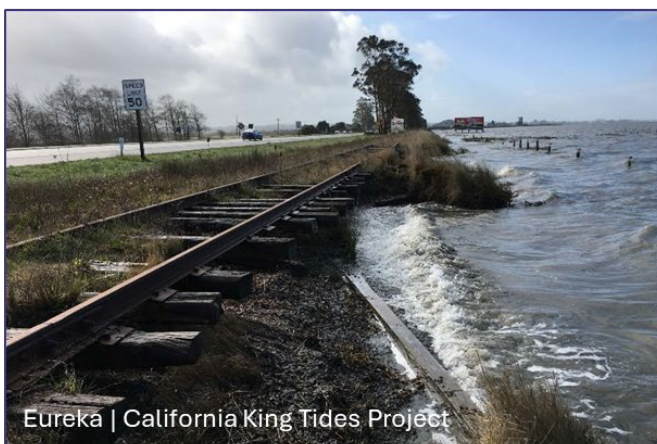




# CALIFORNIA COASTAL COMMISSION SEA LEVEL RISE POLICY GUIDANCE

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## *Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits*



Original Guidance unanimously adopted – August 12, 2015  
Science Update unanimously adopted – November 7, 2018  
2024 Update unanimously adopted – November 13, 2024

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The **original** *California Coastal Commission Sea Level Rise Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits* was unanimously adopted by the California Coastal Commission on August 12, 2015.

- Commissioners:** Steve Kinsey (Chair), Dayna Bochco (Vice Chair), Gregory Cox, Carole Groom, Erik Howell, Martha McClure, Wendy Mitchell, Mary K. Shallenberger, Effie Turnbull-Sanders, Roberto Uranga, Mark Vargas
- Alt. Commissioners:** Olga Diaz, Belinda Faustinos, Sarah Glade Gurney, Steve Kram, Marciela Morales, Randy Pestor, Dr. Paul Song
- Ex Officio Members:** John Laird/Janelle Beland, Lt. Gov. Gavin Newsom/Jennifer Lucchesi/ Kevin Schmidt, Brian P. Kelly/Dale Jones

A **Science Update** to the *California Coastal Commission Sea Level Rise Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits* was unanimously adopted by the California Coastal Commission on November 7, 2018.

- Commissioners:** Dayna Bochco (Chair), Effie Turnbull-Sanders (Vice Chair), Sara Aminzadeh, Donne Brownsey, Carole Groom, Erik Howell, Mary Luéveno, Steve Padilla, Aaron Peskin, Ryan Sundberg, Roberto Uranga, Roberto Uranga, Mark Vargas
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- Ex Officio Members:** John Laird/Thomas Gibson, Betty Yee/Anne Baker/Nicole Jones, Brian Annis/ Jeremiah Ketchum

A **2024 Update** to the *California Coastal Commission Sea Level Rise Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits* was unanimously adopted by the California Coastal Commission on November 13, 2024.

- Commissioners:** Caryl Hart (Chair), Linda Escalante (Vice Chair), Paloma Aguirre, Dayna Bochco, Justin Cummings, Meagan Harmon, Susan Lowenberg, Ann Notthoff, Katie Rice, Effie Turnbull-Sanders, Roberto Uranga, Mike Wilson
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## SUMMARY OF DOCUMENT REVISIONS

The Coastal Commission intends to periodically update this policy guidance to reflect developing scientific research on sea level rise projections as well as the evolving understanding of adaptation options and planning practices. Updates will be roughly timed to follow updates of other state and national sea level rise reports or other significant changes in the field of sea level rise adaptation planning.

The first version of this Guidance was adopted by the Coastal Commission on August 12, 2015. That version of the guidance referenced the best available science on sea level rise available at the time, the National Research Council's 2012 Report, [Sea-Level Rise for the Coasts of California, Oregon and Washington: Past, Present, and Future](#). In 2017, the Ocean Protection Council (OPC), acting on direction from Governor Brown, released a scientific report entitled [Rising Seas in California: An Update on Sea-Level Rise Science](#), which synthesized the evolving research on sea level rise science. OPC then updated the [State of California Sea-Level Rise Guidance](#) to reflect this new science, and the Coastal Commission followed with a complementary update (adopted on November 7, 2018) to this Sea Level Rise Policy Guidance.

In 2019, the Coastal Commission adopted its [Environmental Justice Policy](#) to provide guidance for Commissioners, staff, and the public on how the Commission will implement its environmental justice authority and integrate the principles of environmental justice, equality, and social equity into all aspects of the Commission's program and operations. The Environmental Justice Policy contains a set of guiding principles, including one on climate change, and complements the Sea Level Rise Policy Guidance section on environmental justice and equity. This update to the Guidance builds upon the Commission's Environmental Justice Policy and intentionally integrates environmental justice and equity considerations to further inform recommendations that address sea level rise.

Most recently, in June 2024, the OPC adopted its most recent update to the [State of California Sea Level Rise Guidance](#) (OPC 2024), which reflects the previous five years of scientific research on sea level rise projections, including the IPCC's [Sixth Assessment Report](#) (2021) and NOAA's national report, [Global and National Sea Level Rise Scenarios for the United States](#) (Sweet et al., 2022). The Coastal Commission Guidance is now being updated to be consistent with the State Sea Level Rise Guidance (OPC 2024), provide additional detail specific to the Coastal Act, and address other developments that have occurred since 2018. Key updates include:

- Updates to sea level rise scenarios to reflect 1) more certainty about near-term sea level rise amounts as compared to the 2018 numbers, and 2) updated understanding of the potential timing of worst-case Antarctica ice sheet melt, which has the effect of slightly slowing the possible worst case SLR scenario.
- Discussion of [SB 272](#) (Laird, 2023), which requires local governments to develop sea level rise adaptation plans as part of new or updated LCPs by January 1, 2034. The new information in this Guidance related to SB 272 is intended to fulfill the legislation's

requirement for the Coastal Commission to establish guidelines (by December 31, 2024) for the preparation of those plans.

- Integration of environmental justice principles as detailed in the Commission’s Environmental Justice Policy, including additional information on consequences of sea level rise to environmental justice communities, the importance of meaningful engagement, how to consider and include environmental justice communities in the planning and permitting process, and equitable adaptation strategies. This work was supported by eight external subject matter experts in sea level rise science and environmental justice, who acted as project advisors. These advisors were consulted at the beginning of and throughout the process to ensure guidelines reflect the priorities of environmental justice communities.

## How to Use this Document

<b>What this document <u>IS</u> and <u>IS NOT</u>:</b>
<b>This document is <u>guidance</u>, it is <u>NOT regulations</u></b>
This Guidance is advisory and not a regulatory document or legal standard of review for the actions that the Commission or local governments may take under the Coastal Act. Such actions are subject to the applicable requirements of the Coastal Act, the federal Coastal Zone Management Act, certified Local Coastal Programs, and other applicable laws and regulations as applied in the context of the evidence in the record for that action. This Guidance also fulfills the Commission’s duty, pursuant to Public Resources Code Section 30985.2, to establish guidelines for the preparation of the sea level rise plans required pursuant to subdivision (a) of Public Resources Code Section 30985.
<b>This document is <u>dynamic</u>, it is <u>NOT static</u></b>
This Guidance will be updated periodically to address new sea level rise science, information, and approaches regarding sea level rise adaptation, and new legal precedent. Updates will occur with public notice, opportunities for public input, and public Commission meetings. The Commission will also continue working on SLR through other projects, as outlined in <a href="#">Chapter 9: Next Steps</a> .
<b>This document is <u>multi-purpose for multiple audiences</u>, it is <u>NOT meant to be read cover-to-cover</u></b>
This Guidance is a comprehensive, multi-purpose resource and it is intended to be useful for many audiences. As such, it includes a high level of detail on many subjects. However, chapters were written as stand-alone documents to provide usable tools for readers.
<b>This document is <u>a menu of options</u>, it is <u>NOT a checklist</u></b>
Since this document is intended for use statewide, it is not specific to a particular geographic location or development intensity (e.g., urban or rural locations). Therefore, not all of the content will be applicable to all users, and readers should view the content as a menu of options to use only if relevant, rather than a checklist of required actions.

### Reading Tips

- Look carefully at the Table of Contents and identify sections of interest.
- Do not expect all of the content to apply to your particular situation. As a statewide document, a wide variety of information is included to address the concerns of various users.
- Navigate to your desired level of detail: The *Executive Summary* provides a basic summary of the content; the body of the document provides a detailed discussion; and the *Appendices* provide more scientific and technical detail and a variety of useful resources.

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>13</b>
Principles for Addressing Sea Level Rise in the Coastal Zone	16
Best Available Science and Consequences of Sea Level Rise	18
Addressing Sea Level Rise in Local Coastal Programs	19
Addressing Sea Level Rise in Coastal Development Permits	22
Adaptation Strategies	24
<b>1. INTRODUCTION</b>	<b>27</b>
Environmental, Economic, and Social Impacts of Sea Level Rise	28
Sea Level Rise and the California Coastal Act	31
The Importance of Addressing Sea Level Rise in Local Coastal Programs	33
Coastal Resiliency and Preparing for Sea Level Rise: The Federal and State Context	35
Federal and State Action on Environmental Justice and Sea Level Rise Planning	38
Coastal Commission Action on Environmental Justice	40
Looking Ahead: Planning and Project Design with Sea Level Rise	40
<b>2. PRINCIPLES FOR ADDRESSING SEA LEVEL RISE IN THE COASTAL ZONE</b>	<b>43</b>
Use Science to Guide Decisions	44
Minimize Coastal Hazard Risks through Planning and Development Standards	47
Maximize Protection of Public Access, Recreation, and Sensitive Coastal Resources	48
Maximize Agency Coordination, Meaningful Engagement, and Public Participation	50
Prioritize Environmental Justice Communities	51
<b>3. SEA LEVEL RISE SCIENCE</b>	<b>53</b>
Best Available Science on Sea Level Rise	54
Guidance for Application of Best Available Science	65
Physical Effects of Sea Level Rise	71
Storms and Extreme Events	74
<b>4. CONSEQUENCES OF SEA LEVEL RISE FOR COMMUNITIES, COASTAL RESOURCES, AND DEVELOPMENT</b>	<b>77</b>
Sea Level Rise Adaptation Planning and Environmental Justice	78
Sea Level Rise Consequences Unique to Tribal Communities	84
Consequences of Sea Level Rise for Coastal Act Resources	86
<b>5. ADDRESSING SEA LEVEL RISE IN LOCAL COASTAL PROGRAMS</b>	<b>93</b>
Step 1 – Initiate planning effort, identify key goals, engage with EJ communities	103
Step 2 – Determine range of sea level rise projections relevant to LCP planning area/segment	108
Step 3 – Identify potential physical sea level rise impacts in LCP planning area/segment	113
Step 4 – Assess potential risks from SLR to coastal resources, development, EJ communities	119
Step 5 – Identify equitable adaptation measures	128

Step 6 – Draft updated or new LCP for certification with the California Coastal Commission	132
Step 7 – Implement LCP and monitor and revise as needed	139
<b>6. ADDRESSING SEA LEVEL RISE IN COASTAL DEVELOPMENT PERMITS</b>	<b>148</b>
Step 1 – Initiate CDP application, gather project information, engage with EJ communities	152
Step 2 – Establish the projected sea level rise range for the proposed project	155
Step 3 – Determine how physical impacts from sea level rise may constrain the project site	159
Step 4 – Determine how the project may impact coastal resources, EJ communities	161
Step 5 – Identify project alternatives that avoid/minimize resource, EJ impacts and risks	167
Step 6 – Finalize project design and submit CDP application	171
<b>7. ADAPTATION STRATEGIES</b>	<b>181</b>
General Adaptation Approaches	183
Specific Adaptation Strategies	189
A. Coastal Development and Hazards	190
B. Public Access and Recreation	209
C. Coastal Habitats, ESHA, and Wetlands	213
D. Agricultural Resources	219
E. Water Quality and Supply	222
F. Archaeological, Tribal Cultural, and Paleontological Resources	226
G. Scenic and Visual Resources	227
<b>8. LEGAL CONTEXT OF ADAPTATION PLANNING</b>	<b>229</b>
Seawalls and Other Shoreline Protective Devices	230
Public Trust Boundary	235
Potential Private Property Takings Issues	236
<b>9. ADDITIONAL CCC EFFORTS TO ADDRESS SLR</b>	<b>239</b>
<b>GLOSSARY</b>	<b>245</b>
<b>REFERENCES</b>	<b>261</b>
<b>APPENDICES</b>	<b>277</b>
Appendix A. Sea Level Rise Science and Scenarios of Future Change	279
Appendix B. Developing Local Hazard Conditions Based on Regional or Local Sea Level Rise Using Best Available Science	299
Appendix C. Resources for Addressing Sea Level Rise	325
Appendix D. General LCP Amendment Processing Steps and Best Practices	333
Appendix E. Primary Coastal Act Policies Related to Sea Level Rise and Coastal Hazards	337
Appendix F. Sea Level Rise Scenarios for 14 California Tide Gauges	349
Appendix G. Coastal Commission Contact Information	365



## List of Figures

<b>Figure 1.</b> Flowchart for addressing sea level rise in Local Coastal Programs and other plans .....	21
<b>Figure 2.</b> Flowchart for addressing sea level rise in Coastal Development Permits .....	23
<b>Figure 3.</b> Climate-sensitive processes and components that can influence global and regional sea level. ....	55
<b>Figure 4.</b> IPCC AR6 plausible range of future sea level rise. ....	56
<b>Figure 5.</b> IPCC AR6 SLR projections by 2100.....	57
<b>Figure 6.</b> Global Sea Level Rise Scenarios from Sweet <i>et al.</i> , 2022.....	58
<b>Figure 7.</b> Sea level rise scenarios for the contiguous United States .....	59
<b>Figure 8.</b> Photo of Esplanade Apartments threatened by cliff erosion	73
<b>Figure 9.</b> Photo of infrastructure at risk near Rincon Beach, Ventura, CA .....	87
<b>Figure 10.</b> Summary of sea level rise impacts and consequences.....	92
<b>Figure 11.</b> Sea level rise adaptation planning process for new and updated Local Coastal Programs .....	98
<b>Figure 12.</b> Agencies, organizations, and planning efforts related to sea level rise adaptation .	102
<b>Figure 13.</b> Example of analysis of SLR impacts. ....	116
<b>Figure 14.</b> Flowchart for addressing sea level rise in Local Coastal Programs and other plans .	147
<b>Figure 15.</b> Process for addressing sea level rise in Coastal Development Permits .....	151
<b>Figure 16.</b> Flowchart for steps to address sea level rise in Coastal Development Permits.....	174
<b>Figure 17.</b> The effects of coastal squeeze (Graphic by Jeremy Smith) .....	184
<b>Figure 18.</b> Photo depicting passive erosion.....	185
<b>Figure 19.</b> Photo depicting “managed retreat” and restoration .....	187
<b>Figure 20.</b> Examples of general adaptation strategies .....	187
<b>Figure 21.</b> Photo depicting a development setback in Pismo Beach .....	193
<b>Figure 22.</b> Photo depicting eroding bluff and exposed caissons in Encinitas, CA .....	196
<b>Figure 23.</b> Photo depicting dune restoration at Surfer’s Point, Ventura .....	200
<b>Figure 24.</b> Photo depicting removal of shoreline protective structure .....	204
<b>Figure 25.</b> Photo depicting planned retreat for major public infrastructure .....	207
<b>Figure 26.</b> Photo depicting the preservation and conservation of open space along an urban-rural boundary .....	216
<b>Figure 27.</b> Photo depicting habitat protection at Salinas River State Beach .....	218
<b>Figure 28.</b> Photo depicting protection of visual resources and public access .....	228

**Figure A-1.** IPCC AR6 plausible range of future SLR ..... 285

**Figure A-2.** Global SLR Scenarios from Sweet *et al.*, 2022..... 287

**Figure A-3.** SLR Scenarios for the contiguous United States ..... 288

**Figure A-4.** Schematic showing construction of the sea level scenarios based on SSPs..... 289

**Figure B-1.** Diagram showing beach erosion from both sea level rise and winter storm conditions ..... 303

**Figure B-2.** Changes to the intertidal zone with sea level rise and erosion, without wave impacts ..... 305

**Figure B-3.** Photo series documenting rapid bank and wetland erosion in Elkhorn Slough ..... 306

**Figure B-4.** Illustration of differences between a hydrodynamic model and a "bathtub" model ..... 308

**Figure B-5.** Illustration of components of coastal total water levels..... 309

**Figure B-6.** Diagram illustrating the compounding effects of sea level rise on coastal wave hazards ..... 311

**Figure B-7.** Diagram illustrating how sea level rise can influence fluvial flooding upstream .... 312

**Figure B-8.** Photo of pluvial flooding at an undercrossing in San Mateo, CA ..... 314

**Figure B-9.** Diagram illustrating current groundwater table and saline groundwater wedge in blue and future groundwater table and saline groundwater wedge in pink..... 315

**Figure B-10.** Screenshot of ASCE Tsunami Hazard Tool..... 316

**Figure F-1.** Map of tide gauge locations (from OPC 2018) ..... 350

**Figure G-1.** Location of Coastal Commission Offices ..... 366

### List of Tables

**Table 1.** Sea Level Rise Scenarios for California ..... 19

**Table 2.** Sea Level Rise Scenarios for California ..... 46

**Table 3.** Sea Level Rise Scenarios for California ..... 60

**Table 4.** Exceedance probabilities for the sea level scenarios based on IPCC warming level-based global mean sea level projections..... 63

**Table 5.** Sea Level Rise Scenarios for California ..... 110

**Table 6.** Sea Level Rise Mapping Tools..... 117

**Table 7.** Sea Level Rise Scenarios for California ..... 158

**Table A-1.** Sea Level Rise Scenarios for California ..... 292

<b>Table A-2.</b> Exceedance probabilities for the sea level scenarios based on IPCC warming level–based global mean sea level projections .....	293
<b>Table B-1.</b> Factors that Influence Local Water Level Conditions .....	317
<b>Table B-2.</b> General Resources for Developing Local Hazard Conditions.....	318
<b>Table F-1.</b> Sea Level Scenarios for Crescent City .....	351
<b>Table F-2.</b> Sea Level Scenarios for North Spit, Humboldt Bay. ....	352
<b>Table F-3.</b> Sea Level Scenarios for Arena Cove.....	353
<b>Table F-4.</b> Sea Level Scenarios for Point Reyes .....	354
<b>Table F-5.</b> Sea Level Scenarios for San Francisco .....	355
<b>Table F-6.</b> Sea Level Scenarios for Alameda .....	356
<b>Table F-7.</b> Sea Level Scenarios for Port Chicago.....	357
<b>Table F-8.</b> Sea Level Scenarios for Monterey .....	358
<b>Table F-9.</b> Sea Level Scenarios for Port San Luis.....	359
<b>Table F-10.</b> Sea Level Scenarios for Santa Barbara.....	360
<b>Table F-11.</b> Sea Level Scenarios for Santa Monica .....	361
<b>Table F-12.</b> Sea Level Scenarios for Los Angeles .....	362
<b>Table F-13.</b> Sea Level Scenarios for La Jolla.....	363
<b>Table F-14.</b> Sea Level Scenarios for San Diego .....	364

## **Commonly Used Acronyms and Agency Names**

(See the [Glossary](#) for definitions and explanations of key terms)

### **Terms:**

AR6 – IPCC Sixth Assessment Report

CDP – Coastal Development Permit

CoSMoS – Coastal Storm Modeling System

EJ – Environmental Justice

ENSO – El Niño Southern Oscillation

ESHA – Environmentally Sensitive Habitat Area

GHG – Greenhouse gas

IP – Implementation Plan

IPCC – Intergovernmental Panel on Climate Change

LCP – Local Coastal Program

LUP – Land Use Plan

PDO – Pacific Decadal Oscillation

SLR – Sea level rise

**Agency Names:**

BCDC – [San Francisco Bay Conservation and Development Commission](#)

BOEM – [Bureau of Ocean Energy Management](#)

Cal OES – [California Governor’s Office of Emergency Services](#)

Caltrans – [California Department of Transportation](#)

CCC/Commission – [California Coastal Commission](#)

CDFW – [California Department of Fish and Wildlife](#)

CNRA – [California Natural Resources Agency](#)

Conservancy – [California State Coastal Conservancy](#)

DTSC – [Department of Toxic Substances Control](#)

EPA – [Environmental Protection Agency](#)

FEMA – [Federal Emergency Management Agency](#)

NAHC – [California Native American Heritage Commission](#)

NASA – [National Aeronautics and Space Administration](#)

NERR – [National Estuarine Research Reserve](#)

NMS – [National Marine Sanctuary](#)

NOAA – [National Oceanic and Atmospheric Administration](#)

OPC – [California Ocean Protection Council](#)

OPR – [California Governor’s Office of Planning and Research](#)

State Lands – [California State Lands Commission](#)

State Parks – [California Department of Parks and Recreation](#)

SWRCB – [State Water Resources Control Board](#)

USACE – [United States Army Corps of Engineers](#)

USFWS – [United States Fish and Wildlife Service](#)

USGS – [United States Geological Survey](#)



# Executive Summary

Climate change is upon us, affecting almost every facet of California’s natural, social, and built environment. Rising global temperatures are causing significant effects at global, regional, and local scales. In the past century, average global temperature has increased by about 0.8°C (1.4°F), and average global sea level has increased by nearly 8 inches (20 cm; Fox-Kemper *et al.*, 2021). According to the most recent best available science, by the year 2100, sea levels in California may rise by 1 to 6.6 feet (0.3 to 2.0 meters) depending on emissions levels (OPC 2024). While the California coast regularly experiences erosion, flooding, and significant storm events, sea level rise will exacerbate these natural forces, leading to significant social, environmental, and economic impacts.

Importantly, sea level rise will exacerbate burdens already felt among environmental justice and tribal communities who experience a higher vulnerability to climate change. In California, generations of discriminatory land use policies and practices have resulted in an inequitable distribution of environmental burdens, including a lack of investments in creating or maintaining natural resource benefits within these communities. Meaningful engagement<sup>1</sup> and equitable planning that centers environmental justice and tribal communities are important for addressing these specific burdens while seeking to holistically address sea level rise risks and vulnerabilities across the state.

The evidence of the value of proactive planning to prepare for sea level rise is compelling. The [Third National Climate Assessment](#) notes that there is strong evidence showing that the cost of doing nothing to prepare for the impacts of sea level rise exceeds the costs associated with adapting to them by about 4 to 10 times (Moser *et al.*, 2014). Similarly, several studies show that the cumulative costs of keeping infrastructure safely in place within areas vulnerable to sea level rise could eventually outweigh the costs of relocation (Cutler *et al.*, 2020; Turner *et al.*, 2007; King *et al.* 2011). Therefore, it is critically important that California proactively plan and prepare for the impacts of sea level rise to ensure a resilient California coast for present and future generations.

The California Coastal Act is one of the state’s primary coastal management laws for addressing land use, public access and recreation, and the protection of coast and ocean resources in the coastal zone. It is also the primary coastal hazards law governing development along the coast. Using the Coastal Act, the Coastal Commission and local governments have nearly five decades of experience managing coastal development, including addressing the challenges presented by coastal hazards like storms, flooding, and erosion as well as responses to these hazards such as armoring. However, sea level rise and the changing climate present management challenges of a new magnitude, with the potential to significantly threaten many coastal resources, including shoreline development, coastal beach access and recreation, habitats, agricultural lands, cultural resources, and scenic resources, all of which are subject to specific protections and

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<sup>1</sup> Meaningful engagement is the intentional outreach, inclusion, and consideration of the voices and perspectives from presently and historically underserved and marginalized communities in the design, development, implementation, and policies that may impact the health, environment, and livelihood of their communities. For more information about meaningful engagement best practices and resources, see [Chapter 4](#).

regulations in the Coastal Act. Therefore, effective implementation of the Coastal Act and the protection of California’s coast must address global sea level rise and the greater management challenges it will bring. In recognition of this fact, the California Legislature added Section 30270 to the Coastal Act in 2021, which requires the Commission to take the effects of sea level rise into account in its policies and activities.<sup>2</sup>

This document focuses specifically on how to apply the Coastal Act to the challenges presented by sea level rise through Local Coastal Program (LCP) certifications and updates and Coastal Development Permit (CDP) decisions. It organizes current science, technical, and other information and practices into a single resource to facilitate implementation of the Coastal Act by coastal managers at the state and local level. This Guidance also includes environmental justice perspectives that build upon the Commission’s existing [Environmental Justice Policy](#), and provides information on how to address impacts to, benefits for, and engagement with environmental justice communities<sup>3</sup> when planning and analyzing for sea level rise.

Additionally, this document provides guidance on how local governments can comply with their obligations under [SB 272](#) (Laird, 2023)<sup>4,5</sup>, which requires local governments in the Coastal Zone to submit an LCP, or amendment to their existing LCP, that contains a sea level rise plan. However, while the document is intended to guide LCP planning and development decisions to ensure effective coastal management actions, it is advisory and does not alter or supersede existing legal requirements, such as the policies of SB 272, the Coastal Act, and certified LCPs. One of the Commission’s priority goals continues to be coordinating with local governments to complete and update LCPs in a manner that adequately addresses sea level rise within the context of local conditions and reflects the recommendations in this Guidance.

This Guidance document is also part of a larger statewide strategy to respond to climate change that includes both emissions reductions and adaptation planning to address the impacts of a changing climate. Recent efforts include the [California Climate Adaptation Strategy](#) (2021) (an update to the 2014 [Safeguarding California](#) plan and the 2009 [California Climate Adaptation Strategy](#)), the California Air Resources Board’s [Scoping Plan for Achieving Carbon Neutrality](#)

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<sup>2</sup> [Senate Bill \(SB\) 1](#) (Atkins, 2021).

<sup>3</sup> The term “environmental justice communities” is used in this Guidance to refer low-income communities, communities of color, and other historically marginalized communities that have been disproportionately burdened by or less able to prevent, respond to, and recover from, adverse environmental impacts and discriminatory land use practices.

<sup>4</sup> SB 272 added Division 20.6.9 (Section 30985 et seq.) to the California Public Resources Code. This document uses “SB 272” and “Section 30985 et seq.” interchangeably.

<sup>5</sup> Note that SB 272 also includes a requirement for local jurisdictions within San Francisco Bay to develop plans that are subject to review by the Bay Conservation and Development Commission (BCDC). The basic requirements are the same for both agencies/plan types, and Commission and BCDC staff have coordinated to develop guidelines pursuant to the requirements of SB 272; however, some specific details and best practices will vary based on differences between relevant enacting legislation (the Coastal Act versus the McAtteer-Petris Act) and planning contexts. More information on BCDC’s work to implement SB 272 can be found through the BCDC [Regional Shoreline Adaptation Plan](#).

(2022), the [California Natural Resources Agency’s Environmental Justice Policy](#) (2020), the [General Plan Guidelines](#) (Cal OPR 2023), the [California State Hazard Mitigation Plan](#) (2023), and several documents developed by the Ocean Protection Council (OPC) in collaboration with other state agencies, including the [State Sea Level Rise Guidance](#) (2024), [Making California’s Coast Resilience to Sea Level Rise: Principles for Aligned State Action](#) (2020), and the [State Agency Sea-Level Rise Action Plan for California](#) (2022).

The Commission has also been providing, and will continue to provide, funding for SLR adaptation planning through its [LCP Local Assistance Grant Program](#), and Commission staff participate in multi-agency partnerships, including the Sea Level Rise State and Regional Support Collaborative, formerly known as the Sea Level Rise Leadership Team, convened by the OPC. For more detail on these efforts, see the [Introduction](#).

## **PRINCIPLES FOR ADDRESSING SEA LEVEL RISE IN THE COASTAL ZONE**

This Guidance is rooted in certain fundamental guiding principles, many of which derive directly from the requirements of the Coastal Act. These Principles broadly lay out the common ideas and a framework by which sea level rise planning and permitting actions can be assessed, and as such represent the goals to which actions should aspire. Individual actions and outcomes may vary based on a variety of factors, including applicable policies and location- or project-specific factors that may affect feasibility. The Guiding Principles are summarized below and discussed in greater detail in [Chapter 2](#).

### **Use Science to Guide Decisions** [Coastal Act Sections 30006.5; 30335.5; 30270]

1. Recognize and address sea level rise as necessary in planning and permitting decisions.
2. Use the best available science to determine locally relevant and context-specific sea level rise scenarios and potential impacts for all Coastal Act planning processes, project design, and permitting reviews.
3. Recognize scientific uncertainty by using scenario planning and adaptive management techniques.
4. Use a precautionary approach by planning and providing adaptive capacity for the higher end of the range of possible sea level rise.
5. Design adaptation strategies according to local conditions and existing development patterns, in accordance with the Coastal Act.

### **Minimize Coastal Hazard Risks through Planning and Development Standards** [Coastal Act Sections 30253; 30235; 30270; 30001; 30001.5]

6. Avoid significant coastal hazard risks to new development where feasible.
7. Minimize hazard risks to new development over the life of authorized structures.
8. Minimize coastal hazard risks and resource impacts when making redevelopment decisions.



9. Account for the social and economic needs of the people of the state, including environmental justice and tribal priorities; assure priority for coastal-dependent and coastal-related development over other development.
10. Ensure that property owners understand and assume the risks, and mitigate the coastal resource impacts, of new development in hazardous areas.

**Maximize Protection of Public Access, Recreation, and Sensitive Coastal Resources** [Coastal Act Chapter 3 policies]

11. Provide for maximum protection of coastal resources in all coastal planning and regulatory decisions.
12. Maximize natural shoreline values and processes; avoid expansion and minimize the perpetuation of shoreline armoring.
13. Recognize that sea level rise will cause the public trust boundary to move inland. Protect public trust lands and resources, including as sea level rises. New shoreline protective devices should not result in the loss of public trust lands.
14. Address other potential coastal resource impacts (to wetlands, habitat, agriculture, scenic, *etc.*) from hazard management decisions, consistent with the Coastal Act.
15. Address the cumulative impacts and regional contexts of planning and permitting decisions.
16. Require mitigation of unavoidable coastal resource impacts related to permitting and shoreline management decisions.
17. Consider best available information on resource valuation when mitigating coastal resource impacts.

**Maximize Agency and Tribal Coordination, Meaningful Engagement, and Public Participation** [Coastal Act Chapter 5 policies; Sections 30006; 30320; 30339; 30500; 30503; 30711]

18. Coordinate planning and regulatory decision making with other appropriate local, state, and federal agencies; support research and monitoring efforts.
19. Collaborate with local governments to plan for and adapt to sea level rise.
20. Coordinate with tribes to address tribal priorities and concerns when making planning decisions.
21. Consider conducting vulnerability assessments and adaptation planning at the regional level.
22. Provide for maximum public participation and meaningful engagement in planning and regulatory processes.

**Prioritize Environmental Justice Communities** [California Coastal Commission Environmental Justice Policy; Coastal Act Sections 30006; 30013; 30320; 30339; 30500; 30503; 30604(h); 30711]

23. Consider environmental justice when making planning and permitting decisions. Evaluate and address any disproportionate environmental and public health burdens these communities may experience as a result of sea level rise impacts.

### **BEST AVAILABLE SCIENCE AND CONSEQUENCES OF SEA LEVEL RISE**

The Coastal Act directs the Coastal Commission and local governments to use the best available science in coastal land use planning and development. This Guidance recommends using the best available science on sea level rise scenarios to inform planning decisions and project design.

The State of California has long supported the preparation and provision of scientific information on climate change and sea level rise to help guide appropriate and resilient planning, permitting, investment, and other decisions. For example, [California Fourth Climate Change Assessment](#) advances actionable science on the impacts of climate change, including sea level rise, that serves the needs of state and local-level decision-makers.<sup>6</sup> The Ocean Protection Council updates the State Sea Level Rise Guidance roughly every five years to synthesize best available science on sea level rise. The 2024 [State Sea Level Rise Guidance](#) contains a set of sea level rise scenarios for statewide use (which reflects a statewide average rate of vertical land motion), as well as sets for each of the 14 tide gauges throughout California. The Coastal Commission recommends using these scenarios and related information as best available science on sea level rise in California (see [Table 1](#) for the statewide scenarios and [Appendix F](#) for scenarios for other tide gauges). It is understood that sea level rise science will continue to evolve, and the Coastal Commission will re-examine best available science periodically and as needed with the release of new information.

In addition to sea level rise scenarios, the [State Sea Level Rise Guidance](#) (OPC 2024) and many other publications provide information on the impacts of sea level rise in California. According to these reports, sea level rise will cause flooding and inundation, increased coastal erosion, changes in sediment supply and movement, and saltwater intrusion to varying degrees along the California coast. These effects in turn could have a significant impact on the coastal economy and could put important coastal resources and development at risk, including ports, marine terminals, commercial fishing infrastructure, public access, recreation, wetlands and other coastal habitats, water quality, biological productivity in coastal waters, coastal agriculture, and archaeological and paleontological resources. These impacts and their consequences for coastal resources and communities are discussed in more detail in [Chapters 3](#) and [4](#).

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<sup>6</sup> Fifth California Climate Assessment research is underway and will be released in 2026. Some of the new data products, including SLR projections data, are already available via the [Cal-Adapt Analytics Engine](#).

Table 1. Sea Level Rise Scenarios for California <sup>7</sup>

Projected SLR Amounts (in feet)					
	Low	Intermediate-Low	Intermediate	Intermediate-High	High
<b>2030</b>	0.3	0.4	0.4	0.4	0.4
<b>2040</b>	0.4	0.5	0.6	0.7	0.8
<b>2050</b>	0.5	0.6	0.8	1.0	1.2
<b>2060</b>	0.6	0.8	1.1	1.5	2.0
<b>2070</b>	0.7	1.0	1.4	2.2	3.0
<b>2080</b>	0.8	1.2	1.8	3.0	4.1
<b>2090</b>	0.9	1.4	2.4	3.9	5.4
<b>2100</b>	1.0	1.6	3.1	4.9	6.6
<b>2110</b>	1.1	1.8	3.8	5.7	8.0
<b>2120</b>	1.1	2.0	4.5	6.4	9.1
<b>2130</b>	1.2	2.2	5.0	7.1	10.0
<b>2140</b>	1.3	2.4	5.6	7.7	11.0
<b>2150</b>	1.3	2.6	6.1	8.3	11.9

### ADDRESSING SEA LEVEL RISE IN LOCAL COASTAL PROGRAMS

This document provides a step-by-step process for addressing sea level rise and adaptation planning in new and updated Local Coastal Programs in a manner that prioritizes the needs of environmental justice communities. These Steps, summarized below in text and in [Figure 1](#), can be tailored to fit the needs of individual communities and address the specific coastal resource and development issues of a community, such as dealing with bluff erosion or providing for effective redevelopment, urban infill, and concentration of development in already developed areas. Ideally, Commission and local government staff will establish regular coordination and work together in the early steps of any LCP planning process. For a detailed explanation of these LCP planning Steps, see [Chapter 5](#). Communities in areas where sea level rise vulnerability assessment work is already underway can start later in the process, at Step 5, or other relevant Step(s).

<sup>7</sup> This table provides median values for sea level scenarios for California, in feet, relative to a year 2000 baseline. These statewide values all incorporate an average statewide value of vertical land motion – a negligible rate of 0.1 mm (0.0003 ft) per year uplift (OPC 2024). The red box highlights the three scenarios that the State Sea Level Rise Guidance and this guidance recommend for use in various planning and project contexts.

- Step 1. Initiate planning effort**, identify key goals and stakeholders, and engage with environmental justice communities.
- Step 2. Determine a range of sea level rise scenarios relevant to LCP planning area/segment** using best-available science, which is currently the [State Sea Level Rise Guidance](#) (OPC 2024).
- Step 3. Identify potential physical sea level rise impacts in the LCP planning area/segment**, including inundation, storm flooding, wave impacts, erosion, and/or saltwater intrusion into freshwater resources.
- Step 4. Assess potential risks from sea level rise to coastal resources, development, and environmental justice communities in the LCP planning area/segment**, including those resources addressed in Chapter 3 of the Coastal Act.
- Step 5. Identify equitable adaptation measures** to address identified risks in the planning area, considering different coastal resource needs and local and statewide goals.
- Step 6. Draft updated or new LCP for certification by California Coastal Commission**, incorporating updates to the Land Use Plan and Implementing Ordinances.
- Step 7. Implement the LCP and monitor and re-evaluate strategies as needed** to address new circumstances relevant to the area.

## Planning Process for Local Coastal Programs and Other Plans



Figure 1. Flowchart for addressing sea level rise in Local Coastal Programs and other plans.

## ADDRESSING SEA LEVEL RISE IN COASTAL DEVELOPMENT PERMITS

New development within the coastal zone generally requires a Coastal Development Permit (CDP). Many projects reviewed through the CDP application process already examine sea level rise impacts as part of the hazards analysis, though not every CDP application will need to consider sea level rise. In general, sea level rise is only likely to affect those projects that are on low-lying land, on eroding coastal bluffs, in close proximity to water, or rely upon a shallow aquifer for water supply. This document offers a step-by-step outline, summarized below in text and in [Figure 2](#), for how to conduct such an analysis as a standard part of the CDP application process. The goal of these Steps is to ensure careful attention to minimizing risk to development and avoiding, minimizing, and mitigating impacts to coastal resources, including any coastal resource-related impacts to environmental justice communities, over the life of the project. Early coordination with Coastal Commission staff is highly recommended, and staff will be available to consult with applicants during this process. Adopting or updating LCPs as recommended in this Guidance should facilitate subsequent review of CDPs. LCPs can identify areas where a closer review of sea level rise concerns is necessary. If kept up to date, they can also provide information for evaluation at the permit stage and specify appropriate mitigation measures for CDPs to incorporate. For a detailed explanation of these steps, see [Chapter 6](#) of this Guidance.

- Step 1. Initiate CDP application**, gather proposed project information, and engage with environmental justice communities.
- Step 2. Establish the projected sea level rise range for the proposed project's** planning horizon using the best available science, which is currently the [State Sea Level Rise Guidance](#) (OPC 2024).
- Step 3. Determine how physical impacts from sea level rise may constrain the project site**, including erosion, structural and geologic stability, flooding, and inundation.
- Step 4. Determine how the project may impact coastal resources, including as they relate to environmental justice communities, considering the influence of future sea level rise upon the landscape** as well as potential impacts of sea level rise adaptation strategies that may be used over the lifetime of the project.
- Step 5. Identify alternatives to both avoid resource and related environmental justice impacts and minimize risks** throughout the expected life of the development.
- Step 6. Finalize project design and submit CDP application.**

## Planning Process for Coastal Development Permits

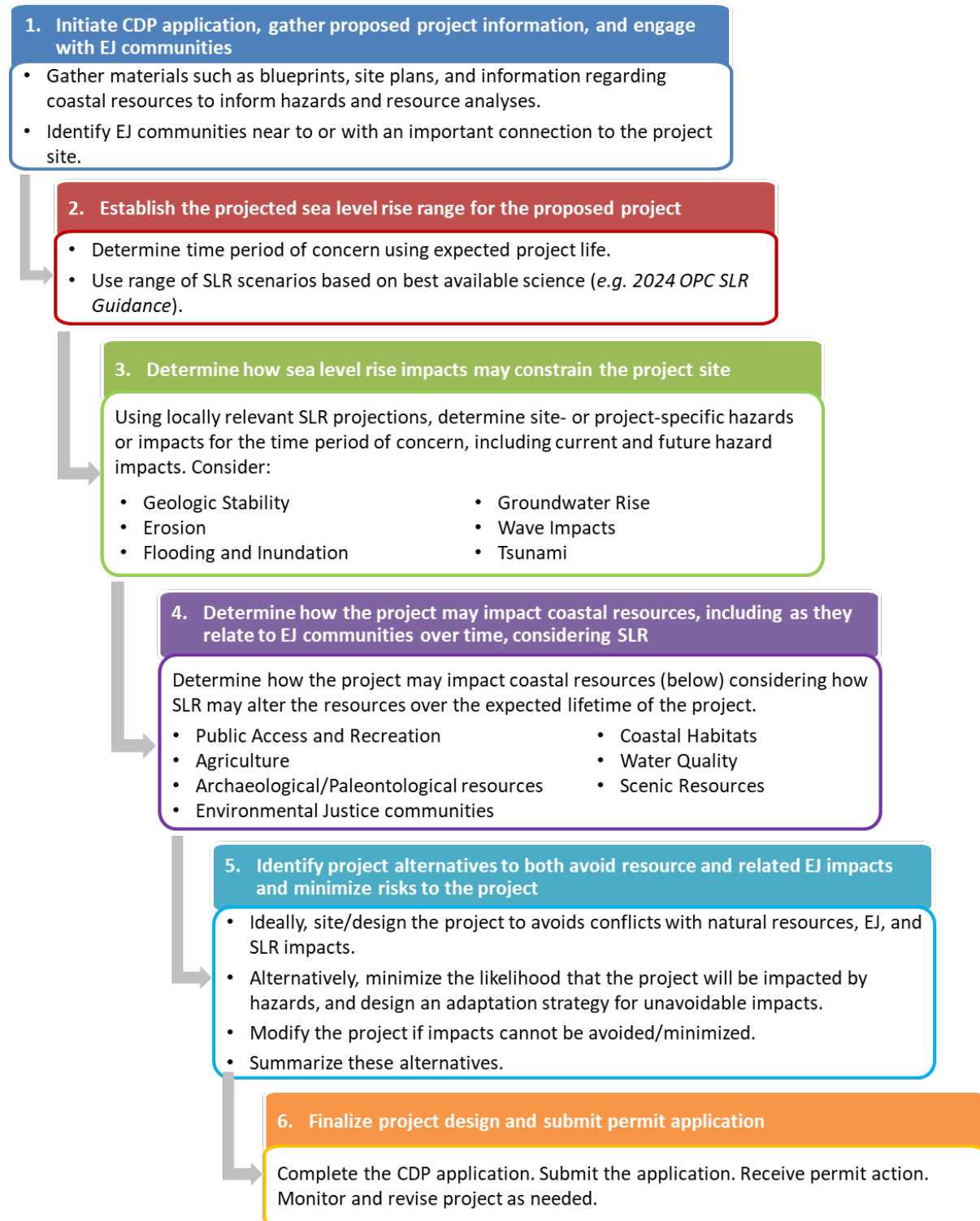


Figure 2. Flowchart for addressing sea level rise in Coastal Development Permits

## ADAPTATION STRATEGIES

Steps 1 through 4 of the processes for addressing sea level rise in LCPs and CDPs will help planners and project applicants identify particular vulnerabilities to the planning region and specific project sites. Such vulnerabilities may include impacts to communities, including environmental justice communities, as well as a number of resources identified in the Coastal Act, including development and infrastructure; public access and recreational opportunities; beaches, wetlands, environmentally sensitive habitat areas (ESHA), and other coastal habitats; agricultural resources; water quality; archaeological and paleontological resources; and scenic and visual resources. Planners and project applicants will need to identify, develop, and implement various adaptation strategies designed to protect or enhance coastal resources that do not exacerbate burdens to environmental justice communities. These strategies should fulfill the hazard minimization and resource protection policies of the Coastal Act and should account for local conditions and environmental justice concerns. In many cases, strategies will need to be implemented incrementally (or in a phased approach) as conditions change, and planners, project applicants, and partners will need to think creatively and progressively to ensure that coastal resources and development are protected over time. [Chapter 7](#) of this Guidance summarizes a number of strategies to protect different coastal resources and meet the goals and requirements of the Coastal Act, as well as different approaches to adaptation planning such as phased adaptation.

## ADDITIONAL INFORMATION

In addition to providing a summary of best available science on sea level rise, step-by-step approaches for addressing sea level rise in LCPs and CDPs, and a discussion of numerous adaptation strategies, the Guidance includes the following supplemental information:

- [Chapter 8](#): A brief discussion of the legal context of adaptation
- [Chapter 9](#): Next steps for Commission staff in coordination with other relevant partners and research institutions, based on objectives and actions from the Commission adopted [California Coastal Commission Strategic Plan 2021-2025](#) (2021)
- [Appendix A](#): Detailed information on the drivers of sea level rise and sea level rise scenarios
- [Appendix B](#): Technical information for how to assess local hazard conditions based on regional sea level rise scenarios, which is applicable to both LCPs and CDPs
- [Appendix C](#): Lists of useful resources and references, including examples of sea level rise adaptation documents from other state agencies
- [Appendix D](#): General steps for processing an LCP amendment
- [Appendix E](#): Key Coastal Act policies relevant to sea level rise and coastal hazards
- [Appendix F](#): Sea level rise scenarios for the 14 California tide gauges
- [Appendix G](#): Coastal Commission contact information



## CONTEXT OF THIS DOCUMENT

This Guidance is part of a larger body of work on climate change by State agencies, regional collaborations, local leadership, academic research, and other organizations. Many of these efforts are included as resources in [Appendix C](#). Users of the document should take advantage of these existing resources, collaborate with others, and share best practices as much as possible.

**Finally, this document is intended to function as interpretive guidance for effective implementation of the Coastal Act and LCPs in light of sea level rise. It also provides the guidance to local governments that is required pursuant to Public Resources Code Section 30985.2 regarding the preparation of sea level rise plans. It is not a regulatory document and does not contain any new regulations. Further, it does not amend or supersede existing legal authorities or the standard of review for Local Coastal Programs and Coastal Development Permit decisions pursuant to the Coastal Act. Those actions are subject to the applicable requirements of the Coastal Act, the Coastal Zone Management Act, certified LCPs, and other applicable laws and regulations as applied in the context of the evidence in the records for those actions. The Commission is adopting this Guidance as interpretive guidelines pursuant to its authority under Public Resources Code Sections 30620.**