

Policy Summit
"One California, One Coast"

Adaptive Pathways for a Changing California Coast



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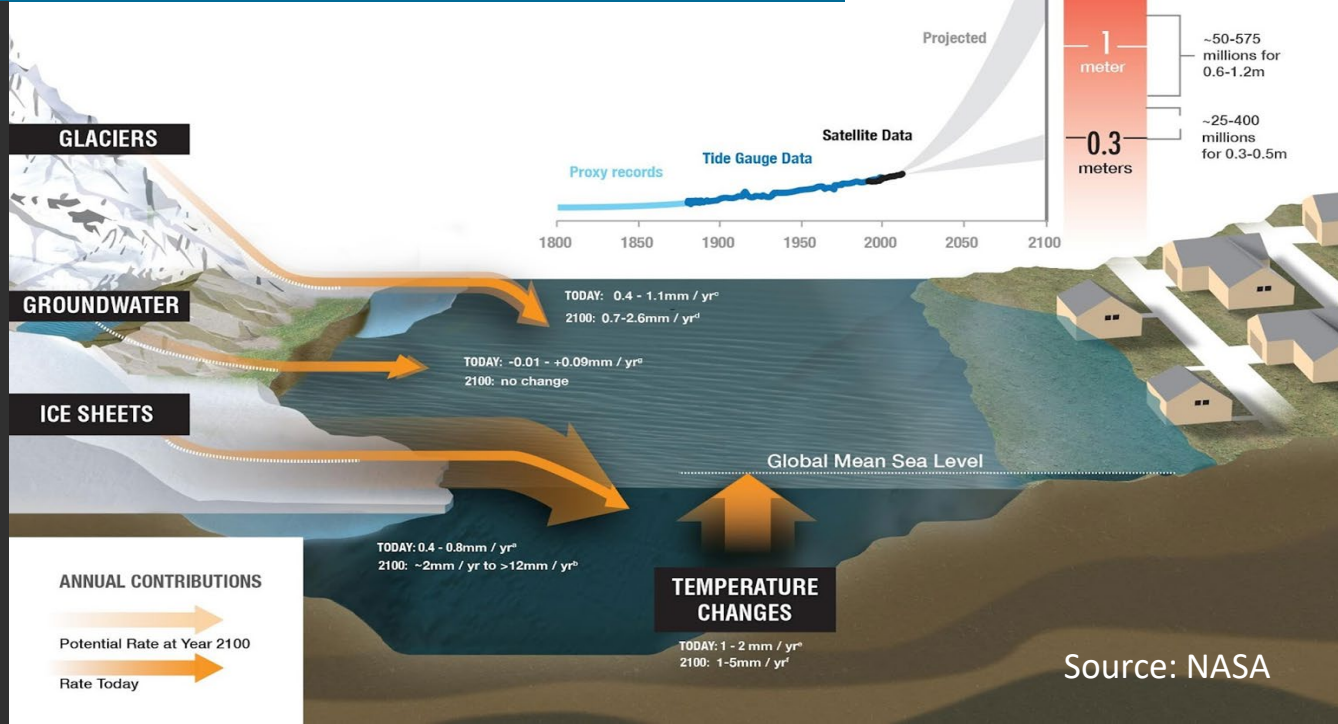


What are the causes of sea-level rise?

Global Warming

Thermal Expansion

Ice Melt



How is sea-level rise measured?

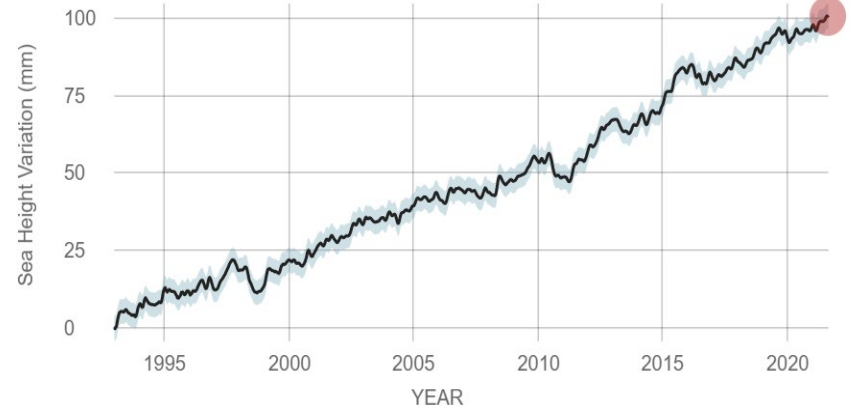


SATELLITE DATA: 1993-PRESENT

Data source: Satellite sea level observations.
Credit: NASA's Goddard Space Flight Center

RATE OF CHANGE

↑ **3.4**
millimeters per year



La Jolla, CA [9410230]

[Station Home](#)

[More Data](#)

Today's Tides

Time	Tide	Height
3:18 AM	high	4.11 ft
8:31 AM	low	2.67 ft
1:57 PM	high	4.24 ft
9:05 PM	low	0.28 ft

Recent Data as of 12/10/2021 1:36 PM

Local Time



Water Level: 3.95 ft Above MLLW

Next Tide at 1:57 PM: high 4.24 ft above MLLW



Water Temp: 58.6 ° F

Air Temp: 59.7 ° F

Barometric Pressure: 1018.7 mb

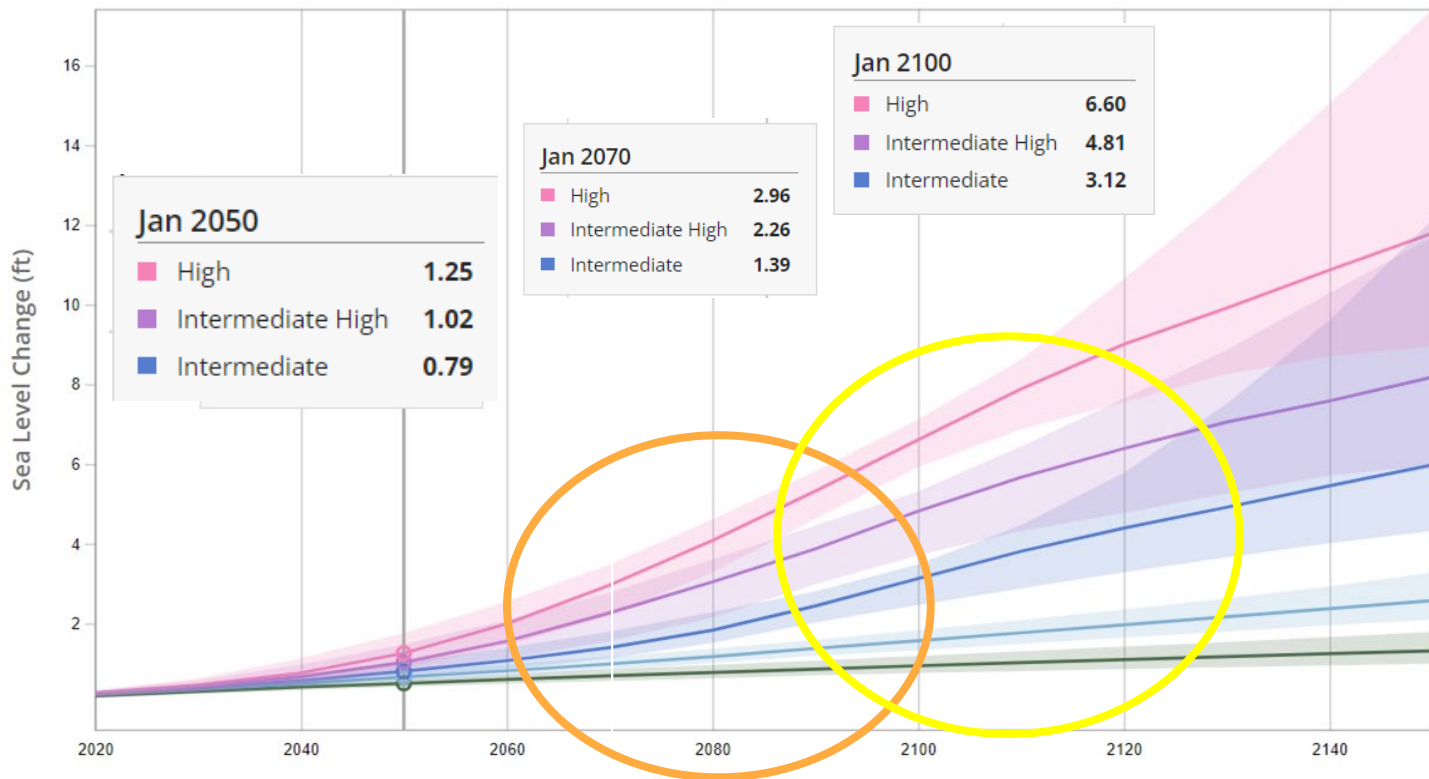
Winds: 3.9 kts from WSW

Source: NOAA

U.S. Interagency SLR Projections for La Jolla

sealevel.nasa.gov

2023 US Interagency SLR Technical Report



- No more extreme scenario
- More localized projections by decade
- Reflects ice sheet model improvements

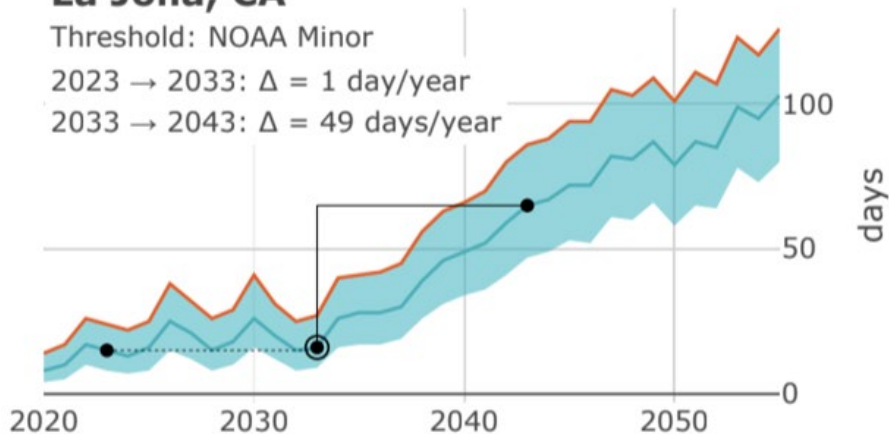
Projected Increases in High Tide Flooding

La Jolla, CA

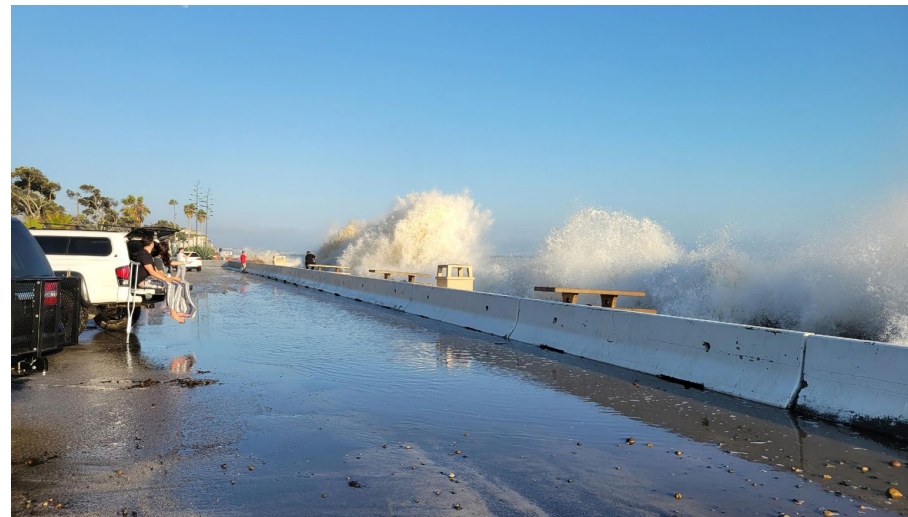
Threshold: NOAA Minor

2023 → 2033: $\Delta = 1$ day/year

2023 → 2043: $\Delta = 49$ days/year



Philip R. Thompson et al, Rapid increases and extreme months in projections of United States high -tide flooding, *Nature Climate Change* (2021).

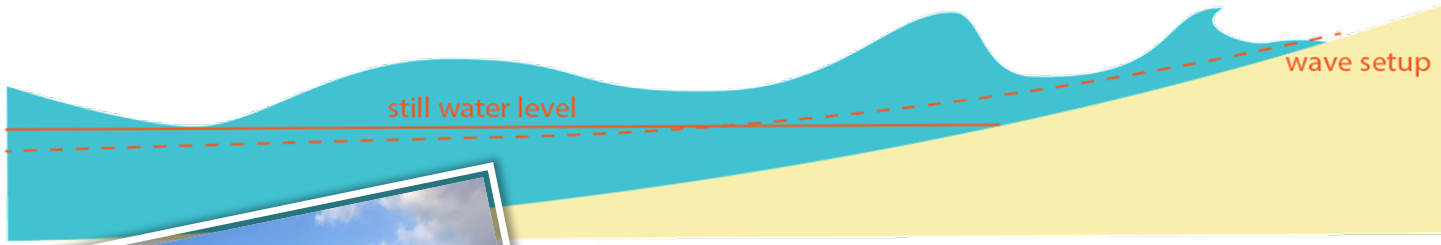


Capistrano Beach, CA – June 21, 2021

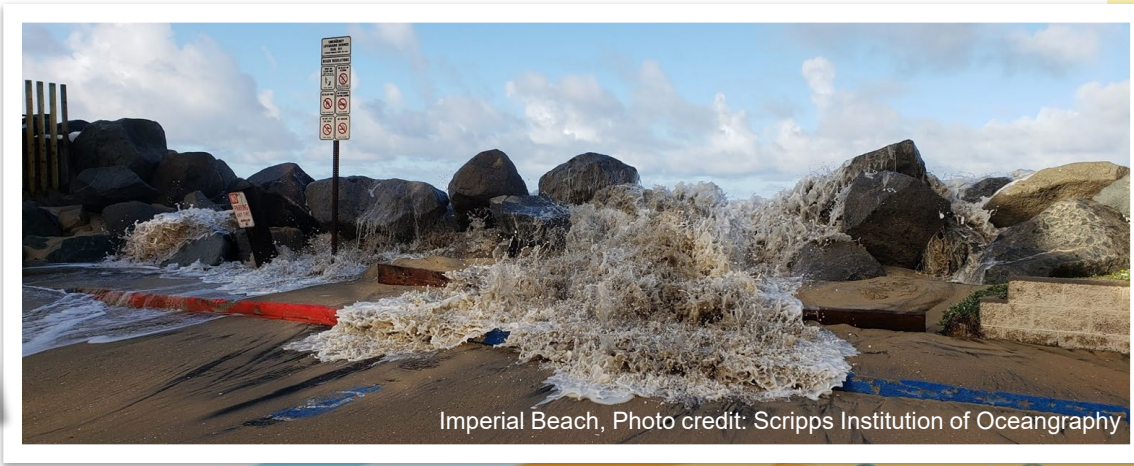
High tide + summer swell

Photo credit: L Engeman

SLR + Waves + High Tides = + Flooding



Julia Fiedler 2014



Shoreline and Cliff Erosion



Credit: Scripps
Institution of
Oceanography



Credit: City of Carlsbad

Adaptation Options and Sequencing

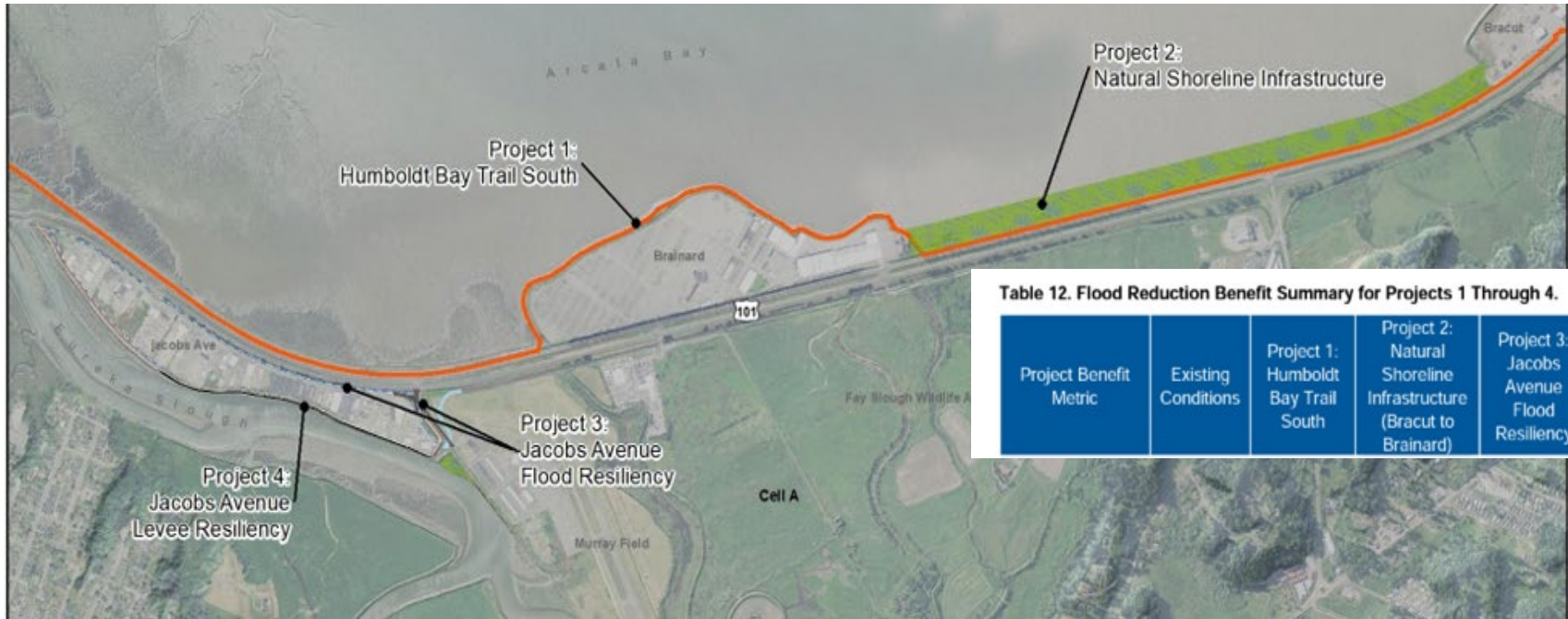


Table 12. Flood Reduction Benefit Summary for Projects 1 Through 4.

Project Benefit Metric	Existing Conditions	Project 1: Humboldt Bay Trail South	Project 2: Natural Shoreline Infrastructure (Bracut to Brainard)	Project 3: Jacobs Avenue Flood Resiliency	Project 4: Jacobs Avenue Levee Resiliency

Source: Sea Level Rise Adaptation Plan for Transportation Infrastructure and Other Critical Resources in the Eureka Slough Hydrographic Area, Humboldt Bay

https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1039&context=hsuslri_local

How, where do nature-based solutions fit into coastal adaptation strategies

- Flood mitigation
- Habitat resilience
- Sand retention
- “Buy-time” strategy or longer-term viability



Source: The Bay Foundation, Santa Monica Bay Beach Restoration Pilot Project

How long and when do you implement them?



Source: California Sea Grant, Surfer's Pt. Ventura

How fast and to what extent can coastal habitats be re-established?

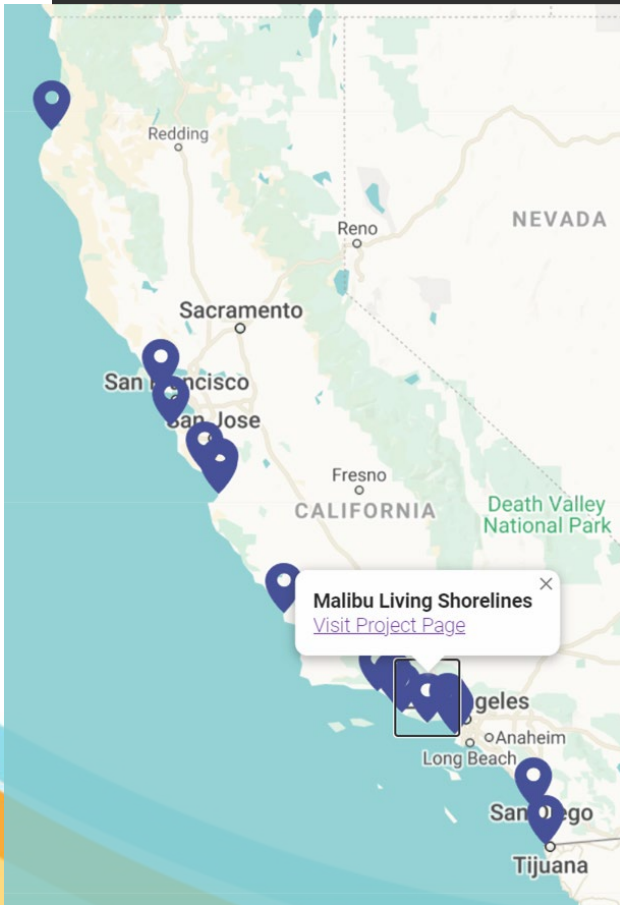


Source: Rincon Consulting, Ponto Beach, Carlsbad dune pilot project

How long might they survive (on their own or with our help)?

California Dune Science Network

www.resilientcoastlines.com



Implemented

Humboldt Coastal Resilience Project

Over 7 miles of dunes restoration in Humboldt and Del Norte counties since the 1980s, and plans for additional restoration.



Implemented

Cardiff Living Shorelines Project



In Planning

Malibu Living Shoreline Project

A dune habitat restoration project to increase the resiliency of the shoreline at Zuma and Point Dume Beaches.

California Dune Science Network

www.resilientcoastlines.com

Coastal Scientists, Students and Resource Managers

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Coastal Water Research Project

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Jeremy Smith, CA Coastal Commission

Ella McDougall, OPC

**250+ Network
Members**



The fate and stewardship of our coastal landscape is changing but we can change too...



Photo credit: L. Engeman, California Sea Grant



Photo credit: L. Engeman, California Sea Grant