

Executive Summary

Introduction

Integrated regional water management (IRWM) is an approach to water resource management in California that is being strongly promoted by the State as a way to increase regional self-sufficiency. IRWM offers an approach for managing the uncertainties that lie ahead, particularly in light of climate change. The IRWM planning process brings together water and natural resource managers, along with other community stakeholders, to collaboratively plan for and ensure the region's continued water supply reliability, improved water quality, flood management, and healthy functioning ecosystems—allowing for creative new solutions and greater efficiencies. This IRWM Plan has been developed for the Greater Monterey County IRWM region to fulfill the goals of IRWM planning in this region and to provide eligibility for State IRWM grant funds.

Section A: Governance

The Greater Monterey County Regional Water Management Group (RWMG) is the group responsible for development of this IRWM Plan. The Greater Monterey County RWMG consists of 18 organizations including government agencies, nonprofit organizations, educational organizations, water service districts, private water companies, and organizations representing agricultural, environmental, and community interests:

- Big Sur Land Trust
- California State University Monterey Bay
- California Water Service Company
- Castroville Community Services District
- City of Salinas
- City of Soledad
- Elkhorn Slough National Estuarine Research Reserve
- Environmental Justice Coalition for Water
- Marina Coast Water District
- Monterey Bay National Marine Sanctuary
- Monterey County Agricultural Commissioner's Office
- Monterey County Resource Management Agency
- Monterey County Water Resources Agency
- Monterey One Water
- Moss Landing Marine Laboratories
- Resource Conservation District of Monterey County
- Rural Community Assistance Corporation
- San Jerardo Cooperative, Inc.

Members of the RWMG have entered into a Memorandum of Understanding (MOU) to acknowledge cooperative efforts in the planning region and to form an institutional structure to develop and implement an IRWM Plan. The IRWM Plan is intended to be a long-term planning document with a minimum 20-year planning horizon. As such, the Plan will need to undergo periodic updates and revisions to reflect changing conditions. RWMG membership and governance processes may evolve over time.

Section B: Greater Monterey County Region Description

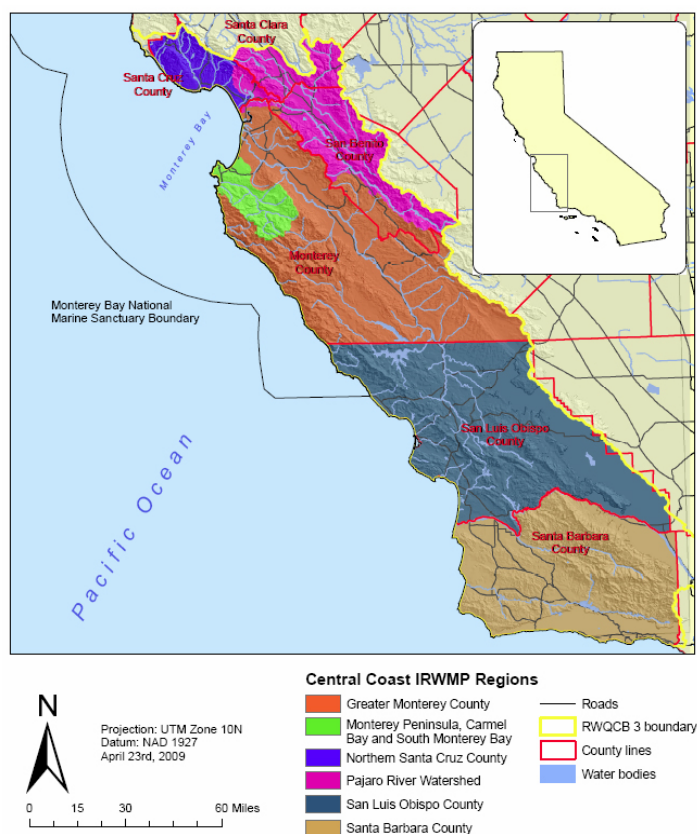
The Greater Monterey County IRWM region lies entirely within the Central Coast Regional Water Quality Control Board district and is part of the IRWM Central Coast Funding Area. Adjacent IRWM regions include:

- Pajaro River Watershed IRWM region
- Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM region
- San Luis Obispo County IRWM region

Together these four regions, plus the Northern Santa Cruz County and the Santa Barbara County IRWM regions, form the Central Coast IRWM Funding Area.

The Greater Monterey County IRWM region includes the entirety of Monterey County exclusive of the Pajaro River Watershed IRWM region and the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM region established under Proposition 50. The Greater Monterey County IRWM region also includes a small portion of San Benito County where the Salinas River watershed extends outside of Monterey County. Generally, the region includes the entire Salinas River watershed north of the San Luis Obispo County line, all of the Gabilan and Bolsa Nueva watersheds in the northern part of the county, and all of the coastal watersheds of the Big Sur coastal region within Monterey County.

Areas within Monterey County that are not represented in this IRWM Plan (but that are represented in other IRWM Plans) include: the Pajaro River watershed, represented in the Pajaro River Watershed IRWM Plan; and the Carmel River watershed, the San Jose Creek watershed, areas overlying the Seaside Groundwater Basin, and all areas within the Monterey Peninsula Water Management District jurisdictional boundary (including the Monterey Peninsula cities of Carmel-by-the-Sea, Del Rey Oaks, Pacific Grove, Monterey, Sand City, and Seaside), which are represented in the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM Plan.



This chapter provides an overview of the watersheds, significant environmental resources, and water systems in the region, including surface waters, groundwater, reclaimed water, desalination, floodwater, and water supply infrastructure. These systems are integrally interconnected. The Greater Monterey County IRWM region receives no “imported” water, that is, no water from the State Water Project or from any other water source imported from outside of its boundaries (except for water from the Salinas River, which flows naturally from San Luis Obispo County). Therefore, maintaining the region’s water systems is absolutely critical for ensuring the health, prosperity, and long-term sustainability of local communities in the region.

The Greater Monterey County IRWM region includes six major watersheds (or portions thereof). The Salinas River watershed is by far the largest watershed in the region, encompassing an area of approximately 3,950 square miles within Monterey and San Luis Obispo Counties. The significant surface waters of the Greater Monterey County IRWM region include the Salinas River in the Salinas Valley and its tributaries, the largest of which are the Arroyo Seco, San Antonio, and Nacimiento Rivers; the San Antonio and Nacimiento Reservoirs; the numerous rivers originating in the Santa Lucia Mountains along the Big Sur coast; Elkhorn Slough and Moro Cojo Slough; Monterey Bay, and the coastal waters of the Monterey Bay National Marine Sanctuary. The Nacimiento and San Antonio Reservoirs are considered the most prominent elements of the region's water infrastructure. The Nacimiento Reservoir yields on average about 62 percent of the total water in the Salinas River system, while the San Antonio Reservoir yields on average about 13 percent of the total water in the Salinas River system.

Groundwater is the main source of water for most water users in the planning region with the exception of residents along the Big Sur coast, who depend entirely on surface water and shallow wells for their water supply, and of residents in an area near Greenfield in the Salinas Valley, who have a diversion from the Arroyo Seco River. The largest groundwater basin in the planning region is the Salinas Valley Groundwater Basin. The basin consists of one large hydrologic unit comprised of eight sub-basins. According to the 2015 MCWRA Ground Water Extraction Data Summary Report, total groundwater pumping from the Salinas Valley Groundwater Basin in the 2015 reporting year was 514,714 acre feet (AF). Agricultural pumping accounted for 93 percent of total groundwater pumping and urban uses accounted for the remaining 7 percent of the reported extractions. Groundwater recharge in the Salinas Valley is principally from infiltration from the Salinas River, Arroyo Seco, and to a much less extent, other tributaries to the Salinas River, and from deep percolation of rainfall. It is estimated that stream recharge accounts for approximately half of the total basin recharge.

The chapter also describes internal boundaries within the Greater Monterey County region, including political boundaries; service areas of individual water, wastewater, and flood control districts; and service areas of land use agencies. The Greater Monterey County IRWM region includes six incorporated cities, which comprise 69 percent of the region's population: Salinas, Soledad, Marina, Greenfield, King City, and Gonzales. Unincorporated communities include: Prunedale, Castroville, and the significantly smaller communities of Moss Landing, Las Lomas, Spreckels, Chualar, San Lucas, San Ardo, Lockwood, Bradley, and Parkfield. Along the Big Sur coast, unincorporated communities include: Big Sur, Lucia, and Gorda. Military areas in the region include Fort Hunter Liggett, a United States Army Reserve command post encompassing 165,000 acres on the eastern side of the Santa Lucia Mountains, and Camp Roberts, a National Guard training base located in southern Monterey County and northern San Luis Obispo County, encompassing approximately 17,000 acres within Monterey County.

Water supply in the region is managed by several agencies, both public and private. Monterey County Water Resource Agency (MCWRA), formed in 1947, is the primary water management agency for Monterey County and is responsible for managing, protecting, and enhancing water supply and water quality, as well as providing flood protection, in the County.

Major water suppliers in the region include California Water Service Company, California American Water Company, Alco Water Service Company, Marina Coast Water District, Castroville Community Services District, and the municipalities of Gonzales, Greenfield, Soledad, and King City. The U.S. Army and California State Parks supply water for use on their properties. The majority of residents and businesses in the Big Sur coastal region obtain water from private wells and springs.

The Water Supply and Water Demand section describes historic land use, population, and water use trends in the region, and projected water demand over a 25-year planning horizon based on projected land

use and population trends. Most of the urban development in the region has occurred in the cities of Salinas, Soledad, Gonzales, Greenfield, and King City. Over the next 20 years, population in the Big Sur coastal region is expected to remain relatively stable; however, continuous growth is expected in the cities of Gonzales, Greenfield, Salinas, King City, and Soledad.

The primary land use in Monterey County is agriculture, representing about 56 percent of the total land area and occupying more than 1.4 million acres of land. The second largest land use consists of public and quasi-public uses (such as parks, recreational, community, and military facilities), comprising about 23 percent of the total land area. Only 5 percent of the county has been developed with residential, industrial, and commercial uses.

Water use in the Salinas Valley Groundwater Basin has significantly outpaced water supply over the past several decades, resulting in overextraction and seawater intrusion. Conditions are expected to improve somewhat by 2030, at least in terms of basin overdraft. However, seawater intrusion is expected to worsen, particularly with increasing impacts of climate change. The IRWM Plan promotes projects that address specific infrastructure needs as well as overall water supply reliability for the region.

The chapter also describes current water quality conditions in the Greater Monterey County IRWM region for surface and groundwater, regional water quality goals and objectives, and current efforts to protect and improve water quality in the IRWM planning region. The quality of surface waters in the region is greatly influenced by land use practices. Primary causes of pollutants to surface waters include urban runoff, agricultural runoff, erosion and sedimentation, and septic systems. Erosion is a widespread problem in Monterey County. Two major water quality problems affecting the Salinas Valley Groundwater Basin are nitrate contamination and seawater intrusion. Nitrate contamination is due primarily to use of nitrogen-based synthetic fertilizers for irrigated agriculture, and commonly occurs in the unconfined and semi-confined aquifers that underlie areas of intense agricultural activity. Seawater intrusion was first observed in a few wells in the Castroville area in 1932. As of 2017, seawater has intruded approximately 7.5 miles inland in the 180-Foot Aquifer and 4.5 miles inland in the 400-Foot Aquifer. As a result of seawater intrusion, urban and agricultural supply wells have been abandoned, destroyed, and relocated.

Within the Greater Monterey County IRWM region, 31 water bodies have been determined by the RWQCB to be impaired under Section 303(d) of the Clean Water Act. The water bodies in the lower Salinas Valley have some of the worst pollutant impairments on the Central Coast. The Lower Salinas River has the most pollutant impairments identified on the 303(d) list of any other water body on the Central Coast, with 19 impairments.

Section C: Flood Management

This chapter describes the current framework for flood management in the Greater Monterey County IRWM region and identifies the potential for integrated flood management. Historic records from 1911-2007 show flooding and flood damage to have occurred on a fairly regular basis (every few years) within Monterey County. The agency with primary responsibility for floodplain management in Monterey County is the Monterey County Water Resources Agency (MCWRA). Flood control also falls under the authority of municipalities throughout the region, which are responsible for storm drain maintenance and surface water disposal. The Nacimiento and San Antonio Dams, constructed in 1957 and 1967 respectively, dams were constructed to control floodwaters and to release water into the Salinas River for percolation to underground aquifers throughout the summer.

Section D: Goals and Objectives

This chapter includes a description of the process for identifying the goals and objectives for the Greater Monterey County IRWM planning region, the list of approved goals and objectives, a matrix used to measure progress toward achieving each of the objectives, and an explanation of why the Greater Monterey County RWMG chose not to prioritize objectives. Below are the goals and objectives for this IRWM Plan:

WATER SUPPLY Goal: Improve water supply reliability and protect groundwater and surface water supplies.

WATER SUPPLY Objectives:

- Increase groundwater recharge and protect groundwater recharge areas.
- Optimize the use of groundwater storage with infrastructure enhancements and improved operational techniques.
- Increase and optimize water storage and conveyance capacity through construction, repair, replacement, and augmentation of infrastructure.
- Diversify water supply sources, including but not limited to the use of recycled water.
- Maximize water conservation programs.
- Capture and manage stormwater runoff.
- Optimize conjunctive use where appropriate.
- Support research and monitoring to better understand identified water supply needs.
- Support the creation of water supply certainties for local production of agricultural products.
- Promote public education about water supply issues and needs.
- Promote planning efforts to provide emergency drinking water to communities in the region in the event of a disaster.

WATER QUALITY Goal: Protect and improve surface, groundwater, estuarine, and coastal water quality, and ensure the provision of high-quality, potable, affordable drinking water for all communities in the region.

WATER QUALITY Objectives:

- Promote practices necessary to meet, or where practicable, exceed all applicable water quality regulatory standards (for drinking water, surface and groundwater quality).
- Promote projects to prevent seawater intrusion.
- Incorporate or promote principles of low impact development where feasible, appropriate, and cost effective.
- Protect surface waters and groundwater basins from contamination and the threat of contamination.
- Support research and pilot projects for the co-management of food safety and water quality protection.
- Improve septic systems, sewer system infrastructure, wastewater treatment systems, and manure management programs to prevent water quality contamination.
- Support research and other efforts on salinity management.
- Support monitoring to better understand major sources of erosion, and implement a comprehensive erosion control program.
- Promote programs and projects to reduce the quantity and improve the quality of urban and agricultural runoff and/or mitigate their effects in surface waters, groundwater, and the marine environment.

- Promote regional monitoring and analysis to better understand water quality conditions.
- Support research and utilization of emerging technologies (enzymes, etc.) to develop effective water pollution prevention and mitigation measures, and source tracking.
- Promote public education about water quality issues and needs.

FLOOD PROTECTION AND FLOODPLAIN MANAGEMENT Goal: Develop, fund, and implement integrated watershed approaches to flood management through collaborative and community supported processes.

FLOOD PROTECTION AND FLOODPLAIN MANAGEMENT Objectives:

- Promote projects and practices to protect infrastructure and property from flood damage.
- Improve flood management infrastructure and operational techniques/strategies.
- Implement flood management projects that provide multiple benefits such as public safety, habitat protection, recreation, agriculture, and economic development.
- Develop and implement projects to protect, restore, and enhance the natural ecological and hydrological functions of rivers, creeks, streams, and their floodplains.
- Support research and monitoring efforts to understand the effects of flooding on transport and persistence of pathogens in food crop production areas.
- Support management of flood waters so that they do not contaminate fresh produce in the field.
- Promote public education about local flood management issues and needs.

ENVIRONMENT Goal: Protect, enhance, and restore the region's ecological resources while respecting the rights of private property owners.

ENVIRONMENT Objectives:

- Support science-based projects to protect, improve, enhance, and/or restore the region's ecological resources, while providing opportunities for public access and recreation where appropriate.
- Protect and enhance state and federally listed species and their habitats.
- Minimize adverse environmental impacts of water resource management projects.
- Support applied research and monitoring to better understand environmental conditions, environmental water needs, and the impacts of water-related projects on environmental resources.
- Implement fish-friendly stream and river corridor restoration projects.
- Reduce adverse impacts of sedimentation into streams, particularly from roads and non-point sources.
- Promote efforts to prevent, control, reduce, and/or eradicate high priority invasive species.
- Promote native drought-tolerant plantings in municipal and residential landscaping.
- Consider opportunities to purchase fee title or conservation easements on lands from willing sellers that provide integrated water resource management benefits. Ensure adequate funding and infrastructure to manage properties and/or monitor easements.
- Support research and monitoring efforts to understand the effects of wildfire events on water resources.

REGIONAL COMMUNICATION AND COOPERATION Goal: Promote regional communication, cooperation, and education regarding water resource management.

REGIONAL COMMUNICATION AND COOPERATION Objectives:

- Facilitate dialogue and reduce inconsistencies in water management strategies/regulations between local, regional, state, and federal entities.

- Promote dialogue between federal and state regulators and small water system managers to facilitate water quality regulation compliance.
- Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for responsible water supply solutions and improved water quality.
- Build relationships with federal, state, and local regulatory agencies and other water agencies to facilitate the permitting, planning, and implementation of water-related projects.
- Increase stakeholder input and public education about the need, complexity, and cost of strategies, programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection.

DISADVANTAGED COMMUNITIES Goal: Ensure the provision of high-quality, potable, affordable water and healthy conditions for disadvantaged communities (DACs).

DISADVANTAGED COMMUNITIES Objectives:

- Seek funding opportunities to ensure all communities have a water system with adequate, safe, high-quality drinking water.
- Seek funding opportunities to ensure all communities have adequate wastewater treatment.
- Ensure that DACs are adequately protected from flooding and the impacts of poor surface and groundwater quality.
- Provide support for the participation of DACs in the development, implementation, monitoring, and long-term maintenance of water resource management projects.
- Promote public education in DACs about water resource protection, pollution prevention, conservation, water quality, and watershed health.

CLIMATE CHANGE Goal: Adapt the region's water management approach to deal with impacts of climate change using science-based approaches, and minimize the regional causal effects.

CLIMATE CHANGE Objectives:

- Plan for potential impacts of future climate change.
- Support increased monitoring and research to obtain greater understanding of long-term impacts of climate change in the Greater Monterey County region.
- Support efforts to research alternative energy and to diversify energy sources appropriate for the region.
- Seek long-term solutions to reduce greenhouse gas (GHG) producing energy use.
- Seek long-term solutions to maintain and protect existing pristine natural resources from the impacts of climate change.
- Support research and/or implementation of land-based efforts such as carbon-sequestration on working lands and wildlands in the Greater Monterey County region.
- Promote public education about impacts of climate change, particularly as it relates to water resource management in the Greater Monterey County region.

Section E: Resource Management Strategies

The IRWM Program requires RWMGs to consider certain resource management strategies for potential use in their regions and for possible inclusion in their IRWM Plans. This chapter describes the 40 regional water management strategies chosen for the IRWM Plan.

Section F: Project Review Process

All projects submitted for inclusion in the IRWM Plan must undergo a thorough review process before they can be formally adopted into the Plan. With each new project solicitation for the IRWM Plan, a Project Review Committee, comprised of RWMG members, is convened to review each of the projects. The result of the project review process is a ranked project list, vetted and approved by the RWMG. Table F-1 shows the categories and the maximum number of points that a project can achieve per the project prioritization process:

Table F-1: Project Ranking - Summary of Points

| Criteria | Explanation of Scoring | Maximum Potential Points |
|---|--|--------------------------|
| Addresses Goals and Objectives | For each goal category (there are 7 goals): 4 = strongly addresses that goal category 2 = moderately addresses 0 = slightly addresses or does not address | 28 |
| Addresses RMS | 4 points = 11 or more RMS 2 points = 5 – 10 RMS 0 points = 0 – 4 RMS | 4 |
| Contributes to climate change adaptation | 2 points = fully addresses 1 point = partially addresses 0 points = inadequate consideration | 2 |
| Contributes to reduction in GHG emissions, compared with project alternatives | 2 points = fully addresses 1 point = partially addresses 0 points = inadequate consideration | 2 |
| TOTAL | | 36 |

Section G: Projects

This chapter provides, as an example, the list of projects included in the IRWM Plan through 2012. The most current Project List is posted on the website: www.greatermontereyirwmp.org/projects.

Section H: Impacts and Benefits

This chapter describes the anticipated benefits and potential impacts that will result from the implementation of this IRWM Plan, both on a project-specific level and in terms of how the projects will help achieve regional goals. The chapter includes detailed tables that summarize the impacts and benefits anticipated from each of the IRWM Plan projects, as described by the project proponents themselves.

Section I: Integration

The intent of the Integration standard in the IRWM Program Guidelines is to ensure that RWMGs intentionally create a system where integration can occur. This section discusses three types of integration: 1) stakeholder/institutional integration, 2) resource integration, and 3) project integration.

Section J: Plan Performance and Monitoring

This chapter describes the process for tracking progress toward meeting IRWM Plan objectives. Project implementation is tracked using the “Conservation Action Tracker” database, a data system for tracking land-use management improvements in the Central Coast region.

Section K: Data Management

The Data Management chapter describes how data from IRWM-funded projects is stored, validated, and shared in the Greater Monterey County IRWM planning region. The intent and design of the Greater Monterey County IRWM Plan data management system focuses on a localized approach to data collection and management with uploading of data into statewide databases.

Section L: Finance

This chapter summarizes the anticipated and potential sources of funding to support the projects and programs included in the IRWM Plan, and describes how the Greater Monterey County IRWM planning process will continue to be supported into the future.

Section M: Technical Analysis

This IRWM Plan was developed almost entirely from existing plans, reports, and studies. This chapter describes the technical information, methods, and analyses used by the RWMG for developing this Plan.

Section N: Relation to Local Water Planning

This chapter describes how the IRWM Plan incorporates local water plans, including: groundwater management plans and studies, urban water management plans, flood management plans, watershed management plans, storm water management plans, emergency response and disaster plans, county and city general plans, and other local plans related to water resource management.

Section O: Relation to Local Land Use Planning

The effort to link land use decisions and water management decisions remains an area of challenge in the Greater Monterey County IRWM region as it does in many other regions of the state. This chapter provides examples of how water resource managers currently communicate with land use planners in the Greater Monterey County IRWM region, and provides suggestions for improving coordination.

Section P: Stakeholder Involvement

The Stakeholder Involvement chapter describes the protocols used for stakeholder involvement in the Greater Monterey County IRWM region, including the process used to identify stakeholders, the process used to communicate with stakeholders, special outreach to disadvantaged communities and Native American tribes, and how stakeholders can participate in the IRWM planning process.

Special effort has been made to encourage the participation of disadvantaged communities (DACs) in the Greater Monterey County IRWM planning process and to ensure that their water resource needs are considered and addressed. DACs are defined as communities with annual median household incomes (MHI) that are less than 80 percent of the statewide MHI (the California MHI was \$61,818 in 2015,

according to the American Community Survey [ACS]). Based on 2015 ACS data, eight US Census places within the IRWM region are defined as disadvantaged, along with numerous census tracts and block groups. In all, 36 percent of the population within the Greater Monterey County IRWM region is defined as being disadvantaged, according to 2015 ACS data at the block group level. The chapter describes recent efforts on the part of the RWMG to identify DACs in the planning region and evaluate their drinking water and wastewater needs.

Section Q: Coordination

The intent of the Coordination standard in the IRWM Program Guidelines is to ensure that RWMGs coordinate their activities with local agencies and stakeholders; are aware of adjacent planning efforts and are coordinating with adjacent RWMGs; and are aware of state, federal, and local agency resources and roles in the implementation of their plans and projects. This chapter describes how the IRWM planning effort in the Greater Monterey County IRWM region addresses that standard.

Section R: Climate Change

The intent of the Climate Change standard in the IRWM Program Guidelines is to ensure that IRWM Plans describe, consider, and address the effects of climate change on their regions and disclose, consider, and reduce when possible greenhouse gas (GHG) emissions when developing and implementing projects. This chapter describes the anticipated impacts of climate change for the Greater Monterey County region, including a vulnerability analysis and risk assessment, and offers preliminary adaptation measures and climate change mitigation and GHG reduction strategies for the planning region. These strategies will be refined as more climate change data, and more refined analysis tools, become available.

The chapter summarizes potential vulnerabilities in the Greater Monterey County IRWM region due to climate change impacts, which include (among others) higher temperatures, changes in rainfall patterns, higher flow rates leading to increased erosion and flooding, more frequent and more severe droughts, sea level rise, increased coastal erosion, increased coastal inundation, and increased seawater intrusion. The RWMG conducted an initial climate impact risk assessment to help water resource managers evaluate these risks and to consider potential adaptation measures. The climate risk analyses and priority impact assessment indicate the following climate risks to be top priority for the RWMG and other water managers in the Greater Monterey County IRWM region for considering how to adapt the region's water management systems for climate change impacts:

- ***Decreased water supply*** due to changes in precipitation, more frequent and severe droughts, increased surface and groundwater consumption, and increased seawater intrusion (due to sea level rise affecting coastal aquifers).
- ***Increased flooding and erosion of creeks and rivers*** due to more intense storm events (higher river flow rates), and overburdening of conveyance systems, levees, and culverts.
- ***Coastal inundation of urban development and other land uses, and impacts to river and wetland ecosystems*** due to changes in rainfall patterns, storm intensity, storm surges (due to increased storm intensity) and sea level rise.

The chapter provides an initial adaptation strategy for the Greater Monterey County IRWM region, discusses the region's adaptive capacity, and describes possible strategies to reduce vulnerabilities, including specific assets that lie within various future climate hazard zones according to climate scenarios for the years 2018-2030, 2030-2060, and 2060-2100. The chapter also discusses greenhouse gas emissions reduction strategies.