



Delta Stewardship Council

A CALIFORNIA STATE AGENCY

**DELTA ADAPTS: CREATING A CLIMATE
RESILIENT FUTURE**

**PLANNING CONTEXT FOR CLIMATE CHANGE IN THE SACRAMENTO-SAN
JOAQUIN DELTA**

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CHAPTER 1. INTRODUCTION

Federal, state, regional, and local agencies in California are at varying stages of planning for climate change and sea level rise. Their roles and authority to plan for climate change adaptation within the Sacramento-San Joaquin Delta (Delta) also vary. The Delta Stewardship Council (Council) sought to understand the diversity of roles, responsibilities, and progress on planning for climate change in the Delta to inform the Delta Adapts initiative.

Understanding agency roles and responsibilities supports the Council's role as the convener of Delta Adapts, in bringing various partners together to work as part of a broader team. Documenting the range of assets and infrastructure in the Delta that agencies maintain and manage will ensure that the vulnerability assessment phase of the project provides information that salient to the Council's partners. Finally, understanding agency progress on planning for climate change will help the Council to identify opportunities to leverage partner research and fill gaps in information and plan implementation where they exist.

Staff performed a comprehensive review of the federal, state, regional, and local government agencies within the Delta. The objectives of this review were to:

1. Identify the suite of agencies that are planning for climate change within the Delta, or more broadly on matters that impact the Delta.
2. Assess the extent to which climate change and sea level rise have been incorporated into agencies' policies and/or planning frameworks.
3. Identify opportunities for Delta Adapts to fill critical gaps.

Based on this review, significant opportunities remain to improve the application of scientific information to policy and planning instruments, and to coordinate among jurisdictional boundaries and across levels of government.



CHAPTER 2. FEDERAL AGENCIES

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), which mandates flood insurance for property with a federally-backed mortgage, located in designated Special Flood Hazard Areas (SFHA). Most of the Delta region is located within SFHAs. In addition to administering flood insurance, the NFIP establishes minimum floodplain management standards, funds and reviews flood insurance studies, and provides maps and other information about flood risk. Although climate change is increasing future flood risk, most flood insurance rate maps (FIRMs) rely on historical data to determine flood hazards, meaning that flood risk is underestimated (Battalio et al 2016, Wing et al 2018). Local jurisdictions may opt to include future conditions flood risk information on their regulatory maps in certain circumstances (FEMA 2019).

The Robert T. Stafford Disaster Relief and Emergency Management Act of 1988 provides FEMA with authority for major disaster recovery programs, including but not limited to the Hazard Mitigation Grant Program (HMGP), which provides funding to States, tribes and local governments to implement projects that reduce risks to property following a major disaster. The federal funding covers 75% of eligible project costs. State and local hazard mitigation plans are required to be developed and updated on a regular basis, every five years, as a condition of HMGP funding.

FEMA has a more nuanced role in disaster recovery in some leveed portions of the Delta. Following the 1983 and 1986 floods, FEMA and State agencies negotiated a Hazard Mitigation Plan (HMP) design standard to be implemented for all Delta levees by September 10, 1991 as a precondition for receiving FEMA disaster assistance if there were a levee breach (Delta Vision 2008). HMP is not an adequate standard for any land use that is intended to avoid flooding, and it was not intended to be a long-term standard by either the State or FEMA when it was established (Delta Vision 2008, PPIC 2008). In 2014, FEMA canceled the agreement with the State of California, making the commitment to provide disaster recovery should the levees fail uncertain (DSC 2015, DSC 2019).

Federal Energy Regulatory Commission (FERC)

The Federal Energy Regulatory Commission (FERC) regulates interstate transmission of electricity, natural gas, and oil, as well as regulates dams (FERC 2019). In the Delta, there are natural gas pipelines, underground natural gas storage facilities, electricity transmission lines, and oil pipelines that are critical energy infrastructure for not only California, but also the Pacific Northwest including Oregon. The California-Oregon Intertie (COI) is a corridor of three electrical transmission lines of 500 kV connecting the electrical grids of Oregon and California, two of which cross through the Delta. The COI enables lower-cost Northwest hydropower to flow to California to meet summer peak demands, and to export California energy to meet the

Northwest’s winter peak demands. Increasingly, COI utilization is driven by seasonal and intraday resource availability and divergence in locational prices; providing ramping and flexibility products in addition to its traditional energy products (CEC 2016). Through Order No. 1000, FERC requires transmission planning to meet public policy directives like California’s Renewable Portfolio Standard (RPS) that calls for 50% of the electric sales by 2030 to be from renewable resources. Importantly, the COI provides access to low-carbon, hydropower electrical generation from the Pacific Northwest (ISO 2018), and because of location is vulnerable to flooding that will be exacerbated by sea level rise and more extreme inflows.

National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) provides data, tools, and information including state-of-the-art models, observations, and outlooks to support understanding of and preparation for climate change – such as the National Centers for Environmental Information, one of the most significant archives for environmental data on Earth (NOAA 2019). The National Ocean Service (NOS) Center for Operational Oceanographic Products and Services (CO-OPS) manages a permanent observing system, the National Water Level Observation Network (NWLON), which consists of stations from which tidal datum and water level information is collected. In the Delta, there are 10 short-term tidal benchmark stations located in areas important for navigation, but these do not adequately cover the region (NOAA 2019). CO-OPS is considering a tiered data policy to integrate other gauges or open sourced data to expand the network, as well as develop cooperative agreements with CO-OPS to re-occupy (or establish new) stations.

National Marine Fisheries Service

Through the 1976 Magnuson-Stevens Fishery Conservation and Management Act, the National Marine Fisheries Service (NMFS), an office of NOAA, regulates marine fisheries management in U.S. federal waters. For the Delta, NMFS has put forward the Adaptive Management Framework which sets forth the method by which five agencies (NMFS, US Fish and Wildlife Service, US Bureau of Reclamation, California Department of Fish and Wildlife, California Department of Water Resources) will operate the Central Valley and State Water Projects to reduce uncertainty and improve the performance of water operations under the 2008 Biological Opinions for Delta Smelt, Sacramento River Winter-run Chinook Salmon, and Central Valley Spring-run Chinook Salmon. The Adaptive Management Framework did not consider climate conditions beyond 25 years in the future (NOAA 2016). In February 2020 the Trump Administration finalized a plan that would increase CVP water supplies for users (Congressional Research Service 2020). In 2019, new Biological Opinions were issued which consider the impacts of climate change, but ultimately conclude that the proposed operations of the Central Valley Project (CVP) and State Water Project (SWP) will not jeopardize threatened or endangered species (NMFS 2019; USFWS 2019). However, both the 2019 Biological Opinions and the Trump Administration’s proposed operational changes to the CVP are currently under litigation.



U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) plays an important role in repair and improvements to federal flood controls works, such as levees, and in disaster recovery in terms of providing cost share for levee rehabilitation after Presidentially-declared disasters (DSC 2015). Aid is available, however, only to project levees that are in active status. Active status requires meeting the program's eligibility requirements as defined by PL 84-99 design and operations and maintenance standards, and passing regular inspections by the USACE. Eligibility also depends on whether the economic benefits exceed the cost of post-disaster reconstruction.

U.S. Environmental Protection Agency

Under the Clean Water Act (CWA), the U.S. Environmental Protection Agency (US EPA) is charged with protecting and restoring the nation's waterways, including waters in the San Francisco Bay Delta Watershed. In California, most of the Clean Water Act programs have been delegated by US EPA to the State, with EPA taking an oversight role, and in some cases, a mandatory review and approval role of California's water quality programs and policies. EPA's oversight role applies to delegated programs such as Total Maximum Daily Loads (TMDLs) and the National Pollutant Discharge Elimination System (NPDES) (US EPA 2019). The US EPA also provides a variety of resources to support planning for water resources protection from damage and loss that could result from climate change (US EPA 2019).

U.S. Department of the Interior

The U.S. Department of the Interior (DOI) protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities (DOI 2019). The DOI administers several federal agencies that in turn have authorities or provide scientific research for Delta assets and resources – these agencies include the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, and U.S. Geological Survey.

U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation (USBR) administers the Central Valley Project (CVP), which is a complex, multi-purpose network of dams, reservoirs, canals, hydroelectric power plants, and other facilities supplying domestic and industrial water in California's Central Valley, as well as providing flood protection. The CVP also supplies water to major urban centers in the Greater Sacramento and San Francisco Bay areas, as well as produces electrical power and offering various recreational opportunities (USBR 2019). In 2014, USBR conducted a climate risk assessment looking out to 2100 and concluded that there would be negative impacts across resource categories including water deliveries, water quality, fish and wildlife species, hydropower generation, recreation, and flood control (USBR 2014). While the report notes that

USBR will utilize findings in long range planning for adaptation, specific policy measures are not identified.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) administers the Endangered Species Act (ESA) of 1973 which seeks to conserve "the ecosystems upon which endangered and threatened species depend," and to conserve and recover listed species (USFWS 2019). There are 32 federally listed plant and animal species in the Delta and Suisun Marsh, including the riparian brush rabbit, the western yellow-billed cuckoo, the giant garter snake, the California red-legged frog, the Delta smelt, and the valley elderberry longhorn beetle (USFWS 2019). Federal agencies consult with the USFWS and NMFS under Section 7 of the Endangered Species Act to avoid jeopardizing listed species or adversely modifying their critical habitat; beginning in 2008, the USBR and the California Department of Water Resources asked USFWS to initiate consultation on the Long-Term Operational Criteria and Plan (OCAP) for coordination of the Central Valley Project and State Water Project, specifically concerning the Delta smelt and its critical habitat (USFWS 2019). USFWS's 2008 Complete Biological Opinion stated that there was no quantitative analysis of how climate change was currently affecting Delta smelt. In 2019, USFWS issued a new Biological Opinion, which considers climate change but ultimately concludes that the proposed operations of the Central Valley Project (CVP) and State Water Project (SWP) will not jeopardize threatened or endangered species (USFWS 2019).

The USFWS Pacific Southwest Region's Bay-Delta Fish and Wildlife Office has responsibility for environmental contaminants, resource damage assessment, and levee work in the Bay-Delta jurisdiction. Upstream of the Bay-Delta, the USFWS has program responsibilities that are related to water storage projects, federal hydropower regulation, and anadromous fishes. USFWS is also responsible for the Coastal Program.

U.S. Geological Survey

The U.S. Geological Survey (USGS), through the California Water Science Center in Sacramento and National Research Program in Menlo Park, provides critical science for the Delta region on hydrodynamics, water quality, and sediment dynamics. One of the most important, ongoing studies relevant to climate change includes CASCaDE (Computational Assessments of Scenarios of Change for the Delta Ecosystem) investigations, which represents a multidisciplinary effort to link models of climate, hydrology, hydrodynamics, sediment, phytoplankton, bivalves, contaminants, marsh accretion, and fishes. The investigation is intended to better understand the functioning of the Delta (and the limitations of our knowledge), to assess possible Delta futures under planning scenarios currently being considered, and to provide basic scientific support to the Delta Stewardship Council and other Delta management agencies.



CHAPTER 3. STATE AGENCIES

Required by Executive Order S-03-05 in 2005, the state of California periodically produces scientific climate change assessments on the potential impacts of climate change which influence legislation and inform policy makers. The most recent assessment, the California's Fourth Climate Change Assessment, was released in August 2018 and included a series of technical reports as well as regional assessments relevant for the Delta region in particular. These reports include *High Resolution Measurement of Levee Subsidence Related to Natural Gas Infrastructure in the Sacramento-San Joaquin Delta* (Brooks et al 2018), *Development of Stage-Frequency Curves in the Sacramento - San Joaquin Delta for Climate Change Sea Level Rise* (Maendly 2018), and regional assessments including the *Sacramento Valley Region Report* (Houlton and Lund 2018), the *San Francisco Bay Area Regional Report* (Ackerly et al 2018), and the *San Joaquin Valley Region Report* (Westerling et al 2018), among others.

There are several interagency workgroups that focus on climate change and seek to coordinate activities. The Coastal and Ocean Resources Working Group for the Climate Action Team (CO-CAT) is a working group comprised of senior level staff from California state agencies with ocean and coastal resource management responsibilities (OPC 2019). CO-CAT's task is to ensure the state's ability to adapt to climate change impacts on ocean and coastal resources while supporting implementation of global warming emission reduction programs. OPR convenes the Safeguarding Climate Action Team (SafeCAT) and coordinates state-led climate adaptation and resilience efforts across agencies (OPR 2019). The SafeCAT was initially convened in 2017 during the last update to the Safeguarding Plan and upon the launch of the Integrated Climate Adaptation and Resiliency Program at OPR.

Another interagency working group, led by the California Marine Sanctuary Foundation and California Ocean Protection Council, developed a sea level rise communications strategy in early 2020 for California. With many State agencies working on their own climate initiatives, the goal of the group was to develop a common message on what sea level rise is, the environmental and economic impacts it causes, and proven solutions to provide clarity to decision makers and the public.

The inter-agency draft Water Resilience Portfolio, developed in response to Governor Newsom's Executive Order N-10-19, provides a suite of recommended actions to help California maintain water security in the face of challenges exacerbated by climate change, such as more extreme droughts and floods and depleted groundwater basins. Jointly developed by the California Natural Resources Agency (CNRA), the California Environmental Protection Agency (CalEPA), and the California Department of Food and Agriculture (CDFA), the Water Resilience Portfolio is intended to help advance the Newsom Administration's efforts to build climate resilience across all sectors in California (CNRA, CalEPA, and CFDA 2020).

California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) administers the California Endangered Species Act (CESA) through issuing status lists of rare, threatened, or endangered species (CDFW 2019); there are a variety of listed species in the Suisun and Delta region including the Delta smelt, Chinook salmon, salt-marsh harvest mouse, the giant garter snake, Swainson's Hawk, and California black rail (CDFW 2019a). CDFW issues the State's Wildlife Action Plan (SWAP), which contains a chapter on the Bay Delta that acknowledges climate change will likely affect all conservation targets in the region which considered a time horizon of 2025 with a 5% improvement in condition across habitat types (CDFW 2015). The SWAP is required to be updated every 10 years by the U.S. Fish and Wildlife Service, and opportunities exist to leverage findings from Delta Adapts as new climate science and policy, such as the Delta Plan Ecosystem Amendment, have been released. CDFW also makes available a variety of spatial datasets that characterize status and opportunities related to species and habitats, as well as aspects relevant to planning for climate change – these datasets include Areas of Conservation Emphasis (CDFW 2018) as well as climate change vulnerability reports (CDFW 2019), and the Biogeographic Information and Observation System (BIOS) (CDFW 2019).

California Department of Food and Agriculture

The California Department of Food and Agriculture (CDFA) through the Office of Environmental Farming and Innovation provides resources and programs to promote emissions reductions in California agriculture. These resources include the *Climate Change Adaptation Consortium for Specialty Crops*, the *CDFA Fertilizer Research and Education Program (FREP) GHG Research* (CDFA 2019), and CDFA's Climate Smart Agriculture Program, including the Healthy Soils Program. The Climate Smart Agriculture Program focuses on soil enhancement, management, and greenhouse gas emission reductions, water conservation and irrigation system improvement grants, dairy methane reduction, technical assistance grants to help farmers apply for these sub-programs, and outreach and communication of sustainability tools and workshops. CDFA's Healthy Soils Program, part of the interagency California Healthy Soils Initiative and a sub-program of the Climate Smart Agriculture Program, provides financial assistance for implementation of practices that improve soil health, reduce greenhouse gas emissions, and sequester carbon.

California Department of Public Health

The California Department of Public Health (CDPH) Climate Change & Health Equity Program has made available resources that characterize climate change and health vulnerability indicators for California (CDPH 2019). For the Delta and Suisun Marsh, the indicators provide information down to the census tract level and opportunities to use this information is discussed at greater detail in the Equity Technical Memorandum.



California Department of Transportation

Within the California Department of Transportation (Caltrans), the Climate Change Branch is responsible for overseeing the development, coordination, and implementation of climate change policies in all aspects of the Department's decision making. Caltrans conducted Climate Change Vulnerability Assessments to identify segments of the State Highway System vulnerable to climate change impacts including precipitation, temperature, wildfire, storm surge, and sea level rise; for the Delta and Suisun Marsh region, Caltrans has completed assessments for District 4 which includes the Bay Area and Suisun Marsh, as well as Districts 3 and 10 which cover the Sacramento and San Joaquin portions of the Delta, respectively (Caltrans 2020).

California Department of Water Resources

The California Department of Water Resources (DWR) administers the California State Water Project (SWP), which is a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants extending across the state of California that supplies water to more than 27 million people in northern California, the Bay Area, the San Joaquin Valley, the Central Coast and southern California (DWR 2019). The SWP delivers water to about 750,000 acres of farmland, mainly in the San Joaquin Valley. In terms of planning for climate change, DWR has developed a Climate Action Plan which is DWR's guide to addressing climate change in the programs, projects, and activities over which it has authority and consists of three phases to address mitigation, adaptation, and consistency in the analysis of climate change (DWR 2019). DWR also provides the California Water Plan, which is the state's strategic plan for sustainably managing and developing water resources for current and future generations (DWR 2019). The 2018 update acknowledges that the Delta's future will be affected by the impacts of climate change such as rising temperatures, changes in runoff timing, sea level rise, and changes in storm timing, intensity, and frequency – but specific plans to improve water supply reliability for 28 million Californians and 3 million acres of farmland remain unknown. Released in April 2019, Executive Order N-10-19 requires that the priorities of the California Water Plan be updated to reflect climate change and impacts to water supply reliability. DWR will implement recommended actions of the California Water Plan in support of the Governor's Water Resilience Portfolio initiative.

California Energy Commission

The California Energy Commission (CEC) is the state's primary energy policy and planning agency. With respect to the Delta and climate change, the CEC has supported research on potential climate change impacts to energy infrastructure in the Delta, including one of the first assessments of sea level rise in the Delta, an *Assessment of Bay Area Natural Gas Pipeline Vulnerability to Climate Change* (Radke et al 2016). More recent research includes *Assessing Extreme Weather-Related Vulnerability and Identifying Resilience Options for California's Interdependent Transportation Fuel Sector* (Radke et al 2018).

Natural gas meets nearly one-third of California’s total energy demand, and natural gas-fired generation is the dominant source of electricity in the state, accounting for approximately 43 percent of all generation in 2012. Given the state’s reliance on this resource, the pipeline infrastructure and facilities designed to store, transmit, and distribute natural gas throughout the region are critical.

California Natural Resources Agency

The California Natural Resources Agency (CNRA), which houses several of the departments and commissions summarized in this Planning Context, issues Safeguarding California, the state’s climate adaptation strategy (CNRA 2018). The Safeguarding California Plan: 2018 Update guides state agency actions to protect California communities, infrastructure, services, and ecosystems from the impacts of climate change. It also guides state agency collaboration and coordination with local and regional climate adaptation efforts.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates services and utilities including electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies (CPUC 2019). In May 2018, the CPUC issued an Order Instituting Rulemaking to consider strategies and guidance for climate change adaptation and is seeking to address the electrical and natural gas utilities in the initial phase of the proceeding (CPUC 2018). Within the Delta and Suisun Marsh, there is utility infrastructure that includes both electrical transmission lines and towers, natural gas wells and pipelines, oil pipelines, and water aqueducts, canals, and intakes (DSC 2017). The minimum standards that CPUC regulates for transmission lines are described in General Order 95 in Rule 37, which defines minimum allowable vertical clearance to water surfaces as it relates to boating and the annual flood level (CPUC 2018). Given the potential climate risks associated with flooding in the Delta for electrical infrastructure, this represents a regulatory gap. The CPUC is also responsible for establishing Renewable Portfolio Standard (RPS) requirements for retail seller utilities, community choice aggregators, and electric service providers (CPUC 2019).

California Strategic Growth Council

The California Strategic Growth Council (SGC) is a cabinet level committee that coordinates state agency actions to advance a number of state priorities, including advancing public health and equity, promoting water conservation, improving air and water quality, and supporting the priorities of the state’s Safeguarding California plan. SGC oversees and supports numerous climate-related programs relevant to the Delta, including its Climate Change Research Program, which has supported research on agricultural practices to promote carbon sequestration, improving resilience to extreme heat, and assessing the impacts of climate change on vulnerable communities, among other topics (SGC 2020).



Central Valley Flood Protection Board

The Central Valley Flood Protection Board (CVFPB) updated the Central Valley Flood Protection Plan (CVFPP) in 2017 (CVFPB 2017). The CVFPP is a strategic and long-range plan for improving flood risk management in the Central Valley, including the Delta, and guides the State's participation in managing flood risk in areas protected by the State Plan of Flood Control. The CVFPP included the latest climate science available at the time to assess the effects of sea-level rise and the hydrological impacts in the Central Valley (an increase in flood volumes of up to 20% and 80% in the Sacramento River Basin and the San Joaquin River Basin respectively), which resulted in a basin-wide strategy that increases flood system capacity primarily through weir and bypass expansions to lower floodwater surface elevations and increase flexibility to accommodate the larger flood flows projected to occur with future climate change (CVFPP 2017). With respect to the Delta and Suisun Marsh, the CVFPP just considered the areas protected by the State Plan of Flood Control – which does not include any part of Suisun Marsh, or most of the central and eastern Delta. In addition, the CVFPP considered a time horizon of 2067, while the Delta Reform Act requires a horizon of 2100.

Delta Protection Commission

The Delta Protection Commission regulates land use and resource management through oversight of the five county general plans within the primary zone through the 2010 Land Use and Resource Management Plan (LURMP) (DPC 2010). Draft policy updates to the LURMP do not consider the potential impacts of climate change on agriculture, Delta communities, flood protection, recreation, water, or utilities and infrastructure (DPC 2019). The Economic Sustainability Plan (ESP) released in 2012 includes recommendations that inform the Council's policies concerning the socioeconomic sustainability of the Delta region as it relates to recreation, agriculture, tourism, and business development. The only recommendation in the ESP that considers climate change is to update the understanding of expected maximum water surface elevations in the Delta (DPC 2012). As of May 2020, several chapters of the ESP are currently being updated.

Delta Stewardship Council

The Delta Plan, which is a comprehensive, long-term management plan for the Delta, was adopted in 2013. Climate change was incorporated in the narrative of each thematic chapters focused on Water Supply, Ecosystem, Water Quality, Delta as Place, Water Quality, and Flood Management – and is present in two of the regulatory policies (ER P2, RR P2) and in five of the recommendations (WR R9, RR R7, ER R2, ER R5) (DSC 2013). The Council's 2017-2021 Science Action Agenda, which is a four-year science agenda for the Delta that prioritizes and aligns science actions to inform management decisions, identifies two priority science actions (AA 3B, AA 4B) that feature research needs relative to climate change (DSC 2017). Future updates of the Science Action Agenda will further consider climate change. Delta Adapts will help identify the research and management gaps with respect to climate change in the Delta.

Governor’s Office of Emergency Services

The Governor’s Office of Emergency Services (CalOES) leads the coordination efforts to update the State Hazard Mitigation Plan (SHMP) and support related implementation efforts (CalOES 2019). The Robert T. Stafford Disaster Relief and Emergency Management Act of 1988 provides FEMA with authority for major disaster recovery programs, including but not limited to the Hazard Mitigation Grant Program (HMGP), which provides funding to States, tribes and local governments to implement projects that reduce risks to property following a major disaster. The federal funding covers 75% of eligible project costs. State and local hazard mitigation plans are required to be developed and updated on a regular basis, every five years, as a condition of HMGP funding.

State hazard mitigation plans must include hazard identification, vulnerability analysis and risk assessment, mitigation strategies, and a description of how strategies and actions will be implemented by various agencies and organizations at the state, regional, and local level. All of California’s State Hazard Mitigation Plans (SHMPs) since 2007 have achieved “Enhanced” status, earning the State additional grant funding. CalOES also provides state review of local hazard mitigation plans as required by the Federal Disaster Mitigation Act of 2000 (CalOES 2019). For a more complete discussion of local governments and eligibility for FEMA Hazard Mitigation Grant Program (HMGP) disaster recovery funds, see the discussion below under *Local Governments in the Delta Region*.

In addition, CalOES has created a set of California Adaptation Planning Guides (APGs) designed to guide local jurisdictions in addressing the unavoidable consequences of climate change. CalOES recently completed a 2020 update of the APG to reflect advances that have occurred since 2012 to further assist jurisdictions in creating and incorporating climate strategies specific to their region (CalOES 2020).

Governor’s Office of Planning and Research

In 2017, the Governor’s Office of Planning and Research (OPR) released General Plan Guidelines (GPGs) which provided guidance related to climate adaptation in the safety element, as well as a general chapter on addressing climate change GHG mitigation (OPR 2017). In addition, adopted in 2015, Senate Bill 246 directs OPR to form the Integrated Climate Adaptation and Resilience Program (ICARP), which is designed to develop a cohesive and coordinated response to the impacts of climate change at the state, regional and local levels, while advancing social equity (OPR 2019).

Ocean Protection Council

State guidance on sea level rise is provided by the Ocean Protection Council, which released an update to the *State of California Sea-Level Rise Guidance* (OPC 2018) that reflects advances in sea-level rise science and addresses the needs of state agencies and local governments as they incorporate sea-level rise into their planning, permitting, and investment decisions. The updated



Guidance provides: 1) a synthesis of the best available science on sea-level rise projections and rates for California; 2) a stepwise approach for state agencies and local governments to evaluate those projections and related hazard information in decision-making; and 3) preferred coastal adaptation approaches.

In addition, OPC also adopted a *Strategic Plan to Protect California's Coast and Ocean 2020-2025* in early 2020 to provide a roadmap for continued progress on protection of these resources with climate change. The Strategic Plan offers four goals to guide California's efforts that include: Goal 1 Safeguard Coastal and Marine Ecosystems and Communities in the Face of Climate Change; Goal 2 Advance Equity Across Ocean and Coastal Policies and Actions; Goal 3 Enhance Coastal and Marine Diversity; and Goal 4 Support Ocean Health through a Sustainable Blue Economy. Objectives, targets, and actions are included to meet each goal in the Strategic Plan.

Sacramento San Joaquin Delta Conservancy

The Sacramento San Joaquin Delta Conservancy (Delta Conservancy) implements projects in the Delta that provide integrated environmental, economic, and social benefits; in 2017 the Delta Conservancy adopted a Climate Change Policy that emphasizes carbon management as a way to reduce greenhouse gas emissions in the Delta, and considers state guidance on sea level rise projections in the ability of projects to adapt (SSJDC 2017).

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) administers the Suisun Marsh Protection Plan, which was adopted in 1976 (BCDC 1976) as a result of the Suisun Marsh Preservation Act of 1974. On March 2019, staff recommended that the Commission initiate an update to the Suisun Marsh Protection Plan and consider whether changes are needed to the Suisun Marsh Preservation Act to address climate change and other emerging issues (BCDC 2019). The update of the Suisun Marsh Protection Plan began in early 2020. BCDC also administers the Adapting to Rising Tides (ART) program that brings together local, regional, state and federal agencies and organizations, as well as non-profit and private associations in collaborative planning projects across the Bay-Delta estuary to identify how current and future flooding will affect communities, infrastructure, ecosystems, and economy (BCDC 2019a). Two ART projects considered areas in the Delta and Suisun Marsh: The Eastern Contra Costa ART Project (BCDC 2019b) and the ART Bay Area Regional Working Group (BCDC 2019c). Building off of the ART program, BCDC initiated Bay Adapt, an initiative to establish regional agreement on sea level rise adaptation actions in the Bay Area (BCDC 2020).

State Water Resources Control Board

In 2017, the State Water Resources Control Board (SWRCB) adopted a resolution which requires a proactive approach to climate change in all Board actions, with the intent to embed climate change consideration into all programs and activities (SWRCB 2017). In the Delta region, the SWRCB is responsible for adopting and updating the Water Quality Control Plan for the San

Francisco Bay/Sacramento–San Joaquin Delta Estuary (Bay-Delta Plan), which establishes water quality control measures and flow requirements needed to provide reasonable protection of beneficial uses in the watershed. The 2016 Update to the Bay-Delta Plan did not consider sea level rise in the plan (SWRCB 2016), but the 2018 update acknowledges the impacts of climate change and states that future SWRCB activities should address climate change and provide appropriate guidance to water resource agencies (SWRCB 2018).

The SWRCB is also responsible for administering Water Rights throughout the state; for the Delta, the Office of the Delta Watermaster is responsible for overseeing the day-to-day administration of water rights, and, when necessary, for taking enforcement action related to water diversions within the Delta (SWRCB 2019). Within the Delta and Suisun Marsh, as of 2018, there are over 30,000 points of diversion where water rights have been reported (eWRIMS 2019), and many of those points of diversions could be impacted by climate change from flooding exacerbated by sea level rise and more extreme inflows, as well as from salinity intrusion.



CHAPTER 4. REGIONAL AGENCIES

Under the Federal-Aid Highway Act of 1962, the federal government designates Metropolitan Planning Organizations (MPOs) for each metropolitan region, which are responsible for creating and updating regional transportation plans (RTPs). There are three MPOs with planning areas that include land within the Delta and Suisun Marsh: the Sacramento Area Council of Governments (SACOG), the San Joaquin Council of Governments (SJCOG), and the Metropolitan Transportation Commission (MTC). MPOs must update RTPs every four years in coordination with local governments within the given region.

MPOs in California are also responsible for creating Sustainable Communities Strategies (SCSs), long-range plans which are designed to assist the State in meeting its climate and air quality goals by aligning transportation, land use, and housing actions to reduce GHG emissions to the required targets set by the California Air Resources Board (SB 375). MPOs typically create a combined RTP/SCS. RTPs and SCSs have typically focused more on climate mitigation (greenhouse gas emissions reduction) than adaptation. However, SACOG and SJCOG are both currently conducting transportation-focused climate adaptation plans that will inform future RTP/SCS policies (SJCOG 2020).

Sacramento Area Council of Governments

SACOG's Sacramento Region Transportation Climate Adaptation Plan (2015) identifies high-level climate risks to the Sacramento region and provides a generalized assessment of how transportation assets in the region could be vulnerable to those risks (SACOG 2015). The plan also defines a variety of policy and planning actions to improve resiliency of transportation assets in the Sacramento region.

Building off of the 2015 Sacramento Region Transportation Climate Adaptation Plan, which was relatively high-level, the 2020 Sacramento Transportation Project-Level Climate Adaptation Strategies for the Sacramento Region project consists of a detailed transportation vulnerability assessment and a guidance document for addressing adaptation in transportation projects, examining planning- and asset-level adaptation strategies for a handful of representative transportation projects in the region (SACOG 2020b; SACOG 2020a).

Sacramento Metropolitan Air Quality Management District

The Sacramento Metropolitan Air Quality Management District (SMAQMD) and the Local Government Commission recently completed the Capital Region Urban Heat Island Mitigation Project, which developed an urban heat island index specific to the Capital region, identified areas for priority heat mitigation efforts, and assessed the effectiveness of various heat mitigation strategies (SMAQMD and LGC 2020). The project also produced resources for use by

jurisdictions in heat-related climate adaptation planning, including the Capital Region Transportation Sector Urban Heat Island Mitigation Plan.

San Joaquin Council of Governments

SJCOG’s Climate Adaptation & Resiliency Study: Climate Adaptation Report is phase 1 of SJCOG’s climate adaptation and resiliency effort that aims to assess climate risks and vulnerabilities in the San Joaquin region, assess current local government efforts and plans related to climate adaptation and identify planning gaps, and develop a regional adaptation plan (SJCOG 2020). The Climate Adaptation Report includes recommendations to incorporate climate resilience into SJCOG’s RTP.

Metropolitan Transportation Council and the Association of Bay Area Governments

MTC and ABAG are currently updating the Bay Area Regional Transportation Plan and Sustainable Communities Strategy (Plan Bay Area). Expected to be adopted in summer 2021, Plan Bay Area 2050 will focus on four main areas—the economy, environment, housing and transportation—and will include strategies to protect communities from sea level rise and retrofit existing buildings to increase building resilience to wildfire, drought, and earthquakes and increase energy efficiency (MTC/ABAG 2020). MTC/ABAG will use findings from BCDC’s Adapting to Rising Tides (ART) program to inform sea level rise resiliency metrics for the RTP/SCS.



CHAPTER 5. LOCAL AGENCIES

In California, general plans provide the legal rationale for the adoption and implementation of local zoning ordinances and other development management tools. Seismic safety elements became a mandatory component of city and county general plans in 1971, in response to the 6.4 magnitude San Fernando earthquake that caused extensive damage throughout coastal Southern California (Wiley 2000). The seismic safety element was expanded to cover a broader range of hazards in 1984. Local governments are now required to address subsidence and liquefaction, flooding, and wildfire in their safety elements, among other hazards (Gov. Code section 65302).

In addition to the safety element of the general plan, the state requires local open space elements to consider areas deserving of special management or regulation because of hazards, including but not limited to unstable soil areas, floodplains, fuel/fire breaks, and water supply watersheds (Gov. Code section 65560). In 2007, the legislature adopted additional statutory requirements for including flood risk mapping in the safety, land use, housing, *and* conservation general plan elements (CalOES 2013). Requiring identification of natural hazards in multiple general plan elements encourages local governments to consider how hazards affect different aspects of land use planning, and how development management can exacerbate or mitigate hazards. California requires Local Hazard Mitigation Plans (LHMPs) to be consistent with the goals and objectives of the State Hazard Mitigation Plan (SHMP) and local general plans. Because the SHMP explicitly describes risks associated with climate change, consistency with the SHMP should entail an integration of climate change impacts into the LHMP. Senate Bill 379, adopted in 2015, requires that the safety element in general plans, or local hazard mitigation plan, be reviewed and updated to include goals, policies, and objectives reflecting climate vulnerabilities that consider climate adaptation and resiliency strategies before January 1, 2022. As of May 2020, no Delta jurisdictions have yet met SB 379 requirements by updating their general plan safety elements, but several Delta jurisdictions are currently in the process of updating their safety elements. Table 1 shows the SB 379 compliance status of Delta cities and counties as of May 15, 2020.

Table 1: SB 379 compliance status of Delta cities and counties

Local Jurisdiction	SB 379 Compliance Met?	Source(s)
Alameda County	No	Alameda County General Plan Safety Element (Amended 2014)
Contra Costa County	In progress	“Envision Contra Costa 2040 Overview” website
Sacramento County	In progress	“General Plan Amendments” website; General Plan of 2005-2030 (2011).
San Joaquin County	No	San Joaquin County General Plan 2035.
Solano County	No	Solano County General Plan Public Health & Safety Element (update adopted August 2015).
Yolo County	No	2030 Countywide General Plan (adopted 2009).
City of Antioch	No	City of Antioch General Plan (adopted 2003).
City of Benicia	In Progress	City of Benicia Climate Change Adaptation Plan: Preparing Benicia for a Resilient Future (2016); City of Benicia General Plan (adopted 1999).
City of Brentwood	No	City of Brentwood General Plan (adopted July 2014).
City of Fairfield	No	City of Fairfield General Plan.
City of Isleton	In progress	City of Isleton Comprehensive General Plan (adopted 2000)
City of Lathrop	In progress	City of Lathrop General Plan Update (website); Comprehensive General Plan for the City of Lathrop.
City of Manteca	In progress	City of Manteca Draft General Plan (2019).
City of Oakley	In progress	City of Oakley General Plan Update (website).
City of Pittsburg	In progress	Envision Pittsburg Existing Conditions Report (2019).
City of Rio Vista	No	City of Rio Vista General Plan 2001 (adopted 2002).
City of Sacramento	In progress	City of Sacramento 2035 General Plan (adopted 2015); 2040 General Plan Update (website)
City of Stockton	No	Envision Stockton 2040 General Plan (adopted 2018)
City of Suisun City	No	City of Suisun City 2035 General Plan (adopted 2015).
City of Tracy	No	City of Tracy General Plan (adopted 2011).
City of West Sacramento	In progress	City of West Sacramento 2035 General Plan (adopted 2016).

Delta Adapts aims to provide resources and information useful for local jurisdictions as they update their general plan safety elements to include a climate change vulnerability assessment and associated adaptation strategies, goals, and policies.

Adopted in 2016, SB 1000 complements SB 379 obligations by requiring that the safety element be reviewed and revised to identify new information to address flooding and fires for the protection of the community from unreasonable risks. SB 379 requirements are triggered upon



the next update of a LHMP on or after January 1, 2017. If a city or county has not adopted a LHMP, then the safety element of the general plan must be updated to address climate adaptation and resiliency strategies by January 1, 2022. AB 2140 provides financial incentives to local agencies to prepare LHMPs, and California OES encourages local agencies to adopt their LHMPs as part of the general plan safety elements.

SB 1000 also requires cities and counties to update their general plans to identify goals, policies, and objectives to reduce risks to *disadvantaged communities* (DACs), defined as areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation, or with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment (Health and Safety Code [Health & Saf. Code] section 39711). Cities and counties may include this information in an environmental justice element, or can incorporate environmental justice goals, policies, and objectives into other elements of the general plan. Local jurisdictions must adopt or review the environmental justice element or policies upon the adoption or next revision of two or more elements concurrently on or after January 1, 2018.

Two Delta jurisdictions—Sacramento County and the City of Stockton—have updated their general plans to comply with SB 1000 environmental justice requirements, while various Delta jurisdictions are currently updating general plans to incorporate environmental justice. For an overview of the Delta cities and counties that have incorporated environmental justice elements into their general plan, see Table 2. For a summary of plans, programs, and tools relevant to environmental justice and vulnerable populations in the Delta, see the Equity Technical Memorandum.

Table 2: SB 1000 environmental justice compliance status of Delta cities and counties

Local Jurisdiction	Environmental Justice Element or Policies Added to General Plan?	Source(s)
Alameda County	In progress	Adopted Alameda County General Plan.
Contra Costa County	In progress	“Envision Contra Costa 2040 Overview” (website).
Sacramento County	Yes	Sacramento County Environmental Justice Element (2019).
San Joaquin County	No	San Joaquin County General Plan 2035.
Solano County	No	Solano County General Plan 2030 (adopted 2008).
Yolo County	No	2030 Countywide General Plan (adopted 2009).
City of Antioch	No	City of Antioch General Plan (adopted 2003).
City of Benicia	No	City of Benicia General Plan (adopted 1999).
City of Brentwood	No	City of Brentwood General Plan (adopted July 2014).
City of Fairfield	No	City of Fairfield General Plan
City of Isleton	In progress	City of Isleton Comprehensive General Plan (adopted 2000).
City of Lathrop	In progress	City of Lathrop General Plan Update (website); Comprehensive General Plan for the City of Lathrop.
City of Manteca	In progress	City of Manteca Draft General Plan (2019).
City of Oakley	In progress	City of Oakley General Plan Update (website).
City of Pittsburg	In progress	Envision Pittsburg Existing Conditions Report (2019).
City of Rio Vista	No	City of Rio Vista General Plan 2001 (adopted 2002)
City of Sacramento	In progress	City of Sacramento 2035 General Plan (adopted 2015); 2040 General Plan Update (website).
City of Stockton	Yes	Envision Stockton 2040 General Plan (adopted 2018).
City of Suisun City	No	City of Suisun City 2035 General Plan (adopted 2015).
City of Tracy	No	City of Tracy General Plan (adopted 2011).
City of West Sacramento	In progress	City of West Sacramento 2035 General Plan (adopted 2016).



CHAPTER 6. CONCLUSION

In this review, the Council sought to understand the diversity of roles, responsibilities, and progress on planning for climate change in the Delta across various levels of government. Specifically, the goals of this review were to:

1. Identify the suite of agencies that are planning for climate change within the Delta, or more broadly on matters that impact the Delta.
2. Assess the extent to which climate change and sea level rise have been incorporated into agencies' policies and/or planning frameworks.
3. Identify opportunities for Delta Adapts to fill critical gaps.

Results from this review indicate that opportunities remain to improve the application of scientific information to policy and planning instruments in the Delta region, and to coordinate among jurisdictional boundaries and across all levels of government. The review indicates that many agencies have started planning for climate change in the Delta, though some agencies are still in the process of planning for climate change or have not yet started. For instance, California cities and counties are required to develop climate change adaptation strategies based on a vulnerability assessment and to incorporate this information into general plan safety elements. While this work is in progress for some Delta cities and counties, others have not yet started this process. Delta Adapts will help address these gaps by providing information that Delta agencies can use when planning for climate change.



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