



Appendix C

Resources for Addressing Sea Level Rise

This section contains lists of sea level rise viewers, guidebooks, 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 1-6 of the LCP planning process ([Chapter 5](#)). Tables include:

- [Table C-1](#) – Sea Level Rise Mapping Tools.
This may be particularly relevant for Steps 1-3.
- [Table C-2](#) – Sea Level Rise Data and Resource Clearinghouses.
This may be particularly relevant for Steps 1-4.
- [Table C-3](#) – Adaptation Planning Guidebooks.
This may be particularly relevant for Steps 1-3.
- [Table C-4](#) – Resources for Assessing Adaptation Measures.
This may be particularly relevant for Step 4.
- [Table C-5](#) – Examples of Sea Level Rise Vulnerability Assessments in California.
This may be particularly relevant for Steps 1-3.
- [Table C-6](#) – California Climate Adaptation Plans that Address Sea Level Rise.
This may be particularly relevant for Steps 1-4.
- [Table C-7](#) – California State Agency Resources

Table C-1. Sea Level Rise Mapping Tools

Tool	Description	Link
Statewide		
NOAA Digital Coast Sea Level Rise and Coastal Flooding Impacts Viewer	Displays potential future sea levels with a slider bar. Communicates spatial uncertainty of mapped sea level rise, overlays social and economic data onto sea level rise maps, and models potential marsh migration due to sea level rise. Maps do not include any influence of beach or dune erosion.	https://coast.noaa.gov/digitalcoast/tools/slr.html
Cal-Adapt – Exploring California’s Climate	Represents inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting from different increments of sea level rise coupled with extreme storm events. Incorporates real, time series water level data from past (near 100 year) storm events to capture the dynamic effect of storm surges in modeling inundation using a three dimensional hydrodynamic model (per Radke et al., 2017).	http://cal-adapt.org/tools/slr-calflod-3d/
Climate Central Surging Seas	Overlays sea level rise data with socio-economic information and ability to analyze property values, population, socio-economic status, ethnicity, and income or areas at risk. Can compare exposure across the whole state or selected county.	http://sealevel.climatecentral.org/ssrf/california
Pacific Institute Sea Level Rise Maps (Heberger <i>et al.</i> 2009)	Downloadable PDF maps showing the coastal flood and erosion hazard zones from the 2009 study. Data are overlaid on aerial photographs and show major roads. Also available are an interactive online map and downloadable maps showing sea level rise and population and property at risk, miles of vulnerable roads and railroads, vulnerable power plants and wastewater treatment plants, and wetland migration potential.	http://www.pacinst.org/reports/sea_level_rise/maps/ For the 2009 report <i>The Impacts of Sea-Level Rise on the California Coast</i> , see: http://pacinst.org/publication/the-impacts-of-sea-level-rise-on-the-california-coast/

<p>Sea Level Affecting Marshes Model (SLAMM)</p>	<p>Simulates the dominant processes involved in wetland conversions and shoreline modifications during long-term sea level rise. Map distributions of wetlands are predicted under conditions of accelerated sea level rise, and results are summarized in tabular and graphical form.</p>	<p>http://www.warrenpinnacle.com/prof/SLAMM</p>
<p>Coastal Storm Modeling System (CoSMoS); tool hosted by Our Coast Our Future</p>	<p>Currently available for Point Arena to the Mexico border, with a statewide expansion anticipated in 2018/2019. The Coastal Storm Modeling System (CoSMoS) is a dynamic modeling approach that allows detailed predictions of coastal flooding due to both future sea level rise and storms, and integrated with long-term coastal evolution (i.e., beach changes and cliff/bluff retreat)</p>	<p>https://walrus.wr.usgs.gov/coastal_processes/cosmos/ http://data.pointblue.org/apps/ocof/cms/</p>
<p>TNC Coastal Resilience</p>	<p>An online mapping tool showing potential impacts from sea level rise and coastal hazards designed to help communities develop and implement solutions that incorporate ecosystem-based adaptation approaches. Available statewide with more detailed modelling for Monterey Bay, Santa Barbara, Ventura, and Santa Monica.</p>	<p>http://maps.coastalresilience.org/california/</p>
<p>Humboldt Bay Sea Level Rise Adaptation Project</p>	<p>This project is a multi-phased, regional collaboration. Phase I produced the <i>Humboldt Bay Shoreline Inventory, Mapping, and Sea Level Rise Vulnerability Assessment</i> which describes current shoreline conditions and vulnerabilities under the current tidal regime. Phase II included hydrodynamic modeling to develop vulnerability maps of areas surrounding Humboldt Bay vulnerable to inundation from existing and future sea levels. Phase II produced the <i>Humboldt Bay Sea Level Rise Modeling Inundation Mapping Report</i> and the <i>Humboldt Bay Sea Level Rise Conceptual Groundwater Model</i>.</p>	<p>All reports are available at: http://humboltdbay.org/humboldt-bay-sea-level-rise-adaptation-planning-project</p>

Table C-2. Sea Level Rise Data and Resource Clearinghouses

Resource	Description	Link
California State Adaptation Clearinghouse	Hosted by the OPR Integrated Climate Adaptation and Resiliency Program (ICARP), a centralized source of information that provides the resources necessary to guide decision makers at the state, regional, and local levels when planning for and implementing climate adaptation projects to promote resiliency to climate change in California.	http://opr.ca.gov/clearinghouse/adaptation/ or https://resilientca.org/
California Climate Commons	Offers a point of access to climate change data and related resources, information about the science that produced it, and the opportunity to communicate with others about applying climate change science to conservation in California.	http://climate.calcommons.org/
Climate Adaptation Knowledge Exchange (CAKE)	Provides an online library of climate adaptation case studies and resources, plus ways to connect with an online climate adaptation community/network.	http://www.cakex.org/
Ecosystem Based Management Tools Network Database	Provides a searchable database of tools available for climate adaptation, conservation planning, sea level rise impact assessment, <i>etc.</i>	http://www.ebmtools.org/about_ebm_tools.html
Climate.Data.gov	Recently launched federal government data portal that includes a number of data sets on climate change, including sea level rise impacts.	http://www.data.gov/climate/
NOAA Digital Coast	This NOAA-sponsored website is focused on helping communities address coastal issues. The Digital Coast provides coastal data, tools, training, and information from reputable sources.	http://coast.noaa.gov/digitalcoast/

Table C-3. Adaptation Planning Guidebooks

Title	Description	Link
<p>Scanning the Conservation Horizon (National Wildlife Federation 2011)</p>	<p>Designed to assist conservation and resource professionals to better plan, execute, and interpret climate change vulnerability assessments.</p>	<p>https://www.nwf.org/~media/pdfs/global-warming/climate-smart-conservation/nwfscanningtheconservationhorizonfinal92311.ashx</p>
<p>Adapting to Sea Level Rise: A Guide for California's Coastal Communities (Russell and Griggs 2012)</p>	<p>Intended to assist California's coastal managers and community planners in developing adaptation plans for sea level rise that are suited to their local conditions and communities.</p>	<p>http://seymourcenter.ucsc.edu/OOB/Adapting%20to%20Sea%20Level%20Rise.pdf</p>
<p>California Adaptation Planning Guide (APG) (Cal EMA/CNRA 2012)</p>	<p>Provides guidance to support regional and local communities in proactively addressing the unavoidable consequences of climate change. Includes a step-by-step process for local and regional climate vulnerability assessment and adaptation strategy development.</p>	<p>http://resources.ca.gov/climate/safeguarding/local-action/</p>
<p>Preparing for Climate Change: A Guidebook for Regional and State Governments (Snover <i>et al.</i> 2007)</p>	<p>Assists decision makers in a local, regional, or state government prepare for climate change by recommending a detailed, easy-to-understand process for climate change preparedness based on familiar resources and tools.</p>	<p>http://cses.washington.edu/db/pdf/snoveretalgb574.pdf</p>
<p>Adapting to Climate Change: a Planning Guide for State Coastal Managers (NOAA 2010)</p>	<p>Guide offers a framework for state coastal managers to follow as they develop and implement climate change adaptation plans in their own states.</p>	<p>https://coast.noaa.gov/czm/media/adaptationguide.pdf</p>

<p>Using Scenarios to Explore Climate Change: A Handbook for Practitioners (NPS 2013)</p>	<p>Describes the five-step process for developing multivariate climate change scenarios taught by the Global Business Network (GBN). Detailed instructions are provided on how to accomplish each step. Appendices include a hypothetical scenario exercise that demonstrates how to implement the process and some early examples of how national parks are using climate change scenarios to inform planning and decision making.</p>	<p>http://www.nps.gov/subjects/climatechange/upload/CCScenariosHandbookJuly2013.pdf</p>
<p>Scenario Planning for Climate Change Adaptation: A Guidance for Resource Managers (Moore <i>et al.</i> 2013)</p>	<p>Step-by-step guide to using scenarios to plan for climate change adaptation for natural resource managers, planners, scientists, and other stakeholders working at a local or regional scale to develop resource management approaches that take future climate change impacts and other important uncertainties into account.</p>	<p>http://scc.ca.gov/files/2013/07/Scenario_planning_17july2013_FINAL-3.pdf</p>

Table C-4. Resources for Assessing Adaptation Measures

Resource	Description	Link
General		
<p>Georgetown Climate Center’s Climate Adaptation Toolkit – Sea Level Rise and Coastal Land Use</p>	<p>Explores 18 different land-use tools that can be used to preemptively respond to the threats posed by sea level rise to both public and private coastal development and infrastructure, and strives to assist governments in determining which tools to employ to meet their unique socio-economic and political contexts.</p>	<p>http://www.georgetownclimate.org/resources/adaptation-tool-kit-sea-level-rise-and-coastal-land-use</p>
<p>What Will Adaptation Cost? (ERGI 2013)</p>	<p>“This report provides a framework that community leaders and planners can use to make more economically informed decisions about adapting to sea level rise and storm flooding. The four-step framework can be used to perform a holistic assessment of costs and benefits of different adaptation approaches across a community, or to focus in on select infrastructure. The report also discusses the expertise needed at each step in the process.”</p>	<p>https://coast.noaa.gov/data/digitalcoast/pdf/adaptation-report.pdf</p>
<p>Center for Ocean Solutions: Adaptation in Action: Examples from the Field</p>	<p>Provides case studies of various adaptation strategies including overlay zones, non-conformities, setbacks, buffers, development conditions, shoreline protection devices, managed retreat, capital improvement programs, acquisition programs, conservation easements, rolling easements, tax incentives, transfer development rights, and real estate disclosures.</p>	<p>http://www.centerforoceansolutions.org/sites/default/files/Application%20of%20Land%20Use%20Practices%20and%20Tools%20to%20Prepare.pdf</p>

<p>Combatting Sea Level Rise in Southern California: How Local Government Can Seize Adaptation Opportunities While Minimizing Legal Risk (Herzog and Hecht 2013)</p>	<p>Identifies how local governments can harness legal doctrines to support aggressive, innovative strategies to achieve successful sea level rise adaptation outcomes for Southern California while minimizing legal risk. Broadly outlines likely sea level rise impacts in Southern California, and evaluates the risks and opportunities of potential protection, accommodation, and retreat adaptation strategies that local governments could deploy.</p>	<p>http://www.law.ucla.edu/~/media/Files/UCLA/Law/Pages/Publications/CEN_EM_PUB%20Combatting%20Sea-Level%20Rise.ashx</p>
<p>Strategies for Erosion-Related Impacts</p>		
<p>Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay</p>	<p>Provides a technical evaluation of various erosion mitigation measures, conducts a cost benefit analysis of some of the more promising measures, and includes recommendations for addressing coastal erosion in Southern Monterey Bay. The report is intended to be relevant for other areas of California as well.</p>	<p>https://montereybay.noaa.gov/research/techreports/tresapwa2012.html</p>
<p>Rolling Easements</p>		
<p>Rolling Easements- A Primer (Titus 2011)</p>	<p>Examines more than a dozen different legal approaches to rolling easements. It differentiates opportunities for legislatures, regulators, land trusts, developers, and individual landowners. Considers different shoreline environments (<i>e.g.</i>, wetlands, barrier islands) and different objectives (<i>e.g.</i>, public access, wetland migration)</p>	<p>http://papers.risingsea.net/rolling-easements.html</p>
<p>No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast (Caldwell and Segall 2007)</p>	<p>Provides a description of sea level rise impacts to ecosystems and public access, strategies to address these impacts, and case study examples of rolling easement strategies for the California coast.</p>	<p>http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1833&context=elq</p>

Natural Resources		
PRBO Climate Smart Conservation	Lists science-based, climate-smart conservation planning and management tools and methods, including restoration projects designed for climate change and extremes.	http://www.pointblue.org/priorities/climate-smart-conservation/
US Forest Service System for Assessing Vulnerability of Species- Climate Change Tool	Quantifies the relative impact of expected climate change effects for terrestrial vertebrate species.	http://www.fs.fed.us/rm/g rassland-shrubland-desert/products/species-vulnerability/savs-climate-change-tool/
The Nature Conservancy: Reducing Climate Risk with Natural Infrastructure report	Presents a series of nine case studies in which natural, “green” infrastructure was successfully used to mitigate climate impacts. The economic costs and benefits of the green infrastructure are compared with traditional “gray” approaches.	http://www.nature.org/our-initiatives/regions/northamerica/unitedstates/california/ca-green-vs-gray-report-2.pdf
CDFW Essential Habitat Connectivity Project	“The California Department of Fish and Wildlife and the California Department of Transportation (Caltrans) commissioned a team of consultants to produce a statewide assessment of essential habitat connectivity by February of 2010, using the best available science, datasets, spatial analyses, and modeling techniques. The goal was to identify large remaining blocks of intact habitat or natural landscape and model linkages between them that need to be maintained, particularly as corridors for wildlife.”	https://www.wildlife.ca.gov/Conservation/Planning/Connectivity
CDFW Areas of Conservation Emphasis tool	Provides a mapping tool and reports on the best available statewide, spatial information on California's biological richness, including species diversity, rarity, and sensitive habitats, as well as recreational needs and opportunities throughout the state, including fishing, hunting and wildlife-viewing.	http://www.dfg.ca.gov/bio/geodata/ace/

Table C-5. Examples of Sea Level Rise Vulnerability Assessments in California

Title	Description	Link
Humboldt Bay Sea Level Rise Adaptation Planning Project	Multiphase project to assess vulnerability of Humboldt Bay shoreline and adjacent areas to sea level rise and coastal hazards.	http://humboldt-bay-sea-level-rise-adaptation-planning-project
Marin Ocean Coast Sea Level Rise Vulnerability Assessment (2018)	Assesses vulnerability of Marin County’s ocean coastal areas to sea level rise, specifically evaluating 5 SLR and storm scenarios through approximately 2100. Findings are organized both by asset type and community.	https://www.marincounty.org/depts/cd/divisions/planning/csmart-sea-level-rise/csmart-publications-csmart-infospot
San Francisco Sea Level Rise Existing Data and Analyses Technical Memorandum (2016)	Summarizes existing data and analyses of SLR vulnerability within the Coastal Zone and lays the foundation for San Francisco’s proposed LCP amendment.	http://default.sfplanning.org/plans-and-programs/local_coastal_prgm/20160506.SFLCP_SLR_Tech_Memo.FINAL.pdf
Plan Half Moon Bay Sea Level Rise Vulnerability Assessment (2016)	Identifies the primary vulnerabilities within Half Moon Bay and sets forth next steps that the City and other involved agencies may take to further assess and address these vulnerabilities.	http://nebula.wsimg.com/0849a308eececc2c58ce202e2851bade?AccessKeyId=06ACEAA5216D33A5C3B0&disposition=0&alloworigin=1
City of Monterey Final Sea Level Rise and Vulnerability Analyses, Existing Conditions and Issues Report (2016)	Provides a science-based assessment of climate change vulnerabilities that includes extensive field data gathering, and compilation of existing data and information.	https://www.monterey.org/Portals/0/Policies-Procedures/Planning/WorkProgram/LCP/16_0316_FINAL_Monterey_ExistingConditions_wAppendixA_WEB.pdf
City of Pacific Grove Climate Change Vulnerability Assessment (2015)	Provides an evaluation of potential significant impacts of climate change for the city’s coastal zone with an emphasis on how anticipated climate change may affect people, resources, and infrastructure along the coast.	http://www.cityofpacificgrove.org/sites/default/files/general-documents/local-coastal-program/pg-lcp-final-vulnerability-assessment-011515.pdf
City of Morro Bay Community Vulnerability and Resilience Assessment (2017)	Provides a best estimate of likely future conditions, based on local demographic projections and the most recently available scientific projections of future climate conditions, given current trends.	http://www.morrobayca.gov/DocumentCenter/View/10676/Final-Draft--Revised-Community-Vulnerability-and-Resilience-Assessment-3-6-17?bidId=

<p>City of Goleta Coastal Hazards Vulnerability Assessment and Fiscal Impact Report (2015)</p>	<p>Provides a science-based assessment that includes extensive field data gathering, compilation of existing data and information, and the participation of stakeholders such as citizens, business owners, local organizations, and community leaders. Enhances community planning by identifying coastal hazards and associated vulnerabilities that are in balance with fiscal resources.</p>	<p>https://www.conservationgateway.org/ConservationPractices/Marine/crr/library/Documents/GoletaCoastalVulnerability.pdf</p>
<p>City of Oxnard Sea Level Rise Atlas (2016)</p>	<p>Maps and identifies areas and assets at risk to existing and future conditions, including sea level rise.</p>	<p>http://nebula.wsimg.com/64b81b1805381307f1e6492bf187b6d9?AccessKeyId=D91312DA8FC16C8BCDB9&disposition=0&alloworigin=1</p>
<p>County of San Diego Climate Change Vulnerability Assessment (2017)</p>	<p>Identifies the primary threats from a changing climate facing the unincorporated areas of San Diego county, and its vulnerability to these threats.</p>	<p>https://www.sandiegocounty.gov/content/dam/sdc/pds/advance/cap/publicreviewdocuments/PostBOSDocs/CAP%20Appendix%20D%20-%20Climate%20Change%20Vulnerability%20Assessment.pdf</p>
<p>City of Imperial Beach Sea Level Rise Assessment (2016)</p>	<p>Identifies vulnerabilities from sea level rise and coastal hazards; a range of adaptation strategies including tradeoffs and economics; and recommends strategies over time that are politically digestible and economically feasible.</p>	<p>http://www.imperialbeachca.gov/vertical/sites/%7B6283CA4C-E2BD-4DFA-A7F7-8D4ECD543E0F%7D/uploads/100516_IB_Sea_Level_Rise_Assessment_FINAL.pdf</p>
<p>Santa Barbara Sea Level Rise Vulnerability Study (Russell and Griggs 2012)</p>	<p>Assesses the vulnerability of the City of Santa Barbara to future sea level rise and related coastal hazards (by Years 2050 and 2100) based upon past events, shoreline topography, and exposure to sea level rise and wave attack. It also evaluates the likely impacts of coastal hazards to specific areas of the City, analyzes their risks and the City's ability to respond, and recommends potential adaptation responses.</p>	<p>http://www.energy.ca.gov/2012publications/CEC-500-2012-039/CEC-500-2012-039.pdf</p>

<p>City of Santa Cruz Climate Change Vulnerability Assessment (Griggs and Haddad 2011)</p>	<p>Delineates and evaluates the likely impacts of future climate change on the city of Santa Cruz, analyzes the risks that these hazards pose for the city, and then recommends potential adaptation responses to reduce the risk and exposure from these hazards in the future.</p>	<p>http://seymourcenter.ucsc.edu/OOB/SCClimateChangeVulnerabilityAssessment.pdf</p>
<p>Developing Climate Adaptation Strategies for San Luis Obispo County: Preliminary Vulnerability Assessment for Social Systems (Moser 2012)</p>	<p>Describes the likely impacts of climate change on the resources and social systems of San Luis Obispo County, and assesses key areas of vulnerability. Sea level rise is identified as a major source of risk to fishing, coastal tourism, coastal development, and infrastructure.</p>	<p>http://www.energy.ca.gov/2012publications/CEC-500-2012-054/CEC-500-2012-054.pdf</p>
<p>Monterey Bay Sea Level Rise Vulnerability Study (Monterey Bay National Marine Sanctuary and PWA ESA; In progress)</p>	<p>Will assess potential future impacts from sea level rise for the Monterey Bay region. The project will estimate the extent of future coastal erosion in Monterey Bay due to accelerated sea level rise and evaluate areas subjected to coastal flooding by inundation from wave action and/or storm surges. The project will update and refine existing Monterey Bay coastal hazard zones maps (erosion and flooding).</p>	<p>Project scope and grant details: http://scc.ca.gov/webmaster/ftp/pdf/scbb/2012/1201/20120119Board03D_Monterey_Bay_Sea_Level_Rise.pdf</p>
<p>Sea Level Rise Vulnerability Study for the City of LA (Adapt LA) (USC Sea Grant 2013)</p>	<p>This report provides a summary of the initial research on the potential impacts of sea level rise and associated flooding from storms for coastal communities in the City of L.A. The study concentrates on the City's three coastal regions: Pacific Palisades from Malibu to Santa Monica; Venice and Playa del Rey; and San Pedro, Wilmington and the Port of Los Angeles.</p>	<p>http://dornsife.usc.edu/uscseagrant/la-sl/</p>

* See also the Coastal Commission's [LCP Grant website](#) for a status chart of sea level rise work completed by grantees (updated on an approximately quarterly basis).

Table C-6. California Climate Adaptation Plans that Address Sea Level Rise

Title	Description	Link
Marin Ocean Coast Sea Level Rise Adaptation Report (2018)	Presents near-, medium-, and long-term options to accommodate, protect against, or retreat from the threats of SLR and extreme events and is intended to inform Marin County’s Local Coastal Program (LCP), coastal permitting, and other county goals related to SLR preparation.	https://www.marincounty.org/depts/cd/divisions/planning/csmart-sea-level-rise/csmart-publications-csmart-infospot
Morro Bay Sea Level Rise Adaptation Strategy Report (2018)	Presents adaptation strategies for three sites within the City, selected to represent the general exposure of a type of hazard or asset.	http://www.morro-bay.ca.us/DocumentCenter/View/11753/Sea-Level-Rise-Adaptation-Report-January-2018
Adapting to Rising Tides (ART) Project	The ART project is a collaborative planning effort led by the San Francisco Bay Conservation and Development Commission to help SF Bay Area communities adapt to rising sea levels. The project has started with a vulnerability assessment for a portion of the Alameda County shoreline.	http://www.adaptingtorisingtides.org/
Santa Cruz Climate Adaptation Plan	An update to the 2007 Hazard Mitigation Plan, the adaptation plan includes strategies and best available science for integrating climate change impacts into City of Santa Cruz operations.	Complete plan is available: http://www.cityofsantacruz.com/home/showdocument?id=23644
San Diego Bay Sea Level Rise Adaptation Strategy	The strategy provides measures to evaluate and manage risks from sea level rise and other climate change impacts, and includes a vulnerability assessment of community assets at risk, and broad recommendations to increase resilience of these assets.	http://icleiusa.org/wp-content/uploads/2015/08/San-Diego-Sea-Level-Rise.pdf

* See also the Coastal Commission’s [LCP Grant website](#) for a status chart of sea level rise work completed by grantees (updated on an approximately quarterly basis).

Table C-7. California State Agency Resources

Agency	Document	Description and Link
California Natural Resources Agency	<i>Safeguarding California Plan: 2018 Update (2018)</i>	An update to the 2014 Safeguarding document: http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf
	<i>Safeguarding California from Climate Change (2014)</i>	An update to the 2009 <i>California Climate Adaptation Strategy</i> : http://resources.ca.gov/docs/climate/Final_Safeguarding_CA_Plan_July_31_2014.pdf
	<i>California Climate Adaptation Strategy (2009)</i>	Summarizes climate change impacts and recommends adaptation strategies across seven sectors: Public Health, Biodiversity and Habitat, Oceans and Coastal Resources, Water, Agriculture, Forestry, and Transportation and Energy: http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf
Office of the Governor	<i>Executive Order S-13-08 (2008)</i>	This 2008 Executive Order required the CA Natural Resources Agency to develop a statewide climate adaptation strategy, and requested that the National Academy of Sciences convene an independent scientific panel to assess sea level rise in California. http://www.climatechange.ca.gov/state/executive_orders.html
	<i>Executive Order B-30-15 (2015)</i>	This 2015 Executive Order established an interim greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to expand upon the targets already included in AB32 and emphasized the need for adaptation in line with the actions identified in the <i>Safeguarding California</i> document. http://gov.ca.gov/news.php?id=18938
Governor’s Office of Planning and Research	<i>Defining Vulnerable Communities in the Context of Climate Adaptation</i>	Resource guide developed by the Integrated Climate Adaptation and Resiliency Program (ICARP) as a starting point for practitioners to use when first considering how to define vulnerable communities in an adaptation context. http://opr.ca.gov/planning/icarp/vulnerable-communities.html
California Ocean Protection Council (and the Coasts &	<i>State of California Sea-Level Rise Guidance: 2018 Update (2018)</i>	Provides guidance for incorporating sea level rise projections into planning and decision making. Updated to include <i>Rising Seas</i> science, 2018: http://www.opc.ca.gov/updating-californias-sea-level-rise-guidance/

Oceans Climate Action Team, or CO-CAT)	<i>Rising Seas in California: An Update on Sea-Level Rise Science</i>	Provides a synthesis of the state of the science on sea-level rise and forms the scientific foundation for the updated OPC SLR Guidance. http://www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf
	<i>Resolution on Implementation of the Safeguarding California Plan for Reducing Climate Risks (2014)</i>	Resolves that OPC staff and the State Coastal Leadership Group on SLR will develop an action plan to implement the <i>Safeguarding California</i> plan. http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20140827/Item5 OPC Aug2014 Exhibit 1 Safeguarding Resolution ADOPTED.pdf
	<i>Resolution on Sea Level Rise (2011)</i>	Recognizes that state agencies should address SLR through various actions such as the consideration of SLR risks in decision making, investment of public funds, stakeholder engagement, state SLR guidance updates, etc. http://www.opc.ca.gov/webmaster/ftp/pdf/docs/OPC SeaLevelRise Resolution Adopted031111.pdf
	<i>California State Sea-Level Rise Guidance Document (2013)</i>	Provides guidance for incorporating sea level rise projections into planning and decision making for projects in California. Updated to include NRC projections March 2013: http://www.opc.ca.gov/webmaster/ftp/pdf/docs/2013 SLR Guidance Update FINAL1.pdf
California Coastal Conservancy	<i>Climate Change Policy (2010)</i>	Includes policies on 1) consideration of climate change in project evaluation, 2) consideration of sea level rise impacts in vulnerability assessments, 3) collaboration to support adaptation strategies, and 4) encouragement of adaptation strategies in project applications mitigation and adaptation: http://scc.ca.gov/2009/01/21/coastal-conservancy-climate-change-policy-and-project-selection-criteria/
	<i>Project Selection Criteria (2011)</i>	Adds sea level rise vulnerability to project selection criteria: http://scc.ca.gov/2009/01/21/coastal-conservancy-climate-change-policy-and-project-selection-criteria/

	Guidance for addressing climate change in CA Coastal Conservancy projects (2012)	Includes the following steps: 1) conduct initial vulnerability assessment, 2) conduct more comprehensive vulnerability assessment, 3) reduce risks and increase adaptive capacity, and 4) identify adaptation options: http://scc.ca.gov/2013/04/24/guidance-for-grantees
San Francisco Bay Conservation and Development Commission (BCDC)	<i>Climate Change Bay Plan Amendment</i> (2011)	Amends <i>Bay Plan</i> to include policies on climate change and sea level rise. Policies require: 1) a sea level rise risk assessment for shoreline planning and larger shoreline projects, and 2) if risks exist, the project must be designed to cope with flood levels by mid-century, and include a plan to address flood risks at end of century. Assessments are required to “identify all types of potential flooding, degrees of uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices”: http://www.bcdc.ca.gov/proposed_bay_plan/bp_amend_1-08.shtml
	<i>Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline</i> (2011)	Provides the background staff report identifying vulnerabilities in the Bay Area’s economic and environmental systems, as well as the potential impacts of climate change on public health and safety. The report provides the basis for all versions of the proposed findings and policies concerning climate change: http://www.bcdc.ca.gov/BPA/LivingWithRisingBay.pdf
California Department of Transportation (Caltrans)	<i>Estimating Sea Level for Project Initiation Documents</i> (2012)	Provides guidance on converting tidal datums and predicting future sea levels. http://www.dot.ca.gov/hq/row/landsurveys/SurveyManual/Estimating_Sea_Level_v1.pdf

	<p><i>Guidance on Incorporating Sea Level Rise</i> (2011)</p>	<p>Provides guidance on how to incorporate sea level rise concerns into programming and design of Caltrans projects. Includes screening criteria for determining whether to include SLR and steps for evaluating degree of potential impacts, developing adaptation alternatives, and implementing the adaptation strategies: http://www.dot.ca.gov/ser/downloads/sealevel/guide_incorp_slr.pdf</p>
	<p><i>Addressing Climate Change in Adaptation Regional Transportation Plans: A Guide for MPOs and RTPAs</i> (2013)</p>	<p>Provides a clear methodology for regional agencies to address climate change impacts through adaptation of transportation infrastructure: http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/documents/FR3_CA_Climate_Change_Adaptation_Guide_2013-02-26_.pdf</p>
	<p><i>District-wide Vulnerability Assessments</i> (2018, ongoing)</p>	<p>Caltrans is currently in the process of completing climate change and sea level rise vulnerability assessments for each of its Districts. http://www.dot.ca.gov/transplanning/ocp/vulnerability-assessment.html</p>
<p>Cal OES</p>	<p><i>California Multi-Hazard Mitigation Plan</i> (Draft SHMP 2018)</p>	<p>The California (CA) State Hazard Mitigation Plan (SHMP) represents the state’s primary hazard mitigation guidance document - providing an updated analysis of the state’s historical and current hazards, hazard mitigation goals and objectives, and hazard mitigation strategies and actions. The plan represents the state’s overall commitment to supporting a comprehensive mitigation strategy to reduce or eliminate potential risks and impacts of disasters in order to promote faster recovery after disasters and, overall, a more resilient state: http://www.caloes.ca.gov/for-individuals-families/hazard-mitigation-planning/state-hazard-mitigation-plan</p>
<p>State Lands Commission</p>	<p>Application for Lease of State Lands</p>	<p>Requires assessment of climate change risks, and preference is given to projects that reduce climate change risks: http://www.slc.ca.gov/Forms/LMDApplication/LeaseApp.pdf</p>

California State Parks	Sea level rise guidance (<i>in development</i>)	Will provide guidance to Park staff on how to assess impacts to parklands.
Groups of state agencies	California Climate Change Center's 3 rd Assessment	Explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts: http://climatechange.ca.gov/climate_action_team/reports/third_assessment/
	<i>California Climate Adaptation Planning Guide (APG)</i>	Provides a decision-making framework intended for use by local and regional stakeholders to aid in the interpretation of climate science and to develop a systematic rationale for reducing risks caused, or exacerbated, by climate change (2012): http://resources.ca.gov/climate/safeguarding/local-action/