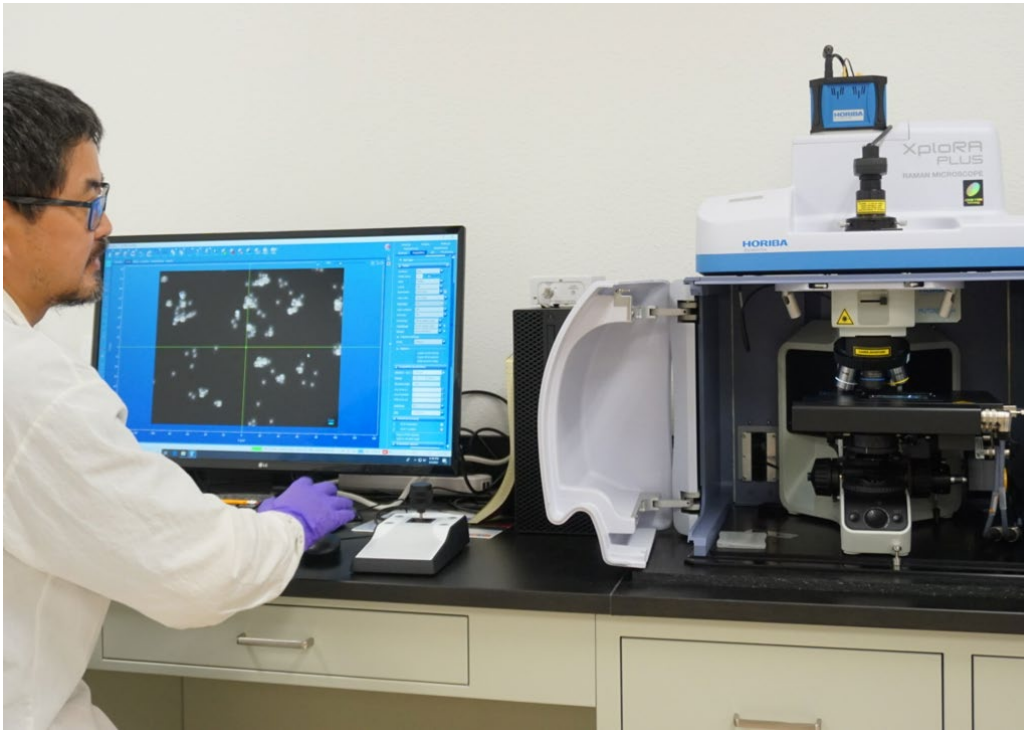

SCCWRP Director's Report

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WINTER 2022 ISSUE

SCCWRP helps establish basis for microplastics management

A series of international SCCWRP-facilitated scientific studies and workshops over the past year examining how to better monitor and understand microplastics contamination is helping to form the scientific foundation for a pair of proposed statewide actions that will help cement California's place as a global leader in managing this ubiquitous form of aquatic pollution.

First, the State Water Resources Control Board in November released a draft policy that will require drinking water facilities in California to monitor microplastics for four years; the policy is based largely on an international SCCWRP-facilitated study that developed best-practices recommendations for measuring and monitoring microplastics in drinking water. The State Water Board will consider formally adopting the policy this spring.

Second, the California Ocean Protection Council in December released a draft statewide microplastics strategy for the coastal ocean that calls for a coordinated, multi-pronged series of actions to combat microplastics pollution. A number of the research recommendations outlined in the draft strategy were informed by an international, SCCWRP-facilitated scientific workshop that developed expert consensus on the critical thresholds at which aquatic organisms begin to experience adverse biological effects from microplastics exposure.

Collectively, these two major proposed statewide actions reflect SCCWRP's influential role in informing the development of microplastics management strategies for California and beyond. Indeed, the proposed actions are the first of their kind in the world, creating microplastics management templates that could be replicated and adapted elsewhere.

The development of these statewide actions was called for in 2018 with passage of Senate Bill 1422 and Senate Bill 1263, which focus on combatting microplastics in drinking water and the coastal ocean, respectively.

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Cover photo: SCCWRP's Dr. Wayne Lao uses a Raman spectroscopy instrument to measure the levels of microplastic particles in a water sample. SCCWRP is helping to build the scientific foundation for California to take aggressive actions to combat microplastics pollution.

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 10
CTAG quarterly meeting
(Remote participation only)

Friday, March 4
Commission meeting
(Remote participation only)

Image courtesy of Kennedy Bucci, University of Toronto

Fish larvae that have been exposed to increasing concentrations of microplastics in a University of Toronto laboratory accumulate the particles in their digestive tract; the particles appear as black flecks visible through the larvae's largely transparent bodies. The California Ocean Protection Council has developed a draft microplastics management strategy that is based in part on an SCCWRP-facilitated international effort to build scientific consensus on the thresholds at which aquatic organisms experience adverse health effects from microplastics exposure.

Microplastics contamination is a growing management concern worldwide, with researchers finding microplastic particles nearly everywhere they look, even in remote, pristine locations. However, relatively little is known about how microplastics impact the health of humans and wildlife that inadvertently ingest them – in part, because of a lack of standardized monitoring methods.

Some treatment processes are especially effective at reducing microplastics levels in drinking water, although it remains unclear how much microplastics contamination is present in drinking water across California.

Meanwhile, the spread of microplastics in aquatic environments is accelerating, even with previous actions by California to curb their introduction to the environment, such as via bans on single-use plastic bags and microplastic beads in personal care products.

Under the draft State Water Board microplastics monitoring policy, drinking water agencies will be required to monitor microplastics over an initial four-year period using one of two measurement methods. The two methods – Fourier-transform infrared spectroscopy (FTIR) and Raman spectroscopy – were standardized during an international SCCWRP-facilitated study spanning 40 laboratories in six countries, including 22 laboratories that worked specifically on standardizing the drinking water methods.

Already, SCCWRP has begun working with California's Environmental Laboratory Accreditation Program to develop standard operating protocols (SOPs) and proficiency standards that will pave the way for laboratories across California to begin measuring microplastics levels in drinking water statewide.

Meanwhile, on the coastal ocean front, the California Ocean Protection Council in December released a 34-page draft strategy on managing microplastics in the coastal ocean.

The strategy calls for a series of targeted research investments that were informed in part by the consensus recommendations of the Microplastics Health Effects Workshop. The SCCWRP-facilitated workshop developed a proposed management framework by which California could extend stronger protections to aquatic life affected by microplastics, as well as reached initial consensus on the microplastics thresholds that managers would need to know to effectively protect aquatic life from microplastics exposure.

The OPC's strategy recommends expanding upon this initial set of exposure thresholds developed during the Microplastics Health Effects Workshop.

The draft statewide microplastics strategy could be considered for formal adoption by the OPC as early as February 23.

For more information, contact Dr. Leah Thornton Hampton or Dr. Charles Wong.

Stormwater drainage conference helps connect SCCWRP to researchers worldwide

SCCWRP hosted an international engineering conference focused on improving modeling of urban stormwater drainage systems over a three-day period in January that attracted 146 researchers and practitioners – more than half from outside the United States.

The 12th Urban Drainage Modeling Conference, which was held for only the second time ever in the U.S. since it began in 1986, provided a forum for engineers, scientists and others to advance the modeling work that underlies many routine stormwater planning and

permitting activities, including implementation of stormwater BMPs (best management practices).

SCCWRP's selection as the conference's host helped raise the agency's profile within this international research community as a leader in improving management of wet- and dry-weather runoff. SCCWRP made stormwater BMPs one of its eight major thematic research areas in 2019 to underscore the agency's commitment to visionary, forward-looking research in this field.

SCWRP was selected to host the conference by the International Working Group on Data and Models, a subcommittee of the Joint Committee on Urban Drainage. The international organization works to emphasize and promote effective interactions between experts in hydraulics, hydrology, and water quality.

About 20 participants from five countries attended in person at SCCWRP, adhering to strict COVID-19 protocols; the remainder participated remotely through a hybrid online/in-person format.

About 50 participants hailed from Europe, five from developing countries, and a handful from Japan, Taiwan and Australia. Nine projects involving SCCWRP member agencies were presented.

Among the conference's highlights were two workshop sessions on the use and advancement of open-source modeling tools like the U.S. Environmental Protection Agency's Storm Water Management Model (SWMM). Participants agreed that stormwater researchers' shift towards open-source modeling tools has been a strategically important advance that has enabled more efficient implementation and progress across the field.

Image courtesy of Dr. Marko Hsu, Feng Chia University

In-person attendees at the SCCWRP-hosted 12th Urban Drainage Modeling Conference sit in socially distanced chairs in SCCWRP's main conference room as they are joined by others attending remotely. SCCWRP's selection as host of this international conference helped raise the agency's profile within this research community as a leader in improving management of wet- and dry-weather runoff.

SCCWRP and its member agencies already have been investing in high-quality, open-source tools and approaches as a foundation for improving standardization of data collection and reporting methods, as well as for building regionally compatible data sets.

For example, SCCWRP is working with the Southern California Stormwater Monitoring Coalition to build a regional BMP monitoring network for measuring and tracking the performance of a wide variety of stormwater BMPs. Key to the network's success will be development of standardized collection and reporting methods that enable multiple participating agencies to generate high-quality, comparable data sets, as well as to leverage results to increase statistical confidence in quantitative conclusions.

SCCWRP Commissioner Mark Gold from the California Ocean Protection Council served as the opening keynote speaker during the conference; he urged conference attendees to consider the wide variety of managerially relevant research needs they can help fill, including improved understanding of stormwater/groundwater interactions, changes in hydrology due to wildfires and climate change, the link between stormwater runoff and management of ocean water quality, and availability of data to support models.

Video recordings of at least some of the talks are expected to be posted publicly to the conference's website in the coming weeks. A full list of the 74 oral conference presentations and 19 posters, including abstracts for the talks, already is publicly accessible on the conference website.

For more information, contact Dr. Elizabeth Fassman-Beck.

Study demonstrates how to use framework to restore more natural flows to streams

SCCWRP and its partners have completed a three-year study demonstrating how watershed managers can build a rigorous scientific foundation for integrating environmental flow considerations into their stream restoration planning efforts.

The study, completed in January, used a standardized, multi-tiered framework known as the California Environmental Flows Framework to systematically study 23,000 linear feet of degraded stream habitat in southern Orange County, with a focus on evaluating how altered, unnatural flow patterns are contributing to poor stream biology.

Stream managers will be able to use the study's insights to decide what specific, targeted actions they should take where to reverse the area's unnatural flow patterns and work toward achieving the greatest improvements to ecological health. These actions are expected to include installation of flow-capture devices across multiple adjacent watersheds to reduce unnatural dry-weather flows.

The South Orange County Flow Ecology Study represents a significant advance in how watershed managers in California approach protecting the environmental flow needs of streams. Traditionally, managers maintain a narrow focus when assessing environmental flow needs, often examining a single species during a single season at a single location – an approach that can lead to potentially ineffective stream restoration actions.

By contrast, the California Environmental Flows Framework requires stream managers to holistically evaluate key aspects of flow patterns that functionally sustain multiple native species across multiple seasons; the framework can be used to study multiple stream reaches simultaneously that are undergoing a range of site-specific environmental stresses.

Thus, the southern Orange County study served as a key opportunity to test-drive the statewide framework during its development; the California Environmental Flows Framework, which was co-developed by SCCWRP, was unveiled in draft form in 2021 and is undergoing final review.

A storm drain discharges unnatural dry-weather flows into a tributary of Arroyo Trabuco Creek in southern Orange County. Researchers have completed a study that sheds light on how stream managers can take a science-informed approach to deciding how they should reverse the area's unnatural flow patterns and improve 23,000 linear feet of degraded stream habitat.

The completion of the South Orange County Flow Ecology Study comes on the heels of another California Environmental Flows Framework demonstration project that focused on the Los Angeles River. During that study, completed in spring 2021, researchers examined the consequences of diverting more wastewater effluent and runoff discharges from the river for water recycling purposes – a scenario that is expected to become more commonplace with climate change.

Compared to the L.A. River study, the southern Orange County study was more extensive, involving a much wider study area and more diffuse discharge sources.

A priority during the southern Orange County study was improving understanding of how altered flow patterns trigger adverse effects to stream biological communities. Under the federal stormwater discharge permit for southern Orange County, watershed managers have determined that altered flows are one of the highest-priority impairments that should be addressed to improve stream biology and protect ecosystem health.

In response, SCCWRP and its partners used extensive bioassessment data collected from across Southern California to develop flow-ecology models that relate levels of flow alteration to biological health. Watershed managers will be able use the modeling tools and prioritization maps to determine what actions they should prioritize taking where to improve and protect biological health.

The study is described in two articles published in the journal *Frontiers in Environmental Science* – one on the approach that researchers took to linking altered flow patterns to the biological integrity of streams, and a second on determining southern Orange County's environmental flow needs.

For more information, contact Dr. Kris Taniguchi-Quan.

Study examines climate change's influence on eutrophication in Santa Margarita watershed

SCCWRP and its partners have completed a three-year study examining how climate change is expected to influence eutrophication in the Santa Margarita River watershed – the final piece of a decade-long effort to build a scientific foundation for how to reduce ecologically disruptive algal bloom events in Santa Margarita and similar watersheds.

The study, published in January as a SCCWRP technical report, evaluated how changing rainfall patterns and water temperatures stemming from climate change will alter the trajectory of algal blooms and low dissolved oxygen levels in the watershed, which spans Riverside and northern San Diego Counties.

Water-quality managers for Santa Margarita and beyond will need to understand how climate change influences watershed health as they begin developing scientifically defensible limits for the nutrient loading levels that can be sustainably discharged into these systems.

The San Diego Regional Water Quality Control Board is planning to release a draft of its comprehensive water-quality management plan for protecting the Santa Margarita watershed as early as 2023. The State Water Resources Control Board, meanwhile, is using Santa Margarita as a case study that will help inform the development of a planned biointegrity-biostimulatory policy to protect the health of wadeable streams statewide.

During the climate change study, researchers used computer modeling analyses of climate, watershed flow, land use, and receiving water effects to show that climate change will make it harder for water-quality managers to manage eutrophication in Santa Margarita and other eutrophication-prone watersheds. For example, the study found that rising water temperatures triggered by climate change will limit how much oxygen can dissolve in water, threatening to extirpate cold-water species like Steelhead trout that will not have enough oxygen to breathe.

Given the effects of climate change on watershed health, the study concluded that establishing numeric targets for nutrient loading will not be enough to protect watersheds like Santa Margarita from eutrophication.

Instead of focusing on nutrients alone, researchers found that monitoring biological indicators such as algal and benthic invertebrate communities, along with tradition indicators like algal biomass and dissolved oxygen, will provide a more integrated, nuanced picture of the effects that global and local eutrophication drivers are having on ecosystem health.

Consequently, a major focus of the study was evaluating what additional, complementary actions managers could take to blunt the effects of climate change. For example, to protect dissolved-oxygen levels as water temperatures rise, the study found that managers could increase the river's base flows during dry weather and/or increase stream tree cover. (In the Santa Margarita River, base flow augmentation has already occurred because of a water rights settlement.)

The climate change study builds on a decade-long series of Santa Margarita-focused investigations probing how land-based nutrient discharges combine with environmental factors to exacerbate Santa Margarita's eutrophic conditions – especially at the 192-acre estuarine terminus of the watershed in northern San Diego County – and how managers should intervene to optimally protect ecosystem health.

Managers will be able to use the findings from this suite of investigations to develop municipal stormwater water quality improvement plans, agricultural monitoring orders, and other programs and policies that incorporate specific requirements for guarding against eutrophication, including biostimulatory targets and targeted nutrient load reductions.

A SCCWRP field crew wades into the Santa Margarita River, which spans Riverside and San Diego Counties, to collect algae samples. Researchers are laying the scientific foundation for how watershed managers for Santa Margarita and similar watersheds can take optimal action to reduce ecologically disruptive algal bloom events.

Because the Santa Margarita work also is being used to test-drive technical elements of the State Water Board's anticipated statewide stream biointegrity-biostimulatory policy, the State Water Board in 2018 released multiple draft technical products from the Santa Margarita investigations that are expected to help form the strategy's scientific foundation.

For more information, contact Dr. Martha Sutula.

Updates by Thematic Area

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

BIOASSESSMENT

Modeling tool under development to predict biological consequences of ionic stress

SCCWRP and its partners have begun developing a modeling tool to help Santa Ana River watershed managers understand the relationship between ion levels in the watershed and how aquatic life will be affected as these levels rise.

The project, which kicked off last fall, is designed to help watershed managers understand how to apply a set of existing Santa Ana basin objectives that cap the concentrations of several major ions, including chlorine and sodium, and provide prescriptive requirements for related indicators of ionic stress, including water hardness.

None of the indicators have been correlated with biological effects in aquatic life, limiting managers' ability to effectively use these indicators to manage ionic stress across the Santa Ana region.

The project involves developing models that predict when ionic stress can be expected to adversely harm in-stream biological communities. The models will predict the biological consequences of ionic stress at nearly every stream in the Santa Ana, eliminating the need to calibrate numerous site-specific biogeochemical models.

ECOHYDROLOGY

Scientific process for evaluating environmental flows used to develop L.A. River diversion proposals

Two agencies that discharge treated wastewater and stormwater into the Los Angeles River have used a scientific process co-developed by SCCWRP to develop two independent proposals for diverting some of their discharges for water-recycling purposes.

The City of Los Angeles Bureau of Sanitation and the City of Los Angeles Department of Water and Power (DWP) have each completed a comprehensive analysis of how their proposed L.A. River discharge reductions would affect the river's ecological health and recreational opportunities. The analyses – submitted to the State in December and September, respectively, as part of a California Environmental Quality Act (CEQA) review – are based on a standardized scientific

The Los Angeles River's flows during dry weather are sustained by treated wastewater and stormwater discharges. Two agencies that discharge into the river have used a scientific process co-developed by SCCWRP to develop proposals for diverting some of their discharges for water-recycling purposes. The proposals consider how the reductions would affect the river's ecological health and recreational opportunities.

process for evaluating environmental flow requirements that was finalized last year for the L.A. River.

The Bureau of Sanitation is seeking to divert treated wastewater from a water reclamation plant in the San Fernando Valley to a groundwater basin, while DWP is seeking to capture more stormwater in specially designed underground structures instead of allowing it to run off into the L.A. River.

The analyses provide a scientific foundation for making decisions about whether to approve the two diversion plans.

Study reshapes understanding of how to manage stream flows to protect ecological health

SCCWRP and its partners have completed a two-year study that has helped reshape understanding of how to manage stream flow patterns in California to optimally protect overall ecological health.

The study, published in January by the journal *Frontiers in Environmental Science*, found that the health of stream ecosystems is more affected by the seasonal timing of flows than by the total annual volume of these flows.

The study's findings run contrary to California's traditional flow management paradigm, which emphasizes ensuring streams receive appropriate minimum flow allocations over the course of the year – but does not emphasize ensuring these streams receive appropriate season-specific flows, including dry-season base flows and fall pulse flows.

By analyzing the relationship between season-specific flow patterns and the health of aquatic life in streams across California, researchers were able to show that the season-dependent timing of flows is more important than overall flow volume for protecting stream health.

Tijuana River sediment fluxes estimated for effort to improve sediment management practices

SCCWRP and San Diego State University have successfully estimated the sediment fluxes being discharged from the Tijuana River at the U.S.-Mexico border to its coastal estuarine terminus – a key step in an ongoing effort to examine how to improve sediment management practices to mitigate the adverse ecological effects of these fluxes.

The two-year study, completed in January, will support a Tijuana River demonstration project intended to showcase how a more integrated approach to sediment management could improve outcomes for downstream coastal environments. Managers devote significant resources to sediment management, including as part of stormwater discharge permits.

The Tijuana River demonstration project will use computer modeling to explain how sediment fluxes interact with coastal estuaries and nearshore processes. The project also will consider how these interactions are expected to change in response to sea level rise and climate change.

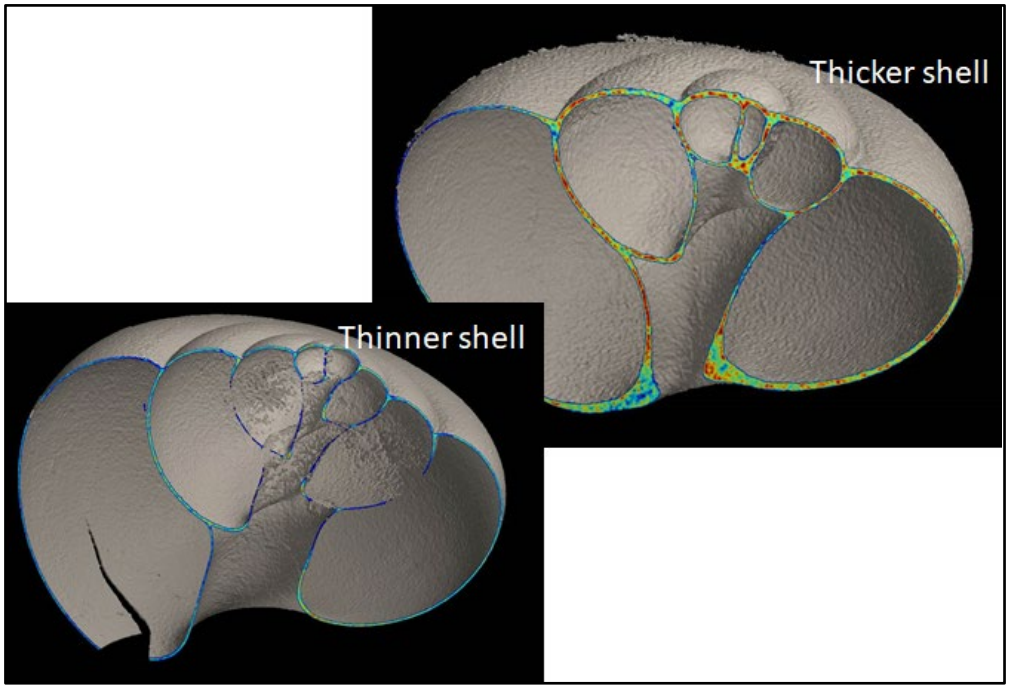
The findings could help inform projects such as wetland restoration and beach nourishment.

EUTROPHICATION

Acidification modeling work probing whether management scenarios could mitigate ecological effects

SCCWRP and its partners have begun investigating whether Southern California's water-quality management community could mitigate the ecological effects of coastal ocean acidification and hypoxia (OAH) by investing in a combination of nutrient reduction strategies and wastewater recycling practices.

The work began last fall when researchers ran computer modeling simulations for eight different management scenarios on



Pteropods, or sea snails that form the base of marine food webs, are among the organisms vulnerable to ocean acidification because it causes them to have difficulty forming and maintaining their shells. Researchers have begun examining whether environmental managers could mitigate potential ecological effects of coastal acidification by investing in a combination of nutrient reduction strategies and wastewater recycling practices.

a supercomputer – a data-intensive simulation that took about four months.

The coastal OAH modeling tools were originally developed by a team of West Coast researchers that includes SCCWRP to examine how OAH will change coastal seawater chemistry in the coming years, including reducing the availability of dissolved oxygen and biologically important seawater minerals.

With the eight OAH simulations complete, researchers are now applying a suite of newly developed OAH biological assessment tools to the modeling results to examine if one or more of the eight management intervention scenarios could be expected to reduce OAH's effects on sensitive marine life.

The results are expected to be shared with project stakeholders this summer.

HABs modeling tool undergoing validation to predict when, where toxin-producing events will occur

SCCWRP and its partners have begun working to validate the outputs of a newly developed computer model that predicts when and where toxins produced by a common type of marine algal bloom can be expected to occur along the California coast.

The model validation step, launched in January, involves comparing modeling predictions about harmful algal bloom (HAB) events in Southern California coastal waters to field data on when and where they actually occurred.

The development and validation of the model build off preliminary modeling work by the University of California, Santa Cruz to understand the drivers and impacts of *Pseudo-nitzschia* blooms on marine life. Domoic acid produced by the blooms can poison mammals and contaminate commercially important species like Dungeness crab.

The model makes use of a coupled physical-biogeochemical ocean model that predicts how land-based discharges affect coastal acidification and hypoxia.

Image courtesy of National Oceanic and Atmospheric Administration

Sea otters have become sickened and died off the coast of California as a result of poisoning by toxins produced by harmful algal blooms. Researchers are developing a modeling tool that will predict when and where toxins produced by a common type of harmful algal bloom known as *Pseudo-nitzschia* can be expected to occur along the California Coast.

Sediment quality study examines how to protect coastal estuaries from eutrophication

SCCWRP and its partners have completed a two-year sediment quality study examining how to protect bottom-dwelling aquatic life in coastal estuaries from excess organic matter triggered by eutrophication.

The study, completed in January using data from the Southern California Bight Regional Monitoring Program, investigated the relationship between the deposition of organic matter in sediment and the biological diversity of benthic invertebrate communities. Eutrophication triggers production of excess organic matter that eventually settles in sediment.

Researchers identified the levels of organic nitrogen – a measure of organic matter – at which benthic habitat quality rapidly declines.

The study is expected to help form the technical underpinnings of a planned State Water Board biointegrity-biostimulatory policy to protect the health of coastal estuaries statewide.

MICROBIAL WATER QUALITY

Methods for monitoring COVID-19 in wastewater being transitioned to statewide program

A SCCWRP-led statewide committee that has been developing methods for using wastewater streams to monitor COVID-19 infections in communities has begun working with the California Department of Public Health (CDPH) to transition the methods into a routine statewide monitoring program.

The method transfer effort, launched in January by the California Water Quality Monitoring Council's Wastewater Based Epidemiology Committee, will enable CDPH to eventually take over tracking COVID-19 virus levels entering about 18 wastewater treatment plants across

California, including those run by SCCWRP's member agencies.

Over the past 1-1/2 years – as the monitoring methods were being developed and vetted – individual plants across California have been monitoring influent streams with support from academic and other partners, including SCCWRP, and, later, from the Wastewater Based Epidemiology Committee, which SCCWRP chairs. The handoff to CDPH will help ensure the monitoring program's long-term sustainability.

The handoff started with an interlaboratory calibration exercise – expected to be completed this spring – to ensure the CDPH can produce monitoring data comparable to other laboratories, including SCCWRP.

Method shows promise for detecting small leaks in underground sewer pipes

SCCWRP and its partners have developed a promising new method for measuring leaks in underground sewer pipes that has the potential to detect volumetric losses of as little as a half gallon.

The exfiltration detection method, which has been undergoing pilot testing since fall 2020, involves pumping a known volume of water at a controlled rate through an isolated, 300- to 400-foot-long section of pipe, then looking for a difference in the volume pumped in vs. recovered.

Researchers decided last fall to expand the pilot testing to three sites in the San Diego area, following successful initial pilot testing in El Cajon.

The new method is intended to support an ongoing, multi-year effort to identify the origins of widespread fecal contamination in Southern California waterways during wet weather.

SCCWRP works with staff from the San Diego County Department of Public Works and others to recover water from a sewer manhole as part of an effort to develop a new method for measuring leaks in underground sewer pipes. The exfiltration detection method, which has been showing promise during pilot testing, involves pumping a known volume of water at a controlled rate through an isolated section of pipe, then looking for a difference in the volume pumped in vs. recovered.

STORMWATER BMPs

SMC preparing to kick off pilot phase to build regional BMP performance monitoring network

The Southern California Stormwater Monitoring Coalition (SMC) is preparing to kick off the initial pilot phase of a SCCWRP-led effort to build a regional network for monitoring the performance of a wide variety of structural stormwater BMPs (best management practices) across Southern California.

The SMC's Regional BMP Monitoring Network, expected to be operational in 2023, will help address significant, persistent knowledge gaps in managers' understanding of how to optimize the operation, maintenance and performance of these water-quality control measures.

During the pilot phase, scheduled to begin this winter, SMC member agencies are investigating two key aspects of BMP performance: (1) what levels and types of pollutants are being removed by flow-through bioretention/biofiltration BMPs, and (2) the rates at which sediment loading into multiple types of BMPs decreases the infiltration rates of runoff.

Results from the pilot monitoring are expected to be available in summer 2023.

TEDx Shorts podcast featuring SCCWRP engineer makes case for green infrastructure

SCCWRP's Dr. Elizabeth Fassman-Beck is featured in a newly released TEDx Shorts podcast discussing why runoff should be managed with green infrastructure instead of traditional flood control infrastructure.

The nine-minute podcast, titled "The Potential of Green Infrastructure" and released in November, discusses in plain language how aging stormwater infrastructure threatens access to clean water.

Fassman-Beck explains how advances in engineering have enabled stormwater

managers to design infrastructure solutions that more closely mimic natural runoff patterns, and more effectively mitigate pollution from runoff.

The podcast is free to listen to via Google Podcasts; no subscription or login is required.

REGIONAL MONITORING

First regional survey examining health of Southern California eelgrass beds to be launched

SCCWRP and its partners have developed plans to conduct the first regional monitoring survey examining the health of eelgrass beds across coastal Southern California.

The two-year monitoring survey, which will be launched in March, will provide baseline data to inform ongoing efforts to protect and restore these ecologically significant habitats, including within California's estuarine Marine Protected Areas (MPAs).

During the survey, researchers will use a three-tiered assessment framework for assessing the health of seagrass beds that was developed by SCCWRP in 2020. Eelgrass is a type of seagrass.

Researchers will focus on assessing the ecological functioning of eelgrass beds, as opposed to only documenting the locations and extent of eelgrass, as is more commonly done.

The health of eelgrass beds like this one, above, in Newport Bay in Orange County will be assessed as part of Southern California's first regional monitoring survey examining the condition of this ecologically important habitat.

New SCCWRP Publications

Journal Articles

Abdalla, E., V. Pons, V. Stovin, S. De-Ville, E. Fassman-Beck, K. Alfredsen, T. Muthanna. 2021. Evaluating different machine learning methods to simulate runoff from extensive green roofs. *Hydrology and Earth System* Sciences 25:5917–5935.

Abdi, R., A. Rust, J.M. Wolfand, K.T. Taniguchi-Quan, K. Irving, D. Philippus, E.D. Stein, T.S. Hogue. 2022. Thermal Suitability of the Los Angeles River for Cold Water Resident and Migrating Fish Under Physical Restoration Alternatives. *Frontiers in Environmental Science* 9:749085.

Bueno de Mesquita, C.P., J. Zhou, S. Theroux, S.G. Tringe. 2021. Methanogenesis and Salt Tolerance Genes of a Novel Halophilic Methanosarcinaceae Metagenome-Assembled Genome from a Former Solar Saltern. *Genes* 12:1609.

Irving, K., S.C. Jähnig, M. Kuemmerlen. 2021. Disentangling the effect of climatic and hydrological predictor variables on benthic macroinvertebrate distributions from predictive models. *Hydrobiologia* 2021:1-20.

Mazor, R.D., B.J. Topping, T. Nadeau, K.M. Fritz, J.E. Kelso, R.A. Harrington, W.S. Beck, K. McCune, A.O. Allen, R. Leidy, J. Robb, G. David. 2021. Implementing an Operational Framework to Develop a Streamflow Duration Assessment Method: A Case Study from the Arid West United States. *Water* 13:3310.

Peek, R., K. Irving, S.M. Yarnell, R. Lusardi, E.D. Stein, R.D. Mazor. 2022. Identifying Functional Flow Linkages Between Stream Alteration and Biological Stream Condition Indices Across California. *Frontiers in Environmental Science* 9:790667.

Place, B.J., E.M. Ulrich, J.K. Challis, A. Chao, B. Du, K. Favela, Y. Feng, C.M. Fisher, P. Gardinali, A. Hood, A.M. Knolhoff, A.D. McEachran, S.L. Nason, S.R. Newton, B. Ng, J. Nuñez, K.T. Peter, A.L. Phillips, N. Quinete, R. Renslow, J.R. Sobus, E.M. Sussman, B. Warth, S. Wickramasekara, A.J. Williams. 2021. An Introduction to the Benchmarking and Publications for Non-Targeted Analysis Working Group. *Analytical Chemistry* 93:16289-16296.

Stein, E.D., J. Zimmerman, S.M. Yarnell, B. Stanford, B. Lane, K.T. Taniguchi-Quan, A. Obester, T.E. Grantham, R.A. Lusardi, S. Sandoval-Solis. 2021. The California Environmental Flows Framework: Meeting the Challenges of Developing a Large-Scale Environmental Flows Program. *Frontiers in Environmental Science* 9:769943.

Vanderpont, A.K., C. Lobson, Z. Lu, K. Luong, M. Arentsen, T. Vera, D. Moore, M.S. White, R.S. Prosser, C.S. Wong, M.L. Hanson. 2022. Fate of thiamethoxam from treated seeds in mesocosms and response of aquatic invertebrate communities. *Ecotoxicology* DOI:10.1007/s 10646-021-02500-8.

Walker, J.B., E.D. Grosholz, J.D. Long. 2021. Predicting burrowing crab impacts on salt marsh plants. *Ecosphere* 12:e03803.

Wang P., J.K. Challis, Z-X. He, C.S. Wong, E.Y. Zeng. Effects of biofouling on the uptake of perfluorinated alkyl acids by organic-diffusive gradients in thin films passive samplers. *Environmental Science: Processes & Impacts* DOI:10.1039/D1EM00436K.

Yarnell, S.M, A. Willis, A. Obester, R.A Peek, R.A Lusardi, J. Zimmerman, T. Grantham, E.D. Stein. 2022. Functional Flows in Groundwater-Influenced Streams: Application of the California Environmental Flows Framework to Determine Ecological Flow Needs. *Frontiers in Environmental Science* 9:788295.

Journal Articles (Accepted)

Irving, K., K. Taniguchi-Quan, A. Aprahamian, C. Rivers, G. Sharp, R.D Mazor, S, Theroux, R. Peek, E.D. Stein. In press. Application of flow ecology analysis to inform prioritization for stream restoration and management actions. *Frontiers in Environmental Science-Freshwater Science.*

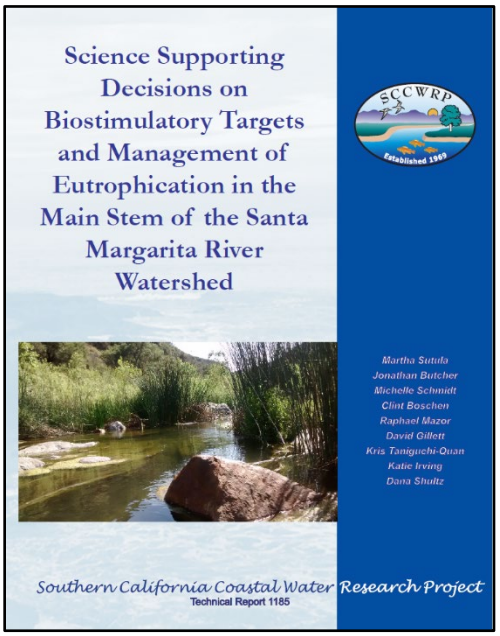
Taniguchi-Quan, K.T., K. Irving, E.D. Stein, A. Poresky, R.A. Wildman Jr., A. Aprahamian, C. Rivers, G. Sharp, S. Yarnell, J. Feldman. In press. Developing ecological flow needs in a highly altered region: Application of California Environmental Flows Framework in Southern California, USA. *Frontiers in Environmental Science-Freshwater Science. https://*doi: 10.3389/fenvs.2022.787631

T. Grantham, D.M. Carlisle, J. Howard, B. Lane, R. Lusardi, A. Obester, S. Sandoval-Solis, B. Standord, E.D. Stein, K.T. Taniguchi-Quan, S.M. Yarnell, J. Zimmerman. In press. Modeling Functional Flows in California's Rivers. *Frontiers in Environmental Science-Freshwater Science.*

Zimmer-Faust, A.G., J. Griffith, J. Steele, L. Asato, T. Chiem, S. Choi, A. Diaz, J. Guzman, M. Padilla, J. Quach-Cu, V. Ruiz, B. Santos, M. Woo and S.B. Weisberg. In press. Assessing cross-laboratory performance for quantifying coliphage using EPA Method 1642. *Journal of Applied Microbiology*.

Technical Reports

Sutula, M., J. Butcher, M. Schmidt, C. Boschen, R. Mazor, D. Gillett, K. Taniguchi-Quan, K. Irving, and D. Shultz. 2022. Science Supporting Decisions on Biostimulatory Targets and Management of Eutrophication in the Santa Margarita River Main Stem, California. Technical Report 1185. Southern California Coastal Water Research Project. Costa Mesa, CA.



SCCWRP has published a technical report on how climate change is expected to influence eutrophication in the Santa Margarita River watershed -- a document that helps form the scientific foundation for how watershed managers for Santa Margarita and similar watersheds can take optimal action to reduce ecologically disruptive algal bloom events.

Quarter in Review

Conference Presentations

Gillett, D.J., S. Alin, D. Cadien, K. Barwick, W. Enright, D. Tang, A. Latker, R. Velarde, C. Larsen. What do you see down there? Insights from nearly 50 years of regional benthic monitoring. Coastal and Estuarine Research Federation Bi-Annual Conference. November 9, 2021. Via webinar.

Ho, M., F. Kessouri, M. Sutula, K. McLaughlin, F. Frieder, B. Bianchi, J.C. McWilliams. Can potable-use wastewater recycling and nitrogen management reduce acidification and oxygen loss in Southern California? Coastal and Estuarine Research Federation Conference. November 1-11, 2021. Via webinar.

Hoel, P., F. Kessouri, D. Bianchi and M. Ho. Comparing influence of physical dynamics and nutrient additions of Southern California waste water outflows. Coastal and Estuarine Research Federation Conference. November 1-11, 2021. Via webinar.

Kessouri, F. Session chair. Ocean model at the service of sustainable solutions. Coastal and Estuarine Research Federation Conference. November 1-11, 2021. Via webinar.

Kessouri, F., D. Bianchi, M. Ho, M. Sandoval, A. Moreno, J. Smith, J McWilliams, M. Sutula. Coastal eutrophication and the triple effects of HABs, ocean acidification, and deoxygenation in southern California. Coastal and Estuarine Research Federation Conference. November 1-11, 2021. Via webinar.

Mutzner, L., C.S. Wong, L. Vezzaro. Special session moderators. A decade of collecting data on trace contaminants in wet weather discharges: are we ready to model them? Urban Drainage Modeling Conference. January 10-12, 2022. Costa Mesa CA.

Parks, A., D. Greenstein, K. Schiff. Application of a copper site-specific objective study in Marina del Rey Harbor. Society of Environmental Chemistry and Toxicity Annual Conference. November 15-18, 2021. Via webinar.

Schiff, K. The Impact of Urban Watersheds on Estuarine Sediment Quality. Society of Environmental Chemistry and Toxicity Annual Conference. November 15-18, 2021. Via webinar

Schiff, K. Session facilitator. Contaminants in Runoff. Society of Environmental Chemistry and Toxicity Annual Conference. November 15-18, 2021. Via webinar.

Sutula, M., J. Kimball, F. Kessouri, D. Bianchi, M. Ho, K. McLaughlin, E. Howard, C. Frieder and J. McWilliams. Ingredients to a solution: addressing climate change stress on nearshore ecosystem in the Southern California Bight. Coastal and Estuarine Research Federation Conference. November 1-11, 2021. Via webinar.

Taniguchi-Quan, K., K. Irving, E.D. Stein, R. Wildman, A. Poresky, A. Aprahemian, C. Rivers, G. Sharp. The South Orange County, CA Flow Ecology Study: Part 2, Flow Ecology Approach for Flow Management Prioritization. 12th Urban Drainage Modeling Conference. January 10, 2022. Costa Mesa, CA.

Wolfand, J., R. Abdi, E.M. Gallo, V. Hennon, K. Irving, D. Philippus, K. Taniguchi-Quan, A. Sytsma, J. Taylor, E.D. Stein, T.S. Hogue. The Los Angeles River Environmental Flows Project: Balancing Water Reuse and Ecological Support Goals in an Effluent Dominated River. American Geophysical Union Fall Meeting. December 13-17, 2021. Via webinar.

Wong, C.S. California's international interlaboratory microplastic measurement methods evaluation study. Pacificchem 2021: International Chemical Congress of Pacific Basin Societies. December 16-21, 2021. Via webinar.

Conference Posters

Fassman-Beck, E., E. Darin, M. McGauley, B. Wadzuk. How Many Events Do You Need? A Statistical Approach to Developing a GSI/BMP Monitoring Program. Urban Drainage Modeling Conference. January 10-12, 2022. Costa Mesa, CA.

Nissen, K., M. Borst, E. Fassman-Beck. Evaluation of methods of measuring flowrates for bioretention planters. Urban Drainage Modeling Conference. January 10-12, 2022. Costa Mesa, CA.

Other Presentations

Fassman-Beck, E. The potential of green infrastructure. TEDx Shorts podcast. Posted November 7, 2021.

Mazor, R. Assessing biointegrity and biostimulatory conditions in modified channels. Central Valley Irrigated Lands Regulatory Program (ILRP) agricultural coalition. December 20, 2021. Via webinar.

Mazor, R. 2022 Dry Rivers Research Coordination Network annual meeting. January 10-12, 2022. Via webinar.

Mazor., R. Mentor. Society for Freshwater Science's Emerge Community underrepresented students mentorship program.

Schiff, K. Guest lecturer. University of California, Irvine Ridges to Reefs Program. November 22, 2021. Irvine, CA.

Stein, E. and K. Schiff. Effects of Sea Level Rise on the San Diego Coastline. Briefing to San Diego County Supervisor Nora Vargas. October 26, 2021. Via webinar.

Stein, E. and K. Taniguchi-Quan. Los Angeles River Environmental Flow Tools and Application: Overview for Regulatory Use. California Department of Fish and Wildlife CEQA and LSA Review Group. January 14, 2022. Via webinar.

Taniguchi-Quan, K. Conclusions of the South Orange County Flow Ecology Special Study. Santa Margarita Water District Water Quality and Treatment Committee Meeting. December 14, 2021. Via webinar.

SCCWRP Personnel Notes

Commission

Crystal Benham, the new Program Manager for the San Diego County Water Protection Program, was named Commissioner in February, replacing Todd Snyder, who left the County last fall. Snyder served on the Commission for about seven years.

Jo Ann Weber, Water Resources Manager for the San Diego County Water Protection Program who has served as a CTAG Representative for more than 15 years, was appointed Alternate Commissioner last fall, replacing Jeff Moneda. Weber also will continue to serve as CTAG Representative.

Daniel Lafferty, who has served as Commissioner for the Los Angeles County Flood Control District for the past three years, retired in December. His replacement has not yet been named.

CTAG

Joshua Westfall, a Senior Environmental Scientist for the Sanitation Districts of Los Angeles County, was appointed CTAG Representative in February, replacing Philip Markle, who retired last fall. Markle served on CTAG for 4-1/2 years.

Scientific Leadership

Dr. **Elizabeth Fassman-Beck** chaired the 12th Urban Drainage Modeling Conference, held January 10-12, 2022 at SCCWRP and via webinar.

Dr. **Elizabeth Fassman-Beck** has been appointed to the advisory board of the State of Oregon's Stormwater Technology Testing Center.

Dr. **Raphael Mazor** has been appointed to the doctoral dissertation committee of Melissa von Mayrhauser at the University of California, Berkeley.

Kenneth Schiff has been appointed by the Center for Watershed Protection to the National Watershed Research Council.

Dr. **Jayme Smith** has been appointed a member of the San Francisco Bay Harmful Algae Data Analysis Expert Group.

Dr. **Stephen Weisberg** has been appointed Vice-Chair of the Safe and Sustainable Water Resources Committee for the U.S. Environmental Protection Agency's Board of Scientific Counselors.

Staff

Dr. **Nina Bednarsek**, a Senior Scientist in the Biogeochemistry Department since 2017, left SCCWRP in December to take a position with Oregon State University.

Dr. **Bowen Du**, a Scientist in the Chemistry Department since 2017, left SCCWRP in December to pursue other opportunities.

Duy Nguyen, a Research Technician on SCCWRP's IT team who started as a part-time Laboratory Assistant in 2019, left SCCWRP in early February to take a position with the U.S. Navy.

SCCWRP COMMISSIONER SPOTLIGHT

Stormwater manager loves engaging with public

On a day-to-day basis, Mark Lombos works on a wide range of stormwater projects and strategic planning initiatives related to Los Angeles County's compliance with its federal discharge permit.

Mark Lombos

He loves diving into complex data analyses and designing and managing infrastructure. But Lombos says the best part of his job isn't the technical work; rather, it's engaging with the communities that are beneficiaries of his work.

"Community engagement is my most favorite part of the job, especially when I see the light bulb moments of community members recognizing, 'Oh, you're doing this to improve our community,'" said Lombos, Assistant Deputy Director of the Stormwater Quality Division at the L.A. County Department of Public Works. "It's a great feeling to be protecting the environment and enhancing public anemities in the communities we serve."

Lombos was named a SCCWRP Alternate Commissioner and CTAG Representative in October, replacing Paul Alva, who retired. Alva served on the Commission for three years and on CTAG for nearly seven years.

Lombos, who formerly served as Alva's deputy, oversees a 50-member division that manages all aspects of stormwater permit compliance, from monitoring to special studies to runoff control projects.

Lombos has worked for L.A. County Public Works his entire career. He's also chosen to spend all 23 years in water, including water quality, water resources, and flood management and maintenance.

Mark Lombos, right, explores the Maui coastline from the air with a hired pilot aboard a two-person, powered hang glider during a recent trip to Hawaii.

Mark Lombos, P.E.

Job: Assistant Deputy Director, Stormwater Quality Division, Los Angeles County Department of Public Works

SCCWRP role: Alternate Commissioner and CTAG Representative (started October 2021)

Prior jobs: 23 years with Los Angeles County Department of Public Works; formerly Principal Engineer (2018-2021), Senior Civil Engineer (2015-2018), Civil Engineer (2012-2015), Associate Civil Engineer (2006-2012), Principal, Senior and Civil Engineering Assistant (1998-2006)

Education: B.S. civil and environmental engineering, University of California, Irvine (1998)

Residence: Porter Ranch

Family: Wife Audrey, a retired financial services consultant

Birthplace: Manilla in the Philippines

Hobbies: Traveling; playing basketball with friends; playing video games

He especially loves overseeing multi-benefit projects that enhance public spaces – for example, installation of stormwater capture infrastructure in a public park that enables the County to simulateously add rain gardens and update sports fields.

Lombos has been fascinated by water management since childhood. Born in Manilla in the Philippines, Lombos experienced water rationing as a young child and remembers being warned about the dangers of swimming in contaminated streams.

At age 8, he emigrated with his family to the U.S. and moved to Southern California. In college at UC Irvine, he studied civil engineering because his father and uncle are both civil engineers. But he never lost his passion for water, and took as many classes as possible related to water resources management.

"Water has always been my primary interest," Lombos said. "I think it's one of the most dynamic fields of engineering."

When he's not working, Lombos enjoys playing video games. During the pandemic, he's become a fan of Animal Crossing and Diablo.

He also enjoys traveling with his wife – from weekend trips to Santa Barbara to international destinations including Italy and Japan.

CTAG SPOTLIGHT

Manager finds perfect blend of policy, science

Kaitlyn Kalua has spent the past decade working at the intersection of environmental science and policy – for NGOs including the California Coastkeeper Alliance, on environmental law issues at Stanford University and State agencies, and as a Knauss Sea Grant Marine Policy Fellow in Washington, D.C.

Kaitlyn Kalua

But for Kalua, none of these experiences have quite so wholly captured the excitement and energy of working at the interface of science and policy as her new role with the California Ocean Protection Council (OPC).

"OPC truly embodies the intersection of science and policy, and that phrase is far from a buzzword," said Kalua, who starated in November as the OPC's Water Quality Program Manager. "The whole reason the OPC exists is to advance policy through science – I'm connecting other State agencies to funding and opportunities, ensuring State agencies are getting the science they need to inform the decisions they need to make."

Kalua, who started at the OPC in November, is the OPC's new CTAG Representative, replacing Holly Wyer, who left the OPC to take a new position with the California Coastal Commission. Wyer served on CTAG for four years.

Kalua's first OPC assignment was serving as the lead architect of a comprehensive statewide OPC strategy for managing microplastics pollution in the coastal ocean. Released in draft form in December, the strategy calls for a coordinated, multi-pronged series of management actions in California to combat microplastics pollution, as well as targeted research investments.

Kaitlyn Kalua, pictured perching on top of a rock, backpacks through Desolation Wilderness near Lake Tahoe in 2020 with partner Stephen and dog Ella.

Kaitlyn Kalua, J.D.

Job: Water Quality Program Manager, California Ocean Protection Council (started November 2021)

SCCWRP role: CTAG Representative

Prior jobs: Policy Manager and Policy Analyst, California Coastkeeper Alliance (2018-2021); Policy Analyst, National Weather Service (via Knauss Sea Grant Fellowship) (2017-2018); Legal Research Assistant and Legal Intern, Stanford University (2015-2017); Legal Extern, California State Water Resources Control Board (2014-2015); Law Clerk, California Governor's Office of Planning and Research (2014); Policy Coordinator and Aide, Ocean Conservancy (2012-2013)

Education: J.D., University of California, Davis (2016); B.A. international relations, UC Davis (2011)

Residence: Sacramento

Family: Partner Stephen, an environmental scientist; dog Ella, a Pyrenees Labrador

Hometown: Santa Rosa

Hobbies: Vegetable gardening; yoga, especially Vinyasa and Yin; camping and backpacking; road trips

While Kalua's precedessor focused primarily on marine debris issues for OPC, Kalua's role has been expanded to also encompass broader water-quality issues that impact coastal health, including coastal ocean acidification and hypoxia, plus water-quality and water-supply management challenges on land.

Kalua has long been captivated by California's water management issues. Her family owns a small cattle ranch in Somona County that made her acutely aware from a young age of the intense demands in California on limited water resources.

At UC Davis, Kalua took an undergraduate course in environmental case law that opened her eyes to the legal side of environmental management. After spending 1-1/2 years working for the Ocean Conservancy, she enrolled in law school at UC Davis – not to become a litigator, but to become more effective at shaping policy.

"I went to law school for the skill set," she said.

In her spare time, Kalua enjoys taking road trips to explore Northern California's wilderness. Her favorite spots are the Trinity Alps, June Lake in the Eastern Sierra, and Gualala on the Mendocino coast.

SCCWRP PARTNER SPOTLIGHT

Regional Board scientist relies on SCCWRP's work

Since joining joined the San Diego Regional Water Quality Control Board in May 2020, Lark Starkey's time has been consumed almost entirely by one massive project: Shepherding development of a multi-decade management strategy for reducing eutrophication in the Santa Margarita River watershed.

Lark Starkey

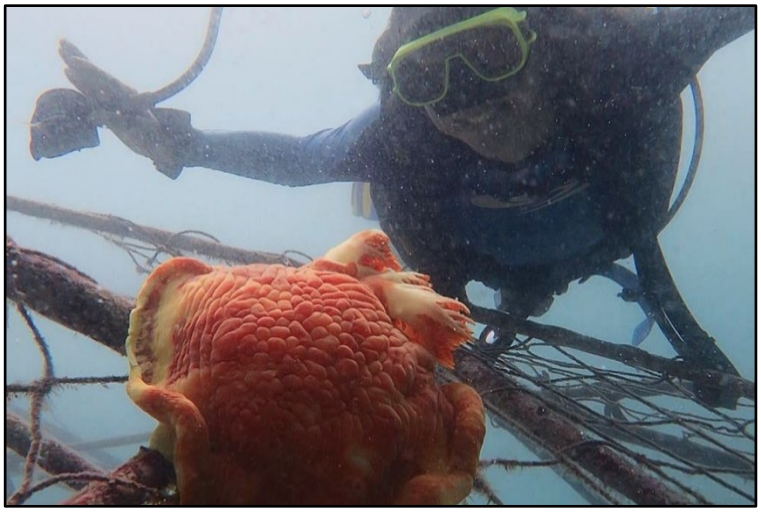
The project, which pre-dates Starkey's Regional Board tenure, encompasses multiple monitoring and modeling studies to understand how a complex set of environmental conditions and human activities is triggering ecologically disruptive algal blooms in the watershed.

And Starkey says she couldn't do her job without SCCWRP, which has been co-leading scientific investigations in Santa Margarita for the past decade.

"It's been incredibly helpful for me to connect with SCCWRP throughout my time working on this project," said Starkey, an Environmental Scientist for the San Diego Regional Board. "This is a really complex problem – we're going to need as much scientific evidence as possible to move forward with our water-quality restoration plan."

Starkey, who has begun drafting an initial version of the restoration plan for internal review, has been interacting regularly with SCCWRP since Day 1, relying on SCCWRP staff for advice, insights and perspective.

The management outcomes in Santa Margarita are particularly important because they're expected to serve as a key case study informing development of a planned statewide biointegrity-biostimulatory policy that will govern the health of streams across California.



Lark Starkey encounters a type of sea slug known as a Spanish Dancer nudibranch while training for her Divemaster scuba diving certification in Borneo in 2016.

Lark Starkey

Job: Environmental Scientist, San Diego Regional Water Quality Control Board (since 2020)

SCCWRP role: Partner on Santa Margarita River watershed biostimulatory management research

Prior jobs: Aquatic Scientist, Wood Environment and Infrastructure Solutions (2019-2020); California Sea Grant Fellow, State Water Resources Control Board (2018-2019); Conservation and Science Educator, WILDCOAST (2017-2018); Crew Leader, Bristol Bay Science and Research Institute (2015-2017); Conservation and Communications Specialist, Tropical Research and Conservation Center in Borneo (2016); Communications and Development Manager, Alaska Marine Conservation Council (2014-2016)

Education: M.A.S. marine biodiversity and conservation, University of California, San Diego (2017); B.A. English literature, Queen Mary University of London (2011)

Residence: San Diego

Hometown: St. Croix Falls, Wisconsin and Anchorage, Alaska

Family: Husband Travis, a marine biogeochemistry professor; dog Stella, a Latin shepherd mix

Hobbies: Surfing; scuba diving; reading fiction; going to local music concerts

Starkey's passion for environmental management started shortly after graduating college, when she spent a year traveling through the island nations of southeastern Asia.

"When you visit these places, it slaps you in the face how unsustainable human practices are," Starkey said.

Starkey took a science communications position for 1-1/2 years at a fisheries organization in Alaska, where she's from, then enrolled in a master's in marine biodiversity and conservation at UC San Diego.

After graduating, she completed a year-long Sea Grant fellowship at the State Water Board in Sacramento, where her primary responsibility was supporting fecal indicator bacteria objectives. The fellowship convinced Starkey she wanted to work for the Regional Board.

In her spare time, Starkey is an avid surfer and scuba diver. Starkey also is active in the NGO world; she recently completed a two-year stint on the Executive Committee of the San Diego chapter of Surfrider Foundation.

SCCWRP STAFF SPOTLIGHT

Computer major uses pandemic to expand skills

As Dan Ortiz approached his graduation from Cal State Fullerton a year ago, he did everything right to line up a job.

Dan Ortiz

The computer science major started interacting with job recruiters from multiple companies, expressing his interest in a position in networking or software engineering.

But then, just two months before graduation, the COVID-19 pandemic hit. All of Ortiz's leads suddenly dried up, and recruiters informed him that hiring freezes and layoffs were coming.

Despite Ortiz's disappointment, he resolved to make the most of the unexpected limbo he'd been put in. Ortiz began using his free time to expand his programming skills. He used open-source courseware and other online tutorials to learn new programming languages and computer networking on his own, building on skill sets he's learned in school.

"I treated what I was doing as a class – I would assign myself to redo a project I'd already completed in school, but using a different programming language," Ortiz said. "I told myself, 'Whenever I start applying for jobs again, I'm going to be ready.'"

Ortiz started last spring as a Research Technician under Systems Administrator Paul Smith. He is responsible for a variety of IT network tasks, taking over some of Robert Butler's duties so Butler can focus on more programming and web development work. Ortiz also helps with programming projects.

Dan Ortiz explores Crystal Cove Trail in Newport Beach during a hike in 2021.

Dan Ortiz

Job: Research Technician, Cross-Department Technical Support (started May 2021)

Prior jobs: Barista, Starbucks (2019-2020); Product Support Intern, BlackBerry Cylance in Irvine (2019); disability support services transcriptionist, Cal State Fullerton (2017-2019)

Education: B.S. computer science, California State University, Fullerton (2020)

Residence and hometown: Garden Grove

Hobbies: Working out; hiking; playing basketball and soccer; cooking; reading, especially fantasy novels; playing online games

Ortiz has known about SCCWRP's IT team for about two years, since his good friend and former Cal State Fullerton classmate – SCCWRP's Mahzaib Quraishi – began working on SCCWRP's IT team.

"Zaib told me she was doing a lot of web development and database work, and it really interested me," Ortiz said. "And then when I learned that SCCWRP's overall focus is to help the environment, I saw the purpose behind why we're here – that became more what made me want to work here."

Ortiz has known since he started as a Cal State Fullerton freshman in 2016 that he wanted to study computer science. His original intent was to pursue a career in computer game development – a hobby he had long enjoyed as an online gamer.

But his professors, along a summer internship at the cybersecurity arm of mobile device maker BlackBerry, showed him there was much more to the profession than just game development.

Since college, Ortiz also has developed a love-hate relationship with online gaming. He still enjoys multiplayer games like League of Legends and Apex Legends, but they can be addicting, he said, and he doesn't enjoy interacting with toxic players in the gaming community.

During the pandemic, Ortiz has become an avid cook. He particularly enjoys cooking Italian pasta dishes, and he's also been learning how to make his mother's Peruvian specialties.

Ortiz is the fifth of seven siblings, and the first in his family to graduate from college.

During the pandemic, he's been living at home in Garden Grove, where all but one of his siblings still live, although he plans to move out on his own in the coming months, likely to Irvine.

SCCWRP SCENES

Recognizing four decades of service

SCCWRP's Darrin Greenstein – the second longest-serving staff member of all time and the longest-serving current staff member – celebrated 40 years of SCCWRP service on February 1, 2022. Greenstein has played a pivotal role in numerous SCCWRP scientific advances over the years, including development and implementation of multiple toxicology-based methods for assessing water quality and sediment quality. A long-time member of the Toxicology Department, he was part of the SCCWRP team that led the development of the technical underpinnings for California's Sediment Quality Objectives regulatory program for enclosed bays and estuaries. For the past two decades, Greenstein has served as SCCWRP's Laboratory Coordinator, helping to design both SCCWRP's current laboratory facilities in Costa Mesa as well as the agency's previous facilities in Westminster.

Clockwise from right: Darrin Greenstein dissecting kelp bass in a SCCWRP laboratory in the 1980s; Greenstein sampling stormwater circa 1990; Greenstein collecting parking lot runoff in 2015; and Greenstein appearing in a short film produced for SCCWRP's 50th anniversary in 2019.