



Staff Recommendation

June 4, 2024

Item 4

Action Item:

**Consideration of Adoption of the State of California Sea Level Rise
Guidance: 2024 Science and Policy Update**

Justine Kimball, Senior Climate Change Program Manager

Recommended Action: Staff recommends that Ocean Protection Council adopt the following resolution pursuant to Sections 35500 et seq. of the Public Resources Code:

“The California Ocean Protection Council hereby adopts the State of California Sea Level Rise Guidance: 2024 Science and Policy Update (Exhibit A) to help state and local governments prepare for and adapt to sea level rise.”

Location: Statewide

Strategic Plan Goals and Objectives: Goal 1: Safeguard Coastal and Marine Ecosystems and Communities in the Face of Climate Change; Objective 1.1: Build Resiliency to Sea-Level Rise, Coastal Storms, Erosion, and Flooding

Equity and Environmental Justice Benefits: Adverse impacts from sea level rise may not be felt equitably across the state. Sea level rise hazards may have disproportionate impacts on communities with fewer resources, including communities in low-lying areas or located near sites with contaminants that can mobilize during flooding. Updated scientific guidance is needed to inform local, regional, and tribal decision-making and to plan for sea level rise.

Exhibits:

Exhibit A: State of California Sea Level Rise Guidance: 2024 Science and Policy Update

Exhibit B: Frequently Asked Questions

Exhibit C: Summary of Public Comments and Revisions

Findings and Resolution:

Staff recommends that the Ocean Protection Council (OPC) adopt the following resolution pursuant to Sections 35500 et seq. of the Public Resources Code:

“The California Ocean Protection Council hereby adopts the State of California Sea Level Rise Guidance: 2024 Science and Policy Update (Exhibit A) to help state and local governments prepare for and adapt to sea level rise.”

Executive Summary:

Climate change is altering California’s coastline. Rising seas, colliding with more frequent and extreme storms, are drowning beaches, eroding bluffs, flooding homes and businesses, and damaging roads and other essential public infrastructure. Close to 70% of California’s residents live in coastal counties, and millions more visit every year, driving the state’s \$44 billion coastal economy as people come to the coast for recreation, cultural and spiritual wellbeing, a connection to nature, and to support their livelihoods. To ensure that people, the environment, and the economy can continue to thrive, California must take bold and swift action to help prepare communities for the impacts we are starting to see now and that are projected to worsen in the years ahead.

The previous [2018 State of California Sea-Level Rise Guidance](#) (2018 Guidance) was based on a synthesis of best available science at that time. Since then, there have been significant advancements in scientific understanding and ability to project future sea level rise. In February 2022, a national report entitled Global and Regional Sea Level Rise Scenarios for the United States was released updating Sea Level Scenarios for the United States based on global projections in the latest Intergovernmental Panel on Climate Change report. This national update presented an opportunity to update California’s sea level rise guidance with best available science and align the state’s approach with national coastal adaptation efforts.

This report updates and replaces the previous 2018 Guidance and marks the fourth iteration of statewide guidance since 2010 for state and local decision-makers to incorporate best available science on sea level rise into planning, design, permitting, investments, and other decisions. It will support state and local action to assess vulnerability to rising seas and climate-driven flooding and the creation of adaptation plans and projects that build resilience into the future.

Project Summary:

Background:

Over the past five years, sea level rise planning in California has been guided by the 2018 Guidance. In that guidance, OPC committed to updates approximately every five years to ensure that adaptation planning and projects are based on the best available science.

Since 2018, state agencies and departments have advanced sea level rise adaptation through the development, uptake, and implementation of multiple sea level rise policies, programs, and actions. For example, in 2020 the California Natural Resources Agency and California Environmental Protection Agency released a set of [Sea Level Rise Principles](#) (Principles) with the purpose of aligning state planning, policy setting, project development, collaboration, and decision-making around sea level rise. These Principles were co-developed with the State Sea Level Rise Collaborative (Collaborative), which is a group of 17 state agencies that meet quarterly to discuss coastal resilience issues at the state level, including emerging science, policy, and projects. Facilitated by OPC, the Collaborative co-produced the [State Agency Sea Level Rise Action Plan](#) for California in 2022 and further updated in February 2024, which provides a roadmap for coordinated and aligned state agency efforts to build resilience.

Since 2018, sea level rise planning efforts across the state have advanced in number, scale, and sophistication. Many coastal cities and counties have completed vulnerability assessments, which estimate the threat that sea level rise poses to public infrastructure, private homes, businesses, recreation areas, community centers, coastal habitats, and more. However, most of this planning has not yet considered the potential for impacts from rising groundwater or compound flooding. Sea level rise projections have been incorporated into local and regional planning and decision frameworks including Local Coastal Programs (LCPs), hazard mitigation plans, and the Delta Stewardship Council Delta Plan and Delta Adapts, among others.

In recent years, California has passed legislation aimed at advancing sea level rise adaptation planning throughout the state. Senate Bill 1 (SB 1, Atkins, 2021), the Sea Level Rise Mitigation and Adaptation Act, was signed into law in 2021. SB 1 directs OPC to administer grants to local and regional governments to plan for sea level rise and implement adaptation projects. With funding for SB 1 implementation in the Budget Acts 2022 and 2023, OPC established the [SB 1 Sea Level Rise Adaptation Planning Grant Program](#), which includes a technical assistance component, with the goal 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 and San Francisco Bay. Additionally, Senate Bill 272 (SB 272, Laird, 2023) was signed into law in 2023 requiring all coastal local governments develop sea level rise plans and prioritizes local governments with approved sea level rise plans for adaptation funding. These plans must be integrated into LCPs or San

Francisco Bay shoreline resiliency plans by 2034. SB 272 also requires the California Coastal Commission, San Francisco Bay Conservation and Development Commission, and OPC to establish minimum guidelines for sea level rise plans by 2024. Actions 4.1-4.3 in the State Agency Sea Level Rise Action Plan directly address and support these SB 272 requirements.

Project Summary:

In June 2022, OPC and the California Ocean Science Trust (OST) convened an interdisciplinary Sea Level Rise Science Task Force (Task Force) to update the science foundation for state sea level rise policy. Task Force members contributed their technical expertise in meetings and discussions. OPC and OST consulted and gained input from state agency staff and local and regional planners, through multiple meetings and workshops, to align the updated science and guidance with their needs, interests, and opportunities for planning and preparing for sea level rise. The updated sea level rise science for California in Chapter 2.0 of this report was peer reviewed by three independent experts to ensure technical rigor and was revised in response to reviewer comments.

OPC conducted initial listening sessions and formal consultation with California Native American tribes to ensure that the guidance reflects tribal priorities and meets the needs of tribal governments and tribal communities. Feedback from the State Sea Level Rise Collaborative was incorporated prior to and after a public comment period. This final version reflects edits made in response to public comments received during a 45-day public comment period.

To support science-based decision-making, this report consists of syntheses of the best available science on sea level rise and other coastal hazards (e.g., flooding and erosion) with pragmatic and practical approaches for using this new scientific information (Chapters 2.0 and 3.0), primarily led and authored by the Task Force, as well as specific policy recommendations for incorporating this information into decision-making (Chapter 4.0), led and authored by OPC.

Key Takeaways:

There is greater certainty and a narrowing range of the amount of sea level rise through 2050, with the range of sea level rise projections expanding through end of century and beyond:

- The California Sea Level Scenarios show greater certainty in the amount of sea level rise expected in the next 30 years than previous reports and demonstrate a narrow range across all possible emissions scenarios. Statewide, sea levels are most likely to rise 0.8 ft (Intermediate Scenario) by 2050.
- In the mid-term (2050-2100), the range of possible sea level rise projections expands due to more uncertainty in projected future warming from different emissions pathways and certain physical processes (i.e. rapid ice sheet melt). By 2100, statewide average sea levels

are expected to rise between 1.6 ft and 3.1 ft (Intermediate-Low to Intermediate Scenarios), although higher amounts are possible.

- Over the long-term (towards 2100 and beyond), the range of sea level rise projections becomes increasingly large due to uncertainties associated with physical processes, such as earlier-than-expected ice sheet loss. Sea levels may rise from 2.6 ft to 11.9 ft (Intermediate-Low to High Scenarios) by 2150, and even higher amounts cannot be ruled out.
- The pathway associated with the extreme sea level rise scenario (i.e. H++) from Rising Seas 2017 is higher than the best available science now supports. The key lines of evidence that resulted in the extreme sea level rise scenario (i.e. H++) from Rising Seas 2017 have been updated and are now reflected in the Intermediate-High and High Scenarios.

Sea level rise, when combined with extreme storms and higher tides, will result in accelerated cliff and bluff erosion, increased coastal flooding, and flooding from groundwater:

- Today's coastal storms provide a glimpse into our future in which storm events will become more damaging and dangerous as climate change and sea level rise continue. Coastal storms under future sea level scenarios will cause accelerated cliff and bluff erosion, coastal flooding and beach loss, and mobilization of subsurface contaminants. Sea level rise will increase the exposure of communities, assets, services and culturally important areas to significant impacts from coastal storms.
- Sea level rise will increase the frequency of coastal flooding events, which occur when sea level rise amplifies short-term elevated water levels associated with higher tides, large storms, El Niño events, or when large waves coincide with high tides. California communities need to be aware of and prepared for a likely rapid increase in the frequency of coastal flooding in the 2030s, even beyond the increases in coastal flood frequency already occurring as a result of extreme storms.
- Groundwater rise poses a threat to below-ground infrastructure and freshwater aquifers under future Sea Level Scenarios. In areas with shallow unconfined groundwater, the water table will generally rise with sea level, depending on local geomorphology.

A precautionary stepwise process for incorporating sea level rise scenarios into planning and project is needed to phase adaptation actions over time:

- A stepwise process is recommended for incorporating Sea Level Scenarios into planning and projects. The most precautionary approach, when feasible, is to evaluate Intermediate, Intermediate-High, and High Scenarios to assess a spectrum of potential impacts, consequences, and responses.

- The process of selecting an implementation project or adaptation pathway that is adaptive to a certain amount of sea level rise will include consideration of risk, budget, regulatory constraints, environmental and community impacts, and stakeholder input, in addition to other factors. Selection will often be a negotiation and assessment of trade-offs, and using trigger-based adaptation pathways to account for sea level rise over time - rather than incorporating the full sea level rise amount into initial project design - will likely be a common approach.

Consistency with California Ocean Protection Act:

The proposed project is consistent with the Ocean Protection Act, Division 26.5 of the Public Resources Code, because it is consistent with trust-fund allowable projects, defined in Public Resources Code Section 35650(b)(2) as projects which:

- Eliminate or reduce threats to coastal and ocean ecosystems, habitats, and species.
- Improve the management of fisheries and/or foster sustainable fisheries.
- Improve coastal water quality.
- Allow for increased public access to, and enjoyment of, ocean and coastal resources, consistent with sustainable, long-term protection and conservation of those resources.
- Improve management, conservation, and protection of coastal waters and ocean ecosystems.
- Protect, conserve, and restore coastal waters and ocean ecosystems.