

*Policy Summit*  
"One California, One Coast"

# Lessons from Economics for Sea Level Rise Adaptation

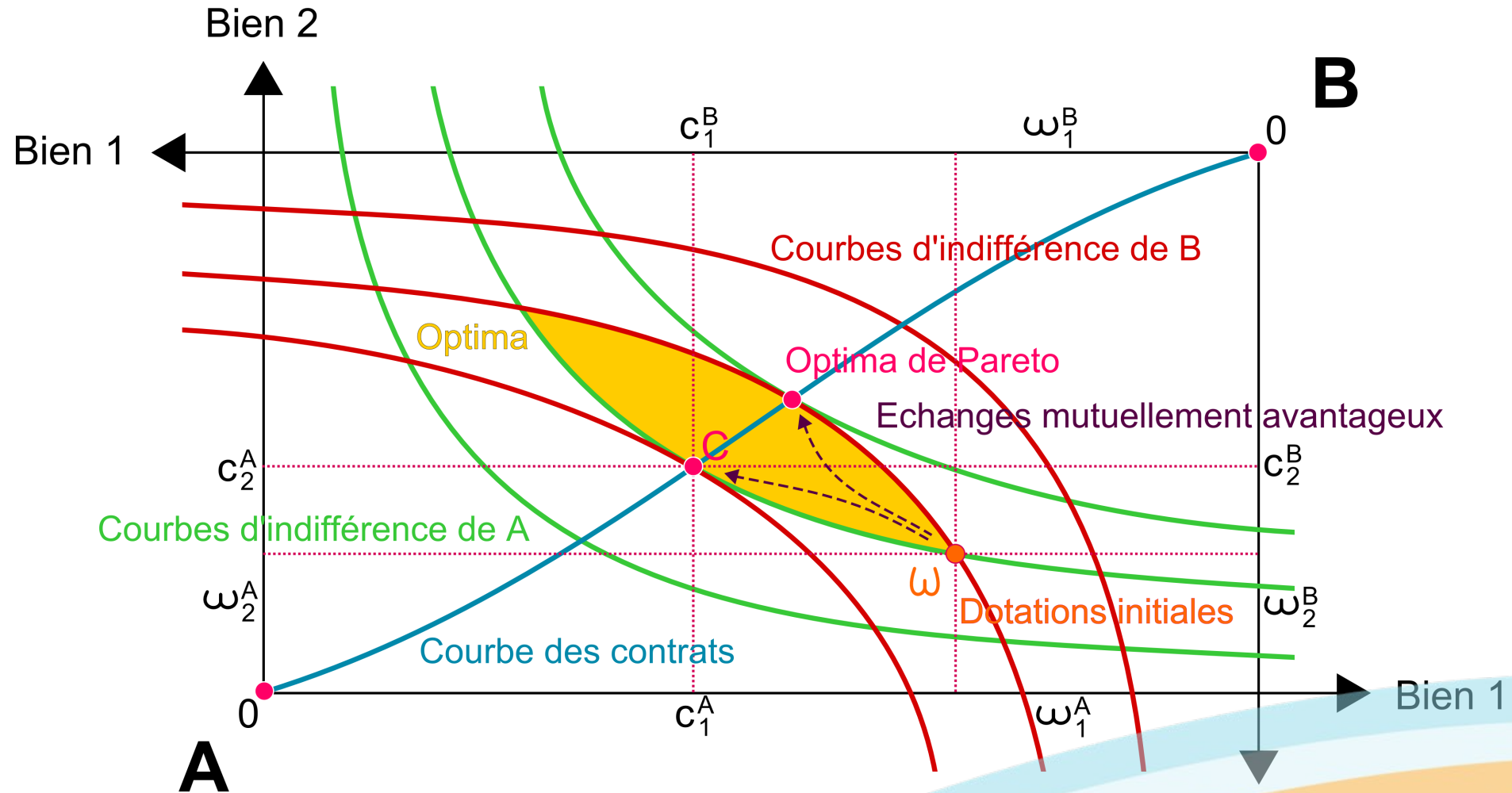
Charles Lester  
May 19, 2023

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# Welfare Economics and the Coast





# The Coast is a Public Good

## *The People Declared:*

The coastal zone is a distinct and valuable natural resource belonging to all the people and existing as a delicately balanced ecosystem;

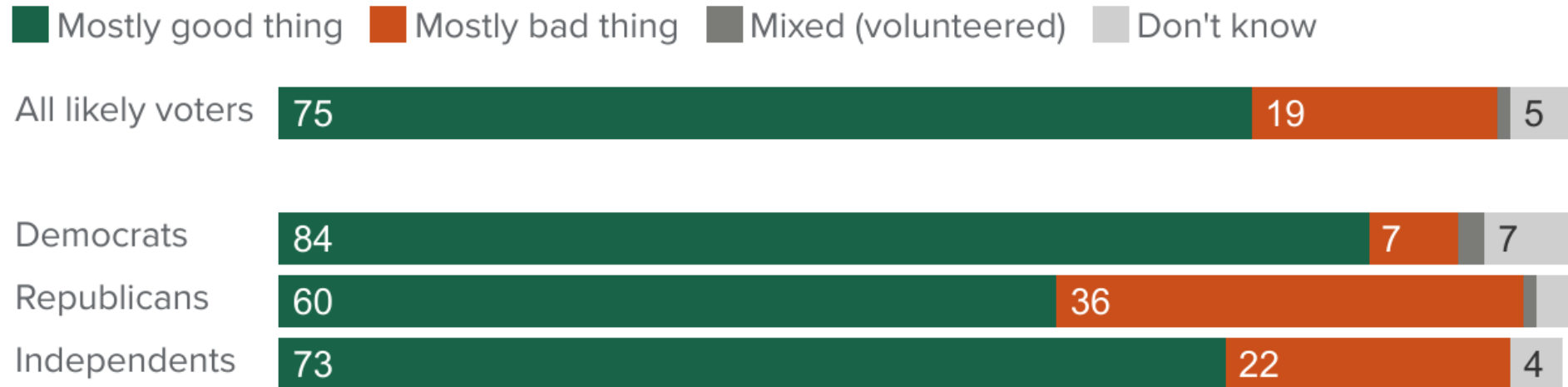
That the permanent protection of the remaining natural and scenic resources of the zone is a paramount concern to present and future generations of the state and nation. . .





# And the Public Agrees . . .

**Most likely voters say passing Prop 20 – the 1972 measure that established the California Coastal Commission and regional commissions – has been mostly a good thing**



**SOURCE:** PPIC Statewide Survey, July 2022. Survey was fielded from July 8–15, 2022 (n=1,648 adults, n=1,132 likely voters).

**FROM:** PPIC Blog, July 2022.

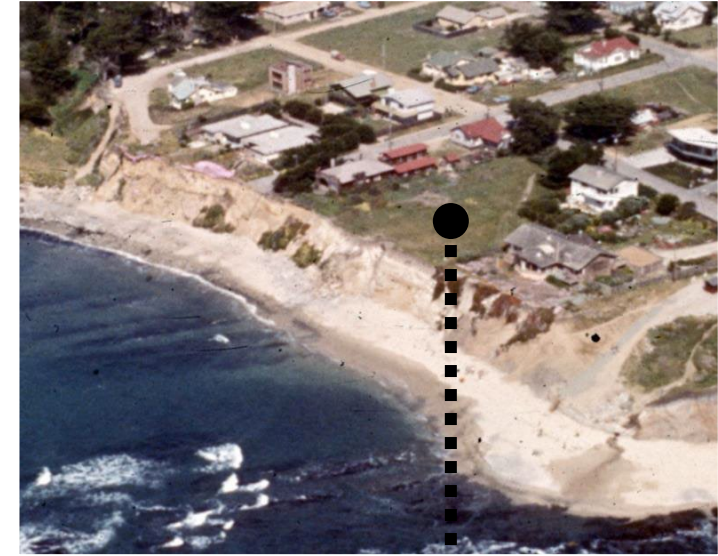


# Coastal Development creates Externalities





# Shoreline Protection External Costs to the Coast





# The Coastal Squeeze is an External Cost of a Fixed Backshore



**Figure 5. CoSMoS Projected Shoreline Change, 100 cm of SLR by 2100, Del Mar, CA.<sup>21</sup> CA100.**





# How much is a walkable beach worth?

King Tide Beach Walk, Del Mar, 2021

Photo: Charles Lester



# Adaptation on the Coast involves many layers of Social Costs and Benefits





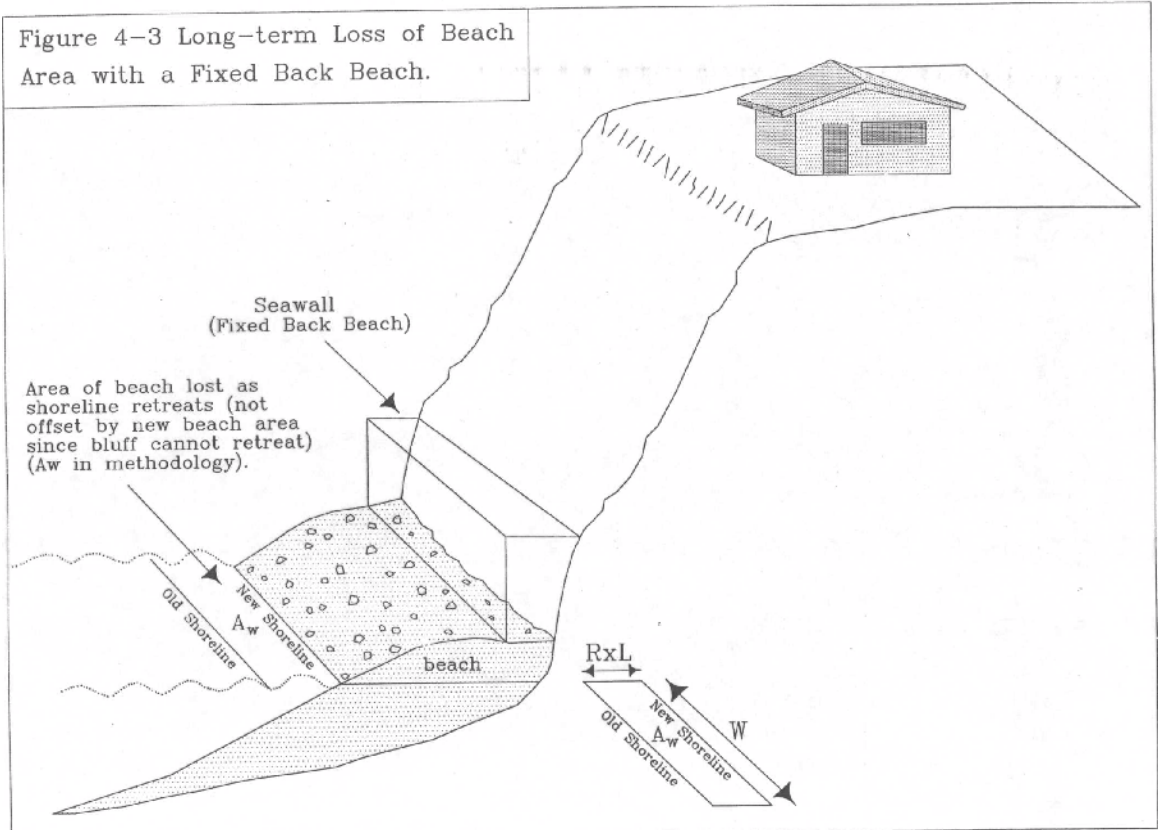
# Internalizing Externalities through Assumption of Risk

- ❖ Assumption of Risk
- ❖ No Future Seawall
- ❖ Removal Required
- ❖ Foundation Design

Trinidad



# Valuing the External Costs of Seawalls







Internalizing the Externalities...

A private taking of the public beach?  
→ \$5.2 million mitigation fee

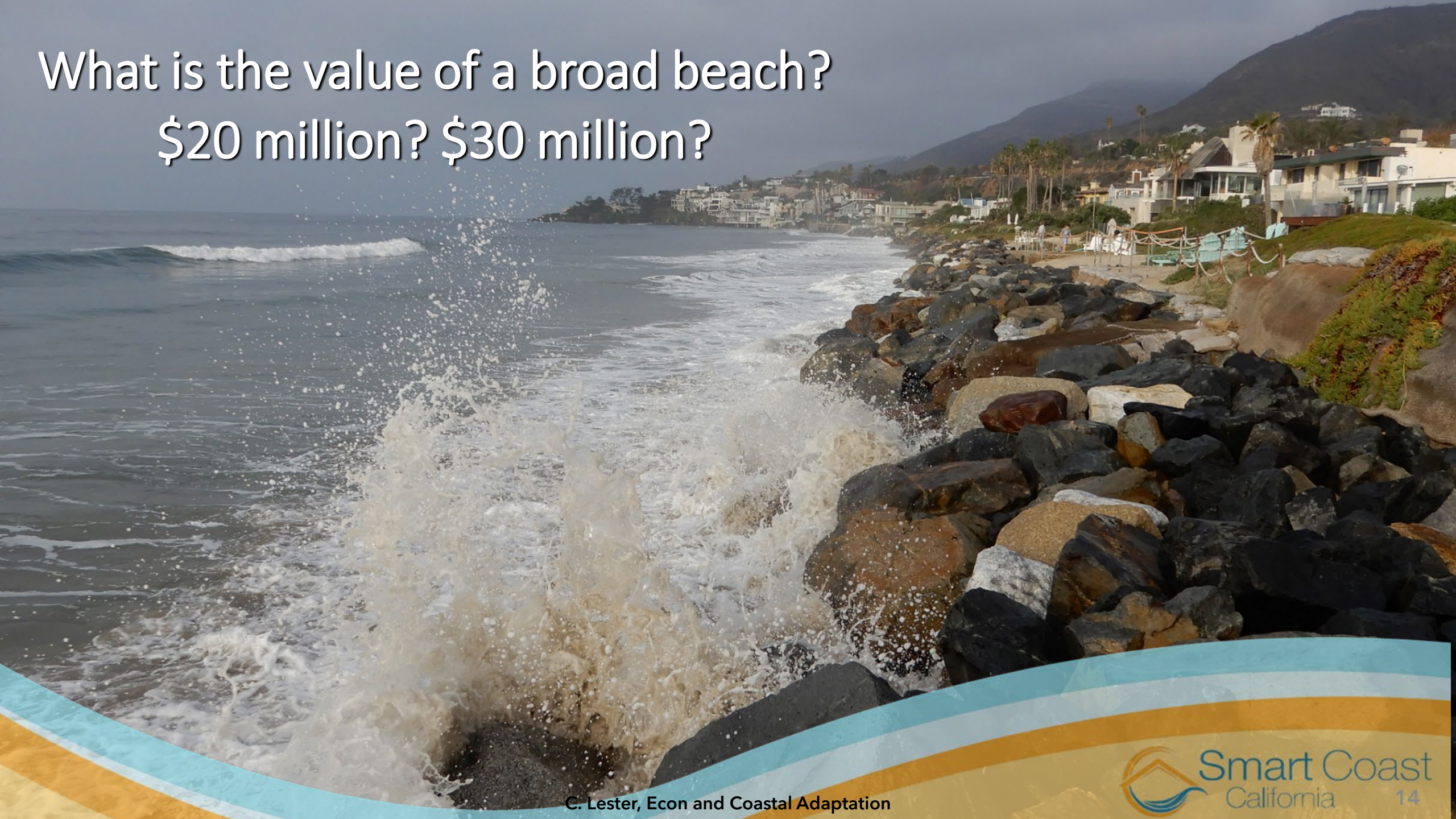


# King-tide at Ocean Harbor House





What is the value of a broad beach?  
\$20 million? \$30 million?















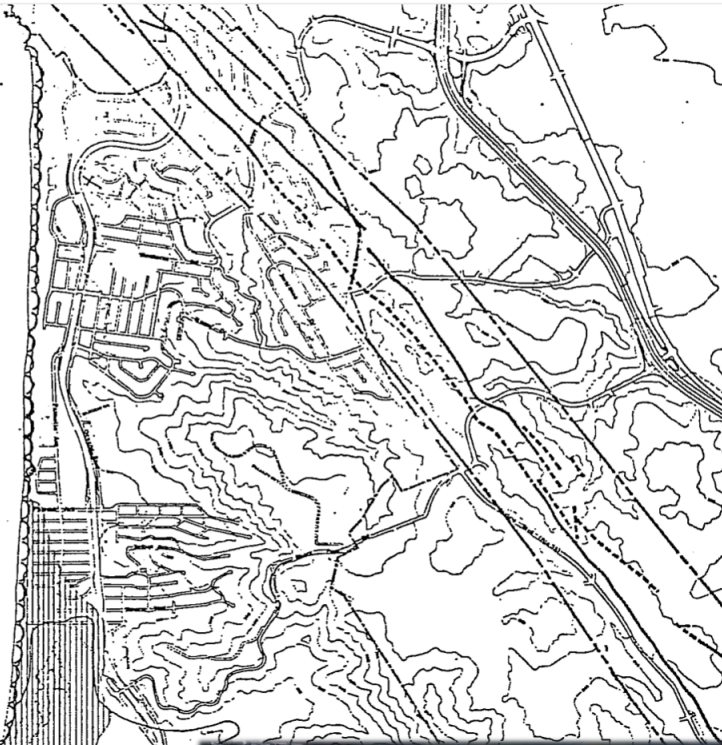
# What is our shared public interest in the shoreline, and how do we value it?



# PACIFICA GEOTECHNICAL HAZARDS

-  San Andreas Fault (dashed where approximate)
-  Alquist-Priolo Special Studies Zone
-  Low Stability of Coastal Bluffs  
High potential for hazard
-  Moderate Stability of Coastal Bluffs  
Intermediate potential for hazard
-  Large Landslide
-  Concentrations of Landslides
-  Flood Hazard Area<sup>1</sup>
-  Potential Tsunami Hazard<sup>2</sup>

1. Source: U.S. Department of Housing and Urban Development,  
Flood Hazard Boundary Map H-01-05  
2. Source: San Mateo County Seismic and Safety Element,  
Map Sheet 1



## Information is Key to Efficient Property





# Malibu LCP - full disclosure

4.42 As a condition of approval of development on a beach or shoreline which is subject to wave action, erosion, flooding, landslides, or other hazards associated with development on a beach or bluff, the property owner shall be required to **execute and record a deed restriction which acknowledges and assumes said risks and waives any future claims of damage or liability** against the permitting agency and agrees to indemnify the permitting agency against any liability, claims, damages or expenses arising from any injury or damage due to such hazards.

4.44 As a condition of approval . . . the property owner shall be required to record a deed restriction against the property that **ensures that no shoreline protection structure shall be proposed or constructed** to protect the development approved and which expressly waives any future right to construct such devices that may exist pursuant to Public Resources Code Section 30235.



# Hawaii - Seller Must Disclose Any Risk of SLR



## DISCLOSURE REQUIREMENT

### For Residential Real Estate in the Sea Level Rise Exposure Area

The State of Hawai'i recently enacted a new update to the Mandatory Seller Disclosures in Real Estate Transactions Law in 2021, codified within Hawai'i Revised Statutes §508D-15, requiring that real estate transactions within the State of Hawai'i must disclose any risk of sea level rise to the property.

Risks to oceanfront properties from shoreline erosion and coastal flooding are increasing with sea level rise as documented in scientific and government studies around Hawai'i.

Photo: Sea level rise putting homes at risk.

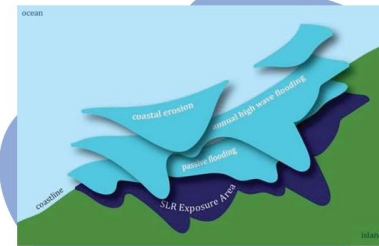


### How do I know if my property is at risk?

State of Hawai'i Sea Level Rise Viewer is available at: <https://www.hawaiisealevelriseviewer.org>

From this tool you can identify property risk for 3.2 foot increase in sea level following state and county guidance.

### The Sea Level Rise Exposure Area (SLR-XA) is a combined area of risk for:



#### Passive Flooding

Low-lying coastal plains are especially vulnerable to multiple passive flood sources including but not limited to rising groundwater, backflow through stormwater drainage, and direct overland marine flooding. Groundwater inundation in particular is difficult to manage because it completely saturates the ground and can evade seawalls or bulkheads.



#### Annual High Wave Flooding

All sides of the Hawaiian Islands are exposed to open-ocean swell. Damage from high wave flooding can be exacerbated over time by continuous exposure to the elements with increased sea level rise, high-velocity impacts from waves, and increased storms, which may result in total failure of structures on the shoreline.



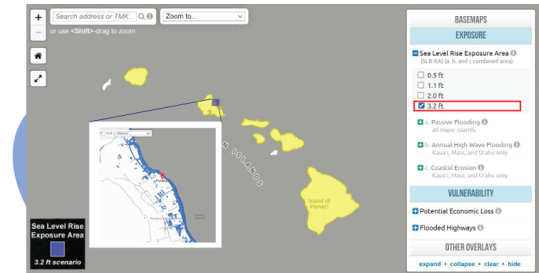
#### Coastal Erosion

Chronic coastal erosion is a widespread problem in the Hawaiian Islands. Chronic long term erosion leads to permanent shoreline recession and land-loss.



## ABOUT SEA LEVEL RISE VIEWER TOOL

### Assessing Properties Impacted by 3.2 Feet Sea Level Rise



To identify a property's location relative to a sea level rise exposure area, visit the Hawai'i Sea Level Rise Viewer and enter the street address or Tax Map Key (TMK) number for the property of interest into the upper left box. Note that when using TMKs as an identifier, it must be entered as a nine-digit number excluding any dashes or punctuations. For example, TMK (1) 3-5-004:001 would be entered as 135004001.

Click the box for 3.2 ft under Sea Level Rise Exposure Area on the right side to view the combined footprint of the three risks identified (passive flooding, annual high wave flooding, and coastal erosion).

### What exactly do I need to disclose?

Hawai'i Revised Statutes §508D-15 requires a mandatory disclosure for properties within State of Hawai'i's Sea Level Rise Exposure Area, which is up to the and includes the 3.2-feet scenario.

Additional Resources at: <https://climate.hawaii.gov/hi-facts/sea-level-rise/>

Previous Page Photos:  
 Photo: High-wave flooding in Honolulu area of West Maui. Photo by Don McLeish.  
 Photo: Severe beach erosion on Oahu. Coastal residents here are at risk from tidal flooding and storm surge. Photo by Dr. Shelle Isabel, OCC.  
 Photo: Water bubbles up from a storm drain in Mapunapuna, an area of Honolulu that frequently floods during the highest tides of the year. Photo by Sea Grant King Tides Project, 2017.





# Market Power and Distributional Equity

**COASTAL PLAN VISION:** “Well-maintained, older, less-expensive housing that provides opportunities for people of all incomes to live near the ocean....”

**EQUALITY OF ACCESS:** Increase housing for low and moderate income persons. Give priority to developments that provide lower priced units: protect existing, providing new, regulate condo-conversions

*Coastal Act 2013. Lower cost visitor and recreational facilities and housing opportunities for persons of low and moderate income shall be protected, encouraged, and, where feasible, provided.*



# Affordable Housing in the Coastal Zone

The May 5, 1981 guidelines: *Meaningful access to the coast requires housing opportunities as well as other forms of coastal access... If the coast is not to exclude the less affluent members of society and become an exclusive enclave of the wealthy, affordable housing must be protected, encouraged, and, where feasible, provided.*

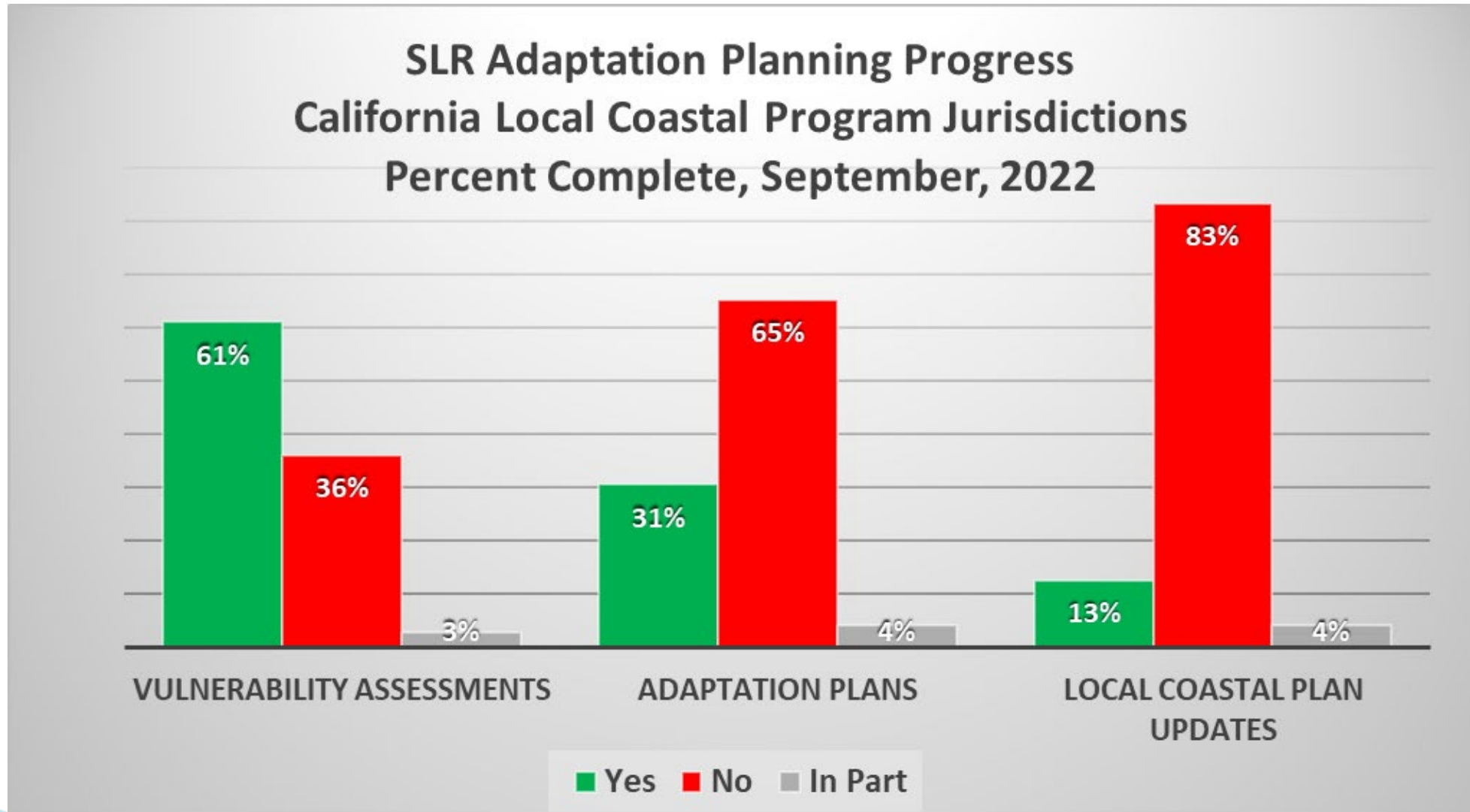
## Coastal Commission, Between 1977 and 1981:

- **5000 Affordable Units through Inclusionary Housing**
- **Demolition of 1100 existing affordable units denied**
- **\$2,000,000 in in lieu fees for affordable housing**

→ 1981: Legislature removes 30213 housing requirement, adds Section 30500.1: *No local coastal program shall be required to include housing policies and programs.*



# Transaction Costs - Can we Improve our Process?





# Defining Property Rights Improves Efficiency





# Martin's Beach - Eminent Domain for Access?

PRC 6210.9. The State Lands Commission may acquire rights-of-way or easements for access to tidelands.

PRC 6213.5. The SLC may acquire an easement for public access to and along the shoreline, including the sandy beach, at Martins Beach.



# Public Tideland Access (Property?) Rights

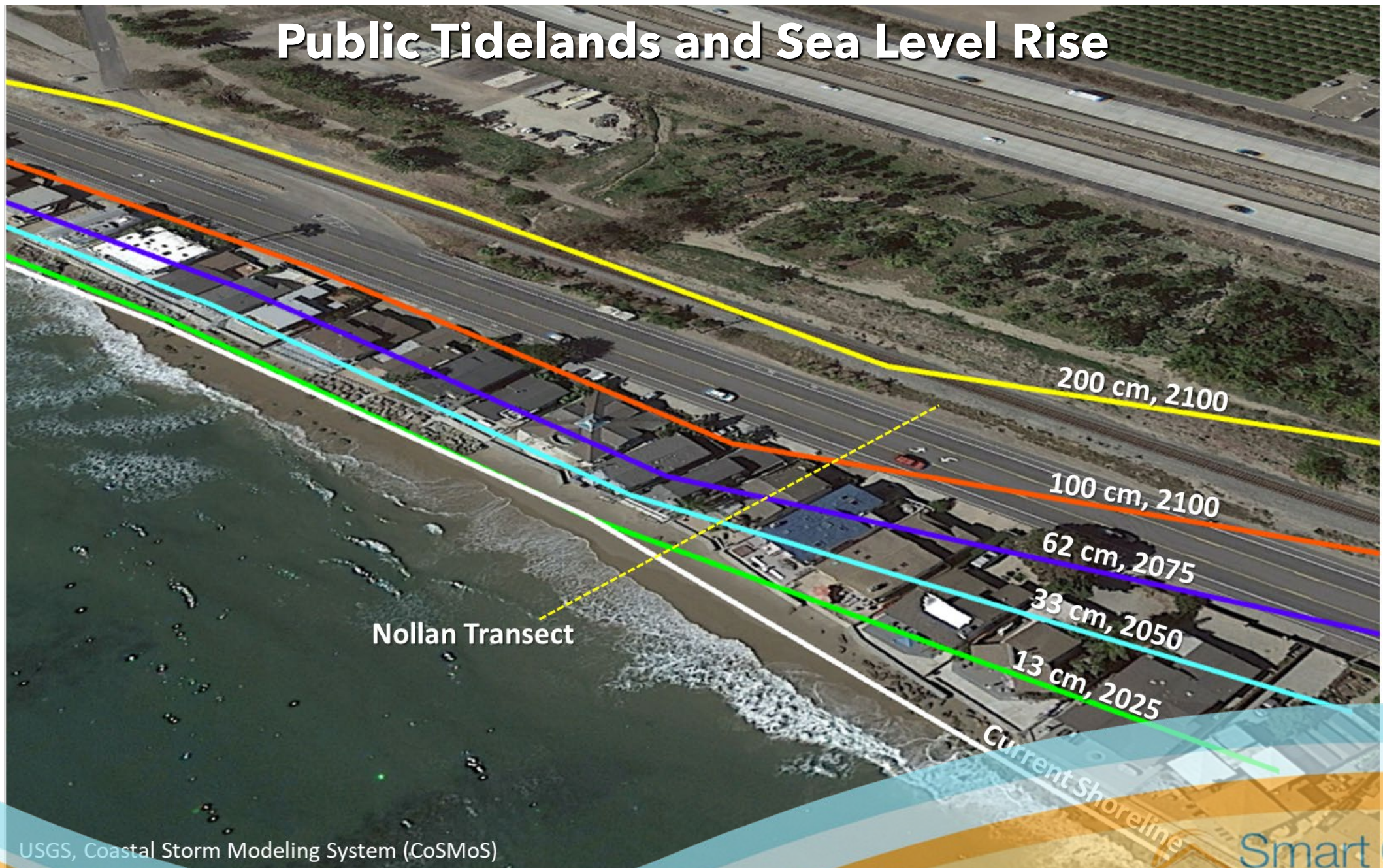
Minority Opinion (Brennan): The deed restriction . . . provide[s] a formal declaration of the public's right of access, thereby ensuring that the shifting character of the tidelands, and the presence of private development immediately adjacent to it, would not jeopardize enjoyment of that right.



Photo: Charles Lester



# Public Tidelands and Sea Level Rise



USGS, Coastal Storm Modeling System (CoSMoS)

C. Lester, Econ and Coastal Adaptation



# Public Tidelands and Sea Level Rise



**Kingtide 2019-2020**

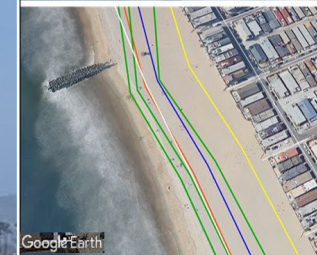
CA Kingtides, Photo 330, 2019-220 Ventura Faira Beach



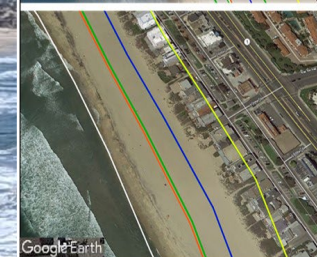
# Remove development if “no longer located on private property due to migration of the public trust boundary.”



**CosMos up to 9.75 ft SLR “erosion uncertainty”.**  
“The applicant further agrees, on behalf of himself and all successors and assigns, that the landowner(s) shall remove the development authorized by this permit, including the residence, garage, foundations, permitted encroachments, and patio if (c) the development is no longer located on private property due to the migration of the public trust boundary;” 5-17-0792 (Dhawan Family Limited Partnership); 5-19-0405(Maxwell); 5-18-0651 (Diversified Holdings, LLC)



**CosMos up to 200 cm SLR.**  
“In addition, the boundary between public tidelands and private land may shift with rising seas, the structure(s) may eventually be located on public trust lands, and the development approval does not permit encroachment onto public trust land; any future encroachment must be removed unless the Coastal Commission determines that the encroachment is legally permissible pursuant to the Coastal Act and authorizes it to remain, and any future encroachment would also be subject to the State Lands Commission’s (or other trustee agency’s) leasing approval.” 5-19-0272 (3805 Seashore Drive, LLC)



**CosMos up to 200 cm SLR.**  
“By acceptance of this permit, the applicant further agrees, on behalf of itself and all successors and assigns, that the landowner(s) shall remove the development authorized by this permit, including the residence, garage, foundations, and hardscape if: . . . (c) the development is no longer located on private property due to the migration of the public trust boundary; . . .” 5-17-0017 (Redhill) Sunset Beach

CoSMoS, *Id.*  
Note 21.

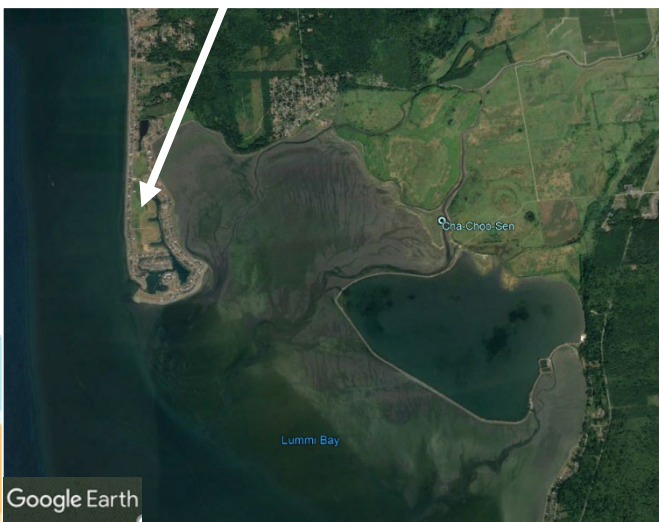
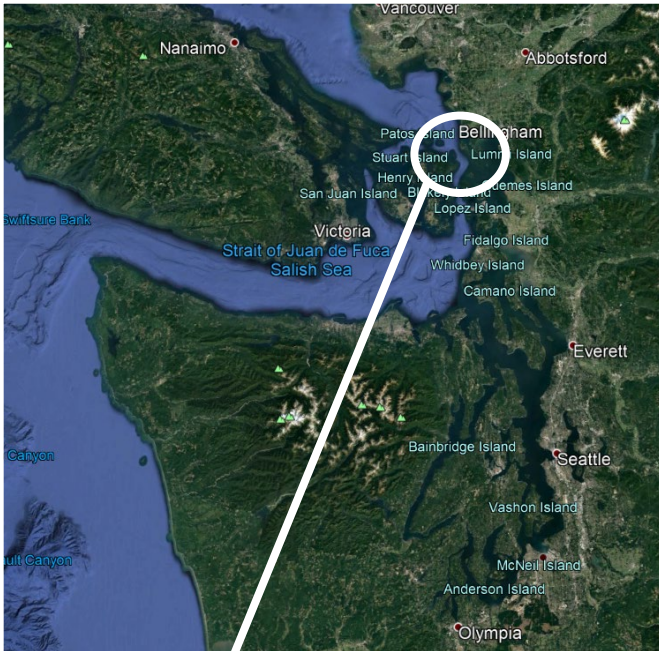


# United States v. Milner, 583 F.3d 1174 (9th Cir. 2009).

... both the tideland owner and the upland owner have a **right to an ambulatory boundary**, and each has a vested right in the potential gains that accrue from the movement of the boundary line.

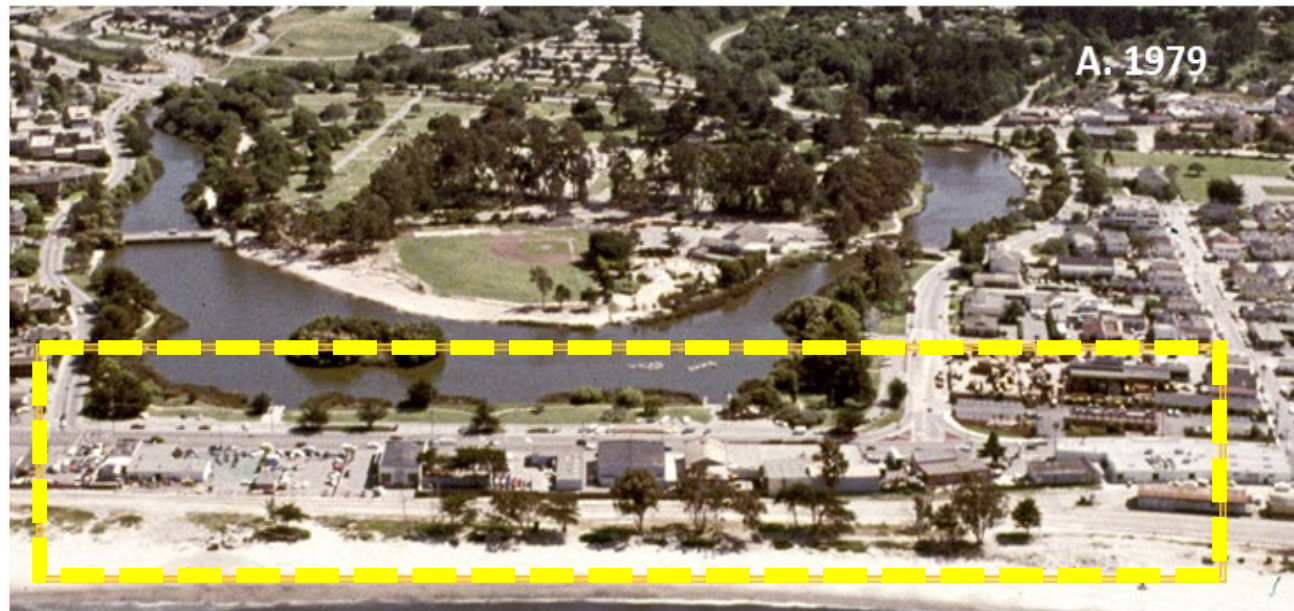


... the **Homeowners do not have the right to permanently fix the property boundary** absent consent from the United States or the Lummi Nation.





# City of Monterey, Window on the Bay





# Thank You



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Photo: Charles Lester