California’s Coastal Management Program

• San Francisco Bay Conservation and Development Commission (BCDC)

• California Coastal Commission (Outer Coast)

• State Coastal Conservancy
The Adaptation Challenge is great: Most urban footprints established before modern CZM

Santa Cruz Co, Opal Cliffs -- 1943

Santa Cruz Co, Opal Cliffs -- 1967

Source: http://library.ucsc.edu/maps/view-digitized-aerial-flight-photos-by-county
The Coastal Squeeze is Real
Coastal Act Hazards Management

**PRC 30253** requires that new development minimize risks to life and property and not require the construction of shoreline protective structures.

**PRC 30235** requires the Commission to approve shoreline structures for endangered existing development if it is the least environmentally-damaging, feasible alternative and sand supply impacts are mitigated.

➔ 76 local coastal government must complete a Local Coastal Program (LCP) to implement the Coastal Act.
Change can be Sudden and Episodic -- Pacifica
Change can be Sudden and Episodic -- Pacifica
Required Hazard Setbacks

Pre-Coastal Act

Required Setback
Inevitable Seawalls – Solana Beach

1989

2010
A private taking of the public beach?

Internalizing Externalities

➡️ $5.2 million mitigation fee
LCP Planning Grants

- 2014: $1,000,000, 11 awards
- 2015: $3,015,750, 24 awards
- 2016: $5,491,761, 38 awards
- 2017: $6,038,446, 45 awards
- 2018: $6,788,446, 50 awards
- 2019: $8,288,446, 62 awards
Accommodate:
- Siting and design standards
- Retrofit existing structures
- Stormwater management

Protect:
- Hard protection
- Soft protection/living shorelines
- Protect agricultural barriers for flood protection

Hybrid:
- Accommodate over short-term, relocate over long-term
- Update land use designations and zoning ordinances
- Redevelopment restrictions
- Permit conditions

Retreat:
- Limit new development in hazardous areas and areas adjacent to wetlands, ESA, other habitats
- Removal of vulnerable development
- Promote preservation and conservation of open space
Projected Shoreline at Goleta Beach – SB County:

2047 (52 cm slr), 2075 (118 cm slr), 2100 (200 cm slr)

C. Lester, EESI Wash. DC 12.04.2019
# Beach Widths Going to Zero

<table>
<thead>
<tr>
<th>SLR Amount</th>
<th>Beach Widths Going to Zero</th>
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</thead>
<tbody>
<tr>
<td>0 cm</td>
<td>Low</td>
</tr>
<tr>
<td>25 cm</td>
<td>High</td>
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<tr>
<td>50 cm</td>
<td>High</td>
</tr>
<tr>
<td>100 cm</td>
<td>High</td>
</tr>
<tr>
<td>200 cm</td>
<td>High</td>
</tr>
</tbody>
</table>

**Table 4: Beach Widths Over Time with SLR**

<table>
<thead>
<tr>
<th>Beach Width (ft)</th>
<th>Historic Rate (no SLR)</th>
<th>Historic Rate + Low SLR</th>
<th>Historic Rate + Mid SLR</th>
<th>Historic Rate + High SLR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2020</td>
<td>2030</td>
<td>2040</td>
</tr>
<tr>
<td>95</td>
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<tr>
<td>95</td>
<td>95</td>
<td>69</td>
<td>53</td>
<td>34</td>
</tr>
</tbody>
</table>

**Marin County**

**Del Mar**
Moss Beach Loss

1972

Today
Accommodating the Public Trust
Future vistas along the beach?
What to do about future private encroachments on public land?
Adaptation Strategy: Unplanned Retreat?
Gleason’s Beach, Sonoma County
Pacifica – Demo on the Esplanade
Defend, Elevate, Replenish, Retreat?

Del Mar stands firm against 'planned retreat'
Defend, Elevate, Replenish, Retreat?
The Cost of Retreat

At Broad Beach, $120 million = 12 homes on average

Zillow est. 12/9/2018
Solana Beach Sand Replenishment

- 150’ added beach width
- 7,200 linear feet
- Initial Volume = 700,000 cy
- Renourishment Volume = 290,000 cy
Photo-Simulation of Dune Restoration and Beach Nourishment
(Not To Scale)
Broad Beach GHAD:

“DEDICATED TO RESTORING AND PROTECTING MALIBU’S HISTORIC BROAD BEACH”

When will the public beach be made whole?
Environmental Justice Impacts of Eroding Beaches
SB 5: Local-State Sustainable Investment Incentive Program

An act to add Part 4 (commencing with Section 55900) to Division 2 of Title 5 of the Government Code, and to add Section 57.681.1 to the Revenue and Taxation Code, relating to local government.

LEGISLATIVE COUNCIL'S Inserts
Sitting 5, as introduced, Beall, Local-State Sustainable Investment Incentive Program.

Existing property tax law requires the county auditor, in each fiscal year, to allocate property tax revenue to local jurisdictions in accordance with special need, and in the absence of special need, to the County. This law is hereby amended to require, in each fiscal year, the allocation of property tax revenue to local jurisdictions for the purpose of providing local governments with a mechanism to finance local government projects.

80130. The sum of four hundred forty-three million dollars ($443,000,000) shall be available, upon appropriation by the Legislature, as competitive grants for projects that plan, develop, and implement climate adaptation and resiliency projects.

(E) Protecting communities dealing with the effects of sea level rise, which is one of the most significant threats of climate change, including the construction, repair, replacement, and maintenance infrastructure related to protecting communities from sea level rise.


CHAPTER 10. Climate Preparedness, Habitat Resiliency, Resource Enhancement, and Innovation

80130. The sum of four hundred forty-three million dollars ($443,000,000) shall be available, upon appropriation by the Legislature, as competitive grants for projects that plan, develop, and implement climate adaptation and resiliency projects.
Surfer’s Point, Ventura

Cardiff Beach Before & After

November 2018

February 2019

May 2019
Two Decades of Rolling Easements

- Assumption of Risk
- No Future Seawall
- Removal Required
- Foundation Design
Isla Vista Managed Retreat

1972

1989

2004

2013

C. Lester, EESI Wash. DC 12.04.2019
Resilience : Stilwell Hall, Fort Ord, 2003
Resilience: Fort Ord Dunes State Park, 2013
Planned Retreat of Infrastructure: Relocation of the Morro Bay Wastewater Treatment Plant to Water Reclamation Facility site.
Regulating Realignment of Highway One – Piedras Blancas

Emergency Revetment - 1997

Realignment, 300-500 ft. inland -- 2017

New Alignment

Restored Shoreline

Future Coastal Trail
Monterey – Window on the Bay
Monterey – Window on the Bay
Planned & Managed Retreat begins at the Half Moon Bay Ritz Carlton...
Concluding Observations

✓ Context Matters -- no single strategy is right
✓ Planning takes time and investment, and meaningful engagement
✓ Phased implementation with monitoring, thresholds for action
✓ Combination of strategies to structure incentives and provide options
✓ Fed, state, local partnerships are essential
✓ Social cost benefit assessment of alternatives
✓ Significant $$$ is needed for adaptation
✓ Managing change over decades in a dynamic, complex system
✓ Resilience is balance of cost effective risk reduction, environmental protection & stewardship and social equity.
Thank you to the California Coastal Records Project
https://www.californiacostline.org/