



Strategy to Optimize Resource Management of Storm Water

January 6, 2016

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Acronyms and Abbreviations

CASQA	California Stormwater Quality Association
CED	California Environmental Dialog
CEDEN	California Environmental Data Exchange Network
CIWQS	California Integrated Water Quality System
CWA	Clean Water Act
DPR	Department of Pesticide Regulation
DTSC	Department of Toxic Substances Control
IRWM	Integrated Regional Water Management
JPA	Joint Power Agreement
LID	Low Impact Development
MEP	Maximum Extent Practicable
MOA	Memorandum of Agreement
MS4	Municipal Separate Storm Sewer System
NEL	Numeric Effluent Limitation
NPDES	National Pollutant Discharge Elimination System
OPP	Office of Pesticide Programs
Draft Proposal	Draft Proposal to Develop a Storm Water Program Workplan and Implementation Strategy
Regional Water Board	Regional Water Quality Control Board
SGMA	Sustainable Groundwater Management Act
SMARTS	Storm Water Multiple Application and Report Tracking System
State Water Board	State Water Resources Control Board
Storm Water Strategy	Strategy to Optimize Resource Management of Storm Water
SWAMP	Surface Water Ambient Monitoring Program
SWGPP	Storm Water Grant Program
TMDL	Total Maximum Daily Load
UCLA	University of California, Los Angeles
USEPA	United States Environmental Protection Agency
WAMP	Watershed Management Plan
Water Boards	State Water Resources Control Board and Regional Water Quality Control Boards
WDRs	Waste Discharge Requirements

1. Executive Summary

Storm water¹ runoff from municipal separate storm sewer systems (MS4s), industrial facilities, and construction sites can be a source of pollutants and has contributed to water quality impairments in developed areas of California. Additionally, population growth, climate change and the current drought are increasing pressure on the state to take immediate action and manage its water resources more effectively. These challenges represent an opportunity to redefine how California utilizes and values storm water as a water resource. The State Water Board Resolution No. 2009-0011 (Policy for Water Quality Control for Recycled Water) identified the goal for California to increase the use of storm water over use in 2007 by at least 500,000 acre-ft/year by 2020, and by at least one million acre-ft/year by 2030.

Well-conceived storm water management actions provide multiple benefits for California communities, including improved water quality, increased water supply, increased space for public recreation, increased tree canopy, enhanced stream and riparian habitat area, as well as many other benefits. Accordingly, this proposed Strategy to Optimize Resource Management of Storm Water (Storm Water Strategy) identifies the goals, objectives, and actions needed for the State Water Resources Control Board and nine Regional Water Quality Control Boards (Water Boards) to improve the regulation, management, and utilization of California's storm water resources.

In June 2015, a multidisciplinary team (composed of engineers, scientists, and geologists from the Central Coast, Los Angeles and San Diego Regional Water Boards and the State Water Resources Control Board (State Water Board)) created a Draft Proposal to Develop a Storm Water Program Workplan and Implementation Strategy ([Draft Proposal](#)) included as Appendix C. Executive Sponsors from the San Francisco Bay and Los Angeles Regional Water Boards and the State Water Board provided guidance on the effort; in addition to a collaborative process with stakeholders representing environmental advocacy groups, non-profit organizations, municipal storm water permittees, industrial and construction storm water permittees, and the general public. The Draft Proposal was used to develop this Strategy to Optimize Resource Management of Storm Water (Storm Water Strategy) with the purpose of: (1) providing clarity on the goals the Water Boards intend to achieve; (2) identifying objectives and projects that will enable the Water Boards to achieve the goals; and (3) proposing ways to measure progress.

The overarching intent of the Storm Water Strategy is to establish the value of storm water as a resource in California and encourage its application to beneficial uses. The evolution of storm water management may be accomplished through a watershed-based evaluation of needs and a coordinated implementation strategy. Because a number of regulatory and non-regulatory interests overlap in their efforts to manage storm water, development of a coordinated and complementary approach will benefit both interests. Successful collaboration with the regulated community will require evaluation of compliance approaches, storm water capture strategies,

¹ Storm water is defined as temporary surface water runoff and drainage generated by immediately preceding storms (Water Code, §10561.5 (b)).

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and funding options for capital improvement projects. This Storm Water Strategy also aims to establish financially sustainable storm water programs through additional grant funding and elimination of funding barriers.

This Storm Water Strategy identifies a ten year vision and mission with a description of outcomes anticipated (**Table 1**). Goals, objectives, and proposed projects are also identified (**Table 2**) to successfully implement the mission and achieve the vision. Finally, the Storm Water Strategy includes a phased implementation approach based on internal and external resources to accomplish the proposed projects.

Storm Water Strategy Vision

Successful implementation of the Storm Water Strategy will result in a future where *storm water is sustainably managed and utilized in California to support water quality and water availability for human uses as well as the environment.*

VISION

Storm water is sustainably managed and utilized in California to support water quality and water availability for human uses as well as the environment.

Storm Water Strategy Mission

To lead the evolution of storm water management in California by advancing the perspective that storm water is a valuable resource, supporting policies for collaborative watershed-level storm water management and pollution prevention, removing obstacles to funding, developing resources, and integrating regulatory and non-regulatory interests.

MISSION

To lead the evolution of storm water management in California by advancing the perspective that storm water is a valuable resource, supporting policies for collaborative watershed-level storm water management and pollution prevention, removing obstacles to funding, developing resources, and integrating regulatory and non-regulatory interests.

2. Introduction

In 1987, the United States Congress amended the Federal Water Pollution Control Act (Clean Water Act; CWA) to include section 402(p), requiring the United States Environmental Protection Agency (USEPA) to address storm water impacts to water quality. Almost 30 years later, storm water runoff from MS4s and from some construction sites and industrial facilities continues to be a source of pollutants and has contributed to water quality impairments in California ([2010 Integrated Report](#)). Consequently, it is imperative that the Water Boards' Storm Water Program continues to revise and update policies and plans to guide storm water regulation, draft and reissue permits, and improve efforts that address water quality problems resulting from storm water discharges.

Water management in California has historically been divided and compartmentalized into water quality, water supply, and flood control interests across a variety of state, county, and local agencies. With the impacts of population growth, climate change, and the current drought, storm water management must evolve into a more collaborative approach that recognizes the value of storm water as a resource that can be managed more effectively to improve both water quality and water supply. The primary approaches to improving storm water management are through reduced runoff, increased storm water retention, and pollution prevention.

2.1 Background

In 2013, the State Water Board recognized the need to formulate a long-term vision for the statewide storm water program. The California Water Action Plan, released in January 2014, further called for multiple benefit storm water management solutions and efficient permitting for multiple benefit projects. Additionally, in early 2014, the California Environmental Dialog (CED) conducted a special session to consider setting a vision for a "Storm Water Strategy." The overall vision of the session was to manage storm water in a manner that is beneficial to water quality and water supply (CED, 2014). In April 2014, the Water Boards responded by forming the Storm Water Strategic Initiative (Initiative). The goal of this effort was to transition the Storm Water Program to better address new challenges, including drought and climate change. Water Board staff (Staff) developed a concept paper and then met extensively with stakeholders to understand their interests and to solicit suggestions. The result was the Draft Proposal capturing the intention to integrate watershed management, including multiple benefits and source control, into the statewide storm water regulatory program to improve storm water management efficiency and effectiveness.

On August 19, 2015, the State Water Board held a workshop to receive input on the Proposal with presentations from the Department of Toxic Substances Control, California Stormwater Quality Association, California Coastkeeper Alliance, California Council for Environmental and Economic Balance, and the Business Community Coalition. Based on the feedback received during the workshop, Staff was directed to proceed with the Proposal's work plan and consider the following suggestions:

- Develop a strategic vision for the program with discrete goals.

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- Consolidate the overlapping tasks and priorities into implementable projects.
- Leverage existing information and efforts.
- Facilitate the collaboration of regulatory and non-regulatory interests.
- Consider the creation of an Implementation Committee.

2.2 Relationship to the California Water Plan

The [California Water Plan Update 2013](#) (Bulletin 160-13) provides a collaborative planning framework for elected officials, agencies, tribes, water and resource managers, businesses, academia, stakeholders, and the public to make informed decisions for our state's water future. The California Water Plan identifies statewide resource management strategies, and evaluates different combinations of these strategies to reduce water demand, increase water supply, reduce flood risk, improve water quality, and enhance environmental and resource stewardship.²

[Urban Stormwater Runoff Management](#) (**Figure 1**) is a resource management strategy identified in the California Water Plan with linkages to other resource management strategies, such as Urban Water Use Efficiency, Conjunctive Management and Groundwater Storage, Municipal Recycled Water, Pollution Prevention, Land Use Planning and Management, Recharge Area Protection, and Watershed Management. This Storm Water Strategy enhances these linkages by promoting storm water as a valuable resource where capture and use can result in multiple benefits within a watershed.

² <http://www.waterplan.water.ca.gov/cwpu2013/final/index.cfm>



Figure 1. Urban Stormwater Runoff Management

2.3 Relationship to the California Water Action Plan

The [California Water Action Plan](#), issued by Governor Brown in January 2014, provides a roadmap for the first five years of the state’s journey toward sustainable water management.³ Ten actions (**Figure 2**) were identified in the California Water Action Plan to address the most important issues in the state, while also laying the groundwork for a sustainable future. The plan calls for an increased focus on projects with multiple benefits, such as storm water capture and floodplain reconnection, that can help simultaneously improve the environment, flood management, and water supplies. Collaboration between state, federal, and local governments, regional agencies, tribal governments, and the public and private sectors will be necessary for successful implementation. This Storm Water Strategy assists in achieving many of the actions identified in the California Water Action Plan by promoting multiple benefit projects where storm water is treated as a resource to be captured and used; therefore resulting in increased flood protection, integrated water management, protection of important ecosystems, and improvement of groundwater management.

³ http://resources.ca.gov/california_water_action_plan/

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Figure 2. California Water Plan Action Items

This Storm Water Strategy further emphasizes and supports the following actions identified in the California Water Action Plan:

- **Make Conservation a Way of Life**

The [2009 Water Conservation Act](#) (Senate Bill X7-7) aims to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. The promotion of storm water capture and beneficial use is one of the many strategies identified in the California Water Action Plan to increase the value and awareness of how we use water in order to work toward this goal.

- **Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government**

Over the past decade, the state has provided technical and financial assistance to regions to incentivize inter-agency/stakeholder cooperation in planning and implementing multi-objective actions that provide both regional and statewide benefits to water resources management and protection. Several projects identified in the Storm Water Strategy are intended to evaluate existing programs and propose modifications to incentivize integrated water management, promote storm water capture and use, and emphasize low impact development (LID) strategies in storm water permits.

- **Expand Water Storage Capacity and Improve Groundwater Management**

Surface and groundwater storage is necessary to deal with the effects of drought and climate change on water supplies for human and environmental needs. Groundwater storage improvement consists of replenishing groundwater basins directly through injection, by allowing water to percolate into the ground naturally, or from constructed spreading basins and/or storm water capture. The Storm Water Strategy is supportive of the efforts identified in the California Water Action Plan to improve interagency

coordination and identify additional needs to evaluate groundwater recharge opportunities, such as capture and infiltration of storm water.

2.4 Relationship to Sustainable Groundwater Management

Sustainable groundwater management is an essential part of California's future. As such, on September 16, 2014, Governor Brown signed a three-bill package known as the [Sustainable Groundwater Management Act](#).⁴ The legislation charges local agencies with the management of local groundwater basins through the creation of groundwater sustainability agencies and groundwater sustainability plans. The State Water Board, in coordination with the Department of Water Resources, is committed to engaging local groundwater managers in the development of locally-driven sustainable groundwater solutions.⁵

The Department of Water Resources drafted a [Strategic Plan](#) that describes its responsibilities and vision for implementing the Sustainable Groundwater Management Act. The draft Strategic Plan outlines key actions the Department of Water Resources will undertake over the next several years to position itself to better support local agencies across California to achieve sustainable groundwater management.⁶ In addition, the Department of Water Resources is developing regulations for groundwater sustainability plans, while allowing agencies the flexibility to customize these plans to their regional economic and environmental needs. The Department of Water Resources will review groundwater sustainability plans and, if found inadequate, will refer the plan to the State Water Board for intervention. Intervention could result in the State Water Board writing and implementing an interim groundwater sustainability plan where local efforts are not successful.

In compliance with the Sustainable Groundwater Management Act, and in concert with the Department of Water Resources' draft Strategic Plan, the Storm Water Strategy will assist efforts to sustainably manage groundwater through the removal of impediments to recharge such as through the capture and infiltration of storm water.

3. Vision and Mission

3.1 Storm Water Strategy Vision

Vision Statement

Storm water is sustainably managed and utilized in California to support water quality and water availability for human uses as well as the environment.

⁴ <http://groundwater.ca.gov/legislation.cfm>

⁵ http://www.waterboards.ca.gov/water_issues/programs/groundwater/workplan.shtml

⁶ <http://www.water.ca.gov/groundwater/sgm/>

Vision Outcome (Ten Year)

Achieving this vision will result in a future where Californians understand the importance of water resources and incorporate this knowledge into home and work activities on a daily basis and are fully engaged in protecting this resource.

Furthermore, this vision encompasses a future where watershed processes critical to watershed health, such as overland flow, infiltration and groundwater recharge, interflow, and evapotranspiration, are improved and protected, where urbanized areas of California retain, infiltrate, and use rain falling within their jurisdictions and municipalities regularly build and maintain multi-benefit storm water projects to achieve positive community, watershed and water resource management outcomes.

And finally, achieving this vision will result in water resource practices that adapt to or offset the impacts of climate change, including moving or locating infrastructure outside of hazard zones, building resilient features that provide community, hydrologic, public safety and environmental benefits.

Table 1. Vision Outcome (Ten Year)

Achieving this vision will result in a future where -
Every Californian understands the importance of water resources and incorporates this knowledge into home and work activities on a daily basis and is fully engaged in protecting this resource.
Furthermore, this vision encompasses a future -
Where watershed processes critical to watershed health, such as overland flow, infiltration and groundwater recharge, interflow, and evapotranspiration, are improved and protected
Where urbanized areas of California retain, infiltrate, and use rain falling within their jurisdictions
Where municipalities regularly build and maintain multi-benefit storm water projects to achieve positive community, watershed and water resource management outcomes
And finally, achieving this vision will result in a future -
Where the impacts of climate change are offset through sustainable alternatives that optimize storm water as a resource.
Where the life cycle of materials is considered when determining what actions, behaviors, or processes could be altered to reduce the exposure and contributions to storm water.

3.2 Storm Water Strategy Mission of the Water Board along with Key Partners

To lead the evolution of storm water management in California by advancing the perspective that storm water is a valuable resource, supporting policies for collaborative watershed-level storm water management, minimizing barriers to collaborative watershed-level management, developing resources, and integrating regulatory and non-regulatory interests.

4. Implementation Strategy

An overall goal of the Storm Water Strategy is to leverage existing regulatory tools for management of storm water to better focus on incentive-driven multiple benefit approaches that achieve tangible results in terms of both improved water quality and supply. Concepts and efforts captured as part of the Draft Proposal (Appendix C) were used to establish a framework for the following proposed implementation strategy. The intent is to establish priorities, focus energy and resources, and ensure that staff and stakeholders are working toward common goals.

4.1 Terminology

The following terms are defined in this document as follows:

- **Goal** – A broad statement describing a desired end state.
- **Objective** – A specific, measurable output that supports achievement of a goal.
- **Project** – A set of tasks that contribute to achievement of an objective.

4.2 Goals

The guiding principles identified in the Draft Proposal were developed by a multidisciplinary team composed of engineers, scientists, and geologists from the State and Regional Water Boards through a thoughtful internal process. The guiding principles were further refined through a stakeholder involved process that included representatives of environmental advocacy groups, non-profit organizations, storm water permittees, and the general public. In order to recognize and preserve the collaboration and thought placed into development of the guiding principles, they have been revised as the goals of this Storm Water Strategy. The goals listed below represent the fundamental values the Water Board aspires to uphold and advance, from the perspective of the regulator as well as the regulated community and other stakeholders. Furthermore, the manner in which each individual project addresses or contributes to the Storm Water Strategy's goals is detailed in the attached Proposed Project List (Appendix A).

Goal 1 – Change the Perspective that Storm Water is a Waste or Hazard, and Treat it as a Valuable Water Resource

Storm water is a valuable resource and a critical element of local sustainability. Past land development practices increased impervious areas and compacted soils, resulting

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in less storm water infiltrating and more surface runoff. Traditional MS4s and infrastructure were designed to rapidly convey storm water from the landscape into receiving waters and eventually the ocean, bays, and estuaries. In many cases under predevelopment conditions, storm water would infiltrate and recharge the water table rather than discharge to surface waters. As a result of land use impacts, groundwater characteristics and flow regimes are also altered, reducing available groundwater supplies as well as base flow for perennial streams during dry periods. This paradigm needs to shift. Capturing and using storm water as a resource can provide multiple benefits such as offsetting drought related impacts through additional recharge and aquifer storage, mitigating storm water pollution, creating open space, enhancing fish and wildlife habitat, supporting watershed processes, and improving water use efficiency while mitigating the adverse effects of flood flows.

Goal 2 – Manage Storm Water to Preserve Watershed Processes and Achieve Desired Water Quality and Environmental Outcomes

In California, pollutants in storm water from urban areas are a primary cause of impairment of rivers, lakes, reservoirs, estuaries, and the ocean. Urbanization causes changes in the natural landscape and hydrology resulting in increased loads of pollutants, increased toxicity, changes in stream flow magnitude and frequency, changes in the seasonality of various discharges, physical changes to stream, lake, and wetland habitats, changes in the energy dynamics of food webs, sunlight, and temperature, and biotic interactions between native and exotics species. Management of storm water to maintain watershed processes within natural ranges can avoid these impacts. Restoring key watershed processes,⁷ through actions such as retrofitting of the existing urban environment, can help mitigate the damage done by past land development practices.

Goal 3 - Implement Efficient and Effective Regulatory Programs

Improving the efficiency and effectiveness of the Water Boards' Storm Water Program increases Water Board productivity while concurrently achieving progress toward desired environmental outcomes. Because external stakeholders must focus on environmental outcomes, the Water Boards should ensure its regulatory and funding programs also focus on environmental outcomes. Implementing a more efficient and sustainable storm water program will allow staff to work on other important program issues and is a critical key to success of this effort. As California's population increases, pressure mounts on the environment, which leads to pressure on the Water Boards to improve regulatory results (e.g. updated permits, inspections, improved data management, policy changes). Accordingly, the Water Boards seek to improve regulatory results while also achieving environmental outcomes such as improved water quality, reliable water supply, and healthy watersheds.

⁷ Key watershed processes include overland flow, rilling and gullyng, infiltration and groundwater recharge, interflow (i.e., shallow groundwater flow), evapotranspiration, delivery of sediment and organic matter to waterbodies, and chemical/biological transformations.

Goal 4 – Collaborate in order to Solve Water Quality and Pollutant Problems with an Array of Regulatory and Non-Regulatory Approaches

While standard regulatory approaches such as issuing permits can be effective, other less common regulatory and source control approaches can play an important role in reducing pollutant discharges and protecting water quality. For example, removing pollutants before they enter storm water can be more effective than traditional treatment-based management practices. Limited resources have been applied to source control related techniques, such as product replacement, product substitutions, and green chemistry. Supporting, and where possible, implementing and incentivizing these concepts through the Water Boards' Storm Water Program can appreciably improve storm water quality at reduced cost relative to treatment-based management practices. For example, few materials commonly reported in storm water are evaluated from a lifecycle perspective: that is, what actions, processes, or handling techniques are causing high pollutant levels in storm water and what actions, behaviors, or processes could be altered to reduce the exposure. These types of actions necessitate extensive collaboration with industries and require those agencies with appropriate authorities to take action to achieve success. Additional efforts will include public and stakeholder outreach to share information and promote change.

4.3 Objectives and Projects

The projects identified in the Draft Proposal have been reevaluated and further developed into projects that support this Storm Water Strategy. The projects have been unified under six overarching objectives to identify cohesion among them. The projects listed under a particular objective may require the same partnerships for implementation, use similar resources, or be led by the same Staff member. The six objectives are as follows:

Objective 1 - Increase Storm Water Capture and Use through Regulatory and Non-Regulatory Approaches

The projects captured in this objective are intended to increase sustainable management of storm water by establishing a technical guidance on capture and use, identifying key market drivers for estimating a monetary value for storm water and providing permit-driven incentives for storm water capture. Furthermore, the projects will examine the technical, legal, and financial barriers to storm water capture, in order to address and resolve them.

Objective 2 - Increase Stakeholder Collaboration on a Watershed Scale

Watershed and waterbody scaled partnerships increase the efficacy of water quality improvement actions and ensure that regional projects receive adequate support and funding. The project captured in this objective promotes collaboration between flood control agencies, water conservation agencies, groundwater sustainability agencies,

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municipalities, and other key partners, to work toward sustainable management and use of storm water.

Objective 3 - Establish Permit Pathways to Assess Storm Water Programs and Meet Water Quality Requirements

The projects captured in this objective aim to evaluate current storm water programs, with particular emphasis on the municipal program, and identify alternative compliance pathways, as well as the appropriate tools and methods applied to assess compliance with these compliance pathways.

Objective 4 - Establish Financially Sustainable Storm Water Programs

The cost of compliance is a major issue for many storm water permittees and a significant source of contention among the regulated community, environmental advocacy groups and Water Boards. The projects captured in this objective aim to identify the costs of compliance with the municipal, industrial, and construction permitting programs. Additionally, projects within this objective will focus on making funding accessible to storm water projects.

Objective 5 - Improve and Align State Board Oversight of Water Board Programs and Water Quality Planning Efforts

Storm water is unique in comparison to other types of discharges and these differences are rarely accounted for in program planning, data collection or integration with other monitoring efforts. The projects captured in this objective aim to improve program oversight through a data-driven approach, and align storm water data collection with other water quality planning efforts at the Water Board.

Objective 6 - Increase Source Control and Pollution Prevention

The projects captured in this objective aim to develop strategies to reduce storm water pollutant discharges to waterbodies through the promotion of source control and other non-regulatory strategies that would reduce the exposure of pollutants to runoff.

Each project listed below ([Table 2](#)) is described in detail in Appendix A. A description of the associated timelines and products for each project is also included in Appendix A.

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Table 2: Objectives, Projects, and Goals

Objective	Projects	Goal
Objective 1 Increase Storm Water Capture and Use through Regulatory and Non-Regulatory Approaches	💧 Project 1a – Promote Storm Water Capture and Use	1
	💧 Project 1b – Identify and Eliminate Barriers to Storm Water Capture and Use	1
	💧 Project 1c – Increase Storm Water Capture and Use through Regulatory Approaches	1
	💧 Project 1d – Develop and Establish a Monetary Value of Storm Water	1
Objective 2 Increase Stakeholder Collaboration on a Watershed Scale	💧 Project 2a – Increase Stakeholder Collaboration to Promote Storm Water as a Resource	1
		4
Objective 3 Establish Permit Pathways to Assess Storm Water Programs and Meet Water Quality Requirements	💧 Project 3a – Develop Guidance for Alternative Compliance Approaches for Municipal Storm Water Permit Receiving Water Limitations	2
	💧 Project 3b – Develop Watershed-Based Compliance and Management Guidelines and Tools	2
	💧 Project 3c – Assess Municipal Storm Water Program Monitoring and Effectiveness	3
	💧 Project 3d – Establish Statewide Regulatory Framework for Municipal Storm Water Programs	3
	💧 Project 3e – Standardize Minimum Control Measures for Specific Municipal Program Elements	3
	💧 Project 3f – Develop Guidance for Implementation of Post-Construction Requirements to Improve Watershed Health	2
	💧 Project 3g – Establish Guidance for Storm Water Program Asset Management Planning and Cost Estimation	3
Objective 4 Establish Financially Sustainable Storm Water Programs	💧 Project 4a – Implement Senate Bill 985 – Incorporate Principles of Storm Water Resource Plan Guidelines into Storm Water Programs	1
		2
	💧 Project 4b – Eliminate Barriers to Funding Storm Water Programs and Identify Funding for Storm Water Capture and Use Projects	1
		2
		3

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Objective	Projects	Goal
	<ul style="list-style-type: none"> Project 4c – Identify Municipal Storm Water Permit Compliance Costs 	3
	<ul style="list-style-type: none"> Project 4d – Identify Industrial and Construction Storm Water Permit Compliance Cost 	3
Objective 5 Improve and Align State Board Oversight of Water Board Programs and Water Quality Planning Efforts	<ul style="list-style-type: none"> Project 5a – Create Storm Water Program Data and Information “Open Data” 	3
		4
	<ul style="list-style-type: none"> Project 5b – Evaluate and Increase Storm Water Permit Compliance 	3
		4
	<ul style="list-style-type: none"> Project 5c – Establish Sector-specific Technology-based Numeric Effluent Limitations for Industrial and Construction Storm Water Permits 	3
		4
	<ul style="list-style-type: none"> Project 5d – Align Water Quality Statewide Planning Efforts with Storm Water Program Implementation – Pilot Project Using the Biological Integrity Plan 	3
Objective 6 Increase Source Control and Pollution Prevention	<ul style="list-style-type: none"> Project 6a – Establish Statewide Framework for Urban Pesticide Reduction 	4
	<ul style="list-style-type: none"> Project 6b – Identify Opportunities for Source Control and Pollution Prevention 	4
	<ul style="list-style-type: none"> Project 6c – Evaluate and Implement Trash Control 	3
		4
Goal 1 – Change the Perspective that Storm Water is a Waste or Hazard, and Treat it as a Valuable Water Resource		
Goal 2 – Manage Storm Water to Preserve Watershed Processes and Achieve Desired Water Quality and Environmental Outcomes.		
Goal 3 - Implement Efficient and Effective Regulatory Programs		
Goal 4 – Collaborate in order to Solve Water Quality and Pollutant Problems with an Array of Regulatory and Non-Regulatory Approaches		

5. Implementation Resources

The State Water Board, Division of Water Quality (Division), created the Storm Water Planning Unit through redirection of existing Division resources. The unit consists of one Senior Water Resource Control Engineer, four Water Resource Control Engineers (two of which are Limited Term), one Engineering Geologist, and one Environmental Scientist. These staff are dedicated to successful implementation of the Storm Water Strategy.

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The Storm Water Planning Unit will recognize the multi-benefit aspect of the Storm Water Strategy as it will overlap with a variety of State Water Board programs. The implementation of the Storm Water Strategy will bring together those involved in storm water permitting, storm water resource planning, funding programs, groundwater management, and water rights. The Storm Water Strategy will provide the opportunity to coordinate these interests and collaborate on the identification of program priorities, and the application of regulations, policies, and funding. A Water Board Storm Water Program Roundtable also exists to ensure efficient, consistent, and effective implementation of program requirements and policy direction by providing a forum for the following: 1) incubation of ideas and information exchange, 2) consideration of program challenges and associated lessons learned, 3) consideration of program improvements, and 4) development of collective feedback and recommendations on program implementation and improvement. Priorities identified for the storm water program by this roundtable will be captured and updated as part of this Strategy.

The Storm Water Planning Unit will collaborate with other related Water Board programs including but not limited to, storm water permitting, basin planning, TMDLs, Surface Water Ambient Monitoring Program (SWAMP), enforcement, water rights, funding, and groundwater management, to ensure that input, updates, and assistance are provided holistically from a Water Boards perspective (**Figure 3**). In addition, the Water Boards have assigned four Executive Sponsors, along with committed participation from staff in four Regional Water Boards (San Diego, Los Angeles, Central Coast, and North Coast) to assist and provide regional expertise and guidance for project outcomes.



Figure 3. Storm Water Planning Interconnectivity with Water Board Programs

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Additional non-Water Board ancillary resources include, but are not limited to:

- **Contractors supported through project contract funding**

The State Water Board may provide limited discretionary funding to the University of California, California State University, or other research organizations to evaluate highly controversial issues or perform technical studies outside their expertise or to provide equipment and services not available in-house. Because the regulated community and environmental advocacy groups differ significantly on how storm water should be managed, using third party contractors to assist in assessing controversial issues will provide significant benefit to the Water Boards as well as stakeholders. Typically, the products and deliverables generated as a result of these contracts directly influence permit conditions and requirements. Existing examples are described below.

- Project 1a is intended to support Goal 1 to stimulate greater storm water capture and use in California. Significant feedback was received during initial outreach and stakeholder meetings from the storm water community suggesting that legal, economic, and technical hurdles limit storm water capture and use. This project is contracted to Office of Water Programs at California State University at Sacramento to assess and evaluate the actual benefits that may be realized in California with storm water capture and use, identify critical legal, economic, and technical hurdles that currently impede municipalities from implementing storm water capture and use, identify forcing factors that significantly affect the success of existing projects, and identify opportunities for expansion of capture and use approaches in California. The goal of this project is to provide the basis for development of a storm water capture and use policy for California.
- Project 3a is intended to directly address Goal 2 to manage storm water to preserve watershed processes to achieve desired water quality outcomes. In California, municipal storm water permits are increasingly incorporating alternative compliance pathways in order to better preserve and protect watershed processes as well as water quality. Assessing compliance with alternative compliance pathways requires sophisticated watershed and water quality based models and forecasting tools to assess whether planned improvements and associated infrastructure will meet permit requirements. This project is intended to address the quality and improve the consistency of reasonable assurance analyses throughout the state, and address the significant sources of uncertainty within the data tools and studies these analyses rely upon. This project is also contracted to Office of Water Programs at California State University at Sacramento.

- **Storm Water Strategy Implementation Committee**

A Storm Water Strategy Implementation Committee (Implementation Committee) is expected to provide a forum for stakeholders from other state agencies, the regulated community, and nonprofit organizations to work with staff on continued evaluation and guidance of the Storm Water Strategy. Staff anticipates the following sectors and organizations to be represented on the Implementation Committee:

- Environmental advocacy groups
- Phase I and phase II municipal storm water permittees
- Industrial and construction storm water permittees
- Water suppliers
- Public owned treatment works (wastewater)
- Public health agencies/organizations
- Businesses with storm water interests
- Flood Control
- Other appropriate sectors

The sector and organizational specific representatives will be decided by the attendees at a kickoff meeting. The Implementation Committee will discuss and coordinate applicable regulatory programs and policies to develop mutually beneficial approaches to storm water management for common objectives. The Implementation Committee will meet periodically (initially quarterly) at varying locations to discuss additional collaboration opportunities, impacts and interpretation of regulations, regional storm water capture considerations and priorities, performance metrics, and ongoing program feedback and recommendations. This committee will serve in an advisory capacity for the benefit of staff and management and is expected to sunset in seven years.

- **Regional Pilot Projects**

Any regional efforts proposed, already underway or completed that can provide additional information to the projects identified in this Storm Water Strategy will be captured. The extent of the information will be systematically evaluated and compiled for consideration as a resource or as information to guide subsequent strategic efforts. The regional nature of the information must be considered within the context of California's watersheds, and categorized accordingly. To the extent feasible, the information will also be made available through the Water Board as part of a library of resources to be accessed by both the regulatory and non-regulatory community. A list of potential pilot projects identified by interested parties is included in Appendix B.

5.1 Training and Information Sharing

As an ongoing project, the Storm Water Planning Unit will review the available storm water management training opportunities and identify gaps in storm water education. The unit will develop and/or conduct training events with staff, the regulated community, and the public as directed by the analysis. This ongoing project was not included in the formal project list

because it has no distinct timeline and is ongoing as information is developed and staff changes occur. However, it is included in this Storm Water Strategy to communicate the intention of the Storm Water Planning Unit to continually evaluate the need for specific storm water training and educational outreach.

5.2 Proposed Phased Implementation of Projects

The following three-phased implementation plan was developed based on projects available to initiate, individual project priority, regional pilot projects available, Water Board resources available, Regional Water Board resources available, and contract funding. Target start and completion dates are estimations and may be revised at a later date.

5.2.1 Proposed Phase I Projects

The following projects are recommended for implementation as part of the Phase I Projects (**Table 3**). These projects will be initiated immediately, with deliverables and project completion targeted within four years. The projects will use a combination of State Water Board staff, Regional Water Board staff, and contracted partners to achieve the objectives.

Table 3. Phase I Projects

Phase I Projects	Target Start	Target Completion
1a. Promote Storm Water Capture and Use	2016	2018
1b. Identify and Eliminate Barriers to Storm Water Capture and Use	2016	2019
3a. Develop Guidance for Alternative Compliance Approaches for Municipal Storm Water Permit Receiving Water Limitations	2016	2019
3b. Develop Watershed-Based Compliance and Management Guidelines and Tools	2016	2019
4a. Implement Senate Bill 985 – Incorporate Principles of Storm Water Resource Plan Guidelines into Storm Water Programs	2016	2018
4b. Eliminate Barriers to Funding Storm Water Programs and Identify Funding for Storm Water Capture and Use Projects	2016	2018
5a. Create Storm Water Program Data and Information “Open Data”	2016	2020
6a. Establish Statewide Framework for Urban Pesticide Reduction	2016	2018
6b. Identify Opportunities for Source Control and Pollution Prevention	2016	2020

5.2.2 Proposed Phase II Projects

Proposed Phase II Projects are targeted for completion within eight years of initiating the program. Lessons learned from the Phase I Projects may influence the scope, priority, and identification of the Phase II Projects (**Table 4**) resulting in potential changes and/or additions to Table 4. Estimated start dates were determined based on the average targeted completion date of Phase I Projects with the exception of a Phase II Project with identified prerequisites. In that case the start date immediately follows completion of the prerequisites. Alternatively, additional contractor funding may be necessary to partner on a project, or to initiate a project on a timeframe independent of Water Board staff resources.

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Table 4. Phase II Projects

Phase II Projects	Prerequisites	Target Start	Target Completion
1c. Increase Storm Water Capture and Use through Regulatory Approaches	1a, 1b	2019	2021
1d. Develop and Establish a Monetary Value of Storm Water	None	2019	2023
2a. Increase Stakeholder Collaboration to Promote Storm Water as a Resource	None	2019	2021
3c. Assess Municipal Storm Water Program Monitoring and Effectiveness	None	2019	2022
3d. Establish Statewide Regulatory Framework for Municipal Storm Water Programs	None	2019	2024
3f. Develop Guidance for Implementation of Post-Construction Requirements to Improve Watershed Health	None	2019	2023
4c. Identify Municipal Storm Water Permit Compliance Cost	None	2019	2021
5b. Evaluate and Increase Storm Water Permit Compliance	None	2019	2021
5d. Align Water Quality Statewide Planning Efforts with Storm Water Program Implementation – Pilot Project Using the Biological Integrity Plan	None	2019	2021
6c. Evaluate and Implement Trash Control	None	2019	2022

5.2.3 Proposed Phase III Projects

Phase III Projects have been targeted for completion within twelve years of initiating the program (**Table 5**). Proposed Phase III Projects include projects categorized as medium and low priority. Estimated start dates were determined based on the average targeted completion date of Phase II Projects with the exception of a Phase III Project with an identified prerequisite. In that case the start date immediately follows completion of the prerequisite.

Table 5. Phase III Projects

Phase III Projects	Prerequisites	Target Start	Target Completion
3e. Standardize Minimum Control Measures for Specific Municipal Program Elements	None	2022	2023
3g. Establish Guidance for Storm Water Program Asset Management Planning and Cost Estimation	None	2022	2023
4d. Identify Industrial and Construction Storm Water Permit Compliance Cost	5c	2028	2030
5c. Establish Sector-specific Technology-based Numeric Effluent Limitations for Industrial and Construction Storm Water Permits	None	2022	2028

A timeline illustrating the projects included in the Storm Water Strategy is included as **Figure 4**. Additional work will likely occur, in many cases, beyond the times shown; however, specific activities are not yet clearly identified.

6. Measuring and Reporting Progress

The following performance reporting mechanisms are intended to evaluate the success of the Storm Water Strategy in making progress towards the goals identified.

6.1 Performance Reporting - Part I

Currently, information collected by the Water Boards includes permittee information (enrollment in general permit, co-permittees, type of facility, industry code, location, size, etc.), compliance evaluations (inspections, ad-hoc and annual report review, etc.), and enforcement actions (notices of violation, notices of non-compliance, formal enforcement, etc.). Overall Storm Water Strategy performance measures cannot be established based on the data collected at this time. The intent of proposed Project 5a (Storm Water Program Data and Information “Open Data”) is to increase the amount and use of storm water data and information for Water Boards’ decision making and program performance review. Accordingly, completion of proposed Project 5a will be integral to identifying and achieving data driven performance measures and their targets.

The Water Boards, in conjunction with the Implementation Committee proposed in Section 5 above, will complete the development of specific data-driven performance measures and their targets. State Water Board staff will create baselines, set appropriate targets, and measure progress toward the targets with periodic updates provided to the State Water Board.

6.2 Interim Performance Reporting - Part II

Integrated Regional Water Management (IRWM) Funding Provided to Storm Water Projects

The Storm Water Resource Planning Act (Senate Bill 985) requires the development of a watershed-based Storm Water Resource Plan as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 2014. The Storm Water Resource Plan must include a prioritized list of storm water and dry weather capture projects and be integrated into the appropriate IRWM Plan. The integration of the Storm Water Resource Plan into an IRWM Plan is intended to facilitate the partnering of the various water quality, water supply, and environmental interests.

Two previous voter-approved bonds, Proposition 50 and 84, included funds for IRWM projects. Proposition 50 funds were co-managed by the State Water Board and the Department of Water Resources, and Proposition 84 funds were managed entirely by the Department of Water Resources. The projects funded through both of the IRWM grants were spread across the state, and some of the regions included both storm water and dry weather runoff capture projects.

In order to quantify the impact of Senate Bill 985, the amount of Propositions 50 and 84 IRWM funds that were awarded to storm water and dry weather capture projects will be identified and summarized as a reference or baseline. **As the Proposition 1 IRWM funds are awarded, those projects will be screened for storm water capture projects to include in the**

tracking summary and compare to previous IRWM grant programs (Propositions 50 and 84).

Annual Accounting and Reporting of Information-Sharing Outlets

One method to achieve Goal 1 (Change the Perspective that Storm Water is a Waste or Hazard, and Treat it as a Valuable Water Resource) is to identify, establish, and capitalize on opportunities for public outreach and education by the State Water Board's Storm Water Planning Unit. **An accounting of media outlets (lyris e-mails, websites, social networking, etc.), public training classes, and speaking opportunities will be conducted annually.** A table summary report will be established and updated on the State Water Board's Storm Water Strategy website.

Year 5 - Stakeholder Follow-up Survey

Over twenty stakeholder meetings were conducted in the summer and fall of 2014 as part of an initial stakeholder process. Each meeting targeted specific groups including representatives from environmental advocacy groups, non-profit organizations, municipal storm water permittees, industrial and construction storm water permittees, the general public, and Regional Water Board staff to gather input on how to improve the effectiveness of the Storm Water Program. Cumulatively, forty issues were identified through this process as barriers to effective storm water management and water quality protection.

By Year 5, a follow-up survey will be conducted targeting the same initial stakeholder groups discussed above. Survey questions will be crafted to closely follow the questions asked during the stakeholder meetings held in 2014. Successful implementation of the Storm Water Strategy will result in fewer identified issues as compared to the 2014 compilation.

7. Strategy Updates and Revisions

The Storm Water Strategy is envisioned as a living process that will take advantage of the interactive nature of the internet. Accordingly, an interactive website will be created to display the Storm Water Strategy's goals, objectives, and associated projects, while also providing routine project status updates and deliverables.

In addition, the interactive website will be designed to integrate previous comments received and new stakeholder input on specific sections of the Storm Water Strategy. The interactive nature of this format will generate new connections, concepts, and solutions for the goals of the Storm Water Strategy. Lessons learned from projects initiated in previous phases of implementation may also influence the scope and priority of future projects or result in new projects being added to the Storm Water Strategy.

There are many regulatory, non-governmental organizations, and educational institutions with efforts that support the goals and objectives of the Storm Water Strategy. The interactive

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website will also be used as a repository for linking existing efforts and will attempt to consolidate content of ongoing studies, data, and/or regulations.