SCCWRP Director's Report

PUBLISHED JANUARY 30, 2026 | COVERING NOVEMBER 1, 2025-JANUARY 30, 2026

WINTER 2026 ISSUE

Regional monitoring program approved for coastal wetlands

SCCWRP and its partners have received unanimous management approval to begin implementing a new regional monitoring program for comprehensively assessing the health of Southern California's coastal wetlands – an endorsement that paves the way for managers to use standardized methods to collect directly comparable data for the region's approximately 100 wetlands.

The Southern California Coastal Wetland Regional Monitoring Program – which was unanimously endorsed in December by 18 local, State and federal management agencies that make up the governing board of the Southern California Wetlands Recovery Project – is the culmination of a five-year effort to design, build and pilot-test the program.

The new program seamlessly integrates with both the Southern California Bight Regional Monitoring Program and California Estuarine Marine Protected Areas (EMPA) Monitoring Program.

Already, multiple agencies have committed to begin incorporating elements of the monitoring program into their regulatory and grant requirements, and assisting in coordinating monitoring efforts. Meanwhile, the upcoming 2028 cycle of the Southern California Bight Regional Monitoring Program (Bight '28) is expected to collect the first regional-scale data sets for the newly launched program.

The program's wetland monitoring protocols were developed over the past few years for the statewide EMPA program, which is in the final stages of development. The protocols were then pilot-tested through the Bight '23 Estuaries study element. Researchers' long-term goal is for other regions of California to adopt the structure of the Southern California Coastal Wetland Regional Monitoring Program, thereby forming a statewide program encompassing all wetlands in California, not just the subset of wetlands that are designated EMPAs (where there is already overlap).

Contents

Cover photo: The newly approved Southern California Coastal Wetland Regional Monitoring Program – unanimously endorsed in December by 18 local, State and federal management agencies – will comprehensively assess the health of coastal wetlands across Southern California, including Batiquitos Lagoon in Carlsbad, pictured.

To subscribe: The SCCWRP Director's Report is published quarterly by the Southern California Coastal Water Research Project. To receive this newsletter by email, contact pubrequest@sccwrp.org.

Calendar

Thursday, February 5
CTAG quarterly meeting
(In-person meeting)

Friday, March 7
Commission meeting
(In-person meeting)

California has spent more than $600 million over the past two decades to protect and preserve wetlands, but these efforts have largely been site-specific and siloed, with managers lacking rigorous assessment tools and a unified monitoring program to evaluate the effectiveness of management interventions. Agencies that monitor coastal wetlands traditionally have used their own methods and approaches to collect data on wetland extent, abundance, and condition, resulting in inconsistent data stored in multiple locations – and limiting managers' ability to understand how these systems have been affected by climate change and local human activities.

The monitoring program uses a standardized assessment approach that focuses on the ecological functioning of estuaries. Although this approach is advantageous in that it is directly tied to the beneficial-use goals that estuary managers are working to protect, it also is more complex and laborious to implement than traditional monitoring approaches, which rely on simpler measures of ecosystem condition like the wetland monitoring approach codified into the California Rapid Assessment Method (CRAM).

At the same time, the new monitoring program is modular in its design, giving participants flexibility to decide which aspects of wetland health they will monitor and how intensely – while simultaneously enabling disparate data sets to be stitched together to paint an overall picture of wetland health. The regional data sets also will enable researchers to determine the relative success of different wetland restoration projects across Southern California.

Core to the monitoring program's design is a 37-site sentinel site network – unveiled in 2024 – that serves as the equivalent of the program's reference sites, which are sites that monitored sites can be compared to. While some of the network's sites are actual reference sites, others are recently restored sites – reflecting the fact that few Southern California wetland sites are in reference condition due to ecological degradation.

A field crew sorts through samples collected via a trawl net at San Elijo Lagoon in San Diego County as part of an assessment of the lagoon's overall health. The new Southern California Coastal Wetland Regional Monitoring Program uses a standardized approach that focuses on ecological functioning to assess the health of wetlands like San Elijo Lagoon.

Coastal wetlands play a critical role at the land-sea interface, helping to buffer against coastal flooding, filter and retain contaminants, and provide critical habitat for vulnerable plant and animal communities.

Since the mid-1800s, more than half of Southern California's coastal wetlands have been lost as a result of intensive human development. A 2017 analysis by SCCWRP and its partners found that about half of the region's remaining wetlands are expected to become permanently submerged by 2100 as a result of sea level rise.

But the news is not all bad: If Southern California were to realign levees, roads and other infrastructure, the region has the potential to experience a net gain of up to 4,800 acres of wetlands.

In 2018, the Southern California Wetlands Recovery Project – a consortium of seven State agencies, five federal agencies, and six local agencies – developed a master, long-term strategy calling on the region's wetlands to be managed as an interconnected, interdependent network, and to build capacity to conduct regional assessments of wetland health.

The development of the Southern California Coastal Wetland Regional Monitoring Program consists of four major components, which are described in four guidance documents: Sentinel site network, Monitoring strategy, Agency-specific guidelines and Implementation strategy.

For more information, contact Dr. Jan Walker.

Effort launched to expand DNA reference libraries for intertidal habitats

SCCWRP and its partners have launched a multi-year initiative to build a comprehensive library of genetic identifying information for thousands of species in California's coastal intertidal areas – a major statewide investment that will pave the way for robust, ongoing DNA-based monitoring in these ecologically diverse habitats.

The California Intertidal Biodiversity DNA Barcode Library project, which kicked off with a two-day planning workshop in January that was hosted by SCCWRP, is the first large-scale, coordinated effort within California to generate comprehensive genetic identifying information for thousands of fish, invertebrates and algae across an aquatic habitat. Researchers hope the project will serve as a template for coordinating and building comprehensive DNA reference libraries for other types of aquatic habitats in the future.

As traditional, manual identification of aquatic organisms by trained taxonomists gives way to rapid, DNA-based identification methods, environmental managers increasingly are relying on DNA reference libraries to identify the species they are monitoring.

Although this information has already been published for some species and although the libraries are continually expanding, DNA reference libraries remain incomplete and uneven across species and habitats, limiting managers' ability to use DNA-based methods to monitor all species of interest.

The limitation is particularly constraining when managers are monitoring organisms via the DNA they shed into their environment, known as environmental DNA (eDNA). eDNA monitoring makes it possible to cast a wide net, but in the absence of DNA reference libraries for every species of interest, many "dark taxa" go routinely undetected.

The SCCWRP-facilitated project is a strategic statewide mandate issued by the Office of Governor Gavin Newsom to the California Ocean Protection Council.

Researchers are treating the project as a demonstration for how to organize large-scale DNA field sampling events, analyze and extract high-quality DNA barcoding data, and ensure samples are properly archived in public museum collections. SCCWRP and its partners are exploring how to develop DNA sequencing databases and data analysis tools that not only make genetic identification information accessible, but also support analyses of species distributions and temporal trends.

Intertidal habitats are the narrow area of the coastline that alternates between being submerged at high tide and exposed at low tide. These areas are among the most vulnerable coastal habitats to the intensifying effects of climate change, including rising water temperatures and sea levels.

Key to the success of the project's large-scale sampling "bioblitzes" will be ensuring that all participants follow standardized workflows and methods to generate comparable, comprehensive genetic identification information.

During the January workshop, researchers and managers from several environmental agencies, including SCCWRP member agencies, reached agreement on how to collect and store both voucher specimens and DNA for thousands of intertidal species. The workshop also focused on identifying best practices for making the resulting data publicly accessible and interpretable by the broader management community, including an interactive website and data portal.

A technical report summarizing the workshop outcomes and next steps is expected to be published this spring.

For more information, contact Dr. Susanna Theroux.

Photo courtesy of Multi-Agency Rocky Intertidal Network (MARINe), UC Santa Cruz

Researchers have kicked off the first large-scale, coordinated effort in California to build a comprehensive library of genetic identifying information for thousands of species in California's coastal intertidal areas, including for the intertidal habitat at Point Conception in Santa Barbara County, above. DNA reference libraries incomplete and uneven across species and habitats, limiting managers' ability to use DNA-based methods to monitor all species of interest.

Study probing influence of habitat restoration on biological health of engineered channels

SCCWRP and the Southern California Stormwater Monitoring Coalition (SMC) have begun working to understand how restoring the physical habitat of streams that flow through Southern California's engineered channels could potentially improve their biological health – an effort that builds on previous research evaluating other potential options for improving stream biological health.

The three-year study, launched in July, will examine whether physical habitat restoration strategies like adding native vegetation, creating naturalistic side channels, and re-creating natural channel forms can be expected to improve the biological health of engineered channels. Engineered channels, which are ubiquitous across Southern California's urban areas, are characterized by hardening of their banks and bottom, and/or modifications to channel shape.

During previous investigations, SCCWRP and the SMC evaluated two other potential options for improving the biological health of these streams: improving water chemistry, and restoring flow patterns to a less altered state. Researchers found that both options have the potential to result in some improvement in biological health for some streams, but likely not enough to meet potential regulatory targets for biological health. The findings have underscored the need to evaluate multiple strategies for improving stream health.

Streams that flow through engineered channels are much more likely to receive lower biological condition scores than their unmodified counterparts, as these modifications can eliminate habitat for aquatic organisms, disrupt natural hydrologic and sediment regimes, increase thermal stress, and increase susceptibility to eutrophication.

At the same time, options for improving stream biological health are often limited. For example, the primary reason for channel modifications is to help protect against flooding – a function that must be maintained.

SCCWRP and the Southern California Stormwater Monitoring Coalition have begun working to understand how to protect and restore the biological health of Southern California's engineered channels, including this one, above, that depicts a field crew removing accumulated sediment as part of channel maintenance. The study will examine whether physical habitat restoration strategies can be expected to improve stream biological health.

California is increasingly adopting biology-based approaches for assessing and protecting stream health.

Regulations based on bioassessment index scoring tools already are in place across California, including in TMDLs (total maximum daily loads) and basin plans. Additionally, in 2020, the San Diego Regional Water Quality Control Board adopted a narrative biological objective for streams that uses the California Stream Condition Index (CSCI) – a tool co-developed by SCCWRP – as a numeric translator. This water quality standard, which is undergoing review by the State Water Resources Control Board and has not yet taken effect, applies to all natural channels, as well as engineered channels with soft or natural stream beds; it does not apply to streams that are "fully hardened" as a result of being lined with concrete, rock and similar materials.

As part of the newly launched engineered channels investigation, researchers will conduct a series of analyses of historical data. They will revisit the two previously studied management options in more depth – improvements to water chemistry and reductions to flow alterations – and simultaneously evaluate how physical habitat restoration projects can influence stream biological health.

The study aligns with the SMC's research priorities outlined in its latest bioassessment workplan, which calls for investigating all three of these management options:

» Improve water quality by reducing the chemical stressors that can degrade biological health

» Restore flow patterns to a less altered state – an action that reflects the fact that engineered channels tend to experience significant flow modifications that can degrade biological health

» Pursue physical habitat restoration strategies – specifically, habitat changes that can be made without compromising a channel's flood control functions

Managers may need to consider combinations of all three options to optimize their chances of improving biological health across Southern California's diverse urban streams.

From these analyses, researchers hope to develop a management framework for identifying urban streams that are most vs. least likely to benefit from one or more of the three stream management options, enabling managers to prioritize streams and actions that show the most promise.

For more information, contact Dr. Raphael Mazor.

Short-term strategies identified for controlling HABs in California coastal waters

An expert working group of researchers and environmental managers that was tasked with reviewing short-term strategies for controlling and mitigating harmful algal blooms (HABs) in marine environments has identified multiple approaches that California should prioritize implementing over the next five years, including expanded field monitoring programs, improved modeling tools for forecasting HABs, and bolstered capacity to respond to mass wildlife poisoning events.

In a technical report published in January, the 21-member working group provided its assessment of multiple types of potentially effective short-term HAB control and mitigation strategies, as well as those that are unlikely to be effective or viable to implement in California coastal waters. The working group formulated its recommendations during a two-day workshop in January facilitated by SCCWRP and held at the Orange County Sanitation District.

HAB management along California's coast has traditionally focused on long-term prevention measures, especially reducing discharges of land-based nutrient sources that can exacerbate blooms. But as HABs increase in frequency and severity due to changing environmental conditions, including climate change, the California Ocean Protection Council asked SCCWRP to bring together an expert working group to evaluate HAB control options that could provide relief on shorter time horizons.

Among the promising shorter-term solutions that the working group recommended exploring is co-cultivation of shellfish and seaweed farms. Shellfish like oysters and mussels are filter feeders that consume tiny particles in the water column, including the phytoplankton species that cause HAB events, while seaweed plants could use up nutrients, draw down dissolved carbon dioxide levels, and release compounds that inhibit algal growth. The group recommended investigating the effectiveness and feasibility of implementing these aquaculture practices at scale in coastal waters to mitigate coastal bloom events.

Simultaneously, the group ruled out a number of other emerging biological, physical and chemical HAB control technologies. These technologies are designed to destroy HAB cells and/or their toxins, physically remove cells or toxins from aquatic systems, or limit cell growth and proliferation. The group concluded that many of these emerging technologies would require substantial efficacy testing; the technologies also have not been vetted for potential unintended ecological damage, and likely are logistically or economically impractical to implement at sufficiently large scales. For example, some short-term HAB control strategies involve spraying chemicals over the water surface to inhibit algal growth.

In recent years, major bloom events along California's coast have disrupted the fishing and shellfish industries, as well as stranded thousands of marine mammals en masse at beaches as a result of poisoning by domoic acid, which is the toxin produced by a ubiquitous type of HAB known as *Pseudo-nitzschia*.

The working group focused most of its recommendations on improving managers' ability to track bloom patterns in coastal waters – both via expanded HAB field monitoring programs and via enhanced HAB forecasting tools.

The group also recommended enhancing existing mitigation strategies that focus on

An expert working group of researchers and environmental managers, pictured at a two-day workshop at the Orange County Sanitation District, has developed recommendations for multiple short-term approaches that California should prioritize implementing over the next five years to control and mitigate harmful algal blooms (HABs) in coastal marine environments.

minimizing the effects of HABs on both wildlife and commercial and recreational fisheries, including by bolstering resources for wildlife rehabilitation centers that routinely respond to mass coastal strandings of poisoned marine mammals, and expanding public health infrastructure to prevent people from inadvertently consuming seafood contaminated with HAB toxins.

The California Ocean Protection Council intends to use the workshop's recommendations as a community resource for guiding investments in California's coastal HAB management strategies going forward.

For more information, contact Dr. Jayme Smith.

Updates by Thematic Area

SCCWRP Research Themes BIOASSESSMENT • ECOHYDROLOGY • EUTROPHICATION • CLIMATE RESILIENCY • CONTAMINANTS OF EMERGING CONCERN • MICROBIAL WATER QUALITY • STORMWATER BMPs • REGIONAL MONITORING

BIOASSESSMENT

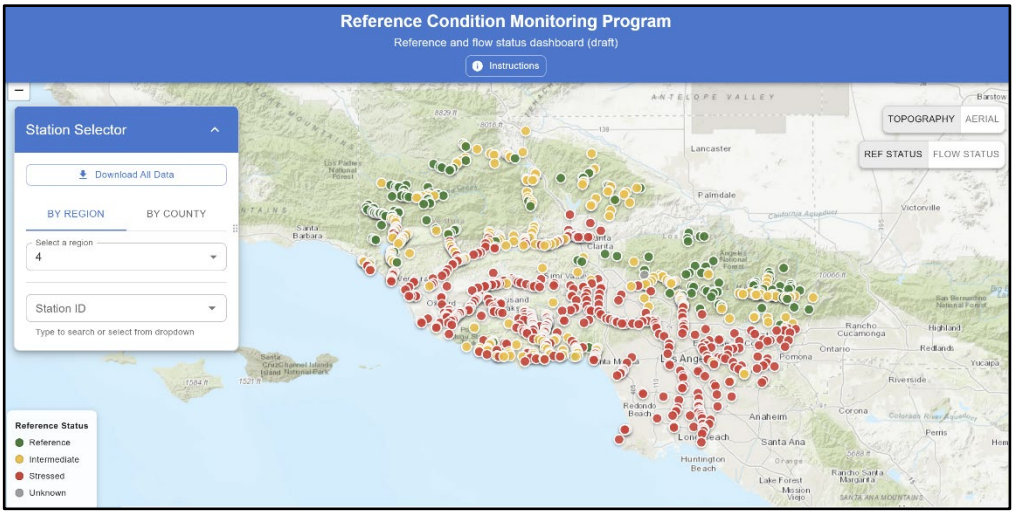
New data dashboards enhance access to foundational California stream data sets

SCCWRP has developed a pair of data dashboards to streamline access to foundational California stream bioassessment and hydrologic data sets – an effort intended to help standardize how the data get used in stream management decisions.

The Reference Condition Monitoring Program dashboard provides key information about more than 5,000 stream sites across California that are considered minimally disturbed reference sites, including classifications based on the site's flow duration (e.g., perennial vs. intermittent).

The Channel Engineering Review dashboard provides key information about bioassessment scores in engineered channels and the extent of channel hardening at these sites.

Both dashboards went live in January. Over the long term, SCCWRP envisions integrating both dashboards into a single dashboard resource for tracking reference condition, flow duration, and channel engineering status.



The Reference Condition Monitoring Program dashboard – one of two newly developed data dashboards intended to streamline access to foundational California stream data sets – provides key information about more than 5,000 stream sites across California that are considered minimally disturbed reference sites, including providing classification information on flow duration.

Prototype index scoring tool successfully used to assess regional health of eelgrass beds

SCCWRP and its partners have developed and applied a prototype bioassessment-based index scoring tool to evaluate the health of Southern California eelgrass beds based on their ecological functioning – a proof-of-concept study that paves the way for ongoing monitoring of eelgrass health through programs like the Southern California Bight Regional Monitoring Program.

The pilot study, completed in December, used a newly developed eelgrass condition assessment index to evaluate the aquatic plants' ability to provide refugia to fish and other animals, as well as other ecosystem services, including attenuating ocean waves and sequestering carbon.

Eelgrass beds, which are scattered across shallow, soft-bottom coastal areas of Southern California, are the dominant type of seagrass found in California's coastal embayments. In recent years, California has invested significant resources into restoring and protecting seagrass beds, which have been degraded by a range of human activities.

The prototype index scoring tool will be refined and then applied to assess regional eelgrass health through the Southern California Bight 2023 Regional Monitoring Program's ongoing Submerged Aquatic Vegetation (SAV) study element.

Study developing tools to measure nature-based recreational benefits provided by water bodies

SCCWRP and its partners have launched an effort to develop tools for quantifying the nature-based recreational benefits provided by water bodies – benefits that include birdwatching, nature-viewing and similar activities that rely on natural elements of the environment.

The study, which kicked off in December, will focus on developing frameworks for measuring how changes to water quality, stream flow patterns, local demographics and land use affect a range of nature-based recreation activities.

While nature-based recreation is included in California's regulatory definition of non-contact water recreation (REC-2), most assessments have been limited to examining illness risks and other public health risks, not on assessing the ability of water bodies to provide recreational benefits.

Managers will be able to use the frameworks to explore how changes in one factor (e.g., flow patterns) affect the water body's potential to provide nature-based recreation and other benefits.

Although focused on REC-2 beneficial uses, researchers expect that the framework developed during this study will be able to serve as a template for evaluating other human benefits provided by healthy water bodies.

ECOHYDROLOGY

Flows framework to be used to understand effects of potential flow reductions in Santa Ana River watershed

SCCWRP and the Orange County Water District have launched a three-year study to evaluate how reducing discharges that have traditionally flowed into the Prado Basin in the Santa Ana River watershed can be expected to affect the ecological health of the basin's ecosystems.

The study, which kicked off in January, is using the California Environmental Flows Framework (CEFF) to determine what flow patterns need to be maintained in the middle Santa Ana River and its tributaries – located upstream of Prado Dam in Corona – to sustain both healthy aquatic ecosystems and human uses.

Photo courtesy of U.S. Army Corps of Engineers

SCCWRP and the Orange County Water District have begun evaluating how reducing discharges that have traditionally flowed into Prado Basin, above, can be expected to affect the ecological health of the basin's ecosystems. The study is using the California Environmental Flows Framework (CEFF) to determine what flow patterns need to be maintained in the basin to sustain both healthy aquatic ecosystems and human uses.

Communities upstream of the Prado Basin are interested in reducing the amount of treated wastewater effluent and runoff they discharge into the Santa Ana River watershed to achieve their local water-reuse goals. But these flows support groundwater recharge and sustain critical riparian habitats in Prado Basin, underscoring the need to identify balanced flow management solutions.

CEFF, which was co-developed by SCCWRP, provides a standardized statewide approach for establishing flow targets for streams that balance multiple human and ecosystem needs for flowing water.

Modeling approach developed for study seeking to enhance statewide framework for establishing stream flow targets

SCCWRP and its partners have reached consensus on a conceptual approach for designing modeling tools that predict how changes in stream flow patterns will influence stream temperature across space and time – the first milestone in an ongoing three-year study seeking to expand the management utility of the California Environmental Flows Framework (CEFF).

The conceptual approach, which the California Water Quality Monitoring Council's Environmental Flows Workgroup agreed to in November, will enable researchers to develop regional-scale models that address more integrated management questions about how changes in stream flow patterns can influence ecosystem health.

CEFF, which was co-developed by SCCWRP and unveiled in 2021, offers a rigorous, standardized approach for determining how to allocate limited surface flows that balance both human and ecosystem needs for flowing water. The existing modeling tools that support CEFF, however, do not adequately consider the relationships between flows and other parameters, including water temperature.

The new "From Framework to Flows (F2F)" models will consider flow patterns – as well as elevation, canopy cover and groundwater (which can interact with surface-level flows) – to predict stream temperatures for different sites and different seasons.

Relationship between stream temperature and ecosystem health modeled for effluent discharge studies

SCCWRP and its partners have successfully used modeling tools to estimate how changes in stream temperature can influence the ecological health of Southern California streams – the latest step in a pair of ongoing studies investigating how changes to the volume of treated wastewater effluent discharges into the Los Angeles and upper Santa Clara Rivers, respectively, affect stream health.

The modeling analyses, completed in December, involved developing a series of curves that explain the relationship between stream temperature changes and the biological condition of stream benthic communities, as measured by stream bioassessment index scoring tools. Little field-collected temperature data exist for Southern California stream sites, necessitating the use of a modeling approach.

The study is motivated by a new generation of wastewater discharge permits that have lowered the maximum temperature at which receiving water is required to be maintained from 86 to 80 degrees Fahrenheit; the permits also prohibit effluent discharges from triggering more than a 5-degree increase in water temperature.

The lower allowable temperatures are more difficult to reach because wastewater effluent is typically discharged into streams above the streams' ambient temperature; streams are subject to seasonal heating associated with warm weather and low canopy cover (i.e., minimal shading).

Photo courtesy of the California Freshwater and Estuarine Harmful Algal Bloom Program

Algal mats cover a log at the bottom of the Eel River in Northern California. SCCWRP and its partners have begun test-driving a set of standardized statewide protocols for monitoring toxin-producing benthic blooms, which tend to form mats along the bottom of water bodies.

EUTROPHICATION

Best practices published for using satellite imagery to monitor inland HABs

SCCWRP and its partners have published best-practices guidance for using satellite imagery data as a routine management tool to detect and monitor harmful algal blooms (HABs) in California's large lakes and reservoirs.

The guidance, described in a manuscript published in January by the journal *Ecological Indicators*, provides quality-assurance safeguards to help improve management confidence in satellite imaging data as a tool for assessing HABs status and trends. Because routine field-based monitoring is rare for many large lakes and reservoirs, water-body managers commonly rely on satellite imagery data for tracking HABs.

Satellite remote sensing data have the potential to provide a viable, cost-effective way to generate a continuous stream of real-time HABs monitoring data. In 2022, SCCWRP and its partners demonstrated how to use satellite imaging data to build a comprehensive, five-year portrait of when and where HABs have been occurring in California's large lakes and reservoirs.

Pilot study being developed to monitor benthic HABs in streams

SCCWRP and the Water Boards' Freshwater Harmful Algal Blooms (HABs) Program have begun working to develop a statewide pilot program for monitoring toxin-producing harmful algal blooms (HABs) that form along the bottom of wadeable streams, known as benthic HABs.

The benthic HABs monitoring program, which researchers began drafting a workplan for in January, represents a first-of-its-kind effort in California to more holistically evaluate benthic HABs at a statewide scale to inform management responses. The workplan will incorporate standardized best-practices benthic HAB monitoring protocols that were developed last year by the Benthic HABs Subcommittee of the California Cyanobacterial and Harmful Algal Bloom (CCHAB) Network.

Unlike planktonic HABs that grow in the water column, benthic HABs have not been as extensively monitored and studied. In California, existing HAB toxin thresholds designed to protect humans and wildlife from exposure are for water-column HABs only. Meanwhile, because benthic HABs tend to form as mats, researchers believe humans and wildlife can be exposed to benthic HABs in more uneven and unpredictable ways (i.e., when

pieces of the mat suddenly break off and become suspended in the water column).

Pilot monitoring is planned for this summer. To participate in the pilot monitoring study, contact Dr. Jayme Smith.

Updated HAB toxin monitoring methods being piloted in coastal waters

SCCWRP and its partners have begun test-driving a set of updated methods for monitoring toxin-producing harmful algal bloom (HAB) in Southern California's coastal waters that are designed to offer more sensitivity, enable faster turnaround times, and target a wider range of toxin types.

The updated and expanded toxin analysis protocols, which researchers began piloting in December through California's 18-year-old Harmful Algal Bloom Monitoring and Alert Program (HABMAP), include use of LC-MS (liquid chromatography–mass spectrometry) methods, instead of the immunological methods that have been traditionally used.

The updated protocols also have added monitoring of yessotoxin, which is a HAB toxin produced during some red tide events. Most marine HAB toxin monitoring to date in California has focused on domoic acid, which is produced by a ubiquitous HAB species known as *Pseudo-nitzschia*.

The updated toxin monitoring capabilities are coming at a time when toxin-producing HAB events are becoming more severe and more frequent off the coast of California, leading to mass poisoning of sea lions and other marine mammals, which are being sickened en masse from exposure to HAB toxins.

HABs modeling tool developed to predict influence of nutrients on when, where toxin-producing events will occur

SCCWRP and the University of California, Los Angeles have developed a modeling tool that predicts when and where toxins produced by a common type of marine algal bloom can be expected to occur along the California coast, and how land-based nutrient discharges to Southern California coastal waters are influencing the frequency and extent of these events.

Photo courtesy of National Oceanic and Atmospheric Administration

A pteropod, or sea snail, with pit marks on its shell, shows signs of shell dissolution in response to ocean acidification. Researchers have worked collaboratively with a subcommittee of the SCCWRP Commission's Technical Advisory Group (CTAG) to complete a case study demonstrating how to quantify uncertainty associated with the predictions of coastal ocean acidification and hypoxia (OAH) modeling tools.

The findings, described in a manuscript published in January by the journal *Harmful Algae*, involved comparing modeling predictions for domoic acid – a toxin produced by a ubiquitous type of HAB known as *Pseudo-nitzschia* – to field-collected data on when and where toxin-producing blooms actually occurred.

The model predicted that land-based nutrient discharges amplify domoic acid production by a non-trivial amount relative to the natural susceptibility of Southern California coastal waters to these blooms (i.e., as a result of ocean processes like natural coastal upwelling events). Domoic acid produced by the blooms can poison mammals and contaminate commercially important species like Dungeness crab.

The modeling work is helping managers understand to what extent local, land-based sources of nutrients are exacerbating coastal conditions. The model makes use of a coupled physical-biogeochemical ocean model that predicts how land-based discharges affect coastal acidification and hypoxia.

CLIMATE RESILIENCY

Case study completed for how to quantify uncertainty in coastal OAH modeling tools

A research team that has been modeling how land-based nutrient discharges into Southern California coastal waters influence ocean acidification and hypoxia (OAH) has completed a case study demonstrating how to quantify uncertainty, or error, in the modeling tools' predictions.

The case study, completed in December and undergoing final review prior to publication as a SCCWRP technical report, has helped engage a technical subcommittee of the SCCWRP Commission's Technical Advisory Group (CTAG) in focused discussions about what additional work is needed to improve existing methods for quantifying modeling uncertainty.

These consensus-building conversations are critical as coastal ocean managers

weigh how much confidence to place in the OAH modeling tools' predictions, as well as decide if and how to use the predictions as a basis for taking management actions in response to intensifying coastal OAH.

In a parallel effort, the modeling team has expanded its quality assurance documentation for the modeling tools. This new documentation, published in December as a SCCWRP technical report, is intended to enhance transparency and understanding of how the tools are being used; it also is expected to serve as the basis for a modeling Quality Assurance Project Plan (QAPP) that the State Water Board is planning to develop.

EMERGING CONTAMINANTS

SCCWRP releases open data portal for post-fire monitoring network

SCCWRP has unveiled an open data portal for the Los Angeles-area Post-Fire Water Quality Monitoring Network that provides centralized access to high-quality, comparable data tracking the environmental effects of pollution and debris from the Palisades and Eaton fires.

The data portal, which went live in January, contains data for nearly 100 different contaminants and other water-quality metrics spanning Santa Monica Bay and the Los Angeles River and San Gabriel River watersheds; the data sets published so far cover the first six months after the fires.

Managers can use the data portal to assess the overall extent of effects from the fires, including which sites exceed contaminant thresholds for human health and aquatic health.

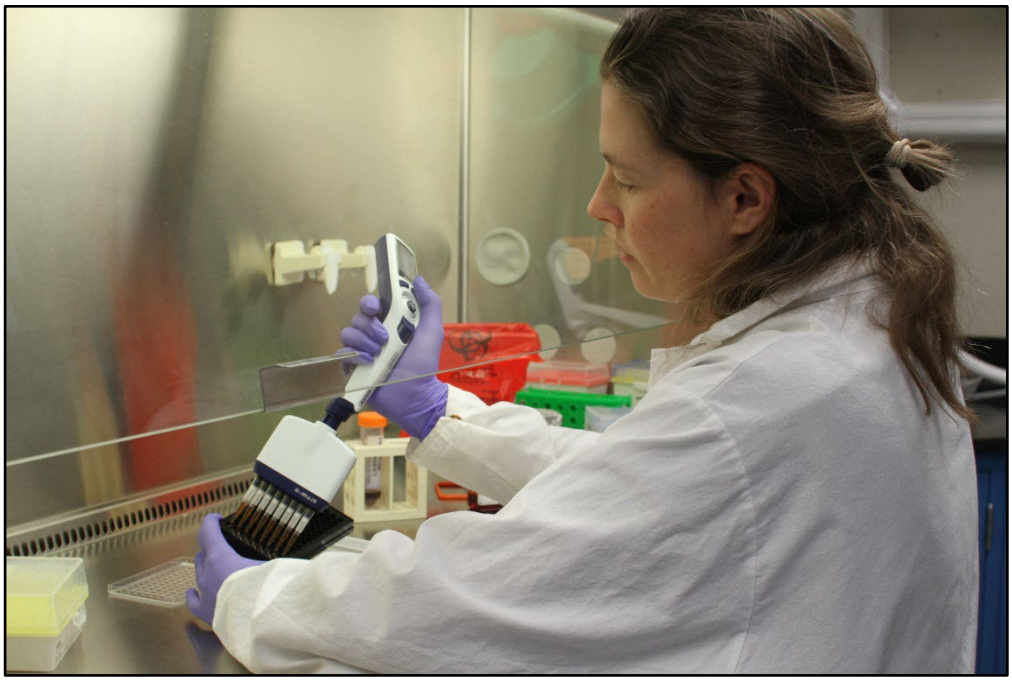
First phase completed in OEHHA study using cell bioassays to study adverse health effects of CECs

SCCWRP has successfully completed the first phase of an ongoing study with California's Office of Environmental Health Hazard Assessment (OEHHA) that is using bioanalytical screening assays to improve understanding of the health risks associated with exposure to understudied chemicals found in consumer products.

During the study's first phase, completed last fall, researchers generated cell bioassay data that was then used to evaluate the performance of modeling tools designed to estimate exposure risks for both humans and aquatic life.

Researchers hope the modeling tools will enable faster, more cost-effective evaluations of thousands of understudied CECs (contaminants of emerging concern) than traditional, chemical-by-chemical health risk assessments.

Cell bioassays are a laboratory-based method used to rapidly screen environmental samples and detect chemical classes that could be harmful to human and aquatic life, including chemicals found in disinfectant and personal-care products, such as per- and polyfluoroalkyl substances (PFAS).



SCCWRP's Dr. Tori McGruer transfers cells into assay wells for a bioanalytical screening test. The technology is being used for an ongoing study that is working to improve understanding of the health risks associated with exposure to thousands of understudied chemicals found in consumer products.

MICROBIAL WATER QUALITY

Committee working to identify actions managers should take based on HF183 fecal contamination measurements

SCCWRP and the Southern California Stormwater Monitoring Coalition have convened an 12-member advisory committee to develop recommendations for what management actions are appropriate to take upon measuring exceedances of a genetic indicator of human fecal contamination known as HF183 in runoff.

The management advisory committee's deliberations, which began in January, follow publication of a 2025 SMC study that identified the numerical threshold, or inflection point, at which levels of HF183 in wet-weather runoff correspond to an elevated illness risk for people swimming and surfing in contaminated receiving waters.

Unlike with more established indicators of fecal contamination like *Enterococcus* bacteria, which have regulatory thresholds, stormwater managers lack guidance on if and how to act upon measuring HF183 in runoff or a water body. Consequently, they have struggled with how to use HF183 measurement data as a basis for taking actions to protect the health of beachgoers and others downstream who may be inadvertently exposed to fecal contamination.

The committee's membership includes representation from both the stormwater and wastewater management sectors, along with water-quality regulators, an environmental nonprofit, and experts in microbiology and health risk modeling. The committee's recommendations are expected to be finalized in summer 2027.

STORMWATER BMPs

First round of field testing completed for study quantifying runoff benefits of drip-irrigated landscapes

SCCWRP and the County of San Diego have completed the first round of field testing for a study measuring how much irrigation water and rainfall soaks into the ground vs. becomes runoff in residential areas – an ongoing effort that could transform Southern California's understanding of the runoff benefits associated with replacing traditional spray-irrigated turf with drip-irrigated, drought-tolerant landscaping.

During the initial round of field testing, completed in January, researchers used a new rainfall generator custom-built by SCCWRP to quantify the ratio of water that soaks into the ground vs. runs off the land – known as the runoff coefficient – across impermeable surfaces (e.g., concrete driveways), one of the three main types of residential land covers being investigated. The other two land cover types, which researchers already have begun field testing on, are grass turf lawns and drip-irrigated, drought tolerant landscapes.

Historically, managers have relied on decades-old runoff coefficients published in reference textbooks and practitioner manuals to estimate runoff volumes from turf lawns and impermeable surfaces, and there are no published values at all for drip-irrigated landscaping because it is a relatively new type of land cover.

Turf replacement projects are considered a type of non-structural stormwater BMP (best management practice) because they can reduce the volumes of irrigation and wet-weather runoff entering storm drains.

Site selection completed for study quantifying street sweeping's efficiency

SCCWRP and the Southern California Stormwater Monitoring Coalition (SMC) have completed site selection for a two-year study that will measure the efficiency of routine street sweeping in removing contaminants that would otherwise enter storm drains and contribute to runoff pollution.

Field testing at the 10 selected sites, which will begin in February, will involve using a custom-built rainfall generator designed by SCCWRP to simulate rainfall on a set of swept roadway segments and a corresponding set of unswept segments, then looking for differences in pollutant levels in the generated runoff between the two sets of areas.

Half the sites will be swept with mechanical broom sweepers, and the other half by regenerative air sweepers, which will also enable researchers to compare the performance of two different street-sweeping technologies.

Street sweeping is a type of non-structural BMP (best management practice) that is a routine part of stormwater management programs in communities across Southern California. What has historically been unclear, however, is what portion of stormwater pollutants – sediment, nutrients, trace heavy metals, microplastics and bacteria – are removed from roadways through street sweeping.

The study follows the completion of a pilot study in early 2025 that developed a robust, repeatable method for quantifying the influence of street sweeping in reducing runoff pollution.

A field crew uses a custom-built rainfall generator to create controlled runoff conditions on a residential concrete driveway. The work is part of an ongoing study seeking to measure how much irrigation water and rainfall soaks into the ground vs. becomes runoff in residential areas – foundational insights that could transform Southern California's understanding of the runoff benefits associated with replacing traditional spray-irrigated turf with drip-irrigated, drought-tolerant landscaping.

New SCCWRP Publications

Journal Articles

Caron, D.A., A.A.Y. Lie, B. Stewart, A. Tinoco, I. Kalra, S. Smith, A.L. Willingham, S. Sneddon, J. Smith, E. Webb, K. Florea, M.D.A. Howard. 2025. Spatial Structure and Temporal Dynamics in Clear Lake, CA: The Role of Wind in Promoting and Sustaining Harmful Cyanobacterial Blooms. *Water* 17:3265.

Frieder, C.A., T.W. Bell, H. Berry, K. Cavanaugh, D.C. Claar, J. Freiwald, B. Grime, S. Hamilton, H.F. Houskeeper, N. Lombardo, S. Marion, T.A. McHugh, G. McKenna, P.E. Parnell, P. Spector, S.B. Weisberg. 2025. Developing a Status and Trends Assessment for Floating Kelp Canopies across Large Geographic Areas. *Environmental Science & Technology* DOI:10.1021/acs.est.5c07501.

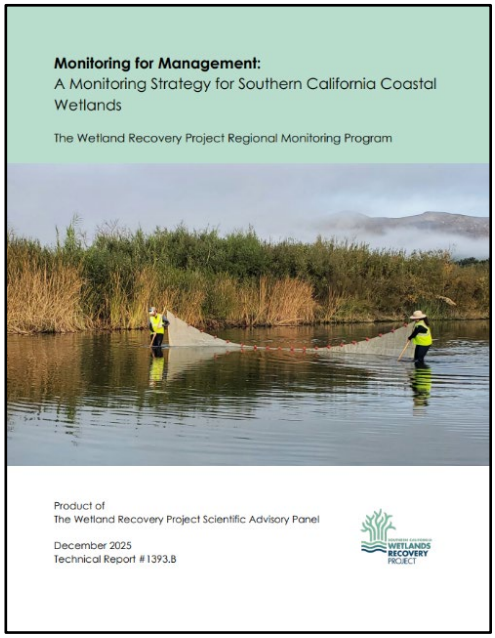
Lao, W., S. Sauers, C.S. Wong. 2025. Characterization and potential influence of laboratory airborne particle fallout on microplastics analysis. *Journal of Hazardous Materials* 499:140309.

Lie, A.A.Y., M.M. Coffer, M. Van Dyke, C. Nilson, J. Smith. 2026. California's approach to standardizing cyanobacterial bloom metrics derived from satellite imagery. *Ecological Indicators* 182:114492.

Nissen, K.A., M. Borst, E. Fassman-Beck, R. Sousa. 2026. Bioretention Flow-Through Planter Performance and Design Considerations. *Journal of Sustainable Water in the Built Environment* DOI:10.1061/JSWBAY.SWENG-582.

Sandoval-Belmar, M., F. Kessouri, J. Smith, A.R. Moreno, C. Anderson, R.M. Kudela, M. Sutula, M. Ho, P. Damien, C. Benitez-Nelson, J.C. McWilliams, D. Bianchi. 2026. Urban eutrophication enhances domoic acid production by Pseudo-nitzschia in the Southern California Bight. *Harmful Algae* 151:103023.

Schiff, K.C., L.L. Tiefenthaler, J. Westfall, M. Mori, K. Kelly, R. Kempster, A. Latker, E. Moon, N. Searing, D. Tang, J. Bennett. 2026. Quantifying ocean monitoring effort and cost in the Southern California Bight over the last 25 years. *Journal of Environmental Management* 397:128383.



A newly approved strategy for monitoring the health of Southern California coastal wetlands is described in a series of technical reports developed by SCCWRP in partnership with the Southern California Wetlands Recovery Project.

Zhang, Y., Y. Kong, K. Osborn, E. Tsutakawa, C. Beale, E. Moreno, A. Muhammad, A. Sinacori, V. Tong, L. Tran, D. Velazquez, M.C. De Lucca, N. Bui, A. Casillas, M. chang, A. Ding, S. Jun, J. Kuo, T. Lakhanpal, J. Lin, J. Vuong, Z. Asnani, R. Chowdhry, A. Espinoza, H. Hill, K. McMillan, M. Cheema, J.F. Griffith, J.A. Steele, C. Dickerson, L. Henning, N. Korir, J.A. Jay. 2026. Elevated Antibiotic Resistance in Escherichia coli from Surface Waters Impacted by Concentrated Animal Feeding Operations in California and Michigan. *Water* DOI:10.3390/w18020207.

Journal Articles (Accepted)

Kaufman, J., J. Rothman, S. Grimm, W. Bradshaw, K. Whiteson, K. Langlois, J.A. Steele, J.F. Griffith. Deep metatranscriptomic sequencing data of wastewater from Los Angeles, USA, 2023-2024. *Scientific Data.*

Kleindl, W.J., S.P. Church, K.C. Rains, M.C. Rains, E.D. Stein, M.K. Suddreth. Bridging Functions and Values: Advancing Wetland Ecosystem Service Assessment Through Use of a Service Capacity Index. *Wetlands.*

Technical Reports

Fassman-Beck, E., D. Xin, S. Sauers, D. Nguyen, J. Gray. 2026. Field Monitoring of Microplastics Loading and Accumulation in Biofiltration Best Management Practices. Technical Report 1457. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D. 2025. Bioassessment Survey of the Stormwater Monitoring Coalition: Workplan for Years 2021 through 2025 Version 6.0 (2026 continuation year). Technical Report 1174. Southern California Coastal Water Research Project. Costa Mesa, CA.

Smith, J., M. Sutula, A.A.Y. Lie, S.B. Weisberg. 2026. Harmful Algal Bloom Control in California Coastal Waters: January 12-13, 2026 Workshop Proceedings. Technical Report 1463. Southern California Coastal Water Research Project. Costa Mesa, CA.

Southern California Wetlands Recovery Project. 2025. Monitoring for Management: A Monitoring Strategy for Southern California Coastal Wetlands. Technical Report 1393.B. Southern California Wetlands Recovery Project. Oakland, CA.

Southern California Wetlands Recovery Project. 2025. Applicability of Regional Monitoring for Agencies: Guidelines for Incorporating the WRP Regional Monitoring Program into Agency Programs. Technical Report 1393.C. Southern California Wetlands Recovery Project. Oakland, CA.

Southern California Wetlands Recovery Project. 2025. Implementation Strategy for the Wetland Recovery Project Regional Monitoring Program: Provides recommendations for identifying the administrative structure and programmatic needs for long-term implementation of the WRP RMP

program. Technical Report 1393.D. Southern California Wetlands Recovery Project. Oakland, CA.

Sutula, M., F. Kessouri, C.A. Frieder, N. Lombardo. 2025. Quality Control Procedures for the Development, Validation and Science Applications of the Regional Ocean Modeling System with Biogeochemical Elemental Cycling Model (2019-2026). Technical Report 1444. Southern California Coastal Water Research Project. Costa Mesa, CA.

Whitcraft, C., E.D. Stein, J.B. Walker, B. Spies, R. Dagit, R. Ambrose, K. Johnston, J. Tupitza, A. Le Compte Santiago. 2026. Santa Monica Bay National Estuary Program State of the Bay Technical Chapter: Coastal Wetlands. Technical Report 1460. Southern California Coastal Water Research Project. Costa Mesa, CA..

Quarter in Review

Conference Presentations

Grosso, C., E. Stein, P. Kauhanen, D. Gillett, J. Walker, J. Tupitza, A. Braud. 2025. A statewide strategy to track coastal habitat change over time. Coastal and Estuarine Research Federation Biannual Meeting. November 10-13, 2025. Richmond, VA.

O'Connor, K., J. Walker, E Stein, C. Whitcraft, B. Hughes, J. Largier, C. Toms. 2025. California estuary marine protected area monitoring program. Coastal and Estuarine Research Federation Biannual Meeting. November 10-13, 2025. Richmond, VA.

Reynolds, M., A. Handler, L.S. Jansen. Lake and catchment characteristics alter toxic algal bloom risk from anthropogenic nutrient inputs across the conterminous United States. American Geological Union 2025 Annual Meeting. December 15-19, 2025. New Orleans, LA.

Steele, J.A., J.F. Griffith. A microbial sequencing approach to identify contamination from sewers in an urban watershed. American Water Works Association Water Quality Technology Conference. November 9-12, 2025. Tacoma, WA.

Steele, J.A. A Microbial Sequencing Approach to Identify Contamination from Sewers in an Urban Watershed. Microbes in Wastewater Symposium. January 15-16, 2026. Newport Beach, CA.

Stein E.D. 2025. Sentinel Site Networks as Mechanism to Evaluate Progress Toward Meeting Restoration Goals. Coastal and Estuarine Research Federation Biannual Meeting. November 10-13, 2025. Richmond, VA.

Whitcraft, C., E. Stein, J. Walker, K. O'Connor, B. Hughes, S. Garcia, S. 2025. Developing function-based assessment of nekton function for California streams. Coastal and Estuarine Research Federation Biannual Meeting. November 10-13, 2025. Richmond, VA.

Wong, C.S. 2025. DDT+ off the southern California coast: Spatial and temporal distribution, and consequences of contamination. National Conference on Environmental Chemistry. November 28-December 2, 2025. Jiangmen, China.

Wong, C.S. 2025. Effective strategies and tips for responding to reviewers' comments. National Conference on Environmental Chemistry. November 28-December 2, 2025. Jiangmen, China.

Wong, C.S. 2025. Standardizing environmental microplastics collection and measurement for regulatory and compliance monitoring. National Conference on Environmental Chemistry. November 28-December 2, 2025. Jiangmen, China.

Wong, C.S., W. Lao, M. Lankhorst, U. Send, L.A. Fernandez, K. Schiff. 2025. DDT+ in waters off Southern California: Concentrations, spatial and temporal distributions, sediment-water fluxes, and ramifications. Society of Environmental Toxicology and Chemistry North America Meeting. November 16-20, 2025. Portland, OR.

Xin, D., W. Lao, S. Dial-Sauers, C. Wong. One extraction, dual instrumental analysis of pesticide suites in water and passive samplers: Multi-laboratory method validation and SOP development. SETAC North America 46th Annual Meeting. November 18, 2025. Portland, OR.

Conference Posters

Mehinto, A., V. McGruer, G. Braun, B. Escher. Using New Approaches Methodologies to Evaluate Water Quality Improvements from Street Sweeping. SETAC North America 46th Annual Meeting. November 18, 2025. Portland, OR.

Other Presentations

Fassman-Beck, E. Measuring Water Quality Impacts from Street Sweeping. Safe, Clean Water Symposium, Los Angeles County Public Works. November 12, 2025. Alhambra, CA.

Fassman-Beck, E. Introduction to the Southwest Stormwater Center of Excellence. National Stormwater Day Webinar, National Municipal Stormwater Alliance. November 17, 2025. Via webinar.

Fassman-Beck, E. Field Monitoring of Microplastics Loading and Accumulation in Low Impact Development Best Management Practices. Ocean Protection Council Microplastics Research Webinar. November 25, 2025. Via webinar.

Fassman-Beck, E. Multi-year treatment performance analysis of 13 biofilters in Southern California. Center for Watershed Protection Webinar Series. January 21, 2026. Via webinar.

Frieder, C.A. A status and trends assessment for floating kelp canopies to support environmental report cards. Region Nine Kelp Survey Consortium Biennial Meeting. November 3, 2025. Via webinar.

Mazor, R.D. Development of a reference site tracking system. SWAMP Roundtable. December 9, 2025. Via webinar.

Mehinto, A. Updates from the Los Angeles Post-Fire Network: Initial Results and Data Visualization Dashboard. Los Angeles Regional Water Quality Control Board Meeting. November 20, 2025. Los Angeles, CA.

Mehinto, A. Los Angeles Post-Fire Network: Coordination of Water Quality Monitoring. San Diego Integrated Regional Water Management Regional Advisory Committee Meeting. December 10, 2025. Via webinar.

Taniguchi-Quan, K. Science to Inform Water Resource Management in California. San Diego State University Geography Awareness Week: Women in Geography. November 18, 2025. San Diego, CA.

Theroux, S., M. Baerwald, Z. Gold, R. Kelly, K. Yamahara. Advancing Next-Generation Ocean Management with Environmental DNA (eDNA). California Ocean Science Trust. November 18, 2025. Via webinar.

Smith, J. Historic and recent trends of cyanobacterial harmful algal blooms and environmental conditions in Clear Lake, California: A 70-year perspective. Clear Lake Hitch Science Summit. December 12, 2025. Via webinar.

Stein, E.D. 2025. Balancing environmental flows with consumptive uses in a water scarce environment: Ecohydrology tools from California. University of Florida. November 19, 2025. Gainesville, FL.

Stein, E.D., C. Grosso, S. Gopal. Tracking coastal habitat acreage change over time: Considerations for mapping. Ocean Protection Council. December 1, 2025. Via webinar.

Stein, E.D. WRP Regional Monitoring Program. Wetlands Recovery Project Directors Group. December 4, 2025. Via webinar.

Wong, C.S. 2025. How to plan, write, and publish effective research papers. South China University of Technology. December 3, 2025. Guangzhou, China.

SCCWRP Personnel Notes

Commission

Dr. **David Pohl**, Assistant Program Manager for the San Diego County Watershed Protection Program, was named an Alternate Commissioner in November, replacing Neil Searing, who continues to serve as a CTAG Representative.

Christiana Gauger, Assistant Director of the City of San Diego Public Utilities Department, was named an Alternate Commissioner in January, replacing Juan Guerreiro, who remains the City's Director of Public Utilities.

Scientific Leadership

Dr. **Alvina Mehinto** has been appointed chair of the Post-Fire Water Quality Workgroup for the California Water Quality Monitoring Council.

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

Departures

Dr. **Nastassia Patin**, who has worked as a joint Scientist with the Scripps Institution of Oceanography and SCCWRP since 2023, left SCCWRP in December to transition to working at Scripps full time.

Ashlyn Leang, who has worked at SCCWRP since 2021, most recently as a Research Technician in the Microbiology Department, left SCCWRP in January to take a position with the Orange County Health Care Agency.

SCCWRP COMMISSIONER SPOTLIGHT

Executive Officer fosters collaboration with partners

For the past eight years at the Santa Ana Regional Water Quality Control Board, Eric Lindberg and his staff have ensured compliance with environmental regulations for protecting both natural ecosystems and the water supplies of more than six million people who live within the region.

Eric Lindberg

Lindberg, who joined the Santa Ana Regional Board in 2017, has worked in regulating agriculture, dairies, and cannabis cultivation. Most recently, he served as Assistant Executive Officer and chief prosecuting officer for board enforcement actions.

Now as the Executive Officer and advisor to a board of seven community leaders, Lindberg has broad oversight of permitting and regulatory compliance for managing the quality of the region's water resources. He and his staff ensure reliability and sustainability of water resources for beneficial uses that include drinking water supply, recreation and habitat.

"Recycled water reuse projects in the Santa Ana region are our crown jewels to making our water supplies reliable and sustainable in the face of an unpredictable climate future, and to meet the Governor's Water Supply Strategy," Lindberg said. "Knowing that the work we do matters to people keeps me excited to come to work every day."

Lindberg became a SCCWRP Commissioner in August after previously serving as Alternate Commissioner for more than a year. He replaced Jayne Joy, who retired after serving more than seven years on the Commission.

Eric Lindberg and Pamela Ybarra hike Eaton Canyon with goats in December 2024.

Eric Lindberg

Job: Executive Officer, Santa Ana Regional Water Quality Control Board (since August 2025)

SCCWRP role: Commissioner (started August 2025)

Prior jobs: *8 years with Santa Ana Regional Water Quality Control Board*: Assistant Executive Officer (2023-2025), Manager, Groundwater Protection Branch (2022-2023), Supervisor and Unit Chief, Agriculture, Dairies and Cannabis Unit (2017-2022); Senior Hydrogeologist, Geo-Logic Associates (2012-2017); Senior Geologist, Wildermuth Environmental, Inc. (2005-2012); Sergeant, U.S. Marine Corps (1997-2001)

Education: B.S. geology, California State University, Chico (2006)

Residence: San Dimas

Hometown: Live Oak, California

Family: Dog Goose, a German shepherd/pitbull mix

Hobbies: Hiking (sometimes with goats); meteorite hunting

For more than 20 years, Lindberg has worked on groundwater recharge programs, including region-scale assessments and monitoring of salts and nutrients in groundwater to ensure water quality is protected.

"What is unique about the groundwater replenishment projects in our region is the collaborative approach to regulating and permitting projects," Lindberg said. "Instead of fighting, we meet with stakeholders from inception through implementation. Shared goals, benefits, funding burdens, and accountability are the structure of a good project."

Lindberg received a B.S. in geology from Chico State University, where he initially wanted to follow in his professor's footsteps and become a volcanologist. At the time, he was primed to pursue a Ph.D. and become a professor. His career trajectory shifted abruptly after interning at an environmental consulting firm in Lake Forest, where he worked on groundwater resources management.

"It was a light switch," Lindberg said, "Working in water was what I was meant to do, much to the chagrin of my professor."

In his spare time, Lindberg enjoys hiking, sometimes with goats, and also with his dog Goose, whom he rescued from an abandoned illegal marijuana grow site that he visited for work. He also likes hunting for meteorites in the desert and keeps a collection of his discoveries.

CTAG SPOTLIGHT

Manager builds capacity to protect State waters

Laurel Warddrip has spent her 18-year career at the California State Water Resources Control Board committed to protecting California's water resources and the communities that depend on them.

Laurel Warddrip

Her management experience spans across a broad range of sectors, including stormwater, wastewater, and coastal waters. For Warddrip, a core part of her leadership includes building her teams' capacity to consult and consider overburdened community and tribal interests when working on water-quality policies.

"Environmental justice and equity components are interwoven in all of the work we do," Warddrip said. "We have to make sure we're honoring and helping communities who both rely on our resources."

Warddrip, who is currently an Environmental Program Manager at the State Water Board, became her agency's Alternate CTAG Representative in July 2025.

In her role, Warddrip oversees multiple programs within the Division of Water Quality, including the Ocean Standards unit, which manages statewide plans and policies for protecting marine beneficial uses and water quality. She is also involved in environmental programs that protect and preserve California's aquatic environments, including ocean desalination, constituents of emerging concern, wastewater pretreatment, and the Santa Monica Bay Restoration Commission.

Growing up in a rural part of Placer County, Warddrip spent a lot of time surrounded by nature, especially local oak and pine forests.

Laurel Warddrip and partner Brent hike the Sierra Nevada Mountains in 2025.

Laurel Warddrip

Job: Environmental Program Manager, California State Water Resources Control Board (since 2024)

SCCWRP role: Alternate CTAG Representative (started July 2025)

Prior jobs: *18 years with California State Water Resources Control Board*: Senior Environmental Scientist (2015-2024); Environmental Scientist (2008-2015)

Education: B.S. plant sciences, University of California, Santa Cruz (2007); A.S. geographic information science and cartography, American River College (2017)

Residence and Hometown: Placer County, CA

Family: Partner Brent; two cats

Hobbies: Exploring the outdoors; gardening; fishing

She initially wanted to become a park ranger to protect nature – a dream that was inspired by environmental activist Julia Butterfly Hill.

Warddrip attended the University of California, Santa Cruz to study plant sciences. During her undergrad, she interned at the Central Valley Regional Water Quality Control Board and became interested in the regulatory management side of science.

After graduating, Warddrip joined the State Water Board under its National Pollutant Discharge Elimination System (NPDES) Industrial and Construction Stormwater Permitting Program led by former SCCWRP Alternate Commissioner Greg Gearheart.

"Greg was so passionate and inspiring, so I really looked up to him," Warddrip said. "He really showed me that there's so much we can learn and do to protect our precious water resources."

Warddrip became familiar with SCCWRP early in her career, but it wasn't until she joined CTAG that her understanding of SCCWRP deepened.

"Being in CTAG has really helped me appreciate SCCWRP's research a lot more," Warddrip said. "It's really important for helping us at the table make informed management decisions."

In her spare time, Warddrip enjoys tending to her garden and spending time outdoors. She also loves tinkering with repairs around her house and spending time at local lakes fishing with family.

SCCWRP PARTNER SPOTLIGHT

Director champions community-driven research

With her expertise in harmful algal blooms (HABs) and marine toxicology, Dr. Misty Peacock guides research that not only advances monitoring and management strategies for harmful algae, but also protects seafood resources and the coastal communities that depend on them.

Dr. Misty Peacock

When she was a graduate student at the University of California, Santa Cruz, Peacock worked closely with undergraduates from underrepresented communities through outreach and education programs.

Today, that commitment continues to shape her leadership as the Director of the Salish Sea Research Center at Northwest Indian College.

"It's important that we work closely with underrepresented tribal groups to protect the ecological and cultural health of our aquatic systems," Peacock said. "Building that network lets us do research that supports our environment while having that deeper understanding of their culture."

At the Salish Sea Research Center, Peacock oversees community-driven research that supports seafood and data sovereignty for Coast Salish tribes. Northwest Indian College is one of 37 tribal colleges and universities in the United States, and the only one to have a dedicated marine research center.

Currently, Peacock is working with SCCWRP on a study investigating the potential effects of intensifying climate change on HABs that produce toxins affecting shellfish health.

"Most of the people we work with are subsistence harvesters as part of their culture, so we're making sure that the seafood they eat is safe," Peacock said. "At the same time, our work is also helping inform the larger research picture on marine biotoxins."

Dr. Misty Peacock and children Dani, left, and Leighton, visit the pier on a rainy day in Bellingham, Washington.

Misty Peacock, Ph.D.

Job: Director, Salish Sea Research Center, Northwest Indian College (since 2016)

SCCWRP role: Research partner on harmful algal blooms (HABs)

Prior jobs: Postdoctoral Researcher, University of California, Santa Cruz, and San Francisco Estuary Institute (2013-2016)

Education: Ph.D. biological oceanography, University of California, Santa Cruz (2013); B.S. marine biology, University of California, Santa Cruz (2005)

Residence: Bellingham, WA

Hometown: McKinleyville, CA

Family: Husband Robin, a manager at a home for adults with disabilities; son Leighton, 13; daughter Dani, 10; pet Aga, a gargoyle gecko

Hobbies: Hiking; paddleboarding; throwing knives and axes; swimming

Peacock has also worked with tribal partners to use environmental eDNA (eDNA) to monitor longfin smelt – a culturally important forage fish in Washington – and help fill critical knowledge gaps about the species.

Peacock received both her Ph.D. in biological oceanography and B.S. in marine biology from the University of California, Santa Cruz.

As an undergrad, Peacock originally wanted to be a fisheries biologist until she learned about HABs during a class by Dr. Raphael Kudela – a long-time SCCWRP research partner.

"After Raphe's class, I knew this was something that I wanted to do, so I actually postponed going to grad school to work with him in his lab," Peacock said. "Then through his long history with SCCWRP, I got to work more closely with SCCWRP researchers, who have all been amazing and super accomodating."

In her free time, Peacock enjoys outdoor activities, such as hiking and paddleboarding, with her family. She is also an avid swimmer and is part of a U.S. Masters team.

SCCWRP STAFF SPOTLIGHT

Researcher explores illness risks in coastal waters

For Shelby Marhoefer-Jess, the thrill of solving problems and answering complex questions is what drew her to pursuing a career in environmental science.

Shelby Marhoefer-Jess

Growing up near the ocean, she became fascinated with how much of the ocean remains unknown and wanted to learn more. That curiosity quickly turned into a deeper calling.

"After I learned how quickly our ocean is changing due to climate change and pollution, I knew I wanted to do something to help preserve and conserve the environment for the future," Marhoefer-Jess said. "I saw there were opportunities out there to do meaningful research that makes an impact."

Marhoefer-Jess joined SCCWRP in September as a Senior Research Technician in the Microbiology Department. She will be focused on ongoing efforts by the Southern California Bight Regional Monitoring Program to investigate contaminants and pathogens in shellfish and support other microbiology studies.

She specializes in using cell culture and PCR (polymerase chain reaction)-based methods to detect pathogens and study genetic material.

Living in San Diego, Marhoefer-Jess spent much of her time in the ocean and playing on local beaches. After graduating high school, she received her SCUBA diving certification, which led to her participating in scientific dives later in college.

"My connection to the ocean has always been ingrained in me, and I've been so fortunate to have been near one throughout my life," Marhoefer-Jess said. "I wanted to stay close to the ocean and that naturally led me into the marine science field."

Shelby Marhoefer-Jess takes a boat out to Mission Bay in San Diego for the Scripps Institution of Oceanography's Pathogen Forecast Model project.

Shelby Marhoefer-Jess

Job: Senior Research Technician, SCCWRP Microbiology Department (started September 2025)

Prior jobs: Staff Research Associate III, Scripps Institution of Oceanography (2023-2025); Associate Cell Biologist, Quality Control, ScienCell Research Laboratories (2022-2023); Grant Writer and Educator, Puget Sound Estuarium (2020-2022); Graduate Student Researcher, James Cook University (2019-2021)

Education: M.S. marine biology, James Cook University (2020); B.A. marine sciences, University of Hawaii at Hilo (2017)

Residence and Hometown: San Diego

Family: Husband Josh, a production manager for an aquaculture equipment company; cats Luna and Lentil

Hobbies: Camping; diving; traveling; boating; sculpting

Marhoefer-Jess received a B.A. in marine sciences from the University of Hawaii at Hilo. She later received a professional M.S. in marine biology from James Cook University in Australia, where she studied population genetics of coral in the Great Barrier Reef.

After grad school, Marhoefer-Jess moved to Washington for two years before returning to Southern California to work in a cell culture laboratory as quality control. She then worked as a research associate at the Scripps Institution of Oceanography, where she quantified norovirus levels along the San Diego coast to support a model for understanding potential illness risks from cross-border sewage contamination.

During her time at Scripps, she collaborated with SCCWRP's Dr. John Griffith and Dr. Joshua Steele, who helped with testing and method development. She also participated in a droplet digital PCR (ddPCR) intercalibration study led by SCCWRP.

Marhoefer-Jess is excited to work on science at SCCWRP that helps inform environmental policy.

"Being that middle entity connecting science to policy is really special," Marhoefer-Jess said. "For me, I really hope to be able to communicate science for policymakers and support solutions to our environmental problems."

Marhoefer-Jess is also passionate about giving back to her community and has volunteered for several environmental nonprofits, including the Hilo chapter of the Surfrider Foundation, the American Cetacean Society, and the Puget Sound Estuarium.

In her free time, Marhoefer-Jess enjoys camping and hanging out with her cats. She is also an avid traveler and loves trying cuisines from around the world.

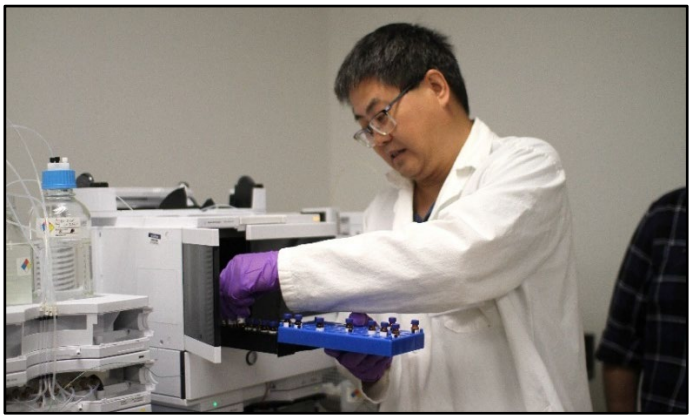
SCCWRP SCENES

Training on HAB toxin measurements

Assessors who accredit environmental laboratories in California received training on a suite of methods for measuring harmful algal bloom (HAB) toxins during a three-day workshop co-presented by SCCWRP in January. About 20 accreditors from California's Environmental Laboratory Accreditation Program (ELAP), along with third-party assessors, attended the workshop, which included live demonstrations in SCCWRP's laboratories on how to use four methods to measure a range of common HAB toxins.

Among the methods that assessors were trained on is a newly developed method for measuring a type of HAB toxin called saxitoxins in shellfish; the California Department of Food and Agriculture is championing use of this method for seafood-safety monitoring. ELAP, which accredits all public and private laboratories that produce environmental data that get used in State decision-making processes, is considering developing a standardized process for laboratories to demonstrate proficiency measuring saxitoxins.

The workshop is part of a series of SCCWRP-led trainings for ELAP assessors that began in 2023. Past trainings focused on a suite of commonly used fish bioassay toxicity tests, methods for measuring PFAS in drinking water and environmental matrices, and the *Ceriodaphnia dubia* toxicity test.



From top to bottom, SCCWRP's Dr. Wayne Lao demonstrates how to use high-performance liquid chromatography to analyze samples for microcystin toxins during a three-day California Environmental Laboratory Accreditation Program (ELAP) workshop at SCCWRP; SCCWRP's Dr. Charles Wong presents to workshop attendees on how to use enzyme-linked immunoassay (ELISA) technology to measure HAB toxins; and Dr. Wayne Lao prepares harmful algal bloom (HAB) samples for analysis.