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SCCWRP Director's Report



WINTER 2024 ISSUE

Bight '23 shellfish study to benefit 4 study elements

The 2023 cycle of the Southern California Bight Regional Monitoring Program has launched a year-long investigation to comprehensively track the accumulation of multiple different types of contaminants in shellfish – a highly leveraged effort that will generate insights benefitting four Bight '23 study elements.

The Bight '23 shellfish assessment, which kicked off in January, will investigate the degree to which legacy contaminants, PFAS (per- and polyfluoroalkyl substances), toxins produced by harmful algal blooms (HABs), microplastics, and pathogens are accumulating in the tissues of oysters and mussels.

Via this study, four separate Bight '23 study elements that have traditionally operated mostly in silos – Sediment Quality, HABs, Trash and Microbiology – will work collaboratively to oversee and manage the shellfish assessment, making it a uniquely cross-cutting Bight '23 investigation.

The shellfish assessment's kickoff follows the [successful completion of field sampling](#) for the Bight '23 Sediment Quality study element last summer.

Shellfish, which are filter feeders that can inadvertently take up and concentrate contaminants from surrounding water, are a cornerstone of marine food webs. Humans also consume locally harvested shellfish and use shellfish as fishing bait, underscoring the importance of assessing what levels and types of contaminants are accumulating in their tissues.

Field crews are collecting wild oysters and mussels from 30 sites from the Southern California Bight coastal zone that are ecologically important or popular recreational harvesting locations. Samples will be collected during the winter, spring and fall to capture a range of exposure conditions and pathways in the Bight.

The field protocols and selection of monitoring sites are being informed by the California State Mussel Watch Program, which monitored contamination levels in

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Cover photo: SCCWRP's Samuel Lillywhite, center, demonstrates how to collect shellfish in Newport Harbor in Orange County during a training with Bight '23 sampling partners. The Southern California Bight Regional Monitoring Program has launched an investigation to comprehensively track the accumulation of multiple types of contaminants in shellfish.

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Calendar

Thursday, February 1
CTAG quarterly meeting
(Hybrid meeting)

Friday, March 1
Commission meeting
(In-person meeting)

mussels from the 1970s to 2003. Significantly, the Bight '23 shellfish assessment will compare its data to historical Mussel Watch data. Mussel Watch also is expected to resume monitoring this year in coordination with Bight '23.

The Bight '23 shellfish assessment is targeting both oysters and mussels, which can hold contaminants in their tissues for differing amounts of time. Oysters also are

a cornerstone species in ongoing efforts to build "living shorelines" across California that help restore and protect vulnerable coastal areas. Mussels, meanwhile, are often used as bait for recreational sportfishing.

Bight '23 intends to report concentrations of each indicator relative to human health and ecosystem health thresholds that could result in impacts from consumption of shellfish tissues.

The study will also provide regional context benefitting multiple local studies investigating the effects of contamination on shellfish in the Bight, including an ongoing monthly HAB toxin shellfish survey overseen by the Los Angeles Regional Water Quality Control Board, a shellfish contaminant assessment in San Diego County, and an ongoing study examining the appropriateness of an existing California water-quality standard designed to protect the health of people who consume shellfish.

The shellfish study represents the Bight program's bioaccumulation study for Bight '23. Since 1998, the Bight program has conducted bioaccumulation studies as a line of evidence supporting the overall contaminant impact narrative for the Sediment Quality study element. Previous bioaccumulation studies have focused on sportfish and bird eggs.

Bioaccumulation is the process by which contamination in sediment and the water column passes through marine food webs from prey to predator, eventually reaching humans.

For more information, contact Dr. [Karen McLaughlin](#) or Dr. [Jayme Smith](#).



The Southern California Bight 2023 Regional Monitoring Program has launched a year-long investigation to track accumulation of multiple types of contaminants in both oysters, above, and mussels.

SMC studies being used to investigate BMPs' potential to remove microplastics in runoff

SCCWRP and its partners have initiated a pair of studies exploring the potential of different types of stormwater BMPs to reduce microplastics pollution in runoff – with both studies leveraging ongoing Southern California Stormwater Monitoring Coalition (SMC) investigations examining BMP effectiveness at removing a range of traditional stormwater pollutants.

For both microplastics investigations, researchers are building on the SMC's original study designs – which are focused on contaminants like sediments, nutrients, trace heavy metals and bacteria – to also

evaluate the BMPs' potential to remove microplastics.

BMPs are stormwater management solutions designed to improve runoff water quality and quantity. Although not expressly designed to remove microplastics, some BMPs are designed to filter and/or retain particulate matter – suggesting their potential to also remove microplastics.

Investigating potential solutions for curbing the spread of microplastics in aquatic environments is a statewide priority for California, which last year released a comprehensive [microplastics](#)

[management strategy](#) to help chart future directions for microplastics research.

During the pair of studies, researchers will measure microplastics removal efficacy for two types of BMPs:

» Structural BMPs – specifically, biofiltration and bioretention systems, which are ubiquitous BMP solutions in Southern California

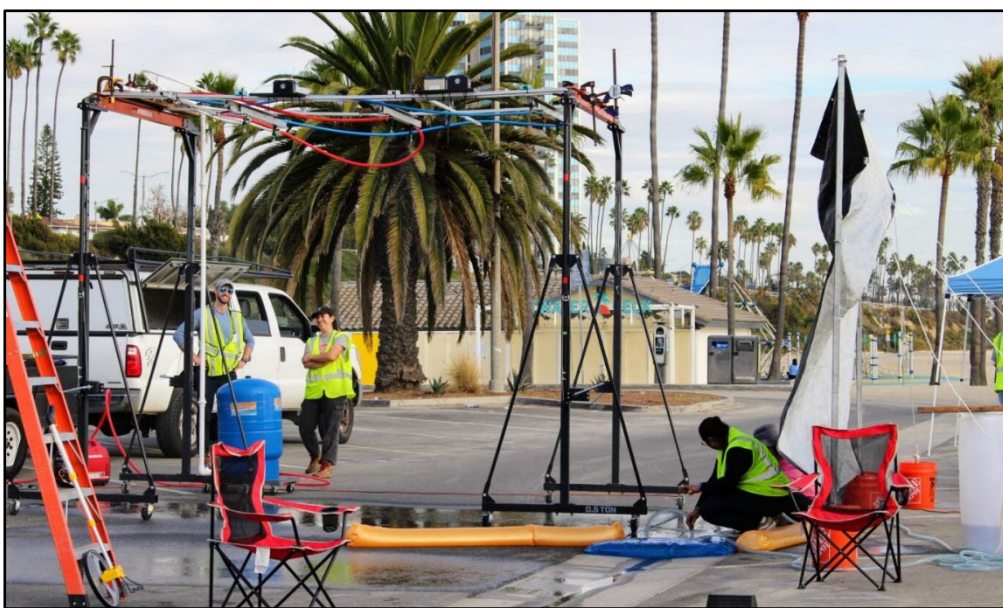
» Non-structural BMPs – specifically, routine street sweeping, which is a ubiquitous strategy for managing trash and debris on roadways that also may reduce pollution loading to storm drains

Because both microplastics studies are add-ons to existing SMC BMP investigations, the studies are benefitting from cost and resource leveraging.

For the structural BMP microplastics investigation, which was launched in November, researchers are leveraging the SMC's one-year-old Regional BMP Monitoring Network, a regional monitoring program collecting high-quality, comparable data on how effectively structural BMPs remove a range of common pollutants in runoff.

As part of the BMP monitoring program's ongoing 2023-2024 wet-weather sampling season, researchers are studying microplastics capture efficacy at up to six bioretention and biofiltration BMP sites across Southern California. The study is working to understand how specific characteristics of different types of BMP engineered media influence the removal of microplastics from runoff.

The study's partners are California State University, Long Beach and California State University, Los Angeles, which are recruiting a team of university students to help collect samples in the field, as well as measure their microplastics content in the laboratory. The study is aiming to recruit students from underrepresented backgrounds to create unique career development opportunities.



A field crew uses a custom-built rainfall generator to create controlled wet-weather conditions in a Long Beach parking lot – part of an effort to quantify street sweeping's effectiveness in preventing roadway pollution from entering storm drains. Researchers are leveraging the study to also investigate street sweeping's ability to remove microplastics.

For the non-structural BMP microplastics investigation, which was launched last spring, researchers are leveraging an ongoing SMC study investigating the effectiveness of street sweeping at removing pollution on roadways that would otherwise enter storm drains and contribute to runoff pollution.

The street sweeping study is using a field-deployable rainfall generator custom-built

by SCCWRP to quantify street sweeping's effectiveness in removing multiple types of stormwater contaminants, including microplastics. The microplastics component was added onto the street sweeping study via a collaboration with the City of Santa Barbara.

For more information, contact Dr. [Elizabeth Fassman-Beck](#).

Effort launched to develop protective assessment tools for California streams

SCCWRP and its partners have begun developing a suite of tools to help managers identify the specific stressors that present significant ecological risks to California streams that are in good health – a new frontier known as stream protective assessment that will complement causal assessment.

The protective assessment tools, which researchers began working to build in late October, will use stream monitoring data to shed light on how much risk different environmental stressors pose to the health of the stream's biological communities.

The tools will focus on a range of common stressors, such as altered flow, altered habitat and elevated conductivity. Each stressor will be rated either a high, medium or low risk.

The protective assessment tools are being designed to illuminate the most serious ecological threats facing streams that are presently in good health, enabling managers to take informed actions to prevent these streams from experiencing ecological degradation. Proactive management steps could include stream restoration projects and/or implementing stormwater BMPs (best management

practices) to remove contaminants in runoff.

As with causal assessment, these protective assessment tools will provide site-specific insights about vulnerabilities facing individual streams, as opposed to general statements about how biological communities respond to stressors.

The tools, which will be developed over the next two years, also will evaluate how future land-use changes and climate change will affect how much of a risk each stressor will likely pose to stream health in the future.



A field crew collects data on the health of a stream in the Big Bear Lake watershed. SCCWRP and its partners have begun developing a suite of protective assessment tools to help managers identify the specific stressors that present significant ecological risks to streams in California that are in good health.

The protective assessment tools are being built to complement a set of causal assessment tools for Southern California streams that was first unveiled in 2019.

The causal assessment tools include the [Rapid Screening Causal Assessment](#) (RSCA) tool, a screening-level tool for rapidly identifying which specific stressors are most likely responsible for ecological degradation in streams that are in poor health; the RSCA tool is complemented by

two other tiers of tools – Detailed and Confirmatory assessments – that are designed to provide increasing levels of confidence about the causes of stream degradation.

Protective assessment, which can be viewed as the inverse of causal assessment, will consist of two tiers of tools – Assessment of Present Risk and Assessment of Future Risks – that are designed to extend the time horizons of

analyses and help in planning preventative actions.

Significantly, protective assessment has the potential to help direct more management attention to protecting streams that are in good ecological condition. Although protection of high-quality waters is a cornerstone of state and federal environmental policy, stream managers typically focus more of their resources and time on remediating ecologically degraded water bodies.

Researchers envision both the protective and causal assessment tools working in concert to guide managers in identifying how human activities are affecting the ecological health of streams. The tools are designed to promote transparency and consistency in how managers analyze stream data, whether for protective or causal assessment purposes.

Like the interactive [Rapid Screening Causal Assessment](#) (RSCA) tool, the protective assessment tool will be housed on a publicly accessible, interactive web dashboard that presents users with a range of analysis capabilities, from summaries to detailed outputs about the threats that different stressors pose to individual streams and stream segments.

For more information, contact Dr. [David Gillett](#).

New SCCWRP data portal enhances access to most-requested data products

SCCWRP has publicly unveiled a web-based [data portal](#) that provides centralized access to millions of environmental data points and cutting-edge data analysis tools – the culmination of a years-long effort to create a one-stop shop for easily retrieving, visualizing and analyzing SCCWRP's most requested data products.

The data portal, which went live in November, is built on the [Esri ArcGIS Open Data](#) platform and features flagship regional monitoring data sets from the Southern California Bight Regional Monitoring Program, Southern California

Stormwater Monitoring Coalition (SMC), and California Estuary Marine Protected Area (EMPA) Monitoring Program, among many other data sets dating back decades.

Many of these programs and projects have been building out a data presence on the Open Data platform for years; the centralized data portal is designed to consolidate and streamline all of these data initiatives under one roof, while simultaneously enhancing and polishing the user experience.

Many of the features and functionalities built into SCCWRP's central data portal were developed in response to extensive testing and feedback from SCCWRP's member agencies and other partners.

The open data portal, which is linked from the main SCCWRP website, solves many of the historical challenges that SCCWRP staff and public end users have faced storing, retrieving and analyzing environmental data sets.

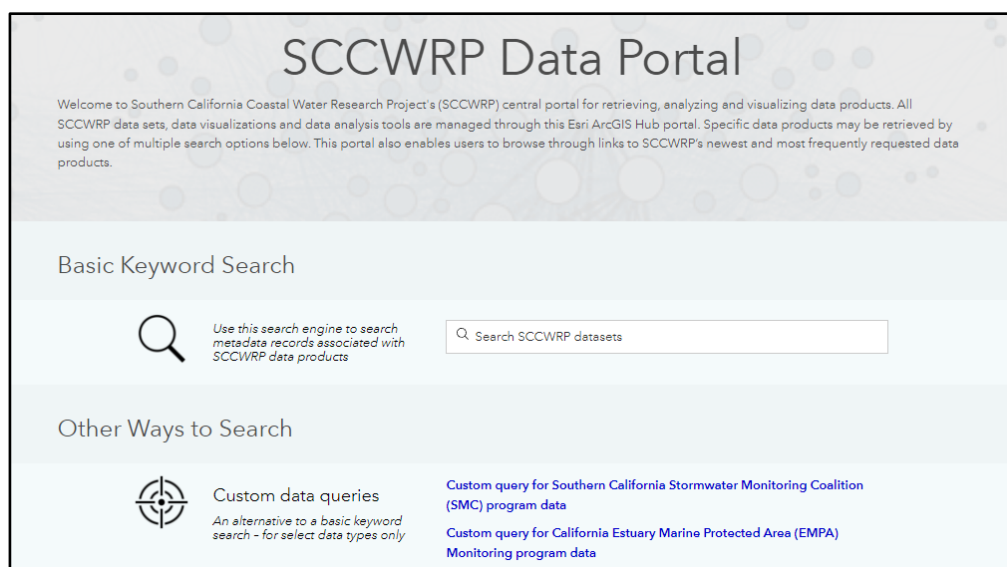
With SCCWRP's previous data web page, for example, users who wanted to access

data sets were required to download individually separated raw data files for each of their data queries and then manually compile them into a single file – a complicated and labor-intensive process prone to errors for inexperienced users.

The new data portal enables users to easily retrieve data using a search engine or interactive ArcGIS map interface. Users can simply filter data products with keywords or guided queries for different subsets of data, such as specific locations, time periods, or measurement parameters (i.e., individual pollutants or biological species), in addition to entire data sets. Selected data can then be downloaded in different formats as defined by the user.

Another feature of the new data portal is improved data uploading. Previously, when users submitted their data to SCCWRP, someone would need to laboriously complete quality-assurance steps by manually validating the completeness, accuracy and precision of uploaded data.

Automated quality-assurance checkers now review all data submitted to SCCWRP and flag or reject data that don't meet specific quality-assurance criteria. The checkers ensure all submitted data are of the highest quality and enable data submitters to efficiently repair data sets before submission, saving hundreds of hours and paving the way for data submissions in minutes instead of months.



SCCWRP has unveiled a new web-based data portal, above, to provide centralized access to millions of environmental data points and cutting-edge data analysis tools. It consolidates and streamlines all of SCCWRP's data initiatives under one roof, including flagship regional monitoring data sets dating back decades.

All new SCCWRP data products going forward will be accessible through the data portal. SCCWRP has developed internal staff guidelines to ensure all data products are ready for public dissemination and maintained to consistently high standards over time.

Many of SCCWRP's key historical data sets dating back to the 1970s already have been migrated to the data portal; others are still in the process of being transferred, including data housed in SCCWRP's 1990s-era predecessor data portal.

SCCWRP is continuing to enhance the data portal with new online data analysis and visualization capabilities, including tools for creating maps and seamless integration of web-enabled assessment tool calculators. These features enable anyone with an internet connection the ability to use leading-edge research tools.

For more information, or to be added to SCCWRP's list of candidate beta-testers, contact [Paul Smith](#).

Updates by Thematic Area

SCCWRP Research Themes [BIOASSESSMENT](#) • [ECOHYDROLOGY](#) • [EUTROPHICATION](#) • [CLIMATE CHANGE](#) • [CONTAMINANTS OF EMERGING CONCERN](#) • [MICROBIAL WATER QUALITY](#) • [STORMWATER BMPs](#) • [REGIONAL MONITORING](#)

BIOASSESSMENT

Causal assessment study launched in San Luis Rey River watershed

SCCWRP and its partners have launched a causal assessment study in the San Luis Rey River watershed in San Diego County to help managers evaluate the likely vs. unlikely causes of the degraded biological health of the watershed.

The study, kicked off in December in partnership with the City of Oceanside and the County of San Diego, will utilize the new [Rapid Screening Causal Assessment \(RSCA\)](#) tool that was co-developed by SCCWRP to rapidly identify likely stressors affecting the health of the watershed's biological communities. This screening-level assessment will be followed by a detailed causal assessment to provide additional insights and improve

management confidence in the stressors responsible for biological degradation.

San Luis Rey River watershed managers intend to use the study's findings to inform directions for the watershed's Water Quality Improvement Plan (WQIP).

For SCCWRP, the study will mark the first time the RSCA will be used to evaluate if altered stream flows could be a likely

cause of impaired stream health. Other stressors that the RSCA already evaluates include altered habitat, elevated conductivity, elevated temperature and eutrophication.

SMC study examining why some modified channels are healthier than others

The Southern California Stormwater Monitoring Coalition (SMC) has launched an investigation into why some streams that have been modified via channel hardening have healthier biological communities than others – part of a three-year study examining how to improve the biological health of modified streams while preserving the channel modification features that are crucial for flood protection.

The investigation, launched in December and led by SCCWRP, is working to identify specific factors that influence stream biological health; such insights could pave the way for managers to take informed actions to improve the health of modified channels that are in relatively poor biological health.

In addition to engaging in field sampling work, researchers are analyzing historical monitoring data using the newly developed [Rapid Screening Causal Assessment \(RSCA\)](#) tool, which is designed to rapidly narrow down the likely vs. unlikely causes of degraded biological condition in streams.

ECOHYDROLOGY

Flows framework applied in groundwater management efforts

The California Department of Water Resources (DWR) has begun using a statewide scientific framework that was originally developed to help managers determine the environmental flow needs of California streams to also help shape more sustainable groundwater management practices statewide.

The California Environmental Flows Framework (CEFF), which was co-developed by SCCWRP, is in the process of being incorporated into ongoing efforts by



Modified channels like Temescal Creek, above, a soft-bottom channel in Riverside County, are the focus of an investigation by the Southern California Stormwater Monitoring Coalition (SMC) into how to improve the biological health of modified streams while preserving the channel modification features that are crucial for flood protection.

DWR to determine when groundwater pumping may adversely affect the environmental flows that sustain vulnerable aquatic life and ecosystems, as well as DWR efforts to set sustainability criteria for groundwater management that help protect beneficial uses provided by flowing surface waters.

CEFF, unveiled in 2021, was originally developed to help managers make informed decisions about how to allocate limited surface flows that balance both human and ecosystem needs for flowing water.

In November, SCCWRP trained about 125 DWR staff on using CEFF. DWR also intends to use the framework for other groundwater management applications, including to inform strategies for implementing flood managed aquifer recharge (Flood-MAR), in which certain areas are deliberately flooded to recharge underground aquifers.

EUTROPHICATION

OAH model used to investigate effects of nutrient discharges in coastal waters

A research team that has been modeling how land-based nutrient discharges into California coastal waters influences ocean acidification and hypoxia (OAH) has demonstrated how to use the model for predicting how coastal OAH conditions would be affected if these discharges were reduced.

The modeling effort, described in a [journal article](#) published in December, tested multiple hypothetical management scenarios that involve reducing nitrogen discharges by 0%, 50% and 85% across 19 Southern California wastewater outfalls.

The modeling work predicted that nitrogen reductions would result in a reversal of subsurface oxygen and pH losses, an expansion of simulated habitat volume for shelled organisms that are sensitive to pH losses, and an expansion of aerobic habitat for fish.

The findings, which are undergoing review by an independent [panel of scientific experts](#) convened to review the OAH

modeling work, mark a key first step toward answering management questions about the role of land-based nutrient discharges, if any, in exacerbating coastal OAH conditions.

The next step is to run modeling simulations with more realistic nutrient-reduction scenarios – scenarios informed by changes that managers at each outfall could realistically make to their water recycling and nutrient management practices. Researchers also need to weigh the potential benefits of taking short-term actions to reduce nutrients against the pace with which OAH is intensifying in Southern California coastal waters.

Tools developed to predict risk of mass marine mammal strandings caused by HAB toxin

SCCWRP and its partners have developed a set of tools for predicting the likelihood of marine mammals becoming stranded on Southern California beaches based on exposure to elevated levels of domoic acid, a toxin produced by a harmful algal bloom (HAB) known as *Pseudo-nitzschia*.

The predictive tools, described in a [journal article](#) published in December, are intended to provide environmental managers and marine mammal rescue centers with critical early warnings about anticipated mass strandings of sea lions and other animals as a result of domoic acid poisoning, such as an event last summer that [sickened or killed](#) hundreds of marine mammals.

The predictive tools leverage HABs monitoring data collected at ocean piers via California's Harmful Algal Bloom Monitoring and Alert Program (HABMAP), plus data collected further offshore via rapid-response HABs monitoring efforts.

During major bloom events, marine mammal rescue centers – which are mostly volunteer-driven operations – struggle to keep up with sudden, dramatic spikes in marine mammal strandings on beaches. Generally, about 40%-60% of all stranded mammals that are rescued can recover if administered appropriate anti-seizure medications and/or moved from populated beaches to local rehabilitation centers.

CLIMATE CHANGE

Expert panel begins review of OAH modeling tools

An independent panel of scientific experts has begun reviewing a set of modeling tools that predicts the ecological consequences of intensifying ocean acidification and hypoxia (OAH) in California coastal waters and the degree to which land-based activities are influencing this trajectory.

The [six-member expert panel](#) held three meetings in December and January, including a two-day, in-person meeting in Irvine.

At the in-person meeting, panelists reviewed the model validation steps that researchers took prior to using the models to predict how OAH conditions would be affected if land-based nutrient discharges into the coastal ocean are reduced.

The panel is tasked with quantifying the level of uncertainty associated with the coastal OAH modeling tools' predictions, as well as weighing in on what additional steps are needed to improve management confidence in the modeling work.

The panel is expected to release a preliminary report in mid-February. Video recordings of the meetings are available on the [panel's website](#).

Pair of studies evaluates seaweed farming's potential to remove carbon dioxide from coastal waters

SCCWRP and its partners have published a pair of studies exploring how seaweed farming could be used to remove dissolved carbon dioxide directly from coastal waters – a potential management solution that could help combat global climate change as well as alleviate the effects of intensifying ocean acidification.

The [first study](#) found that the area where seaweed is farmed would need to be 370 times larger than it presently is to remove 1 billion tons of carbon dioxide from the atmosphere annually.



Seaweed farms, such as this farm off the coast of Santa Barbara, above, are the focus of a pair of studies exploring how seaweed farming could be used to remove dissolved carbon dioxide directly from coastal waters.

The [second study](#) found that growing seaweed would have the greatest benefit as a climate change mitigation measure if seaweed were to replace crops grown on land that have a larger carbon footprint; this benefit would be greater than sinking seaweed into the deep sea.

Both studies were published last year.

Seaweed farming is one of multiple marine carbon dioxide removal (mCDR) solutions being explored in Southern California coastal waters as a potential offset for managing the effects of both climate change and ocean acidification.

CONTAMINANTS OF EMERGING CONCERN

Study launched to evaluate collection methods for microplastics in drinking water

SCCWRP and its partners have launched a study comparing the performance of two methods for collecting drinking water samples in preparation for measuring their microplastics content – a key step toward enabling California drinking water agencies to start routinely monitoring microplastics.

The two-year study, which kicked off in October, will focus on an open-system method approved by the American Society for Testing and Materials (ASTM) and a closed-system method refined by the University of Toronto. Researchers will compare their effectiveness at eliminating external contamination when filtering thousands of liters of water, which can be necessary to collect enough microplastics particles from a drinking water sample.

The study's goal is to standardize sample collection methods as part of California's efforts to develop a comprehensive statewide monitoring program capable of generating high-quality, directly comparable data on the prevalence and spread of microplastics across diverse aquatic settings. Drinking water agencies in California are required to monitor microplastics for an initial four-year period under a policy approved by the State Water Resources Control Board in 2022.

Researchers are expected to develop draft standard operating procedures (SOPs) for collecting drinking water samples by early 2025.

Study reassesses sediment contamination at Palos Verdes Superfund site completed

SCCWRP has completed a follow-up study assessing the state of sediment contamination along the Palos Verdes shelf a decade after completing the Superfund site's last ecological condition assessment.

The study, completed in December, will add to historical trend lines tracking the persistent effects of the pesticide DDT and an industrial class of chemicals known as PCBs in seafloor sediment. Although DDT and PCBs were banned decades ago, millions of pounds of the chemicals were discharged along the Palos Verdes shelf in the years prior. The chemicals can continue to exert toxic effects for decades.

During the study, researchers deployed passive samplers across the 17-square-mile Superfund site in 2022 to measure levels of DDT and PCBs that are leaching out of surface layers of sediment into the water column above.

A final report summarizing the study's findings has been submitted to the U.S. Environmental Protection Agency, Region 9 and is expected to be available later this year.

In a separate but related study, SCCWRP and the Scripps Institution of Oceanography have begun working to develop a modeling tool for predicting how the pesticide DDT and its breakdown products are continuing to bioaccumulate in marine food webs off the coast of Southern California five decades after DDT was banned.

The two-year bioaccumulation study is measuring levels of DDT and its breakdown products – collectively referred to as DDT+ – in sportfish, as well as leaching from surface layers of seafloor sediment.

Fish consumption survey to inform L.A. Regional Board deliberations about potential new beneficial use designation for urban lakes

SCCWRP has launched a two-year study to inform deliberations by the Los Angeles Regional Water Quality Control Board about whether one or more urban lakes in

Los Angeles County should receive a regulatory designation known as a Subsistence Fishing beneficial use based on the consumption habits of people who eat fish caught in the lakes.

During the study, which kicked off in January, researchers will survey anglers at four urban lakes – Alondra Park Lake, Magic Johnson Lake, Legg Lake and Peck Road Park Lake – to document what types of fish they catch and how often they consume these fish.

The Los Angeles Regional Water Quality Control Board intends to use the findings to evaluate whether to add a Subsistence Fishing beneficial use designation to one or more of these lakes; the goal of taking this regulatory action would be to direct more focus and resources toward protecting the health of individuals who rely on catching fish from these lakes to supplement their diet.

Study findings will also be used to estimate fish consumption rates, which will then be compared to existing fish consumption advisory guidelines developed by California's Office of Environmental Health Hazard Assessment (OEHHHA).



Researchers will document the fish consumption habits of anglers at four urban lakes in Los Angeles County, including Legg Lake, above, as part of a two-year study to help the Los Angeles Regional Water Quality Control Board decide if the lakes should receive a regulatory designation known as a Subsistence Fishing beneficial use.

Lab accreditation agencies trained on bioassay methods for fish

Assessors who accredit environmental laboratories in California received training in testing requirements and data quality issues associated with a suite of commonly used fish bioassay toxicity tests during a three-day workshop co-presented by SCCWRP in October – the first training in what is expected to be a series of trainings co-hosted by SCCWRP to enhance the expertise of laboratory assessors.

The workshop comes in response to an effort by California's Environmental Laboratory Accreditation Program (ELAP) to initiate continuing education opportunities for its assessors. ELAP accredits all public and private laboratories that produce environmental data that get used in State decision-making processes.

Accreditors on ELAP's staff attended the workshop, as did third-party assessors from other states who contract with ELAP to fill gaps in the routine accreditation services that ELAP provides.

SCCWRP kicked off the training series by focusing on multiple well-established fish toxicity tests, but intends to eventually expand to offering continuing education in newer areas, including bioanalytical cell assays that screen water samples for the presence of bioactive contaminants.

MICROBIAL WATER QUALITY

Modeling work underway for study probing relationship between HF183 and illness risk

SCCWRP and its partners have begun working to model the levels at which exposure to the fecal contamination marker HF183 in wet-weather runoff is associated with increased illness risks for humans – the culmination of a four-year study aiming to increase the management utility of HF183.

Researchers' initial health risk modeling work was presented in December to the Southern California Stormwater Monitoring Coalition (SMC), which is



A field crew recovers water from a sewer manhole in San Diego County as part of an effort to measure exfiltration from underground sewer pipes. Researchers have begun working to estimate what portion of human fecal contamination in the San Diego River watershed can be attributed to raw wastewater exfiltrating from public sewer systems.

overseeing the study. Final results are expected to be published in summer 2024.

Although HF183 is widely used as a management tool for detecting human sources of fecal contamination in aquatic environments, no health thresholds have been developed to date that explain illness risks for beachgoers and other people who may inadvertently ingest fecal contamination that comes from wet-weather runoff.

Researchers, who began the study by collecting field data across two wet-weather seasons, have since transitioned to using the data to develop an HF183 health risk model that can predict how many humans will get sick after exposure to runoff that is contaminated with a given level of HF183.

Study working to estimate what portion of human fecal contamination in San Diego waterways attributable to public sewers

SCCWRP and its partners have begun working to estimate what portion of human fecal contamination in the San

Diego River watershed can be attributed to raw wastewater exfiltrating from public sewer systems, following the successful completion of field-testing of a representative sample of pipes in the watershed.

The findings of the public sewer investigation, which are expected to be finalized and released publicly in March, are expected to provide key insights supporting an ongoing, multi-component study investigating multiple potential sources of fecal contamination in the San Diego River watershed during wet weather. Researchers are also investigating potential contributions from sanitary sewers, private sewer lateral lines and septic tanks during both wet and dry weather.

The public sewer exfiltration investigation involved testing more than 20 underground sewer pipes in the San Diego watershed for leaks using a newly developed method that can detect volumetric losses of as little as a one liter out of 4,000 liters. The method, which was developed by SCCWRP, involves pumping a known volume of water at a controlled rate through an isolated section of sewer pipe, then looking at the difference in volume pumped in vs. recovered.

STORMWATER BMPs

Additional monitoring added to study quantifying benefits of replacing turf lawns

SCCWRP and the County of San Diego have added an additional year of monitoring to a study seeking to quantify the runoff reduction benefits of replacing residential grass with drought-tolerant landscaping, following promising initial results that suggest turf replacement can reduce volumes of dry- and wet-weather runoff by absorbing more irrigation and rainfall on site.

The expanded monitoring phase, launched in January, uses continuous soil moisture sensors to quantify how much more dry- and wet-weather runoff stays on site after turf and traditional spray irrigation are replaced with drought-tolerant landscaping and drip irrigation. Turf replacements are a type of non-structural stormwater BMP (best management practice).

Water districts commonly offer property owners rebates and incentives for turf replacements to reduce water usage. By evaluating the potential of turf replacements to soak up irrigation and rainfall, the County of San Diego study is exploring via this first-of-its-kind study if turf replacement also is effective as a non-structural BMP.

REGIONAL MONITORING

SCCWRP exploring how to integrate coastal estuary monitoring with California State Parks

SCCWRP has begun exploring how to integrate a suite of newly developed tools for monitoring the health of coastal estuaries into California State Parks' estuarine monitoring and management programs.



Courtesy of Adrian Montoya, Riverside County Flood Control and Watershed Protection District

A field crew installs monitoring instruments and engineered media in a bioretention BMP in Riverside County. The Southern California Stormwater Monitoring Coalition's Regional BMP Monitoring Network is collecting water-quality and maintenance data from up to 11 BMPs across Southern California in its second year of BMP performance monitoring.

During a State Parks workshop in December, SCCWRP's Dr. Jan Walker highlighted recent partnerships that SCCWRP has helped forge to [advance estuarine monitoring](#) across coastal California, including California's new Estuary Marine Protected Area (EMPA) Monitoring Program and the ongoing Estuaries study element of the Southern California Bight 2023 Regional Monitoring Program. The programs are using a new statewide monitoring framework intended to bring consistency to estuary monitoring across California.

California State Parks manages nearly a quarter of the California coast, including 153 estuaries that are affiliated with 98 unique State Parks units. Furthermore, 75% of all State Parks coastal units are affiliated with an estuary.

Regional BMP monitoring program adds monitoring sites in second year of BMP performance monitoring

The Southern California Stormwater Monitoring Coalition (SMC) has expanded

the number of structural BMPs where field teams are collecting data on the performance of structural stormwater BMPs as the SMC begins its second year of BMP performance monitoring.

Field teams are collecting water-quality and maintenance data from up to 11 BMPs across Southern California during the 2023-2024 wet-weather season. During the first year of field sampling in 2022-2023, the SMC collected BMP performance data from seven BMPs across five locations.

For Year 2, California Sea Grant and the Ocean Protection Council are partnering with the SMC to add microplastics to the network's suite of pollutants being monitored to evaluate the effectiveness of structural BMPs at removing a range of pollutants in runoff.

The SMC also has agreed to continue BMP monitoring for an additional five years to help address significant, persistent knowledge gaps in managers' understanding of how to optimize the performance, operation and maintenance of structural stormwater BMPs.

New SCCWRP Publications

Journal Articles

Damien, P., D. Bianchi, [F. Kessouri](#), J.C. McWilliams. 2023. [Modulation of Phytoplankton Uptake by Mesoscale and Submesoscale Eddies in the California Current System](#). *Geophysical Research Letters* DOI:10.1029/2023GL104853.

[Frieder, C.A.](#), C. Yan, M. Chamecki, D. Dauhajre, J.C. McWilliams, J. Infante, M.L. McPherson, R.M. Kudela, [F. Kessouri](#), [M. Sutula](#), I.B. Arzeno-Soltero, K.A. Davis. 2022. [A Macroalgal Cultivation Modeling System \(MACMODS\): Evaluating the Role of Physical-Biological Coupling on Nutrients and Farm Yield](#). *Frontiers in Marine Science* DOI:10.3389/fmars.2022.752951.

[Ho, M.](#), [F. Kessouri](#), [C.A. Frieder](#), [M. Sutula](#), D. Bianchi, J.C. McWilliams. 2023. [Effect of ocean outfall discharge volume and dissolved inorganic nitrogen load on urban eutrophication outcomes in the Southern California Bight](#). *Scientific Reports* 13:22148.

[Gillett, D.J.](#), [S.B. Weisberg](#), S.R. Alin, D. Caden, R. Velarde, K. Barwick, C. Larsen, A. Latker. 2023. [Changes in the macrobenthic infaunal community of the Southern California continental margin over five decades in relation to oceanographic factors](#). *Marine Ecology Progress Series* 722:65-88.

Rinehart, S.A., J.M. Dybiec, P. Richardson, [J.B. Walker](#), J.D. Peabody, J.A. Cherry. 2024. [Researcher effects on the biological structure and edaphic conditions of field sites and implications for management](#). *Ecosphere* DOI:10.1002/ec52.4750.

[Smith, J.](#), E. Eggleston, M.D.A. Howard, S. Ryan, J. Gichuki, K. Kennedy, A. Tyler, M. Beck, S. Huie, D.A. Caron. 2023. [Historic and recent trends of cyanobacterial harmful algal blooms and environmental conditions in Clear Lake, California: A 70-year perspective](#). *Elementa: Science of the*



SCCWRP has published a technical report outlining the work plan that has been guiding the buildout of the Southern California Stormwater Monitoring Coalition's new Regional BMP Monitoring Network.

Anthropocene DOI:10.1525/elementa.2022.00115.

[Smith, J.](#), J.A. Cram, M.P. Berndt, V. Hoard, D. Shultz, A.C. Deming. 2023. [Quantifying the linkages between California sea lion \(*Zalophus californianus*\) strandings and particulate domoic acid concentrations at piers across Southern California](#). *Frontiers in Marine Science* 10:1278293.

Starks, M., C.M. Schaefer, K.M. Jeffries, D. Deslauriers, K.H. Luong, [C.S. Wong](#), M.L. Hanson, C.W. Knapp. 2023. [Presence of antibiotic resistance genes in the receiving environment of Iqaluit's wastewater treatment plant in water, sediment, and clams sampled from Frobisher Bay, Nunavut: a preliminary study in the Canadian Arctic](#). *Arctic Science* 9:919-927.

Ulses, C., C. Estournel, P. Marsaleix, M. Soetaert, M. Fourrier, L. Coppola, D.

Lefevre, F. Touratier, C. Goyet, V. Guglielmi, [F. Kessouri](#), P. Testor, X. Durrieu de Madron. 2023. [Seasonal dynamics and annual budget of dissolved inorganic carbon in the northwestern Mediterranean deep-convection region](#). *Biogeosciences* 20:4683-4710.

Wolfand, J.M., A. Sytsma, [K.T. Taniguchi-Quan](#), [E.D. Stein](#), T.S. Hogue. 2023. [Impact of wastewater reuse on contaminants of emerging concern in an effluent-dominated river](#). *Frontiers in Environmental Science* DOI:10.3389/fenvs.2023.1091229.

Zhou, J., J.G. Izett, C.A. Edwards, P. Damien, [F. Kessouri](#), J.C. McWilliams. 2023. [Modeling the dispersal of the San Francisco Bay plume over the northern and central California shelf](#). *Estuarine, Coastal and Shelf Science* 287:108336.

Technical Reports

[Brown, J.S.](#), [R.D. Mazor](#). 2023. [An assessment of the biological condition of streams in the San Francisco Bay](#). Technical Report 1340. Southern California Coastal Water Research Project. Costa Mesa, CA.

[Fassman-Beck, E.](#), [K.C. Schiff](#), [R. Butler](#). 2023. [Development of the SMC Regional BMP Monitoring Network 2020-2023](#). Technical Report 1352. Southern California Coastal Water Research Project. Costa Mesa, CA.

[Mazor, R.D.](#). 2023. [A standard taxonomic effort \(STE\) for terrestrial arthropods collected from dry streams in California and Arizona](#). Technical Report 1343. Southern California Coastal Water Research Project. Costa Mesa, CA.

[Mazor, R.D.](#), J. Olson, T. Clark. 2023. [A standard taxonomic effort \(STE\) for bryophytes collected from dry streambeds in California and Arizona](#). Technical Report 1344. Southern California Coastal Water Research Project. Costa Mesa, CA.

Quarter in Review

Conference Presentations

Greenstein, D. Interlaboratory Studies of the *Ceriodaphnia dubia* Chronic Test Method: The California Experience II. Society of Environmental Toxicology and Chemistry North America Annual Conference. November 12-16, 2023. Louisville, KY.

Mehinto, A. Statewide Quality Assurance Studies to Support Whole Effluent Toxicity Testing in California, USA. Society of Environmental Toxicology and Chemistry North America Annual Conference. November 12-16, 2023. Louisville, KY.

Sutula, M. et al. Numerical Modeling to Support Evaluation of OAH Impacts and Mitigation Strategies Along the California Coast. Coastal and Estuarine Research Federation. November 16, 2023. Portland, OR.

Wong, C.S. Environmental microplastics: the monitoring and regulatory perspective. Society of Environmental Toxicology and Chemistry North America Annual Meeting. November 12-16, 2023. Louisville, KY.

Conference Posters

Lao, W., S. Dial, C.S. Wong. Establishing a high efficiency and practical method for analysis of microplastics in complex matrices. Society of Environmental Toxicology and Chemistry North America Annual Meeting. November 12-16, 2023, Louisville, KY.

Thornton Hampton, L.M., D. Briggs Wyler, B. Carney Almroth, S. Coffin, W. Cowger, D. Doyle, E. Hataley, S. Hutton, M. Mair, E. Miller, L. Monclus, E. Sharpe, S. Siddiqui, A. Mehinto. ToMEx: Toxicity of Microplastics Explorer 2.0. Society of Toxicology and Environmental Chemistry North America 44th Annual Meeting. November 13, 2023. Louisville, KY.

Other Presentations

Fassman-Beck, E. SMC Regional BMP Monitoring Network: Microplastics and Tools to Standardize Data Collection and Assessment. Water Quality Monitoring

Coalition, Quarterly Meeting. December 14, 2023. Costa Mesa, CA.

Frieder, C. A comparison of historical time-series for assessing floating kelp: A case study from the Point Loma kelp forest. Biennial Meeting of the Kelp Consortia. December 7, 2023. Via webinar.

Frieder, C. Biological interpretation tools for oxygen loss and acidification. Independent Review Panel to Review Ocean Numerical Modeling. January 9, 2024. Via webinar.

Frieder, C. Application of the Regional Ocean Modeling System with Biogeochemical Cycling to Investigations of Anthropogenic Nutrient Inputs in the Southern California Bight. Independent Review Panel to Review Ocean Numerical Modeling. January 17, 2024. Costa Mesa, CA

Irving, K. Flow-ecology in modified streams. California Aquatic Bioassessment Workgroup Meeting and California Society for Freshwater Science Meeting. November 6, 2023. Costa Mesa, CA.

Irving, K. Ecohydrology and Beyond: species modeling to inform water resource management. Department of Integrated Biology, Oregon State University. November 13, 2023. Corvallis, OR.

Kessouri, F. Validation of the Regional Ocean Modeling System with Biogeochemical Cycling for Nutrient Management Applications in the Southern California Bight. Independent Review Panel to Review Ocean Numerical Modeling. January 18, 2024. Costa Mesa, CA

Mehinto, A. Risk-Based Management Framework for Microplastics Pollution. International Joint Commission Workshop: Towards a Monitoring Program for Microplastics in the Laurentian Great Lakes – Developing a Monitoring Framework. January 17, 2024. Windsor, Canada.

Schiff, K. Can sewer exfiltration be a source to stormwater runoff? Center for Watershed Protection, National Webinar Series. January 24, 2024. Via webinar.

Steele, J. Applied environmental science and its impact. USC Dornsife Environmental Studies Program. November 16, 2023. Los Angeles, CA.

Sutula, M. Investigations of the Effect of Land-Based Nutrients on High Biomass and Toxic Harmful Algal Blooms: A Progress Report. Central Coast Water Board Basin Planning and Standards Meeting. November 29, 2023. San Luis Obispo, CA.

Sutula, M. Configuration and inputs to the Regional Ocean Modeling System with Biogeochemical Cycling in the Southern California Bight. Independent Review Panel to Review Ocean Numerical Modeling. January 17, 2024. Costa Mesa, CA

Taniguchi-Quan, K. California Environmental Flows Framework: Overview and Nexus with Sustainable Groundwater Management. CA Department of Water Resources Environmental Coordination Committee Open Forum. November 16, 2023. Via webinar.

Theroux, S. eDNA for Species Surveillance. Water Quality Monitoring Council webinar series. November 16, 2023. Via webinar.

Thornton Hampton, L.M. ToMEx: Toxicity of Microplastics Explorer. International Joint Commission Workshop: Towards a Monitoring Program for Microplastics in the Laurentian Great Lakes – Developing a Monitoring Framework. January 17, 2024. Windsor, Canada.

Walker, J. California Estuarine Monitoring and Partnership Building. State Parks Estuaries Workshop. December 5, 2023. Santa Cruz, CA.

Walker, J. Estuary Marine Protected Area Monitoring Program Data Infrastructure and QA/QC. Interagency Ecological Program (IEP) Data Utilization Workgroup. December 12, 2023. Via webinar.

SCCWRP Personnel Notes

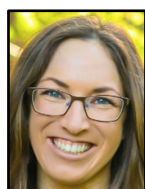
Commission



Justin Gamble, Watershed Protection Program Manager for the San Diego County Watershed Protection Program, was named a Commissioner in January, filling a vacancy created when Crystal Benham took on a new role with the County last spring.



Juan Guerreiro, Director of the City of San Diego Public Utilities Department, was named a Commissioner in January, filling a vacancy.



Kaitlyn Kalua, Deputy Director for the California Ocean Protection Council, was named an Alternate Commissioner in November, replacing Justine Kimball, who served on the Commission for 4-1/2 years.

CTAG

Christine Sur, Water Quality Program Manager for the California Ocean Protection Council, was appointed a CTAG Representative in January, replacing Kaitlyn Kalua, who has been appointed Alternate Commissioner.

Katherine Walsh, Chief of the Ocean Standards Unit for the California State Water Resources Control Board, was appointed a CTAG Alternate Representative in January, supporting CTAG Representative Lori Webber.

Scientific Leadership

Dr. **Jayme Smith** has been appointed to the conference steering committee for the 12th US HAB Symposium.

Dr. **Leah Thornton Hampton** has been appointed to the program committee for the Society of Environmental Toxicology and Chemistry North America 2024 Annual Meeting.

Dr. **Jan Walker** has been elected President-Elect of the California Estuarine Research Society (CAERS).

Dr. **Kris Taniguchi-Quan** has been elected President of the American Society of Photogrammetry and Remote Sensing - Pacific Southwest Region.

Dr. **Eric Stein** has been appointed to the California Cooperative Oceanic Fisheries Investigations (CalCOFI) Council.

Dr. **Charles Wong** has been appointed to Proctor & Gamble's expert panel on constituents of emerging concern.

Dr. **Elizabeth Fassman-Beck** has been appointed to a National Academies of Science, Engineering, and Mathematics consensus committee panel to review approaches for managing pollutant loads in highway stormwater runoff.

Dr. **David Gillett** has been appointed to the National Oceanic and Atmospheric Administration's Margaret A. Davidson Graduate Fellowship review panel.

Dr. **Jayme Smith** has been appointed to the Ph.D. committee of Michella Salvitti at the University of Maryland.

Dr. **Leah Thornton Hampton** has been appointed to the Ph.D. committee of Catherine Wise at Texas Christian University.

Dr. **Leah Thornton Hampton** has been appointed to the master's thesis committee of Alexandra Brown at California State University, Bakersfield.

New Faces



Dr. **Victoria McGruer**, who recently completed her postdoc at the University of California, Riverside, started in November as a Senior Research Technician in the

Toxicology Department. She will support SCCWRP's efforts to develop standardized methods for using cell bioassays to screen for bioactive chemical contaminants in aquatic environments.

Promotions



Dr. **Alle Lie**, who has been working as a Senior Research Technician in the Biogeochemistry Department since November 2022, was promoted in December to Research Coordinator.

SCCWRP COMMISSIONER SPOTLIGHT

Regulatory affairs lead helms diverse programs

Jim Marchese wears many hats in his role as head of Regulatory Affairs for LA Sanitation & Environment (LASAN). He helms the L.A. Clean Cities Coalition, a U.S. Department of Energy carbon reduction program that's embedded within his agency.



Jim Marchese

He oversees programs as diverse as greenhouse gas inventories and special research projects, and he's involved in permitting for both water quality and air quality for the City of Los Angeles. He has recently been added to the LASAN Executive office of Legislative and Government Affairs.

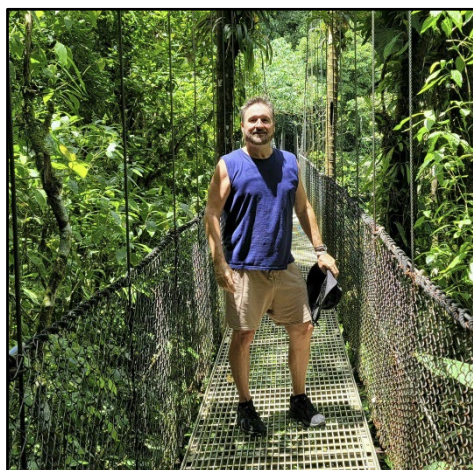
"All of the hats I wear are just different pieces of the same puzzle," said Marchese, who has worked for the City of L.A. for the past 25 years. "I'm passionate about working with scientists and the public in figuring out how clean is clean, and using that knowledge to

inform management decisions and the actions we take to protect our residents and the environment."

Marchese was appointed as a SCCWRP Alternate Commissioner in October 2023, replacing Dr. Mas Dojiri. Dojiri served as a SCCWRP Alternate Commissioner for more than 21 years. Dojiri, who remains LASAN's Assistant General Manager, named Marchese to the position.

Marchese is an environmental scientist by training who's spent his career working at the intersection of science and policy. Before joining the City, he worked for a private environmental laboratory, then as one of two Environmental Coordinators for the oil company Unocal, where he specialized in international audits, emergency response, environmental permitting and compliance.

At the City of Los Angeles, Marchese's earliest jobs included working on environmental issues at Los Angeles International Airport, followed by LASAN's TMDL (Total Maximum Daily Load) regulatory program.



Jim Marchese crosses a bridge during a hike through a rainforest in Costa Rica.

Jim Marchese, B.C.E.S.

Job: Acting Manager, Regulatory Affairs Division, LA Sanitation & Environment (LASAN), City of Los Angeles (started April 2022)

SCCWRP role: Alternate Commissioner (started October 2023)

Prior jobs: 25 years with City of Los Angeles (1998-present): Assistant Division Manager, Legislative and Regulatory Affairs, LASAN (2012-2022); Environmental Supervisor, LASAN (1998-2012); Environmental Coordinator, Unocal (1992-1998); Health and Safety Officer, Central Coast Analytical Services (1990-1992)

Education: B.A. environmental studies, University of California, Santa Barbara

Residence: Long Beach

Hometown: Newbury Park, Ventura County

Family: Partner, three teenagers and a golden retriever

Hobbies: Recreational boating; bicycling; hiking; coaching youth sports; volunteering for the Food Finders food rescue nonprofit

Marchese has been fascinated by environmental issues since he was a child growing up in rural Newbury Park in Ventura County. There he hiked the local mountains to see the Pacific Ocean and spent his youth observing animals, plants and habitats. Later he moved with his family to the San Joaquin Valley to work in agriculture, became a member of the Future Farmers of America, and was an agriculture instructor assistant at his high school.

"Growing up in these rural settings provided me an open air classroom that inspired me to pursue a college degree in the environmental field, and shaped my interest to understand the relationship between environmental conditions and human health," he said.

Marchese is looking forward to serving on the SCCWRP Commission. He's been interacting with SCCWRP since the early 2000s, when he became involved in SCCWRP's work to build a scientific foundation for California to implement its Sediment Quality Objectives regulatory program for bays and estuaries.

"That was when I recognized that the science being done at SCCWRP is vital, and the outcomes are meaningful," he said.

In his spare time, Marchese is an avid boater. He owns a 35-footer in Long Beach Marina and is enrolled in a training program to get his captain's license.

CTAG SPOTLIGHT

Scientist expands career goals to management

When Lauren Briggs first started her career in environmental science working as a part-time field assistant for the Multi-Agency Rocky Intertidal Network, she initially saw herself staying in research and working in a lab.



Lauren Briggs

Briggs worked in environmental research for nine years – often having multiple jobs at the same time while attending Cal Poly Pomona – and became interested in a range of research areas, from studying the health of rocky intertidal communities to looking at effects of ocean warming and acidification on seaweed growth and herbivory.

Although she enjoyed doing research, Briggs also wanted to understand the impact of her work from a management perspective. In 2021, Briggs transitioned her career to focus more on environmental management as an

Environmental Scientist at the Colorado River Basin Regional Water Quality Control Board.

"I wanted to stay in research after grad school but felt like I was watching all of this work happen without ever seeing the final product," Briggs said. "I like that at the Water Board there's actual implementation of the research that is being done to protect the environment."

Briggs, who moved to the Santa Ana Regional Water Quality Control Board a year later, started in October as the Alternate CTAG Representative.

Briggs primarily works on reducing nutrient levels in inland water bodies like Lake Elsinore and Canyon Lake, both of which have TMDLs (total maximum daily loads) to limit nutrient loading. She is also involved in work to reduce bacteria levels in the Middle Santa Ana River.



Lauren Briggs and partner Marcus hike along the Iron Mountain Trail in Poway in February 2023.

Lauren Briggs

Job: Environmental Scientist, Santa Ana Regional Water Quality Control Board (since 2022)

SCCWRP role: Alternate CTAG Representative (started October 2023)

Prior jobs: Environmental Scientist, Colorado River Basin Regional Water Quality Control Board (2021-2022); Staff Research Associate, Scripps Institution of Oceanography (2016-2021); Field Assistant, Multi-Agency Rocky Intertidal Network (2012-2020); Graduate Researcher, California State Polytechnic University, Pomona (2014-2017); Tidepool Educator, Laguna Ocean Foundation (2014-2016)

Education: M.S. biology, California State Polytechnic University, Pomona (2017); B.S. environmental biology, California State Polytechnic University, Pomona (2013)

Residence: Redlands

Hometown: Wildomar

Family: Partner Marcus, an environmental scientist with California State Parks; cat Momma Cat

Hobbies: Gardening; hiking; camping; hanging out with her cat

With interest in other research areas, Briggs is helping to develop a climate change resolution to guide how the Santa Ana Regional Board integrates climate change into regional programs.

Since moving to the Santa Ana Regional Water Board, Briggs has leveraged her previous experiences in climate change and coastal research to become more involved in related work. In addition to CTAG, Briggs serves on the Southern California Caulerpa Action Team (SCCAT) and the ocean acidification and hypoxia subcommittee for the 2023 Southern California Bight Regional Monitoring Program.

"Being on CTAG allows me to work more closely with SCCWRP and become familiar with the coastal work they do, which also aligns with my one of my personal interests," Briggs said.

As an undergraduate student, Briggs solidified her interest in aquatic science after working with an invasive seaweed species in tidepools during an internship. Wanting to learn more about their ecological impacts, Briggs began taking marine biology courses.

In her free time, Briggs enjoys hiking and camping with her partner Marcus. She also tends to her home garden in Redlands, planting seasonal seeds throughout the year. So far, she has had the most success growing pumpkins.

SCCWRP PARTNER SPOTLIGHT

Engineer brings industry experiences to classroom

For more than 12 years, Dr. Rebeka Sultana has shared her civil engineering knowledge as a faculty member at California State University, Long Beach (CSULB), teaching courses focused on water resources engineering.



Dr. Rebeka Sultana

When Sultana learned about an opportunity in 2018 to work with Caltrans, she knew it was a chance to gain valuable experience working on State projects. Because of her passion for teaching, Sultana continued as a Part-time Lecturer at CSULB after joining Caltrans.

"I'm fortunate to be able to do both now and provide that industry perspective for my students," Sultana said. "I can use the principles and theories I'm teaching in my projects while also bringing those industry experiences to my classes."

As part of Caltrans' Office of Stormwater and Landscape Architecture, Sultana works closely with internal and external partners to meet project goals emphasizing safety, equity and climate action. She is responsible for designing highway drainage, implementing stormwater BMPs (best management practices), and hydraulic modeling for various rivers in Los Angeles and Ventura Counties.

Currently, Sultana is leading a project with SCCWRP's Dr. Elizabeth Fassman-Beck and California State University, Los Angeles to investigate the efficacy of structural stormwater BMPs – specifically, biofiltration and bioretention systems – in removing microplastics from runoff. The study will recruit university engineering students to help collect samples and measure microplastics in the laboratory.

"I really like that students will be able to have first-hand experience working with BMPs," Sultana said. "It's so important to be able to take what you learn in the class and apply it in the field."



Dr. Rebeka Sultana enjoys a boat tour around the Golden Gate Bridge during a trip to San Francisco in January 2024.

Rebeka Sultana, Ph.D., P.E.

Job: Project Engineer, California Department of Transportation (started 2018); Part-time Lecturer, California State University, Long Beach (started 2018)

SCCWRP role: SCCWRP collaborator investigating effectiveness of BMPs at capturing microplastics in runoff

Prior jobs: Assistant Professor, California State University, Long Beach (2011-2018)

Education: Ph.D. civil engineering, University of California, Irvine (2011); M.S. civil engineering, Purdue University (2006); B.S. civil engineering, Bangladesh University of Engineering and Technology (1999)

Residence: Cerritos

Hometown: Dhaka, Bangladesh

Family: Husband Shamim, a lecturer at CSULB; daughters Nora, Norwen, and Namira

Hobbies: Traveling; reading and learning; spending time with family

Born and raised in Bangladesh, Sultana admired the engineering and medical professionals who had to take rigorous entrance exams to enroll in the universities. She had always enjoyed working with numbers and decided to explore civil engineering as a future career, earning her B.S. in civil engineering from the Bangladesh University of Engineering and Technology in 1999.

Sultana knew she wanted to travel abroad for her graduate degrees to challenge herself in a competitive environment, so she moved to the United States in 2004.

"Students who do well and want to learn more usually try to go abroad since there is that growth potential you wouldn't get if you stayed in Bangladesh," Sultana said. "A lot of people I know came to the U.S. so it inspired me to also study here."

She received a M.S. and Ph.D. in civil engineering from Purdue University and the University of California, Irvine, respectively. After receiving her Ph.D., Sultana joined CSULB as an Assistant Professor. Her area of research includes watershed modeling, climate change and urban stormwater management. She is also a registered Professional Engineer with the State of California.

In her spare time, Sultana enjoys traveling around the world, with Turkey being her favorite destination. During her travels, she enjoys meeting people and learning about their cultures through conversations and food.

SCCWRP STAFF SPOTLIGHT

Researcher investigates effects of oil toxicity

For Dr. Victoria McGruer, one defining moment that shaped her interest in the aquatic toxicology aspect of environmental science was the 2010 Deepwater Horizon oil spill in the Gulf of Mexico.



Dr. Victoria McGruer

A high schooler at the time, McGruer saw the devastating impacts that such a large-scale disaster had on the environment and began thinking about what she could do to help in the event of a future spill of the same magnitude.

That thought led McGruer to pursue a Ph.D. in environmental toxicology at the University of California, Riverside, where she researched the mechanisms by which polycyclic aromatic hydrocarbons (PAHs) – chemicals found in crude oil, gasoline, and coal – induce toxicity on aquatic ecosystems and organisms, particularly developing fish embryos.

"We're focused on the mechanistic side to understand overall toxicity outcomes when fish are exposed to oil components," McGruer said. "Understanding these mechanisms can help us better inform decision-making if there's another spill."

McGruer joined SCCWRP in November as a Senior Research Technician in the Toxicology Department, where she has been focused on an ongoing effort to develop standardized methods for using cell bioassays to screen for bioactive chemical contaminants in aquatic environments – a project that McGruer was involved with at her postdoc at UCR.

McGruer also collaborated with SCCWRP on a project looking at the impact of endocrine-disrupting compounds on the Santa Ana River.



Dr. Victoria McGruer hikes near Yosemite National Park in September 2023 during a six-month expedition on the Pacific Crest Trail. McGruer hiked the 2,650-mile trail as part of an initiative to document and characterize trash and plastic pollution on trails.

Victoria McGruer, Ph.D.

Job: Senior Research Technician, SCCWRP Toxicology Department (started November 2023)

Prior jobs: Postdoctoral Researcher, University of California, Riverside (2021-2023); Graduate Student Researcher, University of California, Riverside (2017-2021)

Education: Ph.D. environmental toxicology, University of California, Riverside (2021); B.S. environmental science and biology, Northeastern University (2017)

Residence: Long Beach

Hometown: Dover, Massachusetts

Family: Husband Win, a plastic pollution researcher

Hobbies: Backpacking; climbing; playing beach volleyball; sailing

"Having already worked a lot with SCCWRP during my postdoc, I hope this transition will be pretty seamless," McGruer said. "I'm excited to be able to continue working on projects that I'm already familiar with and also explore new research opportunities."

As an undergrad at Northeastern University double-majoring in environmental science and biology, McGruer solidified her interest in toxicology after attending seminars about the effects of pharmaceuticals on aquatic organisms in Boston Harbor.

During her Ph.D. program at UCR, McGruer met Dr. Alvina Mehinto, head of SCCWRP's Toxicology Department, during a seminar and kept in close contact with her throughout her postdoc as well. After completing her postdoc, McGruer embarked on a 2,650-mile hike along the Pacific Crest Trail – from Southern California to Northern Washington – in collaboration with the Moore Institute for Plastic Pollution Research to survey trash and plastic pollution on the trail.

Her group walked about 20 miles each day for six months, documenting trash every 10 miles and collecting soil samples for microplastics analysis every 50 miles.

"You really get to know the West Coast better when you're seeing everything at a slower pace as you're walking," McGruer said. "As a researcher and someone who loves to be outside, I can't think of a better opportunity to do both at the same time."

Since returning home to Long Beach after six months in the backcountry, McGruer spends her free time playing beach volleyball with a beginner-friendly group. She is also interested in other beach activities and would like to get back into sailing and learn how to surf.

SCCWRP SCENES

Convening the bioassessment community

The State Water Resources Control Board held its annual California Aquatic Bioassessment Workgroup (CABW) meeting in November at SCCWRP – the first time the meeting has been held outside of Sacramento in three decades. The two-day meeting brought together more than 175 members of California's bioassessment community – about half of attendees online – to learn about recent advancements in the field, including tools for evaluating the biological health of modified channels, and how to use environmental DNA (eDNA) as a bioassessment monitoring tool. Attendees included staff from many of SCCWRP's member agencies.



Clockwise from top left, California Aquatic Bioassessment Workgroup meeting attendees gather in a SCCWRP conference room for a presentation about visualizing benthic macroinvertebrate community structure; SCCWRP's Dr. Nastassia Patin shares how environmental DNA (eDNA) is being used to advance marine biomonitoring; and meeting attendees mingle during a break between sessions.

