CALIFORNIA COASTAL COMMISSION

SEA LEVEL RISE ADAPTATION PLANNING

IMPLEMENTING STATEWIDE SLR GUIDANCE

Monterey County
Board of Supervisors
2/8/2021

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CALIFORNIA
COASTAL
COMMISSION

COASTAL HAZARDS

- **Inundation** – increased extent of permanently wet areas
- **Flooding** – increased extent of storm/extreme tide floods (temporarily wet)
- **Erosion** – accelerated erosion of bluffs, dunes, and beaches
- **Groundwater Change** – rising groundwater tables and saltwater intrusion

COASTAL HAZARDS

Beach flooding and loss, Del Mar

Pasture flooding near Liscom Slough, Arcata

Flooding at Ledbetter Beach, Santa Barbara

COASTAL HAZARDS


King Tide, January 2020 Pacific Grove


Bluff erosion, Isla Vista


El Niño Storms, Jan. 2016 Pacifica Pier

COASTAL HAZARDS


Highway 1, Half Moon Bay


Wastewater outflow at Ocean Beach, San Francisco


Railroad, Elkhorn Slough


Mandalay Generating Station, Oxnard

STATEWIDE SLR PLANNING

- **S-13-08** State climate strategy & SLR adaptation
- **B-30-15** Climate change considerations in planning and investment
- **AB 2800** State agency consideration of climate change; impacts to infrastructure
- **SB 379** Climate adaptation in safety elements
- **AB 691** SLR vulnerability assessments for public trust lands

CALIFORNIA OCEAN PROTECTION COUNCIL

John Laird, Secretary for Natural Resources, Council Chair
Gavin Newsom, Lieutenant Governor, State Lands Commission Chair
Linda Adams, Secretary for Environmental Protection
Susan Golding, Public Member
Geraldine Knatz, Public Member
Fran Pavley, State Senator
Toni Atkins, State Assemblymember

STATE OF CALIFORNIA SEA-LEVEL RISE GUIDANCE DOCUMENT

Developed by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust

Making California's Coast Resilient to Sea Level Rise: Principles for Aligned State Action

Background

- California's coast, bays, estuaries, and ocean are critical to the state's environmental and economic security, integral to our quality of life, and an iconic part of the state's legacy. Each generation of Californians has an obligation to be strong stewards of the coast and ocean for future generations.
- However, Californians' safety, local and state economies, critical infrastructure, and natural resources face increasing threats from sea level rise (SLR). Every scientific assessment since California's 2009 Climate Adaptation Strategy has revealed that coastal impacts from climate change-caused SLR will occur more quickly and be more severe than previously projected. **California's coast faces a significant risk of experiencing SLR of up to 1.0 feet by 2030 and 7.6 feet by 2100.**
- Warming temperatures and a higher frequency of extreme weather, in conjunction with high tide events, have already resulted in SLR impacts at Imperial Beach, Seal Beach, Del Mar, Pacifica, Arcata, areas along San Francisco Bay, and elsewhere.
- Projections of future SLR point to **significant impacts to California communities**, with considerable environmental justice implications, upwards of hundreds of billions of dollars in impacts to property and development, impacts to statewide and regional water supplies, as well as significant damage to and loss of many miles of beaches, tidepools, coastal rivers, estuaries, and wetlands.
- To improve effectiveness in addressing this immediate challenge, state and regional agencies co-developed and endorsed the following Principles for Aligned State Action.

Photo: Embarcadero, San Francisco, "King Tides," Mike Filippoff

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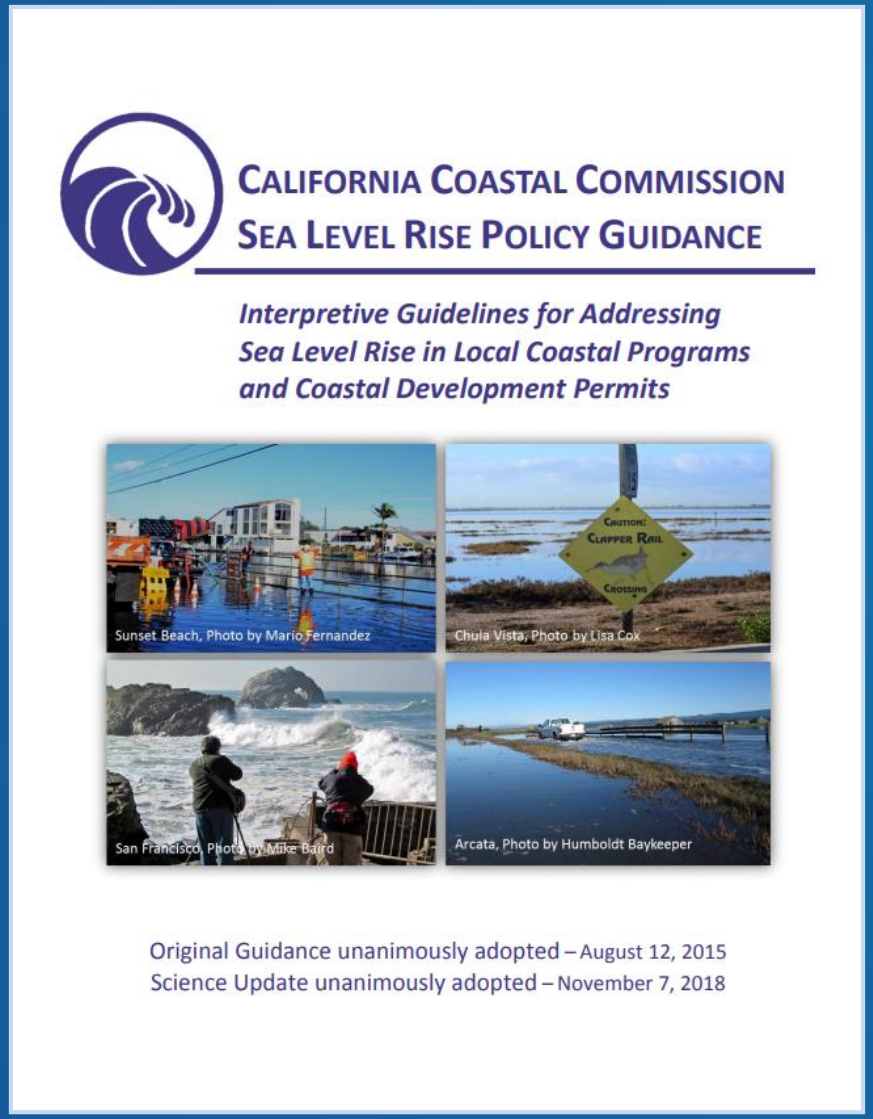
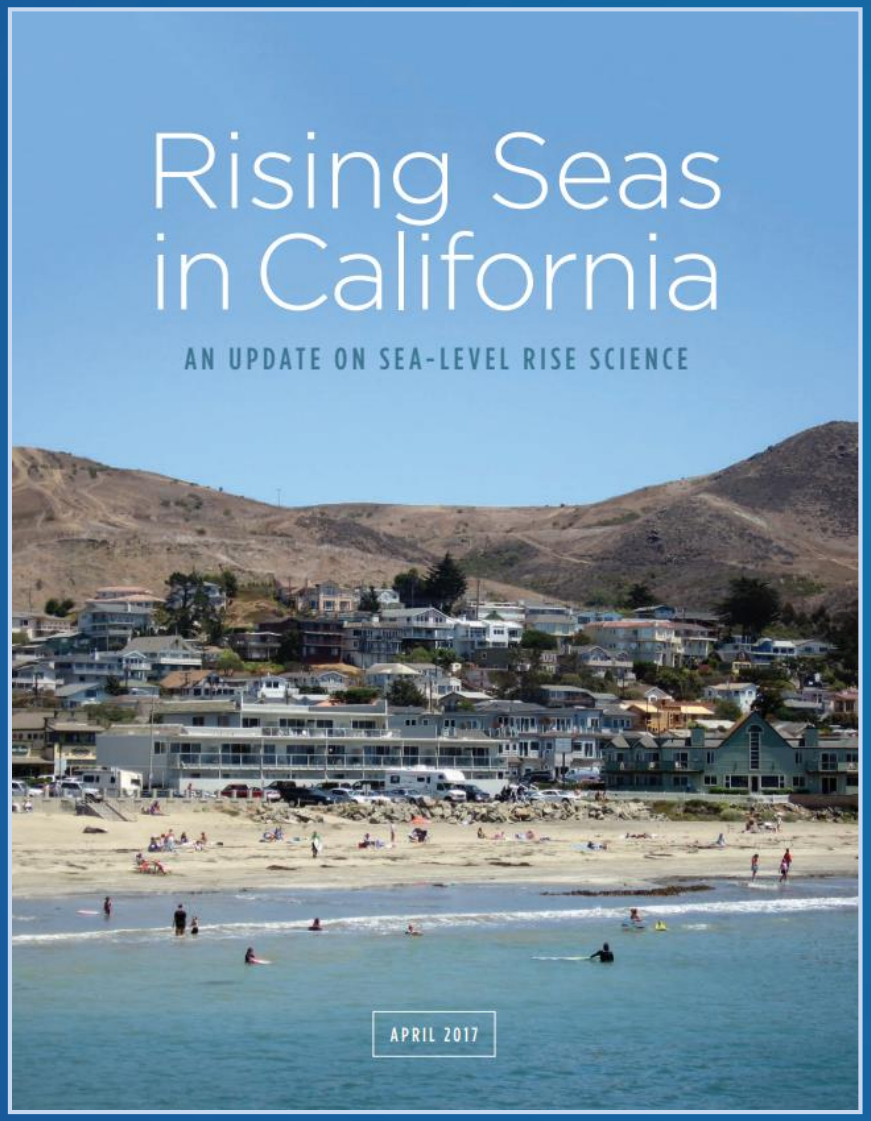
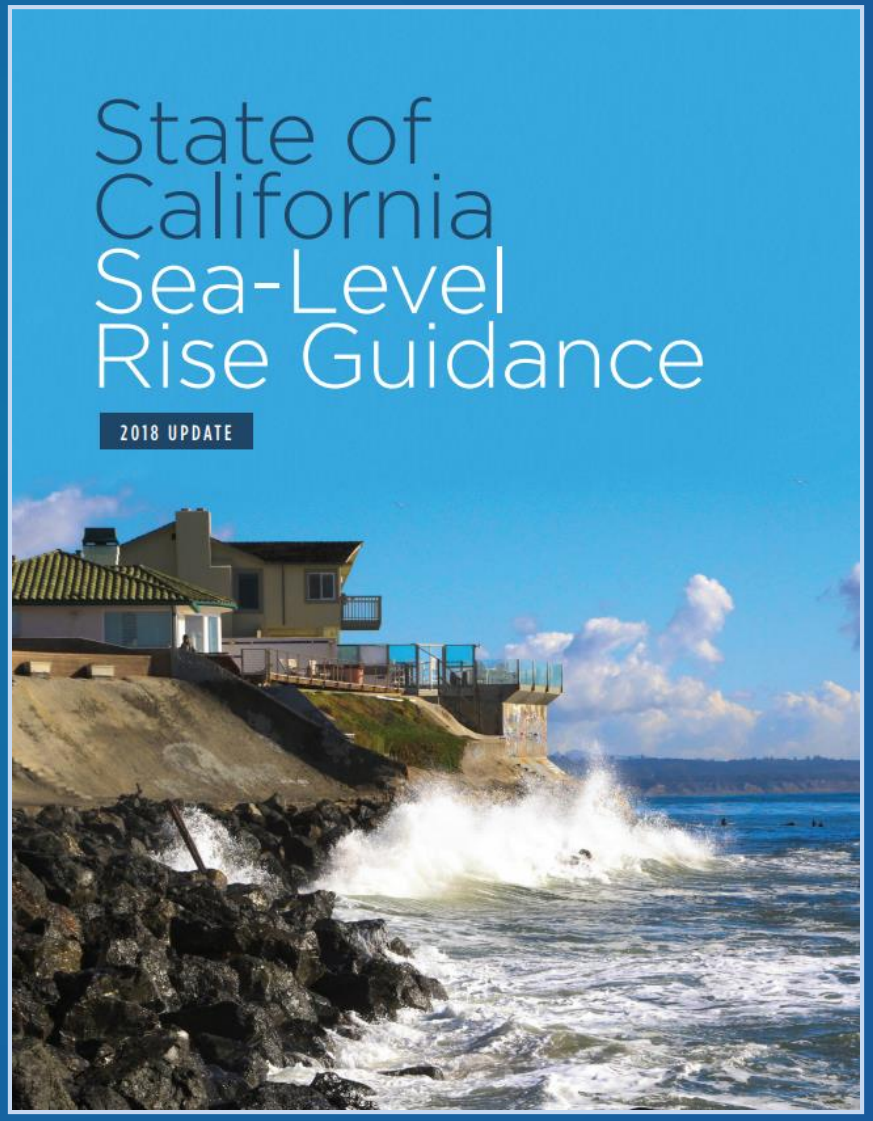
CCC SLR POLICY GUIDANCE



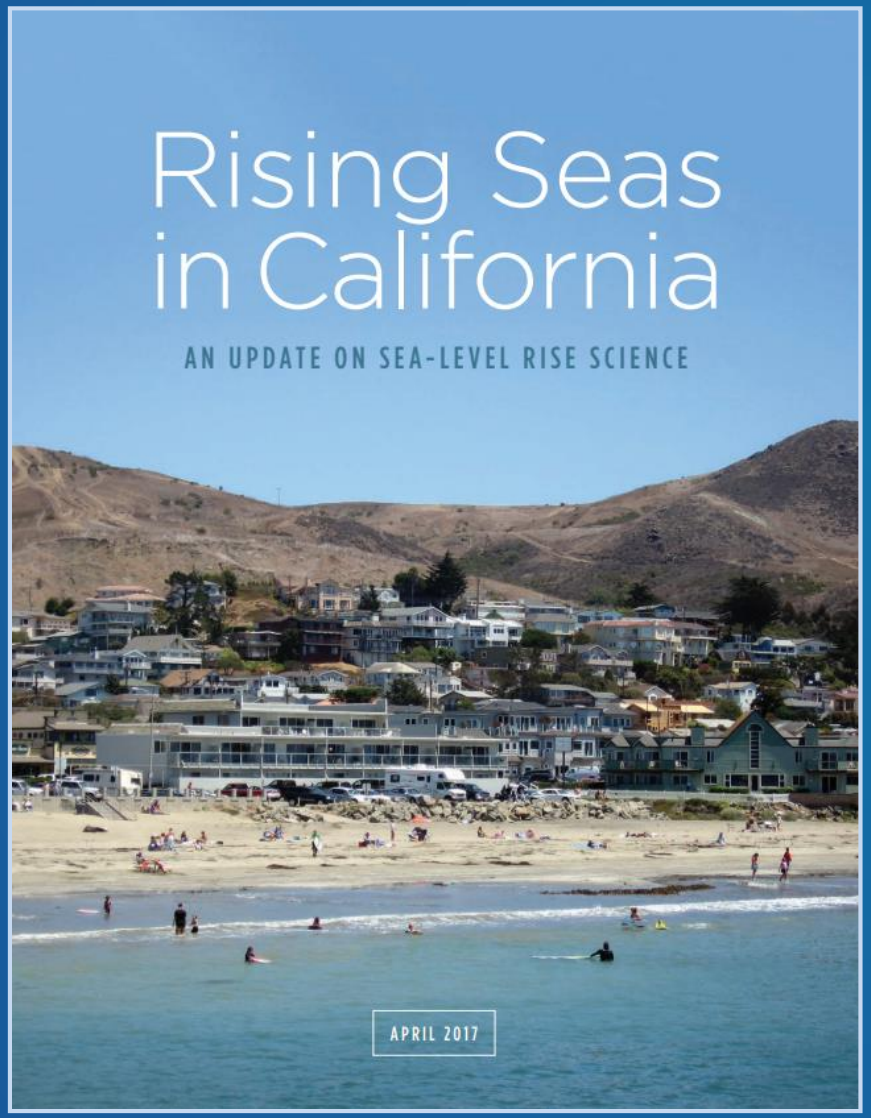
- Overarching guidance from the OPC State SLR Guidance, information specific to CCC context
- Guiding Principles
  - Use best available science
  - Precautionary approach
  - Prioritize natural adaptation options
  - Phased adaptation approaches

UPDATED SLR PROJECTIONS





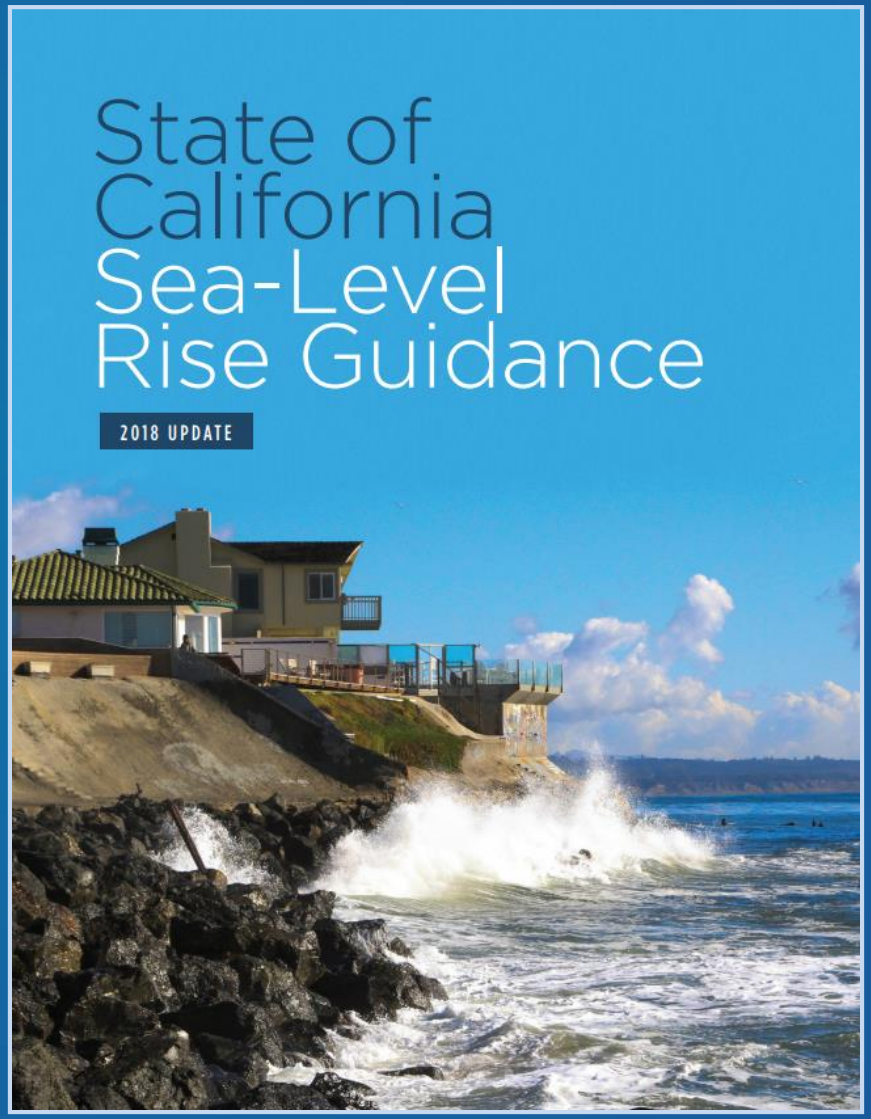
UPDATED SLR PROJECTIONS



- Released April 2017 by a working group of the OPC Science Advisory Trust
- Synthesis of state of the science on sea level rise
- Significant findings:
  - Potential for extreme SLR
  - Probabilistic SLR projections

UPDATED SLR PROJECTIONS

- Update to the 2013 OPC State SLR Guidance
- Updated SLR projections, and recommendations for identifying appropriate projections
- Preferred coastal adaptation approaches



UPDATED SLR PROJECTIONS

Projected Sea Level Rise (in feet): *Monterey*

	Probabilistic Projections (in feet) (based on Kopp et al. 2014)		H++ Scenario (Sweet et al. 2017)
	Low Risk Aversion	**Medium-High Risk Aversion**	**Extreme Risk Aversion**
	Upper limit of "likely range" (~17% probability SLR exceeds...)	*1-in-200 chance (0.5% probability SLR exceeds...)*	*Single scenario (no associated probability)*
2030	0.5	0.8	1.0
2040	0.8	1.2	1.7
2050	1.1	1.9	2.7
2060	1.4	2.6	3.8
2070	1.8	3.4	5.1
2080	2.3	4.4	6.6
2090	2.8	5.5	8.2
2100	3.3	6.9	10.1
2110*	3.4	7.2	11.8
2120	4.0	8.5	14.0
2130	4.5	9.9	16.4
2140	5.1	11.3	18.9
2150	5.7	12.9	21.8

UPDATED SLR PROJECTIONS

Identify appropriate projections based on project type, risk tolerance, potential consequences:

Low risk aversion scenario

Use for projects that would have limited consequences or a higher ability to adapt

Medium-high risk aversion scenario

Use for projects with greater consequences and/or a lower ability to adapt

High risk aversion scenario

Use for projects with little to no adaptive capacity that would be irreversibly destroyed or significantly costly to repair, and/or would have considerable public health, safety, or environmental impacts

ADAPTATION IN ACTION

Project Denial
Morro Bay WWTP

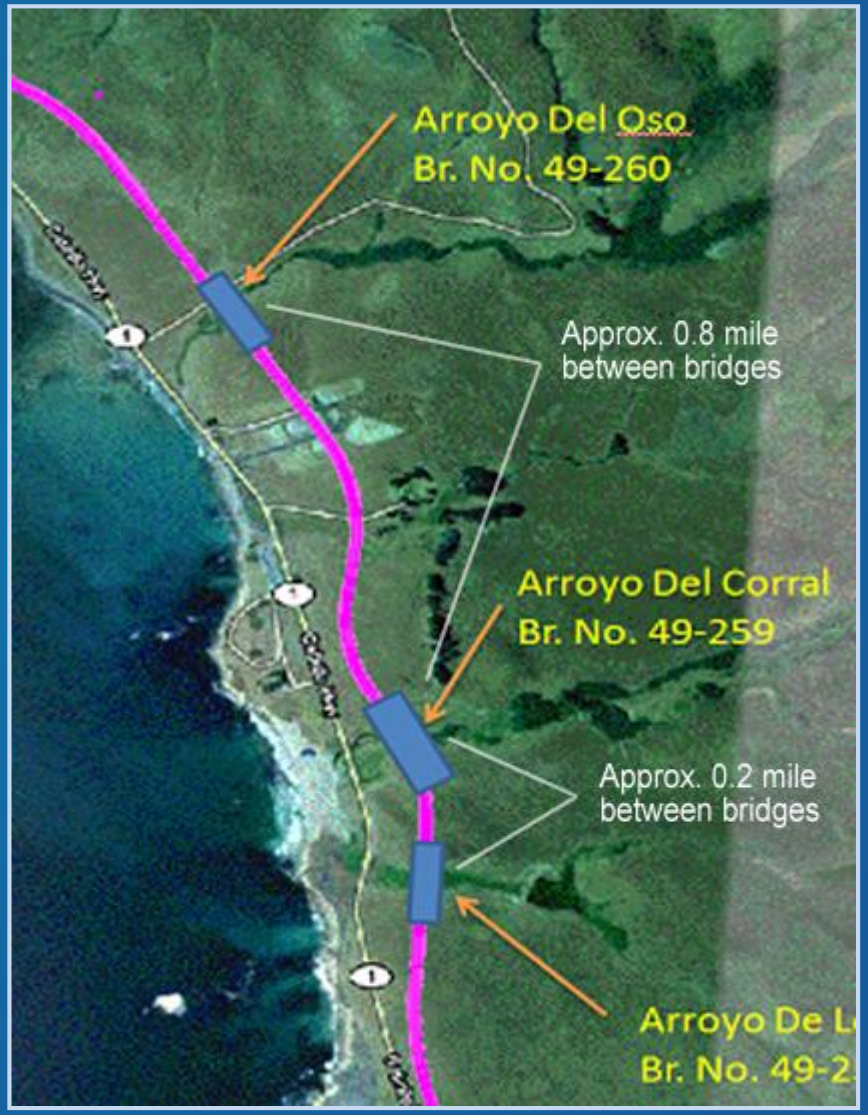
ADAPTATION IN ACTION

New development with conditions
Monterey Bay Shores Resort

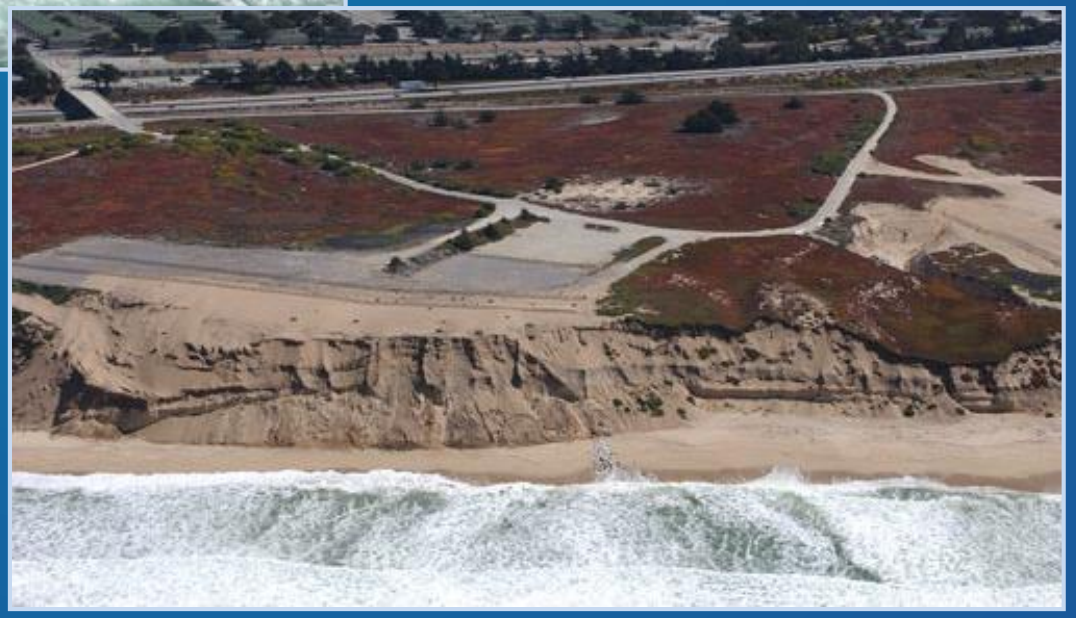
ADAPTATION IN ACTION

Address existing hazards

Hwy. 1 realignment, Piedras Blancas



ADAPTATION IN ACTION



Removal of Stillwell Hall and armoring, Monterey

ADAPTATION IN ACTION

Humboldt Co.
Trinidad
Arcata
Fort Bragg

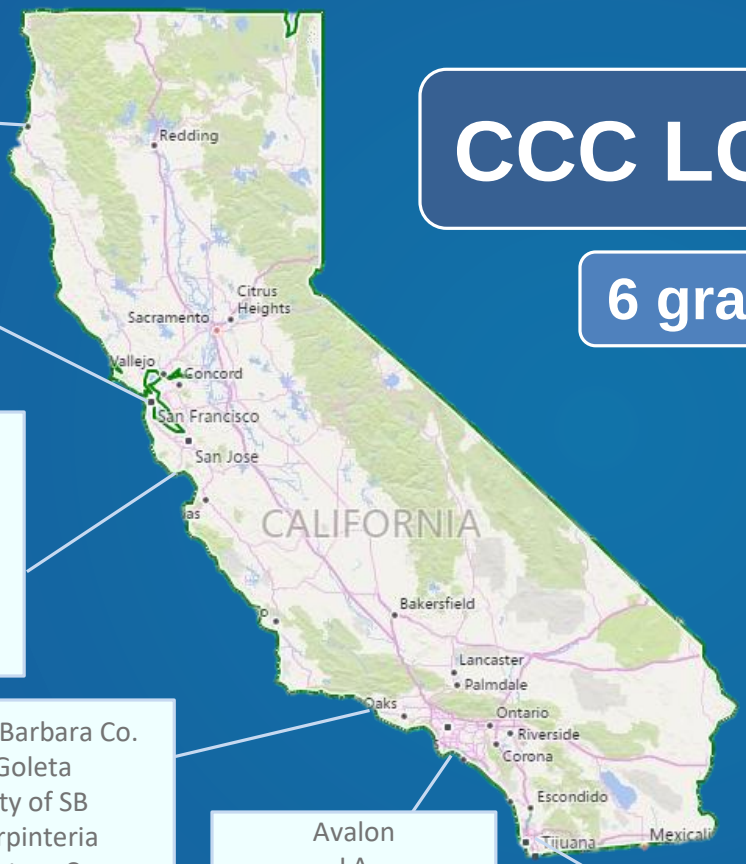
Sonoma Co.
Marin Co.
San Francisco
Pacifica
Half Moon Bay

Santa Cruz
Marina
Monterey
Pacific Grove
San Luis Obispo Co.
Morro Bay
Pismo Beach

Santa Barbara Co.
Goleta
City of SB
Carpinteria
Ventura Co.
Oxnard
Malibu

Avalon
LA
Manhattan Beach
Hermosa Beach
Seal Beach
Huntington Beach
Newport Beach
Dana Point
San Clemente

San Diego Co.
City of SD
Oceanside
Carlsbad
Solana Beach
Del Mar
Imperial Beach



CCC LCP Grant Program

6 grant rounds have awarded…

…~$7 million for…

…62 projects to…

…40 local jurisdictions.

ADAPTATION IN ACTION

Setbacks/project design that incorporate SLR

Deed restrictions/real estate disclosures

ADAPTATION IN ACTION

Location-specific adaptation strategies

Alignment of LCPs, LHMPS, GPs, etc.

SF Ocean Beach

Santa Cruz County

ADAPTATION IN ACTION

Triggers for additional requirements in the future

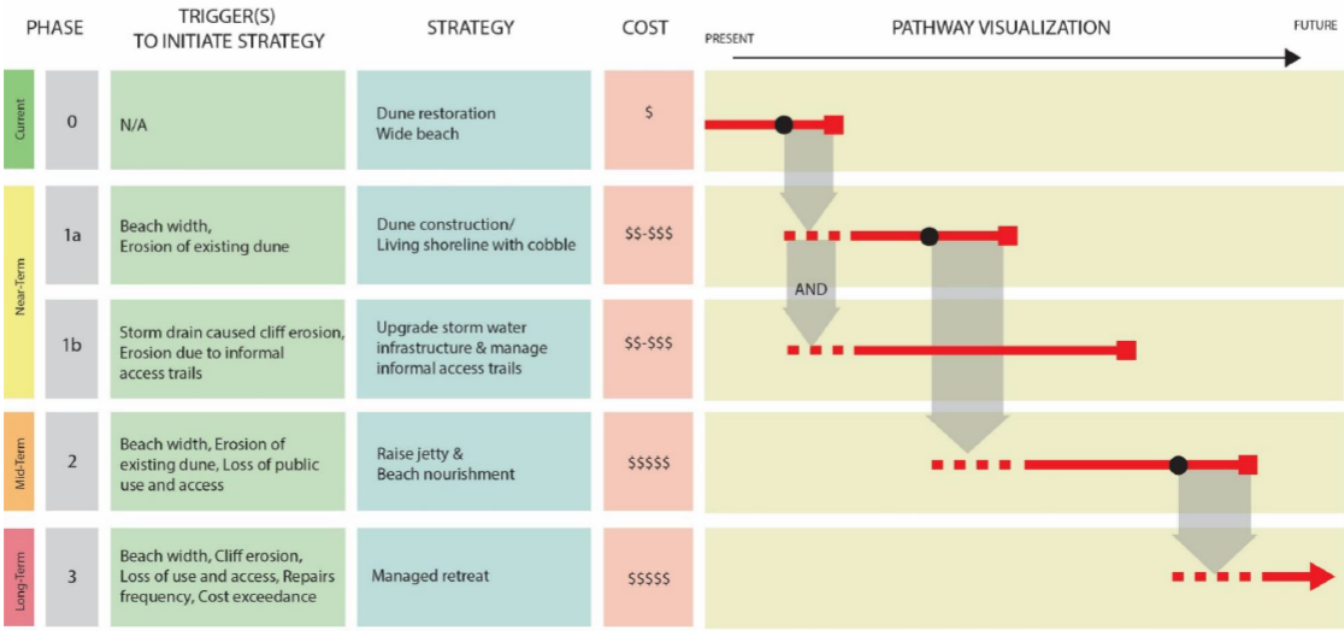


Figure 77. Seabright adaptation pathway: moratorium on new armoring

ADAPTATION IN ACTION

CCC and Local Government SLR Working Group

Monterey, King Tide Nov. 2020

- Members from CCC, CSAC, & League of Cities
- Joint Statement on Adaptation Planning adopted Nov. 2020
- Shared principles for addressing SLR through LCP policy development, adaptation planning, and project decision making

ADDITIONAL GUIDANCE

CALIFORNIA COASTAL COMMISSION
RESIDENTIAL ADAPTATION
POLICY GUIDANCE

Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs

Photo Credit: Mary Matella

MARCH 2018

REVISED

Critical Infrastructure at Risk:

Planning Guidance for California's Coastal Zone

Coming Soon!

under the Coastal Zone Management Act of 1972, as amended, and administered by the Office for Coastal Management, National Oceanic and Atmospheric Administration (NOAA).

THANK YOU!

coastal.ca.gov/climate/slr

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