SOUTHERN CALIFORNIA STORMWATER MONITORING COALITION

2021-2022
ANNUAL REPORT

Contents

Introduction to the SMC

The Southern California Stormwater Monitoring Coalition (SMC) is a partnership of 16 stormwater management agencies working to develop solutions to regional challenges in stormwater management. Since its founding in 2001, the SMC has been pooling its members' resources and expertise to collaboratively conceptualize, develop and fund stormwater research and monitoring initiatives across coastal southern California. This collaborative approach to stormwater management has influenced the development of NPDES permits, 303(d) listings and TMDLs, watershed plans, and stormwater monitoring designs.

SMC mission statement

To solve stormwater management challenges across southern California by building regional consensus around best-in-class tools, methods and monitoring strategies

SMC member agencies

The SMC's 16 member agencies represent the region's largest stormwater management agencies and the regulatory agencies that oversee them. Indirectly, SMC member agencies represent many additional co-permittees.

Stormwater regulated agencies

- City of Los Angeles Watershed Protection Division
- City of Long Beach
- City of San Diego
- Orange County Public Works
- San Diego County Watershed Protection Program
- San Bernardino County Flood Control District
- Los Angeles County Flood Control District
- Riverside County Flood Control and Water Conservation District
- Ventura County Watershed Protection District
- State of California Department of Transportation (Caltrans)

Stormwater regulatory agencies

- Los Angeles Regional Water Quality Control Board
- San Diego Regional Water Quality Control Board
- Santa Ana Regional Water Quality Control Board
- California State Water Resources Control Board
- *(collaborating organization)* U.S. Environmental Protection Agency Office of Research and Development

Non-regulatory/R&D

- Southern California Coastal Water Research Project (SCCWRP)

A field crew for the SMC's Regional Watershed Monitoring Program collects data at a stream site in the Santa Monica Mountains. The cyclical stream monitoring program enables SMC member agencies to generate comparable data sets that paint a rich, encompassing portrait of regional ecosystem health.

The SMC was founded in **2001** when a group of local stormwater management agencies decided they could more effectively pursue their stormwater management priorities by working together. SMC member agencies come from both the regulated and regulatory sectors.

Through a cooperative agreement known as the **SMC Master Agreement**, the SMC's 16 agencies come together to investigate stormwater mechanisms and receiving-water impacts on a regional scale, as well as solutions for improving and protecting watershed health.

SMC projects are funded via a **co-funding model**, where SMC member agencies voluntarily pay for just the work that the Steering Committee has agreed to fund for the fiscal year. This co-funding model enables SMC member agencies to directly select which projects they fund.

SMC Progress Report

The SMC invests in high-quality science and engineering research to build a strong technical foundation upon which to optimize the effectiveness of stormwater management practices in coastal southern California. All of the SMC's work is guided by three main goals. The SMC uses multiple indicators to quantify its progress toward achieving these goals.

Fostering cooperation and collaboration

SMC Goal #1

Foster cooperation and collaboration among SMC member agencies to advance regional stormwater management

Progress Indicators

» **47** external organizations that have partnered with the SMC on research and monitoring over the past five years

» **9 out of 10** SMC projects over the past five years that were done in collaboration with partners external to the SMC

» **67:1** projected average cost-leveraging ratio for each SMC member agency when all SMC 2019-2024 Research Agenda projects are completed

Advancing scientific knowledge

SMC Goal #2

Advance and expand understanding of the science and engineering behind stormwater management

Progress Indicators

» **4 out of 5** SMC projects completed on time and on budget over the past five years

» **5 out of 5** SMC projects over the past five years whose findings have been published in technical reports and/or peer-reviewed scientific literature

Improving management practices

SMC Goal #3

Use SMC research and monitoring data to improve stormwater management practices across southern California

Progress Indicators

» **71%** of SMC member agencies that report that the SMC's work in 2017-2021 positively influenced at least one decision or action within their agency

» **93%** of SMC member agencies that say they believe the SMC can and should strive to have an even more influential impact on stormwater management practices than the organization does today

A 10-member panel of independent technical experts meets at SCCWRP in 2019 to collaboratively develop the SMC's 2019-2024 Research Agenda, a forward-looking document that lays out SMC research priorities over a five-year period. The SMC Research Agenda serves as a roadmap and a guide that helps the SMC decide which research projects to prioritize and fund over the coming five years.

Outgoing Chair's Message

Rebekah Guill

This concludes my second and final year as the SMC Steering Committee Chair and I want to say thank you to all the SMC members for their participation, investment, and commitment to the SMC mission. I am personally driven by the excellence exhibited by my fellow members of the SMC Steering Committee. Despite the difficulties faced during the COVID-19 pandemic, the serving members continued their attention on the priorities for the coming year and being part of the initial implementation of the SMC's strategic plan for increasing our reach and effectiveness as an organization.

Over the past year, we've engaged in in-depth, one-on-one interviews with each of our member agencies to gauge effectiveness of our investments to date with communications and outreach, as well as our research and monitoring portfolio as a whole. From those conversations, we decided to develop a speakers bureau that will allow member agencies to request presentations on-demand about SMC topics they're interested in. Expect to hear much more from the SMC as we design and build the speakers bureau over this next year.

This is the second year that the SMC has published the Annual Report in this reimagined format. It is just one example of the recent successes we've had updating, modernizing and expanding the SMC's communications efforts. We also completed a revamped SMC website, www.socalsmc.org, and are sending out periodic email newsletters to better communicate project status, products, and initiatives. Keep a look out for our updates and please reach out if you want to be added to the newsletter distribution.

I am looking forward to the new leadership of the executive team in the coming year. The SMC Steering Committee is strong in collaboration and engagement as ever.

Rebekah Guill
Chair, SMC Steering Committee, 2020-2022

Senior Flood Control Planner, Riverside County Flood Control and Water Conservation District

Incoming Chair's Message

David Laak

I'm very humbled and honored to be the newly elected Chair of SMC, and excited about the wide variety of interesting and impactful projects that SMC is undertaking as part of its 2019-2024 Research Agenda. The value of SMC's regional approach cannot be overstated.

We recently learned from an internal survey that 93% of SMC member agencies believe the SMC has the potential to have more of an impact on stormwater management than it does currently. I'm excited to be working alongside a very dedicated group of stormwater management professionals within SMC and have no doubt that the collective effort of all involved will lead to more tangible impacts to each member agency and the southern California stormwater community. We have dedicated and engaged Steering Committee members, project partners, and supportive member agency organizations. We will sustain the momentum that has built over the past few years with our new communication and strategic planning efforts, along with a broad portfolio of managerially relevant research and monitoring initiatives.

With a wide variety of projects continuing and new projects beginning this year, I am particularly looking forward to the kickoff of a project that will develop a framework for improving biological conditions in modified streams. All SMC members are going to be faced with tough decisions about protecting biological conditions in streams while also maintaining the stream channels for flood protection and other uses. Through this project, SMC members should gain the tools they need to support healthy streams and to target their restoration, water quality improvement, and flow management activities in locations with the greatest likelihood of success. This is just another example of how SMC identifies and works on priority projects that have real-world implications for water quality managers.

I hope you enjoy the 2021-2022 SMC Annual Report and find its contents of interest. I appreciate any feedback on the report and look forward to a productive and exciting year of collaboration ahead.

David Laak
Chair, SMC Steering Committee, 2022-present

Stormwater Resources Manager, Ventura County Watershed Protection District

FEATURE ARTICLE

Reflecting on two decades of SMC investments in fecal contamination management

Since its 2001 founding, the SMC has been a key driver in advancing the science that managers rely on to protect public health

Two decades ago, stormwater managers' options for monitoring fecal contamination in aquatic environments were limited.

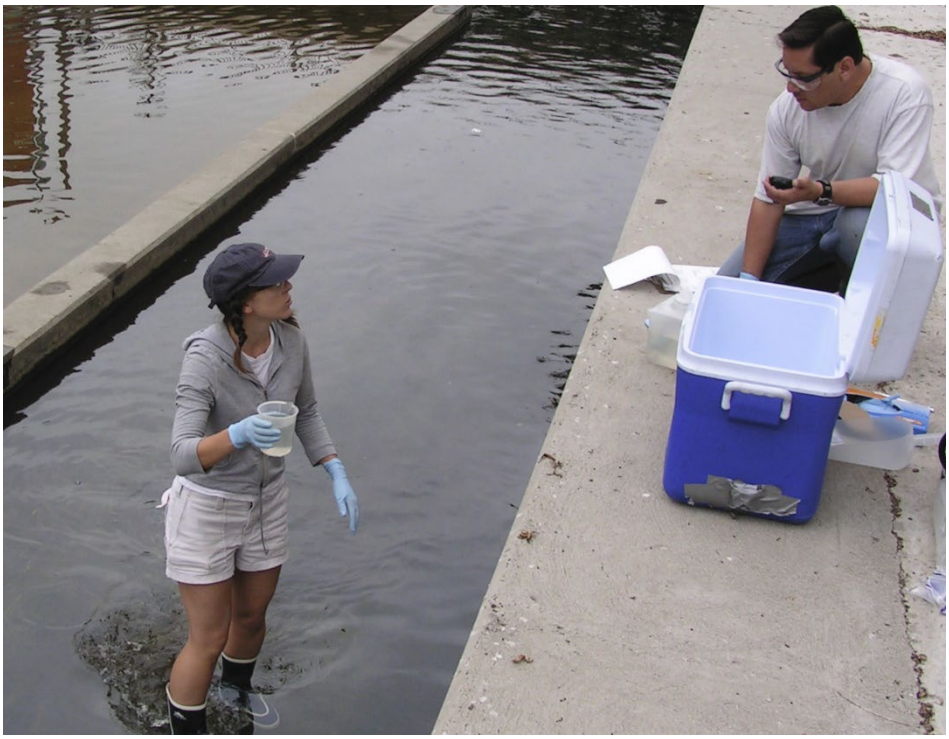
Managers relied on bacteria culture-based methods to test water for fecal pollution – an approach that requires a specific type of bacteria from a water sample to be grown overnight and then quantified. As a result, managers were limited to assessing what water-quality conditions were like yesterday.

Meanwhile, managers lacked the ability to reliably evaluate if a fecal signal in beach water is from a human source, even though the feces of other animals like birds and dogs pose a much lesser health risk to beachgoers than human feces.

Today, managers can get same-day results when testing water for fecal contamination. They also can parse whether fecal contamination is from a human vs. nonhuman source – and trace fecal signals to their upstream points of origin.

These advances have been made possible by strategic investments in research and monitoring over the past two decades – scientific investments that have helped the environmental management community to move expeditiously and effectively toward understanding health risks for Southern California beachgoers, and to prioritize remediating the biggest threats first.

At every stage of this two-decade journey, the SMC has been a key driver in advancing the science behind fecal contamination management.



A field crew collects water samples from Ballona Creek in Los Angeles County as part of an investigation into the sources of fecal contamination in the creek. Since 2001, the SMC has made strategic investments in regional research and monitoring to better understand if and how fecal contamination is threatening public health.

Since the SMC's founding in 2001, the SMC has been pooling resources and coordinating research on multiple fronts – including an ongoing effort to understand how indicators of fecal contamination measured at beaches and other recreational water bodies correspond to specific degrees of health risk.

These regional investments have helped position Southern California as a global leader in producing managerially relevant insights and tools to better manage fecal contamination.

Managing fecal contamination in runoff

At the time of the SMC's founding, wet-weather runoff was increasingly coming into focus as a major contributor to fecal pollution at Southern California beaches.

During a seminal Southern California regional monitoring study in 1998 a few years prior to the SMC's establishment, managers found that while 95% of Southern California beaches met bacterial standards during the dry-weather beachgoing months, coastal fecal contamination soared across the region during wet weather; "nonpoint" sources of fecal pollution were widely viewed as the primary culprit.

Recognizing the magnitude of this challenge, the SMC made fecal contamination the focus of one of its original scientific research projects in 2001. The project probed which of several methods in existence at the time for distinguishing among animal-specific

sources of fecal contamination were reliable, effective methods. Understanding which type(s) of animals are responsible for fecal contamination is critical, as managers prioritize remediating human sources of contamination first.

Given that none of the animal-specific source-identification methods had been subjected to rigorous, independent testing, the SMC began by partnering with the Southern California Coastal Water Research Project (SCCWRP) – an SMC member agency – to develop a national method comparison study.

The landmark study, published in 2003, found that most of the source-identification methods in use at the time – known as phenotypic methods – could not reliably distinguish among fecal sources from different animals, including humans. At the same time, the study found that DNA-based methods – known as genotypic methods – offered a consistently effective way to distinguish among different animal sources.

In response, stormwater managers across Southern California and beyond terminated their use of phenotypic source-identification methods altogether – instead shifting their focus to vetting, optimizing and standardizing genotypic methods for multiple types of priority animals, including humans.

HF183 to detect human fecal sources

Perhaps the most important breakthrough stemming from the 2003 source-identification study work was the discovery of a human-specific genetic marker known as HF183; this DNA marker is found in a type of gut bacteria known as *Bacteroides dorei*.

Researchers further validated the reliability of HF183 and other animal-specific DNA markers of fecal contamination in a follow-up method comparison study that was published in 2013. The most effective of these so-called microbial source tracking (MST) methods, including HF183, was codified in a MST user manual that remains the definitive statewide resource for tracking fecal contamination at California beaches for multiple priority animals, including birds and dogs.

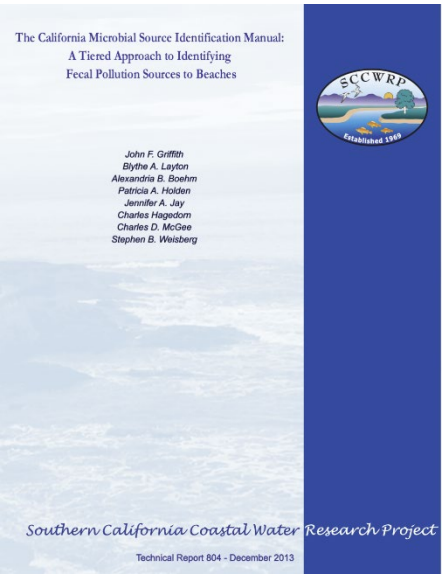
Meanwhile, HF183 has been widely adopted by managers over the past decade as the definitive tool for confirming the presence of human contamination. This particular genetic marker offers a reliable way to distinguish human sources of fecal contamination from non-human sources.

MST to detect other animal fecal contamination

Following the seminal 2003 source-identification study, managers also began generating copious data on fecal contamination levels across Southern California during both dry and wet weather. The more data that managers collected, the more that managers recognized they needed context for discerning when the fecal contamination levels they were measuring are too high.

The SMC responded by investing in a series of studies beginning in 2006 to generate comprehensive regional data sets summarizing what levels of fecal contamination that managers should expect to find in completely natural aquatic environments in the absence of human development.

These SMC studies measured background concentrations for fecal indicator bacteria at so-called "reference" sites across coastal Southern California – both for streams and the coastal ocean. SMC member agencies used the studies to help set multiple Total Maximum Daily Load (TMDL) regulatory targets for fecal contamination.



The SMC's foundational research on fecal contamination source-identification methods eventually led to publication of a 2013 manual, above, that remains the definitive statewide resource for tracking fecal contamination at California beaches.

Correlating HF183 to health risk

With Southern California managers now routinely using HF183 to detect fecal contamination in aquatic environments, the next logical question that managers need to know is how these data points translate to a specific degree of health risk for humans exposed to the contamination. In other words, managers need to know: "How much HF183 is too much?"

In 2020, the SMC launched a multi-year study to evaluate if and how HF183 can be used to quantify health risks from swimming in water bodies with contaminated runoff. Researchers are examining how to reliably and accurately measure human pathogens in runoff so that illness rates from water contact can be modeled using an approach known as quantitative microbial risk assessment (QMRA). Although QMRA has been endorsed by the U.S. Environmental Protection Agency, it has not yet been widely applied to model illness risks linked to contaminated runoff, especially in California.

Insights from this study are expected to increase the management utility of HF183 for prioritizing areas that require remediation for fecal contamination – not just in Southern California, but in any setting where managers are working to protect public health from human fecal contamination.

SMC Project Portfolio

An overview of ongoing, planned and recently completed SMC projects

		SMC 2019-2024 Research Agenda (view)					
		2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
2019-2024 Projects	**Human Fecal Indicators and Health Risk** (Research Agenda Project 2.4)		**ACCOMPLISHMENTS** » Established technical workgroup » Developed project workplan	**ACCOMPLISHMENTS** » Refined pathogen measurement methods » Completed first year of measurements	**PLANNED** » Review first-year data » Complete second year of measurements » Develop health risk models	**PLANNED** » Develop health risk estimates » Prepare final report	
	BMP Regional Monitoring (Research Agenda Project 3.4)		**ACCOMPLISHMENTS** » Established technical workgroup » Identified monitoring questions	**ACCOMPLISHMENTS** » Developed workplan » Identified candidate sites » Built portal for metadata	**PLANNED** » Train field crew » Build data portal » Launch pilot phase	**PLANNED** » Conduct pilot regional survey » Final report	**PLANNED** » Implement regional BMP monitoring network
	Chemistry Laboratory Intercalibration (Research Agenda Project 6.5)		**ACCOMPLISHMENTS** » Held kickoff meeting » Adopted 3-year schedule and scoring criteria	**ACCOMPLISHMENTS** » Completed first intercalibration round (TSS, nutrients, metals, chlorinated hydrocarbons, pyrethroids)	**PLANNED** » Second intercalibration round (to include all first-round analytes plus polycyclic aromatic hydrocarbons)	**PLANNED** » Third intercalibration round for problematic analytes	**PLANNED** » Update laboratory guidance manual
	Streamlining Annual Reporting (Research Agenda Project 4.2)		**ACCOMPLISHMENT** » Created focus group » Reviewed existing reporting practices	**ACCOMPLISHMENTS** » Developed environmental-based and program-based metrics and indicators	**PLANNED** » Create data platform template » Pilot test new web interface	**PLANNED** » Final report and recommendation for new reporting format	
	Effectiveness of Non-Structural BMPs (Research Agenda Project 3.5)			**ACCOMPLISHMENTS** » Completed literature review » Hosted workshop and developed report » Developed draft workplans for street sweeping and catch basin cleaning	**PLANNED** » Implement workplans » Collect data	**PLANNED** » Analyze data	**PLANNED** » Prepare final report
	Stream Ecological Potential Framework (Research Agenda Project 5.3)			**ACCOMPLISHMENT** » Developed workplan	**PLANNED** » Establish technical workgroup » Select study sites » Identify classes of modified streams	**PLANNED** » Evaluate likelihood of improving biological condition based on existing data, then on new data	**PLANNED** » Prepare five-year report
Ongoing initiatives	**SMC Regional Watershed Monitoring Program**	**ACCOMPLISHMENTS** » Completed second monitoring cycle (2014-2019) » Published 2018-2019 Report on the SMC Regional Stream Survey	**ACCOMPLISHMENTS** » Developed Workplan 1.0 for third monitoring cycle (2021-2025) » Initiated field sampling	**ACCOMPLISHMENTS** » Started first-year survey (on track; 20% completed) » Report on causal assessment	**PLANNED** » Complete second-year survey	**PLANNED** » Complete third-year survey	**PLANNED** » Prepare final report
	Communications Plan	**ACCOMPLISHMENT** » Developed implementation workplan	**ACCOMPLISHMENTS** » Adopted updated mission, vision, and goals/metrics » Updated SMC website » Launched quarterly newsletter	**ACCOMPLISHMENT** » Revamped SMC Annual Report	**PLANNED** » Develop SMC speakers bureau		

SMC Project Descriptions

Research Agenda Project 2.4: Human Health Indicators and Health Risk

Existing regulatory thresholds designed to protect body-contact recreation in southern California focus on fecal indicator bacteria – primarily enterococci and *E. coli,* which may not be relevant to actual health risk for multiple reasons. More recently, numerous alternative indicators of fecal pollution, including human-specific indicators, have been developed. To effectively protect public health, stormwater managers need to better understand the relationship between these newer indicators of fecal pollution in southern California recreational waters and the degrees of human health risk that they correlate to. 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 posed by fecal contamination during wet weather, paving the way for stormwater managers to answer the fundamental question of "how much of these indicators is too much" from the perspective of protecting beach recreational beneficial uses. This project will also provide identification of potential indicators; test indicators from human sources and non-sources; measurement of pathogens in human sources; and the development of health risk estimates using QMRA.

Research Agenda Project 3.4: BMP Regional Monitoring

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. 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. In addition, this project will inventory existing and planned structural BMPs, create a study design, establish a field technical support team; revise or expand California BMP database and/or SMC Data Portal as repository for field monitoring data; and conduct a pilot regional survey to test the monitoring program.

Research Agenda Project 6.5: Chemistry Laboratory Intercalibration

As part of the SMC's Model Monitoring Program, 11 analytical laboratories previously completed two intercalibration studies to assess interlaboratory variability and enhance comparability for chemical analysis of runoff samples for SMC member agencies. 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 respects, necessitating a follow-up study that will 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. This round of studies will also include the above constituents and other organic constituents, including organophosphorus pesticides (OP) and polycyclic aromatic hydrocarbons (PAH), that were not part of the original intercalibrations. This follow-up intercalibration also will provide an opportunity to repeat the intercalibration – which needs to be done periodically anyway – and to involve new laboratories and new personnel that were not part of the previous intercalibrations.

Research Agenda Project 4.2: 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, they will work together 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.

Research Agenda Project 3.5: Effectiveness of Non-Structural BMPs

The efficacy of non-structural stormwater BMPs can vary widely and is difficult to accurately quantify, even as all SMC members rely on non-structural BMPs as a first option for pollutant removal. Non-structural BMPs consist of programmatic activities, such as street sweeping or public education, as well as source control (e.g., plastic bag bans). Virtually no quantitative effectiveness data exist for some non-structural BMPs, and even where data may exist, they may not be from southern California. More reliable and quantitative information for these programs will provide greater confidence in predicting their effectiveness in improving the health of receiving water bodies, which has the potential to reduce dependence on typically more costly structural BMPs. This project, scheduled to be initiated in 2021, will create a comprehensive set of recommendations and associated workplan(s) for implementing research to quantify the contributions of non-structural BMPs to water quality improvements. This recommended workplan will also prioritize subsequent SMC research projects on non-structural BMPs, document challenges and benefits of each research project, and estimate project costs and schedule.

Research Agenda Project 5.3: Stream Ecological Potential Framework

Data from the SMC Regional Watershed Monitoring Program suggest that fully and partially engineered channels can have significantly lower bioassessment index scores compared to natural streams. At the same time, data from the SMC and other studies have observed high index scores in certain partially engineered channels. But it is unclear what sets the biological condition in some engineered channels apart from other engineered channels, and what attributes can contribute to this biological potential. The aim of this project is to inform decision-making that maintains healthy biological conditions as well as flood control goals in modified streams. Ultimately, this project's goal is to provide SMC managers with the tools they need to identify sites with the greatest potential for biological restoration, and what restoration efforts – physical habitat, flow, or water quality either alone or in combination – are expected to be most effective. This outcome should provide SMC members with the tools they need to support healthy streams (as required under stream biointegrity policies), and to target their restoration, water quality improvement, and flow management activities in locations with the greatest likelihood of success.

SMC Regional Watershed Monitoring Program

Comprising more than 7,000 stream-kilometers, southern California's coastal watersheds are diverse, ecologically and economically important habitats. Despite devoting extensive local resources to monitoring their condition, SMC member agencies historically could not draw conclusions about overall regional health until the 2009 establishment of the cyclical SMC Regional Watershed Monitoring Program. In addition to providing critical contextual information for interpreting all other stream monitoring in the region, the SMC regional monitoring program produces data that support numerous local watershed management programs and that inform development of statewide policy. The program also serves to promote data quality and comparability and consistency in field and laboratory data collection efforts. The third cycle of SMC regional monitoring is scheduled to be completed in 2024.

Communications Plan

As the SMC was approaching its 20th anniversary in 2021, the SMC recognized it had grown and matured to a point where it needed to develop a strategic communications vision and action plan for more effectively and consistently publicizing SMC goals, progress and accomplishments. The resulting Communications Plan is the SMC's first formal plan for maximizing the effectiveness and reach of SMC communications among both internal and external audiences. The plan's goals are to get executive management and co-permittees more invested in the SMC, improve the Steering Committee onboarding process (including continuity during transitions), and bring new project partners into the SMC fold. Through the Communications Plan, the SMC has updated its mission and vision statements, developed and reported on strategic goals and organizational performance metrics, introduced a quarterly newsletter and written orientation guide for new Steering Committee members, and revamped existing communications products, including the website and Annual Report.

Regional monitoring network being built to evaluate BMP performance

The SMC has begun building a regional monitoring network to help address significant, persistent knowledge gaps in managers' understanding of how to optimize the performance of a wide variety of structural stormwater BMPs (best management practices) across southern California.

The three-year initiative, which kicked off this winter with a pilot monitoring phase, will enable BMP designers, engineers and managers to collect high-quality, comparable data sets for BMP performance at multiple locations across southern California under a variety of different rainfall and site conditions.

The BMP performance data generated through the regional monitoring network will be used to inform long-term watershed planning efforts, as well as improve engineering design for multiple BMP types. Using the network, stormwater managers will be able to identify what data need to be collected to evaluate and optimize long-term treatment effectiveness for a variety of existing BMPs of different ages and maintenance protocols. The network will also help managers to identify conditions that compromise performance.

A field crew constructs a bioretention planter in Riverside County to study its mechanistic inner workings. The SMC is building a regional BMP monitoring network to help fill knowledge gaps in managers' understanding of how to optimize the performance of a wide variety of structural BMPs.

Much like the SMC's Regional Watershed Monitoring Program that assesses the ecological health of thousands of miles of streams, the network will unify and build on existing, smaller BMP monitoring efforts developed by SMC member agencies, as well as bring into the fold member agencies that have not previously conducted BMP monitoring. Over time, participants will generate high-quality, comparable and compatible data sets reflecting the broad diversity of structural BMPs across southern California.

A key impetus for the monitoring network were data gaps identified during the five-year SMC CLEAN project, which developed best-practices guidance for implementing Low-Impact Development (LID) and green infrastructure systems. Among the SMC CLEAN project's conclusions was that much more southern California monitoring data will need to be collected to improve understanding of how to optimize BMP performance in the region.

Eventually, the network is expected to become the largest of its kind in the nation – a necessity in southern California where opportunities to collect BMP performance data are limited by the region's relatively infrequent rain events.

Structural BMPs are a ubiquitous class of engineered field solutions – everything from vegetated bioswales to permeable pavement to subsurface vaults – that are implemented to control, treat and manage wet- and dry-weather runoff.

BMP performance data sets are a foundational component of empirical and modeling analyses that can help inform the optimal design, construction, maintenance and placement of BMPs across southern California and beyond.

For more information and to become part of the SMC Regional BMP Monitoring Network, contact Dr. Elizabeth Fassman-Beck.

Dive deeper

- Why southern California needs a BMP regional monitoring network
- What stormwater managers can expect from the SMC's Regional BMP Monitoring Network
- Learn more about the SMC's plans for the initial pilot phase of the Regional BMP Monitoring Network

Originally published in the SMC Winter 2022 Newsletter

SMC effort underway to build new vision for how dischargers collect, analyze stormwater data

The SMC has launched a three-year effort to assess how Southern California's stormwater management community could extract more managerially relevant insights from the millions of dollars that dischargers spend each year collecting and analyzing data as part of their stormwater permit requirements.

The ongoing SMC Streamlining Annual Reporting project, which began in early 2021, is seeking to build broad, cross-sector consensus on what types of data analyses should be conducted to communicate a cohesive, regional portrait of the progress being made by stormwater dischargers each year as they work to effectively manage wet- and dry-weather runoff across thousands of square miles of diverse, heavily urbanized Southern California landscapes.

SMC member agencies are required to collect and report data from their stormwater programs, including their stream monitoring programs, above, as part of stormwater permit annual reporting requirements. A new SMC project is working to build an updated vision for how to collect and analyze these data sets in more managerially relevant ways.

Significantly, the project is asking not only how data already being collected and reported could be better utilized and presented, but also what types of data ideally should be collected and reported to optimally improve visibility and understanding of stormwater managers' work. Project participants will work toward a common vision for how to analyze and present data more consistently and in more visual, interactive formats across Southern California – while still satisfying permit reporting requirements.

Voluminous data are routinely collected and reported as part of every stormwater discharger's permit requirements, but the data sets are not typically reported in editable, standardized ways, limiting the data's accessibility and utility. Indeed, much of the data lives only in static PDF documents.

To date, the SMC has conducted a series of structured feedback and listening sessions with an SMC-appointed focus group that includes both dischargers and regulators. The focus group

reviewed annual reporting requirements for six Phase I permits issued across southern California, as well as the structure and composition of the most recent annual reports submitted by the SMC's regulated member agencies.

Among the data analyses the focus group is considering prioritizing are water quality indices for receiving water assessments, receiving water attainment assessments, discharge assessments, and flow/volume assessments, as well as related performance metrics for each of these assessments.

Once the focus group has determined what the priority reporting assessments and metrics should be, the SMC will build a web-based platform that enables Southern California dischargers to begin submitting a subset of these priority data analyses on a pilot basis. The project will be completed by the end of 2023.

The recommendations and reporting platform developed through this project are expected to help inform decision-making by stormwater program managers and Southern California's Regional Water Quality Control Boards, which are responsible for codifying data reporting requirements into stormwater discharge permits as they come up for renewal.

Additionally, the State Water Resources Control Board is closely following the project, as it has the potential to help inform the State's own ongoing efforts to streamline, automate and standardize collection and reporting for stormwater dischargers and other regulated parties.

Dive deeper

- How the SMC envisions the project's outcomes will be used
- SMC member agencies who are serving on the project's focus group
- Overview slides from a March 2022 project update

Originally published in the SMC Spring 2022 Newsletter

SMC chemistry intercalibration to ensure consistency, quality of stormwater monitoring data

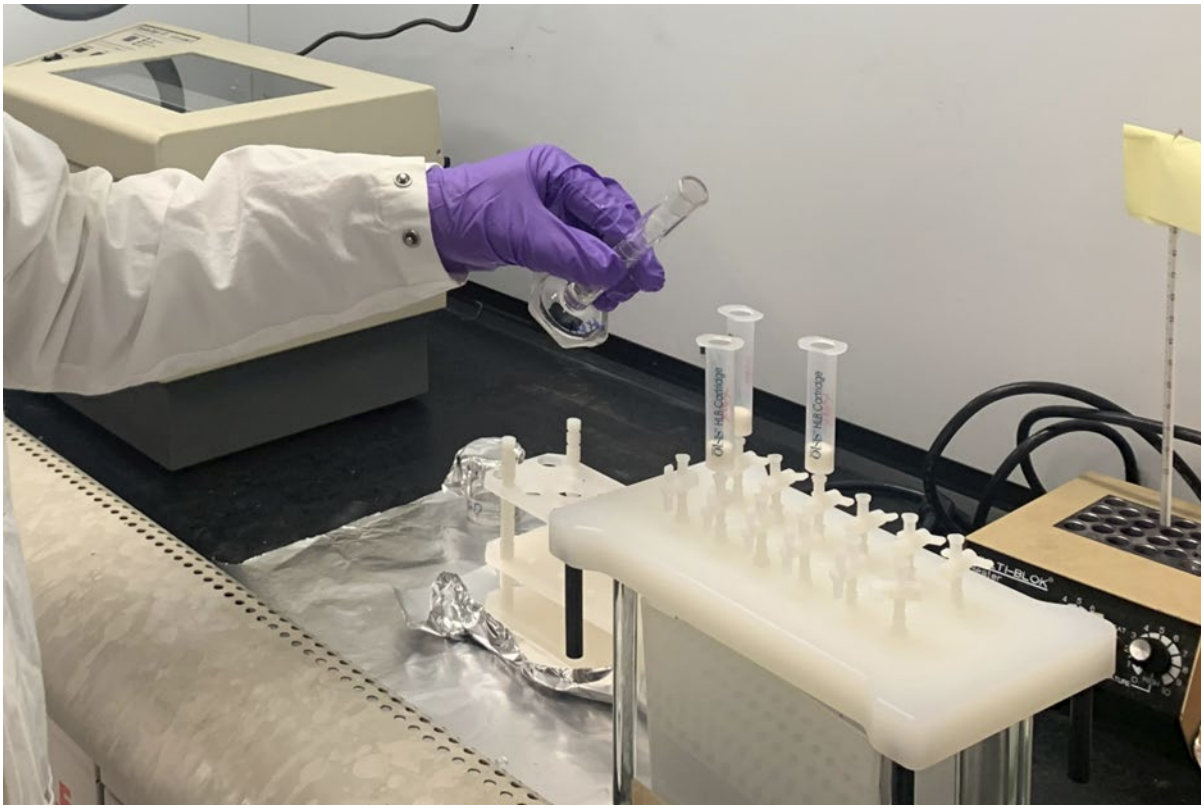
The SMC has launched the fourth cycle of a periodic intercalibration exercise intended to ensure that laboratories that perform routine chemistry analyses of Southern California runoff samples are capable of generating consistently high-quality monitoring data.

The SMC's fourth chemistry laboratory intercalibration, which was launched last year, is evaluating seven laboratories' ability to measure five different classes of chemical contaminants in wet- and dry-weather runoff.

The SMC previously hosted chemistry laboratory intercalibrations in 2004, 2007 and 2010, followed by a toxicity laboratory intercalibration in 2016. The SMC's bioassessment and physical habitat assessment intercalibrations, meanwhile, take place through annual field audits.

The periodic SMC intercalibrations are a prime opportunity for the stormwater monitoring community to come together to directly evaluate the performance of laboratories that produce stormwater monitoring data under discharge permits and other programs.

Through these intercalibrations, SMC member agencies gain confidence that laboratories they contract with are producing comparable data – and moreover, that using a different laboratory will not produce different results.



Periodic intercalibration exercises like the SMC's fourth chemistry laboratory intercalibration –launched last year – play a key role in ensuring that laboratories that generate stormwater monitoring data across Southern California are producing comparable results. SMC member agencies look favorably on laboratories that participate in the voluntary exercise as they make decisions about which laboratories to contract with for their monitoring needs.

Participating laboratories work in an iterative fashion through three rounds of analysis over a three-year period and are scored on both intra- and inter-laboratory variability. Participants help develop the study design, then collectively review and discuss results to optimize their processes in subsequent rounds.

SMC member agencies use participation in SMC intercalibration exercises as part of decision-making about which laboratories to contract with for their monitoring needs. Laboratories that participate and pass the intercalibration typically receive bonus points for proposals. Moreover, some SMC member agencies require laboratories they contract with for chemical analysis to have participated in this intercalibration.

The chemistry laboratory intercalibration is expected to be completed in 2024 and will include publication of an updated manual that provides best-practices guidance for how to ensure proficiency in chemistry analysis techniques, as well as the results of the SMC chemistry laboratory intercalibration.

Although the SMC has completed Round 1 of its three-year intercalibration cycle, additional laboratories are welcome to join in Rounds 2 and 3 as full participants. The Round 2 intercalibration is scheduled to start in fall 2022.
For more information about joining the study, contact Dr. Charles Wong with the Southern California Coastal Water Research Project (SCCWRP).

Dive deeper

- Benefits of participating in the SMC's ongoing chemistry laboratory intercalibration
- Scope of the SMC's chemistry laboratory intercalibration
- List of the seven laboratories participating in the first round of the intercalibration
- Read the full SMC guidance manual produced during the most recent 2010 chemistry laboratory intercalibration
- Read the full SMC guidance manual produced during the first toxicity laboratory intercalibration in 2016

Originally published in the SMC Summer 2022 Newsletter

Contributors to Success

The SMC's success is rooted in the talents, dedication and collaboration of the many individuals and organizations that generously give their time, expertise and funding to support the SMC.

SMC Steering Committee Members

	Agency	Lead Member		Alternate Member	
		Name	Job Title	Name	Job Title
Regulated Agencies	City of Long Beach	Melissa You	Compliance Officer	Cecilia Salazar	Environmental Specialist Associate
	City of Los Angeles Watershed Protection Division	Charlie Yu	Senior Chemist	Zora Baharians	Senior Water Biologist
	City of San Diego	Andre Sonksen	Program Manager, Trans-portation & Storm Water	Ruth Kolb	Biologist-Storm Water Specialist
	Los Angeles County Flood Control District	Melissa Turcotte	Head Environmental Engineering Specialist	Geremew Amenu	Civil Engineer
	Orange County Public Works	James Fortuna	Manager, North OC Watershed Management Area	Grant Sharp	Manager, South OC Watershed Management Area
	Riverside County Flood Control and Water Conservation District	Rebekah Guill	Senior Flood Control Planner	Richard Boon	Chief of Watershed Protection
	San Bernardino County Flood Control District	Arlene Chun	Stormwater Program Manager	Anthony Pham	Division Chief
	San Diego County Stormwater Management Program	Dr. Joanna Wisniewska	Landuse Environmental Planner III	Ryan Jensen	Land Use/Environmental Planner II
	Ventura County Watershed Protection District	David Laak ***Chair***	Stormwater Resource Manager	Arne Anselm	Deputy Director
	California Department of Transportation (Caltrans)	Bhaskar Joshi	Chief, Office of Stormwater Program Development	Cornelis Hakim	Senior Transportation Engineer
	Southern California Coastal Water Research Project	Ken Schiff	Deputy Director	Elizabeth Fassman-Beck	Principal Engineer
Regulatory Agencies	California Regional Water Quality Control Board, Los Angeles Region	Ivar Ridgeway	Senior Environmental Scientist	Vacant	
	California Regional Water Quality Control Board, San Diego Region	Chad Loflen	Senior Environmental Scientist	Wayne Chiu	Senior WRC Engineer Specialist
	California Regional Water Quality Control Board, Santa Ana Region	Adam Fischer	Chief, Inland Storm Water Unit	Vacant	
	California State Water Resources Control Board	Nicholas Martorano	Executive Director, Water Quality Monitoring Council	Amanda Magee ***Vice Chair***	STORMS Unit Chief, Division of Water Quality
	U.S. Environmental Protection Agency Office of Research and Development	Mike Borst	Engineer	Vacant	

External partners in the SMC's success

Dozens of organizations contribute to the SMC's success every year by offering their technical expertise, counsel, resources and perspective. The following is a list of every organization external to the SMC that has partnered on SMC projects over the past five years.

- AECOM
- Aquatic Bioassay & Consulting
- Babcock Laboratories
- Building Industry Association
- Caltest Analytical Laboratory
- California Department of Fish and Wildlife
- California State University, Long Beach
- California State University, Sacramento
- California Stormwater Quality Association
- CloudCompli
- Colorado School of Mines
- Contech Engineered Solutions
- Council for Watershed Health
- County of San Diego Department of Public Health
- County of Orange Health Care Agency
- Enthalpy Laboratory
- Eurofins Laboratory
- Frog Environmental
- Heal the Bay
- Larry Walker & Associates
- Marine Pollution Studies Laboratory at Granite Canyon
- MBC Aquatic Sciences
- Michael Baker International
- Moss Landing Marine Laboratories
- National Park Service
- Nautilus Environmental
- Olaunu
- Oregon State University
- Pacific EcoRisk
- Physis Laboratory
- San Francisco Estuary Institute
- Sanitation Districts of Los Angeles County
- State Water Resources Control Board Surface Water Ambient Monitoring Program
- Tetra Tech
- Truesdail Laboratory
- U.S. Army Corps of Engineers
- University of California, Davis
- University of California, Los Angeles
- University of California, San Diego
- University of Maryland, College Park
- University of California Extension
- University of South Florida
- Ventura Regional Sanitation District
- Vista Analytical Laboratory
- Weck Laboratory
- Weston Solutions
- Wood Environment and Infrastructure Solutions