

South Imperial Beach, TRNERR



# CALIFORNIA COASTAL COMMISSION DRAFT SEA-LEVEL RISE POLICY GUIDANCE

17 September 2014

CMANC Fall 2014 Meeting



CALIFORNIA  
COASTAL  
COMMISSION

# Overview of Presentation

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- California Coastal Commission and Coastal Act
- Coastal Commission's Draft Sea Level Rise Policy Guidance
  - Planning Guidance for Local Coastal Programs
  - Permit Guidance for Coastal Development Permits
- Next Steps for the Draft Sea Level Rise Guidance
- Identified Research Needs







McGrath State Beach | [www.caopensapce.org](http://www.caopensapce.org)



Oxnard Beach | Flickr user Surfingsanders



Oxnard Shores Mobile Home Park | California Coastal Records Project



Rincon Beach, Ventura, CA | Dec 2012

David Powdrell



Oxnard Farm Fields

Reliant Ormand Beach Generating Station | California Coastal Records Project



Port of Hueneme | [portofhueneme.org](http://portofhueneme.org)



Ormand Beach Wetlands | Sierra Club

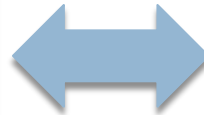
# Contents of the Draft Document

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## Executive Summary

### Main Report

Chapter 1: Introduction  
Chapter 2: Guiding Principles  
Chapter 3: Science  
Chapter 4: Guidance for LCPs  
Chapter 5: Guidance for CDPs  
Chapter 6: Additional Research  
Chapter 7: Next Steps  
Chapter 8: Glossary



### Appendices

Appendix A: Science  
Appendix B: Coastal Engineering  
Appendix C: Adaptation Options  
Appendix D: LCP Resources  
Appendix E: Other Agencies' Programs  
Appendix F: Coastal Act Policies



# About the Draft Document

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## IT IS

Draft

Draft Guidance for addressing Sea-Level Rise in conformance with the Coastal Act

Complement to other Commission materials

Multi-purpose guidance in which users may focus on particular chapters

A list of sea-level rise adaptation options to choose from

A living document

## IT IS NOT

Final

New regulations

Replacement for other Commission materials

Meant to be read cover to cover

A checklist of adaptation measures where all items have to be accomplished

Static





# Goals of the Document

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- Address sea-level rise in California
- Coastal Act: Minimize hazards and impacts to coastal resources due to sea-level rise
- Fulfill Strategic Plan item 3.1.1



Surf scene, San Diego | Nathan Rupert

# Impacts to California

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Pasture near Liscom Slough, Arcata CA | Dec 2012

Sunset Beach, CA | Dec 2012



CA King Tides Initiative | Mario Fernandez





Bolinas, Marin County | Dec 2011



# Highway 1 at Surfer's Beach, Half Moon Bay | Feb 2011



Pacifica, CA



Photo by L Ewing

Coastal Commission

9/17/2014



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CA King Tides Initiative | Dan Jarvis

Oceanside, CA | May 2009



# Sea-Level Rise Science and Projections

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South Jetty, Humboldt Bay | Jan 2013

CA King Tides Initiative | Neva Swensen

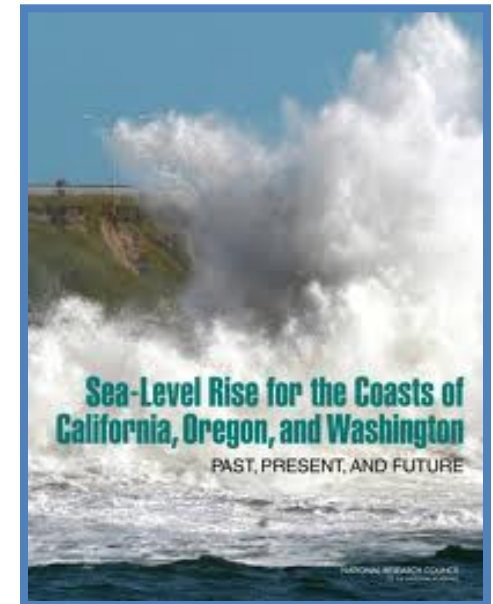


# Best Available Science on SLR

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## □ National Research Council Report SLR Projections for California

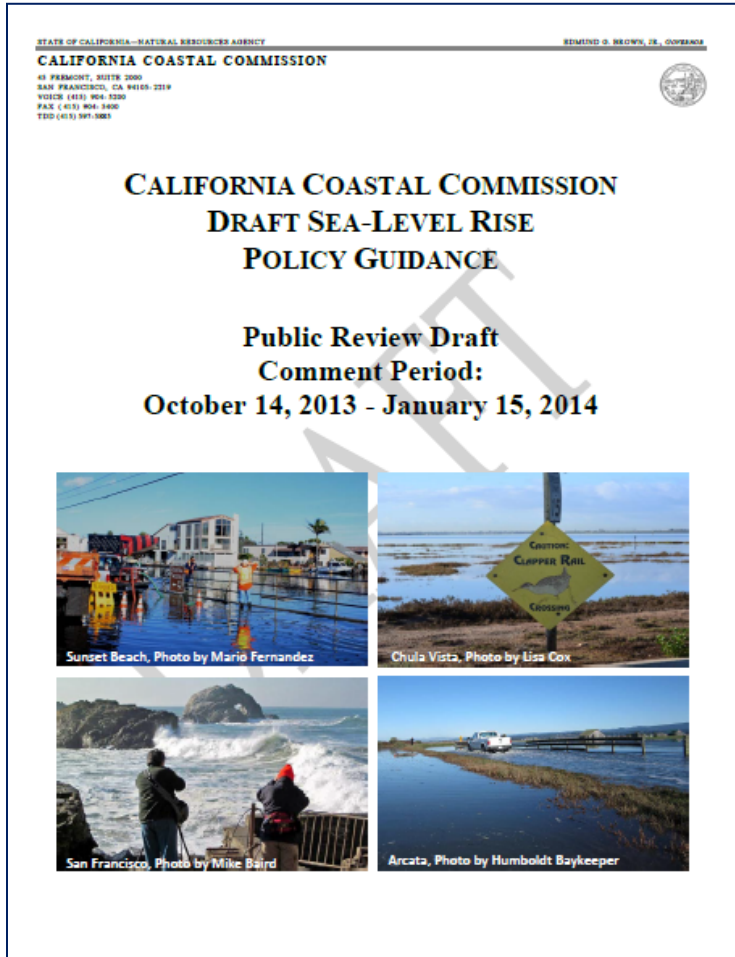
Time Period	South of Cape Mendocino	North of Cape Mendocino
2000-2030	4 – 30 cm (1.5 – 12 inches)	-4 – +23 cm (-1.5 – 9 inches)
2000-2050	12 – 61 cm (5 – 24 inches)	-3 – + 48 cm (-1.2 – 19 inches)
2000-2100	42 – 167 cm (17 – 66 inches)	10 – 143 cm (3.6 – 56 inches)



- Most locations can use these projections without modification
- Humboldt Bay & Eel River Sea Level Rise
  - SLR is at faster rate than region North of Cape Mendocino
  - Modify projections to account for local vertical land motion

# Applications of Best Science

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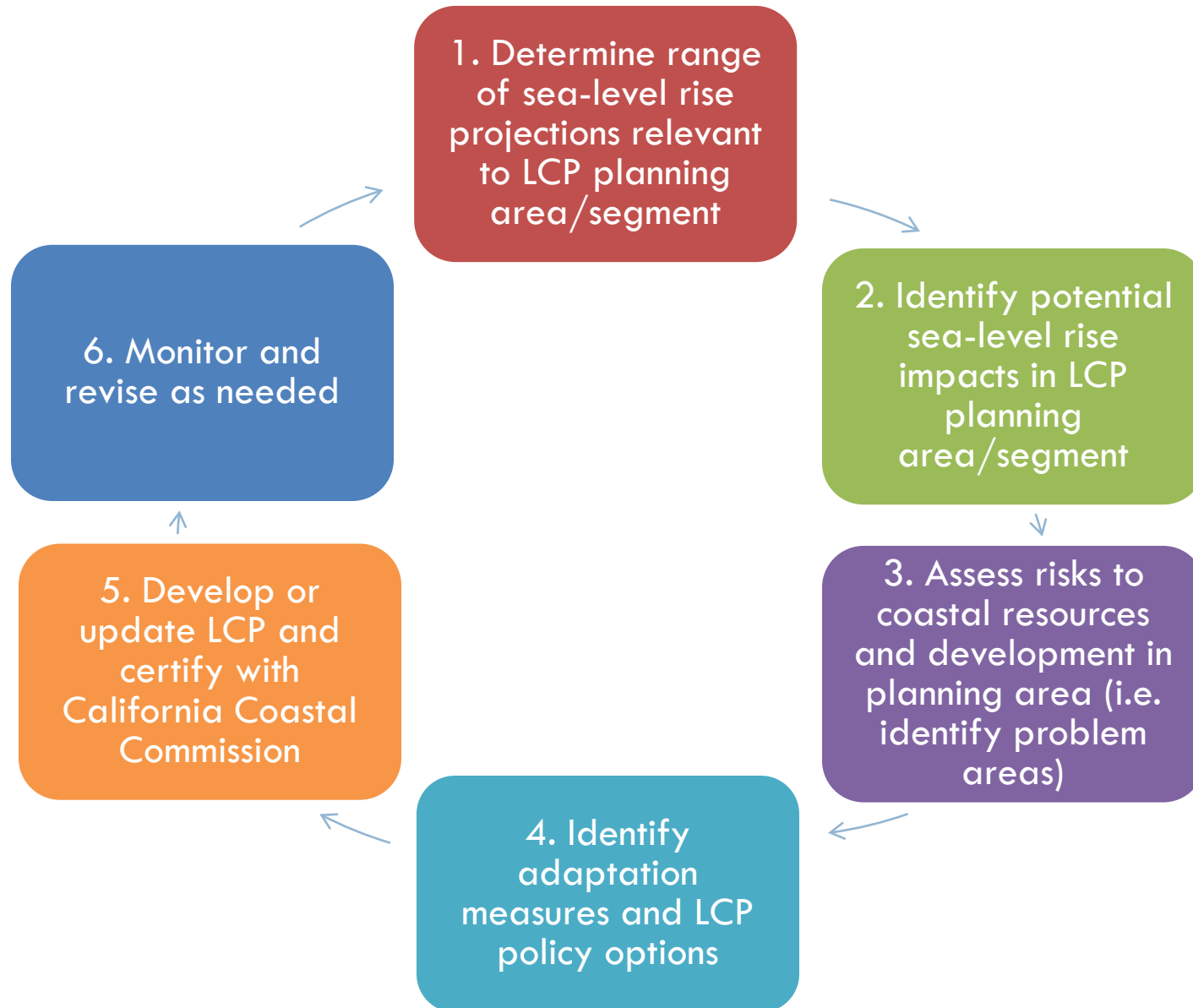
Local Coastal Programs

Long-Range Development Plans  
Port Master Plans  
Federal Consistency

Coastal Development Permits

9/17/2014

# Steps for Addressing SLR in LCPs





# Steps for Addressing SLR in CDPs

1. Establish the projected sea-level rise range for the proposed project

2. Determine how sea-level rise impacts may constrain the project site

3. Determine how the project may impact coastal resources over time, considering SLR

4. Identify project design alternatives to both avoid resource impacts and minimize risks to the project

5. Finalize project design and submit permit application

# CDP Analysis of Sea-Level Rise

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## General Situations for considering sea-level rise:

- On or near a floodplain, beach, wetland, lagoon or estuary
- Exposed to wave impacts or wave runup
- Protected by levees, dikes, bulkheads, seawalls, etc.
- On an eroding coastal bluff
- Reliant on shallow water well for water supply



Coastal dunes, Humboldt Bay |  
Lesley Ewing

# Step 1: Determine SLR Projections

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## Expected Outcomes:

- Appropriate Planning Timeframes
- Proposed project life
- Scenarios of SLR for use in analysis

Time Period *	South of Cape Mendocino	North of Cape Mendocino
by 2030	4 – 30 cm (1.5 – 12 inches)	-4 – +23 cm (-1.5 – 9 inches)
by 2050	12 – 61 cm (5 – 24 inches)	-3 – +48 cm (-1.2 – 19 inches)
by 2100	42 – 167 cm (17 – 66 inches)	10 – 143 cm (3.6 – 56 inches)
* with year 2000 as a baseline		



Levees along Wintersberg Channel, Huntington Beach | Lesley Ewing

# Step 1: Determine SLR Projections

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Time Period	South of Cape Mendocino	North of Cape Mendocino
2000- 2030	4 – 30 cm (1.5 – 12 inches)	-4 – +23 cm (-1.5 – 9 inches)
2000- 2050	12 – 61 cm (5 – 24 inches)	-3 – + 48 cm (-1.2 – 19 inches)
2000- 2100	42 – 167 cm (17 – 66 inches)	10 – 143 cm (3.6 – 56 inches)



Tomales Bay Wetland Restoration | CA King  
Tides Initiative | Jan 2012 | Sarah Allen

**Scenario Based Planning: A tool for developing science-based decisionmaking framework to address SLR uncertainty. Used to inform decision making regarding the range of impacts and vulnerabilities. (Adapted from NOAA 2010)**



## Step 2: Identify SLR Impacts & Constraints

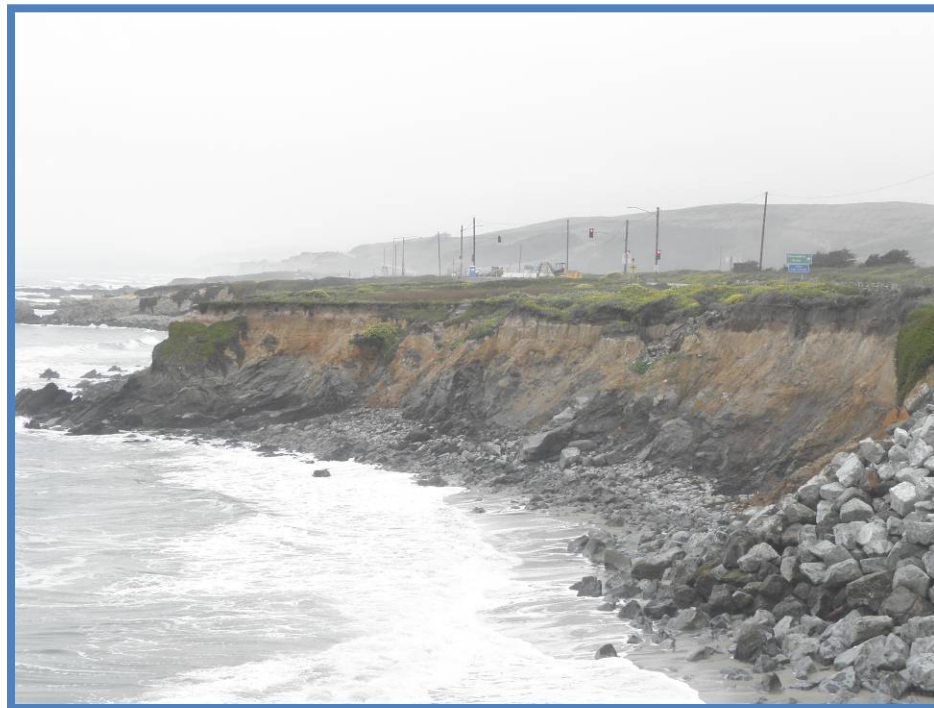
21

### Hazard Analysis Types:

- Geologic Stability
- Erosion
- Waves and wave runup
- Flooding and inundation

### Expected Outcomes:

- Maps of site-specific hazards
- Areas that can safely support development
- Regional-scale for planning, site-specific scale for projects



Highway 1 near Pescadero, San Mateo County |  
Lesley Ewing

## Step 3: Assess Impacts to Coastal Resources

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### Coastal Resources to Consider:

- Public access, beaches, recreation areas
- California Coastal Trail
- Wetlands, ESHA, other habitats
- Agricultural areas
- Cultural sites
- Coastal-dependent uses
- Critical infrastructure
- Coastal Highway 1
- Existing and new development



Ocean Beach, San Francisco | Lesley Ewing

### Expected Outcomes:

SLR risks to coastal resources;  
map overlaying development and  
resource constraints

# Vulnerability - Tools and Resources

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**Humboldt Bay Shoreline Inventory, Mapping, and SLR Vulnerability Assessment**

**Ocean Beach Master Plan**

**City of Santa Cruz Climate Change Vulnerability Assessment**

**Monterey Bay SLR Vulnerability Study**

**Developing Climate Adaptation Strategies for SLO County**

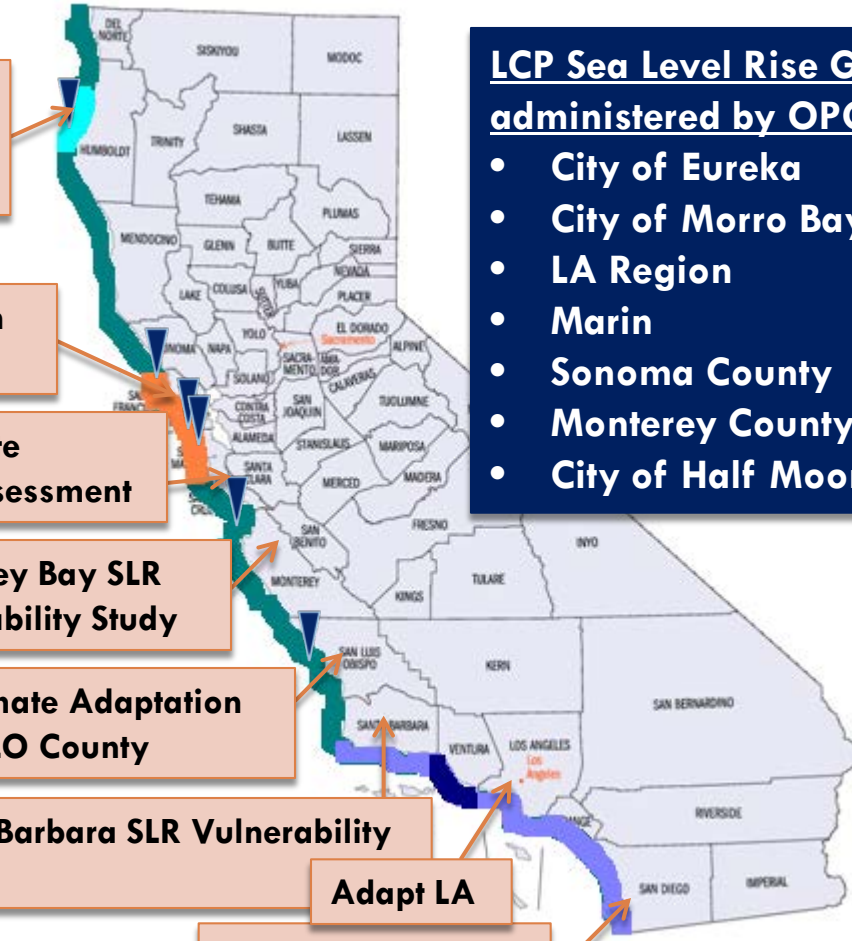
**Santa Barbara SLR Vulnerability Study**

**Adapt LA**

**San Diego SLR Adaptation Strategy**

## **LCP Sea Level Rise Grant Program administered by OPC (awarded)**

- City of Eureka
- City of Morro Bay
- LA Region
- Marin
- Sonoma County
- Monterey County
- City of Half Moon Bay



# Vulnerability - Tools and Resources

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**Humboldt Bay Shoreline Inventory, Mapping, and SLR Vulnerability Assessment**

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**Monterey Bay SLR Vulnerability Study**

**Developing Climate Adaptation Strategies for SLO County**

**Santa Barbara SLR Vulnerability Study**

**Adapt LA**

**San Diego SLR Adaptation Strategy**

## CCC LCP Grants (awarded)

- County of Humboldt
- City of Arcata
- County of Marin
- City of HMB
- City of Pacific Grove
- City of Goleta
- City of Santa Barbara
- City of LA
- City of Hermosa Beach
- City of San Clemente
- City of Solana Beach

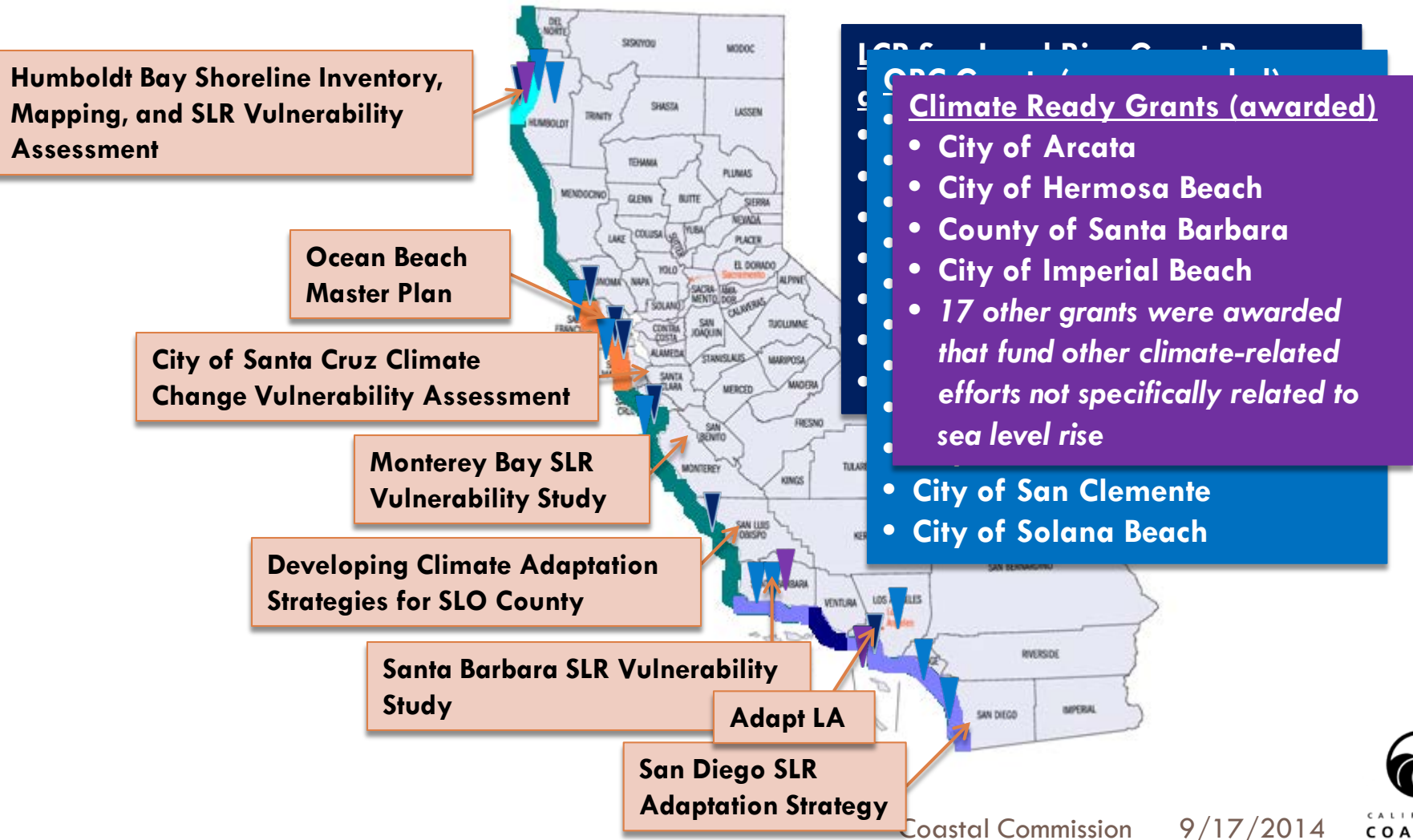


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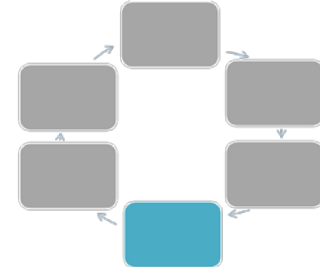


# Vulnerability - Tools and Resources

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## LCP Step 4: Identify LCP Adaptation Measures



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### Expected outcomes:

Identification of necessary updates,  
list of applicable adaptation  
measures applicable, new  
implementation policies/ordinances

Tomales Bay Wetland Restoration | CA King Tides  
Initiative | Jan 2012 | Sarah Allen

# CDP Step 4: Identify Project Alternatives

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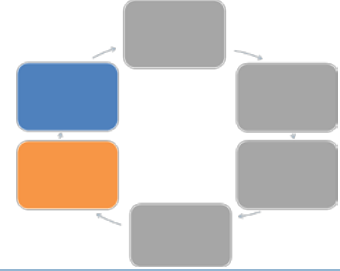


Surfers Point Managed Retreat Project, Ventura, CA

## Expected Outcomes:

- Project modifications and reexamination of impacts
- 1+ project alternatives
- Possible adaptation options

# LCP Steps 5 & 6: Finalize LCP



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Image by California Coastal Commission

## Step 5 expected outcomes:

Certified/updated LCP with policies and land use designations that address sea-level rise and the related hazards

## Step 6 expected outcomes:

Plan to monitor the LCP planning area for SLR and other impacts; revisions when conditions change or science is updated





# CDP Step 5: Finalize Application

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## Expected Outcomes:

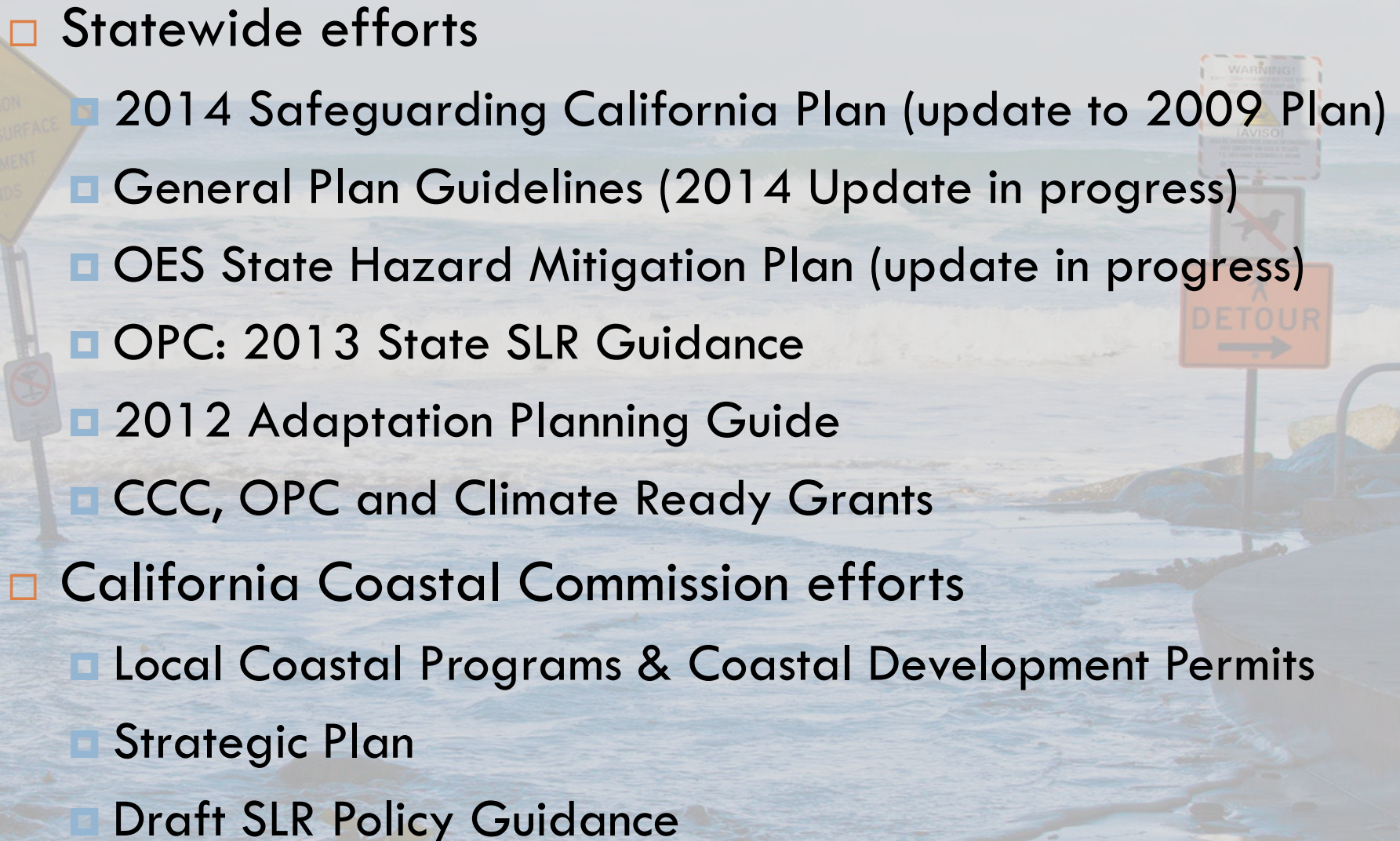
- Analysis of sea-level rise concerns for inclusion in a CDP application
- Combine with other application items for a complete submittal



Pacifica State Beach, Linda Mar Area, Pacifica, CA

# How is California addressing sea-level rise?

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- 
- The background of the slide is a photograph of a beach. In the foreground, there are several road signs. On the left, a yellow diamond-shaped sign reads "CAUTION EVEN SURFACE PAVEMENT ENDS" with a black silhouette of a person walking. Below it is a smaller white rectangular sign with a red circle and a black "X". On the right, there is a white rectangular sign with "WARNING!" and "CAUTION!" text, a red circle with a black "X" over a dog icon, and a red rectangular sign below it that says "A DETOUR" with a black arrow pointing right. The ocean waves are visible in the background, crashing onto the shore.
- Statewide efforts
    - ▣ 2014 Safeguarding California Plan (update to 2009 Plan)
    - ▣ General Plan Guidelines (2014 Update in progress)
    - ▣ OES State Hazard Mitigation Plan (update in progress)
    - ▣ OPC: 2013 State SLR Guidance
    - ▣ 2012 Adaptation Planning Guide
    - ▣ CCC, OPC and Climate Ready Grants
  - California Coastal Commission efforts
    - ▣ Local Coastal Programs & Coastal Development Permits
    - ▣ Strategic Plan
    - ▣ Draft SLR Policy Guidance

# Next Steps

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## Outreach To date:

- 120-day comment period
- 3 webinars
- 14 in-person meetings
- District office meetings
- 350+ people

## Next Steps:

- Revised Draft to Commission, likely this fall
- Trainings and symposia
- Grant support for local governments
- Targeted interest groups

# Additional Research Needs

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- Baseline Data and Monitoring Systems
  - Various Temporal and Spatial Scales
  - Cumulative impacts
- Modelling Sea Level Rise-related Impacts
  - Fluvial – Sea Level Dynamics
- Habitat Evolution Models & Habitat Buffers
- Vertical Land Motion inclusion for Local Analyses
- Future Erosion
  - Sea Level Rise
  - Changing Storminess
- Review of Overtopping methods
- Impacts to Coastal Aquifers
- Case studies
  - Living shorelines
  - Nature-based shore protection
  - Habitat Protection



# Thank you for your attention

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- Thought for the Day -

Two of the greatest assets to have in life are patience and wisdom.



California Coastal Commission,  
Draft Sea Level Rise Policy Guidance:  
<http://www.coastal.ca.gov/climate/SLRguidance.html>

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