Appendix C. Resources for Addressing Sea Level Rise

This section contains lists of sea level rise viewers, guidance documents, and state agency-produced resources and data clearing houses related to sea level rise. These resources will be particularly relevant for informing Steps 1-7 of the LCP planning process (Chapter 5). This section also provides a summary of the Commission's Environmental Justice and LCP Toolkit that is a resource for local jurisdictions to consider and incorporate environmental justice into their LCP planning process.

Resource	Description	Link
Key State Guidance and Research		
California State Sea Level Rise Guidance (OPC 2024)	The Ocean Protection Council's *State of California Sea-Level Rise Guidance* (Guidance) provides a synthesis of the best available science on sea level rise scenarios for California, a stepwise approach for state agencies and local governments to evaluate those scenarios and related hazard information in decision-making and preferred coastal adaptation approaches. This Coastal Commission SLR Policy Guidance includes the same sea level rise scenarios. It also includes recommendations about the application of the best available science that are aligned with those in the *State Sea Level Rise Guidance* but most specific to the Coastal Commission context.	https://opc.ca.gov/wp-content/uploads/2024/05/Item-4-Exhibit-A-Final-Draft-Sea-Level-Rise-Guidance-Update-2024-508.pdf
California Climate Assessments **Fourth California Climate Assessment (2018)** **Fifth California Climate Assessment (2023-2025)**	Senate Bill 1320 (Stern, 2020) called on the State to advance action-based science by developing California Climate Change Assessments at least every five years. Previous Assessments (2006, 2009, 2012, 2018) contributed to a growing understanding about the impacts of climate change in California and offer communities and decision makers the tools to take action, including a technical report that provides sea level rise projections. The Fifth Assessment is currently underway.	Home page: https://www.climateassessment.ca.gov/ Access 4th Assessment SLR projections here. Fifth Assessment data products are available via Cal-Adapt Analytics Engine
California Climate Adaptation Strategy (2021)	The *California Climate Adaptation Strategy*, mandated by Assembly Bill 1482 (Gordon, 2015), links together the state's existing and planned climate adaptation efforts, showing how they collectively achieve	https://climateresilience.ca.gov/

	California's six climate resilience priorities. Its goal is to enable a coordinated, integrated approach to building climate resilience.	
Making California's Coast Resilient to Sea Level Rise: Principles for Aligned State Action (2020)	Adopted by California state agencies with coastal, bay, and shoreline climate resilience responsibilities, these principles guide unified action toward sea level rise resilience for California's coastal communities, ecosystems, and economies. The principles relate to the following subjects: Best Available Science, Partnerships, Alignment, Communications, Local Support, Coastal Resilience Projects, and Equity.	https://opc.ca.gov/wp-content/uploads/2021/01/State-SLR-Principles-Doc_Oct2020.pdf
State Agency Sea-Level Rise Action Plan for California (2022)	This Action Plan is a statewide, collaborative document designed to carry out a preceding document, *Making California's Coast Resilient to Sea Level Rise: Principles for Aligned State Action.* It identifies proposed new and ongoing work for 2022-2027 and includes over 80 trackable actions, covering both a regional and statewide scope.	https://www.opc.ca.gov/webmaster/_media_library/2022/02/Item-7_Exhibit-A_SLR-Action-Plan-Final.pdf
Coastal Hazard Resilience Plan Alignment Guide (2023)	The Coastal Resilience Compass is a planning guide that helps planners along the California coast align their planning efforts to address climate change and manage future risks. It discusses how to align Local Coastal Programs (LCPs), Local Hazard Mitigation Plans (LHMPs), General plans (with a specific focus on safety and Housing Elements), climate adaptation plans, and implementation plans.	https://resilientca.org/plan-alignment/coastal-resilience-compass/
Other Coastal Commission Guidance Documents		
Critical Infrastructure at Risk: Sea Level Rise Adaptation Planning for California's Coastal Zone (CCC 2021)	This guidance promotes resilient coastal infrastructure and protection of coastal resources by providing recommendations for stakeholders on how to plan effectively for the impacts of sea level rise on coastal infrastructure, a description of the regulatory framework that applies to adaptation planning for infrastructure, and model policies that can be used by local governments as a tool for updating LCPs. It addresses two main types of infrastructure – transportation and water – and presents six key considerations for successful adaptation planning.	https://www.coastal.ca.gov/climate/slr/vulnerability-adaptation/infrastructure/
Public Trust Guiding Principles and	This Commission-adopted document describes how the public trust doctrine relates to the Coastal Commission's and local governments' work on sea level rise planning under the Coastal Act. It presents a	https://www.coastal.ca.gov/public-trust/

Action Plan (CCC 2023)	series of principles to guide the Commission's and local governments' work on this subject as well as a set of next steps and research priorities for the Commission.	
California Coastal Commission Sustainability Principles: A Framework for Reducing Greenhouse Gas Emissions in the Coastal Zone (CCC 2023)	This set of Commission-adopted principles aim to improve climate resiliency and minimize the effects of climate change throughout the coastal zone. The principles align with and help carry out the Commission's 2021 to 2025 Strategic Plan, particularly with respect to Objective 4.5 to facilitate greenhouse gas reductions in LCPs, CDPs, and other efforts. The principles also align with the state's goal of carbon neutrality by 2045 and related statewide climate strategies.	https://documents.coastal.ca.gov/assets/lcp/LUPUpdate/Sustainability%20Principles_Adopted%20August%209%202023%20Final.pdf
Progress in California: status of adaptation planning, LCPs, and case studies		
Coastal Commission website	The Coastal Commission's LCP Local Assistance Grant Program webpage provides a "Status of Grantees" chart that links to various local governments' sea level rise vulnerability assessments, adaptation plans, and LCP updates. This chart is a good resource for those looking for examples of recently completed studies and plans related to SLR.	https://www.coastal.ca.gov/lcp/grants/
California Coastal Adaptation Planning Inventory	This online Storymap summarizes the status of coastal adaptation planning in California's 76 coastal jurisdictions along the outer coast, including community vulnerability assessments, adaptation strategies, and local coastal planning under the Coastal Act. The inventory was developed by the research team at UCSB's Ocean and Coastal Policy Center, with major funding from the California Ocean Protection Council (OPC) under Proposition 68, and will be periodically updated.	https://storymaps.arcgis.com/stories/5c3ec4198b564750886cc75b95a8e492
California Adaptation Clearinghouse	Hosted by the OPR Integrated Climate Adaptation and Resiliency Program (ICARP), the *California Adaptation Clearinghouse* is a searchable database of adaptation and resilience resources organized by climate impact, topic, and region. Types of resources in the Clearinghouse include assessments, plans, or strategies; communication and educational materials; planning and policy guidance; data, tools, and research; and case studies, projects, and example planning documents.	https://resilientca.org/

Funding		
Coastal Commission LCP Local Assistance Grant Program	The Coastal Commission's LCP Local Assistance Grant Program provides funds to support local governments in completing or updating Local Coastal Programs (LCP) consistent with the California Coastal Act, with special emphasis on planning for sea level rise and climate change. Grant-funded work has included the sea level rise vulnerability assessments, technical studies, economic analyses, adaptation planning and reports, public outreach and engagement, and LCP policy development. Additional program details, including eligibility information and evaluation criteria, are provided on the program website.	https://www.coastal.ca.gov/lcp/grants/
Ocean Protection Council SB1 Grant Program	OPC's SB 1 SLR Adaptation Planning Grant Program (SB 1 Grant Program) aims to provide funding for coastal communities to develop consistent sea level rise adaptation plans and projects to build resilience to sea level rise along the entire coast of California and San Francisco Bay. One track funds projects in the pre-planning, data collection, and planning phases, and another funds projects in the implementation phase.	https://www.opc.ca.gov/sb-1-funding/
State Coastal Conservancy	The California State Coastal Conservancy has a variety of grant programs to support increased public access to and along the coast, protection and restoration of natural lands and wildlife habitat, preservation of working lands, and increased community resilience to climate change. Funding can support a variety of project stages including feasibility studies, property acquisition, community engagement, environmental review, and monitoring. More information on Conservancy grants can be found on their website.	https://scc.ca.gov/grants/
Grants.ca.gov	The California Grants Portal, a project by the California State Library, is a search engine for all grants and loans offered on a competitive or first-come basis by California state agencies. Agencies that have historically funded projects related to SLR adaptation include: the Federal Emergency Management Agency (FEMA), California Governor's Office of Emergency Services (CalOES), Ocean Protection Council (OPC), Office of Planning and Research (OPR), Strategic Growth Council (SGC), State Coastal Conservancy (SCC), and California Coastal Commission (CCC).	Grants.ca.gov

Coastal Quest Coastal Funding Database	This database provides current funding opportunities that support coastal resilience programs and coastal multi-benefit nature-based solutions, including disaster resilience, 30×30 protection, conservation, and restoration. The database is updated weekly.	https://www.coastal-quest.org/our-programs/coastal-funding-database/
SLR Mapping & Scenario Tools		
Our Coast Our Future (CoSMoS)	The USGS's Coastal Storm Modeling System (CoSMoS) provides maps of various sea level rise-related hazards under half-meter incremental sea level rise scenarios. CoSMoS provides more detailed predictions of coastal flooding due to both future sea level rise and storms integrated with long-term coastal evolution (i.e., beach changes and cliff/bluff retreat) over large geographic areas (100s of kilometers). While projections of groundwater rise and shoreline change are available statewide, other hazards are available from Point Arena to the Mexico border and will be available statewide in the coming years.	Access the online viewer at ourcoastourfuture.org Download GIS data layers at https://www.sciencebase.gov/catalog/item/5633fea2e4b048076347f1cf and view them on Cal Adapt at Cal-Adapt.org (Data is also hosted on the 30x30 California Climate Explorer)
Hazard Exposure Reporting and Analytics (HERA) (CoSMoS data)	The USGS's CoSMoS data is hosted on both ourcoastourfuture.org (above) and on HERA, the Hazard Exposure Reporting and Analytics website. HERA allows users to overlay the hazard data layers of CoSMoS with a host of different spatial datasets on communities, residents, employees, land types, habitats, parcels, and various types of critical infrastructure and facilities. It provides users with statistics regarding the number of people and assets within any give hazard zone.	https://www.usgs.gov/apps/hera/
NOAA Sea Level Rise Viewer	An example of a "bathtub model," this viewer shows areas that are hydrologically connected to the ocean and are located at 1-foot increments of elevation above mean sea level rise, representing the geographic areas that would become inundated with sea level rise up to 10 feet. Storms, waves, erosion, and other coastal processes are not represented.	https://coast.noaa.gov/digitalcoast/tools/slr.html

NASA Flooding Analysis Tool	This tool describes the frequency of high-tide flooding will change under various sea level rise scenarios. Users can view sea-level observations and assess past high-tide flooding frequency, view future changes in high-tide flooding frequency under various sea level rise scenarios, and view statistics and inflection points that support decision making. The tool was developed with funding from the NASA Sea Level Change Team by scientists at the University of Hawaii Sea Level Center and is based on the methods of Thompson *et al*., 2021.	https://sealevel.nasa.gov/data_tools/15/
Cal-Adapt – Exploring California's Climate	Cal-Adapt hosts two datasets on sea level rise hazards: CoSMoS data and CalFloD3D-TFS. The CoSMoS data is the same as the dataset described above. The CalFloD3D-TFS assesses potential coastal flooding exposure to areas of interest to the Transportation Fuel Sector (TFS) over five 20-year planning horizons and the Fourth Assessment scenarios using a 3Di hydrodynamic model during extremely high sea level events (72 hour storm event). Due to the inclusion of aboveground objects such as buildings and levees, CalFloD-3D depicts detailed land surface details. Details are described in Radke *et al*., 2018. Cal-Adapt Analytics Engine provides the foundational climate and environmental data that underpins the California Climate Change Assessment, including sea level rise information.	http://cal-adapt.org/tools/slr-calflod-3d/ https://analytics.cal-adapt.org/
NASA Interagency Sea Level Rise Scenario Tool	The NASA Interagency Sea Level Rise Scenario Tool provides graphs of the sea level rise scenarios in the report, *Global and Regional Sea Level Rise Scenarios for the United States* (Sweet *et al*., 2022). Scenarios are available for all U.S. states and territories, out to the year 2150.	https://sealevel.nasa.gov/task-force-scenario-tool?psmsl_id=1352
NASA & IPCC Sea Level Rise Projection Tool	The NASA Sea Level Projection Tool allows users to visualize and download the sea level projections from the IPCC *Sixth Assessment Report* (AR6). Along with global mean sea level rise projections, projections are available for various regions and tide gauge locations around the globe.	https://sealevel.nasa.gov/ipcc-ar6-sea-level-projection-tool?type=global

The Coastal Commission has developed a resource guide to assist local governments in integrating environmental justice into their LCPs. This guide is a direct response to the Commission's Environmental Justice Policy, which encourages local authorities to include

environmental justice considerations in their coastal management efforts, particularly in addressing sea level rise and ensuring community involvement. The guide is enriched with extensive research, best practices, and examples from jurisdictions like Morro Bay and Half Moon Bay, which have successfully incorporated environmental justice measures into their LCPs. It offers practical advice on amending LCPs to reflect environmental justice concerns, building meaningful relationships with affected communities, and ensuring that these communities' perspectives and needs are central to the planning process. This resource is designed to be a comprehensive tool for local governments to enhance their coastal management strategies and protect vulnerable populations while managing coastal resources effectively. For more detailed information and guidance on how to integrate environmental justice into Local Coastal Programs, you can access the full Resources for Addressing Environmental Justice Through Local Coastal Programs guide on the Commission's webpage.