Collect easements from all property owners in project area.
2. Pursue grant funding for project concept.
3. Initiate design, permitting, and modeling of project.
4. Provide referendum for project funding.
5. Bid project construction once permit received.
6. Construct project.
7. Monitor and maintain project.
8. Adapt project as sea level rises.

**Individual strategies cost  
~\$25/ LF- \$1,600 LF,  
primarily on dry land**

**Joint project along Central  
Captiva ~\$ 5.5 million  
Collaboration would reduce  
permitting burden, support  
wider shoreline projects and  
offers uniform protection with  
potential grant funding.**



# PROVIDE COMMENTS VIA THE CAPTIVA ADAPTATION PROJECT DESIGN FEEDBACK SURVEY!



## Goals:

- ▶ Present project site designs for resident review.
- ▶ Collect input and comments on designs.
- ▶ Identify resident strategy and style preferences.
- ▶ Maximize island wide participation



SCAN QR CODE  
or visit  
<https://bit.ly/AdaPtCaptiva>

*Aerial Site View - Offers a bird's-eye perspective of the mapped project concepts*



Please provide feedback and comments on the cross-section view of the Green Flash design presented below.

Short answer text



# QUESTIONS

## **NICOLE SHARP, PE**

Coastal Market Lead  
[nicole.sharp@aptim.com](mailto:nicole.sharp@aptim.com)

## **SAMANTHA DANCHUK, PhD, PE**

Climate and Coastal Resilience Lead  
[samantha.danchuk@aptim.com](mailto:samantha.danchuk@aptim.com)

## **CIGDEM OZKAN, PhD, PE**

Resilience Engineer  
[Cigdem.Ozkan@aptim.com](mailto:Cigdem.Ozkan@aptim.com)

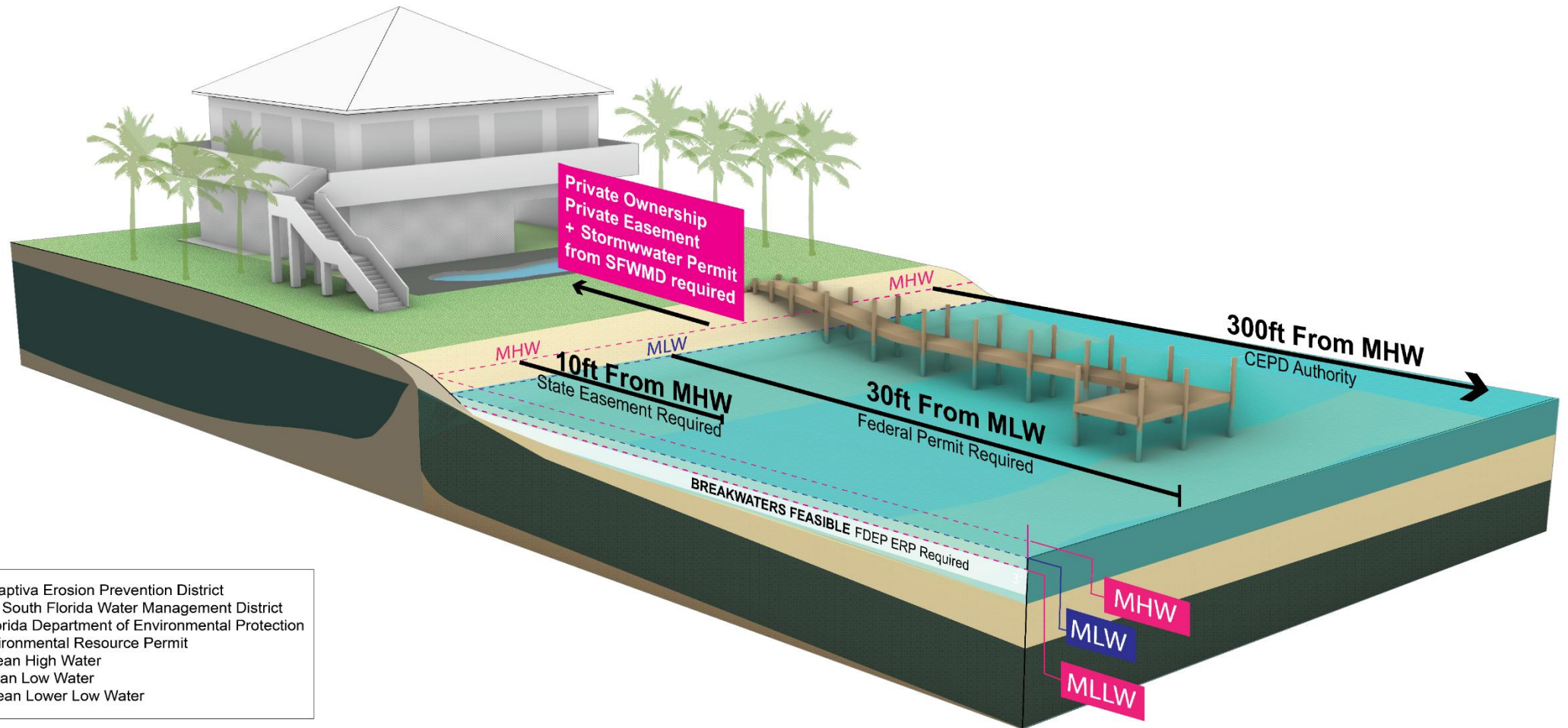
## **PAUL TRITAIK**

CEPD - Interim Executive Director  
[paul@tritaik.com](mailto:paul@tritaik.com)





**Expect the Extraordinary.**



CEPD = Captiva Erosion Prevention District  
 SFWMD = South Florida Water Management District  
 FDEP= Florida Department of Environmental Protection  
 ERP= Environmental Resource Permit  
 MHW = Mean High Water  
 MLW = Mean Low Water  
 MLLW= Mean Lower Low Water

