
ANNUAL MONITORING REPORT 2001-2002

**Stormwater Monitoring Coalition
Of Southern California**

October 25, 2002

INTRODUCTION

Stormwater runoff in southern California has become one of the largest environmental management issues in the region. While current runoff management has become an immensely successful system for flood control, it has not historically been designed to enhance water quality. Current estimates of pollutant loads from stormwater runoff rival those of traditional point sources for many constituents, and several examples of impacts from storm drains and channels have been observed in receiving waters. Examples include the contribution of bacteria that has resulted in posting of beaches for swimming, contributions of nutrients that have resulted in blooms of macroalgae, and contributions of toxics that has led to aquatic toxicity and degradation of aquatic habitats. This combination of emissions and impacts has led to an increasing regulatory focus on stormwater runoff, but much of the science needed to make effective and efficient management decisions is still lacking.

As a result of the increasing regulatory focus and the lack of scientific knowledge base, both stormwater regulators and municipal stormwater management agencies throughout southern California have developed a collaborative working relationship. The goal of this relationship 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. As individuals and agency representatives, there was early recognition that these issues are oftentimes not localized, but typically cross watershed and jurisdictional boundaries. This relationship culminated in a formal letter of agreement signed by all of the Phase I municipal stormwater NPDES lead permittees and the NPDES regulatory agencies in southern California to create the Stormwater Monitoring Coalition (SMC) (Table 1).

The SMC member agencies have developed a clear vision of regional cooperation. The vision includes combining resources to cost effectively achieve their goal. The vision includes improved effectiveness of existing monitoring programs by promoting standardization, coordination, and reducing duplication of effort across individual programs. This will lead to improving the basic infrastructure for exchanging, combining, and analyzing data from across the region. The multi-agency collaboration hopes to trade off redundant or ineffective monitoring program elements in order to allocate resources to the research projects necessary for improving stormwater management. The findings from these applied research projects can then be easily and quickly integrated into the existing stormwater management programs.

This document outlines the activities that the SMC has accomplished over the last year. The initial project promoted by the SMC was the creation of a research agenda. The SMC has subsequently embraced three of the proposed projects in the research agenda and have begun work to accomplish the project objectives. The SMC meets on a quarterly basis to discuss these projects and ensure their success. Cumulatively, these activities demonstrate that the SMC is an active organization and is making great strides in achieving its stated goals. The common vision shared in by the initial founding members

of the SMC has taken root and is being implemented to the benefit of both regulatory and regulated communities.

Table 1. List of member agencies in the Stormwater Monitoring Coalition.

California Regional Water Quality Control Board, Los Angeles Region
California Regional Water Quality Control Board, San Diego Region
California Regional Water Quality Control Board, Santa Ana Region
City of Long Beach
County of Orange, Public Facilities and Resources Dept.
County of San Diego Stormwater Management Program
Los Angeles County Department of Public Works
Riverside County Flood Control and Water Conservation District
San Bernardino County Flood Control District
Southern California Coastal Water Research Project
Ventura County Flood Control District

YEAR END PROJECT STATUS

Creation of a Stormwater Research Agenda (status: complete)

The first project undertaken by the SMC was to develop a research agenda they could jointly undertake. Creation of this research agenda required careful consideration since this document would form the basis of future activities by the SMC. Therefore, the SMC assembled a panel of 16 experts, in a variety of disciplines, for a 3-day facilitated workshop. These experts included hydrologists, civil engineers, water quality scientists, biologists, toxicologists, statisticians, modelers as well as representatives from the regulatory, regulated and environmental community. The goal of the workshop was to create a list of priority project descriptions including background and objectives, general approach, expected products, as well as a timeline and estimated budget. This project was jointly funded by all SMC sponsoring agencies.

The final research agenda was comprised of 15 distinct projects. The 15 projects fell into a three-part framework that included building a monitoring infrastructure, understanding stormwater mechanisms and processes, and understanding receiving water impacts. Building monitoring infrastructure included projects such as developing standardized sampling and analysis protocols, assessing BMP effectiveness, and examining historical monitoring data. Understanding stormwater mechanisms and processes included projects such as developing a systemwide conceptual model, identifying non-point sources that contribute to stormwater, and determining appropriate reference conditions. Understanding receiving water impacts included projects such as developing bioassessment indicators and protocols, developing microbial source tracking techniques, and evaluating indicators of peak flow impacts. The final report entitled "Stormwater

Research Needs in Southern California” can be found online at ftp://ftp.sccwrp.org/pub/download/PDFs/358_stormwater_workplan.pdf

Develop standardized sampling and analysis protocols (Status: initiated and ongoing)

This project is an attempt to build a stormwater monitoring infrastructure in order to increase comparability among programs throughout southern California. The SMC developed a four-step approach to accomplish this goal: (1) define the monitoring questions of interest, (2) assess what monitoring programs are currently doing to determine how well they are answering the monitoring questions, (3) create an optimum design for answering the monitoring questions, and (4) conduct QA intercalibration studies. This study is partially funded by the State Water Resources Control Board (SWRCB) in response to SB 72, whose legislative goal was to standardize sampling, analysis and reporting for stormwater monitoring. It has been made clear that the SMC is only developing a design for the southern California region.

There has been substantial progress thus far. A technical working group has been formed to guide the study and includes the stormwater agencies and regulators on the SMC, the SWRCB, and at least one environmental group. The group has had one meeting and has begun defining the monitoring questions of interest (step 1). The SMC is currently recruiting a facilitator to continue this process. A laboratory intercalibration is in its initial stages will be completed in the upcoming year.

Microbial Source Tracking Method Comparison (status: initiated and ongoing)

There are numerous waterbodies throughout southern California, both marine and freshwater, that suffer contamination of fecal indicator bacteria such as total coliforms, fecal coliforms, and *enterococcus*. There are several Microbial Source Tracking (MST) techniques now being developed for determining sources (i.e. humans, dogs, cats, horses, etc.) of fecal indicator bacteria in receiving waters. However, all of them are in the early stages of development and none have been tested side-by-side for their ability to accurately discriminate or quantify these sources of fecal contamination. This study was designed to evaluate each of these new methods for accuracy and precision, using bacterial sources from southern California, and then make recommendations to the management community on the most effective and efficient method application(s). The SMC is partially funding this study in collaboration with the US Environmental Protection Agency, State Water Resources Control Board, City of Santa Barbara, and the National Water Research Institute.

Twenty-one of the most prominent researchers in the field are testing nine different MST techniques all at the same time on the same split samples. These techniques include techniques such as ribotyping, antibiotic resistance (ARA), pulsed-field gel

electrophoresis (PFGE), polymerase chain reaction (PCR), and terminal restriction fragment length polymorphism (TRFLP). Each of the specific sources were collected in October and shipped to the researchers for characterization. Next, each sample was added to sterile freshwater or seawater in varying mixtures and densities, then were delivered blind to each laboratory. Each researcher will be asked three questions regarding the blind samples: 1) are human or non-human sources of indicator bacteria are present? 2) if non-human sources are present, what source are they (i.e., dog, cow, seagull)? and 3) what fraction of the sample is attributable to each source? Sample analysis is currently underway and results are expected by February 2003.

Peak Flow Impacts (status: initiated)

Watershed development increases imperviousness eventually leading to alterations in runoff flow regimes. This alteration in flow regime, particularly increased flows during high frequency events (i.e. 1-2 year storms), can result in downstream impacts such as increased erosion or habitat loss. The goal of this study is to quantify impacts from increased peak flows as a result of watershed development. Ultimately, the objective of this study is to develop indicators of peak flow and resulting peak flow impacts so that regulators and regulated agencies can develop numerical criteria for peak flow. This project is fully funded by the Los Angeles County Department of Public Works (LACDPW), although all of the SMC members are interested in this study.

This project is in its initial stages. A Request for Proposals (RFP) was released, written proposals were submitted, and short-listed bidders have had an oral interview. The SMC selection committee is in the process of selecting the winning bidder.