California Coastal Commission

Handouts for Senate Budget Subcommittee 2

Coastal Climate Adaptation

March 20, 2014

Handouts

Post WWII Development Boom: Most of California's urban coastal areas were substantially developed before the Coastal Act. The sea level rise adaptation challenge is to address existing development and redevelopment in inherently hazardous locations without adversely impacting coastal resources, including recreational beaches, wetlands, and sensitive shoreline ecologies.

Santa Cruz Co, Opal Cliffs -- **1943**

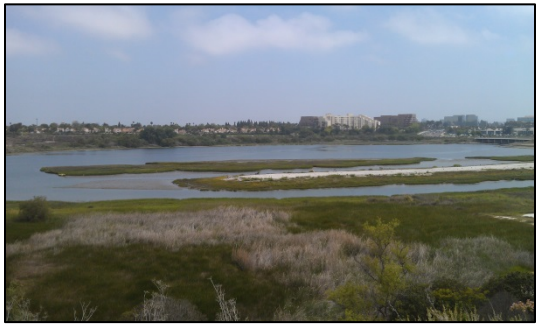
Santa Cruz Co, Opal Cliffs -- **1967**

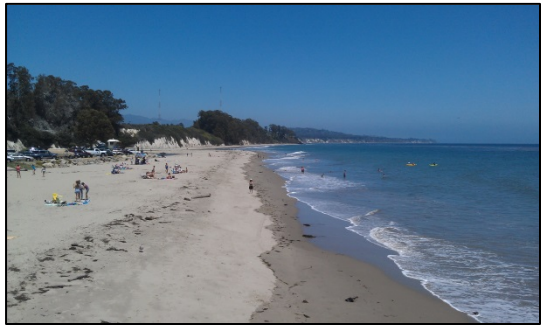
Source: http://library.ucsc.edu/maps/view-digitized-aerial-flight-photos-by-county

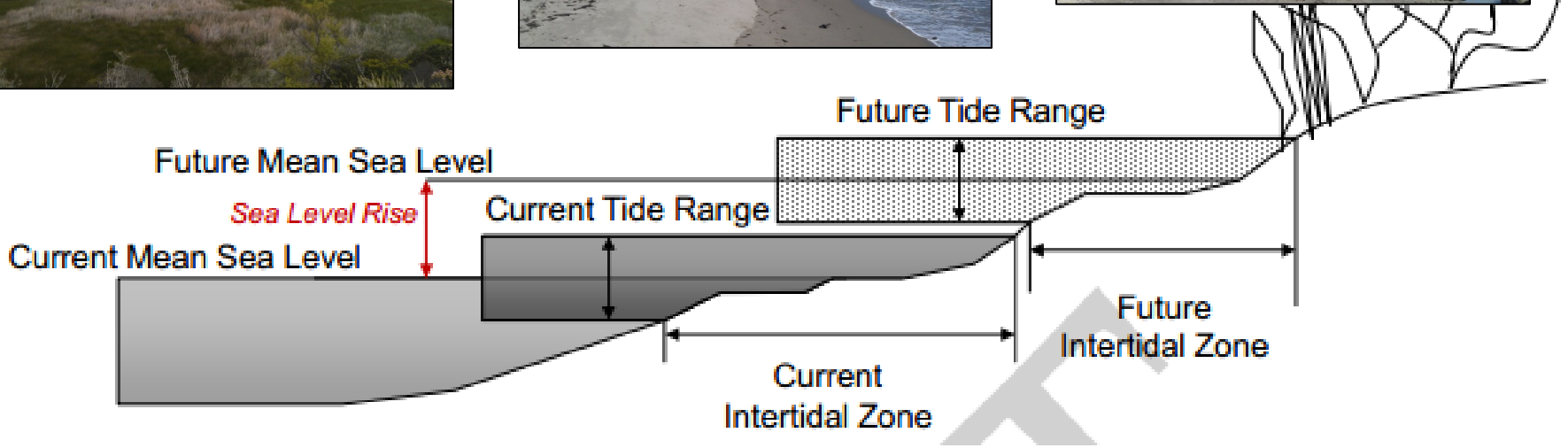
Lands End Apartments in Pacifica lost over 90 feet of bluff land in places over several months in 2009/10, illustrating the sometimes "episodic" nature of bluff erosion, and placing the buildings in an emergency situation. In August, 2013, the Commission gave its final approval to the large emergency seawall to protect the buildings. The approval included significant beach access improvements and in-lieu fees of over $500,000 to mitigate for impacts to public beach access and sand supply.

The Lands End apartments were built just before the Coastal Commission began regulating coastal development in 1973. At that time the apartments were set back from the bluff edge 150 feet based on an assumed 75 year life and 2 feet of erosion a year. The buildings were actually endangered less than 40 years later.

Water Level Determines Coastal Values and Constraints. The land-sea interface shapes wetland and intertidal habitat resources, defines our recreational beach spaces, and influences how we choose to develop along the shoreline. As sea level rises, these resource values and choices will necessarily change, depending in part on how we respond to rising seas.

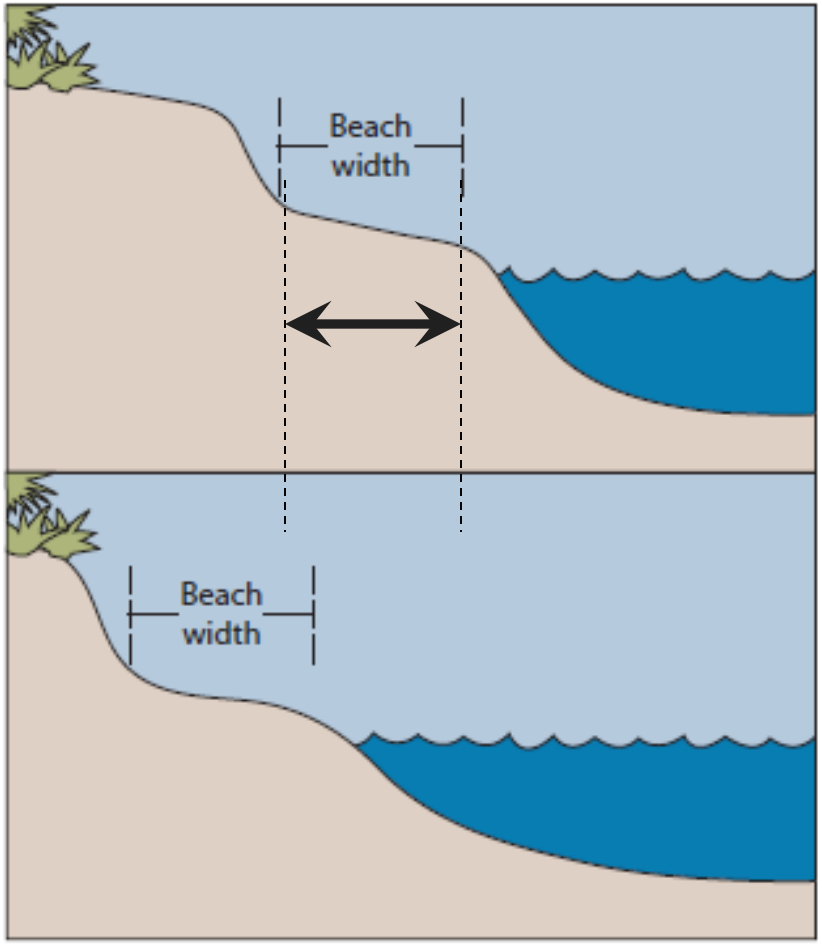




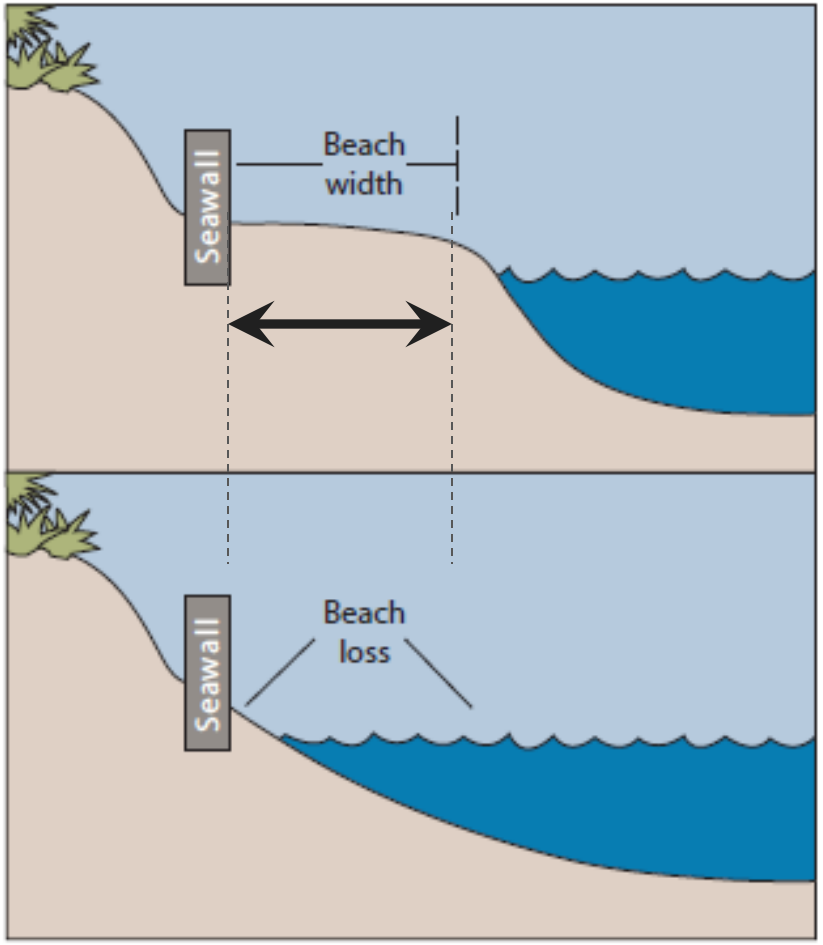


Hazard Response may lead to Beach Loss. When we build seawalls we prevent the beach from naturally retreating, leading to the loss of beaches due to "passive erosion." Absent the seawall, the beach will maintain its width, all other factors being equal.

Normal Beach Retreat



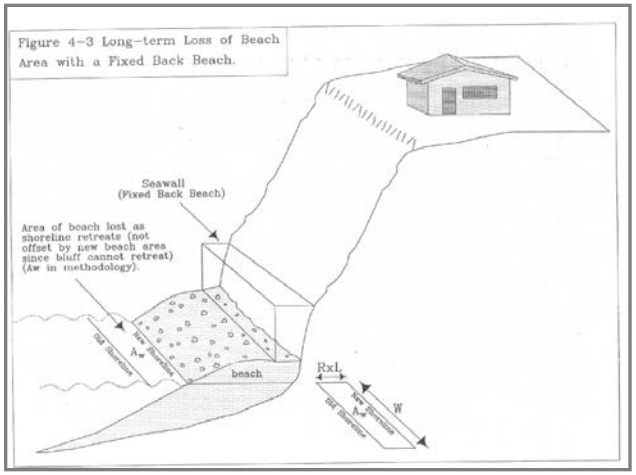
Blocked Beach Retreat



Climate Adaptation Challenge: Seawalls Lead to Lost Public Beaches

Passive Erosion at the Monterey Beach Hotel (pre-Coastal Act).

The beach in front of the hotel's seawall is gradually diminishing. Often lateral access is not possible at higher tides and storm conditions. Note the wider beach on either side of the seawall. Another example is shown of a large seawall in Santa Cruz County. The diagram below depicts the Coastal Commission's methodology for quantifying this seawall impact for mitigation purposes.



Climate Adaptation Challenge: Reactive & Emergency Response has Adverse Impacts

Shoreline Structure Impacts: Loss of Public Beach In 1995 the Coastal Commission completed a cumulative impact analysis of shoreline armoring in Monterey Bay, finding that approximately 25 acres of beach had been lost due to encroachment of shoreline structures. The inset illustrates the Commission's method used to quantify "encroachment" impacts.

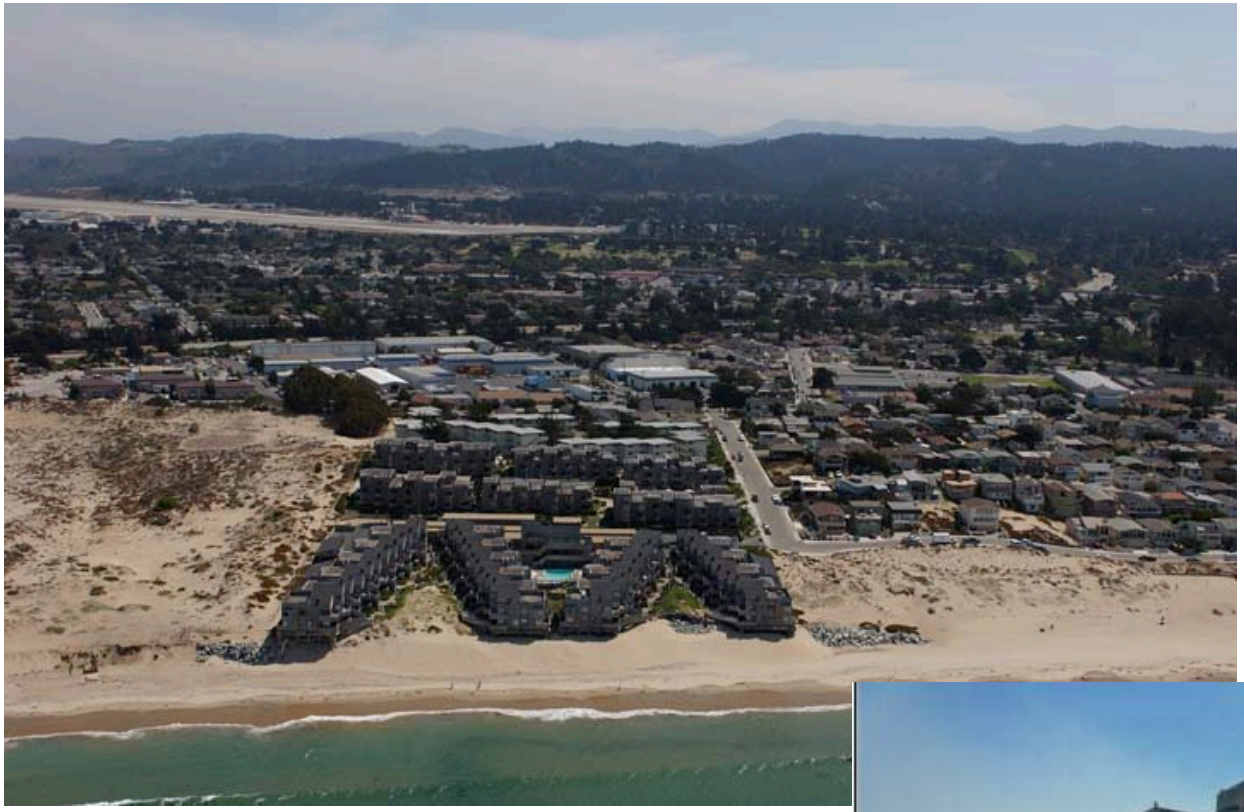
Shoreline Structures also block lateral public beach access and retain thousands of cubic yards of beach sand supply behind them that should be replenishing beaches. Ad hoc emergency response can destroy natural shorelines and aesthetics.

Blocked Public Access

Lost Beach Sand

Aesthetic Impacts

Climate Adaptation Challenge: Mitigating Impacts to Public Access and Recreation



Asking property owners to pay the true costs of sea walls. The Coastal Commission required the Ocean Harbor House Homeowners to pay a $5.3 million in-lieu fee ($2.1 million present value) for lost recreational beach values over the life of the seawall approved to protect this pre-Coastal Act condominium complex in Monterey.

The Coastal Commission's required mitigation fee will be used to provide public shoreline access in another location in the vicinity of the project, since the beach in front of the condos will be lost to passive erosion and rising tides. Eventually the development will begin to form an impassable peninsula out into the surf zone.

Climate Adaptation Challenge: Mitigating Seawall Impacts by Replicating Nature

The Pleasure Point Seawall in Santa Cruz, designed, sculpted, and colored to mimic the natural shoreline at this popular surfing and public access point.

A sea cave collapse . . .

. . . made to blend in with the surrounding landform.

Climate Adaptation Challenge: Siting New Development Out of Harm's Way

Local Coastal Programs (LCPs) and Hazards Management: This photo shows the effect of required bluff top setbacks approved by the Coastal Commission as part of the City of Pismo Beach LCP. The subdivision in the middle of the photo was required to be setback a minimum distance to assure safety from bluff erosion, Public access was also required in front of the development. The development on the left side of the photo was constructed before the Commission's regulatory program came into being.

Climate Adaptation Challenge: Avoiding Unnecessary Shoreline Protection

The Ritz in Half Moon Bay.

The Coastal Commission worked with the Ritz Hotel in Half Moon Bay to remove an unnecessary revetment that had been placed on the beach below the 18th green of the golf course. The Commission found that there was no development in danger and thus that the rocks were not consistent with the Coastal Act requirement to limit shoreline protection to that necessary to protect existing structures in danger from erosion. In addition to being unnecessary, the revetment covered up beach area, interfered with lateral public beach access, and adversely impacted the natural shoreline aesthetic. As seen below, the beach recovered once the revetment was removed.

Climate Adaptation Challenge: Planned Retreat to Protect Coastal Resources

Restoration of the Beach and Public Access at Stilwell Hall

When the Army proposed demolition and removal of Stilwell Hall at Fort Ord in Monterey County, the Commission required the removal of the rock revetment that had been placed on the beach below to protect the building. As seen in the top photo, the rocks effectively blocked lateral beach access due to encroachment and "passive erosion" in front of the rocks. Notice that where the beach was able to retreat naturally on either side of the revetment, the beach was maintained.

In the bottom photo, you can see that soon after the revetment was removed, the beach easily restored itself through the renewal of natural erosion dynamics. This beach and bluff top is now part of Fort Ord Dunes State Park.

Climate Adaptation Challenge: Planned Retreat to Provide Resilient Communities

City of Monterey Window on the Bay. Over the last several decades the City has worked deliberately with willing sellers to convert a developed commercial shoreline strip to a public recreational space.

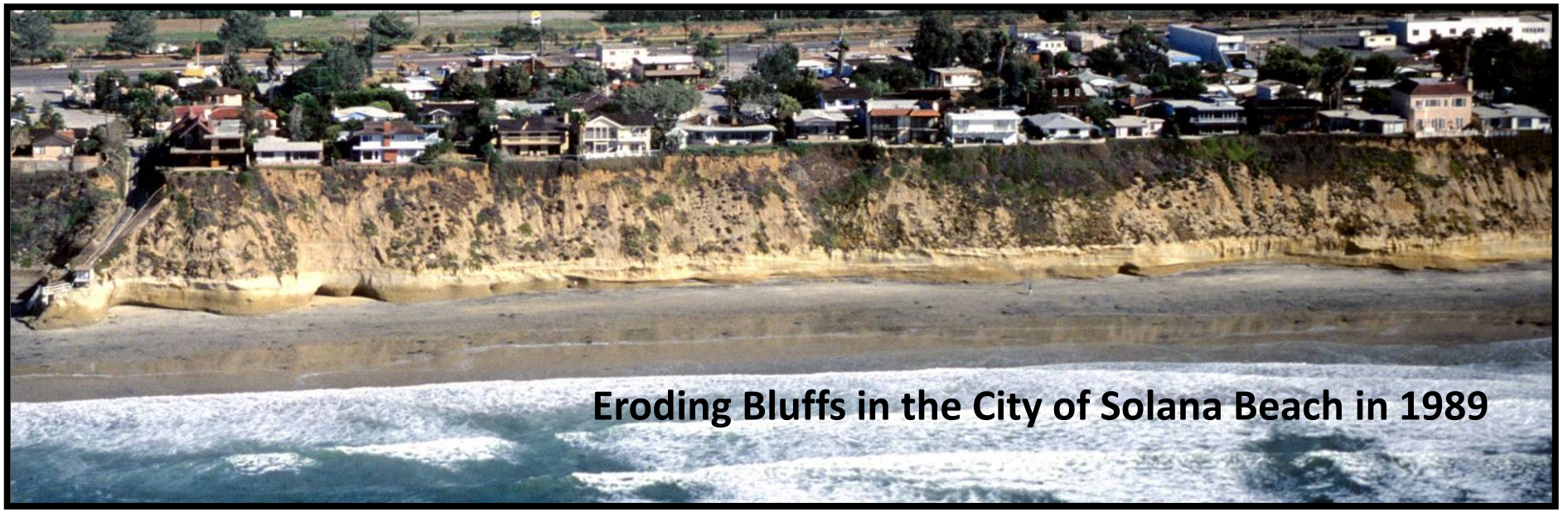
See, http://www.monterey.org/en-us/departments/montereyrecreation/parksandbeaches/windowonthebay.aspx

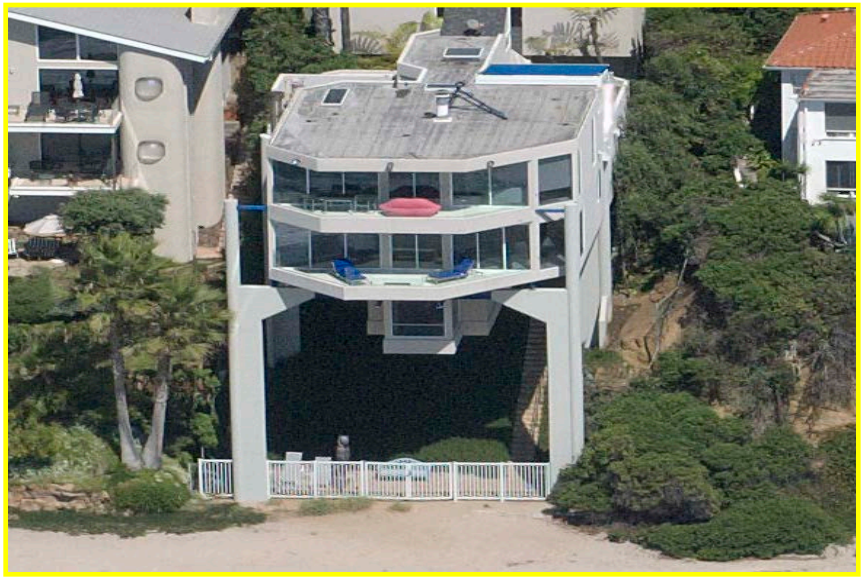
Adaptation Challenge: Extreme Events & Risk to Public Transportation & Infrastructure

Union Pacific Rail line in Elkhorn Slough. This main coastal north-south rail corridor carries freight traffic and Amtrak's Coast Starlight train. The photo shows the tracks partially submerged during a high tide event. Photo taken January 1, 2014

Coastal Highway One at Surfer's Beach in San Mateo County. This major transportation corridor is endangered during extreme events. The public recreational beach seaward of the highway is already overtaken at higher tide events.

Adaptation Challenge: Protecting Existing Urban Areas and Public Beach Resources



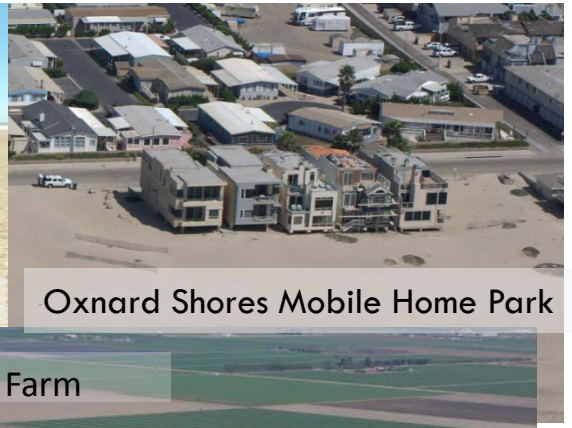


Adaptation Challenge: People will adapt, the question is how? And at what cost? Updated LCP Planning and coastal development regulation can shape our future community adaptation options.

Adaptation Challenge: LCP and Climate Change Adaptation Planning is Complex, involves many stakeholders, multiple resources, and challenging scientific and analytic questions. In one area alone, all of the resources below need to be assessed and planned.


McGrath State Beach


Oxnard Beach State Park


Oxnard Shores Mobile Home Park


Visitor serving facilities, Oxnard


Oxnard Farm Fields

Reliant Ormand Beach Generating Station


Port of Hueneme


Ormand Beach Wetlands

Climate Adaptation Challenge: Planned Retreat for Major Public Infrastructure

Coastal Highway 1 at Piedras Blancas…

at Gleason's Beach in Sonoma…

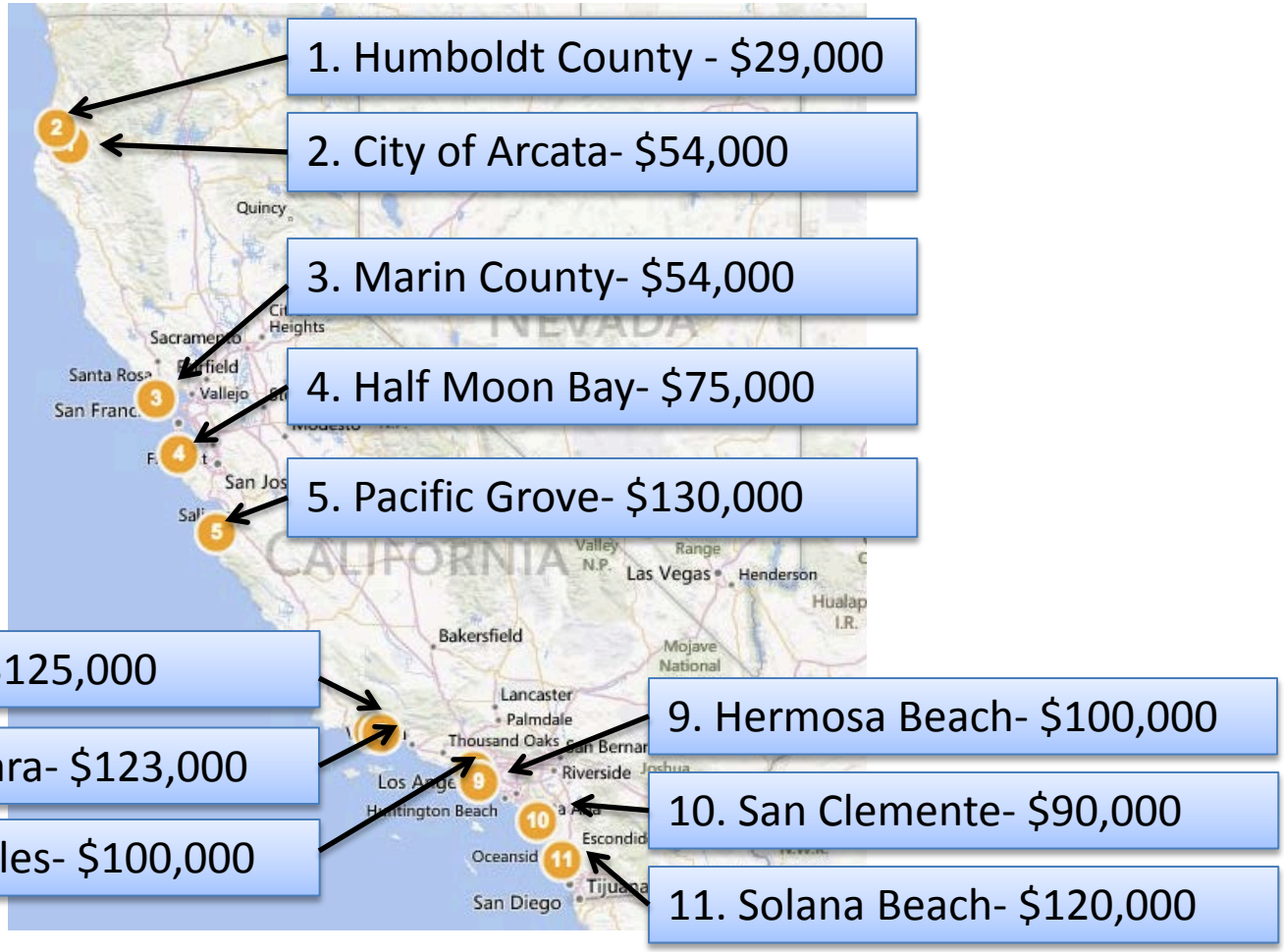
and at Pescadero in San Mateo.

Planning for Hazards to Infrastructure

The Coastal Commission has been working with Caltrans and other public agencies to plan for the relocation of major public infrastructure. At Piedras Blancas in San Luis Obispo County, Highway One will be realigned to provide 100 more years of protection from shoreline erosion.

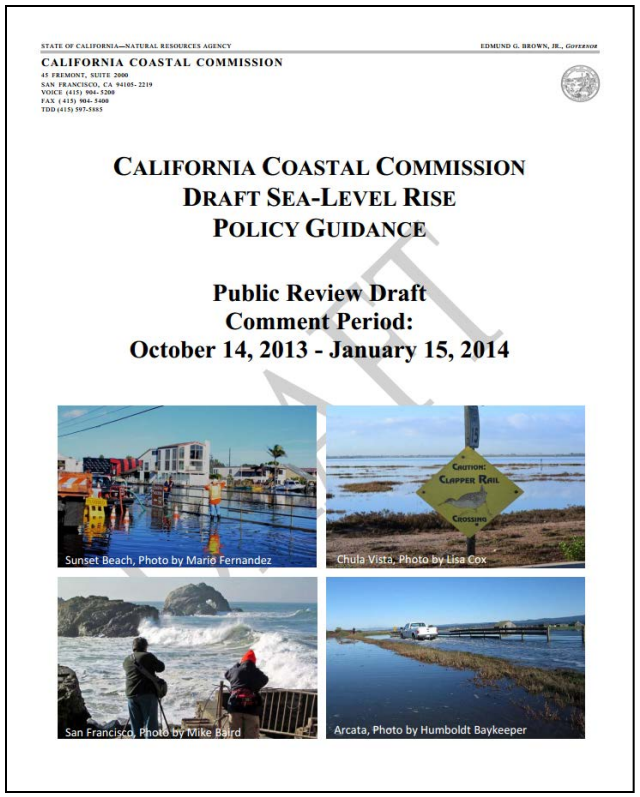
Climate Adaptation Challenge: State and Local Planning Capacity

Coastal Commission LCP Grants Awarded



LCP Planning Challenge. The Coastal Commission works with 76 local governments: 15 counties and 61 cities. There are currently 92 LCP segments that average more than 25 years old and that need to be updated, including to address climate change. **Grants:** $5.2 million requested (28 applications), **$1 million** awarded January 8, 2014.

Coastal Commission's Draft Sea-Level Rise Guidance



- Use Best Available Science
- Assess local risks and impacts
- Analyze Planning Scenarios and Development Constraints
- Identify Adaptation Measures
- Update LCPs/Design Projects to address hazards (be adaptive) and protect other coastal resources
- Monitor and Revise

Charles Lester, California Coastal Commission, Senate Budget Subcommittee 2, 3/20/2014