SCCWRP Director's Report

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FALL 2019 ISSUE

SCCWRP reflects on progress, achievements over 50 years

SCCWRP celebrated its 50th anniversary in October with a special program at the Aquarium of the Pacific in Long Beach that highlighted the agency's progress and achievements over the past five decades and recognized the many individuals who have contributed to its success.

The celebration, which drew about 300 guests, was an opportunity for multiple generations of SCCWRPers to meet, reconnect and network. SCCWRP Commissioners, CTAG Representatives and staff met their predecessors, and former staff who worked at SCCWRP as early as the 1970s flew to Southern California for the event.

The celebration began with a four-hour scientific afternoon program detailing SCCWRP's key scientific accomplishments over the past 50 years. During the program, SCCWRP scientists delivered a series of technical presentations focusing on past, present and future research directions across SCCWRP's major thematic research areas.

Then, during a four-hour evening celebratory dinner and program, SCCWRP recognized the people and institutions that have contributed to the organization's success. The evening session included a private, after-hours dinner in the main aquarium lobby.

Special guests recognized at the event included the author of SCCWRP's founding documents – engineer Charles Carry of the Sanitation Districts of Los Angeles County – and the longest-serving SCCWRP Commissioner in SCCWRP history, Janet Hashimoto of the U.S. Environmental Protection Agency, who served for 28 years. Dr. Robert Ghirelli of the Orange County Sanitation District, a member of the planning committee for the event, is the second longest-serving Commissioner at 26 years.

Also in attendance was the only individual who served as SCCWRP employee, a CTAG Representative, and a Commissioner – Michael Moore of the Orange County Sanitation District.

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Cover photo: Former SCCWRP employees Michael Moore, left, and Harold Stubbs collect seafloor sediment in this historic 1970s photo from SCCWRP's early days. Moore was among the guests who attended SCCWRP's 50th anniversary celebration in October.

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, November 14
CTAG quarterly meeting

Friday, December 6
Seminar: "Innovation in the Ocean: A New Funder's Perspective"

Friday, December 13
Commission meeting

Finally, the two employees who have worked at SCCWRP the longest – Valerie Raco-Rands (40 years) and Steve Bay (39 years) – attended.

During the evening session, SCCWRP debuted five short films that were produced for SCCWRP's 50th anniversary celebration. The first film provides an introduction and overview of SCCWRP, while the other four films recognize, respectively, the SCCWRP Commission, the SCCWRP Scientific Consulting Board (1969-1994) and CTAG, SCCWRP's scientific partners and SCCWRP's staff.

In each film, key individuals reflect on what their association with SCCWRP has meant to them both personally and professionally.

All guests received a copy of SCCWRP at 50, a commemorative book that chronicles SCCWRP history through photos, historic documents and a written narrative.

Also included in the book is a short write-up on key challenges and opportunities that SCCWRP will face in the coming years. Finally, the book includes nearly 50 personal essays written by individuals whose lives and careers have been positively affected through their affiliation with SCCWRP.

During the evening program, representatives from the offices of State Assemblymember Al Muratsuchi and State Senator Ben Allen presented SCCWRP with a formal resolution from the California State Legislature recognizing the agency on its 50th anniversary.

SCCWRP worked closely for more than a year with a five-member planning committee of representatives from SCCWRP member agencies to conceptualize the event, decide on event logistics and review written materials.

The films and book have been uploaded to a 50th anniversary celebration page on SCCWRP's website. Also included on the page is a slideshow of photos captured during the October 11 celebration.

SCCWRP officially turned 50 nine days later, on October 20, 2019.

For more information and to request a copy of the commemorative book, contact Scott Martindale.

Clockwise from top left, guests enjoy dinner service during SCCWRP's 50th anniversary celebration at the Aquarium of the Pacific in Long Beach; SCCWRP Commission Chair Mark Gold delivers opening remarks during the evening program; and more than a dozen employees who worked at SCCWRP in the 1970s pose for a group photo.

Guidance prepared on how to use bioanalytical assays to screen for contaminants

SCCWRP has partnered with the National Water Research Institute (NWRI) to co-author guidance for California's water recycling community on how to incorporate bioanalytical screening technology into routine water-quality monitoring.

The guidance, developed by a seven-member NWRI panel that includes SCCWRP, will offer best-practice recommendations for using bioanalytical cell assays to screen certain types of recycled water for bioactive contaminants. The guidance is expected to be published as a technical report by the end of November.

The State Water Board last year adopted a policy amendment requiring bioanalytical screenings to be incorporated into monitoring of recycled water for potable reuse. During a three-year trial period that starts in 2020, water recycling agencies in California will screen for bioactive contaminants using two types of bioanalytical assays – the estrogen receptor assay and the aryl hydrocarbon receptor assay.

SCCWRP and its partners have spent the past decade adapting these assays to serve as a first line of defense for screening water bodies for bioactive contaminants. The estrogen and the aryl hydrocarbon receptor assays are designed to screen for hundreds of chemicals that trigger a common cellular-level response.

Bioanalytical screening technology, which was originally adapted from the pharmaceutical and food-safety industries, has the potential to provide a rapid, cost-effective approach to comprehensively screen water bodies for major classes of bioactive contaminants that pose potential health risks to humans and wildlife.

California is the first state in the nation to apply this technology to water-quality management. SCCWRP and its partners envision bioanalytical screening serving as a complement to existing, targeted chemical screening efforts.

SCCWRP's Dr. Alvina Mehinto transfers small aliquots of cells into assay wells for a bioanalytical screening test that involves exposing the cells to a water extract sample, then tracking how the cells respond. SCCWRP is part of a seven-member panel of experts that has co-authored guidance for California's water recycling community on how to incorporate this technology into routine water-quality monitoring.

The bioanalytical screening guidance document was coauthored over the past few months by the seven-member Bioanalytical Implementation Advisory Group, which includes SCCWRP's Dr. Alvina Mehinto.

The panel's guidance, which already has been reviewed by the State Water Board, is expected to inform water recycling agencies' efforts to develop standard operating procedures and a quality assurance plan for conducting routine screening.

The guidance document is just one of the ways that SCCWRP has been working to transfer bioanalytical screening technology into routine use by the water-quality management community.

SCCWRP also has hosted meetings that brought together cell assay vendors, consultants and the end-user community to discuss how to meet the new State requirements.

Meanwhile, SCCWRP will host a series of laboratory trainings in the coming months to ensure SCCWRP member agencies are proficient in running the assays and analyzing the data.

For more information, contact Dr. Alvina Mehinto.

Study underscores complexity of predicting acidification's impacts on marine organisms

SCCWRP and its partners have completed a three-year study examining the vulnerability of fisheries in the world's polar regions to ocean acidification (OA) – an analysis that has illuminated the complexity of predicting the regional-scale impacts of acidification on vulnerable marine organisms at the base of marine food webs.

The study, completed in October, predicts how commercial fisheries in one of the most productive polar habitats of the Gulf of Alaska and the Bering Sea will be impacted as fish's primary diet – which is heavily dependent on pteropods, or sea snails – becomes increasingly vulnerable to OA.

The study showed that assessing biological vulnerability of pteropods to OA is not uniform, with vulnerability significantly influenced by factors including genetics of the population, compensation responses and how their demographics are connected across large spatial scales.

In some cases, despite having an identical genetic structure (which does not confer any resilience to OA), some populations of pteropods were less vulnerable because of large-scale spatial connectivity that continuously brings influxes of new organisms into the region.

The study's findings are important as researchers pursue development of biological thresholds that establish for environmental managers how marine life will be impacted by changing seawater chemistry. The impacts of OA will both directly affect vulnerable organisms as well as ripple through marine food webs.

Historically, OA researchers have conducted only laboratory experiments to understand how organisms like pteropods become vulnerable to intensifying OA conditions.

In showing that pteropods and the fish that feed on them are not uniformly affected by a given OA exposure regime, this study makes the case that multi-faceted lines of evidence must be examined when deriving biological thresholds for pteropods.

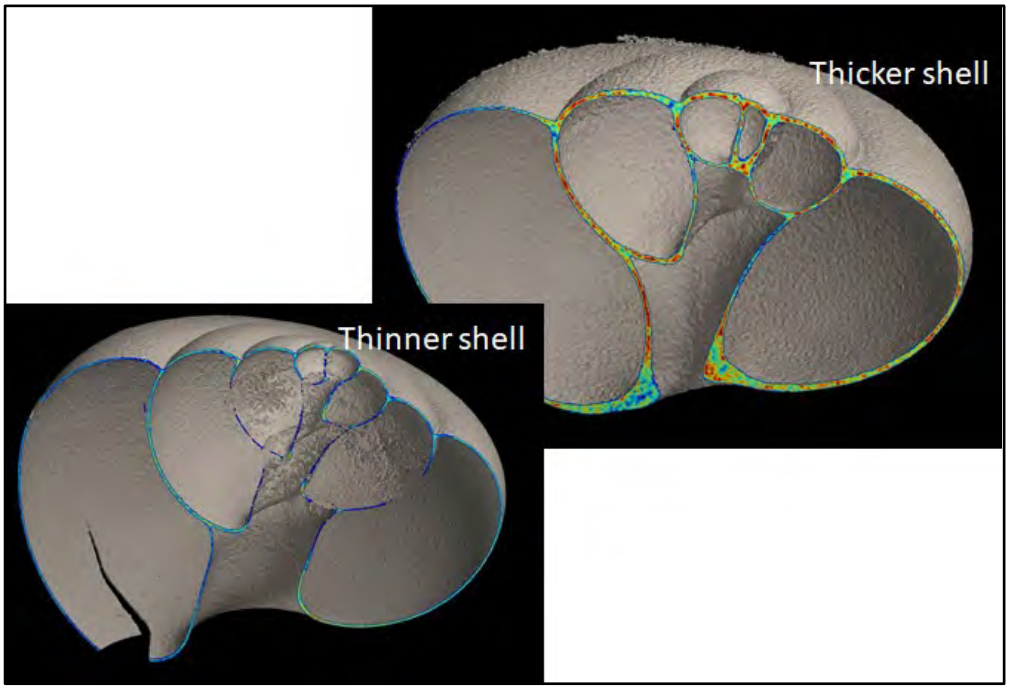
SCCWRP and its partners will be able to apply the same type of analysis as they work to define the biological thresholds at which West Coast marine ecosystems will be impacted by OA in the coming decades. The biological thresholds, in turn, will help environmental managers interpret powerful computer models that SCCWRP and its partners are developing to predict OA's regional impacts.

Already, the West Coast modeling team has begun studying population connectivity in the Southern California Bight and along the California coast to more comprehensively assess OA-related vulnerability among sensitive marine populations.

Fisheries managers in the high-latitudinal polar regions also will benefit from the study's findings as they work to manage fisheries in an area that is undergoing one of the world's most rapid OA changes.

The findings have been submitted as a report to the Alaska-based North Pacific Research Board; a journal manuscript also is being written.

For more information, contact Dr. Nina Bednarsek.



Pteropods, or sea snails that form the base of marine food webs, are among the organisms vulnerable to ocean acidification (OA) because it causes them to have difficulty forming and maintaining their shells. Although pteropods have identical genetic structures, researchers have found that their vulnerability to OA is not uniform.

International study kicks off to standardize microplastics monitoring methods

SCCWRP and its partners have launched an international study to develop standardized methods for measuring microplastic particles in aquatic environments, an effort that has the potential to improve the accuracy and comparability of microplastics monitoring programs worldwide.

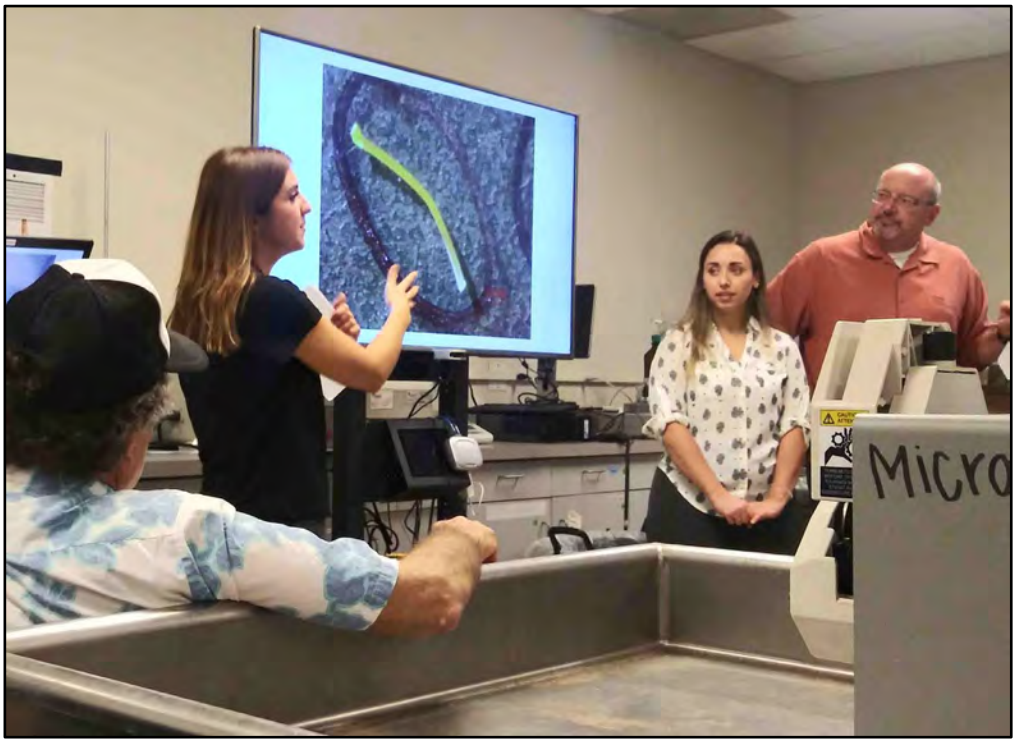
The study, which kicked off in October, will examine precision, repeatability, cost and other issues associated with five commonly used methods for measuring microplastics in aquatic environments: Raman spectroscopy, Fourier-transform infrared spectroscopy (FTIR), stereoscopy, stereoscopy with staining, and Pyrolysis-GCMS (gas chromatography/mass spectrometry).

About 30 research laboratories around the world have signed onto the study, including SCCWRP member agencies.

The microplastics measurement methods evaluation study will help SCCWRP member agencies address California legislation enacted last year that calls for microplastics to be tracked in drinking water and the coastal ocean. California Senate Bill 1422 requires the State Water Board to develop plans to quantify microplastics in drinking water by 2021, while California Senate Bill 1263 requires the California Ocean Protection Council to adopt and implement a statewide strategy to evaluate the ecological risks of microplastics in marine environments.

SCCWRP will serve as key facilitator during the study, including hosting multiple on-site training sessions to teach study participants how to quantify microplastic particles.

During a two-day training workshop at SCCWRP in October, more than 20 participating labs learned how to extract plastics from water, sediment and fish tissue. Then, during a weeklong SCCWRP workshop starting November 18, participants will learn how to differentiate plastics from non-plastics using Raman spectroscopy and FTIR.



Hannah DeFrond, left, and Kennan Munro from the University of Toronto discuss how to extract microplastics from water, sediment and fish tissue during a training workshop at SCCWRP in October. An international team of researchers, including SCCWRP, is participating in a study that will compare the performance of five commonly used methods for measuring microplastics in aquatic environments.

Trainers for the courses include study partners from the laboratory of Dr. Chelsea Rochman at the University of Toronto and instrument manufacturers Horiba and Thermo Scientific.

Method standardization is needed to measure microplastics because the particles can be difficult to distinguish from plant detritus and cloth fibers using light microscopy alone. Although a range of methods have been used, side-by-side evaluations have never been done to compare their relative effectiveness.

Defined as plastic particles between 1 micron and 5 millimeters in diameter, microplastics have become ubiquitous in aquatic environments, even as scientists have relatively little understanding of how they impact the health of humans and wildlife that inadvertently ingest them.

In preparation for the study, SCCWRP has completed a renovation of its chemistry instrument laboratory to house a state-of-the-art Raman spectrometer and a Fourier-transform infrared (FTIR) instrument. The renovation included an upgraded laboratory air circulation system, with HEPA (High Efficiency Particulate Air) filtration and positive pressure to exclude outside air that could be filled with airborne microplastics, including from clothing or other consumer products. These upgrades will minimize particulate contamination during sample processing and analysis.

The full method evaluation study is scheduled to start in December, following the training.

For more information, contact Dr. Charles Wong.

Updates by Thematic Area

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

BIOASSESSMENT

Study launched to determine chances of improving condition of Bay Area streams

SCCWRP has been invited by stormwater managers in the San Francisco Bay Area to participate in a one-year study that will shed light on where managers are more vs. less likely to find success in improving the health of the region's watersheds.

The study, launched in November by the San Francisco Estuary Institute and its stormwater management partners, will use a computer modeling tool co-developed by SCCWRP that predicts the degree to which stream bioassessment scores are likely to be limited, or "constrained," by urban and agricultural development.

SCCWRP will examine whether the Stream Classification and Priority Explorer (SCAPE) interactive web tool needs to be adapted and fine-tuned for use in Bay Area watersheds.

Watershed managers across Southern California already have been using the SCAPE tool to determine where they should direct their limited resources to get the biggest bang for the restoration buck.

Ephemeral stream bioassessment tools show promise for monitoring oil spills

SCCWRP and its partners at California State University, Monterey Bay, have shown in a proof-of-concept study that bioassessment tools designed to evaluate the health of ephemeral streams have the potential to be adapted for assessing ecological damage from oil spills in California.

The study, to be published in a forthcoming technical report, found that the structure and composition of bryophyte and arthropod communities living in dry streambeds were altered in predictable ways by increasing stress from oil spills.

The California Department of Fish and Wildlife's Oil Spill Prevention and Response Team is interested in adapting ephemeral stream tools for oil spill monitoring because they have the potential to provide a quantitative basis for assessing environmental damage and levying appropriate penalties.

Oil spills are becoming increasingly common in dry streambeds in California as a result of local petroleum production and transportation activities.

ECOHYDROLOGY

Stream flow duration tool being adapted for use in U.S. Great Plains region

SCCWRP and its partners have begun adapting a tool that can rapidly distinguish among intermittent, ephemeral and perennial streams for use in the U.S. Great Plains region, building on SCCWRP's prior successes adapting this tool for the U.S. Arid Southwest and Western Mountains regions.

The stream flow duration tool, which determines a stream's flow duration based on easily observed field indicators, is based on a tool developed by the U.S. Environmental Protection Agency for use in the Pacific Northwest.

Field data collection for the Great Plains

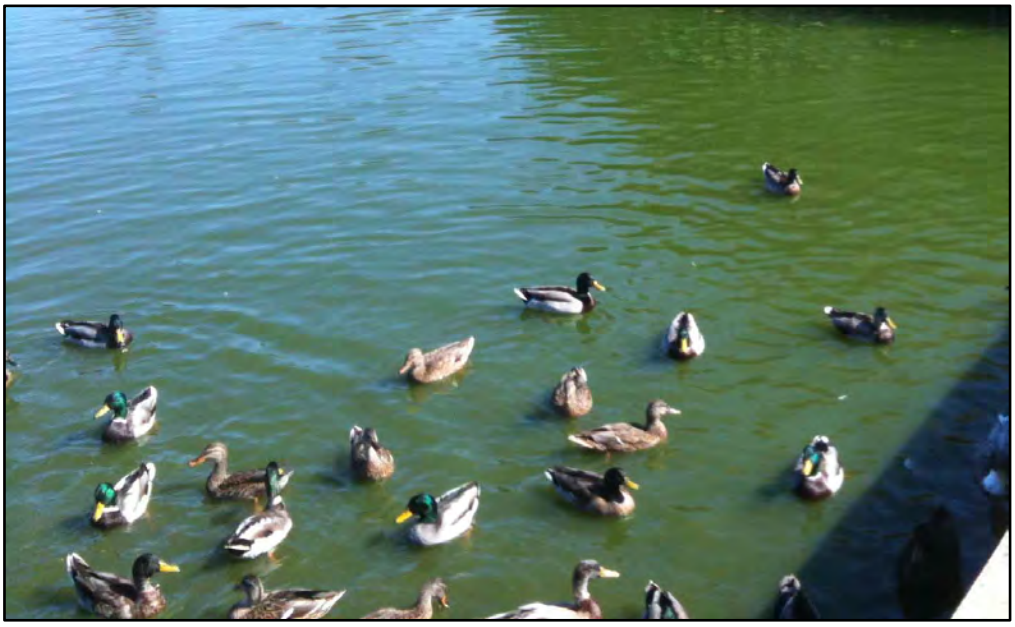
Dr. Raphael Mazor, right, leads a field training exercise in Denver, Colorado in October as part of an effort to adapt a tool for use in the U.S. Great Plains region that can rapidly distinguish among streams with different flow types.

region began with a training exercise in October.

Watershed managers need to be able to distinguish streams with different flow durations because in certain cases, they are subject to different regulatory requirements. Many non-regulatory management decisions also require stream flow information.

Perennial streams have uninterrupted flow year-round. Intermittent streams have sustained seasonal flows from snow melt and groundwater. And ephemeral streams only experience brief surface flows from runoff.

The EPA is interested in having SCCWRP and its partners adapt the stream flow duration tool to eventually encompass the entire U.S., including Alaska and Hawaii, as early as 2023.



Ducks swim in a lake tainted green by a cyanobacterial bloom. A technical advisory group has been convened by SCCWRP to begin examining whether the State Water Board should develop thresholds to protect aquatic life from cyanotoxins produced during blooms.

EUTROPHICATION

Advisory group convened to consider developing cyanotoxin thresholds for aquatic life

SCCWRP has convened a technical advisory group to study whether the State Water Board should develop cyanotoxin monitoring thresholds that better protect vulnerable aquatic life from the impacts of ecologically disruptive cyanobacterial blooms.

The six-member advisory group, which began reviewing cyanotoxin data at a meeting in September, will examine whether existing guidance intended to protect the health of swimmers exposed to cyanotoxins also is relevant for protecting aquatic life exposed for prolonged periods.

The group will identify cyanotoxin concentrations harmful to aquatic organisms, then compare these numbers to recreational thresholds for cyanotoxins that have been proposed by the U.S. Environmental Protection Agency and the State of California.

The results of this review will be presented at a scientific workshop in spring 2020, where experts and water quality managers will be asked to develop research recommendations to address remaining management questions.

Case study to develop eutrophication targets to better protect Elkhorn Slough estuary

SCCWRP and its partners have launched a three-year effort to develop nutrient loading and flow targets intended to reduce eutrophication in the Elkhorn Slough estuary that drains to Monterey Bay.

The project, launched in October, will serve as a key California case study for test-driving technical elements of a proposed State Water Board biostimulatory amendment that is intended to extend greater protections to estuaries statewide. The eutrophication-prone Elkhorn Slough estuary is limiting seagrass habitat and degrading the integrity of salt marshes.

Researchers will use an integrated toolkit of mechanistic computer models and empirical statistical models to simulate how flow, nutrients and temperature are influencing algal blooms and dissolved oxygen levels.

The goal is to demonstrate how to set nutrient loading and flow targets to curb algal blooms in the agriculture-dominated watershed.

CLIMATE CHANGE

Committee offers guidance on how to increase managers' confidence in acidification modeling effort

A stakeholder committee working to help researchers evaluate whether land-based pollution sources are influencing ocean acidification and hypoxia in Southern California's coastal ocean has provided initial feedback about how to increase management confidence in a newly developed computer model that predicts local OAH conditions.

During a September meeting, the stakeholder committee provided SCCWRP and its modeling partners with multiple detailed steps to further validate the model. The committee, which is chaired by George Robertson of the Orange County Sanitation District, also identified a suite

of managerially relevant scenarios that they want to see run through the model.

The modeling work in the Southern California Bight is part of a multi-year, West Coast-wide initiative to help managers understand which marine habitats are most vulnerable to ocean acidification and to what extent local, land-based sources of nutrients could be exacerbating coastal conditions.

Computer model shown to simulate dispersal patterns of wastewater plume in coastal ocean

SCCWRP has used a computer model that simulates biogeochemical cycling in the Southern California Bight to predict the dispersal patterns of the Orange County Sanitation District's wastewater effluent plume.

The model validation, completed in September, is the first phase of a three-year study that will examine how the plume's dilution and mixing patterns are expected to change as more treated effluent is recycled in drought-prone California. The increased recycling will reduce effluent volumes, which is expected to lead to a more concentrated plume that may having different buoyancy and mixing characteristics.

During model validation, researchers showed that the model could successfully reproduce plume dispersal patterns captured in laboratory experiments.

Dynamic exposure lab used to simulate pH buffering effects of kelp forests on oyster larvae

SCCWRP has used its new, state-of-the-art dynamic exposure laboratory to study how underwater kelp forests could lessen the effects of ocean acidification (OA) on oysters and other marine calcifiers.

Managers receive training at SCCWRP in October on how to use a pair of sediment quality assessment frameworks developed by SCCWRP and its partners to evaluate the impacts of sediment contamination. Researchers have developed a new, interactive web version of the Human Health SQO Assssment Tool.

The laboratory portion of the experiment, completed in September in SCCWRP's Dynamic Stressor Exposure Research Facility (DSERF), involved exposing oyster juveniles to a variety of different pH conditions. The conditions were designed to mimic a kelp forest's ability to draw carbon dioxide out of the water and potentially offset OA conditions.

Kelp forests, as part of regular photosynthetic processes, may be able to buffer vulnerable organisms from intensifying OA conditions.

The study marks the first time that dynamic, diel-variability treatment has been used to investigate the biological responses of economically important oysters.

SEDIMENT QUALITY

New version of sediment quality assessment tool developed to streamline analyses

SCCWRP has developed a new, interactive web version of a tool to assist environmental managers in assessing the human health impacts of contaminated sediment at a particular site.

The Human Health SQO Assssment Tool, unveiled at a two-day user training workshop in October, represents a significant improvement over the original, Excel-based tool, which needed to be installed on individual computers.

Developed using the R programming language, the new Sediment Quality Assessment (SQO) tool automates data uploads, model runs and downloading of results.

October's SQO training workshop was the latest in a series of workshops hosted by SCCWRP and the State Water Board to teach managers how to use a pair of sediment quality assessment frameworks developed by SCCWRP to assess the impacts of sediment contamination.

CONTAMINANTS OF EMERGING CONCERN

Study to evaluate performance of film-based passive samplers for measuring microcystins

SCCWRP and its partners have launched a two-year study to evaluate the performance of novel, film-based passive sampling technology for measuring a class of cyanotoxins known as microcystins.

The passive samplers, known as o-DGT and made of inexpensive polymer film, were deployed in September at four water bodies spanning both freshwater and marine environments; o-DGT stands for organic diffusive gradients in thin films.

Researchers are comparing the performance of the o-DGT passive samplers to resin-based passive sampling devices known as Solid Phase Adsorption Toxin Tracking (SPATT).

SPATT devices, which are commonly used for harmful algal blooms (HABs) monitoring, are difficult to calibrate and provide only semi-quantitative estimates of toxin levels in the water column and in sediment. Researchers hope the film-based passive sampling can offer a cheaper, more quantitative alternative for cyanotoxin monitoring.

MICROBIAL WATER QUALITY

Bacterial species, genes being identified for study examining antibiotic resistance in wastewater effluent

SCCWRP and its partners have begun working to confirm the identity of antibiotic-resistant bacteria and bacterial genes in treated wastewater effluent for an ongoing study examining whether this material is being discharged in viable form into the environment following treatment processes.

The confirmation phase, which began in October, will provide a deeper understanding of which antibiotic-resistant bacteria are surviving treatment and whether there are differences among the 10 treatment plants participating in the study.

The study was launched in 2017 to provide a baseline understanding of the prevalence of antibiotic-resistant bacteria and genes in wastewater effluent at Southern California treatment facilities. In particular, if antibiotic-resistant genes are surviving treatment processes that destroy most bacterial cells, they could get discharged into aquatic systems, where they could get taken up by pathogenic bacteria – a phenomenon that could create multidrug-resistant "superbugs."

During the confirmation phase of the study, researchers are identifying more than 2,500 antibiotic-resistant isolates generated during culture sampling.

The bacteria also are being tested for multi-drug resistance using standard antibiotic resistance screening tests.

Field sampling completed for shellfish water-quality study in Newport Bay

SCCWRP and its partners have completed field sampling for a study examining whether a water-quality standard designed to protect the health of people who consume shellfish from Newport Bay in Orange County has been appropriately set.

The sampling, completed in September, involved harvesting oysters that had been placed in cages in Newport Bay. Researchers will measure viral pathogens and fecal bacterial indicators in the oyster tissue, and also analyze water samples to determine if a relationship exists between contamination in the water column and in the oysters' tissue. Oysters are filter feeders that can take up bacteria and viruses from the water column.

The study was developed in response to a looming bacterial TMDL (total maximum daily load) regulatory deadline in Newport Bay that mandates compliance with the statewide recreational shellfish water-quality standard – known as SHEL – by 2022.

Initial data and analyses are expected to be available in spring 2020.

Newport Bay in Orange County faces a looming regulatory compliance deadline for recreational shellfishing. SCCWRP and its partners have completed field sampling for a study evaluating whether a water-quality standard designed to protect the health of people who consume shellfish from the bay has been appropriately set.

REGIONAL MONITORING

Sites being identified for evaluating effectiveness of stormwater BMPs

The Southern California Stormwater Monitoring Coalition (SMC) has begun identifying about a half-dozen sites that will serve as case studies for examining the effectiveness of stormwater BMPs (best management practices) in improving stream condition.

As part of the SMC's 2019-2023 Regional Watershed Monitoring Program, researchers will compare ecological condition at stream sites that receive BMP-treated stormwater to ecologically similar sites that lack BMPs. The candidate sites encompass a broad range of stormwater control measures, including structural (e.g., detention basins) and non-structural (e.g., street sweeping, habitat restoration).

Researchers will focus on using integrative measures of aquatic life, including the California Stream Condition Index, to measure effectiveness in protecting and improving receiving waters.

Monitoring programs for stormwater BMPs typically focus on evaluating performance of the BMP itself; rarely is receiving water quality tracked.

SCCWRP is seeking input from its member agencies prior to finalizing the list of case studies.

TRASH POLLUTION

Study examining spread of microplastic debris through aquatic environments

SCCWRP and its partners have launched a three-year study to examine how microplastic debris is transported via waterways to the coastal ocean and what happens to this pollution once it reaches the contintental shelf.

The study, launched in November, will quantify levels of microplastics in the Los Angeles and San Gabriel Rivers, as well as in the treated wastewater effluent that is discharged into these rivers.

A computer model will be used to investigate what happens to this pollution upon reaching the San Pedro Shelf; the goal is to illuminate risks to pelagic vs. benthic habitats.

New SCCWRP Publications

Journal Articles (Published)

Baltar, F., B. Bayer, N. Bednarsek, S. Deppeler, R. Escribano, C.E. Gonzalez, R.L. Hansman, R.H. Mishra, M.A. Moran, D.J. Repeta, C. Robinson, E. Sintes, C. Tamburini, L.E. Valentin, G.J. Hemdi. 2019. Towards Integrating Evolution, Metabolism, and Climate Change Studies of Marine Ecosystems. *Trends in Ecology and Evolution* DOI:10.1016/j.tree.2019.07.003.

Beck, M., R.D. Mazor, S. Theroux, K.C. Schiff. 2019. The Stream Quality Index: A multi-indicator tool for enhancing environmental management. *Environmental and Sustainability Indicators* DOI:10.1016/j.indic.2019.100004.

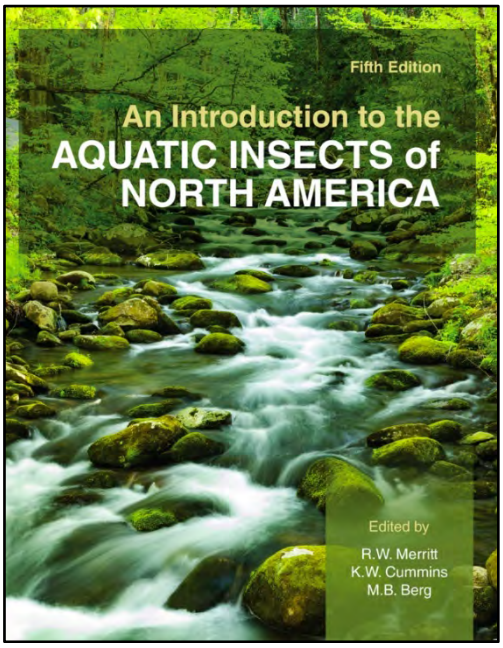
Beck, M., E.T. Sherwood, J.R. Henkel, K. Dorans, K. Ireland, P. Varela. 2019. Assessment of the Cumulative Effects of Restoration Activities on Water Quality in Tampa Bay, Florida. *Estuaries and Coasts* DOI: 10.1007/s12237-019-00619-w.

Buitenhuis, E.T., C.L. Quere, N. Bednarsek, R. Schiebel. 2019. Large Contribution of Pteropods to Shallow $CaCO_3$ Export. *Global Biogeochemical Cycles* 33:458-468.

Canonico, G., P.L. Buttigieg, E. Montes, F.E. Muller-Karger, C. Steplen, D. Wright, A. Benson, B. Helmuth, M. Costello, I. Sousa-Pinto, H. Saeedi, J. Newton, W. Appeltabs, N. Bednarsek, L. Bodrossy, B.D. Best, A. Brandt, K.D. Goodwin, K. Iken, A.C. Marques, P. Miloslavich, M. Ostrowski, W. Turner, E.P. Achterberg, T. Barry, O. Defeo, G. Bigatti, L. Henry, B. Ramiro-Sanchez, P. Duran, T. Morato, J.M. Roberts, A. Garchia-Alegre, M.S. Cuadrado, B. Murton. 2019. Global Observational Needs and Resources for Marine Biodiversity. *Frontiers in Marine Science* 6:1-20.

Gillett, D.J., R.D. Mazor, S.B. Norton. 2019. Selecting comparator sites for ecological causal assessment based on expected biological similarity. *Freshwater Science* 38:554-565.

Giraldo, M.A., S. Dark, P. Pendleton, E.D. Stein, R. Mazor and J. Andreas. 2019. Environmental predictors of stream flow in semi-arid watersheds for biological assessments. *Ecological Indicators* 104:429-438.



SCCWRP is the lead author of a book chapter about the use of aquatic insects in bioassessment in the latest edition of *An Introduction to the Aquatic Insects of North America.*

Leon, P., N. Bednarsek, P. Welsham, K. Cook, S.E. Hartman, D. Wall-Palmer, J. Hindson, K. Mackenzie, L. Webster, E. Bresnan. 2019. Relationship between shell integrity of pelagic gastropods and carbonate chemistry parameters at a Scottish Coastal Observatory monitoring site. *ICES Journal of Marine Science* DOI: 10.1093/icesjms/fsz178.

Smith, J., A. Lie, E.L. Seubert, N. Crowley, G. Robertson, D.A. Caron. 2019. Co-occurring Dissolved Algal Toxins Observed at Multiple Coastal Sites in Southern California via Solid Phase Adsorption Toxin Tracking. *Toxicon* DOI: 10.1016/j.toxicon.2019.10.005.

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Beck, M., R.D. Mazor, S. Johnson, K. Wisenbaker, J. Westfall, P.R. Ode, R. Hill, C. Loflen, M. Sutula, E.D. Stein. 2019. Prioritizing Management Goals for Stream Biological Integrity Within the Developed Landscape Context. *Freshwater Science* DOI:10.1086/705996.

Journal Articles (Accepted)

Beck, M., C. O'Hara, J. Stewart Lowndes, R.D. Mazor, S. Theroux, D.J. Gillett, B. Lane, and G. Gearhart. In press. The importance of open science for biological assessment. *Freshwater Science*.

Giraldo, M.A., S. Dark, P. Pendleton, E.D. Stein, R. Mazor. In press. Environmental predictors of stream flow in semi-arid watersheds for biological assessments. *Ecological Indicators.*

Simons, A., R. Mazor, S. Theroux. In press. Using Co-occurrence Network Topology in Assessing Ecological Stress in Benthic Macroinvertebrate Communities. *Ecology and Evolution*.

Book Chapters

Mazor, R.D., V.H. Resh, D.M. Rosenberg. 2019. Use of Aquatic Insects in Bioassesment. in: R.W. Merritt, K.W. Cummins, M.B. Berg (eds.), *An Introduction to the Aquatic Insects of North America* pp. 141-164. Kendall Hunt Publishing Company. Dubuque, IA.

Technical Reports

Beck, M., R.D. Mazor, S. Theroux, K.C. Schiff. 2019. The Stream Quality Index: A Multi-Indicator Tool for Enhancing Environmental Management Communication. Technical Report 1080. Southern California Coastal Water Research Project. Costa Mesa, CA.

Gillett, D.J., L. Gisbane, K.C. Schiff. 2019. Benthic Infauna of the Southern California Bight Continental Slope: Characterizing Community Structure for the Development of an Index of Disturbance. Technical Report 1096. US Department of the Interior, Bureau of Ocean Energy Management. Camarillo, CA.

Mazor, R.D., J. Olson, M. Robison, A. Caudillo, J.S. Brown. 2019. Assessing the biological condition of dry ephemeral and

intermittent streams. Technical Report 1089. Southern California Coastal Water Research Project. Costa Mesa, CA.

Steele, J.A., D. Ebentier, A. Zimmer-Faust, J.F. Griffith, K.C. Schiff. 2019. Los Coches Creek Microbial Source Tracking Study. Technical Report 1087. Southern California Coastal Water Research Project. Costa Mesa, CA.

Stein, E.D., Y. Sanchez. 2019. Review of Recreational Uses and Associated Flow Needs Along the Main-stem of Los Angeles River. Technical Report 1088. Southern California Coastal Water Research Project. Costa Mesa, CA.

Quarter in Review

Conference Presentations

Bednarsek, N., et al. Modelling carapace dissolution and growth in larval Dungeness crab under severe ocean acidification gradients along the US West Coast. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Bednarsek, N. (session co-chair). Biological effects of ocean acidification on coastal ecosystems. Global Ocean Acidification Observing Network Meeting. China.

Bianchi, D., F. Kessouri, J.C. McWilliams, M.A. Sutula, L. Renault, C. Deutsch, K. McLaughlin, M. Ho. Impacts of submesoscale ocean dynamics on the biogeochemistry and ecosystem of the California Current. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Challis, J.K., A. Parajas, J.C. Anderson, E.K. Asiedu, J.W. Martin, C.S. Wong, M.S. Ross. Photodegradation of napthenic acids and other organic classes in oil sands process-affected water extracts. North America Meeting of the Society of Environmental Toxicology and Chemistry. November 3-7, 2019. Toronto, Canada.

Gillett, D.J., S. Weisberg, M. O'Mahoney, and C. Meyer. Choose your weapon: comparing the identification of benthic infauna via eDNA, single-specimen barcodes, and morphology. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Kessouri, K., N. Bednarsek, M. Sutula (session co-chairs). Ocean acidification in a multiple-climate-change-stressors context: science-based tools for management. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Kessouri, F., D. Bianchi, R. Feely, E. Turner, N. Bednarsek, M. Sutula (session co-chairs). Coastal Acidification, Hypoxia and Warming: Science-Based Tools for Management. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Kessouri, F., M.A. Sutula, D. Bianchi, J.C. McWilliams, C. Deutsch, L. Renault, K. McLaughlin, M. Ho, N. Bednarsek, E. Howard, L. Renault, S. Yang, R. Feely, S. Alin, R. Ambrose, M. Gold and S.B. Weisberg. Submesoscale Simulations to Support Management Conversations on the Impact of Local Pollution in Southern California. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Martindale, S. Effectively communicating science to environmental managers. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Mazor, R., M. Beck, S. Theroux, and K. Schiff. The Stream Quality Index: A multi-indicator tool for enhancing environmental management communication. California Aquatic Bioassessment Workgroup. October 23-24, 2019. Davis, CA.

Mehinto, A.C. Bioanalytical tools for water quality monitoring: Assessing emerging contaminants in recycled and ambient waters. American Water Works Association California-Nevada Section Annual Fall Conference. October 23, 2019. San Diego, CA.

Moore, S.L., S. Weisberg, C. Rochman, and A. Whitley. Methods Workshop Held to Advance the Development of Standardized Methods to Measure Microplastics. Federation of Analytical Chemistry and Spectroscopy Societies SciX Conference. October 13-18, 2019. Palm Springs, CA.

Moore, S. (session co-chair). Microplastics in the environment. Federation of Analytical Chemistry and Spectroscopy Societies SciX Conference. October 13-18, 2019. Palm Springs, CA.

Peek, R., S. Yarnell, R. Lusardi, R. Mazor, and E. Stein. Using benthic macroinvertebrate CSCI data to assess and inform flow management recommendations for California. California Aquatic Bioassessment Workgroup. October 23-24, 2019. Davis, CA.

Pena, S., J. Olson, and R. Mazor: Evaluating the impact of oil production activities in ephemeral streams near Bakersfield, California. California Aquatic Bioassessment Workgroup. October 23-24, 2019. Davis, CA.

Pickard, D., S. Ostermann-Kelm, and R. Mazor. Monitoring the condition of Santa Rosa Island and the Santa Monica Mountains. California Aquatic Bioassessment Workgroup. October 23-24, 2019. Davis, CA.

Smith, J., M.D.A. Howard, R. Kudela, K. McLaughlin, D.A. Caron, M. Roethler, D. Schultz, K. Hayashi, G. Robertson, L. Terriquez, K. Sakamoto, V. Renick, V. Phonsiri, B. Haggin, C.D. Larsen. Persistent Domoic Acid in the Sediments and Benthic Infauna in California. U.S. Harmful Algal Bloom Symposium. November 3-9, 2019. Orange Beach, AL.

Smith, J. Examining Potential Triggers of Algal Blooms and Harmful Algae in the Southern California Bight. Southern California Branch of the American Society

for Microbiology Annual Meeting. October 26, 2019. La Jolla, CA.

Stein, E.D., S.M. Yarnell, T. Grantham, J. Zimmerman, B.A. Lane, S. Sandoval-Solis, R.A. Lusardi, J. Howard. Establishing Environmental Flows for Urban Watersheds under the California Environmental Flows Framework. Biennial Symposium of the International Society for River Science. September 8-19, 2019. Vienna, Austria.

Stein, E.D., and E. Gee. Developing a framework for assessing environmental flows in estuaries. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Stroski, K.M., K.H. Luong, J.K. Challis, L.G. Chaves-Barquero, M.L. Hanson, C.S. Wong. Wastewater sources of per- and polyfluorinated alkyl substances (PFAS) and pharmaceuticals in Canadian Arctic Communities. North America Meeting of the Society of Environmental Toxicology and Chemistry. November 3-7, 2019. Toronto, Canada.

Sutula, M., F. Kessouri, J. McWilliams, C. Deutsch, D. Bianchi, N. Bednarsek, E. Howard, L. Renault, K. McLaughlin, R. Feely, S. Alin, R. Ambrose, S. Weisberg. Nutrient Pollution Effects on Acidification and Hypoxia in Southern California Bight: Biological vs. Water Quality Impacts. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Taniguchi-Quan, K.T., E. Stein, S. Yarnell, J. Zimmerman, S. Sandoval Solis, B. Lane, J. Howard, T. E. Grantham, A. Obester, R. Lusardi. A coordinated approach for developing statewide environmental flow regulations in California. American Fisheries Society and The Wildlife Society Joint Annual Conference. September 29-October 3, 2019. Reno, NV.

Theroux, S. Efforts to standardize molecular approaches to bioassessment in California and beyon. COST Action CA15219 (DNAqua-Net) Meeting. September 30, 2019. Limassol, Cyprus.

Theroux, S. The Integration of Molecular Methods in Bioassessment: Are We There Yet? California Aquatic Bioassessment Workgroup. October 23-24, 2019. Davis, CA.

Theroux, S. R. Mazor, E. Stein. Incorporating molecular ecology tools into coastal and estuarine monitoring programs. Coastal and Estuarine Research Federation Biennial Conference. November 3-7, 2019. Mobile, Alabama.

Weisberg, S. Climate change research at the Southern California Coastal Water Research Project Authority. American Academy of Environmental Engineers and Scientists Annual Meeting. October 17, 2019. Costa Mesa, CA.

Wisenbaker, K., S. Johnson, and R. Mazor. Monitoring to determine the health of perennial and nonperennial streams in the San Gabriel watershed. California Aquatic Bioassessment Workgroup. October 23-24, 2019. Davis, CA.

Wong, C. (session co-chair). Microplastics in the aquatic environment. North American Society of Environmental Toxicology and Chemistry Meeting. November 3-7, 2019. Toronto, Canada.

Wong, C.S. Field evaluation and in situ stress testing of the o-DGT for polar organic contaminants: quantification of known compounds and "quasi-quantification" of unknowns (plenary). Conference on Diffusive Gradients in Thin Films. September 17-20, 2019. Vienna, Austria.

Workman, C.E., A. Becker, C.S. Wong. Associations between concentrations of polyfluoroalkyl substances in human plasma and maternal, infant, and home characteristics in Winnipeg, Canada (plenary). International Conference on Environmental Pollution and Health. August 4-6, 2019. Harbin, China.

Yarnell, S.M., E.D. Stein, T. Grantham, J. Zimmerman, B.A. Lane, S. Sandoval-Solis, R.A. Lusardi, J. Howard. Stakeholder Engagement in the California Environmental Flows Framework. Biennial Symposium of the International Society for River Science. September 8-19, 2019. Vienna, Austria.

Conference Posters

Eggleston, E. J., J. Smith, S. Ryan, J. Gichuki, K. Kennedy, A. Tyler, M.D.A. Howard, D.A. Caron. Determining the Trends and Drivers of CyanoHABs in Clear Lake. U.S. Harmful Algal Bloom Symposium. November 3-9, 2019. Orange Beach, AL.

Hageman, K.J., C. Aebig, C.S. Wong, K.H. Luong, S. Kaserzon, T. Reeks, M. Greenwood, C.D. Mattaei, S. Macaulay. Current-use pesticides in New Zealand streams: Comparing results from grab samples and three types of passive samplers. North America Meeting of the Society of Environmental Toxicology and Chemistry. November 3-7, 2019. Toronto, Canada.

Mehinto, A.C, J. Smith, E. Wenger, M.D.A. Howard, R. Linville, B. Stanton, B.W. Brooks, M. Sutula. Ecotoxicity of Cyanotoxins in Freshwater Habitats - A Systemic Review of the Literature. U.S. Harmful Algal Bloom Symposium. November 3-9, 2019. Orange Beach, AL.

Parks, A.N., W. Lao, E.J. Wenger, K. Maruya, C. Stransky, J. Leather, J. Carilli, S.M. Bay. Influence of dissolved organochlorines on bioaccumulation in San Diego Bay, California. North America Meeting of the Society of Environmental Toxicology and Chemistry. November 3-7, 2019. Toronto, Ontario, Canada.

Parks, A.N., D.J. Greenstein, S.M. Bay. Impacts and interaction effects of sediment contamination and ocean acidification on *Eohaustorius estuarius.* North America Meeting of the Society of Environmental Toxicology and Chemistry. November 3-7, 2019. Toronto, Ontario, Canada.

Other Presentations

Bay, S.M., A.N. Parks, D. Gillett. Sediment Quality Analysis for Sediment Quality Objectives: 2-day training class. October 29-30, 2019. Costa Mesa, CA.

Bednaršek, N. Biological threshold application for forecasting sustainability of estuarine calcifiers in the Salish Sea. Washington Ocean Acidification Center. 2019. Seattle, WA.

Bednaršek, N. Ocean acidification driven biological vulnerability in the high latitudes: comparison between the Gulf of Alaska, Bering Sea and Beaufort Sea. 2019. Japan.

Bednaršek, N. Current impact of present-day ocean acidification conditions on marine calcifiers. National Oceanic and

Atmospheric Administration Pacific Marine Environmental Laboratory. 2019. Seattle, WA.

Bednaršek, N. Kelp as potential chemical refugia for Acidification-Sensitive Pelagic and Benthic Calcifiers. Kelp meeting. 2019. Costa Mesa, CA.

Bednaršek, N. Marine calcifiers under ocean acidification. Université du Québec à Rimouski. 2019. Quebec, Canada.

Bednaršek, N. Marine calcifiers under ocean acidification. Laval University. 2019. Quebec, Canada.

Bednaršek, N.: Biological implications of marine calcifiers in the North Pacific – overlapping opportunities across the Eastern and Western side. Japan Agency for Marine-Earth Science and Technology. 2019. Japan.

Gillett, D. Sediment Quality Analysis for Sediment Quality Objectives Training Course. October 2019.

Gillett, D. Update on Current Research: Southern California Coastal Water Research Project. San Diego Regional Water Quality Control Board. September 11, 2019. San Diego, CA.

Kessouri, F., M. Sutula, et al. Modeling anthropogenic nutrients in the southern California coastal waters. Sanitation Districts of Los Angeles County, City of San Diego Public Utilities Department, and Orange County Sanitation District. June through August, 2019.

Scientific Leadership

Dr. **Nina Bednarsek** has been appointed Guest Editor for a special issue of the journal *Diversity* titled "The Effects of Ocean Acidification on the Species Across the Lower Trophic Levels in the Pelagic Realm."

Dr. **Raphael Mazor** has been appointed an Associate Editor for the journal *Freshwater Science*.

Dr. **Alvina Mehinto** has been appointed to the Technical Advisory Committee of a Global Water Research Coalition project called "Effect-Based Monitoring in Water Safety Planning."

Dr. **Alvina Mehinto** has been re-appointed Co-Secretary of the Southern California chapter of the Society of Environmental Toxicology and Chemistry for 2019-20.

Shelly Moore and Dr. **Steve Weisberg** have been appointed Guest Editors for a special issue of the journal *Applied Spectroscopy* that will focus on measurement of microplastics.

Dr. **Jayme Smith** was elected the first early career committee member of the National Harmful Algal Bloom Committee in August.

Dr. **Alvina Mehinto** has been appointed to the 2020 Society of Environmental Toxicology and Chemistry Program Committee.

SCCWRP was presented a formal resolution from the California State Legislature recognizing the agency's contributions over the past five decades during SCCWRP's 50th anniversary celebration in October in Long Beach.

Kessouri, F., et al. Investigations of Effects of Local Anthropogenic Nutrient Inputs on Acidification and Hypoxia in the Southern California Bight. September 2019. Via webinar.

Moore, S.L. Microplastics Measurement Methods Evaluation Study. Science and Solutions for Microplastic Pollution. October 2, 2019. Berkeley, CA.

Taniguchi-Quan, K.T. California Environmental Flows Framework: Striking the balance between ecological and human water uses. San Diego State University Geography Department Colloquium Seminar. November 1, 2019. San Diego, CA.

Weisberg, S. Presentation about SCCWRP. California Stormwater Authority Governing Board. September 20, 2019. Costa Mesa, CA.

SCCWRP Personnel Notes

Commission

Martha Tremblay, Department Head of Technical Services for the Sanitation Districts of Los Angeles County, was appointed Alternate Commissioner in August, filling the vacancy created when Robert Ferrante was elevated to Commissioner.

Shauna Lorance, the newly hired Director of the City of San Diego Public Utilities Department, became Commissioner in September, filling the vacancy created when Vic Bianes retired.

CTAG

Dr. **Samuel Choi,** Environmental Supervisor for the Orange County Sanitation District, was appointed to CTAG in September, replacing Lisa Haney, who took a new job with the Irvine Ranch Water District.

Dr. **Ryan Kempster,** Senior Marine Biologist for the City of San Diego Public Utilities Department, was appointed to CTAG in September, replacing Ami Latker, who has assumed new job responsibilities.

Dr. **Emily Duncan,** Senior Environmental Scientist Specialist for the Los Angeles Regional Water Quality Control Board, was appointed to CTAG in September, replacing Dr. Jun Zhu, who has assumed new job responsibilities.

New Faces

Dr. **Elizabeth Fassman-Beck,** who has worked for the past five years as an Associate Professor of Civil, Environmental and Ocean Engineering at the Stevens Institute of Technology in New Jersey, joined SCCWRP in November as a Principal Engineer leading SCCWRP's stormwater BMP (best management practices) research.

Dr. **Katherine Irving,** who just completed her Ph.D. at Berlin's Liebniz Institute for Freshwater Ecology and Inland Fisheries, joined SCCWRP in September as a Scientist in the Biology Department.

Po Wang, a Ph.D. student at Jinan University in China, joined SCCWRP in September as a visiting scholar in the Chemistry Department.

Promotions

Minna Ho, who has worked as a Research Technician in the Biogeochemistry Department since September 2018, was promoted to Senior Research Technician in September.

Anne Holt, who has been working as a Laboratory Assistant in the Biology Department since July 2019, was promoted to Research Technician in October.

Departures

Dr. **Marcus Beck,** a Scientist in the Biology Department since 2017, left SCCWRP in September to relocate to Florida to take a position with the Tampa Bay Estuary Program.

SCCWRP COMMISSIONER SPOTLIGHT

Deputy Secretary prioritizes applied science

The way Dr. Mark Gold sees it, California still has a long way to go to expedite the transfer of environmental science to management.

Gold says environmental scientists in California are not optimally aligning their research to answer the complex, enormous environmental challenges California faces.

Dr. Mark Gold

"Sometimes there's a 10-year gap or more in California between doing science and actually using science for resource management," said Gold, Executive Director of the California Ocean Protection Council and California's Deputy Secretary for Oceans and Coastal Policy. "The State cannot do it alone, and just having science published in journals isn't getting it done. There needs to be much better synergy."

Strenghthening these connections is a top priority for Gold, and he sees institutions like SCCWRP playing an invaluable role in this effort.

Gold, who previously served as UCLA's Associate Vice Chancellor for Environment and Sustainability, became SCCWRP's Commission Chair in June, replacing Deborah Halberstadt.

Gold has been interacting with SCCWRP for more than three decades, starting in 1986, when he began volunteering for the fledgling environmental group Heal the Bay.

Gold, who was Heal the Bay's first hire and rose to lead the group from 1994 to 2012, has worked extensively on beach water quality issues, including creating the NGO's marquee Beach Report Card.

In SCCWRP, Gold sees a highly effective organization that fills an "essential void" at the interface of science and management.

"SCCWRP is doing applied research on complex questions that most universities won't touch," Gold said. "It's been exciting to watch SCCWRP grow and work hand in hand with State agencies."

Dr. Mark Gold, left, vacations with his family in Thailand in 2018. From left, daughter Natalie, son Jake, wife Lisette and son Zack.

Mark Gold, D.Env.

Job: Executive Director, California Ocean Protection Council; Deputy Secretary, Oceans and Coastal Policy, California Natural Resources Agency (started July 2019)

SCCWRP role: Commission Chair and Commissioner (2019-present)

Prior jobs: Associate Vice Chancellor for Environment and Sustainability, UCLA (2015-19); Acting Director and Associate Director, UCLA Institute of the Environment and Sustainability (2012-15); Adjunct Professor, UCLA Institute of the Environment and Sustainability (2011-present); President, Heal the Bay (1994-2012); Issue and Programs Director, Heal the Bay (1998-1994); Lecturer, UCLA School of Public Health (1997-98, 2001-02); Environmental Consultant, Engineering Science Inc. (1986-88)

Education: D.Env. environmental science and engineering, University of California, Los Angeles (1994); M.A. biology, UCLA (1986); B.S. biology, UCLA (1984)

Residence: Split between Sacramento and Santa Monica

Hometown: Santa Monica

Family: Wife Lisette, an environmental engineer; children Zack, a UCLA Ph.D. student studying environmental DNA, Jake, a UCLA law student, and Natalie, a UC Berkeley earth systems major; two dogs, Minnow and Mako

Hobbies: Trying new eateries; following L.A. sports teams; spending time with family

Gold is a Santa Monica native whose love of the coastal ocean began as a child; he spent countless hours at the beach.

Although much of Gold's research career has focused on Southern California beaches, Gold's new role in Governor Gavin Newsom's administration is broadening his perspective.

"This is a dream job for me – I'm getting to meet new people, dive into new issues left and right," Gold said.

In his spare time, Gold is a self-described "sports nut" who follows the Dodgers, Lakers, Rams and UCLA Bruins.

Gold also loves trying new eateries wherever he goes. About twice a month, he goes to a place he's never been to. Although he lives in Sacramento part time now, he says he much prefers L.A.'s food scene: "In Sacramento, finding a good taqueria is a difficult challenge!"

CTAG SPOTLIGHT

Marine biologist expands horizons around world

Dr. Ryan Kempster has managed reef assessments in Thailand, and worked on turtle conservation in Costa Rica. For his doctoral dissertation, he journeyed to South Africa to study great white sharks.

Dr. Ryan Kempster

Everywhere Kempster has traveled, he's gained deeper appreciation for the diverse roles that scientists play in protecting marine ecosystems.

"I've always been driven by the unknown – always wanted to tackle areas that I'm not as familiar with," said Kempster, who earned his Ph.D. at the University of Western Australia. "That's what gets me out of bed in the morning."

Since September, Kempster has been tackling his newest challenge – managing the ocean monitoring program for the City of San Diego Public Utilities Department. He replaces Dr. Tim Stebbins, who retired.

Kempster is drawn to the size and complexity of the monitoring program; he has been involved in environmental impact monitoring in the past – most recently, a two-year stint at the Monterey Bay Aquarium working closely with the water chemistry team to ensure discharge compliance for the aquarium's ocean outfalls.

"It's so impressive the extent of the Ocean Monitoring Program in San Diego, and there are so many passionate people here who go above and beyond," said Kempster, who also has been named the City's CTAG Representative.

A native of Manchester in the U.K., Kempster decided to study marine biology as a teenager, at the suggestion of a school counselor. After graduating from nearby Bangor University, he journeyed to Thailand for a six-month assignment managing teams of volunteers performing fish and reef assessments.

Dr. Ryan Kempster observes a great white shark during a 2015 research cruise off the coast of South Africa.

Ryan Kempster, Ph.D.

Job: Senior Marine Biologist, City of San Diego Public Utilities Department (started September 2019)

SCCWRP role: CTAG Representative

Prior jobs: Aquarium Biologist, Monterey Bay Aquarium (2018-19); Postdoctoral Research Associate, University of Western Australia (2013-17); Founder and Science Director, Support Our Sharks Ocean Conservation Society nonprofit (2010-17); Interpretive Guide, SeaLife Aquarium in the U.K. (2008-10); Chief Science Officer, Greenforce Marine Conservation Program (2007-08)

Education: Ph.D. marine neuroecology, University of Western Australia (2013); M.S. and B.S. marine biology, Bangor University in the U.K. (2007 and 2005)

Residence: La Jolla

Hometown: Manchester, U.K.

Family: Wife Channing, a marine biologist; two cats, Mako and Mola

Hobbies: Hiking/mountaineering; traveling around the world

In Thailand, Kempster was captivated by the local shark population – so much so that he started a shark conservation education page on Facebook that eventually amassed more than 200,000 followers.

After completing his master's in marine biology – also at Bangor – Kempster continued to build on his shark conservation work, founding a nonprofit focused on educating children about sharks.

Known as the Support Our Sharks (SOS) Ocean Conservation Society, the project took off when it was absorbed by the University of Western Australia, where Kempster was a Ph.D. student and then a postdoctoral researcher from 2010 to 2017. Kempster coordinated dozens of university volunteers in delivering shark lectures to schoolchildren across southwestern Australia. He received grants to support this work.

"Using sharks is such a great way to get kids interested in science," Kempster said. "The second you throw up a picture of a great white shark, they're just glued to the screen."

In his spare time, Kempster loves hiking and mountaineering. For his 30th birthday, he completed a 12-day hike to Mount Everest's base camp.

SCCWRP PARTNER SPOTLIGHT

College dean builds off tenure at SCCWRP

Dr. Eddy Zeng has spent much of his career studying the sources, fate and transport of chemical contaminants in aquatic systems, including an 11-year stint as a SCCWRP Principal Scientist.

Dr. Eddy Zeng

Then, about five years ago, Zeng had an opportunity to take on a very different challenge – starting a school for environmental studies at a Chinese research university.

In 2014, Zeng was tapped to become founding Dean of the School of Environment at Jinan University in Guangzhou, China, about two hours north of Hong Kong.

"I was able to apply all of the knowledge I've learned about environmental chemistry, math, physics to manage a school," Zeng said. "There's a big gap between economic advancement in China and environmental protections, so this area of study is important."

Over the past five years, Zeng has personally recruited and hired about two-thirds of the school's 50-member faculty. He also has developed and taught an undergraduate course designed to introduce students to the value and need for environmental science and engineering; it quickly became the school's No. 1-ranked course by students.

Zeng has seen his school's ranking rise from about 80 nationally in China to within the top 30.

In recent years, Zeng has focused on strengthening his school's interactions with SCCWRP. He's planning to send multiple students to SCCWRP to learn and collaborate alongside staff, including Po Wang, who arrived in September to study passive sampling.

Dr. Eddy Zeng, bottom right, with his wife Lili and their children Elaine and Sean, plus dog Tong-Tong, in 2018. Although Zeng's job is in China, Zeng's family lives in Irvine. He visits them about three times a year.

Eddy Zeng, Ph.D.

Job: Professor and Dean, School of Environment, Jinan University in China

SCCWRP role: Visiting Scientist, SCCWRP Chemistry Department

Prior jobs: Professor, Guangzhou Institute of Geochemistry in China (2004-14); Principal Scientist, SCCWRP Chemistry Department (1992-2000, 2001-04); software engineer, Calico (2000-01); Senior Chemist, Enviropro (1990-92); Chemistry Lecturer, Zhongshan University in China (1985-86)

Education: Ph.D. and M.A. chemical physics, University of Southern California (1992 and 1989); M.S. physical chemistry, Sun Yat-sen University in China (1985); B.S. geochemistry, University of Science and Technology of China (1982)

Residence: Irvine and Guangzhou, China

Family: Wife Lili, a stay-at-home mother; children Sean, 12, Elaine, 14, and Michelle, a publisher's assistant in Manhattan; dog Tong-Tong, a Pomeranian

Hometown: Guangzhou, China

Hobbies: Playing ping-pong; going on neighborhood walks; spending time with his children

"Working at SCCWRP is going to broaden their vision, help them look at research problems from broader perspectives," Zeng said.

Zeng stumbled into the world of environmental chemistry as he was finishing his Ph.D. in chemical physics at USC in 1992.

Although his first choice was to pursue a career in academia, he ended up working for a local environmental consulting firm, where he learned gas chromatography-mass spectrometry (GC-MS) and other key environmental chemistry methods. Two years later, he joined SCCWRP, where he worked for 11 years.

But Zeng never lost sight of his desire to become a university professor. In 2004, Zeng returned to his hometown in China to take a faculty position at the Guangzhou Institute of Geochemistry.

A decade later, he was recruited to found Jinan University's School of Environment.

In 2016, Zeng and his wife, Lili, decided they wanted their two young children to receive an American education, so Lili moved with the kids to Irvine. Zeng visits them about three times a year, and they visit him during school breaks. He also has an adult daughter living in New York.

SCCWRP STAFF SPOTLIGHT

Stormwater engineer designs living laboratories

For Dr. Elizabeth Fassman-Beck, a laboratory benchtop has never been enough space to carry out her research.

Dr. Elizabeth Fassman-Beck

Fassman-Beck studies how to optimize the design of engineered solutions for managing stormwater – a type of research that involves building massive, outdoor "living laboratory" systems in replicates.

With no template to follow for constructing these facilities, the long-time university professor has had to design her own – along the way, interfacing with construction managers, permitting departments, and green infrastructure consultants.

"It's given me great experience in actual, hands-on design and optimization," said Fassman-Beck, who has worked for the past five years as an Associate Professor at the Stevens Institute of Technology in New Jersey. "It was really exciting as a professor to be doing this – I was there every day in a hard hat."

Fassman-Beck started as a SCCWRP Principal Engineer in November, giving up a tenure-track position at her engineering-focused university just outside New York City to lead SCCWRP's research on stormwater BMPs (best management practices).

Fassman-Beck was particularly drawn to the opportunity to not only help meet the present-day BMP research needs of SCCWRP member agencies, but also to help define for them where they should go over the long term – particularly as they prepare to spend billions of dollars in the coming decades to better manage wet- and dry-weather runoff.

Dr. Elizabeth Fassman-Beck helms Audentes, a Valiant 40 sailboat restored by her husband, off the coast of New Zealand in 2012.

Elizabeth Fassman-Beck, Ph.D.

Job: SCCWRP Principal Engineer (started November 2019)

Prior jobs: Associate Professor, Civil, Environmental and Ocean Engineering, Stevens Institute of Technology in New Jersey (2014-19); Senior Lecturer and Lecturer, University of Auckland in New Zealand (2004-13); Consultant, Wright Water Engineers in Denver (2002-04)

Education: M.S. and Ph.D., civil engineering, University of Virginia (1998 and 2002); B.S.E. civil and environmental engineering, Duke University (1996)

Residence: Long Beach

Family: Husband Lee, an electronics engineer; two cats

Hometown: Westport, Connecticut

Hobbies: Sailing/boating; backpacking; traveling

"This is my dream job – to have the opportunity to help SCCWRP's clients look 10 years down the path of what are the issues to be aware of and start tackling now," she said.

Fassman-Beck chose her career path by marrying her two passions: engineering and water. A Connecticut native, she grew up sailing and swimming. By the time she was in college, stormwater monitoring programs were just spinning up.

"The field was rapidly evolving at the time, and it still is – and we get to be at the forefront," Fassman-Beck said.

After earning her Ph.D. in civil engineering from the University of Virginia in 1998, Fassman-Beck worked for two years as an engineering consultant in Colorado, then decided she wanted to move to a completely different part of the world.

She applied for and eventually earned a tenured faculty position at the University of Auckland in New Zealand, where she became one of the world's leading experts on the design of green roofs to reduce runoff and improve water quality.

A decade later, she moved back to the U.S. to be closer to her parents, taking the faculty position at Stevens.

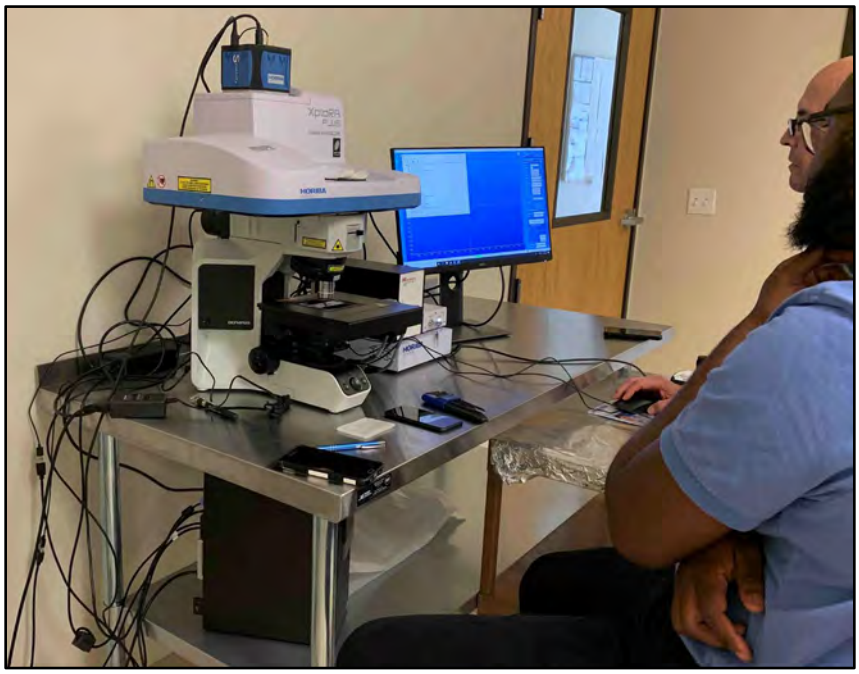
In her spare time, Fassman-Beck loves to go boating and sailing with her husband. They own a 38-foot sport fisher that they're in the process of relocating from their former home, in Middletown along the Jersey Shore.

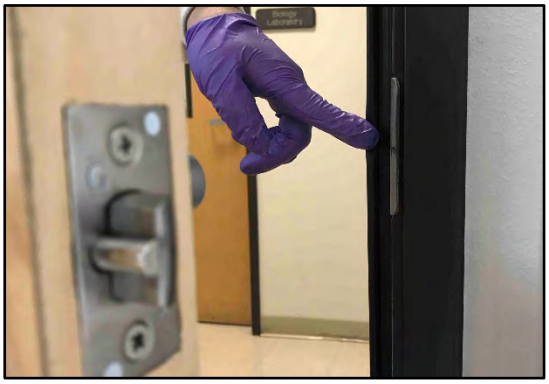
In Southern California, they are living in the Belmont Shores neighborhood of Long Beach – right along the water.

SCCWRP SCENES

Excluding microplastics

SCCWRP has completed a renovation of its chemistry instrument laboratory to exclude airborne microplastics contamination – a precursor to participating in an international study that will develop standardized methods for measuring microplastic particles in aquatic environments. The renovated lab houses two state-of-the art microplastics measurement instruments that SCCWRP has invested in for this study.





Clockwise from top right, the ceiling in SCCWRP's chemistry instrument lab is torn apart to install a new air circulation system with HEPA (High Efficiency Particulate Air) filtration; the new air circulation system will create positive pressure in the lab – as monitored by a pressure gauge at the doorway to the lab – to exclude outside contamination; the doors to the lab feature new rubber gasket seals; SCCWRP's Raman spectroscopy instrument; and SCCWRP's Fourier-transform infrared (FTIR) instrument.