



ANNUAL REPORT

JULY 1, 2019 – JUNE 30, 2020

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EXECUTIVE SUMMARY

Collaboration is a powerful tool for achieving common goals. The Southern California Stormwater Monitoring Coalition (SMC) has exemplified collaboration over the past 20 years filling foundational gaps in knowledge about how to improve stormwater management and monitoring. Creating monitoring infrastructure, deciphering stormwater mechanisms and processes, and assessing receiving water impacts have brought tremendous leap in how dischargers and regulators address the challenging issues of urban runoff. To date, the SMC has funded and completed more than 30 research projects valued at \$17 million, with half of the effort coming as leveraged non-member in-kind resources, underscoring the value of its collaborative research. Recognizing the above-mentioned collaboration was foundational to the SMC's enduring success, the original SMC Master Agreement has been renewed three times, providing the framework for the SMC's interactions and the ability to add a long-term research perspective to ongoing stormwater management needs.

The SMC Annual Report provides an opportunity for the member agencies to present and describe the projects they are working on with other member agencies. Likewise, this report provides a brief overview of projects active during the reporting year and summarizes projects either recently completed or planned for the upcoming year. Each project summary presented in this report includes the lead agency managing the project, the partner agencies, sources of funding, and a list of prepared publications.

The 2019-2020 reporting year included projects covering a wide range of environmental and water quality disciplines. Member agencies were involved in the completion of the five-year regional bioassessments of stream health and multi-year monitoring and assessment project on Low Impact Development (CLEAN Phase I). The newest Master Agreement, spanning five years, called for the development of a forward-looking Research Agenda to guide the SMC's priorities and directions through 2024.

Additionally, the SMC Steering Committee initiated one new multi-faceted project during FY 2019/20. Finally, the SMC approved the support and funding for four new projects which will begin in FY 2020/21.

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ACRONYMS AND ABBREVIATIONS

CASQA	California Stormwater Quality Association
LID	Low Impact Development
NPDES	National Pollutant Discharge Elimination System
PSA	Perennial Stream Assessment
SCCWRP	Southern California Coastal Water Research Project
SETAC	Society for Environmental Toxicity and Chemistry
SMC	Southern California Stormwater Monitoring Coalition

1 INTRODUCTION

The goal of the Southern California Stormwater Monitoring Coalition (SMC) is to develop the technical information necessary to better understand stormwater mechanisms and impacts, and then develop the tools that will effectively and efficiently improve stormwater decision-making. The SMC develops and funds cooperative projects to improve the knowledge of stormwater quality management and reports on the progress of those projects on an annual basis.

The 2019-2020 Annual Report represents an opportunity to report on the status of collaborative projects that are being worked on by member agencies. This report is intended provide a brief overview of projects active during the reporting year and summarize projects either recently completed or planned for the upcoming year. Each project summary presented in this report includes the lead agency managing the project, sources of funding, and a list of prepared publications.

1.1 OVERVIEW OF THE 2019-2020 ANNUAL REPORT

Member agencies are involved in multiple projects or individual projects that have different times for completion and are at various implementation stages. Project information is presented in several sections of this report depending on the implementation status. Recently completed projects, active projects, and projects planned for the upcoming year are provided in Section 3 to Section 5. The 2019 - 2020 Annual Report outline is as follows:

Section 3: SMC member agencies completed several projects during the 2019-2020 reporting year including:

- SMC California LID Evaluation and Analysis Network (SMC CLEAN) Project
- 2019-2020 Research Agenda

Section 4: SMC projects that were active during the 2019-2020 reporting year included:

- Implementing the Regionally Consistent and Integrated Freshwater Stream Bioassessment Monitoring Program
- Communication Plan

Section 5: The SMC also has the following projects planned to begin in the 2020-21 reporting period including:

- Human Indicators and Health Risk
- BMP Regional Monitoring
- Laboratory Intercalibration
- Streamlined Annual Reporting

Information on past annual project updates reported in the SMC Annual Report are available on the SMC website at the following link under the Annual Report tab: www.socalsmc.org

2 STORMWATER MONITORING COALITION OVERVIEW

As a result of an increasing regulatory focus and limited scientific knowledge base, both stormwater regulators and municipal stormwater management agencies throughout Southern California have formed a collaborative working relationship to improve the science of stormwater management. The goal of this relationship is to develop the technical information necessary to better understand stormwater mechanisms and impacts, and then develop tools to effectively and efficiently improve stormwater decision-making. There was early recognition that these issues are often not localized but typically cross watershed and jurisdictional boundaries. This relationship culminated in a formal letter of agreement, signed in 2000, 2009, 2015 and again in 2019 by all Phase I municipal stormwater National Pollutant Discharge Elimination System (NPDES) lead permittees and the NPDES regulatory agencies in Southern California to create the Stormwater Monitoring Coalition (SMC). The SMC is directed by a Steering Committee consisting of member agencies' program managers who are the lead representatives for their respective organizations (Table 2-1).

Table 2-1. List of Member Agencies in the Stormwater Monitoring Coalition

Agency	Lead Representative
California Department of Transportation, Caltrans	Bhaskar Joshi
City of Long Beach	Melissa You
City of Los Angeles, Watershed Protection Division	Charlie Yu
City of San Diego	Andre Sonksen
County of Orange, OC Public Works	Grant Sharp, Chair
County of San Diego Stormwater Management Program	Joanna Wisniewska
Los Angeles County Flood Control District	Geremew Amenu
Riverside County Flood Control and Water Conservation District	Rebekah Guill, Vice Chair
San Bernardino County Flood Control District	Arlene Chun
Southern California Coastal Water Research Project	Ken Schiff, Treasurer
Ventura County Watershed Protection District	David Laak
California Regional Water Quality Control Board, Los Angeles Region	Ivar Ridgeway
California Regional Water Quality Control Board, San Diego Region	Chad Loflen
California Regional Water Quality Control Board, Santa Ana Region	Adam Fischer
State Water Resources Control Board	Nicholas Martorano
US Environmental Protection Agency, Office of Research and Development	

* List current as of June 2020

The value of the SMC to its member agencies is at least four-fold, including:

- The ability to share costs for implementing projects.
 - Cost reductions for SMC member agencies can be significant since collaborative projects can reduce costs by more than 90% relative to financing alone. In addition, the majority of projects have non-member agency cost matching. Since its inception, the SMC has realized a 40:1 cost leveraging of member agency contributions.
- The ability to stretch member agencies' skill bases.
 - Stormwater management requires a wide variety of knowledge, including regulatory policy, engineering, hydrology, biology, chemistry, toxicity, and microbiology, to name a few. Many member agencies have limited staff and, by working together, garner the additional skills that are not sustainable within each agency.
- The ability to communicate.
 - Discussions among member agencies provide context and a richness of ideas for application to local issues. Similarly, discussion between regulatory and regulated agencies in an informal setting leads to more effective implementation of management activities.
- Projects conducted under the SMC umbrella have nearly always resulted in management action.
 - Often, it is difficult for a single agency to affect the current course of regulatory management. Because SMC projects are initiated and vetted through the regulated and regulatory management agencies, the results are adopted quickly into the management framework, including alterations to NPDES permits. In turn, these collaborative relationships help regulated agencies meet compliance with their MS4 Phase I permits.

3 PROJECTS COMPLETED DURING REPORTING TERM

This section provides an overview of the SMC member agencies' projects that were completed during the 2019-20 reporting year. This overview briefly summarizes each project, identifies some key study questions, and lists publications produced from the project efforts. SMC associated projects reported in this report are funded through mechanisms which include direct SMC funds, special agreements with direct funding from member organizations, in kind services, grants / match funding, or direct funding of members with institutional / coordination support of the SMC organization.

3.1 SMC CLEAN PHASE I PROJECT

Table 3-1. SMC CLEAN Phase I Project

Lead Agency	San Bernardino County Flood Control District
Report Year Project Started	2015-2018
Status	100% Complete
Initial Project Budget	\$370,000 (SMC direct funding for Current 3 year project funding) Part of a larger project with total funding of \$1,100,000 – (\$600K Prop 40 grant funding and \$500K in SMC match)
Technical Lead	Arlene Chun, San Bernardino County Flood Control District Daniel Apt, Olaunu Matt Yeager, Yeager Environmental Associates Michael Trapp, Michael Baker International
Key Words: LID, monitoring, BMP performance, and effectiveness	

Background

In March 2020, the SMC CLEAN Consulting Team developed an annotated outline of the SMC CLEAN Phase I Report and received feedback regarding the annotated outline from the SMC CLEAN Technical Advisory Committee (TAC). Based on the annotated outline, a draft SMC CLEAN Phase I Report was developed and provided to the SMC CLEAN TAC in early May 2020 and comments were received from the TAC. Addressing the comments provided by the SMC CLEAN TAC, the SMC CLEAN Phase I Final Report was completed and provided to the SMC CLEAN TAC in late May for approval and adopted at the June 2nd SMC Steering Committee meeting.

Executive Summary of Final Report

The mission of SMC CLEAN is to develop a thorough understanding of the effectiveness of LID BMPs in California both in the short term for use in calibration of watershed programs and the long term for modification of LID design, construction, and maintenance, through coordination

with project partners and others performing LID monitoring. SMC CLEAN accomplishes this by serving as a clearing house for LID monitoring information, developing targeted LID research questions, performing targeted LID monitoring based on these questions, analyzing LID monitoring data, and providing recommendations for the design, construction, maintenance, and monitoring of LID in updates to the Southern California LID Manual to ensure that LID BMPs are implemented in the most effective manner.

This SMC CLEAN Project Report serves as the summary of SMC CLEAN Phase I. In furthering the mission of the SMC CLEAN this report provides an initial understanding of the effectiveness of LID BMPs in California, however more prevalently the report emphasizes the primary finding of SMC CLEAN Phase I, which is that currently there is a lack of existing data, monitoring data and meta data needed to perform the analysis necessary for a thorough understanding of the effectiveness of LID BMPs in California identified in the SMC CLEAN mission. A key finding of the SMC CLEAN Phase I and previous LID effectiveness evaluation work performed by the SMC and its partner agencies, is that long-term monitoring data for LID and GSI projects in Southern California are essential to truly understand the effectiveness of LID and GSI systems in Southern California. This report provides a pathway and process to obtain the monitoring data and meta data to perform the analysis needed to have a thorough understanding of the effectiveness of LID BMPs in California and achieve the SMC CLEAN mission. This pathway and process, identified in Section 5.5, serves as the primary recommendation and outcome of the SMC CLEAN Phase I and a plan for SMC CLEAN Phase II.

The SMC CLEAN project report is organized according to the five primary tasks of the SMC CLEAN Phase I project including:

- Task 1 - Form and coordinate a project Technical Advisory Committee
- Task 2 - Research existing data
- Task 3 - Implement initial monitoring procedures in a beta test phase
- Task 4 - Summarize all monitoring data, make recommendations, and update the LID Manual
- Task 5 - Ongoing collaboration with Project Partners

The report provides a summary of the efforts involved in and work products that resulted from each of the five SMC CLEAN Phase I tasks.

The primary findings and recommendations of the SMC CLEAN Phase I are:

Findings

- There is currently a lack of existing data, monitoring data and meta data needed to perform the analysis necessary for a thorough understanding of the effectiveness of LID BMPs in California.
- Very few organizations are conducting BMP performance monitoring or research across the SMC region.
- BMP performance monitoring that is being completed varies substantially in that different types of BMPs and configurations of BMPs are being monitored using a wide variety of monitoring plans/protocols with an inconsistent set of analytes.

- Meta data (e.g. design plans, inspection records, maintenance records) is not being collected for sites where BMP performance monitoring is being conducted, which can have significant effects on performance.
- Significant barriers exist for sharing unpublished BMP performance data for some organizations usually emanating from lack of understanding of what the data was stating as result of a number of reasons including: little or no data interpretation or processing, results not appearing to show the desired outcomes and hesitation regarding regulatory or public knowledge, or bureaucratic process.
- BMP performance monitoring data that has been performed by organizations is often kept in various locations including paper records, active or inactive databases, or other inaccessible locations that make data analysis and sharing difficult.
- The lack of a centralized location for California specific BMP performance monitoring data and meta data is a barrier to performing analysis of a statistically significant data set over a long period of time to understand the performance of LID and GSI systems.

Recommendations

- A long-term study of at least 10 years is needed to allow for monitoring of a substantial amount of storm events. This will provide the data needed to conduct analyses to help understand how LID and GSI systems perform overtime and with a variety of factors, such as maintenance, that affect performance.
- There is a need for the development of a LID & GSI BMP data submittal tool so that there is a central repository for collected LID monitoring and meta data in Southern California. This will allow for adequate data analysis to be performed to understand the primary elements that affect performance of LID & GSI BMPs in Southern California.
- An important element of any future work of the SMC focused on effectiveness of LID and GSI is to identify what the focus of future research should be. As part of the SMC CLEAN Phase I project, the focus was on bioretention and biofiltration as the most common LID and GSI BMP implemented in Southern California, however any future SMC work should identify if the scope of LID and GSI BMPs should go beyond bioretention/biofiltration to include other LID and GSI BMPs and if so, which targeted research questions should be answered for those BMPs.
- Many of the issues associated with the implementation of LID and GSI systems is the variety of different designs for the same LID or GSI system that make it difficult for contractors to construct these systems effectively. The SMC should evaluate the potential development of statewide LID & GSI BMP standards and specifications for California.
- Based on input from the SMC CLEAN TAC there is a desire to evaluate the development of a California LID & GSI BMP Testing and Certification Program. This effort should evaluate the need among MS4s, developers, regulators, academia, and manufacturers of proprietary LID & GSI BMP systems for the development of a California LID & GSI BMP Testing and Certification Program.

- Future state grants should specify that instead of individual grantees performing monitoring of their projects, entities such as the SMC CLEAN, SCCWRP, and SFEI should perform the monitoring using a standard monitoring protocol such as the SMC CLEAN Monitoring Protocol. This would allow a more consistent monitoring approach statewide resulting in comparable data, acquisition of needed monitoring data and meta data to evaluate the effectiveness of LID/GSI BMPs, and less burden on the grantee project proponents. Additionally, access to perform monitoring past the typical 3-year grant period should be included in the grant guidelines to have the ability for the monitoring entity obtain the needed long-term monitoring data and meta data to truly evaluate the effectiveness of LID/GSI BMPs in California.

3.2. 2019-2020 RESEARCH AGENDA

Table 3-2. 2019-2020 Research Agenda

Lead Agency	Southern California Coastal Research Project
Report Year Project Started	2019-2020
Status	100% Complete
Project Budget	\$100,000
Technical Lead	Ken Schiff, SCCWRP Michael Trapp, Michael Baker International
Key Words:	

Background

The 2020 Research Agenda was developed by an external panel of seven nationally-recognized knowledge leaders in their respective disciplines (chemistry, ecology, microbiology, hydrology, best management practices [BMPs], monitoring, and information technology), and three local experts (a regulated municipality, a regulatory agency, and a non-governmental environmental advocacy organization). The panel met for 3 days in November 2019, developed 64 project concepts, and then finalized 24 priority projects organized into six thematic areas:

- **Microbiology and Human Health Risk (4 projects):** These projects focus on improving the SMC’s capability and capacity to quantify and protect human health, primarily during water-contact recreation. The projects are intended to help SMC members move away from their reliance on traditional fecal indicator bacteria (i.e., *Enterococcus*, *E. coli*, coliforms), which offer limited and incomplete insights into health risks associated with water-contact recreation, and toward standardizing next-generation technologies.
- **BMP Monitoring, Implementation and Effectiveness (5 projects):** These projects focus on filling fundamental, essential knowledge gaps in managers’ understanding of stormwater BMP design, monitoring and lifecycle performance. The projects are wide-ranging, from improving fundamental understanding of BMP mechanisms and

processes that can inform BMP selection, design and standardization, to an integrated and coordinated regionwide monitoring of BMP installations.

- **Innovative Technology and Science Communication (4 projects):** These projects focus on turning data into information and insights that SMC members can use for management, modeling and reporting, as well as to improve data-sharing among SMC member agencies.
- **Expanding the Utility of Biomonitoring (4 projects):** With biological monitoring becoming an increasingly insightful and foundational line of evidence for tracking ecosystem health, there is a need for more focus on extracting managerially relevant insights from biomonitoring to better understand stormwater impacts on receiving water quality.
- **Improving Stormwater Monitoring Effectiveness (5 projects):** These projects focus on evaluating monitoring efforts by SMC member agencies to ensure they are optimally responsive, relevant, and useful to managers and other stakeholders.
- **Emerging Challenges (4 projects):** These projects focus on improving the foundational understanding of up-and-coming issues, which are likely to become front and center for SMC member agencies over the long term, including trash, climate change, emerging pollutants, and homelessness impacts.

The SMC has begun funding their preferred projects, representing a wide range of data and information to assist both regulated and regulatory SMC member agencies, and others within the stormwater management arena.

4 ONGOING PROJECT ACCOMPLISHMENTS

This section provides an overview of the SMC member agencies' active projects along with a brief summary describing the intent of each project, some key study questions, the regional motivation behind the projects, and a list of publications produced from project efforts. While a brief overview is provided in the Annual Report, detailed information can be obtained from the list of technical publications provided at the end of each section or by contacting the Technical Leads.

4.1. IMPLEMENTATING A 5-YEAR REGIONALLY CONSISTENT AND INTEGRATED FRESHWATER STREAM BIOASSESSMENT MONITORING PROGRAM

Table 4-1. Regional Freshwater Stream Bioassessment Monitoring Project

Lead Agency	SCCWRP
Technical Leads	Raphael D. Mazor, SCCWRP
Project Budget	\$1,126,966 Total Project Funding \$426,330 total SMC contribution \$552, 636 in-kind contribution for sampling and analysis from all participating partners \$150,000 match from SWRCB – SWAMP funds

Key Words: bioassessment, freshwater stream biology, aquatic life stressors, sediment

Background

In 2015, the SMC initiated the first year of its redesigned stream bioassessment survey and has since completed three years of sampling. This survey builds upon earlier assessments to address key information gaps. In particular: 1) the biological conditions of nonperennial streams; 2) a better assessment of trends or changes in site conditions, and 2) a change in focus on new analytes and stressors of interest (e.g., sediment contamination, hydromodification).

Results from the first year of the survey were summarized in a report that featured an analysis of the biological conditions of engineered channels. The SMC analyses showed that good biological conditions (as indicated by bioassessment index scores similar to reference) were rarely observed in hardened channels. This report has guided conversations about the assessment of aquatic life beneficial uses in modified channels, notably with the State Water Board as it develops a Biointegrity/Biostimulatory policy.

In Spring of 2020, the SMC workgroup completed a draft report summarizing data collected by the SMC's stream bioassessment survey. The report has been reviewed and endorsed by the workgroup, and a Final Report was approved at the June 2nd Steering Committee.

The Final report features an article on the SMC's hydromodification susceptibility assessments. The survey found that susceptibility was widespread in both developed and undeveloped areas. Efforts to manage hydromodification that focus on channel hardening are associated with poor biological conditions, suggesting that efforts that focus on sources of flow alteration (e.g., low-impact development) may avoid tradeoffs between preventing hydromodification and protecting aquatic life.

Other articles in this Final Report focus on trends in biological condition (which found that many streams were stable and few streams were improving or degrading), and on sediment chemistry (which found that pyrethroids were widespread, with some evidence of risk to aquatic life).

Objectives and Products

The SMC regional monitoring program serves to provide information on the overall regional condition of streams in southern California, trends in condition, and information on important stressors that may affect stream health. In addition to providing critical contextual information for interpreting all other stream monitoring in the region, the SMC regional monitoring program produces data and information that supports numerous local watershed management programs and informs development of statewide policy

Products include annual reports, fact sheets for SWAMP, and data that are available for all SMC members. The regional program also serves to promote data quality and comparability and consistency in field and laboratory data collection efforts.

The most recent report from the SMC survey has been published as a SCCWRP technical report: http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/1127_SMC1819.pdf

Project Accomplishments (FY 2019/2020)

The SMC completed an additional year of sampling (following its current workplan) while the steering committee and technical workgroup deliberate modifications and special studies to incorporate into its future surveys. A wide range of topics are under discussion, such as conducting causal assessments at priority sites or evaluating the impacts of changes in water use practices. A final workplan is expected by the end of the calendar year. This workplan will identify pathways for monitoring groups outside the SMC to coordinate their efforts and support shared regional monitoring goals.

Project-Related Publications

Taniguchi-Quan, K.T., R.D. Mazor, J.S. Brown, R. Guill, M. Yeager, A. Suter, J. Rudolph, W. Isham, S. Johnson. 2020. 2018-2019 Report on the SMC Stream Survey. Technical Report 1127. Southern California Coastal Water Research Project. Costa Mesa, CA.

http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/1127_SMC1819.pdf

SMC Research Objectives Addressed

4.1 Adapt Biological Assessment Tools for Non-Perennial Streams

3.3 Characterization of Stormwater Effects

4.2 COMMUNICATION PLAN

Table 4-2. Communication Plan

Lead Agency	SCCWRP
Technical Leads	Scott Martindale, SCCWRP
Project Budget	\$166,000 (direct SMC Funding)
Key Words:	communications, metrics, newsletter, website, engagement, publicity

Background

The SMC Steering Committee asked for a Communications Plan in 2018 to ensure the SMC is optimally positioned to publicize its goals, progress and accomplishments among both internal and external audiences. The Communications Plan is the first formal plan for maximizing the effectiveness and reach of SMC communications. The goals of the Communications Plan are to get executive management and co-permittees more invested in the SMC, to improve the Steering Committee onboarding process and improve continuity during transitions, and to bring new project partners into the SMC fold. A communications strategy document has been developed to explain how the SMC will expand the impact and reach of SMC communications. Accompanying the communications strategy is a workplan that outlines a phased, five-year plan for executing the communications strategy. Implementation of the Communications Plan kicked off in January 2020.

Objectives and Products

The SMC Communications Plan has six main objectives for the first three years, with multiple products that will be developed to support each objective.

YEAR 1

Objective 1: Provide support to SMC Steering Committee members to maximize their effectiveness in helping to optimally shape the SMC's research agenda.

- Develop a written orientation guide for new SMC Steering Committee members that introduces them to what the Steering Committee does and that outlines their roles, responsibilities and opportunities as a Committee member.
- Develop a complementary training program to be presented to the entire Steering Committee that coincides with the publication of the orientation guide.
- Develop guidance/protocols for how SMC members can and should appropriately communicate and promote the SMC in their official capacity as SMC members.

Objective 2: Develop a structured written communications vehicle through which the SMC can periodically share news and updates with its supporters.

- Conceptualize a template for a quarterly or biannual email blast newsletter, including researching/prioritizing what elements it should contain and how those elements can be consistently/systematically developed.
- Lead the development, writing and editing of the first issue of this newsletter.
- Provide training, documentation and support to the SMC Administrator on how to plan for and put together each issue of the newsletter.

Objective 3: Quantify the SMC's impact on stormwater research and management.

- Research/decide on metrics that best encapsulate and represent the SMC's positive impact on both science and management.
- Develop systems and SOPs that ensure the SMC Administrator can consistently track, report on and publicize metrics.

YEAR 2

Objective 4: Reimagine the SMC's Annual Report as less of a documentation exercise and more of a thought leadership opportunity.

- Research/develop a concept for a revamped SMC Annual Report that satisfies the SMC's need to document SMC accomplishments, while also positioning the SMC as a thought leader in the field.
- Lead the development, writing and editing of the first revamped SMC Annual Report.
- Provide training, documentation and support to the SMC Administrator on how to plan for and put together the Annual Report going forward.

Task 5: Enhance and improve the SMC website to ensure it fully captures and reflects all of the new SMC communications activities.

- Lead a review/visioning process to determine how to redesign and add to the SMC website.
- Lead the process of making structural changes to the website and writing and editing all new content.
- Provide backend coding/development support to support website changes.

YEARS 2 and 3

Task 6: Grow the size of the SMC's audience by publicizing the SMC through additional communications vehicles.

- Research additional communications vehicles through which the SMC should be communicating (e.g., social media, roadshow, articles and other content in third-party outlets).
- Develop and present a plan for how the SMC will communicate through these additional communications vehicles.
- Lead the development, writing and editing of all content for these communications vehicles in the first year.
- Develop metrics to track the effectiveness of these communications activities.

Project Accomplishments (FY 2019/2020)

In the first six months of 2020, the SMC laid a foundation for accomplishing all of its Year 1 objectives.

- The SMC developed and approved a tentative list of topics for the first year of newsletters.
- The SMC developed and endorsed an outline for an orientation guide that will be written to help get new Steering Committee members quickly up to speed.
- The SMC agreed to hold a remote, three-part metrics workshop in summer 2020 to engage in strategic planning for the organization, including revisiting the SMC's mission and vision statements, strategic goals and the metrics the SMC will use to measure its progress. The products of this workshop will inform the development of most other elements in the Communications Plan.

- The SMC authorized an expansion of its email listserves to enable the organization to more effectively target communications to specific audiences.

Project-related Publications

The SMC has developed two documents to guide the implementation of the SMC Communications Strategy:

- SMC Communications Strategy (2019)
- SMC Workplan to Execute Communications Strategy (2019)

5 PROJECTS PLANNED FOR 2019-2020

The summaries reported in this section represent strategic planning efforts or new projects that have been identified as supporting a SMC priority and have received member agency support to be implemented during the 2019-2020 reporting year.

5.1 Linking Indicators of Fecal Contamination to Human Health Risk

Existing regulatory thresholds designed to protect body-contact recreation in southern California are based on epidemiology studies that were conducted outside of southern California in dry weather when sewage was present (Wade et al. 2006). The thresholds focus on fecal indicator bacteria – primarily enterococci and *E. coli*. However, these indicator bacteria thresholds may not be relevant to actual health risk for multiple reasons: sanitary sewers and storm sewers are separate in southern California, and not all enterococci and *E. coli* entering receiving waters in southern California originate from human fecal sources; indeed, these bacteria may be endemic in soils and sediments. Furthermore, the most frequently used tool for detecting human fecal contamination, HF183, is not a pathogen and has rarely been correlated with human health risk in epidemiology studies. To effectively protect public health, stormwater managers need to better understand the relationship between indicators of fecal pollution in southern California recreational waters and human health risk from pathogens. Several potential indicators of human fecal pollution exist that could be evaluated for risk correlations during dry and/or wet weather: coliphage, HF183, specific genetic sequences from *Enterococcus faecium*, and *Lachnospiraceae* markers. Then, prediction of human health risk from a given level of existing or new indicators can be achieved by using risk assessment models such as quantitative microbial risk assessment (QMRA).

This project will identify and evaluate indicators that can be used to reliably and accurately assess human health risk during dry and/or wet weather. The project is intended to pave the way for pursuing new, human specific indicators as a viable option to measuring traditional indicator bacteria. This project will consist of five tasks, each dependent upon the other, and require 24 months for inception to completion.

Task	Product	Cumulative Months to completion
1. Identify potential indicators	List of recommended indicators	2
2. Test indicators from human sources	Presentation on indicator concentrations from each source	14
3. Test indicators from non-human sources	Presentation on indicator concentrations from each source	14
4. Measure pathogens in human sources	Presentation on pathogen concentrations from each source	14

5. Develop health risk estimates using QMRA	Risk profile for each human fecal indicator for setting priorities or target thresholds	24
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5.2 Regional BMP Monitoring Network

Thousands of BMPs have been installed across southern California, and thousands more will be installed over the next 20 years for regulatory compliance, even as little is known about their long-term performance for improving water quality and managing runoff. Despite the growing investment in BMPs, there is a dearth of field data documenting BMP performance for water quality treatment, hydromodification mitigation, operations and maintenance requirements, and other potential benefits. The performance effectiveness programs that currently exist have used different study designs, measured inconsistent indicators, and utilized varying quality assurance requirements. Finally, even if comparable data were collected, there is no uniform framework for sharing these critical monitoring data. A coordinated regional approach to site-scale BMP performance monitoring that encompasses multiple sites monitored concurrently, and where many agencies monitor a subset of BMP types, would be a cost-effective and efficient way to collect large amounts of data in a short amount of time to inform BMP design improvements, as well as operation and maintenance requirements.

The SMC has an existing regional monitoring program for assessing stream health. This regional monitoring program sets the standard for how stream health monitoring is conducted statewide, including California’s Surface Water Ambient Monitoring Program, and has been used as an example for initiating similar programs across the country. The advantage of the SMC’s regional stream monitoring program is the grass roots, integrated and coordinated monitoring effort. While SCCWRP facilitates the regional monitoring, each of the SMC member agencies conducts the monitoring within their jurisdiction, then combines their data with the comparable data from the other SMC member agencies. In this way, each member agency has the information it needs for complying with regulatory requirements, but leverages their effort by an order of magnitude by combining across jurisdictions to make watershed or regional scale assessments. The result of the collaboration is unparalleled information at a fraction of the cost providing insights and context achieved no other way.

This project will develop a regional BMP monitoring program to generate robust, statistically relevant data sets covering a range of BMP types, serving multiple land uses, across a spectrum of operating conditions. These data will be used to improve BMP selection guidance, streamline annual reporting, develop cost-effective asset management programs, and support Reasonable Assurance Analysis and Alternative Compliance. The initial phase of the regional network (i.e. this project) is limited to structural BMPs, since developing a work plan to evaluate non-structural BMPs is covered in Project 3.5.

This project will require approximately 36 months to initiate the network and pilot the

regional monitoring program, and then the program will be ready for full-scale launch.

TASK	DELIVERABLE	DUE DATE (months from project initiation)
1. Form an SMC technical committee	List of names and contact information for working group members	3
2. Identify monitoring questions	Technical memo summarizing monitoring questions	6
3. Inventory existing and planned structural BMPs	GIS repository identifying BMP locations	14
4. Create a study design	Sampling and Analysis Plan, QA Project Plan	14
5. Establish a field tech support team	Ranked/prioritized BMP sites for field monitoring	24
6. Revise or expand California BMP Database and/or SMC Data Portal to serve as repository for field monitoring data	Updated data portal for sharing and analyzing data	30
7. Conduct a pilot regional survey to test monitoring program	Case study report with recommendations	36

5.3. Laboratory Intercalibration Study

One goal of the southern California Stormwater Monitoring Coalition (SMC) is to compile monitoring data from separate monitoring programs to make regionwide assessments. The SMC has begun integrating their monitoring programs by agreeing on goals, objectives, and study designs as part of their development of a southern California Model Monitoring Program. As part of the model monitoring program, 11 analytical laboratories that perform chemical analysis of runoff samples for SMC member agencies conducted two intercalibration studies to assess interlaboratory variability and enhance comparability.

The laboratory intercalibration studies quantified the range of variability both within and among laboratories that SMC member agencies can expect when examining their own data or combining data with other agencies. It was successful because the laboratories worked together to minimize interlaboratory variability through the use of performance-based limits for accuracy, precision, and sensitivity. The intercalibration studies also defined a series of protocols for specific analytical techniques where performance-based guidelines needed to be enhanced with methodological consistency to ensure comparability. Finally, the intercalibration and resulting guidelines/protocols were documented in a Laboratory Guidance Manual for SMC member agency laboratories and supported with draft contract language for member agencies.

The laboratory Guidance Manual and intercalibration efforts, however, were incomplete

in two areas. The first area was the need to repeat the intercalibration periodically as new laboratories, or new personnel at existing laboratories, come along. The second area was the need to intercalibrate on additional constituents. The original laboratory intercalibrations focused on suspended solids (TSS), nutrients, trace metals, and organic constituents such as chlorinated hydrocarbons (CHC) and pyrethroid pesticides. However, other organic constituents such as organophosphorus pesticides (OP) and polycyclic aromatic hydrocarbons (PAH) were not included.

The goal of this proposal is to complete the two areas of missing information to make the Laboratory Guidance Manual and draft contract language an ongoing and effective document. It will involve three steps: 1) establish an annual laboratory intercalibration for TSS, nutrients, and trace metals; 2) initiate an annual intercalibration for remaining organic constituents; and 3) initiate an annual toxicity testing intercalibration program.

This project is an ongoing study and should be completed annually, up to four years. However, organic constituents can alternate between years. This project is anticipated to start on November 1, 2020.

5.4 Streamlining Annual Reporting

Although SMC member agencies spend hundreds to thousands of person-hours each year to produce “annual reports” as a compliance requirement, there is little guidance for reporting these compliance requirements. As a result, annual reports are difficult to read and understand, are almost always comprised of non-machine-readable data, and rarely get used beyond their one-time specific application. Both regulated and regulatory agencies are left with a feeling of wasted effort, incomplete outcomes, and lost opportunities to glean more information and insight. Because both regulated and regulatory agencies are members of the SMC, there is an opportunity to dramatically streamline guidance for annual reporting, focusing on performance metrics that provide the key information for decision-making and that facilitate the reports’ production using an automated, seamless, and transparent process.

This project will accomplish three objectives: 1) identify key metrics that are the essence of program effectiveness, 2) create a data platform for incorporating the data necessary to track and calculate the key metrics, and 3) generate a user interface for quickly and efficiently automating the Annual Report using the key metrics as the focal point of the report format. Ultimately, this project will streamline Annual Reporting for SMC member agencies while producing more actionable information.

This project will require 48 months to complete from project award and initiation.

Task	Deliverable	Due Date
1. Create a Focus Group	SMC Focus Group Committee membership	3
2. Review Current Annual Reports	Inventory of existing SMC member agency Annual Reports	6
3. Identify key metrics for assessing compliance	Key metrics recommended by the Focus Group and approved by SMC Steering Committee	12
4. Create a data platform for data to support key metrics.	Data platform template, data upload/download training tools, user interface with documentation	18
5. Pilot test the streamlined annual report web interface	Summary on success of Pilot test implementation	24
6. Use the Focus Group to refine the new Annual Report format	Report recommending the new Annual Reporting format	48