



It is time to proactively plan our community's vision for a climate resilient future coastline



PROGRESS TOWARD ADAPTATION PATHWAYS

DECEMBER 12, 2019
ARCCA DECEMBER MEETING

A COMMUNITY IN NEED OF A COASTAL VISION

We must address...

- COASTAL ACCESS
- TOURISM + RECREATION
- TRANSPORTATION
- ECOSYSTEMS
- COASTAL INFRASTRUCTURE + POLICY
- SENSE OF PLACE + CULTURAL IDENTITY
- EQUITY

...and create...

- AN INCLUSIVE CONVERSATION
- A COMMUNITY VISION
- A LONG TERM SOLUTION
- A RESILIENT + EQUITABLE COASTLINE

RESILIENT COAST: TWO PROJECTS, ONE GOAL



BUILDING RESILIENCE
TO SEA LEVEL RISE

www.cityofsantacruz.com/ResilientCoast

**West Cliff Drive Adaptation
and Management Plan**

\$343,000 CalTrans funding; \$44k match

**Development of LCP Sea Level
Rise Strategies & Policies to
Support Beach and Public
Access Protection**

\$200,000 Coastal Commission funding; \$82k match

**CITY OF SANTA CRUZ COASTAL HAZARD ANALYSIS
 COMBINED COASTAL CLIMATE CHANGE HAZARD ZONES**
 (includes areas determined to be protected from or managed for flooding)



Boundaries

- SC City Limit
- Coastal Zone Boundary

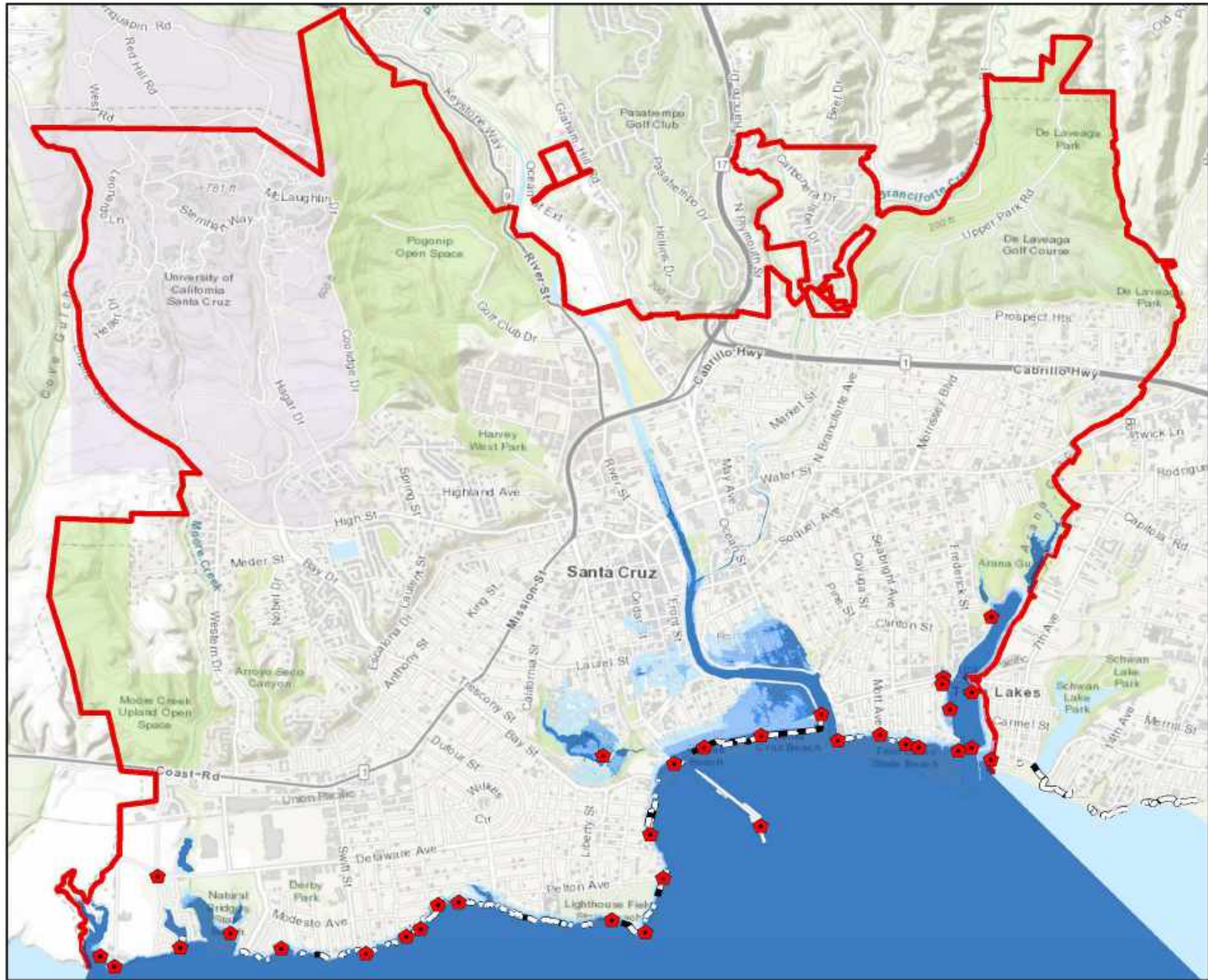
Combined Hazard Zones

- 2010 (Existing)
- 2030 (.3 ft SLR & s2)
- 2060 (2.4 ft SLR & s3)
- 2100 (5.2 ft SLR & s3)

Critical Facilities

- 1 City Hall
- 2 County Government Center
- 3 Lifeguard Headquarters
- 4 PG&E Substation
- 5 Police Department
- 6 Santa Cruz City Fire 1
- 7 Santa Cruz City Fire 2
- 8 Santa Cruz City Fire 3
- 9 Wastewater Plant
- 10 Water Treatment

COASTAL PUBLIC ACCESS IMPACTS

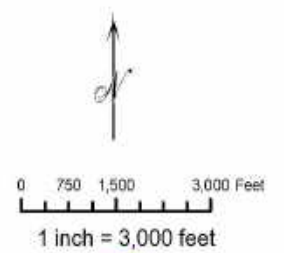


Boundaries

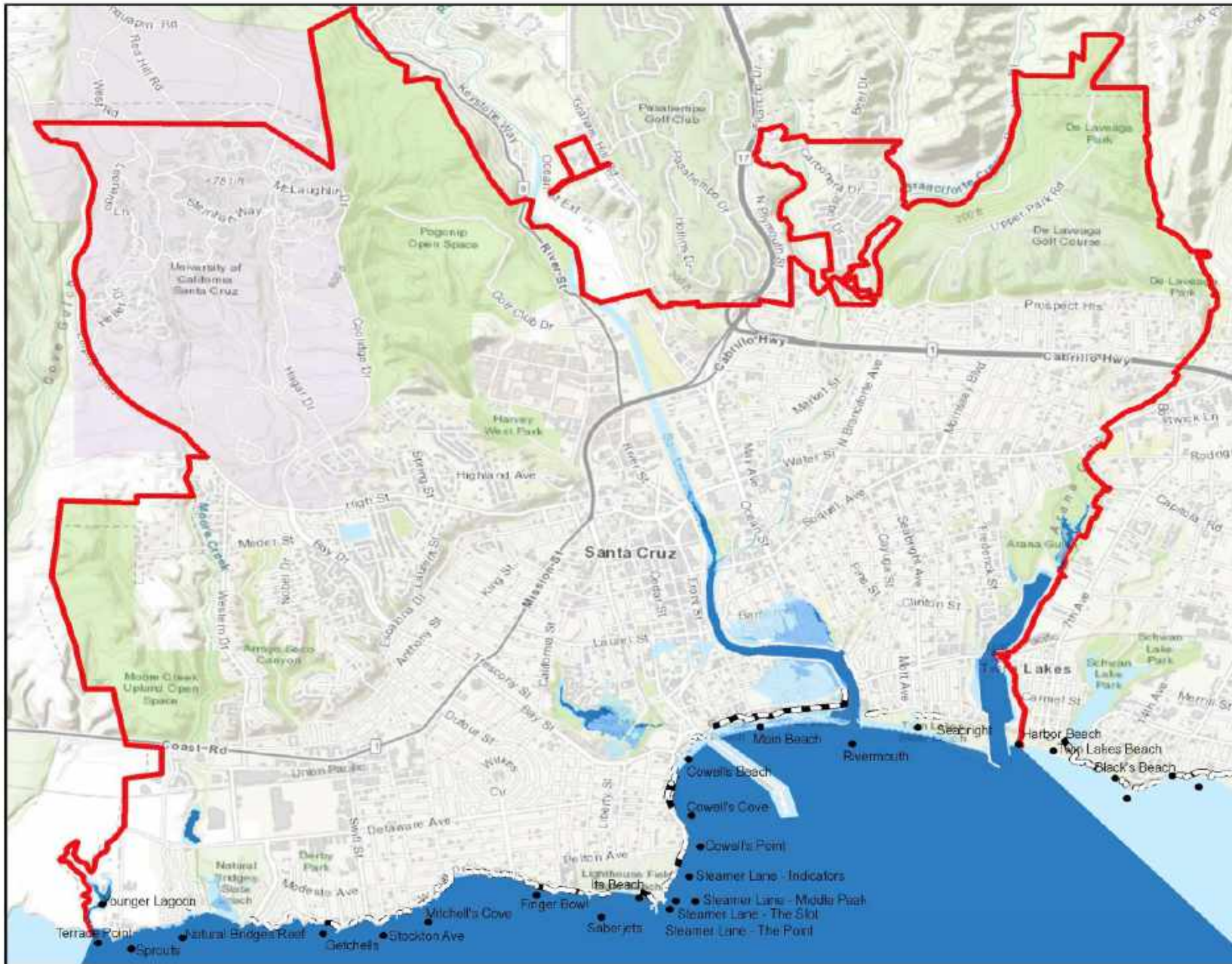
-  Coastal Access
-  Coastal Armoring
-  City Limit

Combined Hazard Zones

-  Existing
-  2030 (.3 ft SLR)
-  2060 (2.4 ft SLR)
-  2100 (5.2 ft SLR)



COASTAL VISITORSHIP & SURF BREAK IMPACTS

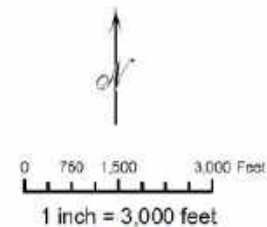


Boundaries

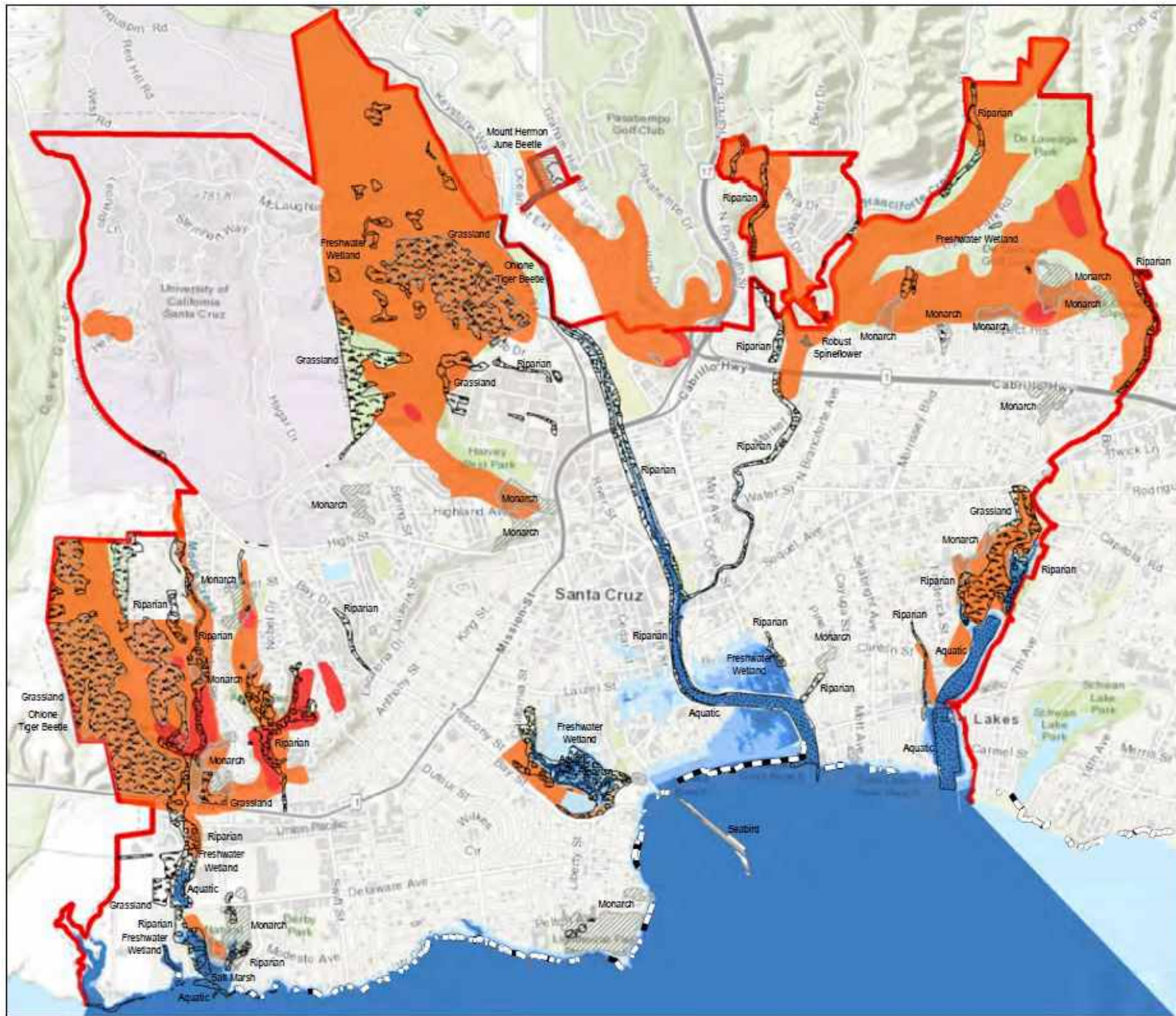
- Beach/Surf Spots
- ▬ Coastal Armoring
- City Limit

Rising Tides

- Existing
- 2030 (.3 ft SLR)
- 2060 (2.4 ft SLR)
- 2100 (5.2 ft SLR)



VULNERABLE HABITAT



Boundaries

- Coastal Armoring
- City Limit
- Aquatic
- Freshwater Wetland
- Grassland
- Riparian
- Salt Marsh
- Monarch
- Mt Hermon June Beetle
- Ohlone Tiger Beetle
- Seabird
- Robust Spineflower

Combined Hazard Zones

- Existing
- 2030 (.3 ft SLR)
- 2060 (2.4 ft SLR)
- 2100 (5.2 ft SLR)

Fire Hazard

- Extreme
- High

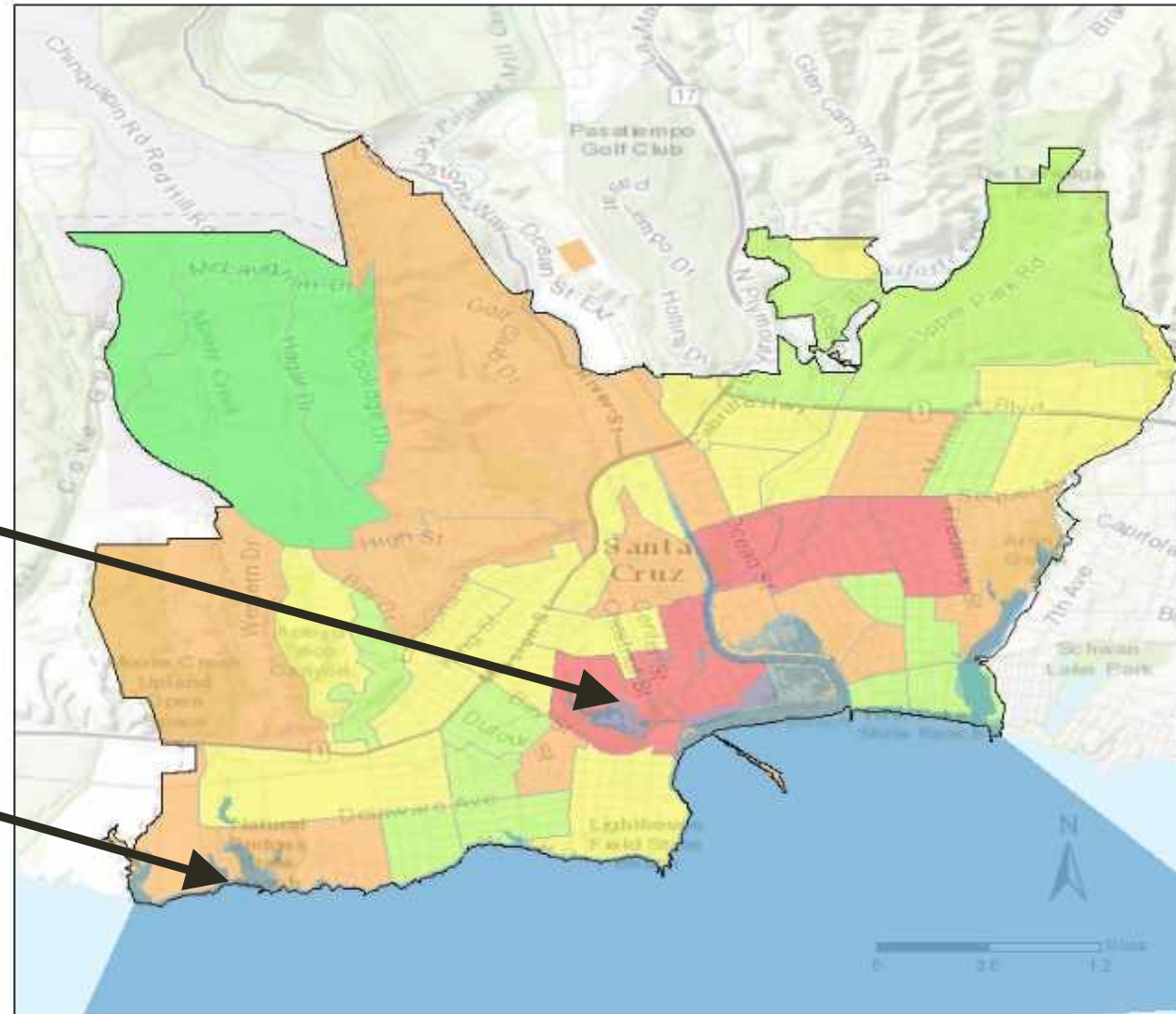


0 750 1,500 3,000 Feet

1 inch = 3,000 feet



SOCIAL VULNERABILITY TO CLIMATE CHANGE ASSESSMENT

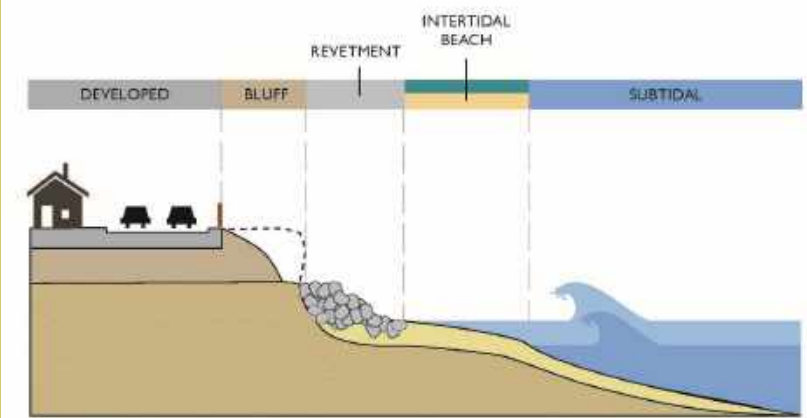
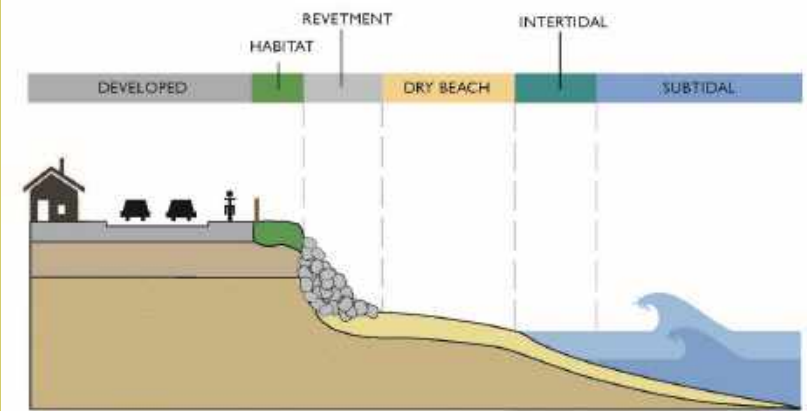


- Santa Cruz City Boundaries
- 2030 (.3 ft SLR & s2)
- 2060 (2.4 ft SLR & s3)
- Vulnerability Scores**
- High
- Medium High
- Medium
- Medium Low
- Low

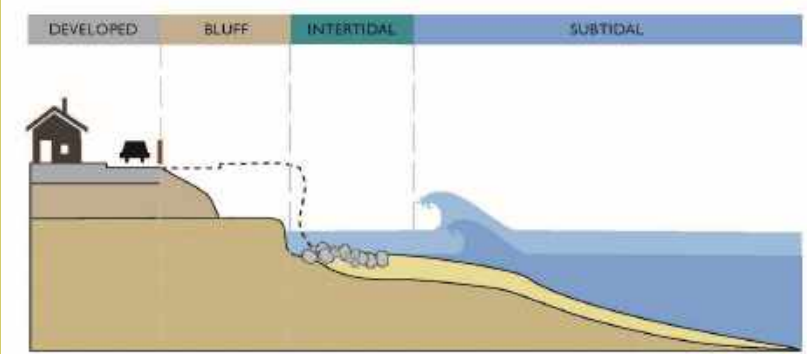
High Social Vulnerability to Coastal Climate Hazards driven by incidence of non english speakers & low incomes

Medium-High Social Vulnerability to Coastal Climate Hazards primarily driven by incidence of elderly folks

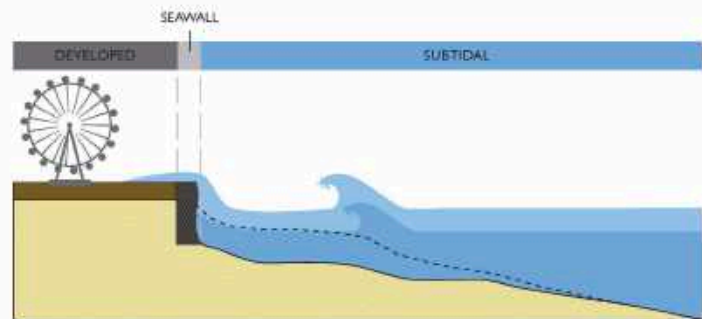
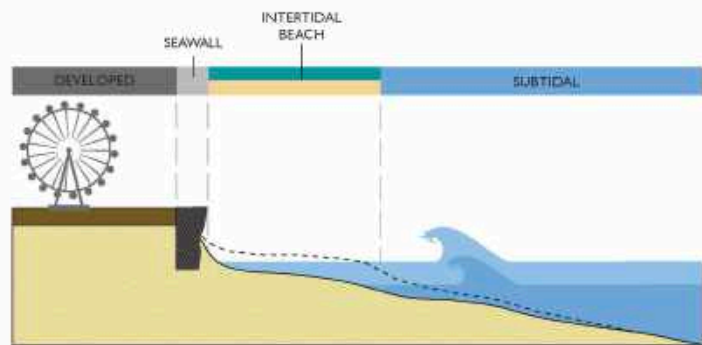
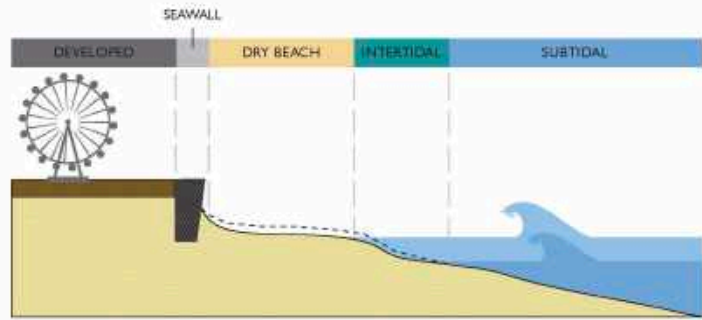
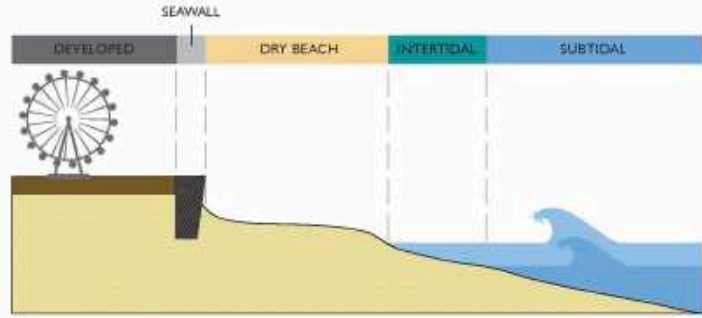
WHAT COULD HAPPEN TO WEST CLIFF DRIVE IF WE TOOK NO ACTION TO DEAL WITH SEA LEVEL RISE?



no habitat, no bike path, intertidal only beach, surf only low tide

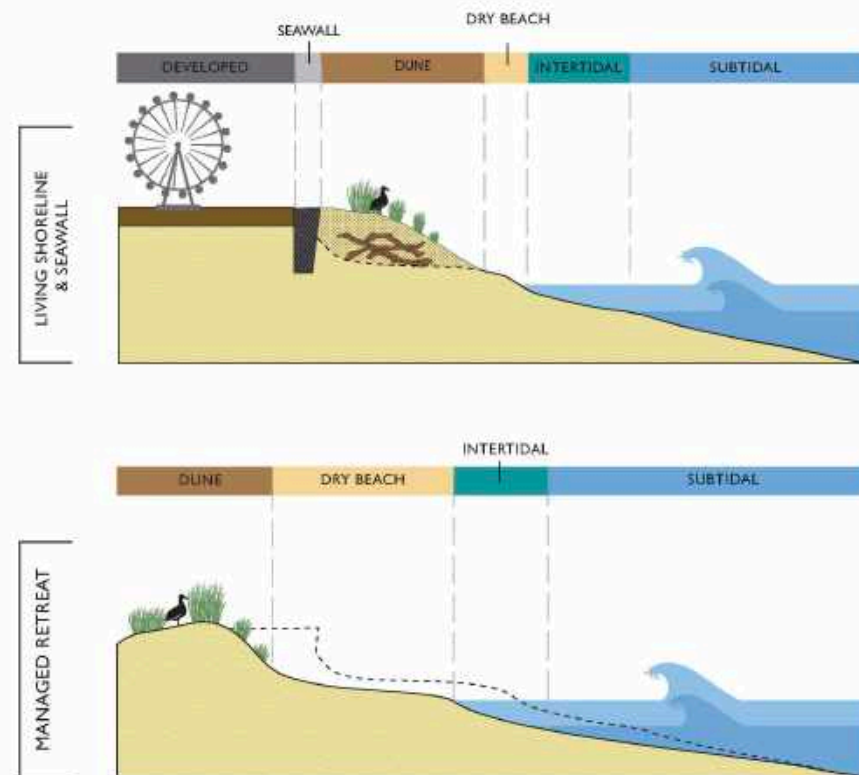
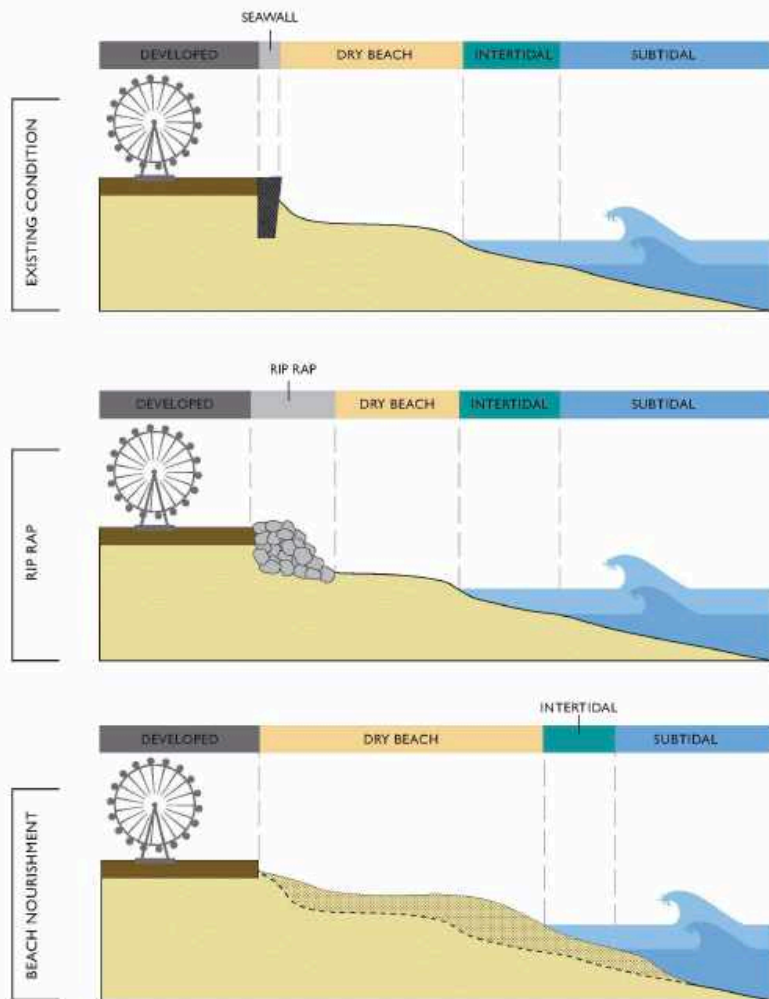


road impacted, no habitat, no bike path, no beach, no surf

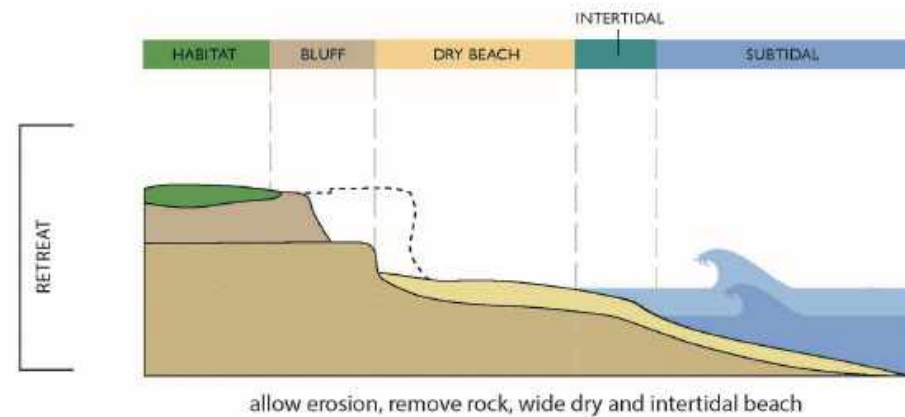
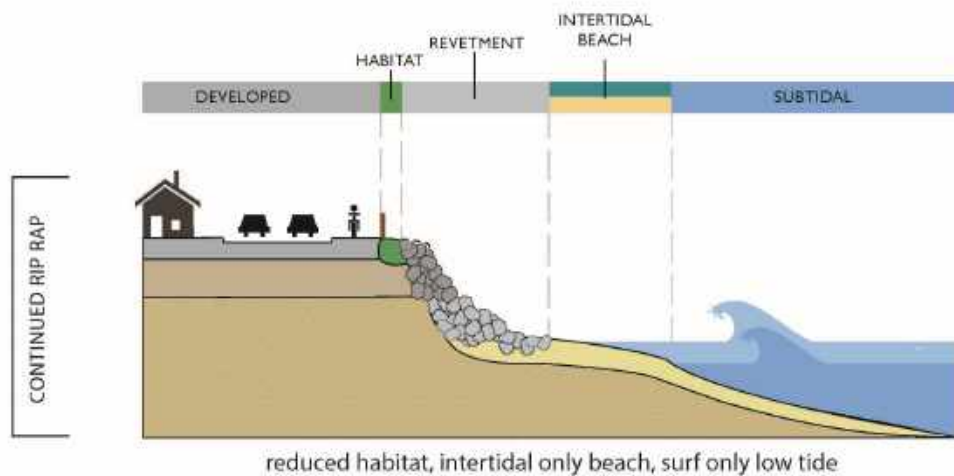
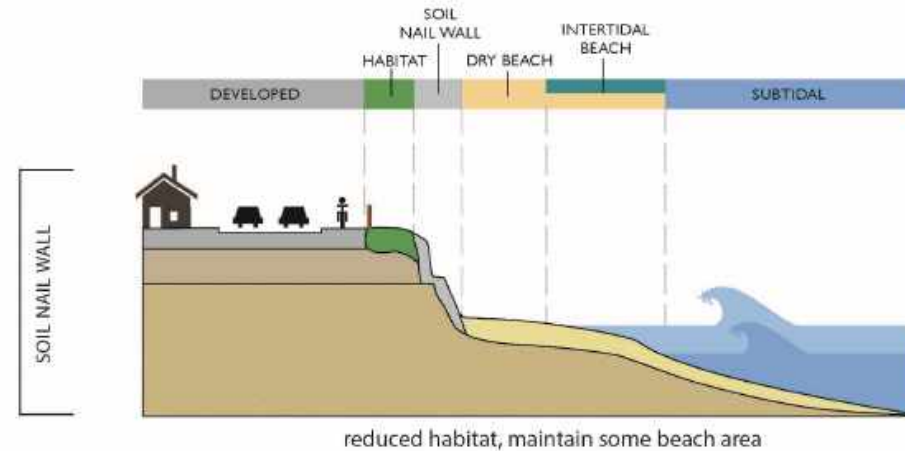
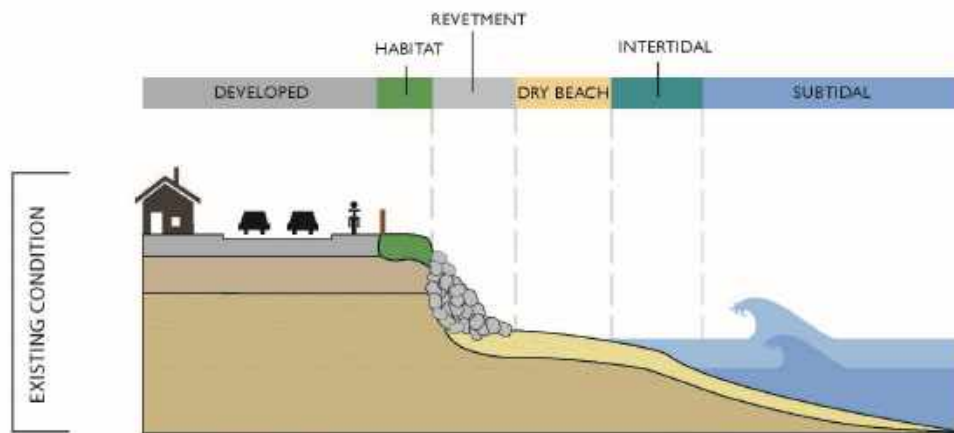


**WHAT COULD HAPPEN TO THE BEACHES
IF WE TOOK NO ACTION TO DEAL WITH
SEA LEVEL RISE?**

ADAPTION SOLUTION OPTIONS - BEACHES



ADAPTION SOLUTION OPTIONS - BLUFFS



SHORT & LONG TERM STRATEGY DEVELOPMENT

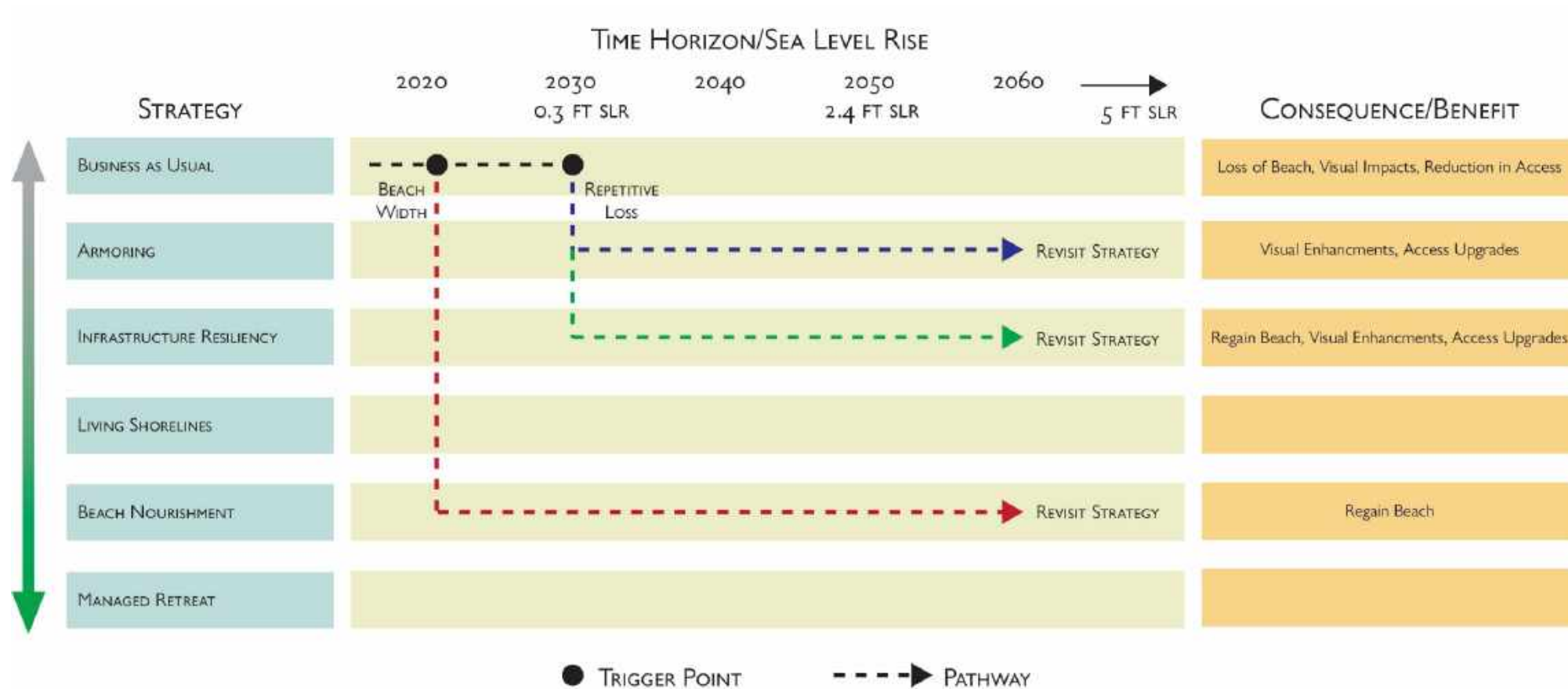
- TAC and Dept Head workshops on exposure, future hazards, possible solutions, tradeoffs, goals and criteria
- Teams identified short and long term strategies for different beach/bluff areas
- Post workshop surveys to refine and find consensus on short and long term strategies, goal priorities and criteria weighting
- Transform workshops into Community Open Houses
- Feeds into options to be fully analyzed / CBA

ADAPTATION PATHWAYS: TRIGGERS/THRESHOLDS

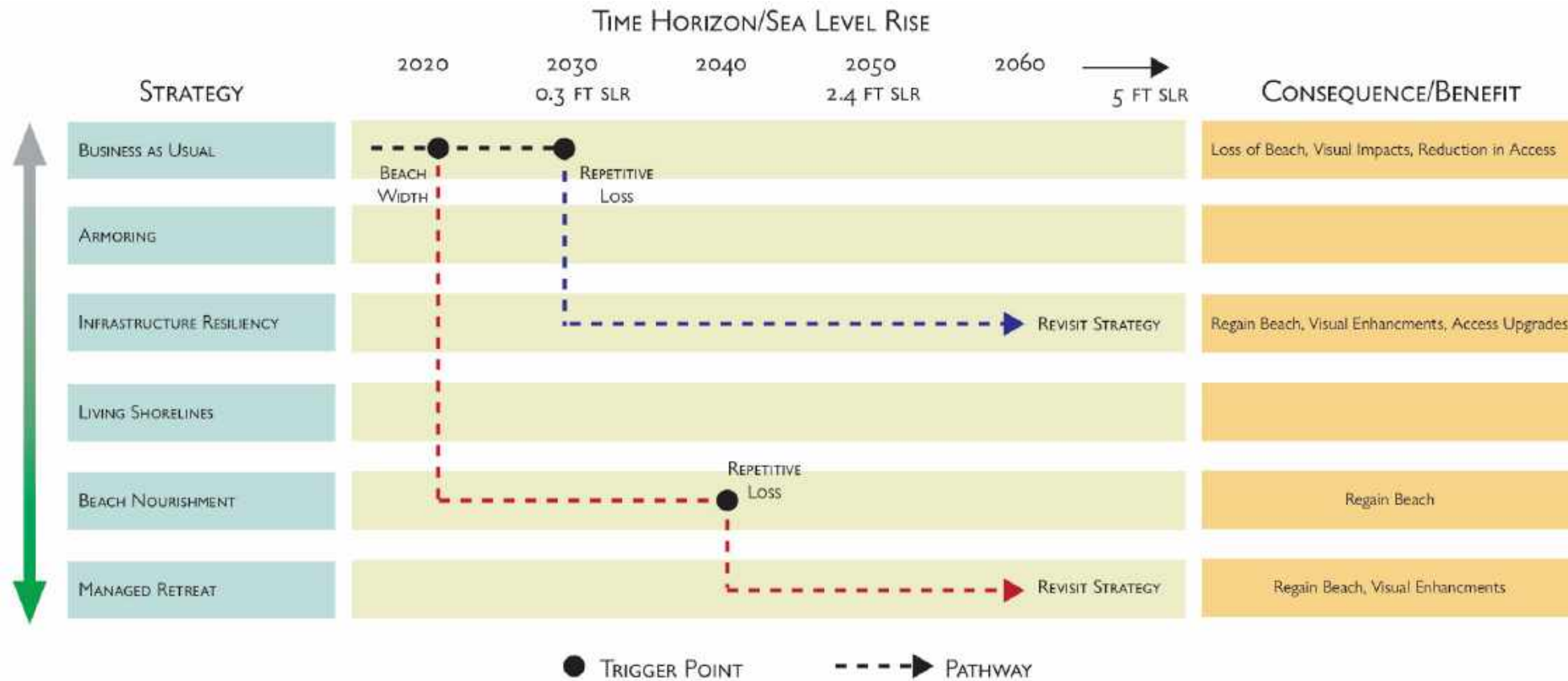
TEMPORAL	ENVIRONMENTAL	STRUCTURAL	FISCAL
DURATION OF TEMPORARY LOSS	FLOOD ELEVATIONS	REPETATIVE LOSS	COST/BENEFIT EXCEEDENCES
FUTURE TIME HORIZON	OCEAN LEVELS	BLUFF FAILURE	WILLINGNESS TO PAY
INFRASTRUCTURE RESILIENCY	SALT WATER INTRUSION	LOSS OR CONDITION OF PROTECTIVE STRUCTURES	
PAST PERMITTED USE	HABITAT IMPACTS OR RESPONSE	LOSS OF SERVICE OR USES	
CUMULATIVE LOSS OF USE OR ACCESS	BEACH WIDTH	PRESCRIPTIVE SETBACKS	
	HAZARDOUS CONDITIONS		
	LOSS OF PUBLIC USE OR ACCESS		

EXAMPLE
ADAPTATION
PATHWAYS
TRIGGERS

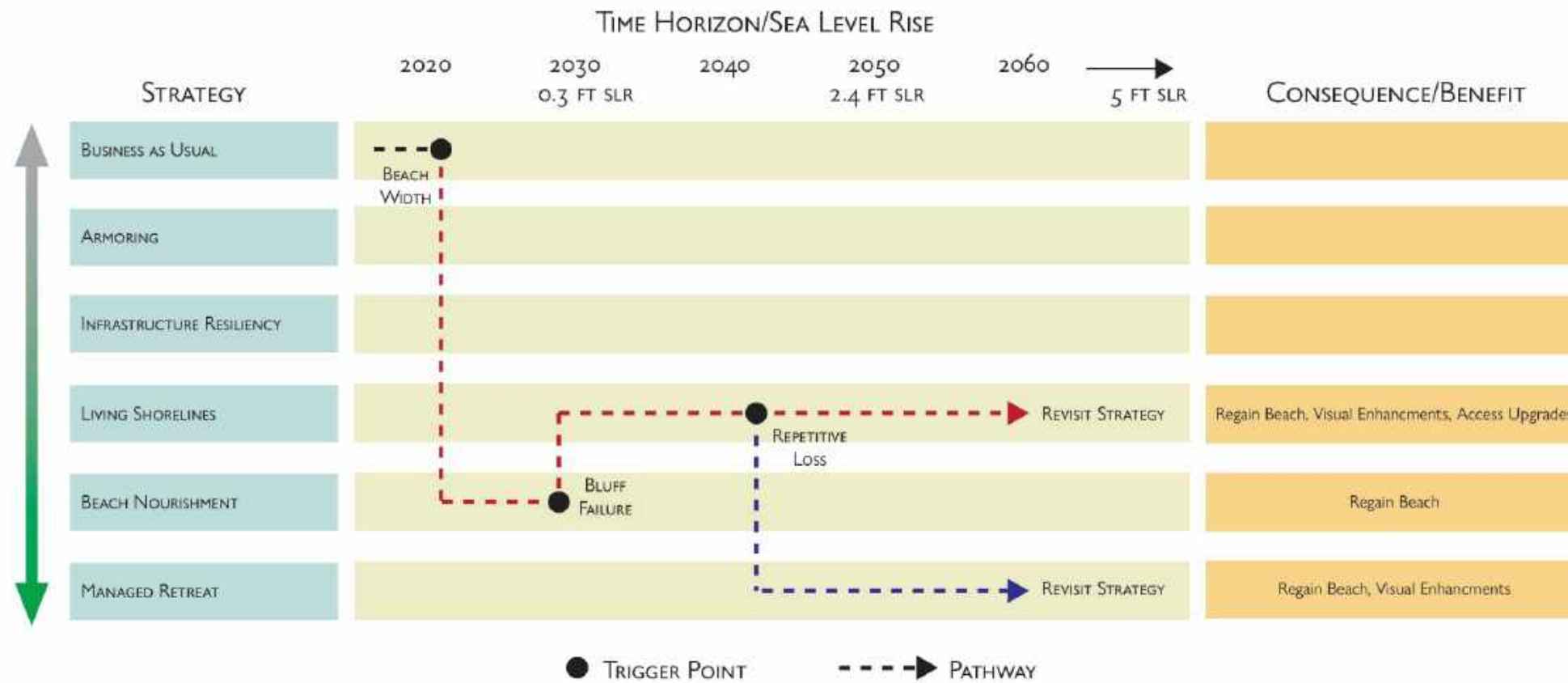
ADAPTATION PATHWAYS — PROTECT IN PLACE



ADAPTATION PATHWAYS — PROTECT (SOFT), ACCOMMODATE + RETREAT



ADAPTATION PATHWAYS — RESTRICT ARMORING



EARLY EQUITABLY CENTERED ADAPTATIONS

SHORT TERM: STORM DRAIN IMPROVEMENTS, MOLD PROOFING, LEEVEE SEEPAGE

	STRATEGY	LIKELY	JUSTIFICATION
Hard (grey) Strategies	BUSINESS AS USUAL	Yes	Flooding hazards managed with pumps
	ARMORING	Yes	Addresses future erosion hazards
	INFRASTRUCTURE RESILIENCY	Yes	Addresses future wave hazards
Soft (green) Strategies	LIVING SHORELINES	Yes	Addresses future wave and flood hazards
	BEACH NOURISHMENT	Yes	Addresses future wave and flood hazards
	MANAGED RETREAT	Yes	Addresses future erosion hazards



FACING CLIMATE CHANGE

The city of Santa Cruz graded the ability of neighborhoods to prepare for, cope with and recover from climate-change-related disasters. Some of the most vulnerable communities will also have elevated risk due to sea level rise.

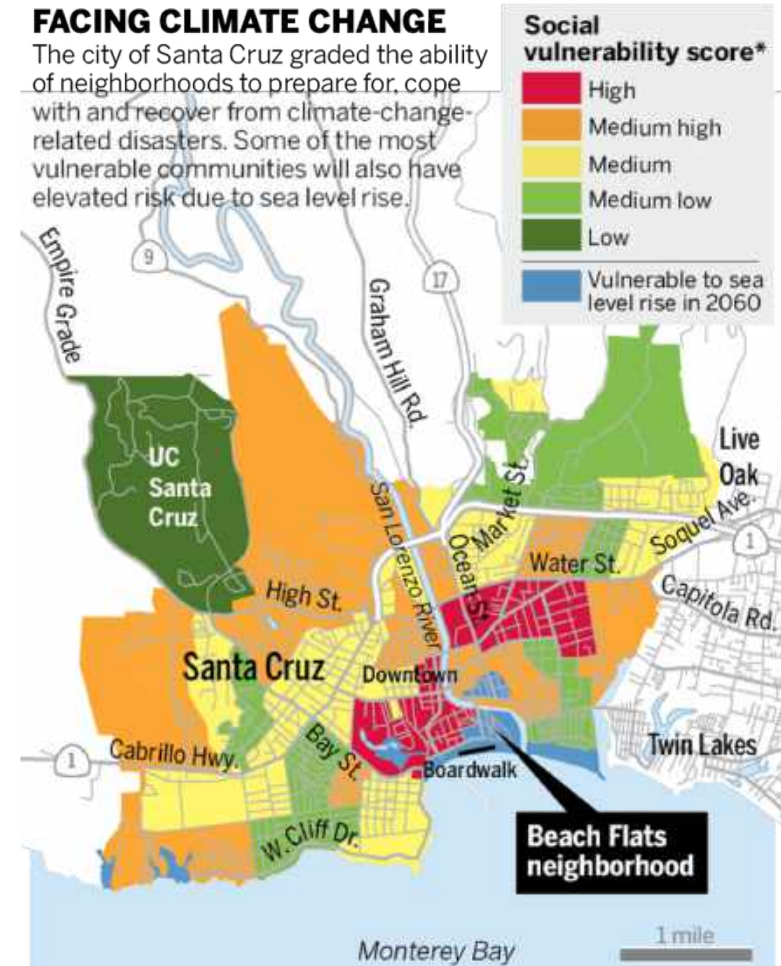


Figure 17. Potential Adaptation Options for Main and Cowell Beaches

LONG TERM: BEACH FLATS EQUITABLE REDEVELOPMENT PLAN (RETREAT? ELEVATE?), HABITAT RESTORATION

* Neighborhoods were scored using five measures of social vulnerability — age, income, disability, language and crime
Source: City of Santa Cruz
BAY AREA NEWS GROUP

RESILIENT COAST: EQUITY CENTERED



- Spend time building trust with frontline community leaders and designed meetings with them
- Academic Partnerships to bring capacity to focus long term on frontline communities
- One on one meetings with historically under represented & follow up
- Internal to City:
 - Agenda reports must highlight equity, sustainability and public health
 - Training of staff, commissioners and other leadership
 - Cross sectoral convenings

TIMELINE ON COMMUNITY OUTREACH AND ENGAGEMENT

July 2019: INTRODUCE PROJECTS + BUILD RELATIONSHIPS

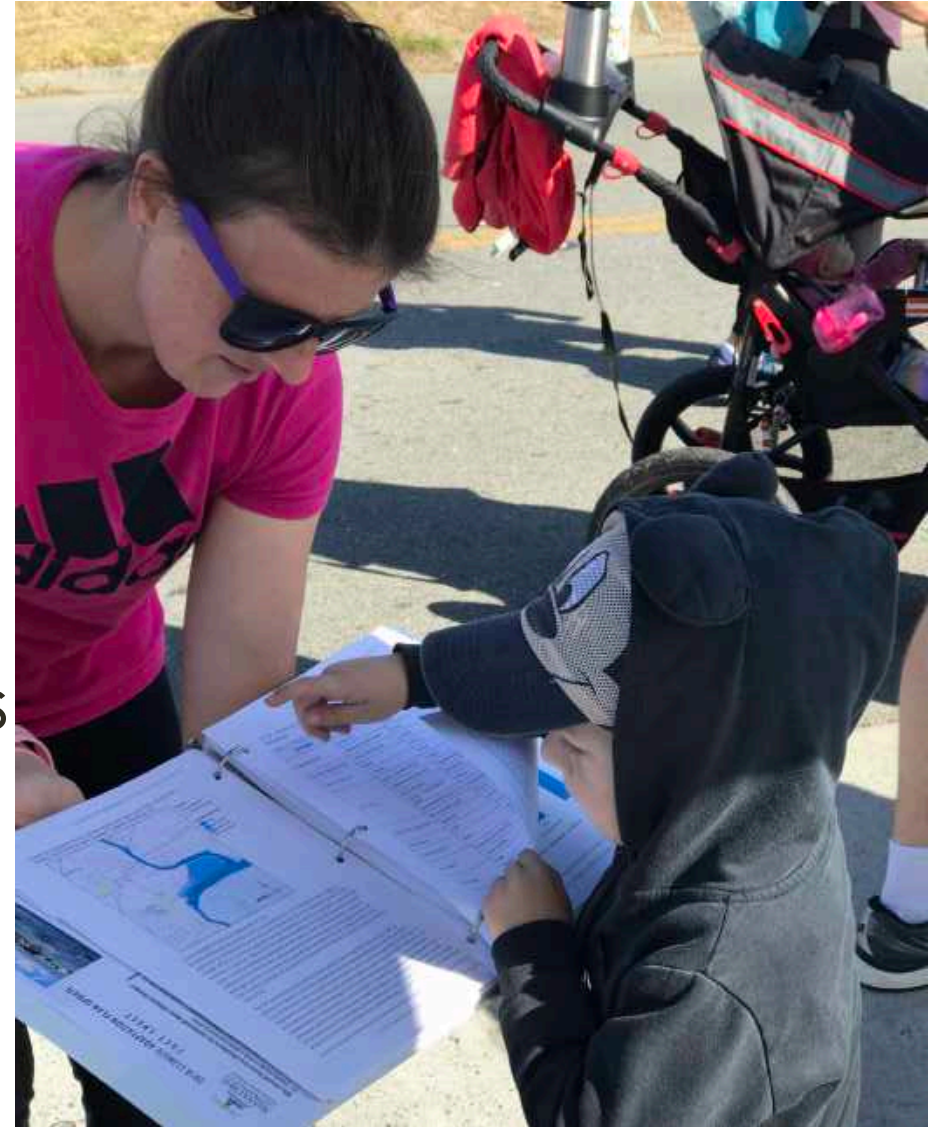
Sept /Oct 2019: COMMUNITY VISIONING

Dec/Jan 2019-2020: IDENTIFY CONDITIONS + NEEDS

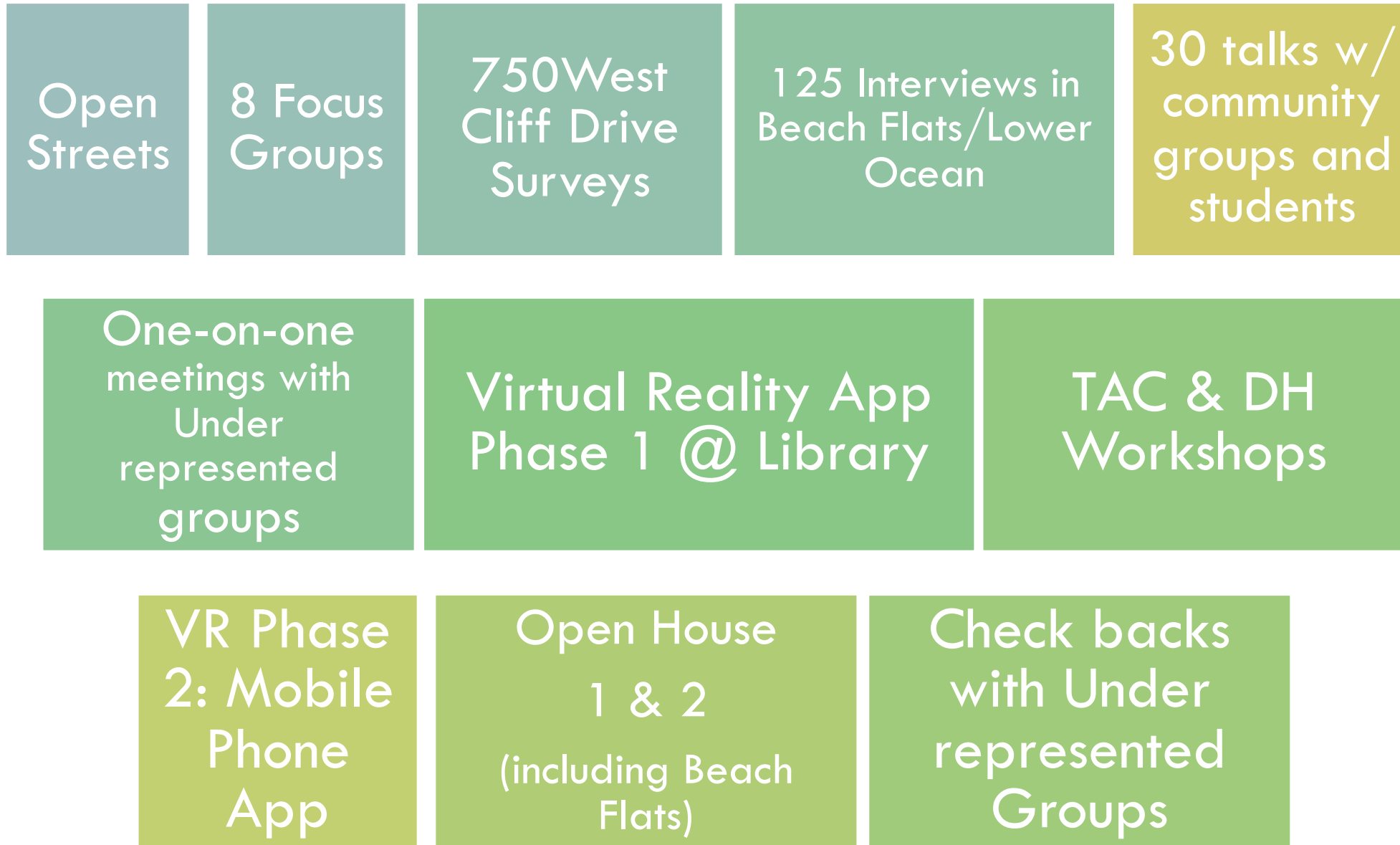
Spring 2020: ADAPTATION SOLUTIONS + TRADEOFFS

Aug 2020: ADAPTATION SOLUTION PRIORITIES + PREFERENCES

December 2020: DOES IT ALL MAKE SENSE?



EXTENSIVE OUTREACH



COMPLETED

FUTURE

VIRTUAL REALITY SEA LEVEL RISE EXPLORER



The Santa Cruz Coastline Is Always Changing

By the end of the century, if we do nothing, sea level rise could cause us to lose our iconic beaches and the bluffs will experience intensified erosion.



SUMMER 2018

The Resilient Coast Santa Cruz Initiative is proactively and collaboratively planning a community vision for climate resilient future coastline management.



PROJECTED FUTURE FLOODING

We can protect, accommodate and relocate.
We are studying the coastline from Seabright Beach to



This Virtual Reality Sea Level Rise Explorer is one of many outreach methods being used to engage the public in the Resilient Coast Santa Cruz Initiative. Here is the initiative's timeline:

APRIL 2019	JANUARY 2020	JUNE 2020	DECEMBER 2020
PHASE 1 April - December, 2019 Current Conditions and Future Climate Hazard Projections	PHASE 2 January - May, 2020 Identification of Feasible Adaptation Solution Options	PHASE 3 June - December, 2020 Development of Adaptation Plans and Policies	

Take a fact sheet and visit our website for more information and to learn when the next community meeting on the Resilient Coast Santa Cruz Initiative is taking place.

cityofsantacruz.com/ResilientCoast

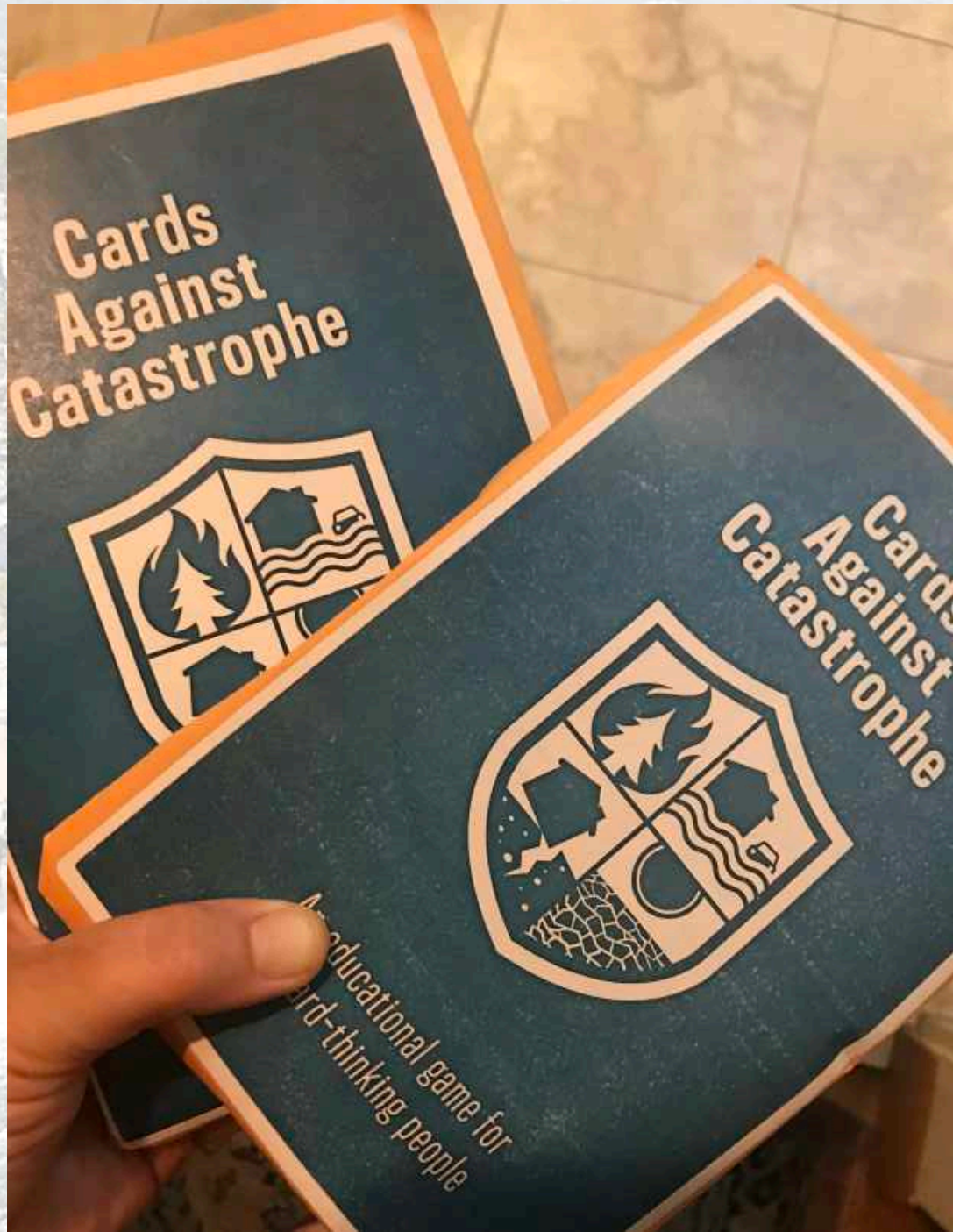


The Resilient Coast Santa Cruz team gratefully acknowledges the project partners and funders:



Narration: Dr. Gary Griggs and Ernesdina Saldaña





THANK YOU + QUESTIONS?

<https://www.facebook.com/SantaCruzClimateAction/>

#ResilientCoastSC



www.cityofsantacruz.com/ResilientCoast