

STATE AGENCY SEA-LEVEL RISE ACTION PLAN FOR CALIFORNIA

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PREPARED BY



**OCEAN
PROTECTION
COUNCIL**

State Agency Sea-Level Rise Action Plan for California Fiscal Year 2021-22 to 2024-25



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Executive Summary

Numerous state agencies are dedicated to helping California prepare for sea-level rise (SLR). Our vision is to make all of California, including its coastlines, inland areas, and bays and estuaries, resilient to the impacts of SLR, such as flooding, erosion, and habitat degradation and loss. This occurs through thoughtful and coordinated plans and projects aimed to protect and conserve our unique biodiversity, public health and safety, infrastructure, outdoor access, and coastal economy. This must be done through an equitable process, inclusive of all Californians, that prioritizes environmental and climate justice with an emphasis on partnerships with California Native American tribes and supporting vulnerable communities.

In 2020, the California Natural Resources Agency, CalEPA and over 15 departments and agencies developed [SLR Principles](#), to guide unified, effective action toward SLR resilience for California's coastal communities, ecosystems, and economies. This action is centered on seven principles:

1. Best Available Science
2. Partnerships
3. Alignment
4. Communications
5. Local Support
6. Coastal Resilience Projects
7. Equity

Though these Principles create a direction for how to align state actions and decision points around SLR, an actionable path was needed. The Ocean Protection Council (OPC) was charged with working with agency partners to create a statewide, collaborative Action Plan that would carry out these principles. The result is this document, the SLR Action Plan, a five-year plan to make advances toward coastal resilience through comprehensive, coordinated, and collaborative work. The actions in this plan address urgent needs by identifying proposed new and ongoing work that will be leveraged upon in the next five years. This Action Plan includes over 80 trackable actions, covering both a regional and statewide scope. This work plan is the first of its kind, and sets California up for a safer, more equitable, and resilient future. The pace of implementation will depend on political will, local capacity and buy-in, and the availability of resources and funding.

SB 1 New Sea-Level Rise Legislation

Governor Newsom signed SB 1 (Atkins) on September 23, 2021. The bill establishes the California Sea Level Rise State and Regional Support Collaborative, which is tasked with:

- educating the public
- advising local, regional, and state government on feasible SLR adaptation efforts
- directing the CCC to incorporate SLR in all planning, development, and mitigation efforts.

We intend to leverage the SLR Leadership Team as the governance structure for the Collaborative to advance coastal resilience priorities for the state.

Call to Action

California's coast could face sea-level rise (SLR) of up to 1 foot by 2050 and 3.5 feet by 2100, threatening our coastal communities and habitats, way of life, and sense of Californian identity. SLR will create cascading and compounding impacts, including floods, groundwater contamination, and extreme wave action. According to California's Fourth Climate Change Assessment, 31 to 67 percent of Southern California beaches may completely erode by 2100 without intervention. A study from the Center for Biological Diversity estimated that 17 percent of threatened and endangered species nationwide are at risk from rising sea levels.

But impacts of SLR will be felt far beyond our sandy beaches. Flooding and exposure pose significant risks to the current and ancestral lands and cultural and natural resources of California Native American tribes. Additionally, the Fourth Climate Assessment also finds that statewide, \$17.9 billion worth of residential and commercial buildings could be inundated with just 1.7 feet of SLR. It's estimated that 3,750 miles of highway will be susceptible to SLR and coastal storms by 2100. Delta Adapts recently found that within the Delta region, 3.5 feet of SLR and changing storm patterns puts \$10.2 billion of agricultural,

residential, and commercial property, and \$11.6 billion of infrastructure that includes critical facilities, communications structures, roadways, and railways at risk of exposure or damage.

The costs associated with damage to the statewide transportation infrastructure from SLR and climate change-driven impacts—and the corresponding investment needed with any adaptation strategy for the transportation system—are significant. For example, realigning and elevating nearly one mile of roadway near Gleason Beach subject to chronic and accelerating bluff erosion costs \$40 million. Without immediate action, the road would require a 29.3-mile detour.

Toxic Tides, a recent study from UC Berkeley and UCLA that analyzed how SLR will impact contaminated sites, found that at least 440 hazardous facilities, including power plants, refineries, industrial facilities, and hazardous waste sites, are at risk of coastal flooding by 2100 under a high emissions scenario (RCP 8.5). Many of these toxic sites are disproportionately located near vulnerable communities burdened by environmental injustice that will bear heavier consequences of climate change and SLR than others. Rising groundwater levels due to SLR will also continue to present a public health concern by exposing coastal residents to toxic contaminants, especially those living near contaminated and toxic sites.

Beyond infrastructure, opportunities for safe and affordable coastal access and recreation are at risk as well. SLR will flood and erode coastal areas, narrowing beaches, reducing recreation space, and restricting lateral access. In Southern California, the Torrey Pines State Beach North Parking Lot offers coastal access, including to a nearby vulnerable and under-resourced community. Continued flooding and erosion caused by SLR may cause the state to remove and relocate the parking lot. Nearby San Elijo State Beach has already lost campgrounds and beach access due to SLR and erosion, resulting in a loss of around \$59,400 in revenue and 4,320 visitors annually. Storm damage and accelerating SLR will exacerbate these impacts.

A look at our expected future SLR impacts offer a grim prediction. A preliminary study done in 2017 by State Parks and the California State Coastal Conservancy indicates that 5 feet of SLR and a 100-year storm could result in the flooding of significant State Parks facilities. These would include 593 structures, 150 acres of parking lots, 93 campgrounds and day-use areas, and 65 miles of access roads.

California has already taken meaningful action to address the threat of SLR, through investments in: best available science; development of guidance documents that help practitioners and decision makers apply scientific projections to adaptation planning; and on-the-ground resilience projects. However, the scope and scale of potential impacts from SLR require that the state take even more ambitious and proactive adaptation action now. Steps taken today can help safeguard public health and safety, access, ecosystems and infrastructure and save the state money in the long run. The Pew Foundation found that every \$1 invested in disaster mitigation saves \$6 in rebuilding and recovery. The longer we wait to take action, the more expensive the impacts of SLR will be, including beach erosion, storm damage, and chronic flooding.

SLR is the direct result of the climate change crisis. The key actions included in this Action Plan align with and leverage California's commitment to 100% renewable energy as a step towards carbon neutrality. Aggressive climate change mitigation is necessary to reduce the impacts of climate change, including SLR. The Action Plan's coordinated roadmap will require time, effort, and funding to carry out these strategies. The pace of implementation will depend upon our collective effort and the feasibility and availability of resources and competing priorities. And while this Plan outlines state agency actions, ongoing partnership and collaboration with local, tribal and federal partners is essential to our success in ensuring that California can adapt to rising seas.

Overarching Goals of this Action Plan

This Action Plan captures much of the work and efforts put forth by agencies participating in the SLR Leadership Team to achieve coastal resilience for the state of California. Through the process of collecting, analyzing, and synthesizing hundreds of actions contributed by state agencies, there were a few key themes that arose as long-term goals that will be achieved through this Action Plan.

- **The entire coast of California should be prepared and planning for SLR.** Adaptation plans are integral to preparing for SLR. Plans should highlight the vulnerabilities of natural and human resources and the impacts of SLR; identify short-, medium-, and long-term solution sets; adequately consider the priority and phasing of actions and strategies; develop project implementation strategies and ensure active community engagement processes that strive for equity across racial/social lines by implementing appropriate, targeted strategies.

- **SLR adaptation plans should lead to project implementation.** Adaptation plans should be specific and actionable, leading to decisions and implementation projects that prepare communities along coast, bays, and estuaries for adaptation. Adaptation plans should guide a governing entity to action that achieves resilience. This may occur through integration with other required planning documents such as Local Coastal Programs, General Plans, and Local Hazard Mitigation Plans.
- **SLR adaptation planning should include pathways to resiliency to 3.5' by 2050 and 6.0' by 2100.** These planning targets represent a standard approach for SLR planning and preparation. They demonstrate an elevated risk scenario that should be considered for long-term and large-scale planning, especially across large jurisdictions or regions with varying projections and risk levels. These planning targets are intended to provide a “standardized approach” option to better promote resilient planning when more locally-specific or varied risk scenario planning is less feasible. However, best available science, such as the [State Sea-Level Rise Guidance](#) should be consulted to determine which scientifically based sea-level rise scenarios are most appropriate. While the 3.5' and 6.0' targets may not be feasible for all situations, planners should consider adaptation pathways to this level of resiliency. Different targets will likely be needed for vulnerability assessments and adaptation strategies associated with coastal ecosystems in order to assess how these areas and associated nature-based solutions might keep pace with rising sea levels. Critical infrastructure (highways, bridges, water treatment plants, etc.) should consider higher SLR scenarios, as appropriate, based on State Guidance. New and re-development in the coastal zone should utilize these targets as consistent minimum criteria for planning for the impacts of SLR. For clarification, the Delta is not considered part of the coastal zone because it is inland, and the Delta's hydrology is extremely complex. SLR projections and planning targets will be updated in the [2023 State Sea-Level Rise Guidance](#).
- **Integrate and prioritize equity and social justice in all SLR adaptation planning and projects.** Community-based organizations and California Native American tribes should be highly involved throughout the SLR planning process. Through meaningful, early, and frequent consultation, the state of California will strive to find opportunities to collaborate and partner with California Native American tribes to ensure adaptation planning incorporates and supports tribal priorities. Under-resourced

communities and those currently or historically burdened by environmental and social injustices will be prioritized during the adaptation planning process. This will include financial support and funding. Tribal expertise, Traditional Knowledge (TK), and cultural practices should be valued and, when appropriate, incorporated into adaptation planning to address coastal vulnerabilities.

- **Nature-based solutions must be prioritized as feasible.** Nature-based solutions are the prioritized method for SLR adaptation pursuant to existing state policy. These include vegetated dunes, living shorelines, and wetlands and marsh restoration. Gray infrastructure such as seawalls and hard armoring should be used only as a last resort after nature-based solutions have been exhausted. Managed retreat, as feasible, should be implemented where needed.
- **Coastal habitats including wetlands, beaches, and dunes should be protected and conserved.** Adaptation planning and implementation should prioritize conservation of coastal habitats in order to maintain biodiversity and associated functions, including allowing space for upland and inland migration of coastal habitats. The traditional, cultural, and ceremonial connection of California Native American tribes to these habitats and the species within these habitats should be included and prioritized in adaptation planning and implementation.

Funding is on the Way for Coastal Resilience

While great advances have been made in 2021 and 2022 for addressing coastal resilience, many forward-thinking actions still lack the financial or legal mechanism to make them a reality. The 2022-2023 state budget included significant funding over multiple years to invest in coastal adaptation efforts, as outlined below:

- \$30M to CCC to update Local Coastal Programs to include SLR
- \$470M to SCC for Coastal Resilience and Nature-based SLR Adaptation
- \$11.5M to State Parks to implement its SLR Adaptation Strategy
- \$22M to various agencies for the Fifth Climate Assessment
- \$50M to OPC for Ocean and Coastal Resilience

About this Document

SLR Statewide Leadership Team

The SLR Statewide Leadership Team is made up of 17 California state agencies who work collectively to achieve coastal resilience for the entire coast of California. These agencies hold jurisdiction over the coastal region through authorities to regulate, fund, and develop and implement local, regional, and state policies. These state agencies include:

- California Coastal Commission (CCC)
- California State Coastal Conservancy (SCC)
- California Department of Insurance (CDI)
- California Department of Transportation (Caltrans)
- California Department of Fish and Wildlife (CDFW)
- California Office of Emergency Services (CalOES)
- California Department of Water Resources (DWR)
- California Department of Toxic Substances and Control (DTSC)
- California State Water Resources Control Board (SWRCB) in consultation with the Regional Water Quality Control Boards (RWQCB), collectively referred to as Water Boards
- California Office of Planning and Research (OPR)
- California Natural Resources Agency - Ocean Protection Council (OPC)
- California Energy Commission (CEC)
- California State Lands Commission (SLC)
- California Environmental Protection Agency (CalEPA)
- California Department of Parks and Recreation (State Parks)
- Bay Conservation and Development Commission (BCDC)
- Delta Stewardship Council (DSC)

Creation of the SLR Action Plan

CNRA and CalEPA, along with 15 different departments and agencies, first created the [SLR Principles](#) in response to a request to CNRA from four members

of the Coastal Commission for greater state action on protecting the coast from SLR. Following development of these principles, department executives requested that the SLR Leadership Team develop a statewide Action Plan to fulfill these guiding principles. OPC was charged with facilitating this group and working with the team to create the Action Plan. Through collaboration, resource sharing, and partnerships, the SLR Leadership Team has contributed actions that are in progress, planned, and forward-thinking to create the Action Plan. The actions are meant to fit together to effectively carry out each SLR Principle, with the end goal of creating a resilient coast that is prepared for impending SLR. Because this issue is so multifaceted, we have taken a coordinated approach to cover all statewide resilience needs.

Monthly working group meetings were held with staff from Leadership Team agencies to discuss priorities and actions that fulfill the SLR Principles. Working group members are agency staff who work on climate and sea-level rise issues and projects. They are well-versed in the ongoing planning, actions, and priorities needed to achieve SLR resilience. By contributing agency-specific targeted actions, projects, and goals, the draft Action Plan was created. While these actions reflect much of the SLR work California coastal agencies aim to carry out in the next five years, it does not capture every action. Full strategic priorities and actions can be found in agency strategic plans, many of which are linked in Appendix B.

OPC provided metrics to measure success, target timelines for completion, which agencies would lead and support action implementation and completion. Some similar actions were combined to create collaborative efforts. No gaps were left in the Action Plan, and all SLR Principle sub-targets were included in the key actions.

Metrics of Success

This Action Plan is formatted and organized in the following ways to ensure state agencies take decisive and coordinated action around each of the seven SLR Principles. For each SLR Principle, a brief paragraph is included to frame the general goals and actions to which the state is already dedicated, and to further explain the context of each Principle. For example, Principle 2 focuses on Partnerships. It is important to encourage the development and leveraging of public-private partnerships, but it is not necessary that any one agency prepare a deliverable for this action, nor is this Action Plan charged with reporting pre-existing agency roles.

Statewide coastal resilience will not be achieved without aggressive, coordinated action. This requires setting goals and targets to move the ball forward in preparation for SLR. Because many climate adaptation strategies are still considered novel pilot projects, monitoring and evaluating success will be crucial to prove their effectiveness. Therefore, a series of key actions and success metrics were created to center around the SLR Principles. These actions are:

- **Trackable** - final product(s) demonstrate success.
- **Centered on leadership** - assigned lead agencies are responsible for tracking progress, while supporting agencies assist and collaborate.
- **Coordinated** - collaboration will happen across agencies that have a stake in the action or goal.
- **Tied to target timelines** - actions should have targets for completion or implementation. Actions and projects that are listed as “ongoing” have already begun or may not have a clearly defined end point. However, the pace of implementation will depend upon the feasibility and availability of resources and competing priorities.
- **Forward thinking** - actions represent efforts that are either ongoing or have been identified as a priority. In some cases, additional funding, capacity/staff, or legislation may be required to fully address a given priority. To indicate which actions are critical for achieving coastal resilience in California, high priority actions have been denoted with a “**C**”.

To stay current and reflect necessary shifts in priorities, SLR Action Plan actions and progress will be reviewed and updated annually by the SLR Leadership Team and posted to the OPC website.

Action Plan Organization

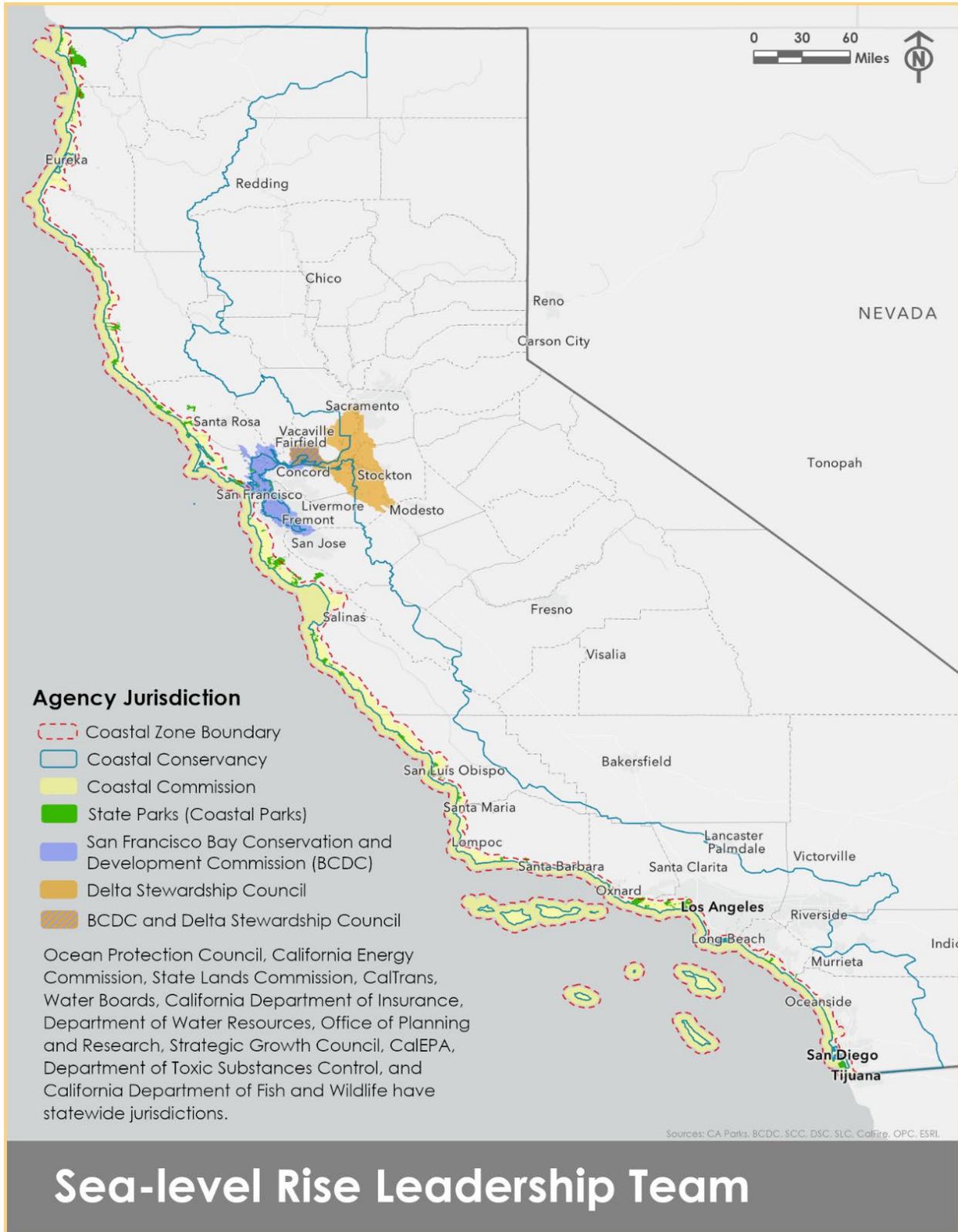
In order to hold ourselves accountable on progress towards success, a structure was created to organize each action item and apply definitive outcomes. To correspond with each of the 7 SLR Principles, the following categories were created for each action:

- **Key Actions (Actions):** Actions were drafted by SLR Leadership Team Working Group members to outline what exactly will occur in the short-term future (until 2026). The actions denoted with a **C** have been listed at the top of each Principle matrix to indicate their critical importance.

- **Metric of Success:** This category assigns a deliverable for each action item. These include items such as reports or strategies, new or updated tools, or blog posts.
- **Lead Agency:** Each action has a lead agency or agencies that will be responsible for working on and completing the action. These agencies have been integral in the development of these actions, and are either already leading these efforts, or dedicated to making them happen. The lead agency will also take responsibility to consult and partner with tribes and underserved communities as applicable.
- **Supporting/Participating Agency:** These agencies share interest in these actions and commit to a supporting or participating role. This may mean participating in a working group, offering staff time or resources, or providing guidance.
- **Timescale:** A due date year is attached to each action item to create a target timeline for progress and success. Many items are labeled as “ongoing” to show that the action may be a routine task or a previous action that is being leveraged. The pace of implementation will depend upon the availability of resources and timescales may be readjusted as needed.

Statewide Coverage

This map shows the coastal jurisdictions of our SLR Leadership Team agencies. While some agencies have clear coastal or regional boundaries, others are statewide.



Sea-level Rise Leadership Team

SLR Principle 1: Develop and Utilize Best Available Science

The best available science should inform all SLR related projects, policy, and decision-making. Traditional knowledge, tribal expertise, and tribal science can play a role in filling knowledge gaps and contributing to coastal resilience priorities shared by tribes and the State. The SLR Leadership Team Working Group therefore encourages strong partnerships with California Native American tribes as well as interdisciplinary, collaborative approaches (state and federal agencies, NGOs, academic institutions) aimed at filling existing knowledge gaps in SLR science and research - such collaborations should support necessary updates to SLR models and viewers by integrating new findings and improving the utility of these tools for relevant stakeholders.

Key Action “C” signifies a critical action	Metric of Success	Lead Agency	Supporting/ Participating Agency	Timescale
1.1 Use findings and coordinate with tribes, researchers, and academic institutions to integrate best available science into emerging climate models (e.g. CMIP 6, AR6 IPCC) to update SLR science for the 5th Climate Assessment and the next update to the California State SLR Guidance. C	Guidance / Report	OPC, OPR, CEC	CNRA, DWR, CCC, BCDC, CEC, CCC, CDFW	2023
1.2 Coordinate with FEMA to prepare Advisory Coastal Hazard Maps that update FEMA Coastal Maps with SLR, coastal erosion, and other necessary metrics of SLR impact. C	Guidance / Report	DWR, CDI	-	2024

<p>1.3 In coordination with federal partners, tribes, academic institutions, and non-profit organizations, update current statewide SLR models (such as CoSMoS, NOAA's Sea-level rise Viewer, and BCDC's Bay Shoreline Flood Explorer) with forthcoming research and best available science.</p>	Tool Update	BCDC, OPC	SLR Leadership Team	Ongoing
<p>1.4 Use the Vulnerability Assessment for Delta and Suisun Marsh as a resource to help guide flood risk reduction related plans (e.g. partnership with Central Valley Flood Protection Board (CVFPB) and the Suisun Marsh Protection Plan) in the Delta.</p>	Guidance	DSC	DWR, BCDC	Ongoing
<p>1.5 Complete Phase 2 of Delta Adapts, the Adaptation Strategy, to identify a comprehensive plan to address climate vulnerabilities in the Delta and Suisun Marsh for the long term resilience of the region.</p>	Report	DSC	DWR, Water Boards	2023
<p>1.6 Disseminate and implement the California Coastal Commission's newly released "Critical Infrastructure at Risk: Sea-level rise Planning Guidance for California's Coastal Zone".</p>	Guidance	CCC	-	Ongoing

<p>1.7 Develop an inventory of coastal habitats (i.e., dunes, beaches, wetlands, rocky intertidal, and eelgrass) and assess their vulnerability to SLR.</p>	Tool	OPC	Water Boards, CDFW, Caltrans, State Parks	2024
<p>1.8 Highlight or coalesce all available mapping components/layers or visual aids to understand spatially how SLR will impact critical infrastructure (e.g. CalEEmod).</p>	Tool	SLR Leadership Team	Caltrans	2024
<p>1.9 Update/refresh Cal-Adapt data.</p>	Tool Update	OPR, CEC	CCC	2025
<p>1.10 Evaluate relative climate vulnerability of coastal wildlife areas and ecological reserves, including sea-level rise-related risks to biodiversity (including endangered and threatened species) and state infrastructure.</p>	Assessment	CDFW	-	2025
<p>1.11 Apply best available SLR science and use innovative technologies to analyze the current and expected future location of the ambulatory mean high tide line or zone at a variety of locations, and the implications to public trust lands, uses, resources, and assets.</p>	Report	SLC, CCC	BCDC, OPC	2025

<p>1.12 Develop an action plan for addressing rocky intertidal and beach habitat loss due to SLR.</p>	<p>Plan</p>	<p>OPC</p>	<p>–</p>	<p>2024</p>
<p>1.13 Develop a beach resiliency plan.</p>	<p>Plan</p>	<p>OPC</p>	<p>-</p>	<p>2024</p>
<p>1.14 Develop and publish Wetland Action Plan, which will include best practices and recommendations for multi-benefit wetland restoration, indicators of resilience, and criteria for prioritization and funding of restoration.</p>	<p>Plan</p>	<p>OPC</p>	<p>Water Boards</p>	<p>2024</p>

SLR Principle 2: Build Coastal Resilience Partnerships

The SLR Leadership Team will continue to convene regularly. There should be ongoing coordination on SLR planning efforts, discussion of legislative efforts, and alignment of coastal and SLR policy. This includes exploring opportunities to develop partnerships with private, federal, and community-based organizations and agencies and California Native American tribes.

Key Action “C” signifies a critical action	Metric of Success	Lead Agency	Supporting/ Participating Agency	Timescale
2.1 Engage and coordinate to ensure alignment and inclusion of State, tribal, regional, and local SLR adaptation strategies/efforts in Regional Transportation Plans and Sustainable Communities Strategies, by consulting with tribes and engaging with the general public and local stakeholders. C	Planning Documents	Caltrans	SLR Leadership Team	Ongoing
2.2 Launch the California Sea-level rise State and Regional Support Collaborative, as required by SB 1 (Atkins, 2021), to support the identification, assessment, and planning necessary to avoid the environmental, social, and economic effects of SLR. C	Collaborative	OPC	SLR Leadership Team	2022
2.3 Continue to invest in and utilize the Adaptation Clearinghouse as a resource repository for SLR adaptation-related efforts for California.	Tool Expansion	OPR	SLR Leadership Team	Ongoing

<p>2.4 Provide local adaptation and planning guidance, including use of adaptation pathway approaches, reducing common obstacles, and community engagement and outreach best practices.</p>	<p>Report</p>	<p>BCDC</p>	<p>OPC, CCC, Water Boards</p>	<p>2022</p>
<p>2.5 Collaborate with state partners, tribes, community representatives, businesses, and insurers to identify areas to invest in conservation and restoration in order to reduce risk of SLR impacts.</p>	<p>Meetings / Report</p>	<p>CDI</p>	<p>DWR, SCC, OPC</p>	<p>Ongoing</p>
<p>2.6 Discuss and identify how water quality threats from SLR affect the mission of other state agencies through regular forums by the Water Boards.</p>	<p>Meetings</p>	<p>Water Boards</p>	<p>-</p>	<p>Ongoing</p>
<p>2.7 Develop resources to inform decisions that protect and adapt public trust lands, assets, and uses, from the impacts of SLR.</p>	<p>Guidance / Report / Tools</p>	<p>CCC, SLC</p>	<p>State Parks</p>	<p>2023</p>
<p>2.8 Update the Suisun Marsh Protection Plan to address SLR.</p>	<p>Plan</p>	<p>BCDC</p>	<p>DSC</p>	<p>2025</p>

SLR Principle 3: Improve Coastal Resilience Communications

SLR should be broadly understood and recognized by the public as a major climate issue. This broad public support is critical to addressing and adapting to SLR. In order to improve communication about coastal resilience, the SLR Leadership Team will continue coordinated efforts on SLR strategy while offering guidance and coordination with coastal and inland communities when developing policy. The Adaptation Clearinghouse, a centralized source of information and relevant resources, will continue to be used to promote statewide transparency on SLR adaptation projects, funding, actions, and planning.

Key Action “C” signifies a critical action	Metric of Success	Lead Agency	Supporting/ Participating Agency	Timescale
3.1 Complete the statewide SLR Communication Strategy, with regular updates to the website highlighting state actions and progress, with storytelling and blog posts that highlight geographic and cultural diversity. C	Campaign and Website	OPC	SLR Leadership Team	2022
3.2 Communicate how clean-ups at contaminated sites subject to SLR will be protective of public health and the environment to the public and local partners. C	Outreach	DTSC, Water Boards	-	Ongoing

<p>3.3 Update the Adaptation Clearinghouse, EcoAtlas, and other outreach platforms with current SLR projects and plans and assess the need for additional features to communicate and leverage best practices.</p>	Case Studies	OPR	SLR Leadership Team	Ongoing
<p>3.4 Require meaningful consultation and collaboration with tribes and community outreach with an emphasis on language access and inclusion to be required in the Scope of Work of all grant-funded SLR-related projects.</p>	Criteria	SLR Leadership Team	-	2025
<p>3.5 Support the continued development and use of outreach and communications strategies associated with online SLR viewer tools (e.g. “Our Coast, Our Future” and “Sea The Future”).</p>	Communication Strategy	SLR Leadership Team	-	Ongoing
<p>3.6 Expand King Tides Project to cover more King Tide events and other major high tide flooding events in more locations, to reach a wider audience, and share more information about tidal processes.</p>	Expanded Campaign	CCC	DWR, State Parks	Ongoing
<p>3.7 Create multilingual education programs for students and teachers around SLR concepts and adaptation strategies.</p>	Program	SLR Leadership Team	SLC, CCC, SCC, State Parks, DSC, BCDC	2025

<p>3.8 Work with museums, aquariums, and CBOs to feature SLR in interactive, multilingual campaigns, exhibits, and programs.</p>	<p>Campaign / Program / Exhibit</p>	<p>SCC</p>	<p>SLR Leadership Team</p>	<p>Ongoing</p>
<p>3.9 Create a repository within the Adaptation Clearinghouse of existing Guidance for Stakeholder Engagement, as it relates to SLR.</p>	<p>Report / Tool</p>	<p>OPR</p>	<p>SLR Leadership Team</p>	<p>2024</p>
<p>3.10 Develop a public tool (potentially through ICARP) that highlights community risk solutions to SLR and other climate hazards and allows consumers to better access insurance pricing information.</p>	<p>Tool Development</p>	<p>CDI</p>	<p>CalOES, OPR</p>	<p>2023</p>

SLR Principle 4: Support Local Leadership and Address Local Conditions

Planning for SLR resiliency will need to be downscaled to the local level, based on local and regional conditions, needs, and past and current planning efforts. Local, tribal, and regional leaders should be supported through state policies and programs, including shared resources, best practices, and projects with community-based organizations and consultants, and recommending similar projects from nearby areas. The SLR Leadership Team Working Group should explore and pursue opportunities to engage with and support local entities (e.g. invite local government representatives to at least one Working Group meeting each year).

Key Action “C” signifies a critical action	Metric of Success	Lead Agency	Supporting/ Participating Agency	Timescale
4.1 Adopt SLR Adaptation Plans (or SLR considerations embedded within LCPs, LHMPs, and/or General Plans) across the entire coast of California, Bay Area, and Delta region, and coastal State Parks, in order to fill existing jurisdictional gaps (See 4.3.) Incorporate OPR’s General Planning Survey Results (see 4.4), implementation strategies, funding mechanisms (see 4.2), permitting, and new SLR science and guidance updates.	Statewide adaptation and implementation plans	State Parks, CCC, OPC, CalOES	BCDC, DSC, Water Boards	2026 and ongoing
4.2 Distribute funding to local and tribal governments to update Local Coastal Programs (LCPs) to address SLR through the LCP Local Assistance Grant Program. C	Number of grants awarded	CCC	-	2025

<p>4.3 Complete inventory to evaluate the status, trends, processes, and outcomes of SLR adaptation planning by the 76 local government jurisdictions along California's outer coast (15 counties and 61 cities) and Bay Area (9 counties and 40+ cities) and create an online inventory of local adaptation planning.</p>	Inventory	OPC	OPR, BCDC, CCC, Water Boards	2023
<p>4.4 Use OPR's General Planning Survey to gather information on existing gaps inhibiting the implementation of proposed SLR projects and/or planning initiatives from local jurisdictions and their partners (CBOs, NGOs, private property owners, etc).</p>	Memo	OPR	BCDC, OPC, Water Boards	2025
<p>4.5 Develop guidance and offer technical support for tribal and local jurisdictions conducting vulnerability assessments and adaptation/resiliency plans, especially pursuant to SB 379 (Jackson, 2015) and other General Plan elements.</p>	Guidance / Strategy	OPR	BCDC, SLC, State Parks, CCC, OPR, SCC, Water Boards, DWR	2025
<p>4.6 Coordinate periodic meetings between state SLR leaders/ICARP Technical Advisory group, tribal and local leadership groups (including Climate Collaboratives) to understand on the ground SLR needs.</p>	Periodic Meetings	OPR	OPC, Water Boards	2025

<p>4.7 Partner with tribal and local jurisdictions to prioritize adaptation actions, emphasizing a preference for those that protect and increase the resiliency of public assets, infrastructure, and projects with multi-benefits.</p>	<p>Report / Guidance</p>	<p>SLC</p>	<p>BCDC, Caltrans, Water Boards</p>	<p>2025</p>
<p>4.8 Utilize the California Sea-level rise State and Regional Support Collaborative (synonymous with the SLR Leadership Team) to offer additional capacity in the form of technical assistance and support to tribal and local governments for SLR funding programs and grant applications, adaptation planning, emergency planning, and project development and implementation.</p>	<p>Staff Capacity</p>	<p>OPC</p>	<p>OPC, SCC, State Parks, CCC, OPR, Water Boards</p>	<p>2023</p>
<p>4.9 Develop a living network of Bay Area community-based organizations to foster collaboration and increase equity in shoreline resilience planning and permitting.</p>	<p>Directory</p>	<p>BCDC</p>	<p>-</p>	<p>2022</p>

SLR Principle 5: Strengthen Alignment around Coastal Resilience

State agencies, decision-makers, project managers, and everyone in between need to align on the basics of SLR adaptation. This includes SLR science, planning efforts, permitting, implementation, monitoring, and education and outreach. The SLR Leadership Team will be at the core of this alignment, offering a space to collaborate and share information. Cross jurisdictional coordination with tribal and local governments and other stakeholders should be supported, especially where assets and hazards exist across jurisdictional boundaries. Multidisciplinary teams and projects that offer multiple benefits should be prioritized.

Key Action “C” signifies a critical action	Metric of Success	Lead Agency	Supporting/ Participating Agency	Timescale
5.1 Update California State SLR Guidance. C	Guidance	OPC	CCC, OPR	2023
5.2 Ensure critical infrastructure facilities have resiliency plans that are implementable within their maintenance period, and longer-term projects are addressed with adaptive management, to the extent feasible. C	Plans / Strategy	Caltrans, Water Boards, SLC, CCC	OPC, OPR	Ongoing
5.3 Develop scientific framework to evaluate the potential impacts of SLR on contaminated sites and how current models could be used to inform site-specific decision-making. C	Framework / Guidance	DTSC	OPC, OPR, CCC, BCDC, SCC, SLC, Caltrans, Water Boards	2023

<p>5.4 Integrate planning requirements, priorities, and standards from tribal and local SLR adaptation and resilience plans within contaminated site-specific cleanup decisions for sites vulnerable to SLR. C</p>	<p>Guidance Document</p>	<p>DTSC</p>	<p>OPC, OPR, CCC, BCDC, SCC, SLC, Caltrans, Water Boards</p>	<p>2023</p>
<p>5.5 Develop shared state agency principles on the protection of public trust tidelands.</p>	<p>Principles</p>	<p>SLC, CCC</p>	<p>SCC, State Parks, OPC, CDFW</p>	<p>2025</p>
<p>5.6 Develop guidance and templates for assessing economic impacts and risks from SLR (e.g. scenario-based cost-benefit analyses), while also considering non-traditional cost-benefit variables such as environmental and social costs.</p>	<p>Guidance</p>	<p>SLC</p>	<p>CCC, Caltrans, OPR</p>	<p>2025</p>
<p>5.7 Participate in and staff regional collaboratives in order to increase regional network capacity and leverage work already implemented (e.g. BCDC's Bay Adapt).</p>	<p>Staff</p>	<p>SCC, OPR</p>	<p>BCDC, Water Boards, CCC</p>	<p>2025</p>

<p>5.8 Pursue statewide and regional strategies and actions to address SLR impacts, including those through planning, regulations, permitting, compliance, and/or funding, potentially through a statewide resolution.</p>	<p>Various (Strategy, Regulation, Permitting, and/or Funding)</p>	<p>Water Boards</p>	<p>CCC</p>	<p>Ongoing</p>
<p>5.9 Develop a site-specific infrastructure resiliency plan focused on state roads, railroads, wastewater treatment plants, water supply facilities, ports, and power plants.</p>	<p>Planning Document</p>	<p>OPC</p>	<p>Caltrans, CEC, OPC, DWR, CCC</p>	<p>2023</p>
<p>5.10 Coordinate with other ongoing state legislative processes to update guidance with recommendations for SLR, especially the update to B-30-15 (Executive Order to reduce greenhouse gas emissions) and N-19-19 (Executive Order addressing climate change, especially via zero-emission vehicles).</p>	<p>Guidance</p>	<p>OPR</p>	<p>-</p>	<p>Ongoing</p>
<p>5.11 Continue coordination and collaboration between relevant agencies, such as CVFPB, and stakeholders in the Delta to ensure alignment between Delta Adapts and other flood risk reduction strategies and related plans.</p>	<p>Plans / Strategy</p>	<p>DSC, DWR</p>	<p>-</p>	<p>Ongoing</p>

<p>5.12 Accelerate implementation of the Bay Area’s Bay Adapt Joint Platform, a regional, multi-sector strategy for SLR to create a “One Bay” vision for shoreline adaptation, community leadership, technical support, coordinated action and regional plans and projects, and regional progress tracking across federal, state, regional and local government.</p>	Plans / Strategy	BCDC	SCC, Caltrans, Water Boards	Ongoing
<p>5.13 Update California Coastal Alignment Tool.</p>	Tool Update	OPR, CCC	Caltrans	2024
<p>5.14 Create an overarching disaster resilience strategy that includes tribal, state, and local actions and incorporates nature-based solutions.</p>	Strategy Report	CDI	OPR, OPC, CalOES	Ongoing
<p>5.15 Address regulatory and financial barriers related to reuse of sediment and soil in coastal wetland restoration and climate resilience in San Francisco Bay.</p>	Policy Amendment	BCDC	-	2025
<p>5.16 Inventory regulated permitted facilities (e.g. POTWs, industrial stormwater facilities) that are vulnerable to SLR.</p>	Inventory	Water Boards	-	Ongoing

SLR Principle 6: Implement and Learn from Coastal Resilience Projects

SLR adaptation plans are one way to begin the process of creating resilience, but those plans need to be realized through on-the-ground projects as soon as feasible. Planning targets should be applied immediately to new and redevelopment, and updated targets should be developed and applied subsequent to the adoption of climate adaptation plans. It is critical that project support comes from all angles - federal, tribal, state, regional, and local. Projects should prioritize nature-based solutions, and pre- and post-project monitoring and evaluation is vital to understanding and measuring success. This should include a standardized set of resilience indicators for a wide variety of coastal habitats, including dunes, beaches, and rocky intertidal areas. Pilot projects and demonstration efforts that are grounded in science/research and supported short- and long- term monitoring are important to test the efficacy of resilience strategies. Legislation, policies, and state mandates should support all levels of project development and implementation, including funding feasibility studies, project planning and design, permitting and ongoing monitoring.

<p align="center">Key Action “C” signifies a critical action</p>	<p align="center">Metric of Success</p>	<p align="center">Lead Agency</p>	<p align="center">Supporting/ Participating Agency</p>	<p align="center">Timescale</p>
<p>6.1 Develop guidance and implementation efforts to coordinate and streamline permitting across agencies statewide (based on Cutting the Green Tape Initiative), improve CEQA review, and regional permitting for monitoring (similar to BRRIT in Bay Area), per AB 72 (Petrie-Norris, 2021). Include identification of planning, design, and regulatory impediments to nature-based solutions.</p>	<p align="center">Guidance / Plan</p>	<p align="center">OPC, SCC, CCC, BCDC</p>	<p align="center">Water Boards, DWR</p>	<p align="center">2025</p>

<p>6.2 Develop and implement SLR adaptation projects within coastal and estuarine state parks per State Parks SLR Strategy, so as to achieve resiliency to SLR for all coastal and shoreline state parks.</p>	<p>Project Implementation</p>	<p>State Parks</p>	<p>-</p>	<p>Ongoing</p>
<p>6.3 Plan, implement, and fund nature-based solutions, strategies, and actions to increase coastal resiliency through flood reduction, habitat restoration, managed retreat, and protection of cultural resources and public access infrastructure, especially at the most vulnerable coastal recreational facilities.</p>	<p>Project Implementation</p>	<p>State Parks, SCC, CCC, OPC, CDFW</p>	<p>SLR Leadership Team</p>	<p>Ongoing</p>
<p>6.4 Support multi-phased wastewater resiliency infrastructure projects that start with planning and end with shovel-ready projects, including wastewater treatment plants and onsite wastewater treatment systems.</p>	<p>Projects</p>	<p>Water Boards</p>	<p>CCC, OPC, SCC</p>	<p>TBD</p>
<p>6.5 Support development of innovative financial mechanisms to tribal, local, and regional governments to implement coastal resilience projects and planning.</p>	<p>Projects</p>	<p>SLR Leadership Team</p>	<p>-</p>	<p>2023</p>
<p>6.6 Provide guidance about resiliency, SLR preparedness, and methods for adaptation response</p>	<p>Guidance</p>	<p>SLC</p>	<p>-</p>	<p>2025</p>

in coastal areas based on AB 691 (Muratsuchi, 2013) Vulnerability Assessments findings and report.				
6.7 Raise capacity for SLR adaptation by hosting interactive and participatory learning sessions, workshops, webinars, guided coastal site walks, contractor trainings, and community events to share best practices from pilot resiliency and adaptation projects.	Sessions / Meetings	OPR	BCDC, SLC, SCC	Ongoing
6.8 Evaluate success of nature-based coastal adaptation projects through regular monitoring so that future projects can benefit from data collection and lessons learned.	Monitoring	State Parks	SLR Leadership Team	Ongoing
6.9 Support projects that address saltwater intrusion into groundwater supply and aquifers.	Projects	Water Boards	DWR	Ongoing
6.10 Provide support and technical assistance on the Coastal Flood Risk Reduction Grant Program.	Technical Assistance	DWR	-	Ongoing
6.11 Work with relevant stakeholders and private insurers to catalyze development of insurance policies and investments that emphasize risk reduction through nature-based solutions.	Insurance	CDI	-	2025

<p>6.12 Support proofs of concept for wetlands-centered parameters and community-based insurance.</p>	<p>Project</p>	<p>CDI</p>	<p>-</p>	<p>2024</p>
<p>6.13 Integrate SLR projections and local SLR adaptation standards into cleanup efforts at contaminated sites that do not have a viable responsible party.</p>	<p>Projects</p>	<p>DTSC, Water Boards</p>	<p>SLR Leadership Team</p>	<p>2023</p>

SLR Principle 7: Integrate and Prioritize Equity and Social Justice

Social justice and equity should be integrated and prioritized in all aspects of state actions focused on building SLR adaptation and resilience. Funding for California Native American tribes and communities that are vulnerable, under-resourced or burdened by environmental and social injustices should be prioritized. Project criteria should consider the impacts and/or benefits to tribes and these communities, including historically redlined communities and communities next to or near contaminated sites. California Native American tribes include all federally recognized California tribes and non-federally recognized California tribes included on the contact list maintained by the Native American Heritage Commission. Communities include disadvantaged and severely disadvantaged communities, and communities that score above 80% on CalEnviroScreen results. Traditional Knowledge (TK) should be incorporated into climate work and SLR planning efforts. Member agencies within the SLR Leadership Team will maintain and enhance technical assistance for grant applications and general project support, especially for California Native American tribes and communities and/or projects addressing climate equity.

Key Action “C” signifies a critical action	Metric of Success	Lead Agency	Supporting/ Participating Agency	Timescale
7.1 Support tribes to develop inventories of tribal cultural resources, sites and traditional uses vulnerable to SLR.	Inventory	SLR Leadership Team	-	2022
7.2 Develop and/or support policy guidance for incorporating Environmental Justice and tribal cultural resources into local planning and adaptation policy that is consistent with the Coastal	Guidance / Report	CCC, OPC, OPR, SLC, BCDC	-	2025

Act and SB 1000 (Leyva, 2016) and the McAteer-Petris Act. C				
7.3 Inventory and prioritize the allocation of resources to address contaminated sites vulnerable to SLR in tribal communities and communities that are under-resourced and overburdened with pollution. C	Resources	DTSC, Water Boards	-	2023
7.4 Support job trainings and apprenticeship opportunities for CBOs, tribal partners, and other community groups related to climate and environmental justice, who are working on SLR resilience projects (e.g. nature-based solutions).	Job and Apprenticeships Created	CCC, OPC, BCDC, SCC, Water Boards	-	Ongoing
7.5 Develop framework to support use of tribal expertise and Traditional Knowledge in the response for SLR preparedness (planning and projects) for impacted regions (See 7.4). C	Tool	OPC	SLR Leadership Team	Ongoing
7.6 Hold workshops to integrate equity into adaptation strategy as part of the Delta Adapts effort.	Workshops	DSC	-	2023

<p>7.7 Develop Vulnerable Communities Platform (statewide) or forum to support and uplift voices from communities burdened by environmental and social injustices where they may not otherwise have been heard or listened to, increase resources to support collaboration and capacity within these communities.</p>	Tool / Strategy	OPR	BCDC, SCC, CCC, Water Boards	Ongoing
<p>7.8 Update and maintain Social Vulnerability Index webpage for the Delta region and BCDC's Community Vulnerability Mapping effort in the Bay Area.</p>	Tool / Strategy	DSC, BCDC	OPR	Ongoing
<p>7.9 Explore opportunities for financial education, premium incentive programs, homeowner discounts, and other insurance mechanisms that decrease financial risk for low income and disadvantaged individuals and communities at risk of SLR.</p>	White Paper	CDI	CalOES, SCC, OPR, OPC	Ongoing
<p>7.10 Consult, collaborate, and partner with tribes on climate change and related impacts on water resources and planning, and where practicable, apply the feedback to SLR response strategies.</p>	Progress Report	Water Boards	OPC, SCC, DWR	Ongoing

Appendix A: List of Acronyms

BCDC – San Francisco Bay Conservation and Development Commission

CCC – California Coastal Commission

CDI – California Department of Insurance

CEC – California Energy Commission

CEQA – California Environmental Quality Act

CNRA – California Natural Resources Agency

CVFPB – Central Valley Flood Protection Board

DFW – Department of Fish and Wildlife

DOT – Department of Transportation (Caltrans)

DPR – Department of Parks and Recreation

DSC – Delta Stewardship Council

DTSC – Department of Toxic Substances Control

DWR – Department of Water Resources

NERR – National Estuarine Research Reserve

NGO – Nongovernmental Organization

OPC – California Ocean Protection Council

OPR – Office of Planning and Research

State Parks – California Department of Parks and Recreation

SFEI – San Francisco Estuary Institute

SLC – State Lands Commission

SWRCB – State Water Resources Control Board

RWQCB – Regional Water Quality Control Boards

Water Boards – State Water Resources Control Board and Regional Water Quality Control Boards collectively

TK – Traditional Knowledges

LCP – Local Coastal Program

LHMP – Local Hazard Mitigation Plan

SLR – Sea-level rise

CVFPP – Central Valley Flood Protection Plan

FEMA – Federal Emergency Management Agency
CoSMoS – Coastal Storm Modeling System
CMIP 6 – Coupled Model Intercomparison Project Phase 6
ICARP – Integrated Climate Adaptation and Resiliency Program
CBOs – Community-Based Organizations
FEMA – Federal Emergency Management Agency
IPCC – Intergovernmental Panel on Climate Change

Appendix B: Agency Strategic Plans

California Coastal Commission's [2021-2025 Strategic Plan](#)
California State Parks' [SLR Adaptation Strategy](#)
California State Land Commission's [2021-2025 Strategic Plan](#)
State Water Resources Control Board's [2019 California Ocean Plan \(Water Quality Control Plan\)](#)
Department of Water Resource's [Strategic Plan](#)