



2019 San Diego Integrated Regional Water Management Plan

2 Vision and Objectives

This chapter addresses requirements set forth in the Objectives Standard included in the 2016 IRWM Program Guidelines (DWR, 2016). Consistent with DWR's 2016 Guidelines, the objectives presented in this chapter were developed to manage or eliminate the challenges faced by the Region as described in detail in *Chapter 3, Region Description*.

2.1 Overview

The intent of this chapter is to document various aspects of the planning hierarchy established for the 2013 and 2019 San Diego IRWM Plans. Specifically, this chapter includes information regarding:

- the process used to develop the IRWM objectives,
- how the objectives address major water-related issues and conflicts of the Region,
- how the objectives will be measured so that achievement of objectives can be monitored,
- an explanation of why the objectives were not prioritized, and
- an explanation of the overall planning hierarchy (vision, mission, goals, and objectives) included in the 2013 and 2019 IRWM Plans.

2.2 Describing the Process

The IRWM planning components (vision, mission, goals, and objectives) were revised for the 2013 IRWM Plan through a collaborative process that involved members of the public, stakeholders, workgroup members, the Regional Advisory Committee (RAC), and the Regional Water Management Group (RWMG). During development of the 2019 San Diego IRWM Plan, these components were revisited by the RWMG and the RAC, who recommended modifications that reflected the Region's current priorities and those of DWR's 2016 Guidelines.

As described in detail in *Chapter 6, Governance and Stakeholder Involvement*, the 2013 IRWM Plan involved a number of workgroups consisting of representatives from the RAC and interested stakeholders, which were convened to provide input on specific components of the Plan. One workgroup, the Priorities and Metrics Workgroup, was convened to complete the following tasks:

- Refine IRWM vision, mission, goals, and objectives
- Review information received during the IRWM Summit (described in detail below) and use that information to refine the vision, mission, goals, and objectives
- Develop a recommended list of targets and metrics that can be used to measure achievement of the IRWM objectives
- Discuss pros and cons of prioritization and potentially prioritize the IRWM objectives

The Priorities and Metrics Workgroup met a total of five times from February to December 2012 and provided substantial input on the development of the IRWM vision, mission, goals, and objectives.

The workgroup used information received at a public IRWM Summit to refine those planning components. Further information regarding the Priorities and Metrics Workgroup, including complete meeting agendas and notes are available online at the following web address: <http://sdirwmp.org/2013-irwm-plan-update-workgroups>.

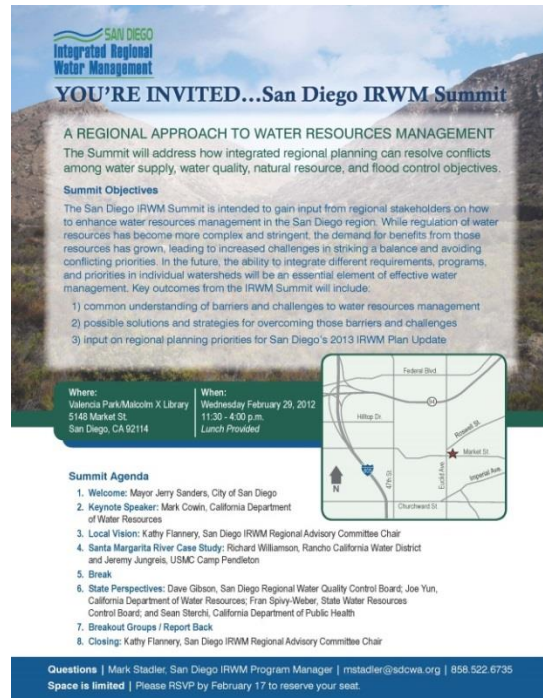
The 2007 IRWM Plan vision, mission, goals, and objectives were used as a starting point for the Priorities and Metrics, as these existing IRWM Plan components were previously determined by the Region's stakeholders. Further, the Priorities and Metrics Workgroup considered existing water management plans such as the Region's 2010 Urban Water Management Plans, the San Diego County General Plan Update, and requirements and considerations established by the California Department of Water Resources (DWR) in the 2012 IRWM Guidelines (DWR, 2012).

The first IRWM Summit, held on February 29, 2012, was open to members of the public and had two purposes: 1) to increase awareness of the IRWM Program and 2013 IRWM Plan as part of the Region's public outreach and involvement process, and 2) to solicit stakeholder input on the existing IRWM objectives, and any additional objectives that may be suitable to include in the 2013 IRWM Plan. IRWM Summit attendees considered a wide array of information to make recommendations regarding the IRWM objectives. IRWM Summit attendees provided input via open discussions, and largely relied upon personal knowledge and experience as the basis for their input.

Determining the IRWM objectives was considerably more challenging than determining the IRWM vision, mission, or goals and included many revisions and substantial input from all stakeholders. Further, due to the planning hierarchy of the vision, mission, goals, and objectives; the goals were reviewed and revised as applicable when revising the objectives to ensure that the information and priorities included in the goals were reflected in the objectives, and vice versa. The Region's understanding of climate change and how it plays a role in most aspects of water resource management is reflected in the shift of climate change from an objective in the 2013 IRWM Plan Update to a goal in the 2019 IRWM Plan Update.

The Priorities and Metrics Workgroup, in coordination with the RWMG, was responsible for compiling a draft version of the vision, mission, goals, and objectives for further vetting through the RAC and members of the public. On December 5, 2012, a joint Public Workshop/RAC meeting was held, which focused on receiving input on the revised IRWM vision, mission, goals, and objectives before they were incorporated into the 2013 IRWM Plan.

The second IRWM Summit, held on February 29, 2016, was open to members of the public and had two purposes: 1) celebrate the successes of the San Diego IRWM Program and reminisce about the



SAN DIEGO Integrated Regional Water Management
YOU'RE INVITED...San Diego IRWM Summit

A REGIONAL APPROACH TO WATER RESOURCES MANAGEMENT
 The Summit will address how integrated regional planning can resolve conflicts among water supply, water quality, natural resource, and food control objectives.

Summit Objectives
 The San Diego IRWM Summit is intended to gain input from regional stakeholders on how to enhance water resources management in the San Diego region. While regulation of water resources has become more complex and stringent, the demand for benefits from those resources has grown, leading to increased challenges in striking a balance and avoiding conflicting priorities. In the future, the ability to integrate different requirements, programs, and priorities in individual watersheds will be an essential element of effective water management. Key outcomes from the IRWM Summit will include:

- 1) common understanding of barriers and challenges to water resources management
- 2) possible solutions and strategies for overcoming those barriers and challenges
- 3) input on regional planning priorities for San Diego's 2013 IRWM Plan Update

Where: Valencia Park/Malcolm X Library
 5148 Market St.
 San Diego, CA 92114

When: Wednesday February 29, 2012
 11:30 - 4:00 p.m.
 Lunch Provided

Summit Agenda

1. Welcome: Mayor Jerry Sanders, City of San Diego
2. Keynote Speaker: Mark Cowin, California Department of Water Resources
3. Local Vision: Kathy Flannery, San Diego IRWM Regional Advisory Committee Chair
4. Santa Margarita River Case Study: Richard Williamson, Rancho California Water District and Jeremy Jungreis, USMC Camp Pendleton
5. Break
6. State Perspectives: Dave Gibson, San Diego Regional Water Quality Control Board; Joe Yin, California Department of Water Resources; Fran Spay-Weber, State Water Resources Control Board; and Sean Storch, California Department of Public Health
7. Breakout Groups / Report Back
8. Closing: Kathy Flannery, San Diego IRWM Regional Advisory Committee Chair

Questions | Mark Stadler, San Diego IRWM Program Manager | mstadler@sdcwa.org | 858.522.6736
Space is limited | Please RSVP by February 17 to reserve your seat.

The IRWM Summit, held in February 2012, provided a venue to receive public input on key aspects of the 2013 IRWM Plan, including the IRWM Objectives.

Program's first 10 years, and 2) identify pressing regional issues and innovative solutions to address those issues, and brainstorm priorities for Proposition 1 IRWM funding. One of the IRWM Summit panels focused on key topics the IRWM Program should address in its next Plan update. Those suggestions were used as a starting point for refinement of this chapter in the 2019 IRWM Plan Update effort.

During the 2019 IRWM Plan Update, the RWMG and RAC revisited the vision, mission, goals, and objectives. At a RAC meeting held February 7, 2018, consideration was given to the process undergone during development of the IRWM Plan Objectives, changes to water resources context and management strategies, updated planning documents, stakeholder feedback on IRWM priorities (from the 2016 IRWM Summit and prior RAC meetings), and continued evolution of the San Diego IRWM Program. The RAC recommended keeping the vision and mission the same as the 2013 IRWM Plan, and converting the climate change objective to a goal to recognize its broad scope and priority in the region. Minor modifications were made to the remaining ten objectives.

The information included in the following sections regarding the IRWM vision, mission, goals, and objectives represents a synthesis of the input received through the aforementioned processes and stakeholder groups. Together, these processes were highly collaborative, involving as many IRWM stakeholders and interested parties as possible. All input received on the IRWM vision, mission, goals, and objectives was compiled into the Public Draft of the 2019 San Diego IRWM Plan Update which was further reviewed and commented upon by IRWM stakeholders, ensuring that the IRWM vision, mission, goals, and objectives were established and reaffirmed through a collaborative stakeholder process.

2.3 Sustainability of Water Resources

The IRWM Program supports the concept of sustainability, which is integrated in the IRWM vision, mission, goals, and objectives. Sustainability, broadly stated, calls for meeting the needs of the present without compromising the ability of future generations to meet their own needs. The San Diego IRWM Program advocates for sustainable water resources planning and has adopted a triple-bottom line definition to foster comprehensive results. The San Diego IRWM Program's definition of sustainability is shown below.

Definition of Sustainability for the 2019 IRWM Plan

Sustainable water resources management involves:

- **Social:** Fostering public health and safety and maintaining a community's quality of life through provision of safe, reliable, affordable water supplies and recreational waters.
- **Environmental:** Providing effective stewardship of water-based natural resources, including protection of water quality, habitat, water supply, and minimizing climate change impacts.
- **Economic:** Providing and protecting reliable, sustainable water resources that supports the regional economy.

Ensuring long term sustainability requires effective leadership and commitment that encourages collaboration, improved integration of infrastructure and natural systems, and addresses conflicting regulations and policies. Sustainability is also furthered by the approach that is taken to assess and manage water resource projects. Considerations in assuring sustainable water management may include: water quality, habitat, floodplain functions, biodiversity, wetland and surface water functions, greenhouse gas emissions, resiliency, and life cycle costing that broadly considers all costs associated with materials, construction, operations maintenance, and decommissioning. No-regret

climate change strategies (discussed in *Section 7.9.1* and the *Climate Change Study* in Appendix 7-D), which are defined as those strategies that would take place in the Region even in the absence of climate change, will also be considered for purposes of assessing sustainability.

As discussed in *Chapter 1, Introduction*, securing reliable sources of funding for these costs, particularly for operation and maintenance costs, is considered a potential implementation barrier as funding for these items is not readily available. For more information on implementation issues and challenges to sustainability, refer to *Chapter 11, Framework for Implementation*.



Principles of Sustainability for the 2019 IRWM Plan

2.4 IRWM Vision

The San Diego IRWM vision is to achieve:

An integrated, balanced, and consensus-based approach to ensuring the long-term sustainability of the Region's water supply, water quality, and natural resources.

2.5 IRWM Mission

The mission of the San Diego IRWM Program is:

To develop and implement an integrated strategy to guide the Region toward protecting, managing, and developing reliable and sustainable water resources. Through a stakeholder-driven and adaptive process, the Region can develop solutions to water-related issues and conflicts that are economically and environmentally preferable, and that provide equitable resource protection for the entire Region.

2.6 IRWM Goals

The San Diego IRWM goals are as follows, and apply to existing and future conditions, including climate change:

1. ***Improve the reliability and sustainability of regional water supplies.***
2. ***Protect and enhance water quality.***
3. ***Protect and enhance our watersheds and natural resources.***
4. ***Enhance resiliency to climate change for local water resources.***
5. ***Promote and support sustainable integrated water resource management.***

How the IRWM Plan Goals Address Issues and Needs in the Region	
1.	Improve the reliability and sustainability of regional water supplies. Expanding local water supply, supporting water supply reliability and security, reducing reliance on the Delta, and generally supporting improved water management help to sustain communities, economies, and the environment.
2.	Protect and enhance water quality. Maintaining healthy and safe water resources is critical to the Region’s public and environmental health, supports compliance with regulatory requirements, and reduces risk in the Region.
3.	Protect and enhance our watersheds and natural resources. Protecting and enhancing our watersheds and natural resources help to promote public and environmental health, improve quality of life, support community engagement, protect threatened and endangered species, and provide opportunities for enriching experiences.
4.	Enhance resiliency to climate change for local water resources. Effective water resources management helps to mitigate risks associated with supply reliability, sea level rise, flooding, wildfire, drought, and other extreme weather events. Responding to climate change impacts may include implementing “climate-proof” water management projects or incorporating greenhouse gas emissions reduction into project implementation. Increasing resiliency to climate change supports the four other goals of the IRWM Plan.
5.	Promote and support sustainable integrated water resource management. Engaging stakeholders in water resource management is critical for achieving buy-in on integrated solutions, which can help resolve potential management challenges, promote efficiency and efficacy in management practices and projects, and achieve sustainable solutions.

2.7 IRWM Objectives

The ten IRWM objectives described below were developed and refined to meet the IRWM goals included in the 2013 and 2019 IRWM Plans. Objective K (addressing climate change) from the 2013 IRWM Plan has been converted into a goal in the 2019 IRWM Plan to better reflect the way climate change affects multiple aspects of water management and the Region’s commitment to climate change resiliency. Table 2-1 provides a “crosswalk” of the Plan objectives and goals. As shown in the table, each of the goals is addressed by multiple objectives. Each objective has a number of targets and associated metrics designed to evaluate how well each objective is being met by the Region’s water management activities. These targets, along with their metrics, are presented in Table 2-3 (page 2-21). The IRWM objectives and targets were developed considering the State’s planning guidance in CWC §10540(c) and DWR’s Proposition 1 Program Success Matrix (2017), and encompass water supply reliability, water quality, groundwater overdraft, environmental stewardship, and water-related needs of economically disadvantaged communities (DACs). These objectives reflect the San Diego Region’s efforts towards obtaining the State’s goal for water and the environment.

Table 2-1: Crosswalk of San Diego IRWM Plan Goals and Objectives

San Diego IRWM Objectives	San Diego IRWM Plan Goals					
	Reliability and Sustainability of Water Supplies	Protect and Enhance Water Quality	Protect and Enhance Watersheds and Natural Resources	Promote and Support Sustainable Integrated Water Resources Management	Enhance Resiliency to Climate Change for Water Resources	
					Adaptation	Climate Mitigation
Objective A: Encourage the development of integrated solutions to address water management issues and conflicts.	○	○	○	●	○	○
Objective B: Maximize stakeholder/community involvement and stewardship of water resources, emphasizing education and outreach.	○	○	○	●	●	○
Objective C: Effectively obtain, manage, and assess water resource data and information.	○	○	○	○	○	○
Objective D: Further scientific and technical foundation of water management.	○	○	○	○	○	○
Objective E: Develop and maintain a diverse mix of water resources, encouraging their efficient use and development of local water supplies.	●	○	●	●	●	●
Objective F: Construct, operate, and maintain a reliable and resilient infrastructure system.	●	●	○	○	●	●
Objective G: Enhance natural hydrologic processes to reduce the effects of hydromodification and encourage integrated flood management.	○	●	●	●	●	●
Objective H: Effectively reduce sources of pollutants and environmental stressors to protect and enhance human health, safety, and the environment.	●	●	●	○	○	○
Objective I: Protect, restore, and maintain habitat and open space.	○	○	●	○	○	●
Objective J: Advance water-based enriching experiences.		○	○	○	○	○

- IRWM Plan objective directly supports the listed IRWM Plan Goal
- IRWM Plan objective indirectly supports the listed IRWM Plan Goal

To be included in the IRWM Plan, projects need to meet one of the ten IRWM objectives (refer to *Chapter 9, Project Evaluation and Prioritization*). However, to be considered for IRWM funding, projects must meet Objective A, Objective B, and at least one other objective. Each of the ten IRWM objectives, as well as information regarding how each objective addresses relevant water management issues, is provided below.

IRWM Funding Requirement – Objective A, Objective B, and One Other

To be included in the IRWM Plan, projects must contribute to at least one IRWM objective. To be **eligible for IRWM funding**, projects must meet Objective A, Objective B, and at least one additional IRWM objective.

Objective A: Encourage the development of integrated solutions to address water management issues and conflicts.

Detailed Description of Objective A

Implement projects and programs that effectively address local water management issues and conflicts through the following types of integration:

1. *Partnerships*: Establishing partnerships between different organizations to increase cost-effectiveness through sharing of data, resources, and infrastructure.
2. *Resource Management*: Employing multiple resource management strategies within a single project to effectively address a variety of issues.
3. *Beneficial Uses*: Developing solutions that address multiple beneficial uses to expand benefits.
4. *Geography*: Implementing watershed- or regional-scale projects to benefit more of people and potentially save costs through economies of scale.
5. *Hydrology*: Addressing multiple watershed functions within the hydrologic cycle to holistically address issues and resolve conflicts.
6. *Sustainability*: Implement projects that meet the needs of the present without compromising the ability of future generations to meet their own needs and broadly support social, environmental, and economic benefits.

The focus of this objective is to meet the requirements of Goal 5/Integration, which focuses on integration of water resources management. Both the vision and mission emphasize an integrated approach to water management, which is also a Statewide Priority (refer to Section 2.9). Goal 4/Climate Resiliency is also addressed by Objective A, because the impacts of climate change cross jurisdictional boundaries and require integrated and multidisciplinary approaches to water management in order to effectively mitigate climate and implement adaptation strategies.

Table 1-2, which can be found in *Chapter 1, Introduction*, includes an overview of identified water management challenges and conflicts relevant to the Region. In addition to the integration definitions described above, attainment of this objective will be evaluated based upon the ability to address relevant issues listed in Table 1-2.

Determination and Rationale for Objective A: The Region is a large and diverse area, falling under the jurisdiction of multiple water management agencies and organizations. By creating an objective that specifically focuses on integrated approaches to water resources and their management, the 2019 IRWM Plan emphasizes the importance of addressing issues across the Region regardless of jurisdictional and other boundaries that are not necessarily conducive to effective water management. Integration is the “I” in IRWM planning, which encourages planning and understanding of the inter-relationships across a variety of resource areas rather than traditional water planning efforts through which different resource areas (water supply, water quality, natural resources, flood management, etc.) are not necessarily coordinated. For example, water reuse efforts in the Region integrate both wastewater management and water supply development, and represent an integrated approach to managing water resources within the Region.

Incorporating cost-effective approaches to water management is essential for sustainable water management. Integration should also focus on the region’s ability to accomplish more with less. The IRWM mission seeks solutions to water-management issues that are economically preferable on a long-term basis. The following text box, developed by the Priorities and Metrics Workgroup, acknowledges some of the disincentives and benefits of integration.

<u>Potential Barriers or Disincentives to Integration</u>	<u>Potential Benefits or Incentives to Integration</u>
<ul style="list-style-type: none"> • Takes a lot of time and energy to coordinate with other partners. • Integration may mean reducing the amount of grant funding that each organization receives. • Administrative costs associated with combining projects and completing grant administrative for multiple entities. • Integrating with other partners could mean losing some control over a project. • Integration makes projects more complex. • May have to give up some benefits or features of the original project concept to integrate with another project concept. 	<ul style="list-style-type: none"> • Integration makes projects more competitive to receive grant funding, although integration in early or pre-design produces more win-win opportunities. • May be more cost-effective – partners such as NGOs can provide services at a lower cost and are adept at grant writing and grant administration. • May be more cost effective due to cost sharing with other agencies. • Integration reduces conflicts, which may result in streamlining for project approvals. • Integration may add additional expertise to a project. • Integration may allow for additional climate adaptation or mitigation strategies.

Objective B: Maximize stakeholder/community involvement and stewardship of water resources, emphasizing education and outreach.

Detailed Description of Objective B

Implement efforts to engage and educate the public on the IRWM Program and the interconnectedness of water supply, water quality, and natural resources. Build stewardship throughout the Region by providing opportunities to participate in water management and promote individual and community ownership of water resource problems and solutions. Increase public knowledge and understanding of the importance of water resource management, including stormwater as a resource, watershed and water quality protection, and supply diversification.

The focus of this objective is to incorporate stakeholder and community involvement and engagement into realization of each IRWM goal. The IRWM vision emphasizes the need for a consensus-based approach in water resources management within the Region, and the mission emphasizes the need for a stakeholder-driven process. Maximizing stakeholder and community involvement and stewardship has been a critical focus of the IRWM Program, and is a component of every aspect of the IRWM planning hierarchy. Due to the importance of stakeholder involvement to the San Diego IRWM Region, stakeholders determined that to be eligible for IRWM grant funding, a project must meet Objective A, Objective B, and at least one additional objective. Refer to *Chapter 9, Project Evaluation and Prioritization* for more information.

Determination and Rationale for Objective B: Stakeholder involvement is a vital part of the IRWM Program, and is necessary to identify and address public interests and perceptions, address stakeholder questions and issues upfront, ensure that the 2019 IRWM Plan and projects are consistent with public interests, provide for public ownership and support of IRWM activities, and bring diverse viewpoints to improve the next iteration of the IRWM Plan. Stakeholder involvement

is also essential for building the capacity of small water systems, especially those in DACs, EDAs, URCs, and EJs where system administrators and operators may not be trained professionals.

Stakeholder involvement may assist in identifying areas where increased public education and outreach is required and help focus on the public's key water management issues and potential solutions. Increasing public knowledge and understanding of the importance of water resource management, as well as finding ways to listen to the community and solicit input on finding solutions to common challenges, is essential for garnering public support for IRWM projects, including stormwater as a resource, watershed and water quality protection, and water supply diversification. It also helps to build knowledge and capacity to increase awareness of the anticipated impacts of climate change and promote projects and activities that support climate adaptation or mitigation strategies. Public education and outreach at community events, workshops, and school-based educational programs are required to promote the identification and understanding of the Region's resources. Hands-on and volunteer participation of the public encourages community ownership of water resource problems and solutions. Stakeholder input is also an essential element in identifying and resolving potential water management conflicts within the Region, and has been a fundamental component of the 2007, 2013, and 2019 San Diego IRWM Plans.

Objective C: Effectively obtain, manage, and assess water resource data and information.

Detailed Description of Objective C

Increase and expand sharing, integration, and comprehensive analysis of water resource and water quality data to provide a basis for improved and adaptive water resources management.

Attainment of each IRWM goal can be enhanced through data and information sharing. Through this objective, the RWMG and RAC recognize that obtaining and evaluating water quality, water supply, environmental, and recreational data is essential to the successful development and implementation of regional water management actions and programs. Data collection and analysis is required to identify trends, document water quality improvements or impairments, assess the effectiveness of water resource management programs, measure impacts from climate change at the regional level, evaluate the effectiveness of climate mitigation and adaptation strategies, and provide direction for future program planning and management strategies.

Determination and Rationale for Objective C: Organizations and individuals that collect data within the Region have historically worked separately, and have not compiled information into a central repository where data can be evaluated, formulated, compared, and shared with interested stakeholders. The IRWM Program has undertaken actions to address this issue and hosts an upgraded online project database that will help to address this need. Refer to *Chapter 10, Data and Technical Analysis* for more information about the online project database (<http://irwm.rmcwater.com/sd/login.php>) and the WaterGIS page (<http://sdirwmp.org/watergis>).

Despite the IRWM Program's efforts towards implementing a Region-wide DMS, there are still challenges associated with data and data management that are the impetus for Objective C. Challenges associated with trying to collect regional data from multiple jurisdictions and organizations include: (1) differences and sometimes incompatibilities in electronic formats, (2) the lack of a centralized system or location for maintaining hard copy data such as reports or maps, (3) proprietary data use concerns, (4) inconsistent data protocols that make data comparison difficult

and time-consuming, and (5) the cost of maintaining an ongoing regional data management system. IRWM Program participants are encouraged to continue submitting data to existing databases, despite known challenges, because data sharing and integration will support better water resources management.

The RWMG and RAC recognize that the IRWM Program offers a potential opportunity for regional entities to coordinate the collection, storage, analysis, and distribution of water quality, water supply, and natural resources data to overcome the challenges stated above. Beyond the regional DMS, other potential data-related opportunities for managers and stakeholders may include:

- making it possible to identify and update water supply, water quality, and other related data that will assist with water management issues
- providing data collection and storage in compatible electronic formats so that it is easily accessible to water managers and regional stakeholders
- analyzing collected data from areas within the Region that will assist in supporting water management actions/decisions
- assessing integration efforts between managers and stakeholders to provide water quality, water supply, and natural resources data in a beneficial manner to all parties involved
- developing a method to implement adequate quality controls for data collection, record keeping and analysis for the Region
- soliciting public/stakeholder involvement on data management and distribution
- identifying gaps in existing data or research needs to improve water resource management

Objective D: Further the scientific and technical foundation of water management.

Detailed Description of Objective D

Promote actions, programs, and projects that increase scientific knowledge and understanding of water management issues and support sustainable science-based regulations and requirements. Coordinate with regulatory agencies to assess and resolve ambiguous or conflicting regulatory standards or requirements.

Attainment of each IRWM goal can also be enhanced through increasing the scientific and technical foundation of water management. Objective D recognizes that additional scientific information and technical understanding is required to effectively implement many water management strategies, as well as improve regulations pertaining to water management.

Determination and Rationale for Objective D: Water management actions for the Region must comply with existing water quality, public health, flood control, environmental, and other laws and regulations. While water management actions must be addressed within the framework of existing regulations, additional technical and peer-reviewed scientific understanding is required to adjust regulations and the way in which regulations are implemented to ensure that such regulations are realistic, cost-effective, and being implemented in a meaningful way.

By addressing scientific and technical issues through regional coordination efforts, implementing agencies may recognize benefits of cost sharing, economies of scale and scope, and the increased potential for outside funding through collaborative approaches. Additionally, increased technical and scientific understanding allows for more consistent and expedient implementation of programs and activities. Sharing technical data, approaches, and results is essential for expanding the knowledge

base of water resource managers within the Region, particularly related to new and emerging technologies such as advanced water treatment or the effectiveness of climate change adaptation strategies. Engaging with the scientific community may advance management-relevant research and partnerships.

Increased scientific data and technical comprehension may allow for the development of regionally-feasible or watershed-based compliance alternatives that may not have been feasible from site-specific or project-specific standpoints. Better scientific understanding will result in more effective use of technology and other natural approaches that will encourage the implementation of the most cost-effective solutions and improved water quality on a long-term basis. The IRWM Plan process may also allow regional agencies to coordinate with regulators to identify areas where modification of regulations or regulatory procedures may be appropriate for maximizing beneficial use and protecting the Region's water resources.

Objective E: Develop and maintain a diverse mix of water resources, encouraging their efficient use and development of local water supplies.

Detailed Description of Objective E

Continue to develop diverse water resources to meet local supply and conservation goals, reduce dependence on imported water supplies, and increase water supply availability and reliability. A diverse mix of water resources includes imported water, water transfers, recycled water, water conservation, desalination (brackish groundwater or seawater), local surface water, stormwater capture and use, potable reuse, and groundwater. Promote ethic of "conserve, reuse, and recycle".

The focus of this objective is to meet the requirements of Goal 1/Water Supply. The Region's population of approximately three million and the Region's economy are both dependent upon a reliable, cost-effective, and diverse water supply. Securing a variety of water supply sources will help the Region ensure that even in drought or emergency conditions, reliable water supply can be made available now and in the future. Ensuring that water supplies are available to meet future demands is essential given that the Region's population is projected to increase by approximately one third by 2030. This objective addresses the variety of water supply sources – both imported and local – that are necessary to sustain the Region's water demands. This also helps address Goal 4/Climate Resiliency by increasing the Region's resiliency to changes in supply availability that may be related to climate change (e.g., more frequent drought, sea level rise, etc.).



El Capitan Reservoir has a storage capacity of 112,800 acre-feet and holds both surface runoff and imported water.

Photo credit: Jeff Pasek, City of San Diego

Determination and Rationale for Objective E: As documented within the *California Water Plan Update 2013* (DWR, 2013), water allocation, environmental, and hydrologic constraints present significant challenges to the sustainability of State Water Project and Colorado River supplies (imported water

supplies), particularly during long-term droughts. Additionally, reliance on imported water supplies renders the Region potentially vulnerable to short-term reliability issues that may occur in the event of a catastrophic emergency such as an earthquake that cuts off imported water supplies for up to six months.

Despite historic reliance on imported water supplies, the Region has made substantial progress in diversifying its water supply portfolio, a trend which will continue to occur in the future. Objective E aims to support the Region's water supply diversification efforts as well as the Region's water conservation efforts, which will both help to increase water supply reliability and reduce demands on imported water supplies. Projects that address Objective E include, but are not limited to, those that increase availability and reliability of local water supply, conservation and water use efficiency, water reuse and recycling, brackish groundwater desalination, and potable reuse. Regional water managers anticipate significant increases in potable reuse over the next few decades as water treatment technologies and regulations are established and more widely accepted.

Objective F: Construct, operate, and maintain a reliable and resilient water management infrastructure system.

Detailed Description of Objective F

Construct, operate, and maintain water conveyance, treatment, storage, and distribution facilities that comprise a reliable water infrastructure system consistent with the future planned mix of water resources. Provide flexibility in system operations, including utilization of natural systems for stormwater management. Improve asset management to allow use of existing infrastructure to meet water management needs and reduce the need for future projects. Address potential hazards to infrastructure from sea level rise and flooding.

The focus of this objective is to provide reliable infrastructure to meet Goals 1/Water Supply, 2/Water Quality, and 3/Natural Resources. Objective F also addresses Goal 4/Climate Resiliency, by providing reliable infrastructure that adapts to the potential impacts of climate change (e.g., design to withstand sea level rise and/or accommodate increased flows during extreme weather events). The Region's residents and economy are both dependent upon a reliable infrastructure to deliver water to residents, businesses, industries, parks, and agricultural lands. The Region's existing water supply infrastructure is described in *Chapter 3, Region Description*, and is a complex system of aqueducts, reservoirs, treatment plants, water pipelines, pump stations, and other appurtenances. Further, this objective addresses water infrastructure required for the disposal and reuse of wastewater, stormwater management, flood control, water quality-related concerns, and natural resources protection and enhancement.

Determination and Rationale for Objective F: Improvements to existing water supply infrastructure are required to ensure facilities are in place to produce, deliver, store, and treat supplies to reliably meet existing and future demands throughout the Region. Capital improvements will focus on increasing water supply flexibility, storage, supply diversity, safety and reliability. Asset management should allow for flexible use (or reoperation) of existing infrastructure to meet current or future water management needs, such as combined water storage, water quality improvement, and flood control benefits of local reservoirs, green infrastructure, or low impact development (LID). Training for DAC, EDA, URC, and EJ managers may help to ensure that technical, managerial, and financial capacity is adequately developed to manage existing infrastructure. Tribal communities specifically identified a need for training in the 2018 Water Needs Assessment.

This objective also addresses requisite improvements to other types of water infrastructure that are required to meet other objectives included in this IRWM Plan. Other types of infrastructure are

related: wastewater, flood control, and stormwater infrastructure should be designed in a manner to address, improve, and maintain water quality, and protect and enhance natural resources and watersheds.

Objective G: Enhance natural hydrologic processes to reduce the effects of hydromodification and encourage integrated flood management.

Detailed Description of Objective G

Restore and enhance natural hydrologic processes, and promote best management practices that reduce negative effects on receiving systems such as natural stream systems, groundwater systems, local water supply reservoirs, and lagoons, bays, and the ocean. Reduce runoff from impervious surfaces, erosion, sedimentation, and flooding. Use integrated flood management to holistically address flood issues, sea level rise, water quality, natural resources, and other water management concerns. Maximize environmental, habitat, and water quality benefits of stormwater projects. Prioritize green infrastructure where feasible.

The focus of this objective is to help achieve Goals 2/Water Quality and 3/Natural Resources, while also addressing Goal 4/Climate Resiliency. Sediment pollution, erosion, and other development-related water quality and hydromodification issues have impacted the Region's water resources, and may affect the Region's ability to respond to climate change by limiting or constraining water management options. This objective is intended to encourage restoration and floodplain management activities that help to address these historical issues, and includes activities that utilize natural infrastructure and mimic natural infrastructure functions.

Determination and Rationale for Objective G: Sedimentation, erosion, and hydromodification present significant water management challenges within many of the Region's watersheds. Development practices may decrease normal, distributed, at-source infiltration and therefore increase the volume and duration of stormwater runoff due to the increased amount of impermeable surfaces, such as paved areas and roofs. These development practices impact natural conveyance systems, such as creeks, streams and rivers due to increases of water loads from storm drain and other discharge points not originally part of the natural drainage system. Additionally, runoff picks up contaminants from roads and other impermeable surfaces before entering receiving waters. Future development in the Region will also contribute to these impacts.



One way to address community flood damage is through integrated flood management solutions.

Photo credit: Bruce Phillips, PACE

Pollution loads due to runoff will reflect the change in residential, commercial, industrial, construction, and agricultural activities (land use changes). These land use changes can result in physical changes (hydromodification) to the Region's waterways. Stormwater management with a focus on habitat protection can maximize the beneficial services that natural systems provide in terms of water attenuation, contaminant removal, and overall water

quality improvement. Addressing these problems will require regional cooperation in identifying and implementing cost-effective strategies. By identifying and addressing areas that are already, or likely to be, affected by hydromodification, stakeholders and managers can prevent or decrease its impacts, mitigate its negative effects, and address economic impacts that future development may have on the current infrastructure.

Further, integrated flood management, which is a Statewide Priority, is also included within this objective. Integrated flood management involves developing solutions for effectively managing flood risks through a watershed approach that allows for development of holistic strategies that can also address beneficial uses and watershed functions. Potential climate change impacts, such as highly variable precipitation patterns (including extreme/extended drought punctuated by extreme precipitation events) and sea level rise, have high potential to result in flooding throughout the region, which can indirectly reduce water quality. Management of natural waterways and habitat areas to decrease vulnerability to these impacts can help to protect the region in the future.

Objective H: Effectively reduce sources of pollutants and environmental stressors to protect and enhance human health, safety, and the environment.

Detailed Description of Objective H

Reduce pollutants and environmental stressors to protect and improve water quality through the application of point and non-point source controls, stormwater best management practices, management measures such as land use planning and conservation, and reservoir management. Reduce pollutant loads to protect the health and safety of humans and the environment and improve asset management to protect and enhance water quality.

The focus of this objective is to help achieve Goals 2/Water Quality and 3/Natural Resources, and to address Goal 4/Climate Resiliency through mitigation of some of the consequences of climate change. Existing regulatory programs control pollutants through a broad array of point source and non-point source programs. These programs are directed towards achieving compliance by mandating pollutant source controls and industry-standard best management practices. This objective is intended to encourage restoration, source control, and treatment activities that help to address water quality issues.

Determination and Rationale for Objective H: Approximately 60 inland surface waters (rivers or streams) and 13 reservoirs are listed on the Federal Clean Water Act 303(d) list of impaired water bodies as not attaining applicable water quality standards. Region-wide constituents of concern include bacteria, sediment, nutrients, and total dissolved solids (TDS). Toxic inorganic and toxic organic constituents are additional pollutants of concern in many of the Region's urbanized watersheds. There is potential that existing environmental stressors may worsen as a result of climate change due to increased occurrence of severe weather events (e.g. drought) and sea level rise. For example, drought can contribute to higher "first flush" pollutant loads once precipitation does occur, while at the same time reducing flows in streams, which generally increases water temperature and reduces ability to dilute pollutant loading in waterways. Reducing compounding stressors on water systems and watersheds (e.g., reducing pollution) may make these systems better able to withstand the impacts from climate change. Thus, reducing compounding stressors may increase adaptive capacity or resilience to climate change.

Cost-effective approaches to reducing pollutant loads, sources, and stressors is essential to bring listed water bodies into attainment of the standards, achieve Total Maximum Daily Load (TMDL)

allocations, and prevent waters that currently meet the standards from slipping into non-attainment or from being placed on the Clean Water Act 303(d) list. Additional data and analysis are required to establish a correlation between the use of pollutant source controls and water quality improvements, which will assist in the identification of predominant pollutant sources.

An important management consideration in addressing pollutants and stressors within local water supplies is reservoir and lake management. Reservoir and lake management strategies, including natural treatment systems, can be considered as a way to reduce problems associated with poor water quality and treatability resulting from stressors such as nitrogen, phosphorus, iron, manganese, and sulfur. Natural treatment systems may also mitigate climate through carbon sequestration in vegetation and carbon burial in sediments.

Objective I: Protect, restore, and maintain habitat and open space.

Detailed Description of Objective I

Manage and acquire land to preserve open space and protect sensitive habitat for endangered, threatened, and locally-important plant and wildlife species. Invasive species management, habitat conservation, and water pollution prevention activities will help to maintain and enhance biological diversity. Utilize stormwater capture to support habitat and environmental needs.

The focus of this objective is to meet Goal 3/Natural Resources; it will also address Goal 4/Climate Resiliency by helping to mitigate climate change. The Region features biologically diverse and important habitats and has a high degree of biological diversity (biodiversity). In recent decades, however, development and population growth within the Region have resulted in the loss of open space and habitat. Additionally, remaining native habitat may be subject to impacts or stress from invasive species, water quality degradation, hydromodification, and climate change impacts.



Lower Otay Reservoir contains extensive wetlands habitats.
 Photo credit: Jeff Pasek, City of San Diego

Determination and Rationale for Objective I: More bird and plant species live within San Diego County than in any other county in the contiguous United States; however, the reduction of available open space lands that can support wildlife habitats has reduced the number of native plants and animals living in the Region, and has reduced overall biodiversity. The trend of decreasing open space land within the Region is projected to continue, and it is anticipated that biodiversity in the Region will decrease as well.

Due to anticipated growth, development and climate change impacts, the preservation and maintenance of open space is an important component of

ensuring protection of the Region’s water quality, water availability, and protection of endangered and threatened species and habitats. Preserving and maintaining open space is also important for maintaining the Region’s natural aesthetics, preserving and enhancing recreational opportunities, enhancing the quality of life for residents, and providing benefits relative to tourism and the

economy. Protecting habitats and green spaces is also a climate adaptation strategy for extreme temperatures – natural habitats and green spaces can reduce temperature at the local level (e.g., reduce the heat island effect). Further, the *Water Quality Control Plan for the San Diego Basin* (Basin Plan) identifies several beneficial uses that address the needs of aquatic, wildlife, and marine habitats. Due to Basin Plan beneficial use designations pertaining to habitats, habitat management in the Region is a regulatory requirement that must be considered in water bodies that have such habitat-related beneficial uses, including Areas of Special Biological Significance (ASBS). Maintaining and expanding habitat can have an additional benefit of improving water quality, particularly when used to manage stormwater flows. Stormwater captured and used to sustain habitat and support local water supply often achieves dual benefits of water filtration (treatment) and infiltration (groundwater recharge). Natural habitat can also act as a carbon sink through sequestration, helping to mitigate the underlying cause of climate change in support of Assembly Bill 32, and the City’s and County’s Climate Action Plans.

Objective J: Advance water-based enriching experiences.

Detailed Description of Objective J

Protect and provide access to water-based enriching experiences such as education, outreach, swimming, fishing, boating, as well as picnicking and hiking along waterways, while ensuring that such activities do not adversely affect other beneficial uses of water. Improve public safety in water-based enrichment areas so that members of the Region can use them freely.

The focus of this objective is to meet Goal 5/Integration. The Basin Plan designates both water contact recreation (swimming, wading, tide pooling, water skiing, surfing) and non-contact recreation (boating, fishing, hiking, bird watching, kayaking) as key beneficial uses of inland and marine waters within the Region.

Determination and Rationale for Objective J: Water contact and non-contact recreation and enriching experiences are important components of the Region’s quality of life and tourism-dependent economy. A considerable number of enrichment opportunities exist at the beaches, rivers, streams, lakes, marine and estuarine waters within the Region.

Urban and agricultural stormwater runoff, aging sanitary sewer infrastructure, spills, and maintenance issues frequently degrade the water quality of the Region’s coastal waters, resulting in the posting of advisories of potential public health threats and beach closures. Controlling these pollutant-contributing activities is critical to enhancing and maintaining water-based enrichment opportunities within the Region.

The Region’s inland lakes are all man-made water supply reservoirs. Many of these reservoirs permit recreational uses that may adversely affect water quality due to contamination from swimmers, boating equipment, camping activities, and littering. Enrichment activities within the Region’s reservoirs must therefore be balanced with water supply and water quality protection needs. While optimizing enrichment opportunities is a Plan objective, restrictions on recreation (limiting public access, conservation easements, limiting certain recreational activities, or requiring implementation of best management practices) may be necessary to protect water supply and other beneficial uses.

Enriching experiences that are supported by Objective J are an essential component of engaging stakeholders in protection and restoration of water resources, as well as increasing their support for mechanisms to adapt to and mitigate the effects of climate change on local waters.

2.7.1 Prioritizing the IRWM Objectives

The ten IRWM objectives described above will be used to evaluate potential projects for inclusion in the 2019 IRWM Plan and will therefore help to determine which projects are submitted in grant applications. The question of prioritizing objectives was discussed by stakeholders in the Priorities and Metrics Workgroup conducted during the 2013 planning effort, who ultimately recommended against prioritizing objectives in the IRWM Plan. While recognizing that prioritizing objectives could make project evaluation easier and more transparent, it was determined that the costs of prioritizing objectives, including limiting the potential breadth of water management activities, losing some of the flexibility of the IRWM Plan, and losing stakeholder support, outweighed the benefits. All 10 IRWM objectives were developed by stakeholders because they address an identified priority for water management in the Region. Balancing project selection such that all objectives are addressed through IRWM funding opportunities and therefore contribute to broader water resource sustainability is the approach that the IRWM Region will take.

2.7.2 Climate Change Considerations

The San Diego IRWM Region recognizes that climate change poses a significant threat to the Region's water resources, which has linked ecological, social, and economic consequences. While the Region typically experiences considerable natural variation in climate, increased greenhouse gases (GHGs) in the atmosphere are leading to more extreme climate variations. We are already seeing the effects of climate change in the region, with extreme drought, altered fire seasons, and moderate sea level rise. While the region is actively planning its water management around projections for future water needs and availability, including the impacts of climate change, and projects water supply reliability into the future, impacts of climate change are expected to affect water supplies as well as have other non-water supply impacts on water resources. The impacts of climate change are expected to increase in severity over coming decades, which has implications for water resources, ecosystems, and human communities that depend on them. The impacts of climate change on the water supply are being quantified in the San Diego Basin Study, which will be finalized in 2019.

Preparing for and responding to climate change will require an integrated approach to resource management, which makes the IRWM program uniquely suited to take action. A key benefit of the San Diego IRWM Program is that all Plan Objectives directly or indirectly support Goal 4/Climate Resiliency to build climate *resilience* through *adaptation* and *mitigation* (Table 2-1). We conceptualize climate resilience, adaptation, and mitigation as related concepts (Figure 2-1) and for the purposes of the IRWM Plan, these terms are defined as:

Climate Resilience: Resilience is the capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (Resources Agency, 2017).

Climate Adaptation: Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (USEPA, 2013).

Mitigation (climate): A human intervention to reduce the human impact on the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks (e.g., carbon storage) (USEPA, 2013).

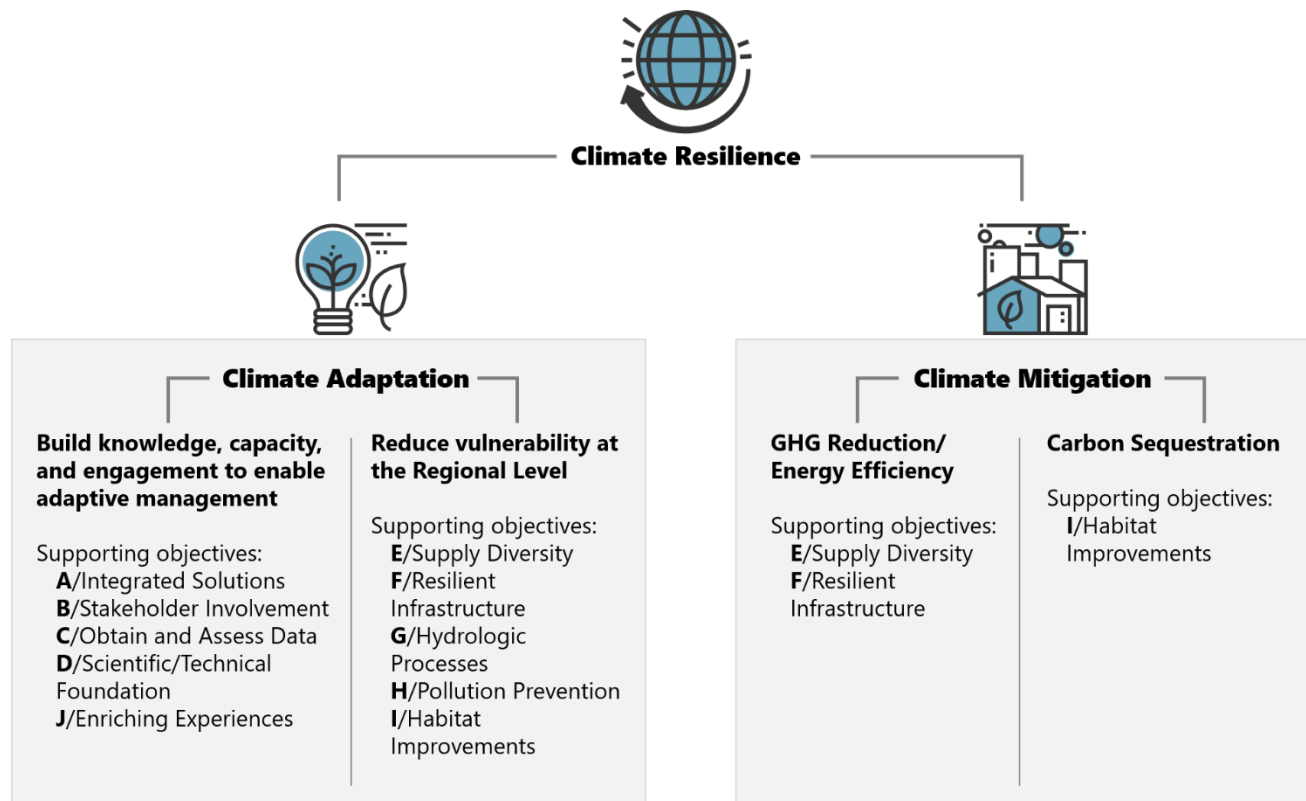
Mitigation (of disaster risk and disaster): The lessening of the potential adverse impacts of physical hazards (including those that are human-induced) through actions that reduce hazard, exposure, and vulnerability (International Panel on Climate Change, 2014).

Vulnerability: In the most general sense, a susceptibility to harm or change. More specifically, the degree to which a system is exposed to, susceptible to, and unable to cope with, the adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, as well as of non-climatic characteristics of the system, including its sensitivity, and its coping and adaptive capacity (Resources Agency, 2009).

Per DWR’s 2016 Guidelines, the San Diego IRWM Region has identified vulnerabilities to climate change and prioritized which are of highest priority to address (see Table 7-16, *Chapter 7, Regional Coordination*). Management strategies to address these vulnerabilities and improve climate resilience have also been identified (Table 7-17, *Chapter 7, Regional Coordination*). All projects included in the IRWM Program will be evaluated on their ability to address the risks to water resources and infrastructure arising from climate change. Projects will be selected for regional grant funding in part by their ability to address the vulnerabilities or implement the resource management strategies identified by the San Diego IRWM Climate Change Planning Study (Appendix 7-D).

Expanding and integrating knowledge about climate change science and adaptation approaches is fundamental to achieving regional resiliency. IRWM serves as a venue to build knowledge, capacity, and coordination among diverse groups to address climate change through integrated solutions.

Figure 2-1: Climate Change Framework for San Diego IRWM Program



2.8 IRWM Planning Hierarchy

This chapter includes an overview of all aspects of the IRWM planning hierarchy. The IRWM planning hierarchy included in this 2019 IRWM Plan is consistent with the planning hierarchy originally developed for previous versions of the IRWM Plan.

The individual components of the planning hierarchy – as illustrated in Figure 2-2 – are explained in the previous sections and are applied consistently throughout the 2019 IRWM Plan.

Figure 2-2: IRWM Planning Hierarchy



2.9 Consistency with Statewide Priorities

The IRWM objectives included in the previous sections address issues specific to the San Diego IRWM Region as identified by and vetted with regional stakeholders. While the objectives address issues specific to the IRWM Region, they are also in conformance with the Statewide Priorities set forth by DWR in the 2016 IRWM Guidelines (DWR, 2016). Table 2-2 demonstrates how the IRWM objectives either directly or indirectly address each Statewide Priority included in the 2016 IRWM Guidelines.

2.10 IRWM Plan Targets

Each of the ten IRWM objectives described above has a number of measurable targets designed to help evaluate how well each objective is being met. Each of these targets has one or more quantitative or qualitative metric to evaluate the targets. The targets and metrics for each objective are described in Table 2-3. The process of assessing attainment of each objective through the targets and metrics is detailed in *Chapter 11, Implementation*. Further, Table 2-3 indicates (with an “x”) whether each measurable target can be implemented through the IRWM Program or through IRWM Projects, which are organized by project type in the table. Revisions to Table 2-3 made for the 2019 IRWM Plan considered DWR’s Proposition 1 Success Metrics. Target and metric language varies to reflect the specific needs, issues, and objectives in the San Diego IRWM Region.

Table 2-2: Conformance of Plan Objectives with Statewide Priorities

San Diego IRWM Objectives	Statewide Priorities									
	Conservation as Way of Life	Regional Self-Reliance and Integrated Water Management	Co-Equal Goals for the Delta	Protect and Restore Important Ecosystems	Manage and Prepare for Dry Periods	Expand Water Storage Capacity and Improve Groundwater	Provide Safe Water for All Communities	Increase Flood Protection	Increase Operational and Regulatory Efficiency	Identify Sustainable and Integrated Financing Opportunities
Objective A: Encourage the development of integrated solutions to address water management issues and conflicts.	●	●	●	●	●	●	●	●	●	●
Objective B: Maximize stakeholder/community involvement and stewardship of water resources, emphasizing education and outreach.	●	○	○	○	○	○	○	○	○	
Objective C: Effectively obtain, manage, and assess water resource data and information.	○	○	○	○	○	○	○	○	○	○
Objective D: Further scientific and technical foundation of water management.	○	○	○	○	○	○	○	○	○	○
Objective E: Develop and maintain a diverse mix of water resources, encouraging their efficient use and development of local water supplies.	●	●	●	○	●	●	●	○	●	
Objective F: Construct, operate, and maintain a reliable and resilient infrastructure system.		●	○	○	●	●	●	●	●	○
Objective G: Enhance natural hydrologic processes to reduce the effects of hydromodification and encourage integrated flood management.			○	●	○	○		●	●	
Objective H: Effectively reduce sources of pollutants and environmental stressors to protect and enhance human health, safety, and the environment.	○			●		○	○	○	●	
Objective I: Protect, restore, and maintain habitat and open space.			○	●					○	
Objective J: Advance water-based enriching experiences.	○		○	○						○

- IRWM Plan objective directly supports the listed Statewide Priority
- IRWM Plan objective indirectly supports the listed Statewide Priority

Table 2-3: IRWM Objectives, Targets, and Metrics

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type							
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience
Objective A: Encourage the development of integrated solutions to address water management issues and conflicts.	1. Encourage the development of partnerships to implement water management projects.	<ul style="list-style-type: none"> Number of IRWM-funded projects that have multiple partners 	x	x	x	x	x	x	x	x	x
	2. Encourage the development of projects that achieve multiple IRWM Plan objectives.	<ul style="list-style-type: none"> Number of IRWM-funded projects that contribute to attainment of multiple IRWM Plan objectives 	x	x	x	x	x	x	x	x	x
	3. Encourage the development of projects that integrate multiple Resource Management Strategies.	<ul style="list-style-type: none"> Number of IRWM-funded projects with multiple Resource Management Strategies 	x	x	x	x	x	x	x	x	x
	4. Encourage the development of projects that provide regional or multi-watershed benefits.	<ul style="list-style-type: none"> Number of IRWM-funded projects that provide multi-watershed or regional benefits 	x	x	x	x	x	x	x	x	x
	5. Encourage the development of projects that consider multiple hydrologic functions.	<ul style="list-style-type: none"> Number of IRWM-funded projects addressing multiple watershed functions considering the hydrology of the system (upstream/downstream, surface/groundwater) 	x	x	x	x	x	x	x	x	x
	6. Realize efficiencies by implementing integrated approaches to water management.	<ul style="list-style-type: none"> Number of benefits per IRWM-funded project 	x	x	x	x	x	x	x	x	x

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type								
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience	
Objective B: Maximize stakeholder/community involvement and stewardship of water resources, emphasizing education and outreach.	1. Maintain the regional IRWM website to provide centralized public access to IRWM program data and information.	<ul style="list-style-type: none"> Regular updates to the website Access provided Number of website visits 	x									
	2. Provide access (via active link) to the regional IRWM website to help inform the Region's population about the IRWM program.	<ul style="list-style-type: none"> Access provided 		x	x	x	x	x	x	x		
	3. Conduct education and outreach activities to obtain a measurable increase in the regional population's knowledge of sustainable water resources management, including the nexus between water and energy.	<ul style="list-style-type: none"> Public workshops, meetings and presentations held Outreach activities (brochures, fair booths, landscape contests); Survey results 	x	x	x	x	x	x	x	x	x	
	4. Provide "hands-on" stewardship and volunteer opportunities in the Region's watersheds, including underserved and disadvantaged communities.	<ul style="list-style-type: none"> Stewardship activities held Number of participants (new vs. returning) 		x	x	x	x	x	x	x		
	5. Encourage the use of partnerships and community contacts to collect and disseminate information on water management.	<ul style="list-style-type: none"> Partners utilized to collect and disseminate information 	x	x	x	x	x	x	x	x	x	
	6. Increase DAC-EDA-URC-EJ participation and engagement	<ul style="list-style-type: none"> Number of DAC-EDA-URC-EJ projects and dollars awarded Number of participating DAC-EDA-URC-EJ residents or organizations Number of new DAC-EDA-URC-EJs attending RAC or submitting projects Percentage of IRWM-sponsored meetings (including funded project meetings) targeting DAC-EDA-URC-EJs 	x	x	x	x	x	x	x	x		

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type								
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience	
	7. Increase Tribal participation and engagement	<ul style="list-style-type: none"> Number of Tribal projects and dollars awarded Number of participating Tribal residents or organizations Number of new Tribal representatives attending RAC or submitting projects Percentage of IRWM-sponsored meetings (including funded project meetings) targeting Tribes 	x	x	x	x	x	x	x	x		
Objective C: Effectively obtain, manage, and assess water resource data and information.	1. Provide centralized public access to key water management data sets related to the IRWM Program and contribute water resources data consistent with established standards to regional data management system (DMS)	<ul style="list-style-type: none"> Regional DMS developed and populated Data sets that meet quality standards contributed Access to regional water quality sampling and reporting data for public health and environmental protection purposes 	x	x	x	x	x	x	x	x	x	
	2. Collect and evaluate water resources data in order to assess and document regional conditions, issues, and potential solutions.	<ul style="list-style-type: none"> Collected data informs and supports decision-making 	x	x	x	x	x	x	x	x	x	
Objective D: Further scientific and technical foundation of water management.	1. Work with the San Diego Water Board to implement collaborative activities to update, improve, and validate the Basin Plan.	<ul style="list-style-type: none"> Collaborative activities with San Diego Water Board Development of alternative strategies (such as implementation plans) to maintain compliance with Basin Plan water quality objectives Implementation of Regulatory Workgroup Strategies Number of scientifically-based site-specific objectives developed 	x	x	x	x	x	x	x	x	x	

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type							
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience
	2. Work with regional flood managers to understand and encourage application of integrated flood management techniques.	<ul style="list-style-type: none"> Studies/projects implemented 	X	X	X	X	X	X	X	X	X
	3. Promote the inclusion of sustainable water resource management policies in land use plans.	<ul style="list-style-type: none"> Number and diversity of water resource management policies included in land use plans 	X								X
	4. Expand the technical foundation of reusing local supplies (i.e. potable reuse, stormwater capture, greywater).	<ul style="list-style-type: none"> Study outcomes Guidelines or specifications developed Research and development, pilot testing, or conceptual design projects implemented New technologies used 	X	X	X	X	X	X	X	X	X
	5. Apply innovative approaches to understanding the connectivity between regional groundwater and surface water supplies.	<ul style="list-style-type: none"> Study outcomes Research and development, pilot testing, or conceptual design projects implemented 	X	X	X	X	X	X	X	X	X
	6. Expand the technical foundation of using riparian habitat for greenhouse gas mitigation.	<ul style="list-style-type: none"> Study outcomes 	X							X	X
	7. Explore innovative Low Impact Development concepts and develop new solutions to manage runoff.	<ul style="list-style-type: none"> Study outcomes Research and development, pilot testing, or conceptual design projects implemented 	X					X			X
	8. Engage with the scientific community to synthesize and translate research in a management-relevant context.	<ul style="list-style-type: none"> Study outcomes 	X	X	X	X	X	X	X	X	X

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type									
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience		
Objective E: Develop and maintain a diverse mix of water resources, encouraging their efficient use and development of local water supplies.	1. Conserve or reuse water to meet aggregated retail agency SBX7-7 demand target of 167 gallons per capita day (gpcd) for the region by 2020.	<ul style="list-style-type: none"> • AFY of water conserved • AFY of recycled water produced for beneficial reuse or used by customers • Urban and agricultural water conservation programs implemented 		x		x						x	
	2. Increase local supply development (recycled water, groundwater, desalinated water, surface water) in urban areas.	<ul style="list-style-type: none"> • AFY of seawater desalinated • AFY of recycled water used • Number of new recycled water connections • AFY of potable reuse (purified water) used • Number of potable reuse projects studied, designed, or implemented • AFY of groundwater produced or recharged • Maintenance of groundwater levels 		x	x	x	x					x	
	3. Implement Colorado River conservation and transfer programs to augment local supply development.	<ul style="list-style-type: none"> • AFY of Colorado River water delivered 		x									x
	4. Encourage efficient technologies, water conservation, and recharge area protection in rural areas in order to assure a sustainable long-term supply of groundwater.	<ul style="list-style-type: none"> • AFY of groundwater produced or recharged • Maintenance or increase of groundwater levels • AFY of water conserved • Water use audits performed • Well meters installed • Studies/projects implemented 		x		x	x						x

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type							
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience
	5. Develop and implement effective and cost efficient approaches for drinking water source protection.	<ul style="list-style-type: none"> Studies/projects implemented Improved local water supply quality 		X	X	X	X	X	X	X	X
	6. Protect water supply from invasive Quagga mussels.	<ul style="list-style-type: none"> Number of sites with Quagga mussels present Amount of Quagga mussels removed, eradicated, or avoided 									
Objective F: Construct, operate, and maintain a reliable and resilient infrastructure system.	1. Develop facilities and manage supplies to ensure adequate emergency and carry-over deliveries.	<ul style="list-style-type: none"> AFY of emergency and carry-over supply % of reservoir storage capacity used Increase in operational flexibility 		X							
	2. Develop, maintain, and optimize infrastructure and water quality for delivering water, collecting wastewater, capturing stormwater, and transporting stormwater and flood flows.	<ul style="list-style-type: none"> Infrastructure developed Length of conveyance pipe installed Construction or maintenance projects implemented Water quality projects that maintain use of infrastructure 		X	X	X	X	X	X		X
	3. Encourage innovative approaches to sustain or increase groundwater supplies in rural areas.	<ul style="list-style-type: none"> AFY of groundwater produced or recharged Infrastructure developed Soil humidity 		X	X	X	X				X
	4. Create, restore, protect, and maintain habitats that also serve a water resources management function.	<ul style="list-style-type: none"> Acreage of habitat associated with water resources Acreage of functioning wetlands Volume of transitory flood storage 		X				X	X	X	X

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type							
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience
	5. Enable small water systems to effectively construct and maintain their infrastructure.	<ul style="list-style-type: none"> • AFY of supply impacted by project • Infrastructure developed • Small water systems brought into drinking water compliance • Management plans developed 		x	x		x				
Objective G: Enhance natural hydrologic processes to reduce the effects of hydromodification and encourage integrated flood management.	1. Integrate cost-effective flood management benefits into water supply and water quality projects.	<ul style="list-style-type: none"> • Integrated projects implemented • AFY of stormwater captured, treated, or reused 		x			x	x	x	x	x
	2. Enhance or restore healthy hydrologic processes in the Region’s watersheds, notably reducing the negative effects of impervious surfaces.	<ul style="list-style-type: none"> • Decrease in peak flow or total runoff • Reduction in flood claims • Reduction in road closures due to flooding • Acreage of impervious surface restored • Acreage of functioning wetlands • Volume of transitory flood storage 					x	x	x	x	
	3. Promote watershed management and land use planning that mitigates or avoids typical hydromodification impacts associated with urbanization.	<ul style="list-style-type: none"> • Policies • Acreage of permeable surface protected • Acreage of riparian or floodplain buffer protected 	x					x	x	x	x

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type							
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience
Objective H: Effectively reduce sources of pollutants and environmental stressors to protect and enhance human health, safety, and the environment.	1. Maintain or improve the water quality entering local reservoirs, groundwater, recharge areas, watersheds, and other local water resources.	<ul style="list-style-type: none"> • AFY flow reduction to ocean outfalls • Decrease in pollutant concentrations • Pounds of trash removed • Pounds of trash prevented from entering water ways • Acreage of buffer vegetation planted • Strategies employed • TMDL implementation plans developed • Number of 303(d)-listed water bodies that are de-listed • Measured decreases in pollutant concentrations • Improved or maintained water quality from MS4 discharges • BMPs implemented 		x	x	x	x	x	x	x	
	2. Implement 3-6 individual groundwater basin plans with stakeholder involvement that adhere to the Salinity/Nutrient Management Guidelines that will assist in the preservation of the quality of the Region’s water resources.	<ul style="list-style-type: none"> • Groundwater basin plans implemented 		x		x	x		x	x	
	3. Develop and implement effective and cost efficient source management strategies to address regionally-significant constituents (e.g., pathogens, nutrients, sediments, solid waste).	<ul style="list-style-type: none"> • Volume of applied fertilizer/pesticide reduced or eliminated • Amount of organic versus chemical fertilizer applied • Decrease in sediment transport • Decrease in solid waste • Strategies employed 		x	x	x	x	x		x	

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type								
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience	
	4. Implement wastewater improvements that reduce the frequency and volume of sanitary sewer overflows within the Region.	<ul style="list-style-type: none"> Number of sewer overflows Reduced beach postings Volume of sewer overflows per mile of pipe 			X							
	5. Implement Low Impact Development (LID) practices to reduce non-stormwater runoff.	<ul style="list-style-type: none"> Decrease in peak flow or total runoff Volume of water retained 						X				
	6. Plan and implement stormwater or natural treatment systems on a watershed scale to improve water quality.	<ul style="list-style-type: none"> Decrease in pollutant concentrations Reduced beach postings Acreage of functioning wetlands 						X	X	X		
	7. Protect and improve groundwater quality in rural basins to ensure compliance with drinking water standards.	<ul style="list-style-type: none"> Decrease in pollutant concentrations Compliance with MCLs 		X		X	X					
Objective I: Protect, restore, and maintain habitat and open space.	1. Identify, conserve, protect, and restore habitat, open space, and sensitive species associated with water resources, including functional aquatic, riparian, and wetland habitat and associated buffer habitat, which may serve as refugia to climate change impacts.	<ul style="list-style-type: none"> Acreage of habitat or open space Number of parcels acquired Number of sensitive species with potential to occur on site Presence/ absence of sensitive species Carbon stored by protected habitats 		X				X	X	X		
	2. Reduce, remove, and control sources of sediment and trash	<ul style="list-style-type: none"> Pounds of trash diverted Pounds of trash collected Metric for sediment 						X				
	3. Remove and control non-native invasive plants that are impacting regional water resources.	<ul style="list-style-type: none"> Acreage of invasive plants % of native planting survival % percent increase in flow capacity Water resources affected 						X	X	X		

Objectives <i>Specific observable outcomes.</i>	Targets <i>Measurable and tangible actions to achieve the objectives.</i>	Metrics <i>Measurements that can be used to evaluate the actions – may be quantitative or qualitative.</i>	IRWM Program	Project Type							
				Water Supply	Wastewater	Recycled Water	Groundwater	Stormwater	Flood Control	Habitat / Open Space	Climate Resilience
	4. Monitor, manage, control, and prevent establishment of nuisance aquatic species in the Region.	<ul style="list-style-type: none"> Water resources affected Increase in operational time due to control 		x						x	
Objective J: Advance water-based enriching experiences.	1. Develop water-based education, outreach or recreational open space that is open to the public and focuses on underserved areas and ensures equal access for disadvantaged communities.	<ul style="list-style-type: none"> Acreage of open space Number of visitors Number of education/outreach events 									
	2. Develop new public access points (boat launch facilities, fishing floats or piers, swim beaches, trails, stairs, parking areas, or similar) to recreational surface waters.	<ul style="list-style-type: none"> Number of public access points Number of visitors Length of trail Connectivity between existing open spaces 		x				x	x	x	
	3. Improve quality of recreation through interpretation, signage, and ADA access.	<ul style="list-style-type: none"> Number/length of wheelchair accessible trails Number of visitors utilizing interpretation resources Number of interpretive signs Amount of trees and urban forests 									

2.11 References

- California Department of Water Resources (DWR). 2016. *Proposition 1 2016 Integrated Regional Water Management Program Guidelines*. July 2016.
- California Natural Resources Agency. 2009. *2009 California Climate Adaptation Strategy*. Available: http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf
- California Natural Resources Agency. 2017. *DRAFT Safeguarding California Plan – Appendix C Glossary of Terms*. May. Available: <http://resources.ca.gov/wp-content/uploads/2017/05/DRAFT-Safeguarding-California-Plan-Appendix-C.pdf>
- United States Environmental Protection Agency (US EPA). June 2013. *2013 Climate Change Adaptation Plan*. Available: https://www.epa.gov/sites/production/files/2015-08/documents/sspp2013appendices_508.pdf
- Intergovernmental Panel on Climate Change (IPCC). 2014. *2014 Mitigation of Climate Change: Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Available: <http://www.ipcc.ch/report/ar5/wg3/>

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