

Ventura County Resource Management Agency  
Planning Division



# VC RESILIENT COASTAL ADAPTATION PROJECT



Draft Vulnerability Assessment Public Workshop #2 – April 11, 2018

## WORKSHOP AGENDA



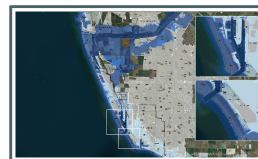
### PART 1: Vulnerability Assessment Presentation

- Science, results, next steps
- Questions/comments welcome, but time is very limited so please submit on the cards

Question card

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### Part 2: Workshop Stations



**Station #1:**  
Science, methods, and sector results

**Station #2:**  
Natural Resources Vulnerability Assessment

**Station #3**  
Adaptation strategies and community mapping exercise

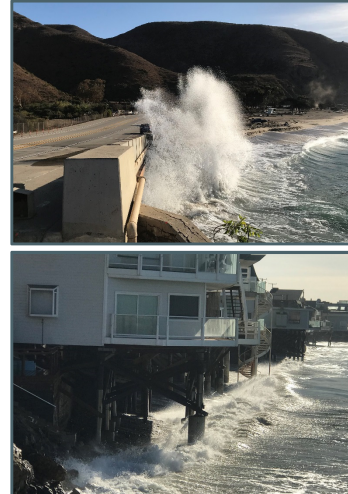


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# WHY PLAN FOR SEA LEVEL RISE NOW?



- Become sea level wise!
  - Preparation now may be less costly than waiting
  - The development “lifetime” of structures can exceed 75+ years
- Existing coastal hazards already pose a threat
  - Coastal erosion, high tides, and coastal storm events
  - Sea level rise adds increased wave heights
- Support long-term coastal resiliency
  - State mandate and guidance; grant funding



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# SEA LEVEL RISE PLANNING



**RECOMMENDED STEPS FOR SEA LEVEL RISE PLANNING**

# VC RESILIENT PROJECT SCOPE



## What VC Resilient covers:

- Comprehensive assessment of potential vulnerabilities
- Uses best available science and data
- Includes natural resources and economic analyses
- The goal is a prepared community and common sense public policy

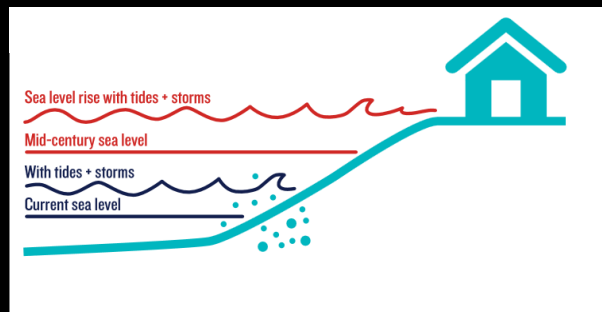
## What VC Resilient doesn't cover:

- Does not include cities, Channel Islands Harbor, or Navy base: *unincorporated County only*
- Not the General Plan Update
- Not the FEMA map update
- Not related to specific development projects



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# WHAT IS SEA LEVEL RISE

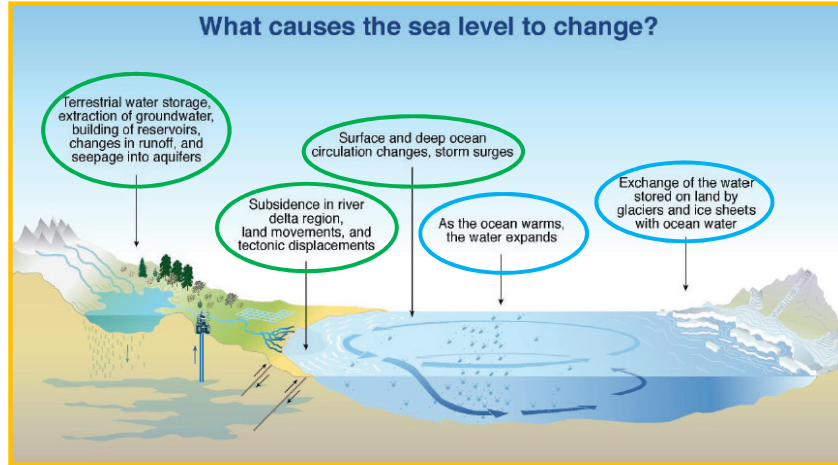


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# WHAT CAUSES SEA LEVEL RISE?



Local or Relative

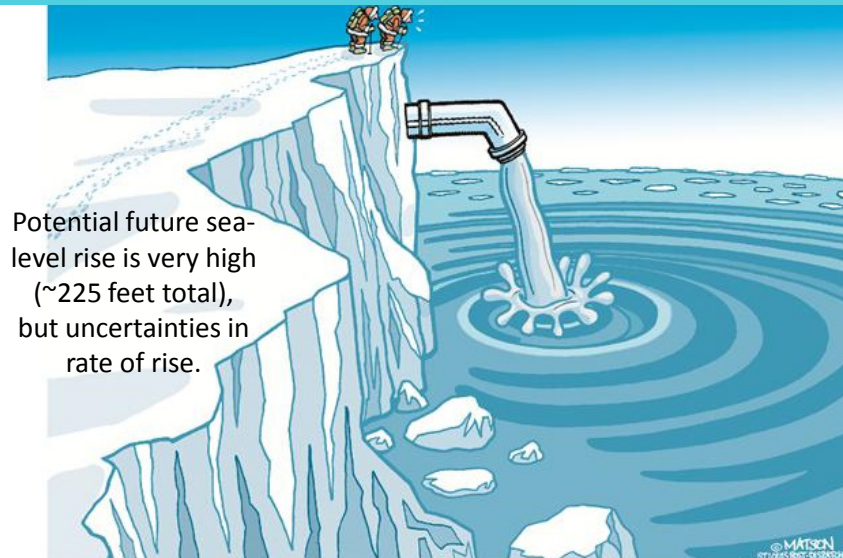


Global



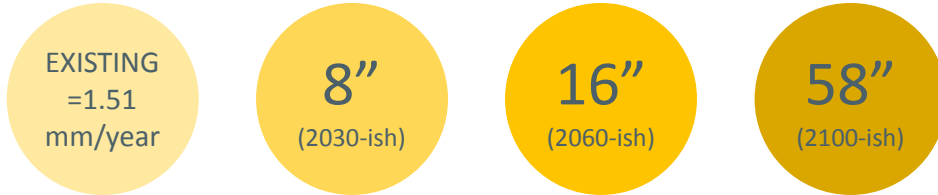
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# GLACIER MELT



"HOW ON EARTH DO WE TURN IT OFF?"

# 1. Choose Range of SLR Projections



Measured at Santa Monica tide gage

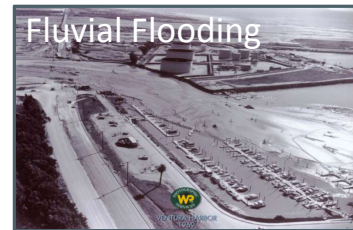
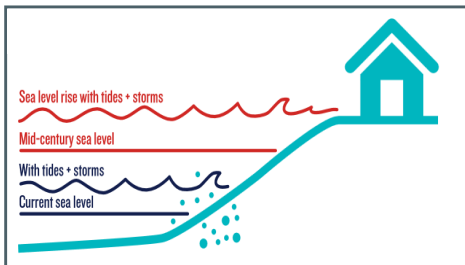
There is more certainty about how much SLR, than by when....

| Approximate Year | Sea Level Rise | Probability of Occurrence in the Approximate Year <sup>1</sup> |
|------------------|----------------|--|
| 2030             | 8 inches       | Approx. 1%   |
| 2060             | 16 inches      | 66%  |
| 2100             | 58 inches      | Between 2% and 3%  |



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# COASTAL HAZARDS



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# PAST EROSION CONTROL



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# SCIENCE AND METHODOLOGY



## North Coast



Wave flooding



Tidal inundation

## Central Coast



Wave flooding



Tidal inundation



Erosion



Fluvial flooding

## South Coast



Wave flooding



Tidal inundation



Erosion



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# STORY MAP

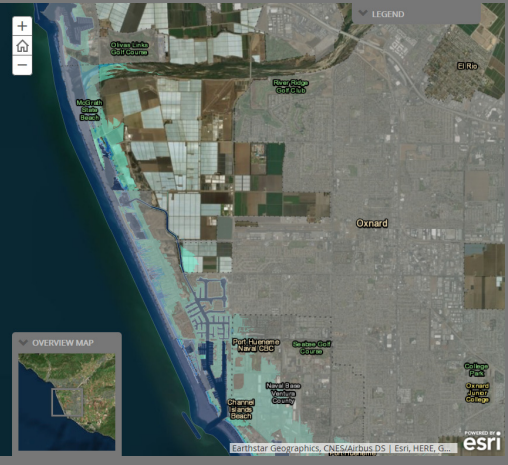


A story map  
 VC Resilient 3.0  
 No issues detected

### Central Coast Vulnerabilities

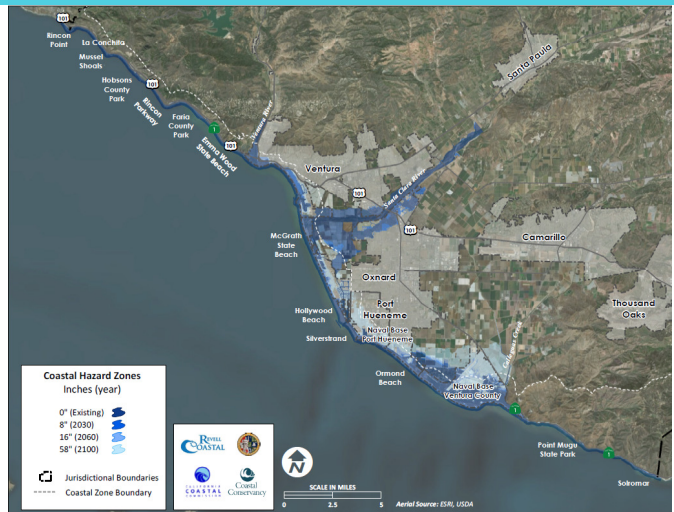
The Central Coast is located in the Oxnard Plain and has a more even topography than the North and South Coasts. Sea level rise impacts will be more incremental here with more areas being at risk of flooding at each scenario. Even so, much of the County's resources are located close to the ocean and are already at risk of flooding during a large coastal storm.

Much of Hollywood Beach and Silverstrand are at risk of flooding during coastal storms even without sea level rise. Due to the low elevation of the storm drains, Hollywood Beach flooding during the March 2018 rain event. With 8 inches of sea level rise, Victoria Avenue becomes at risk of flooding, potentially causing an evacuation choke point during flood hazards.



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# COASTAL HAZARDS - COMBINED



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## Key Findings



- Countywide, residential development, coastal recreation, and transportation and infrastructure corridors are vulnerable to large storm flooding and erosion today. These vulnerabilities will increase in frequency and duration over time.
  - \$1.7 billion in property with 58" of sea level rise, \$981 million with 8"
  - Coastal beach recreation generates \$156 million annually and could be at risk depending on future adaptation choices
- Point Mugu State Park, County Parks, Hollywood Beach Elementary, Channel Islands Community Service District are susceptible to major storm flooding and erosion and will be increasingly vulnerable with sea level rise.



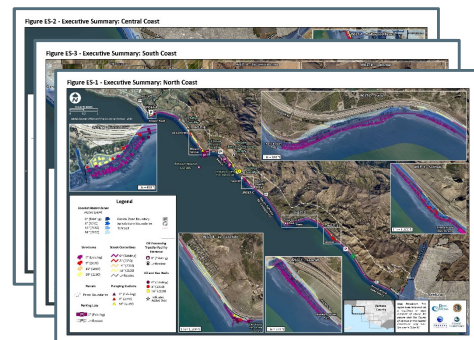
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## IDENTIFY POTENTIAL IMPACTS



### Vulnerability Assessment Outline:

- Chapter 1 – Planning Background
- Chapter 2 – Existing Conditions and Physical Settings
- Chapter 3 – Sea Level Rise Science
- Chapter 4 – Vulnerability Methodology
- Chapter 5 – Sector Vulnerabilities
- Chapter 6 – Adaptation
- Appendix A – Sector Profile Results
- Appendix B – Vulnerability table
- Appendix C – Social Vulnerability
- Appendix D – Natural Resources Vulnerability



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# RESOURCE SECTORS



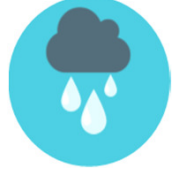
Land Use



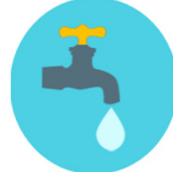
Agriculture



Wastewater



Storm Water



Water Supply



Public Access



Roads and Parking



Public Transit



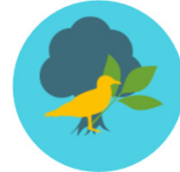
Oil and Gas



Hazardous Materials



Critical Services



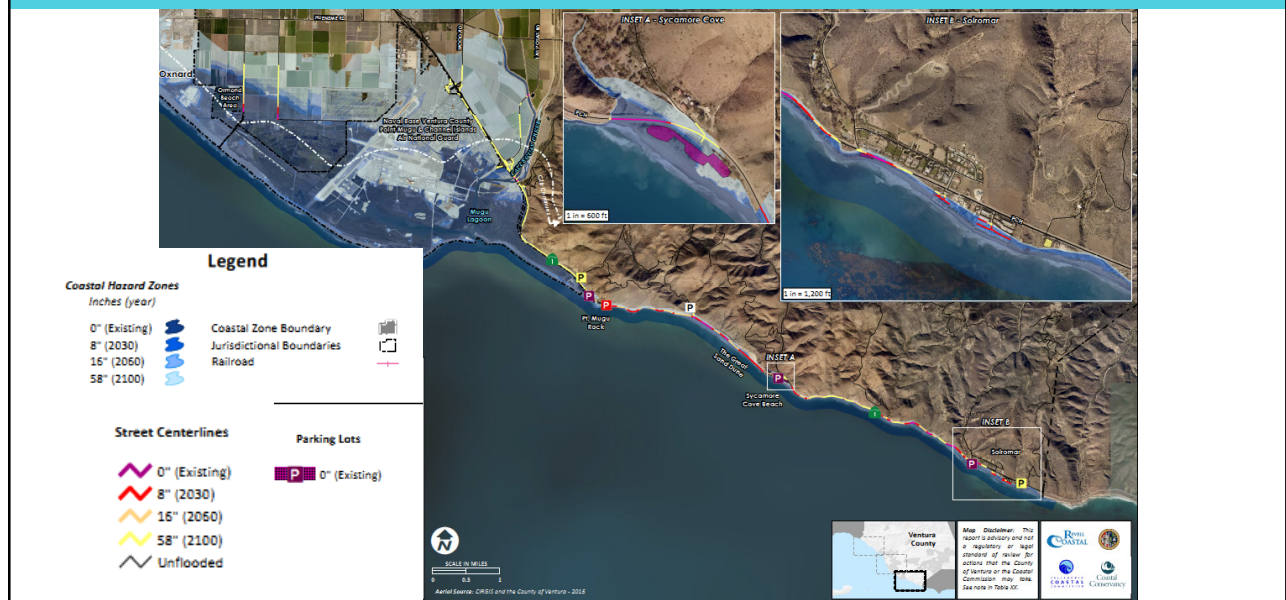
Natural Resources



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# ROADS (SOUTH COAST)





# ROADS



Countywide, roads are susceptible to major storms and could be increasingly eroded and inundated with sea level rise

- 19 miles vulnerable to large storm today
- 45 miles may be impacted by large storm with 58" of sea level rise
- 14 miles may close due to erosion with 58" of sea level rise

Parking lots and access may be lost

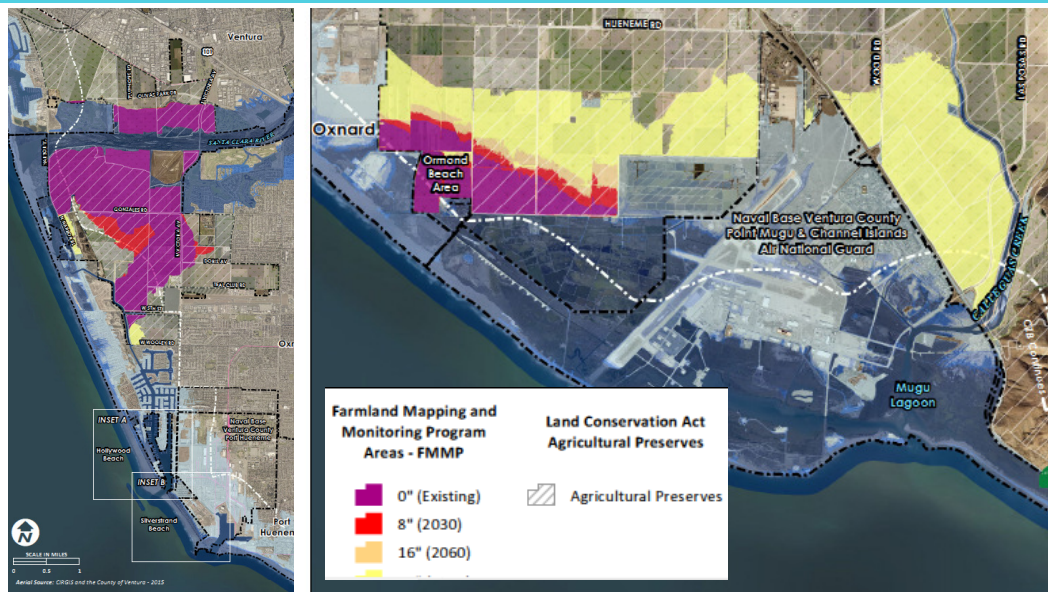
- 8 miles of coastal access may be restricted due to tidal inundation with 58" of sea level rise, particularly on Central Coast
- Erosion damages could increase by \$4.5 million between now and 2030.
- Santa Clara River Bridge may be affected today, Calleguas Creek Bridge may be affected by 2100.



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# AGRICULTURE





## AGRICULTURE



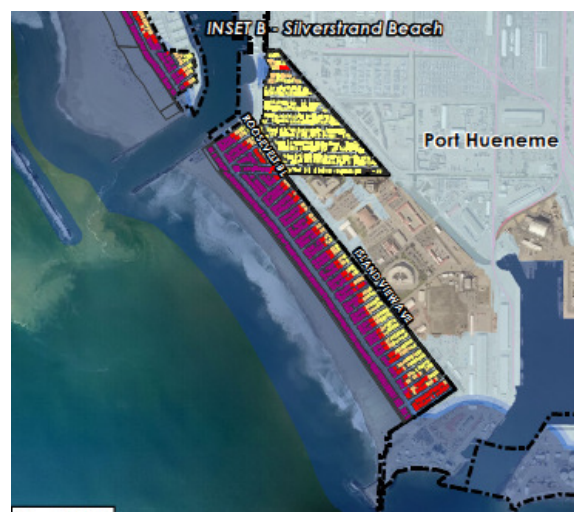
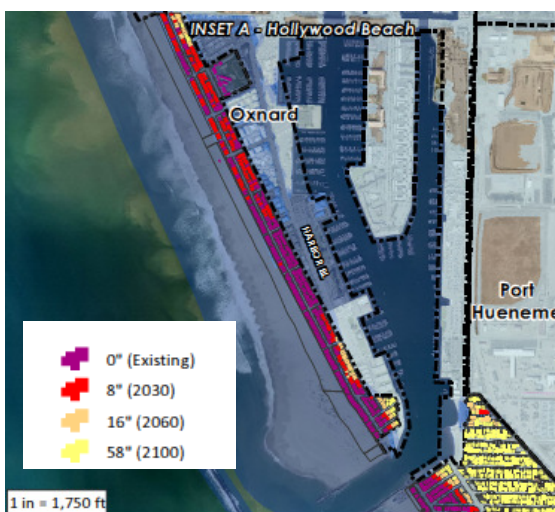
- Coastal storm flooding may disrupt operations
  - Coastal storm today could impact 445 acres ,
  - 58" of sea level rise could impact 1,900 acres
- Rising tides could remove land from production
  - 8" of sea level rise could impact production on 270 acres
  - 58" of sea level rise could impact production on 1,260 acres
- Most potentially impacted areas are along Santa Clara River (storm flooding), and areas inland of Ormond Beach/Calleguas Creek (storm and tidal flooding )



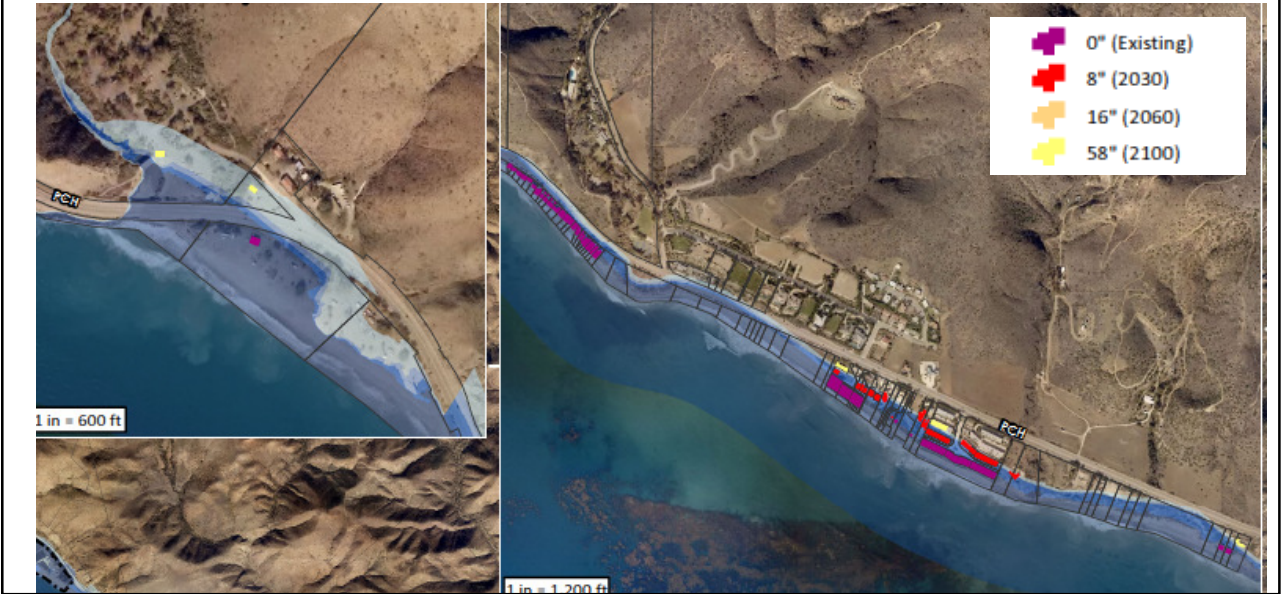
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## STRUCTURES (CENTRAL COAST)

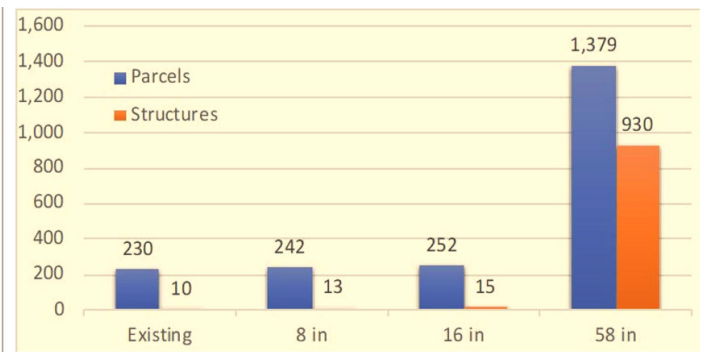


# STRUCTURES (SOUTH COAST)



# STRUCTURES

- About 95% of impacts that may occur are to residential structures
- Tidal inundation vulnerability escalates with 58"/Sea Level Rise



Currently, 230 oceanfront parcels are at risk. Between 16" and ~5 feet impacts escalate by 904 residential structures



# STRUCTURES



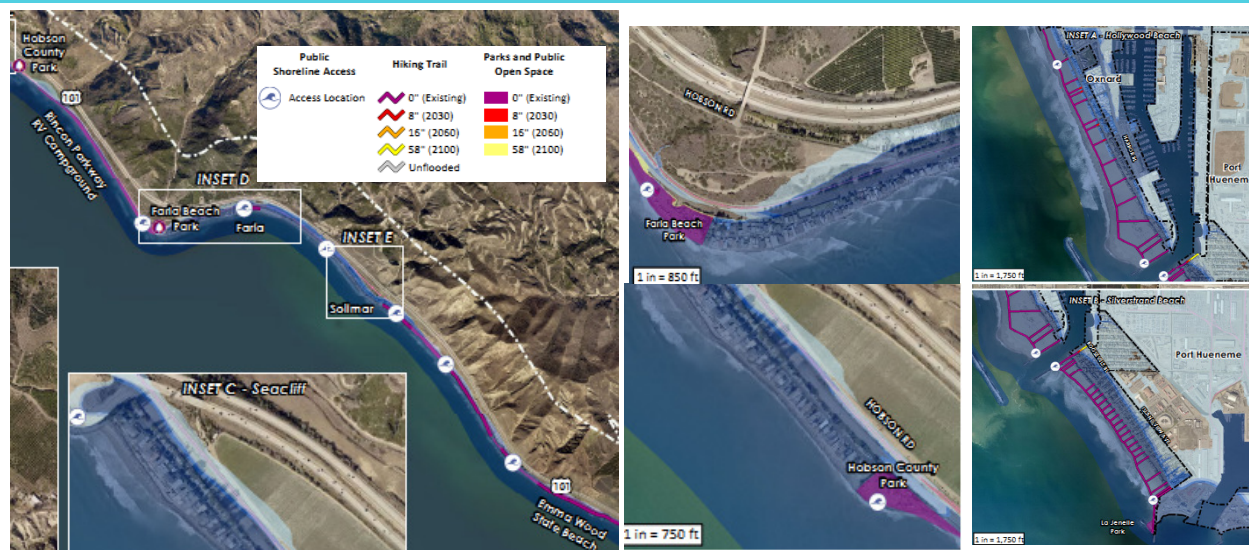
- Future effects of erosion and tidal inundation
  - North Coast with 58" of sea level rise: \$138 million of property at risk, \$70 million from tides.
  - Central Coast with 8" of sea level rise: \$981 million of property at risk, mostly due to erosion w/major storm, increases to \$1.5 billion with 58" Sea Level Rise
  - South Coast with 8" of sea level rise: \$208 million of property at risk, mostly due to cliff erosion



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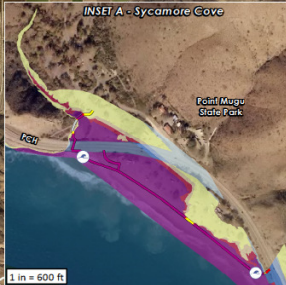


# PARKS AND RECREATION

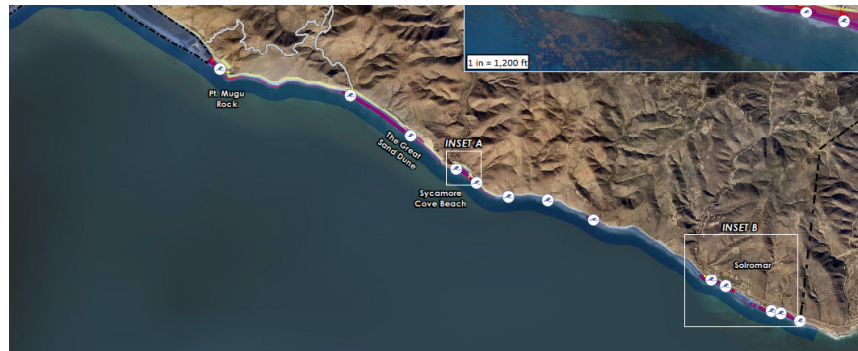




## PARKS AND RECREATION



Winter damage to Thornhill-Broom Campsite in Point Mugu State Park



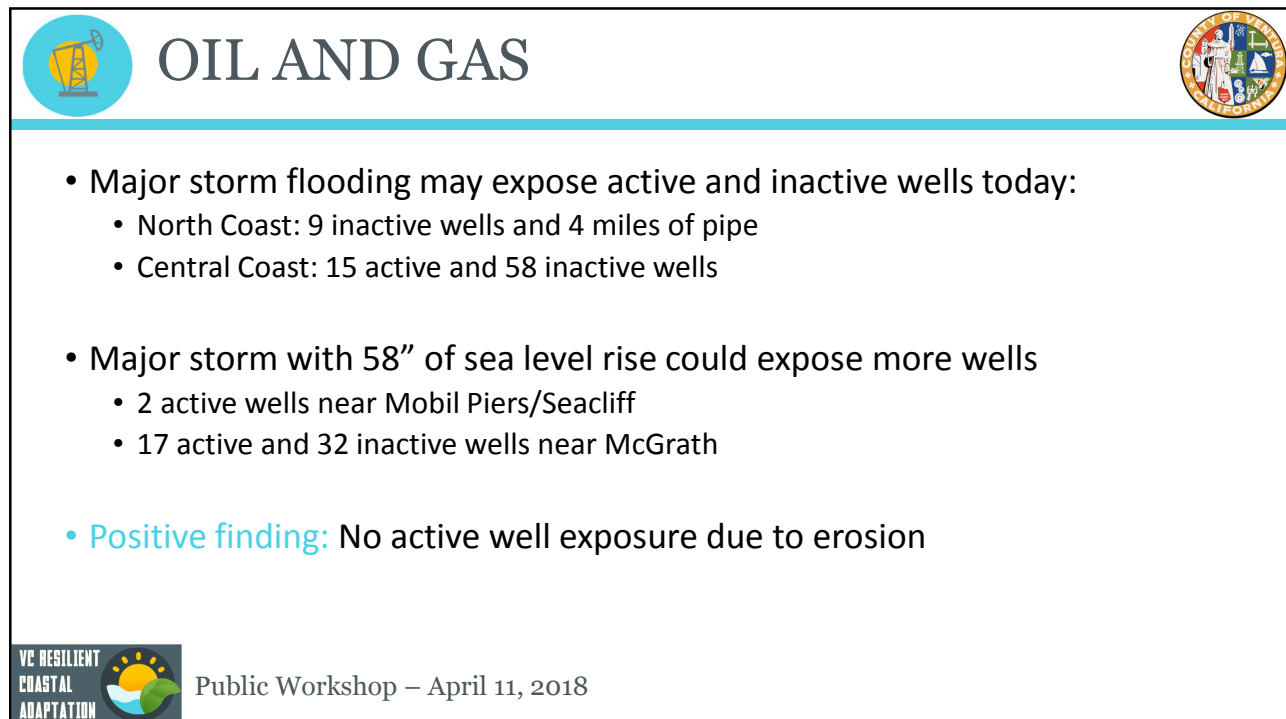
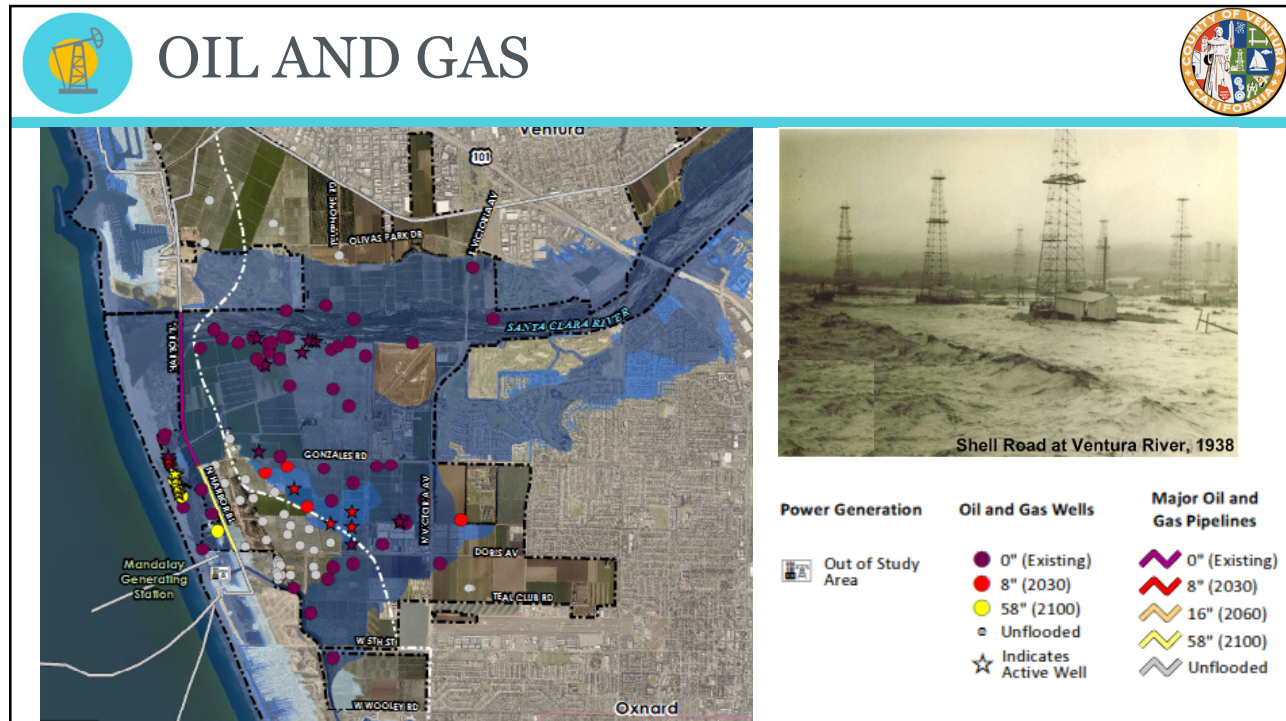
## PARKS AND RECREATION

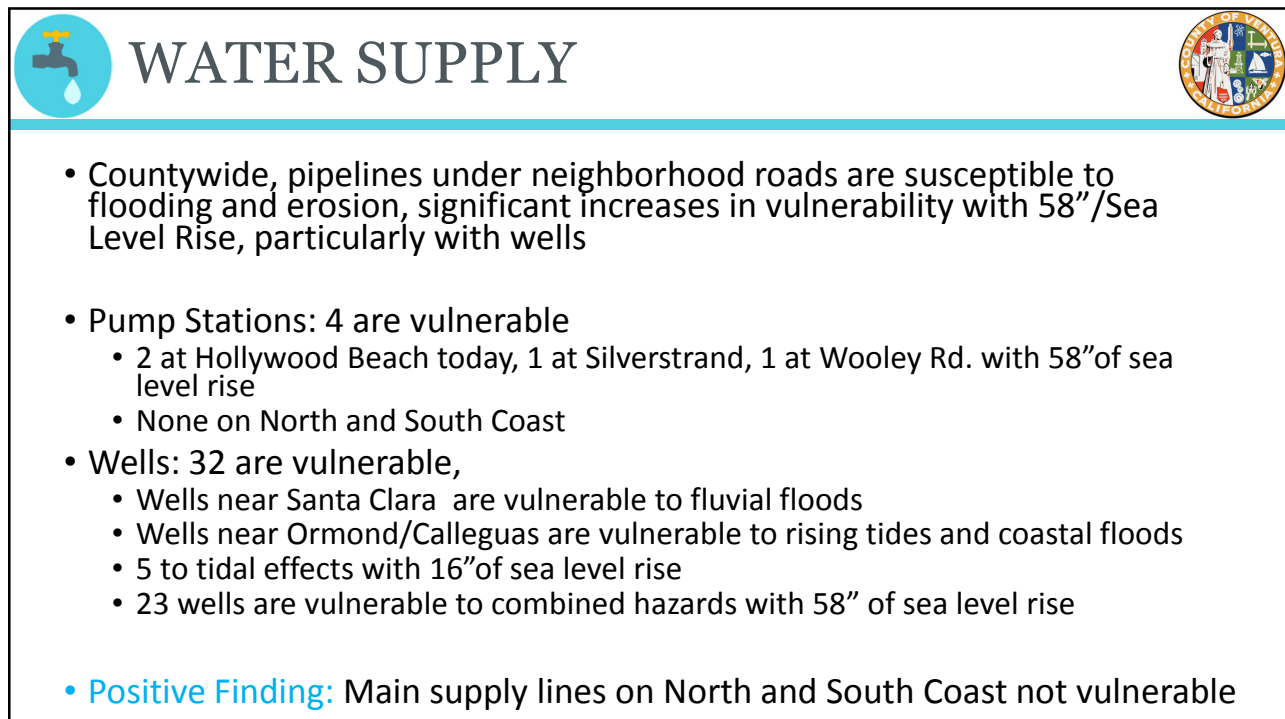
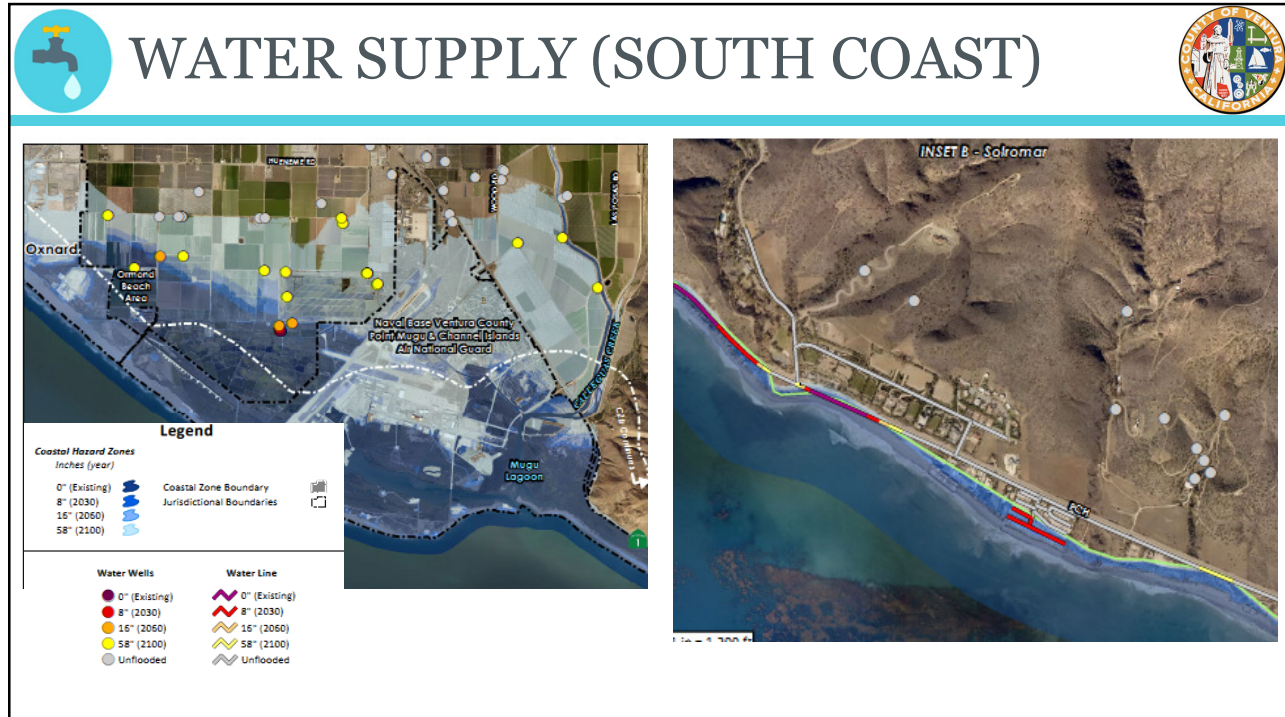


- Nuisance flooding today could be exacerbated by a major storm
  - Central Coast: Wide beaches could be eroded during major storms, McGrath campground flooding may continue
  - South Coast: Approximately 50% of Sycamore Cove and all of Thornhill-Broome Beach flooded/eroded
- Potential future effects of erosion and tidal inundation
  - South Coast with 58" of sea level rise: Impacts could extend inland of PCH in most areas
  - South Coast with 8" of sea level rise: Bluff erosion potential when located seaward of PCH



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## CRITICAL FACILITIES



- Coastal evacuation routes (PCH, Hwy 101, Harbor Blvd), currently exposed to flooding
- Central Coast: Hollywood Beach Elementary is vulnerable to coastal flooding
- **Positive Finding:** no fire, medical, or sheriff stations are currently exposed. Fire Station #56 is not vulnerable with up to 58" of sea level rise



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## NATURAL RESOURCES – HABITATS



### Erosion (Habitat Loss)

- Critical habitat for the Western snowy plover is **currently** at risk and may be completely eroded with 8" Sea Level Rise
- Half of all sand dune habitat is currently vulnerable (7.5 acres), rising to 15 acres with 58" of sea level rise
- 24% of existing estuarine habitats may be eroded with 58" of sea level rise
- Existing freshwater habitats are at low risk

Beach erosion at surfers point in the City of Ventura.



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## NATURAL RESOURCES – HABITATS



### Tidal Inundation

(Consistent Flooding of Habitats)

- Coastal beaches, dunes, and marshes and all federally designated critical habitats vulnerable to tidal inundation and coastal flooding
- Over 90% of estuarine habitats vulnerable to tidal inundation.

Tidal storm surge at Pierpont beach in the City of Ventura.



NOTE: Percentages represent percent change in acreage of existing habitat within the unincorporated County. For countywide estimates see Appendix D.



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## NATURAL RESOURCES – HABITATS



### Fluvial/Storm/Combination

(Intermittent Flooding of Habitats)

- Monarch overwintering sites at Rincon Pt. and Sycamore Canyon are vulnerable to flooding with 58" of sea level rise
- Existing freshwater habitats located in the unincorporated County (86%) may experience intermittent flooding with 58" of sea level rise
- All USFWS species habitats vulnerable to coastal storm flooding (41-88%).

Coastal storm flooding at the Santa Clara River.



NOTE: Percentages represent percent change in acreage of existing habitat within the unincorporated County. For countywide estimates see Appendix D.



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# NATURAL RESOURCES – FOCAL SPECIES



- Beach and dune ecosystems have the most vulnerable species (6 out of the top 10), followed by estuarine environments (3 of the remaining four).



**Beach Species:**  
Top Left -Western Snowy Plover (#8); Top Right -California Grunion (#10)



**Dune Species:**  
Middle Left - Sand verbena (#7) with globose beetle tracks (#2); Middle center - Red Sand verbena (#6); Right Center - Beach evening primrose (#1)

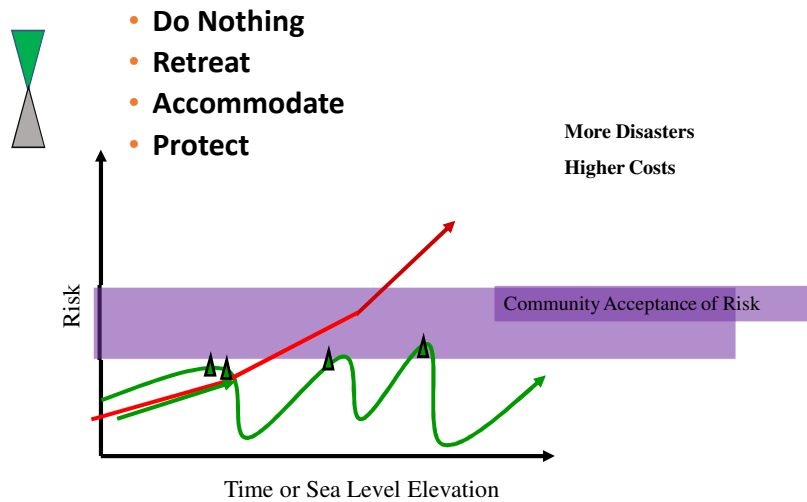


**Estuarine Species:**  
Immediate right - Belding's Savannah Sparrow (#3); Lower right - Tidewater goby (#4); Lower center - Alkali Heath (#9)

**Freshwater Species:**  
Below -Southwestern Pond Turtle (#5)



# ADAPTATION



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# ADAPTATION



Do Nothing

Accommodate



Hybrid



Protect

Inland Relocation



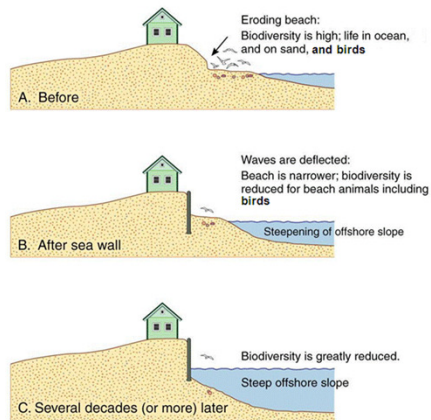
# ADAPTATION - TRADEOFFS



- Construction Costs
- Escalating Maintenance Costs
- Ecology
- Recreation
- Views
- Aesthetics

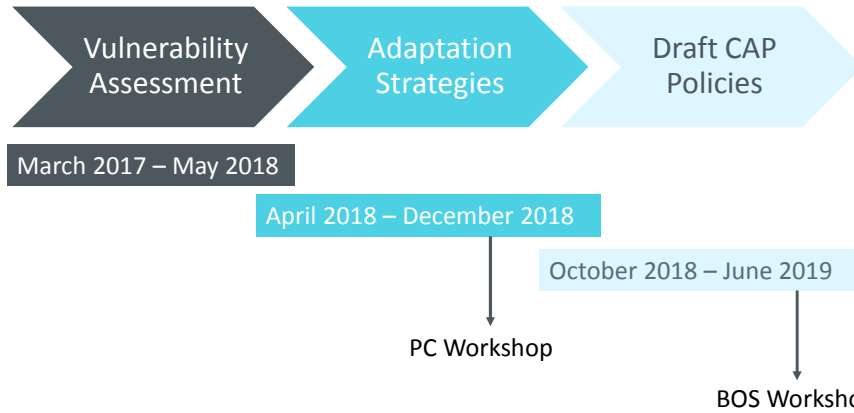


Seawalls destroy beaches and views



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# NEXT STEPS



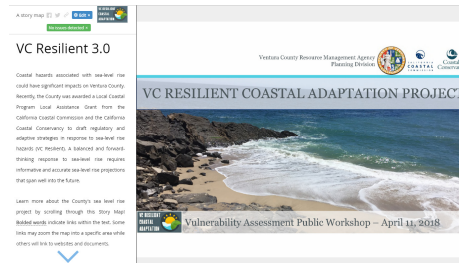
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# PARTICIPATE!



- VC Resilient Public Process**
- Sign up for our project notification list
  - Draft Vulnerability Assessment 30-day comment period (May)
  - Planning Commission hearing, Fall 2018
  - Board hearing, Summer 2019

## VC Resilient Story Map



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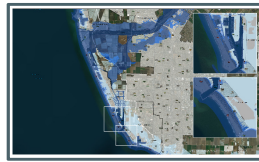
# Part 2: Workshop Stations



**Station #1:**  
Science, methods, and sector results



**Station #2:**  
Natural Resources Vulnerability Assessment



**Station #3**  
Adaptation strategies and community mapping exercise



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## THANK YOU!

Tricia Maier, Long-Range Planning Manager  
Aaron Engstrom, Senior Planner  
Abigail Convery, Planning Biologist  
Angela Kim, CivicSpark Climate Fellow

Dave Revell PhD, Revell Coastal

<https://www.vcrma.org/sea-level-rise-adaptation>



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