



California Stormwater Quality Association®

*Dedicated to the Advancement of Stormwater Quality Management, Science and Regulation*

---

# Vision for Sustainable Stormwater Management

October 2020



## Disclaimer

Neither CASQA, its Board of Directors, the Vision Committee, any contributors, nor the authors make any warranty, expressed or implied, nor assume any legal liability or responsibility for any third party's use of this document or the consequences of use of any information, product, or process described in this document. Mention of trade names or commercial products, organizations, or suppliers does not constitute an actual or implied endorsement or recommendation for or against use, or warranty of products.

---

Copyright © 2020 California Stormwater Quality Association.

All rights reserved. Short sections of text, not to exceed three paragraphs, may be quoted without written permission provided that full attribution is given to the source.



## Preface

The California Stormwater Quality Association (CASQA) first established a Vision for Sustainable Stormwater Management (Vision) in 2015. Over the past several years, CASQA has made updates to the Vision, reflective of advancements in stormwater and regulations. In 2019, CASQA included implementation of the Vision as a core part of setting organizational priorities for each year. Those actions were not only successful in taking significant steps forward, but also inspired new thinking and ideas. CASQA therefore initiated an effort in 2020 to more fundamentally revise the Vision, and in so doing, chart the path forward to sustainable stormwater management.

While this current update was being drafted in the Spring of 2020, the pandemic of COVID-19 created unprecedented global impacts. For stormwater programs, responding to safer at home orders created challenges for day to day program implementation, yet inspired new and creative approaches. The economic impacts are just beginning to unfold, but stormwater programs anticipate financial hardships, reducing current funding levels that may last for years. COVID-19 does not change the actions necessary to achieve sustainable stormwater management, but it does put the following into sharp relief:

- **Funding for Stormwater Needs to Move Beyond the General Fund:** Unlike all other water resources, the vast majority of stormwater programs in California lack a dedicated funding source. Even those stormwater programs that have some level of dedicated funding cannot implement their programs based on that funding alone. Therefore, all stormwater programs rely to a significant extent on the General Fund. In the best of times, municipalities face significant challenges in meeting the needs of the community and stormwater programs must compete for that funding with police, fire, libraries, social services, etc.

COVID-19 has devastated local economies, creating unprecedented shortfalls in the General Fund. Municipalities will struggle more than ever to secure funding for stormwater programs and will face the reality of budget cuts to staff as well as programs. COVID-19 has not changed how stormwater programs are funded, but it highlights the very real need to move past the General Fund and establish dedicated funding, on par with other water resources. The Vision addresses this need by adding a new principle, Principle 4, focused on stormwater program funding.

- **Stormwater Permits Need to Focus on Effectiveness and Prioritized Outcomes:** What constitutes a stormwater program has evolved considerably since the stormwater regulations were promulgated in November 1990. In the 30 years since, stormwater programs have changed from relatively basic task-oriented programs to comprehensive and complicated programs, with each permit term adding new goals and requirements. Despite the evolution of what constitutes a stormwater program, the regulations have not changed and although the permits have become longer and more complex, they are still essentially based on the Part I and Part II permit application requirements from the 1990 regulations.

COVID-19 has forced the fundamental question – what are the essential actions that need to be taken? It is not a question of doing more or doing less. It is a question of priorities and effectiveness. Stormwater permits need to fundamentally shift to identifying prioritized outcomes and the actions that are effective in achieving those outcomes. The Vision addresses these concepts under Principle 2, Action 2.1.

- **Time:** Underlying all regulations and permits is the concept of time. Schedules and deadlines serve to both incentivize action and advancements while providing accountability. Each schedule or deadline has its own unique set of variables that impacts the reality of meeting the goal. Finding the balance is always a challenge, but schedules should not be arbitrary; rather, relevant data and information should be used to develop schedules based in science and fact.

COVID-19 will undoubtedly impact what we can achieve in certain timeframes, inclusive of CASQA, stormwater programs, and the various State and Regional Water Boards. Now, more than ever, we have the opportunity to do better, to focus on prioritized outcomes, to leverage existing resources by partnering and collaborating together. It is through this lens that CASQA presents this updated Vision for Stormwater.

## Table of Contents

Disclaimer	i
Preface	ii
Table of Contents	iv
Vision, Principles, and Purpose	1
Vision for Sustainable Stormwater	1
Guiding Principles	1
Relationship to CASQA's Strategic Plan	2
Defining "Sustainable"	2
Collaboration and Partnerships	3
Vision Updates	5
Vision Implementation	5
<b>Principle #1: Program Implementation – Projects and programs that use stormwater as a resource, protect water quality and beneficial uses, and efficiently minimize pollution are critical for sustainable stormwater management.</b>	<b>6</b>
Action 1.1: Maximize Urban Stormwater Capture	6
Objective 1: Determine the Economic Value of Stormwater as a Resource	6
Objective 2: Evaluate Water Rights for Stormwater Capture	6
Objective 3: Establish a Partnership with Other Water Resource Agencies	7
Objective 4: Maximize Stormwater Capture in Water Resource Planning Documents	7
Objective 5: Develop Strategies to Address Climate Change	7
Objective 6: Balance the Benefits and Impacts of Stormwater Capture	8
Objective 7: Integrate Multi-Benefit Solutions and BMPs in General Plans and Capital Improvement Plans	8
Objective 8: Integrate Stormwater Capture into Green Certifications and Programs	8
Action 1.2: Minimize Pollution Through True Source Control	8
Objective 1: Identify and Prioritize Pollutants for True Source Control Initiatives	9
Objective 2: Implement an Urban Pesticide Program	9
Action 1.3: Maximize Effectiveness of BMPs, Green Stormwater Infrastructure, and Low Impact Development	9
Objective 1: Evaluate Effectiveness and Sustainability of Structural BMPs	10
Objective 2: Evaluate and Determine Effectiveness and Sustainability of Green Stormwater Infrastructure/LID	10
Objective 3: Evaluate and Determine Effectiveness and Sustainability of Operational Source Controls	11
Objective 4: Document and Communicate BMP Effectiveness and Sustainability Results	11
Objective 5: Advance Improvements in BMP Effectiveness and Sustainability	11

<b>Principle #2: Permits, Regulations, and Legislation – Permits, regulations, and legislation need to support sustainable stormwater management.</b>	<b>12</b>
Action 2.1: Develop a Statewide Regulatory Approach Focused on Sustainable Stormwater Management	12
Objective 1: Define Desired Outcomes for a Stormwater Permit	12
Objective 2: Determine the Program Elements Necessary to Achieve Desired Outcomes	13
Objective 3: Establish Effectiveness Assessment and Adaptive Management Principles	13
Objective 4: Define the Data Needs to Assess Desired Outcomes	13
Objective 5: Develop Recommended Permitting Approaches Focused on Outcomes	13
Objective 6: Identify and Resolve Barriers to Implementing Recommended Permitting Approaches	13
Objective 7: Develop a Statewide Regulatory Approach for Stormwater Permits	13
Action 2.2: Develop Regulations and Guidance to Support Sustainable Stormwater Management	14
Objective 1: Focus Regulatory Actions on Priority Water Quality Issues	14
Objective 2: Base Water Quality Standards on All Flow Conditions	14
Objective 3: Identify and Resolve Regulatory Barriers for Stormwater Capture and Use	14
Objective 4: Establish a Statewide Goal for Stormwater Capture and Use	15
Objective 5: Establish a Statewide True Source Control Policy	15
Action 2.3: Promote Legislation That Is Essential for Sustainable Stormwater Management	15
Objective 1: TBD	15
<b>Principle #3: Public Education – Public awareness, understanding, appreciation, and support of the value of stormwater is essential to sustainable stormwater management.</b>	<b>16</b>
Action 3.1: Increase Support for Funding and Sustainable Stormwater Projects	16
Objective 1: Develop a Strategy to Communicate the Value of Stormwater to the Public	16
Objective 2: Educate the Public	16
Objective 3: Educate Elected Officials	16
<b>Principle #4: Funding – Significant financial investment is required to achieve sustainable stormwater management.</b>	<b>17</b>
Action 4.1: Determine the Resource Needs for Sustainable Stormwater Programs	17
Objective 1: Identify Cost of Compliance for Municipal Stormwater Permittees	17
Objective 2: Communicate the Funding Gap to Elected Officials	17
Action 4.2: Develop a Dedicated Funding Source for Stormwater Programs	18
Objective 1: Evaluate Statewide Options for Providing Dedicated Stormwater Funding	18
Objective 2: Promote SB 231 and AB 2304 as Viable Means of Addressing Prop 218	18
Action 4.3: Increase Supplemental Funding Opportunities for Stormwater Programs	18
Objective 1: Increase Funding in California Bond Measures	19
Objective 2: Increase Grant Opportunities	19
Objective 3: Increase Access to the State Revolving Fund	19
Objective 4: Increase Funding Through Multi-Benefit Projects, Partnerships, and Funding Sources	19
<b>Appendix: CASQA's Vision-at-a-Glance</b>	<b>20</b>

## Vision, Principles, and Purpose

### Vision for Sustainable Stormwater

California sustainably manages stormwater as an essential component of the state's water resources that supports human and ecological needs, protects water quality, and enhances and restores our waterways.

Vision  
for Stormwater

### Guiding Principles

There are four guiding principles to achieve this Vision. Like the legs of a chair, each Principle is essential and all four must be in place to support the whole.

#### **Principle #1: Program Implementation**

Projects and programs that use stormwater as a resource, protect water quality and beneficial uses, and efficiently minimize pollution are critical for sustainable stormwater management.

#### **Principle #2: Permits, Regulations, and Legislation**

Permits, regulations, and legislation need to focus on effectiveness and desired outcomes to support sustainable stormwater management.

#### **Principle #3: Public Education**

Public awareness, understanding, and support is essential to sustainable stormwater management.

#### **Principle #4: Funding**

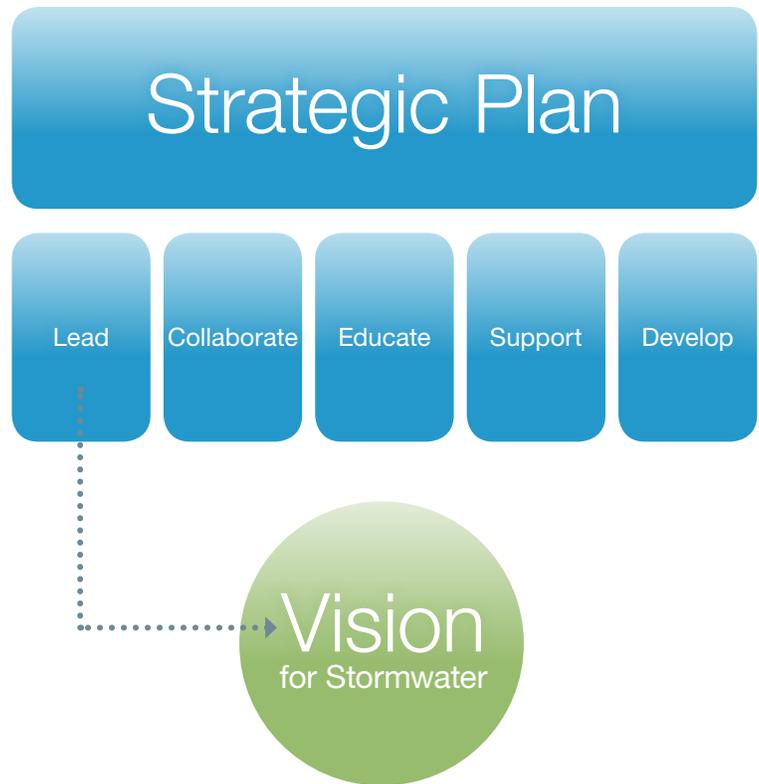
Significant financial investment is required to achieve sustainable stormwater management.



## Relationship to CASQA's Strategic Plan

CASQA has developed two key strategic planning documents. This Vision for Sustainable Stormwater Management and CASQA's Strategic Plan and Organizational Goals.

The Strategic Plan and Organizational Goals identifies what is necessary for CASQA to lead, collaborate, educate, support, and develop the stormwater community. It guides CASQA's actions as an organization and defines our principles. CASQA's Vision for Sustainable Stormwater Management, this document, articulates a comprehensive pathway that will achieve the goals of the Clean Water Act and improve the efficiency and effectiveness of stormwater management. The Vision is a primary component of achieving CASQA's goal to provide leadership to the stormwater community. These two documents form the core of who we are as an organization and what we want to achieve. The figure to the right shows how these two documents relate to each other.



## Defining “Sustainable”

The word sustainable, or sustainability, is used quite frequently in environmental contexts. CASQA consciously has included the term in both the Vision for Stormwater and the Strategic Plan as sustainability includes all three of the following pillars or core areas:

- Environmental
- Social
- Economic

Sustainability satisfies the needs of the present without compromising the capacity of future generations, guaranteeing the balance between economic growth, care for the environment, and social well-being.

## Collaboration and Partnerships

Other organizations are actively implementing projects or have developed strategic documents that are complementary to the goals of CASQA's Vision for Sustainable Stormwater Management. As appropriate, CASQA will work to identify opportunities to support, collaborate, and build partnerships with the following efforts and / or organizations:

- **State Water Board's Strategy to Optimize Resource Management of Stormwater (STORMS):** STORMS is a strategy-based initiative developed and managed by the State Water Board that is closely related to this Vision for Stormwater. The mission of STORMS is “to lead the evolution of stormwater management in California by advancing the perspective that stormwater is a valuable resource, supporting policies for collaborative watershed-level stormwater management and pollution prevention, removing obstacles to funding, developing resources, and integrating regulatory and non-regulatory interests.”
- **California Water Resilience Portfolio:** On July 28, 2020, Governor Gavin Newsom released the [Water Resilience Portfolio](#), the Administration's blueprint for equipping California to cope with more extreme droughts and floods, rising temperatures, declining fish populations, over-reliance on groundwater and other challenges. The Water Resilience Portfolio builds on previous work, including the California Water Action Plan released by the Brown Administration in 2014 and updated in 2016. Consistent with the Governor's executive order, the Water Resilience Portfolio incorporates these principles:
  - Prioritize multi-benefit approaches that meet multiple needs at once
  - Utilize natural infrastructure such as forests and floodplains
  - Embrace innovation and new technologies
  - Encourage regional approaches among water users sharing watersheds
  - Incorporate successful approaches from other parts of the world
  - Integrate investments, policies and programs across state government
  - Strengthen partnerships with local, federal and tribal governments, water agencies and irrigation districts, and other stakeholders

- **Water Environment Federation’s (WEF) *Rainfall to Results*:** The release of this report is the first action of the Water Environment Federation (WEF) Stormwater Institute. The institute and report are designed to help the stormwater sector address challenges by leveraging WEF’s leadership, diverse membership, breadth of knowledge, and varied partnerships. *Rainfall to Results: The Future of Stormwater*, intends to support this effort by setting a vision for the future of sustainable stormwater management. Based on input from stormwater professionals, this report charts a path forward using broad objectives and specific actions for achieving a healthier water environment and more vibrant communities.
  
- **WEF Stormwater Institute**
  - **Strategic Plan Goals and Purpose:** This Stormwater Institute document provides a vision for stormwater, and a mission, critical objectives, and goals for the Institute to affect that vision. The critical objectives are: encourage innovation and best practices, secure tools and financing, build a strong community of professionals, and promote the linkage between stormwater management and water quality. The plan was adopted in early 2019 and is in implementation.
  - **Recommendations to Improve the Stormwater Program in the U.S.:** In association with WEF, the National Municipal Stormwater Alliance (NMSA) has produced an annual “ask” document to aid those advocating with Congressional representatives in the interest of stormwater, including legislative actions that could assist with stormwater program implementation. As stated in the document’s summary: “This fact sheet outlines a long-term strategy to guide the stormwater program through the next 20 years. These strategies are reasonable and practical actions for Congress to enact. These recommendations address the fundamental issues of: reliable funding, infrastructure retrofit and maintenance and pollution source control as the next steps to achieve the goals of the Clean Water Act.”
  
- **California Council for Environmental and Economic Balance’s (CCEEB) *Optimizing Storm Water*:** CCEEB, an organization whose mission is to find environmental and economic balance, has issued the report *Optimizing Storm Water* to recommend a strategy for sustainable, multi-benefit stormwater solutions and integrated approaches to California’s water supplies. The report’s six recommendations complement the State’s STORMS Program. CCEEB proposes that the State Water Board’s STORMS program be advanced in five-year increments, with input from scientific, economic, and legal experts, and a robust public process that incorporates lessons learned.

- **Potential Partnerships:** There are many additional organizations whose missions are complementary to achieving CASQA's Vision. CASQA will seek to work in partnership with organizations, including:

---

Environmental Protection Agency (EPA)

---

State and Regional Water Quality Control Boards

---

California Department of Water Resources (DWR)

---

California Department of Pesticide Regulation (DPR)

---

California Water Quality Monitoring Council

---

California Ocean Protection Council

---

National Municipal Stormwater Alliance (NMSA)

---

Water Environment Federation (WEF)

---

Southern California Coastal Watershed Research Project (SCCWRP)

---

San Francisco Estuary Institute (SFEI)

---



---

Southern California Stormwater Monitoring Coalition (SMC)

---

Southern California Water Coalition

---

Association of California Water Agencies (ACWA)

---

California Association of Sanitation Agencies (CASA)

---

Integrated Regional Water Management (IRWM) Roundtable of Regions

---

American Planning Association (APA) - California Chapter

---

American Public Works Association (APWA) - Northern and Southern California Chapters

---

League of California Cities

---

California State University, Sacramento (CSUS) Office of Water Programs (OWP)

---

## Vision Updates

CASQA's Vision for Stormwater is meant to be implemented and is not just a philosophy. Therefore, as implementation occurs, and the field of stormwater evolves, periodic updates will be necessary. CASQA will conduct an evaluation of the Vision approximately every five years and make changes as needed. This process will keep the Vision current, incorporate new information, and allow each Chair of CASQA's Board of Directors to focus on the most relevant actions needed to achieve the Vision.

## Vision Implementation

As it is not feasible to simultaneously implement all of the efforts identified within this Vision for Stormwater, CASQA has developed a prioritization process. Priorities are established annually by the CASQA Board of Directors, focused on the most pressing needs of the organization and membership, consistent with the Vision. Those priorities will drive the selection of projects for the coming year and allow CASQA to align resources with those most critical needs.

**Principle #1: Program Implementation** – Projects and programs that use stormwater as a resource, protect water quality and beneficial uses, and efficiently minimize pollution are critical for sustainable stormwater management.

This Principle essentially asks, what should a sustainable stormwater program implement in projects and programs?

From a priority perspective, sustainable stormwater management should be based on maximizing the capture of stormwater and minimizing pollution through true source control (eliminating pollution from its source). These two approaches focus on the value and resource of stormwater, by reconnecting the hydrologic cycle and protecting water quality. However, not all stormwater can be captured and true source control, while effective, may not be the best (or only) approach for all pollutants. Stormwater programs therefore also need other effective best management practices (BMPs).

## **Action 1.1: Maximize Urban Stormwater Capture**

Stormwater is a resource, with social, economic, and ecological values, and should be managed in a sustainable manner. Domestic water supply sources in California are strained, and urban stormwater will play an important role in maintaining a consistent and resilient domestic supply. Using and reusing water within local watersheds will help maintain local water balance, reduce energy use, and avoid environmental impact to ground and surface waters. The following objectives identify the steps needed to maximize urban stormwater capture.

### **Objective 1: Determine the Economic Value of Stormwater as a Resource**

In order to maximize stormwater capture, stormwater needs to be viewed as a valuable part of the water resource portfolio in California. Therefore, stormwater needs to have an economic value. This value can then be used to justify the infrastructure needed for stormwater capture.

Potential Collaborators: State Water Board, CA Department of Water Resources, Water Resource Agencies, ACWA, Southern California Water Coalition, IRWM Roundtable of Regions

### **Objective 2: Evaluate Water Rights for Stormwater Capture**

As infrastructure is developed to capture stormwater, understanding water rights will be critical, including clearly articulating who owns the water and if it can be captured.

Potential Collaborators: State Water Board, CA Department of Water Resources

### **Objective 3: Establish a Partnership with Other Water Resource Agencies**

Many organizations have strategic plans / visionary documents that include, to some extent, a one-water concept and / or stormwater capture. An active forum and partnership that brings together organizations that represent stormwater, wastewater, water resource agencies, groundwater management agencies, agriculture, etc., will help to realize these goals. The partnership should be purpose driven and focused on working together on concrete tasks that would advance CASQA's Vision (and other organizations' goals) related to increasing stormwater capture. The partnership should also provide a forum for the various water sectors to learn each other's terminology, goals and priorities, and lessons learned, so various organizations can start to understand each other better, and therefore, identify opportunities for stormwater capture.

Potential Collaborators: Water Resource Agencies; Water Resilience Portfolio, ACWA, CASA, IRWM Roundtable of Regions

### **Objective 4: Maximize Stormwater Capture in Water Resource Planning Documents**

Just as CASQA has a Vision for Stormwater that drives actions for stormwater, there are numerous planning documents that address water resource planning (e.g., California's Water Resilience Portfolio, Integrated Regional Watershed Management Plans). Stormwater needs to not only be considered in these documents, but stormwater agencies need to be engaged in the development and implementation of these documents. Additionally, truly integrated water projects that include stormwater should be encouraged and identified in these documents.

Potential Collaborators: Water Resource Agencies; POTWs; IRWM Roundtable of Regions; DWR; State Water Board

### **Objective 5: Develop Strategies to Address Climate Change**

Climate change predictions indicate that future wet seasons will produce fewer, more intense storms and less snowpack in the mountains. Where historically California relied on the melting snowpack as the method for capturing precipitation as a resource, in the future more precipitation will need to be captured as stormwater runoff to use the water as a resource. Climate change also impacts stormwater programs as wildfires in California are becoming more frequent and more common. Runoff from wildfires represents particular challenges for water quality and stormwater management. Finally, sea level rise may also impact California's water resources, and stormwater capture will help to provide a more resilient water resources portfolio in California.

Potential Collaborators: U.S. Forest Service, DWR, ACWA

## **Objective 6: Balance the Benefits and Impacts of Stormwater Capture**

Sustainability requires not only evaluating the benefits to the water quality, water supply, and climate change aspects of stormwater capture, but also evaluating the natural hydrologic balance and any potential negative ecological impacts. Stormwater capture strategies should strike a balance between these benefits and impacts.

Potential Collaborators: US Fish and Wildlife Service; California Department of Fish and Wildlife, State and Regional Water Boards

## **Objective 7: Integrate Multi-Benefit Solutions and BMPs in General Plans and Capital Improvement Plans**

To affect long-term change, stormwater management needs to be integrated into local development and planning processes. Otherwise, as projects move forward, stormwater is an afterthought, or, an unanticipated (and expensive) addition that requires buy-in from city / county managers outside of the stormwater program. By integrating stormwater capture into general plans and capital improvement plans, local jurisdictions will move toward more sustainable development through the implementation of multi-benefit solutions.

Potential Collaborators: American Planning Association California Chapter, American Public Works Association (Northern and Southern California Chapters), League of California Cities

## **Objective 8: Integrate Stormwater Capture into Green Certifications and Programs**

Stormwater capture should be incentivized through green certifications and programs. This Objective would focus on incorporating criteria into those certifications and programs that recognize green features, thereby incentivizing the design, construction, operations and maintenance of stormwater capture into construction in communities. Potential examples include Leadership in Energy and Environmental Design (LEED) and Envision.

Potential Collaborators: U.S. Green Building Council, American Society of Civil Engineers (ASCE)

### **Action 1.2: Minimize Pollution Through True Source Control**

Minimizing pollution, as opposed to attempting to remove pollution through treatment BMPs, is essential to sustainable stormwater management. True Source Control (the elimination of a pollutant at its source) and the use of alternative products and green chemistry (the design of chemical products and processes that reduce or eliminate the generation of hazardous substances) may ultimately offer the most effective and economical approach to the elimination of many pollutants that impair the beneficial uses of waters. True Source Control also more appropriately aligns the cost of addressing the pollution with its generation, rather than shifting the cost to the environmental impacts. Minimizing pollution at the source is therefore not only more effective, but the most sustainable approach. New legislation may be needed to implement this action.

## Objective 1: Identify and Prioritize Pollutants for True Source Control Initiatives

The purpose of this exercise is to evaluate pollutants based on factors such as source characterization, removal efficiency through traditional BMPs, and the potential feasibility of true source control and/or green chemistry solutions. Given the broad range of true source control needs, a prioritized implementation plan will help focus efforts. Further objectives will be added to Action 1.2 over time as CASQA identifies pollutant-specific strategies.

Potential Collaborators: TBD

## Objective 2: Implement an Urban Pesticide Program

For decades now, the uses of certain pesticides in urban areas – even when applied in compliance with pesticide regulations – have adversely impacted urban water bodies. Currently used pesticides are the primary cause of toxicity in California surface waters, including urban water bodies. CASQA is actively engaged with state and federal regulators in an effort to develop an effective pesticide regulatory system, based primarily on existing statutes, that includes timely identification and mitigation of urban water quality impacts, and proactively prevents additional problems through the registration and registration review processes.

Potential Collaborators: State Water Board, DTSC, EPA, DPR

## Action 1.3: Maximize Effectiveness of BMPs, Green Stormwater Infrastructure, and Low Impact Development

BMPs have been a core component of implementation measures for stormwater programs since the inception of stormwater permits. However, there is a significant knowledge gap in the effectiveness of BMPs, Low Impact Development, and Green Stormwater Infrastructure in improving water quality and achieving desired outcomes. As compliance is at least partially based upon the implementation of structural treatment or retention BMPs in many stormwater permits, municipalities and other stormwater permittees are investing significant public resources in these capital improvement projects. This knowledge gap therefore needs to be reduced to ensure that the investment of public resources is directed to the most effective solutions.

Beyond the technical aspect, BMP effectiveness presents a particular regulatory challenge. As compliance in many permits is driven by the implementation of BMPs, stormwater programs are reluctant to disclose effectiveness data, where effectiveness may be lacking. This challenge needs to be thoughtfully considered as Vision Action 1.3 is implemented, and should likely also be addressed under Vision Action 2.1 (regulatory implications) and Vision Action 3.1 (public perception and communication).

In many permits, compliance is also based upon adhering to prescriptive schedules for the implementation of BMPs. These schedules need to be based upon real data from actual structural BMPs, considering factors such as the time required to obtain the necessary permits, construct the BMP, and collect adequate monitoring and meta data to evaluate BMP effectiveness and improvements in water quality and hydrology. This evaluation needs to consider effectiveness from both a short-term and long-term perspective.

Stormwater programs also need to understand and consider the associated cost of BMPs, including construction, maintenance, monitoring, and inspections.

Collectively, all of these factors are important to provide stormwater programs the necessary tools to select the most effective BMPs. For this Vision Action 1.3, BMP effectiveness is therefore defined as improvements in water quality and hydrology, the time necessary to implement the BMP, cost, and associated maintenance, monitoring, and inspection of the BMP. The process and concepts described here apply equally to not only existing BMPs, but for any new innovative BMPs that may be developed in the future.

## **Objective 1: Evaluate Effectiveness and Sustainability of Structural BMPs**

Structural BMPs are typically physical devices or facilities that address a broad range of water quality pollutants and in some cases improve hydrology. While research has been conducted in this field, including the effectiveness of pollutant removal, hydrological benefits, and more recently, multiple benefits, the knowledge gap remains high. Monitoring data, and meta data, collected in various time scales (short-term and long-term) is critical to support the evaluation of BMP effectiveness.

Potential Collaborators: SCCWRP, SFEI, SMC, OWP

## **Objective 2: Evaluate and Determine Effectiveness and Sustainability of Green Stormwater Infrastructure / LID**

Traditional (or “grey”) stormwater infrastructure is designed largely to move stormwater away from the built environment, whereas Green Stormwater Infrastructure (GSI) and Low Impact Development (LID) reduce the quantity and treat or retain stormwater on site while delivering many other environmental, social, and economic benefits. GSI and LID research is a relatively young field and more data, particularly in California, are needed. Long-term collection of both monitoring and meta data is critical to determining the effectiveness, sustainability, and multiple benefits of GSI and LID.

Potential Collaborators: SCCWRP, SFEI, SMC, OWP

### **Objective 3: Evaluate and Determine Effectiveness and Sustainability of Operational Source Controls**

Operational source controls, like street sweeping and good housekeeping practices, are more traditional operational BMP activities. These operational controls are typically prescriptive requirements in a stormwater permit. Understanding their effectiveness is an important component of connecting desired permit outcomes with effective permit design (see also Vision Action 2.1).

Potential Collaborators: SCCWRP, SFEI, SMC, OWP

### **Objective 4: Document and Communicate BMP Effectiveness and Sustainability Results**

There is a significant need for stormwater program managers, as well as regulators, to have access to comprehensive BMP effectiveness data. There will likely be many sources generating the data (and possibly several efforts to collect and evaluate such data). The focus of this Objective will be to ensure that there is consistent reporting, collection, and access to such data. Possibilities include a California BMP Database, access portal and/or expansion of CASQA's online Pollutant of Concern Reduction Manual.

Potential Collaborators: SCCWRP, SFEI, SMC, OWP, Los Angeles County MS4 Permittees (Measure W projects)

### **Objective 5: Advance Improvements in BMP Effectiveness and Sustainability**

After substantially significant monitoring data and meta data are collected, the multiple benefits, effectiveness, and the sustainability of different BMP types can be evaluated and recommendations on improvements to BMP types will need to be developed and implemented. Additional long-term monitoring will be needed to assess the effectiveness and the sustainability of improved BMPs. Due to the long-term nature and significant level of effort to evaluate the effectiveness of BMPs, collaborative efforts should be pursued to advance improvements in BMP effectiveness and sustainability.

Potential Collaborators: SCCWRP, SFEI, SMC, OWP

## **Principle #2: Permits, Regulations, and Legislation – Permits, regulations, and legislation need to support sustainable stormwater management.**

Stormwater permits, regulations, and legislation all establish requirements (e.g., directing what actions must be taken). The focus of Principle 2 is to evaluate how each of those mechanisms can be vehicles for change, supporting and incentivizing actions that lead to sustainable stormwater management.

### **Action 2.1: Develop a Statewide Regulatory Approach Focused on Sustainable Stormwater Management**

What constitutes a stormwater program has evolved considerably since the stormwater regulations were promulgated in November 1990. In the 30 years since, stormwater programs have changed from relatively basic task-oriented programs to comprehensive and complicated programs, with each permit term adding new goals and requirements. Yet, despite the evolution of what constitutes a stormwater program, the regulations are still essentially based on the Part I and Part II permit application requirements from 1990. As the understanding of stormwater has evolved, it is important to consider the applicability and efficacy of those 1990 regulations in achieving sustainable stormwater management.

Several MS4 permits in California have transitioned into larger, regional permits with an emphasis on managing at the watershed-scale. However, this transition has not been universal throughout the state and has been implemented in various permutations. Fundamental questions about the effectiveness of various permitting concepts remain. The purpose of this Vision Action is to work through a step-wise framework to build a better way to permit stormwater in California. The question is not a matter of doing more or less in a permit, it is a question of effectiveness. How can permits be designed to move forward to our desired outcomes and sustainable stormwater management?

There are various scales that could be explored for implementing this Vision Action, from developing a statewide stakeholder process to one area (permit) of the state serving as a pilot test case. The intention is to first focus on the Phase I MS4 permits, as the other stormwater permits (Phase II Small MS4, Construction, and Industrial), are currently developed at the statewide-level (meaning, there is significantly more variability in the Phase I permits throughout the state). However, the results and progress should equally be applied to those statewide permits.

#### **Objective 1: Define Desired Outcomes for a Stormwater Permit**

The purpose of this Objective is to establish and define desired outcomes (what do we want this permit to achieve?). For example, one desired outcome may be to incentivize the one-water concept. The desired outcomes serve as the foundation from which a permit is developed. The intent is to step outside the thinking of “what we have to do” or “the way it has been done before.” In developing desired outcomes, the concept of time should be included (what do we want to achieve in the permit term? How long will it take to achieve the desired outcome?).

Potential Collaborators: State Water Board; Regional Water Boards, EPA

## **Objective 2: Determine the Program Elements Necessary to Achieve Desired Outcomes**

Part of the purpose of the exercise is to focus on the program elements that target / move toward the desired outcomes (e.g., not constrained to or limited by what is required under the Part I and Part II permit application requirements from 1990).

Potential Collaborators: State Water Board; Regional Water Boards, EPA

## **Objective 3: Establish Effectiveness Assessment and Adaptive Management Principles**

This Objective will define and establish the effectiveness assessment and adaptive management principles. The intent is to clearly define what is needed to evaluate if the program elements are effective in achieving the desired outcomes and, if not, what adaptive management principles need to be applied. A critical component will be the concept of time (e.g., what time periods are necessary for assessment? What time periods are necessary to trigger a programmatic change? Is it appropriate to make the change during the current permit term, or, is it better made in the next permit renewal?).

Potential Collaborators: State Water Board; Regional Water Boards, EPA

## **Objective 4: Define the Data Needs to Assess Desired Outcomes**

The focus of this Objective will be to clearly define the data needs, and associated timeframes for data collection, to assess the desired outcomes. This data could be from a water quality monitoring program within the permit, but could also be sourced from other efforts (e.g., other agencies, other collaborative efforts, etc.).

Potential Collaborators: State Water Board; Regional Water Boards, EPA, SCCWRP, SFEI, SMC, OWP

## **Objective 5: Develop Recommended Permitting Approaches Focused on Outcomes**

This Objective will assess permitting structures in various areas of the state to determine how effective each structure is in achieving the desired outcomes identified in Vision Action 2.1, Objective 1 (and the related results of Objectives 2, 3, and 4). The goal will be to identify and define a recommended permitting approach.

Potential Collaborators: State Water Board; Regional Water Boards, EPA

## **Objective 6: Identify and Resolve Barriers to Implementing Recommended Permitting Approaches**

It is feasible, if not likely, that there may be barriers to implementing the recommended permitting approach(es) in Objective 5. This Objective will focus on developing strategies and approaches to resolve those identified barriers. It is also possible that resolving identified barriers may require revisions to existing policies, regulations, and / or legislation. The identified barriers will be prioritized (which barriers should be resolved first) and efforts will be initiated to resolve those barriers.

Potential Collaborators: State Water Board; Regional Water Boards, EPA

## **Objective 7: Develop a Statewide Regulatory Approach for Stormwater Permits**

The form of the regulatory approach is highly dependent upon the results of Objectives 1-6. Possibilities may include establishing a statewide policy, a statewide Phase I MS4 permit, etc. Once developed, CASQA will support the State Water Board and / or Regional Water Boards to ensure the regulatory action is implemented statewide.

Potential Collaborators: State Water Board; Regional Water Boards, EPA

## Action 2.2: Develop Regulations and Guidance to Support Sustainable Stormwater Management

From the regulatory perspective, additional guidance and, potentially, regulatory actions, are necessary to support stormwater as a resource. Specifically, action is necessary to incentivize stormwater capture and true source control efforts.

### Objective 1: Focus Regulatory Actions on Priority Water Quality Issues

Prioritization is essential for all organizations, recognizing that not all actions can be implemented simultaneously. Identifying priorities allows organizations to align resources and focus efforts. It is a way of acknowledging that funding and time are both limited and actions should be thoughtfully focused on the most critical needs.

In implementing the Vision (2017 version), CASQA developed a robust methodology to evaluate water quality issues at the statewide-level. The evaluation was based on 13 criteria, including drivers from the stormwater community, regulatory agencies, NGOs, and scientific / monitoring advancements. The criteria were scored using a tool developed by EPA to support integrated planning. The assessment identified four priority water quality issues: (1) pathogen indicators, (2) biological integrity / biostimulatory, (3) current use pesticides, and (4) trash.

In addition to focusing regulatory actions (this Action 2.2), these priorities will also inform several aspects of CASQA's Vision (e.g., implementation of Vision Action 1.2, Vision Action 1.3).

### Objective 2: Base Water Quality Standards on All Flow Conditions

Many implementation concerns for permitted stormwater agencies arise due to application of water quality objectives developed primarily based on continuous flow data during dry weather conditions (e.g. wastewater discharges) which are then applied to wet weather without guidance or consideration for implementation. Issues include:

- Consideration of exposure periods for toxic pollutants
- Consideration of the beneficial use impacts during and after storm events as distinct from dry weather conditions
- Program of implementation required to meet standards during wet weather

Porter Cologne (Section 13240) provides an opportunity for the Regional Water Boards to periodically review their Basin Plans to ensure the plans reflect the newest information and data, are current with State and Federal policies, and support the priorities of the Regional Water Board. Basin Plans were primarily developed in the 1970s and 1980s and as a result have limited consideration of wet weather issues. This action will review adopted water quality objectives and beneficial uses (i.e., water quality standards) to ensure they are applicable for wet weather conditions. Some Regional Water Boards have started to address this concern. This action will be designed to support those efforts.

### Objective 3: Identify and Resolve Regulatory Barriers for Stormwater Capture and Use

Regulations have focused on pollutants, but we need to consider stormwater as a resource. The actions needed to overcome regulatory barriers to stormwater capture and use will need to involve collaboration between federal, state, and local agencies, including water districts, wastewater agencies, and resource agencies, as well as professional associations, such as CASA and ACWA. This Objective should be informed by the efforts Vision Action 1.1 and the STORMS Project 1a/1b Report.

Potential Collaborators: State Water Board, DWR, CASA, ACWA, US Fish and Wildlife Service, California Department of Fish and Wildlife

## **Objective 4: Establish a Statewide Goal for Stormwater Capture and Use**

Based on the efforts of Principle 1, Vision Action 1.1, this Objective will focus on working with the State Water Board and DWR to establish a statewide goal for stormwater capture and use. This Objective will also require identifying the method for quantifying stormwater capture in California.

Potential Collaborators: State Water Board, DWR, SCCWRP, California Department of Fish and Wildlife

## **Objective 5: Establish a Statewide True Source Control Policy**

The purpose of this Policy is to incentivize and recognize the value of true source control as essential for sustainable stormwater management. The Policy should identify partners who have a role in implementing true source control and establish partnerships to collaboratively work together to achieve necessary change at the source.

Potential Collaborators: State Water Board, DTSC

## **Action 2.3: Promote Legislation That Is Essential for Sustainable Stormwater Management**

Legislation can play a significant role in stormwater management and the regulatory actions required by State Water Board. For example, to implement a true source control action for copper, CASQA actively advocated for SB 346 (reduction in concentrations of copper in brake pads). To implement this Vision for Sustainable Stormwater Management, CASQA actively monitors state and federal legislation and evaluates any legislation that supports or constrains sustainable stormwater management. It is also possible that the implementation of various Vision Actions may require legislation to affect change. This Vision Action 2.3 is intended to capture any specific legislation (state or federal) that would be significant enough that CASQA would make a conscious decision to engage in advocacy.

Educating legislators (see Vision Action 3.1), is integral to the long-term success of any objective under this Vision Action 2.3. Legislators will need to be educated on the needs of sustainable stormwater management so that when/if the time comes to introduce legislation, there is an understanding of why such legislation is required. Relatedly, education efforts may also help to minimize legislation that is introduced that is counter to achieving this Vision for Sustainable Stormwater Management.

## **Objective 1: TBD**

This objective is a placeholder. If and when specific legislation is identified as necessary to support the implementation of CASQA's Vision for Sustainable Stormwater, it will be included here.

Potential Collaborators: TBD

**Principle #3: Public Education – Public awareness, understanding, appreciation, and support of the value of stormwater is essential to sustainable stormwater management.**

Stormwater agencies need to educate the public about the value of water. Although domestic water is relatively inexpensive and abundant in the United States, the recurring drought and population increases have begun to strain the storage and delivery infrastructure in California and the southwest. Management of water resources in California must change. To make the necessary changes, there must be public support.

**Action 3.1: Increase Support for Funding and Sustainable Stormwater Projects**

From funding local stormwater programs to ensuring the successful implementation of multi-benefit projects, public support is vital. In order to gain that support, public awareness, understanding, and appreciation of the value of stormwater is necessary.

Stormwater protection programs are chronically underfunded, in part due to a lack of public support. The public and elected officials must understand the co-benefits of sustainable stormwater management, improving stormwater quality, and the costs to complete these actions.

**Objective 1: Develop a Strategy to Communicate the Value of Stormwater to the Public**

The focus of this Objective is to develop a strategy that outlines the steps needed to elevate public awareness, understanding, and appreciation of the value of stormwater in California, to clarify the issues of “Who, What, When, Where, How, and Why?” and to develop messaging.

Potential Collaborators: TBD

**Objective 2: Educate the Public**

Implementation of stormwater projects (e.g., capture, infiltration) require public support. Even if stormwater agencies secure funding for a project, the lack of public support can halt a project. Public education is therefore needed to ensure that when a project is implemented, the local community supports the project. Once the messaging is developed under Objective 1, targeted strategies can be implemented.

Potential Collaborators: TBD

**Objective 3: Educate Elected Officials**

To provide funding for stormwater, at any level, will require significant support from elected officials. Targeted outreach and education to elected officials will occur, based upon the messaging developed under Objective 1. See also Vision Action 4.1, Objective 2.

Potential Collaborators: TBD

## **Principle #4: Funding – Significant financial investment is required to achieve sustainable stormwater management.**

Municipal stormwater systems are public facilities, but they differ from other public utilities such as water, sewer, and trash in one key aspect: other utilities existed prior to the passage of Proposition 218 and are financially supported by service fees. By comparison, most stormwater programs rely on the public agency's general fund. This funding structure presents a major challenge for elected officials as they must balance the funding of the stormwater program with other programs supported by the general fund, including such things as law enforcement, fire, paramedics, parks, street lighting, and libraries.

What is abundantly apparent is that stormwater programs cannot be funded solely through the General Fund. To integrate stormwater into California's water resource portfolio, to implement and comply with stormwater permits, to achieve sustainable stormwater management, dedicated funding must be secured. Even if dedicated funding is secured, a portfolio of funding will likely continue to play a substantial role in supporting stormwater (just as other water resource programs rely on both dedicated funding and supplemental funding).

### **Action 4.1: Determine the Resource Needs for Sustainable Stormwater Programs**

Determining the needs and cost of stormwater programs is a substantial challenge. Within agencies, multiple departments carry out various aspects of permit implementation, frequently integrated with other non-stormwater tasks. Between agencies, differences in program design and organization make it difficult to combine information from multiple agencies into a larger, consistent database from which to report average results without significant variability. Without a reliable accounting of funding and funding needs, it is difficult to determine the overall need and therefore identify funding to fill the gaps.

#### **Objective 1: Identify Cost of Compliance for Municipal Stormwater Permittees**

The purpose of this Objective is to better quantify resource needs to implement existing permit requirements in California. Part of the assessment may be recommending the frequency of conducting the needs analysis, given that requirements change and resource needs evolve. EPA, through the Clean Watershed Needs Survey, and WEF, through the Stormwater Needs Survey, are potential partners for this Objective. In addition, CASQA may work with State Water Board staff through the implementation of a STORMS project, to better assist municipalities with how to track and assess individual program needs.

Potential Collaborators: State Water Board, EPA, WEF

#### **Objective 2: Communicate the Funding Gap to Elected Officials**

Increasing funding for stormwater programs will require legislative action by elected officials. Once available resources can be compared to the quantified needs, the funding gap can be articulated. It is critical to work with elected officials to affect change and increase resources.

Potential Collaborators: NMSA, WEF

## Action 4.2: Develop a Dedicated Funding Source for Stormwater Programs

Urban stormwater management is the only major water resource in California that is not financially supported through service fees. Most stormwater programs are currently funded through the general fund of individual municipalities, resulting in significant barriers for investing in the programs and capital improvement projects that are necessary for sustainable stormwater management.

### Objective 1: Evaluate Statewide Options for Providing Dedicated Stormwater Funding

Dedicated funding is essential for sustainable stormwater management. The purpose of this Objective is to evaluate all potential options for dedicated stormwater funding (including options beyond Proposition 218).

Potential Collaborators: TBD

### Objective 2: Promote SB 231 and AB 2304 as Viable Means of Addressing Prop 218

Proposition 218 (1996) requires local voter approval of certain property-related fees. The imposition or increase of a property related fee or charge must be approved by a majority vote of the property owners subject to the fee or charge, or, at the option of the agency imposing the fee or charge, by a two-thirds vote of the electorate residing in the area affected by the fee or charge. Proposition 218 exempts certain types of fees, such as those for water, sewer, and refuse, from the voter approval requirements of Proposition 218.

Legislation has clarified the standing of stormwater within Proposition 218 and the accompanying Omnibus Implementation Act of 1997, relative to the water and sewer exemptions. The passage of AB 2403 (2014) provides an option under the water exemption for funding the capital portion of projects that conserve or use stormwater for water supply. Similarly, the passage of SB 231 (2017) provides the same option under the sewer exemption for projects that benefit sewer services. To date, the option created by AB 2403 has not been used by a MS4 to raise stormwater fees but CASQA expects the passage of SB 231 to encourage MS4s to do so.

The use of either option is expected to be closely watched by interest groups in preparation for bringing one or more lawsuits to try to restrict or reverse the interpretation of the legislation. As a result, the SB 231 Implementation Working Group, a coalition expected to include the legislator's office, the sponsors of the legislation, LCC, CSAC, environmental NGOs, and others are developing a strategy to try to ensure that agencies use the options appropriately and avoid engendering lawsuits that could set legal precedents unfavorable to the needs of stormwater programs. CASQA's continued collaboration and participation in the SB 231 Working Group is essential.

Potential Collaborators: SB 231 Working Group

## Action 4.3: Increase Supplemental Funding Opportunities for Stormwater Programs

Currently, funding for sustainable stormwater projects generally is provided through bond measures and grant opportunities. These funding sources should be substantially increased to support sustainable stormwater projects in California.

In the long-term, even if a dedicated funding source is secured for California, supplemental types of funding options will most surely still be necessary (as they currently are necessary for other water resources that already have dedicated funding sources).

To emphasize the ongoing need for dedicated funding to achieve sustainable stormwater management, these funding sources are being referred to as supplemental (i.e., sustainable stormwater management is not possible by relying solely on these funding sources).

## **Objective 1: Increase Funding in California Bond Measures**

California has invested funding for water resources through various bond measures. However, the funding provided for stormwater is typically dwarfed by allocations for other resources. See also Vision Action 3.1.

## **Objective 2: Increase Grant Opportunities**

Grant funding typically arises from the implementation of federal or state legislative actions. Engaging in the development of the guidelines that disburse the funds is critical to increasing opportunities for supplemental stormwater funding.

Potential Collaborators: WEF, NMSA

## **Objective 3: Increase Access to the State Revolving Fund**

As a practical matter, stormwater projects cannot access the State Revolving Fund as the program is a loan that must be repaid. Essentially, because stormwater programs in California do not have dedicated funding, there is a large need for resources. But supplemental resources like the State Revolving Fund are not available because stormwater programs lack dedicated funding necessary to repay the loan. The focus of this Objective is to break that cycle by creating feasible and realistic access to the State Revolving Fund.

Potential Collaborators: State Water Board, NMSA

## **Objective 4: Increase Funding Through Multi-Benefit Projects, Partnerships, and Funding Sources**

As noted in Vision Action 1.1, multi-benefit solutions are necessary not only for sustainable stormwater management, but also critical to maximizing public investments in infrastructure and communities. Limited stormwater resources can be maximized by thinking beyond funds specific to stormwater and identifying multi-benefit, multi-funding opportunities. Traditional partnerships have included other water resource agencies (e.g., drinking water, wastewater); however, partnerships can and should be expanded to organizations like transportation agencies and other funding sources, like climate change funds. The focus of this Objective is therefore to facilitate and expand the connection of stormwater projects with multi-benefit partnerships and funding sources. Implementation of this Objective could include developing guidance to help organizations integrate multi-benefits into project designs and grant proposals, increasing financial collaboration between stormwater, wastewater, drinking water, transportation / infrastructure organizations, increasing and promoting access to information on multi-benefit funding sources and opportunities, etc.

Potential Collaborators: CASA, ACWA, Transportation Agencies, OWP, EPA Water Infrastructure and Resiliency Finance Center

## Appendix: CASQA's Vision-at-a-Glance

**Principle #1: Program Implementation** – Projects and programs that use stormwater as a resource, protect water quality and beneficial uses, and efficiently minimize pollution are critical for sustainable stormwater management.

**Action 1.1: Maximize Urban Stormwater Capture**

**Action 1.2: Minimize Pollution Through True Source Control**

**Action 1.3: Maximize Effectiveness of BMPs, Green Stormwater Infrastructure, and Low Impact Development**

**Principle #2: Permits, Regulations, and Legislation** – Permits, regulations, and legislation need to support sustainable stormwater management.

**Action 2.1: Develop a Statewide Regulatory Approach Focused on Sustainable Stormwater Management**

**Action 2.2: Develop Regulations and Guidance to Support Sustainable Stormwater Management**

**Action 2.3: Promote Legislation That Is Essential for Sustainable Stormwater Management**

**Principle #3: Public Education** – Public awareness, understanding, appreciation, and support of the value of stormwater is essential to sustainable stormwater management.

**Action 3.1: Increase Support for Funding and Sustainable Stormwater Projects**

**Principle #4: Funding** – Significant financial investment is required to achieve sustainable stormwater management.

**Action 4.1: Determine the Resource Needs for Sustainable Stormwater Programs**

**Action 4.2: Develop a Dedicated Funding Source for Stormwater Programs**

**Action 4.3: Increase Supplemental Funding Opportunities for Stormwater Programs**