SCCWRP Director's Report

PUBLISHED NOVEMBER 2, 2018 | COVERING AUGUST 11-NOVEMBER 2, 2018

FALL 2018 ISSUE

Scoring tool developed to quantify habitat condition

SCCWRP and its partners have developed a statewide scoring tool for quantifying the condition of a stream's physical habitat, enabling watershed managers for the first time to readily interpret and communicate the extensive physical habitat data they collect during routine field assessments of wadeable streams.

The Index of Physical Integrity (IPI), published online in October and described in a technical report, explains how multiple aspects of physical habitat – including streambed substrate, channel morphology and riparian vegetation – influence a stream's overall ecological health. The IPI produces a single numerical score for a stream site, ensuring physical habitat data are interpreted consistently across California.

Although biological indicators such as benthic algae and macroinvertebrates serve as primary lines of evidence for assessing stream condition, watershed managers have traditionally struggled to determine the causes of low stream bioassessment scores because they had no standardized way to meaningfully analyze and interpret their physical habitat data.

For example, if a stream receives low bioassessment scores, watershed managers need to know if degraded habitat condition could be negatively influencing stream biology. Conversely, if IPI scores are high, managers can focus on determining whether water chemistry (e.g., pollutants) could be responsible for low bioassessment scores.

The IPI provides a key ancillary line of evidence that will support watershed managers in interpreting bioassessment scores generated via the benthic invertebrate-based California Stream Condition Index (CSCI) and its algae-based counterpart, the Algae Stream Condition Index (ASCI), both co-developed by SCCWRP.

The IPI will serve as a key component of the Southern California Stormwater Monitoring Coalition's (SMC) stream quality index. Expected to be unveiled in mid-2019, this integrative index will use

Contents

6 | Updates by Thematic Area

11 | New SCCWRP Publications

12 | Quarter in Review

14 | SCCWRP Personnel Notes

15 | SCCWRP Spotlights

Cover photo: The physical habitat of the North Fork of Riverside County's San Jacinto River is characterized by boulders, woody debris and diversity of substrate particles. A new scoring tool enables watershed managers to quantitatively assess the physical habitat condition of such sites.

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Calendar

Thursday, November 8
CTAG quarterly meeting

Friday, November 30
Seminar: "Partnership opportunities between SCCWRP and NOAA National Centers for Coastal Ocean Science"

Friday, December 7
Commission meeting

biology, water chemistry and physical habitat data to produce an overall assessment of stream condition.

Additionally, the IPI will be incorporated into ongoing development of a screening-level causal assessment framework intended to rapidly help managers narrow down possible causes of degraded stream condition.

The IPI was built using the same design principles that guided the development of the CSCI. Like the CSCI, the IPI uses statistical modeling to predict what physical habitat should look like for individual stream sites statewide in the absence of pollutants or other stressors; this modeling approach accounts for diverse local environmental conditions found across California.

In developing the IPI, researchers relied extensively on the physical habitat data sets collected by California watershed managers in recent years.

Through the SMC, Southern California watershed managers played a key role in testing an initial version of the IPI. Their feedback led to revisions of the index to optimize its applicability in the South Coast region, particularly in concrete-lined channels.

SCCWRP and its partners have developed a new stream scoring tool for assessing physical habitat condition that is applicable in diverse streams statewide, from channelized Fullerton Creek in Orange County, left, to the San Gabriel River's East Fork in the San Gabriel Mountains, right. The Index of Physical Integrity explains how multiple measures of physical habitat condition influence a stream's overall ecological health.

SCCWRP is now working to support the State Water Board and the SMC with implementation guidance and IPI calculators.

For more information, contact Dr. Raphael Mazor or Dr. Marcus Beck.

Science tools for proposed stream biointegrity-biostimulatory policy released in draft form

The State Water Board has published draft versions of a suite of technical reports, journal manuscripts and tools co-authored by SCCWRP that will serve as the technical foundation for the State in developing a policy that protects the biological integrity of wadeable streams from the impacts of eutrophication and other stressors.

The draft science products, released in October and available for public review online, will support State Water Board staff in crafting a combined biointegrity-biostimulatory policy that includes programs both for assessing stream biointegrity and for limiting excess loading of biostimulatory substances (i.e., nutrients).

SCCWRP and its partners have spent the past three years building the technical backbone for the State Water Board's anticipated biointegrity-biostimulatory policy. The draft science products were developed in close consultation with various advisory committees and other technical experts.

The State Water Board is planning to spend the next three months soliciting feedback from its advisory groups and the public on the draft products. A draft policy could be released for public comment as early as 2020.

The combined biointegrity-biostimulatory policy is expected to include numeric guidance on how to reduce the biostimulatory impacts of eutrophication and other stressors on wadeable streams. Numeric guidance also will be developed in subsequent phases for lakes, estuaries, enclosed bays and non-wadeable streams.

Separately, California's Regional Water Quality Control Boards are in various stages of developing comparable regional policies.

A SCCWRP field crew collects algae samples in the Santa Margarita River, which spans Riverside and northern San Diego Counties. The State Water Board has published draft versions of a suite of technical reports, journal manuscripts and tools co-authored by SCCWRP that will serve as the technical foundation for developing a statewide policy that protects the biological integrity of wadeable streams from the impacts of eutrophication and other stressors.

The science products developed by SCCWRP and its partners fall into two main categories:

» The **biointegrity products** explain how quantitative measures of a wadeable stream's biological condition relate to the stream's overall ecological health. The State Water Board and other water-quality regulators will consider using this information to establish procedures for sufficiently protecting stream health.

» The **biostimulatory products** identify a suite of eutrophication indicators (e.g., algal biomass, total nitrogen and phosphorus) for quantifying biostimulatory impacts to wadeable streams. They also summarize the scientific basis for setting numeric targets for these eutrophication indicators that guard against biostimulatory impacts.

The key science products include:

» **Algal Stream Condition Index (ASCI)**: This scoring tool uses algae in streambeds to quantitatively evaluate stream health. The ASCI and the macroinvertebrate-based California Stream Condition Index, which was released in 2015, are expected to serve as the foundation for evaluating the biological integrity of wadeable streams statewide.

» **Biological Condition Gradient**: This modeling analysis of California streams explains how CSCI and ASCI scores relate to the incremental losses of a stream's ecological structure and function. Understanding how stream ecological condition degrades along a stressor gradient will help water-quality managers set targets for CSCI and ASCI scores that sufficiently protect the stream's biological integrity.

» **Developed landscapes models**: This computer modeling tool predicts the degree to which stream biointegrity scores are likely to be limited, or "constrained," by urban and agricultural development at a given site. The more constrained a site is, the less likely standard management interventions at the site are to result in improved condition scores. Especially in the South Coast region, where 15% of stream-miles are considered "likely constrained," managers will benefit from understanding the feasibility of improving CSCI and ASCI scores at a given site.

» **Biostimulatory stress-response modeling and synthesis**: This series of reports chronicles a proposed empirical modeling approach for translating stream biointegrity targets to numeric biostimulatory targets. The goal is to help managers understand how to set targets for CSCI and ASCI scores that guard against the biostimulatory impacts of eutrophication. Given that about 80% of South Coast stream-miles are predicted to fail to meet the targets necessary to prevent biostimulatory impacts, the modeling work also sets the stage for important discussions related to developing and implementing an appropriate biostimulatory policy.

For more information, contact Dr. Martha Sutula or Dr. Raphael Mazor.

New workgroup to standardize DNA-based methods for routine aquatic monitoring

The California Water Quality Monitoring Council has formed a statewide workgroup to be led by SCCWRP that will examine how to bring greater consistency and standardization to DNA-based analysis methods for routine aquatic monitoring applications.

The Molecular Methods Workgroup, established in September, will bring together multiple water-quality management agencies and research labs to develop best-practice methods for collecting, processing and analyzing DNA samples. SCCWRP's Dr. Susanna Theroux will lead the workgroup.

Molecular, or DNA-based, analysis methods have emerged in recent years as a potentially viable, cost-effective approach for documenting the composition of aquatic biological communities. Instead of counting and identifying organisms via traditional taxonomy under a microscope, water-quality managers can now isolate and sequence the DNA of these organisms to gain insights into overall water body condition. Molecular methods also can be used to monitor for invasive and endangered species.

The Southern California Stormwater Monitoring Coalition (SMC) was among the earliest end users to test molecular methods for routine aquatic monitoring. During field sampling in 2016, SMC participants collected algae samples that researchers then identified via DNA sequencing and traditional morphological analysis. SCCWRP and its partners obtained DNA results within weeks of submitting samples for analysis, versus six months for traditional morphologic identification, and at a fraction of the cost.

Although DNA-based methods are faster, cheaper and more scalable than traditional taxonomic analyses, water-quality managers in California don't have access to standardized protocols for collecting, processing and analyzing DNA samples, and then interpreting results. Consequently, different agencies and labs have developed their own protocols, resulting in DNA-based monitoring in California that is non-standardized, not coordinated among different agencies, and potentially redundant.

To ensure data sets are of consistently high quality and comparable statewide, the Molecular Methods Workgroup will seek to develop consensus around best practices for DNA-based methods, in much the same way that European countries have been doing through the DNAquaNet group. SCCWRP has been collaborating closely with DNAquaNet participants; an equivalent workgroup does not exist in the U.S.

The Molecular Methods Workgroup will focus initially on some of the biggest pain points associated with using DNA-based methods for routine aquatic monitoring, including minimizing cross-contamination during field sampling and lab analyses, and identifying optimal regions of DNA to target for benthic macroinvertebrate and algal community barcode sequencing.

All recommended protocols developed by the workgroup will be made publicly available online.

Initial workgroup members include the California Department of Fish and Wildlife, the State Water Board, the Surface Water Ambient Monitoring Program (SWAMP), the Smithsonian, the National Oceanic and Atmospheric Administration, and academic labs at the University of California, Los Angeles and UC Riverside.

The Molecular Methods Workgroup is scheduled to hold its first official meeting by the end of November. Any environmental agency or academic lab is welcome to join the workgroup at any time.

For more information, contact Dr. Susanna Theroux.

The eggs and larvae of fish are extracted from a net that was towed through Southern California coastal waters, part of an effort to determine whether DNA-based methods can be used to identify the species present. The California Water Quality Monitoring Council has formed a statewide workgroup to be led by SCCWRP that will examine how to bring greater consistency and standardization to DNA-based analysis methods for routine aquatic monitoring applications.

Environmental flows study to determine impacts of diverting discharges from L.A. River

Water-quality managers that work in the Los Angeles River watershed have initiated a two-year study to determine the potential ecological and recreational effects of diverting treated wastewater effluent and runoff from the river for water recycling purposes.

The environmental flows study, launched in October and facilitated by SCCWRP, marks the first effort by California's water-quality management community to understand how sensitive species, habitats and other beneficial uses will be impacted as land-based discharges to the river are reduced. Three wastewater treatment plants discharge into the effluent-dominated L.A. River.

The study is motivated by changing water use and reuse practices across drought-prone California. Under State Water Code Section 1211, California wastewater treatment agencies have been filing petitions seeking regulatory approval to begin recycling more of the effluent that they're currently discharging into urban streams. Stormwater management agencies also are capturing more land-based runoff, further reducing stream flows.

The study will document how vulnerable species and habitats along an urban, 45-mile stretch of the lower L.A. River are expected to be impacted by multiple combinations of potential flow reductions. Researchers also will document how human recreational uses of the river, such as kayaking, will be impacted.

Additionally, researchers will consider how these impacts could potentially be offset by management interventions, such as river restoration projects and more infiltration to bolster groundwater supplies.

Treated wastewater effluent is discharged into the Los Angeles River from the nearby L.A.-Glendale Water Reclamation Plant. Water-quality managers for the effluent-dominated river have initiated a study to explore the potential ecological and recreational effects of diverting effluent and runoff from the river for water recycling purposes.

Study participants spent about four months conceptualizing the study, reaching agreement in October on the study's scope. The study is a collaboration of the State and Regional Water Boards, the City and County of Los Angeles, the Sanitation Districts of Los Angeles County and SCCWRP.

Researchers plan to divide up the study area into multiple sections, then develop recommended flow targets by season for each section. Researchers also will conduct an optimization analysis to ensure recommended flow targets optimally balance the need to protect the river's beneficial uses with the desire to capture, divert and recycle more of the river's flows. The study will primarily rely on hydrologic computer modeling and habitat/species suitability analyses.

The study is expected to serve as a model for the State Water Board and Regional Water Quality Control Boards to evaluate stormwater management practices and 1211 wastewater change petitions filed in California. The tools developed from the study are expected to be widely applicable to similar cases involving competing demands on limited flow resources.

The study also will help inform various ongoing L.A. River planning efforts, including One Water L.A. and the L.A. River Revitalization Master Plan.

For more information, contact Dr. Eric Stein.

Updates by Thematic Area

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

BIOASSESSMENT

Ephemeral stream scoring tools being transitioned to management use

A new set of tools co-developed by SCCWRP to assess the condition of ephemeral streams when they are dry is being transitioned to pilot testing by the end-user management community.

More than a dozen federal, state and local agencies were trained in how to use the ephemeral stream tools during a three-day training exercise facilitated by SCCWRP in the Coachella Valley in August. The training enabled participants to begin using the tools in their own monitoring programs, including the Los Angeles Regional Water Quality Control Board, which already has launched an ephemeral streams pilot project in the Santa Clara River and Malibu Creek.

The ephemeral stream assessment tools are intended to dramatically expand the types of streams that Southern California water-quality managers can monitor via a bioassessment-based approach. Ephemeral streams, which are streams that run dry for much of the year, make up about 60% of all streams in Southern California, but they have traditionally been excluded from watershed monitoring programs, as existing bioassessment tools are designed for application in perennial and intermittent streams only.

Researchers are now working to develop an index scoring tool that can characterize the complex ecological condition of ephemeral streams using a simple numerical score.

A ramp trap is deployed in a dry streambed to collect arthropods, which SCCWRP and its partners have adapted as a biological indicator of ecological condition in ephemeral streams when they are dry. SCCWRP and its partners are beginning to transition a new set of ephemeral steam scoring tools to pilot testing by the end-user management community.

Effort launched to develop West Coast DNA barcoding library for marine invertebrates

The Smithsonian Institute has partnered with SCCWRP, the Southern California Bight 2018 Regional Monitoring Program and the Western Association of Marine Labs to begin developing a DNA barcoding library that will pave the way for West Coast marine invertebrates living in and on seafloor sediment to be identified via DNA sequencing.

Researchers already have started identifying benthic invertebrate samples that were collected during Bight '18 sediment sampling last summer. The benthic invertebrates will be sent to the Smithsonian for DNA sequencing and analysis.

The composition of benthic invertebrate communities offers key insights into overall ecosystem condition, but identifying these species through traditional taxonomy is labor-intensive and costly. DNA barcoding technology offers a potentially cheaper, equally effective alternative for taxonomic identification.

These data will serve as a DNA reference library for the West Coast that environmental managers can use to identify benthic invertebrates through barcoding methods.

SCCWRP intends to use the benthic invertebrate library to get a better understanding of the organisms that are important for scoring sediment quality via a tool known as the Benthic Response Index. Researchers also will seek to improve understanding of two groups of invertebrate organisms – pelagic invertebrates (pteropods) and sediment meiofauna – that traditionally have been difficult to identify.

Agreement reached on DNA processing, analysis methods for stream food webs study

The technical advisory group for a study examining how ecological stress alters the complexity and interconnectedness of stream food webs has reached agreement on the DNA processing and analysis methods that will be used during the study.

At an October meeting, the advisory group refined the draft study methods proposed by SCCWRP and its partners. The three-year study, which began this year, will use advanced computational approaches to analyze the food-web relationships among bacteria, algae and metazoan invertebrate communities.

The study's goal is to build a more holistic, integrated understanding of stream ecosystem function. Although benthic invertebrates and algae already have been adapted to serve as biological indicators of stream condition, researchers hope to begin using bacterial community structure as a tool to discern subtle changes in stream health.

Researchers already have begun conducting primary analyses of stream samples collected over the past two years using a bioinformatics pipeline, which is a set of protocols for analysis of raw DNA sequence data.

EUTROPHICATION

Santa Margarita River study examining how to develop 'climate-ready' eutrophication targets

SCCWRP and its partners have begun investigating how climate change could influence efforts to reduce eutrophication in the Santa Margarita River watershed, part of a five-year study exploring how to set nutrient loading targets to protect the watershed's ecological health.

During the investigation, which was launched in October, researchers will develop targets for reducing nutrient inputs that take into account how climate change is predicted to alter temperature and flow patterns in the watershed.

The goal is to show how appropriate safety margins can be built into nutrient loading targets to ensure eutrophication management strategies are "climate-ready."

Over the past few years, researchers have built an integrated toolkit of mechanistic computer models and empirical statistical models for setting scientifically defensible nutrient loading targets.

The models are now being expanded to simulate how flow, nutrients and temperature influence algal blooms and dissolved oxygen levels. The models will be used in tandem with regional flow ecology models to understand impacts to aquatic life.

The Santa Margarita River watershed, which spans Riverside and northern San Diego Counties, is serving as a key California case study for test-driving technical elements of a proposed State Water Board biointegrity-biostimulatory policy to govern the health of wadeable streams statewide.

Researchers are exploring how the structure and composition of bacterial communities in California streams, including the Santa Margarita River, above, could be used to provide a more holistic, integrated understanding of stream ecosystem function. Many stream managers already collect bacteria samples as part of their routine algae sampling programs.

CLIMATE CHANGE

Expert panel convened to develop acidification thresholds for echinoderms

SCCWRP has convened a nine-member panel of leading experts on sea stars, urchins and other echinoderms to reach agreement on how to use these organisms to track ocean acidification's biological impacts on West Coast marine communities.

During a three-day workshop at SCCWRP that ran October 30-November 1, the international echinoderm science panel deliberated on the thresholds at which specific environmental conditions linked to increasing acidification are expected to trigger specific adverse biological effects in echinoderms.

The goal is to determine how to use organisms that are sensitive to small-scale changes in seawater conditions as an early-warning indicator of the intensity and pace with which acidification is

impacting coastal marine ecosystems, both in the California Current Ecosystem and globally.

The international echinoderm panel is the second of three expert panels being convened by SCCWRP. The first panel, which focused on sea snails known as pteropods, was convened in fall 2017.

Acidification modeling effort being expanded to toxic marine algal blooms

Researchers working to develop a West Coast computer model that predicts how land-based nutrient sources influence coastal ocean acidification and hypoxia are expanding the effort to examine the potential role of these nutrients in exacerbating toxic marine algal blooms.

The three-year study, launched in October, will focus on a type of harmful algal bloom known as *Pseudo-nitzschia*, which produces a potent neurotoxin that has sickened marine mammals and led to months-long shellfishery closures.

Water-quality managers want to know if the nutrients in wastewater effluent, stormwater runoff and atmospheric deposition are contributing to an increase in the frequency and intensity of *Pseudo-nitzschia* blooms.

The study builds off ongoing work by SCCWRP and its partners to develop a coupled physical-biogeochemical model for the West Coast that predicts if and how human activities on land are driving coastal acidification and hypoxia.

During the study, researchers will expand the model's phytoplankton component to more comprehensively capture potential drivers of *Pseudo-nitzschia* blooms in the marine environment.

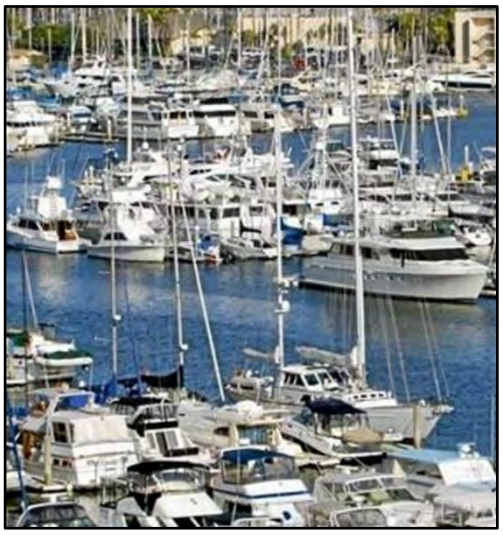
Courtesy of National Oceanic and Atmospheric Administration

Sea otters have become sickened and even died off the coast of California as a result of poisoning by toxins produced by harmful algal blooms. SCCWRP and its partners are using computer modeling to determine whether the discharge of land-based nutrient sources into marine waters could be exacerbating toxic marine algal blooms.

SEDIMENT QUALITY

Advisory committee to review workplan for study revisiting copper TMDL in Marina del Rey Harbor

A technical advisory committee in December is scheduled to review the draft workplan for a study examining whether existing regulatory targets for dissolved copper in Marina del Rey Harbor should be modified to more accurately reflect the ecological threat posed by copper.



Copper-based paints play a key role in preventing fouling on boats, but because copper dissolves in water, the water-quality regulatory targets for copper in places like Marina del Rey Harbor, above, have been exceeded. SCCWRP and its partners are pursuing a study examining whether copper targets should be modified to more accurately reflect copper's ecological threat.

The two-year study, led by SCCWRP, will document the concentrations of copper that aquatic organisms in the Los Angeles County boat harbor are exposed to at different times of the year, and how toxic these copper levels are at different sites across the harbor.

Under the harbor's existing Total Maximum Daily Load (TMDL) regulatory target, Marina del Rey Harbor is required to reduce copper loading by 85%, which would require boat owners to make significant changes to the types of anti-fouling paint they typically use on the underside of boats.

At an all-day meeting scheduled for December 17 in Marina del Rey, the three-member expert panel will provide feedback on the study design and address questions from stakeholders regarding steps to ensure that modified water-quality objectives from the study will protect aquatic life. The draft workplan was released for review in October. Field sampling for the study could begin in early 2019.

Field sampling completed for study probing origins of sediment contaminants that bioaccumulate in fish

SCCWRP and its partners in October completed the second and final round of field sampling for a study investigating whether legacy contaminants found in the tissue of San Diego Bay fish are coming from contaminated bay sediment or from somewhere else.

The two-year study will revisit a common assumption in sediment management – that all legacy chemical contaminants that have bioaccumulated in fish tissue collected at a given site originated with contaminated sediment at the site.

Although now-banned chemical contaminants like PCBs and DDTs – which have sorbed to sediment particles on the seafloor – are known to gradually dissolve back into the water column, it is unclear if these contaminants also are spreading extended distances through the water column.

During two rounds of field sampling, researchers used passive sampling devices to measure the dissolved concentration of sediment-associated contaminants in three locations – just beneath the surface sediment layer, just above the surface sediment layer, and in the water column. Sampling of sediment, fish and zooplankton also was conducted.

A diver retrieves a water column passive sampler from San Diego Bay. The device consists of polyethylene film that was suspended in the water for a month. Contaminants absorbed by the film will be extracted and analyzed to determine the concentration of dissolved PCBs and chlorinated pesticides.

CONTAMINANTS OF EMERGING CONCERN

Study to explore potentially cheaper, more precise methods for quantifying cyanotoxins in lakes, streams

SCCWRP and its partners have launched a three-year study to evaluate potentially cheaper, more precise sampling and analysis methods for tracking cyanotoxin levels in streams and lakes in the Los Angeles area.

The study, launched in September, will compare the performance of new, film-based passive sampling devices with 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.

SCCWRP and its partners will quantify cyanotoxin levels using two different types of analytical methods – an enzyme-linked immunosorbent assay (ELISA) that will screen for broad classes of algal toxins, and liquid chromatography mass spectrometry (LC-MS) that will focus on a handful of individual cyanotoxins.

Film-based passive sampling is envisioned as a cost-effective approach to routinely monitor toxic cyanobacterial blooms in streams, recreational lakes and reservoirs across Southern California. Passive sampling devices measure the freely dissolved concentrations of algal toxins and other organic contaminants, even when present at low levels.

MICROBIAL WATER QUALITY

Study launched to determine possible link between Mexican treatment plant and fecal contamination at Imperial Beach

SCCWRP and its partners have initiated a year-long study to investigate whether fecal contamination at Imperial Beach near the U.S.-Mexico border can be linked to primary-treated effluent being released into coastal waters by a Mexican wastewater treatment plant or to another specific source.

The study, which completed an initial round of field sampling in October, will use DNA sequencing technology to determine whether the microbial sewage community found at the San Antonio de Los Buenos treatment plant near Tijuana has a unique microbial community signature that may be used to identify pollution from the plant impacting Imperial Beach, about 10 miles north.

Researchers are sampling at multiple points along the northward route that the Mexican treatment plant's effluent is hypothesized to be taking to reach Imperial Beach during times when strong

ocean swells coming from the south push water north from Mexico.

Researchers also will examine whether unique microbial signatures can be traced to other specific sources, such as stormwater runoff entering the Tijuana River estuary that contains untreated human sewage.

REGIONAL MONITORING

Field sampling completed for Bight '18 Sediment Quality element

Participants of the Southern California Bight 2018 Regional Monitoring Program's Sediment Quality element have finished collecting seafloor sediment samples from about 400 sites across the Southern California Bight.

The field sampling, completed in September, paves the way for participants to begin evaluating the Bight's chemical, toxicological and biological health. Additional Bight '18 analyses will focus on screening sediment samples for contaminants of emerging concern using bioanalytical cell assays, and quantifying levels of the algal toxin domoic acid in sediment.

As part of field sampling, trawl nets were used at more than 130 sites to sample fish, large invertebrates and trash found along the Bight seafloor. Participants also have been collecting sportfish from across the Bight to look for chemical contaminants known to bioaccumulate in Southern California marine food webs.

A total of 49 environmental organizations are participating in the Bight '18 Sediment Quality element, which is targeting 11 distinct Bight coastal habitats across more than 1,500 square miles of Bight coastal waters.

Bight '18 HABs element developing method to track impacts of cyanotoxins in coastal waters

The Harmful Algal Blooms element of the Southern California Bight 2018 Regional Monitoring Program has begun working to develop an assessment method for tracking the ecological impacts of freshwater cyanotoxins transported to the coastal zone.

Marine mussels, which can filter waterborne cyanotoxins, were deployed in cages at the terminus of multiple Southern California watersheds in October. Researchers will evaluate how the mussels can be used to monitor cyanotoxins that have entered the coastal zone from upstream areas.

The Bight '18 HABs element is planning to characterize the regional extent and magnitude of inland cyanobacterial toxins that get washed into the coastal zone during storm events and during dry weather. These toxins have the potential to adversely impact marine life and coastal habitat quality.

During method development, researchers will evaluate best practices for sampling – including sampling frequency – and compare multiple potential laboratory analytical techniques for quantifying toxins. The full study is planned to start in fall 2019.

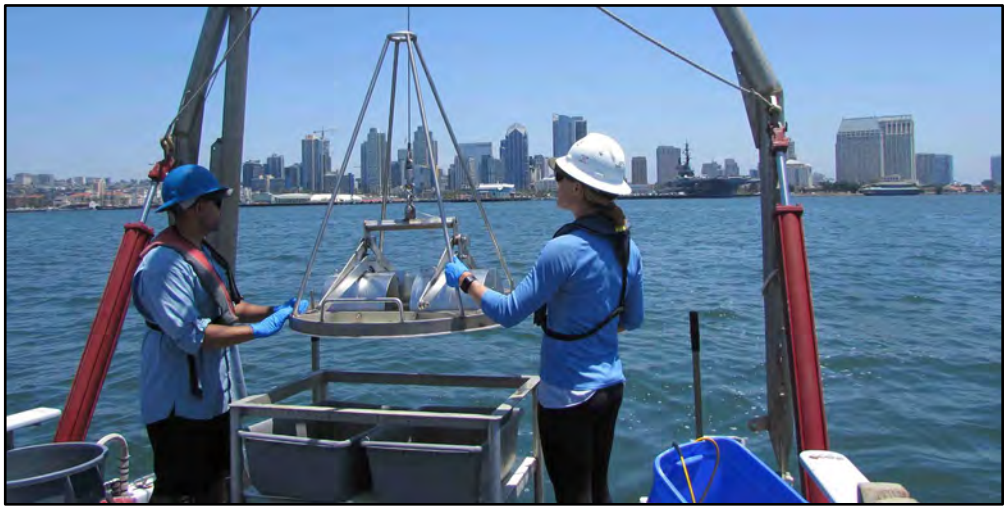
Bight '18 Microbiology element initiates lab training for coliphage-based water-quality monitoring method

Participants of the Southern California Bight 2018 Regional Monitoring Program's Microbiology element have begun laboratory training for a study that will evaluate the relevance and reliability of using coliphage viruses to assess microbial water quality at Southern California beaches.

The Orange County Sanitation District, which was trained in the new coliphage-based monitoring method as part of a validation testing exercise led by the U.S. Environmental Protection Agency, trained SCCWRP microbiologists on the method in October. SCCWRP and OCSD are working to train other Bight '18 Microbiology participants in the new method by the end of this year.

EPA finalized and approved the coliphage-based method, officially known as Method 1642, in summer 2018, paving the way for Bight '18 to evaluate how the new coliphage-based method performs at Southern California beaches. The coliphage-based method will be tested alongside the established *Enterococcus* bacteria-based method for fecal contamination monitoring.

An intercalibration exercise that will ensure quality and comparability among Bight '18 Microbiology participants is planned for early 2019, after participants have been trained in the new method. Labs that experience difficulty achieving proficiency will be provided with support until they master the method.



Courtesy of Wood Environment & Infrastructure Solutions

A field crew lowers a sediment grab sampler into San Diego Bay during field sampling for the Southern California Bight 2018 Regional Monitoring Program. The Bight '18 Sediment Quality element will assess the ecological health of more than 1,500 square miles of coastal waters.

New SCCWRP Publications

Journal Articles (Published)

Bittick, S.J., M. Sutula, and P. Fong. 2018. A tale of two algal blooms: Negative and predictable effects of two common bloom-forming macroalgae on seagrass and epiphytes. *Marine Environmental Research* 140:1-9.

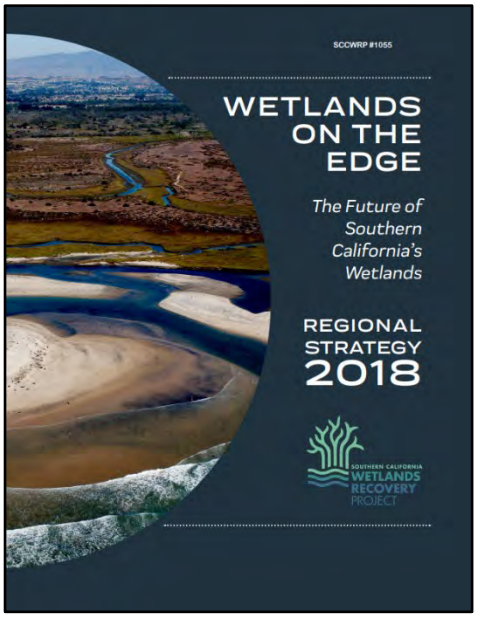
McLaughlin, K., N.P. Nezlin, S.B. Weisberg, A.G. Dickson, J.A.T. Booth, C.L. Cash, A. Feit, J.R. Gully, M. Howard, S. Johnson, A. Latker, M.J. Mengel, G.L. Robertson, A. Steele, and L. Terriquez. 2018. Seasonal patterns in aragonite saturation state on the southern California continental shelf. *Continental Shelf Research* 167:77-86.

Parks, A.N., M.A. Cashman, M.M. Perron, L. Portis, M.G. Cantwell, D.R. Katz, K.T. Ho, and R.M. Burgess. 2018. Magnitude of acute toxicity of marine sediments amended with conventional copper and nanocopper. *Environmental Toxicology and Chemistry* 37:2677-2681.

Peter, K.T., Z. Tian, C. Wu, P. Lin, S. White, B. Du, J.K. McIntyre, N.L. Scholz, E.P. Kolodziej. 2018. Using high-resolution mass spectrometry to identify organic contaminants linked to urban stormwater mortality syndrome in coho salmon. *Environmental Science and Technology* 52:10317-10327.

Journal Articles (Online)

Doughty, C.L., K.C. Cavanaugh, R.F. Ambrose, and E.D. Stein. 2018. Evaluating regional resiliency of coastal wetlands to sea level rise through hypsometry-based modeling. *Global Change Biology* DOI:10.1111/gcb.14429.



The Southern California Wetlands Recovery Project has released a report that provides a comprehensive regional strategy for managing low-lying coastal wetlands in the face of sea level rise. SCCWRP's Dr. Eric Stein is one of the report's lead authors.

Guo, L., M. Brand, B.F. Sanders, E. Foufoula-Georgiou, E.D. Stein. 2018. Tidal asymmetry and residual sediment transport in a short tidal basin under sea level rise. *Advances in Water Resources* DOI:10.1016/j.advwatres.2018.07.012.

Smith, J., P. Connell, R.H. Evans, A.G. Gellene, M.D.A. Howard, B.H. Jones, S. Kaveggia, L. Palmer, A. Schnetzer, B.N. Seegers, E.L. Seubert, A.O. Tatters, D.A. Caron. 2018. A decade and a half of Pseudo-nitzschia spp. and domoic acid along the coast of southern California. *Harmful Algae* DOI:https://doi.org/10.1016/j.hal.2018.07.007.

Journal Articles (Accepted)

Afrooz, A.R.M.N., A.K. Pitol, D. Kitt, A.B. Boehm. In press. Role of microbial cell properties on bacterial pathogen and bacteriophage removal in biochar-modified stormwater biofilters. *Environmental Science: Water Research and Technology*.

Greenstein, D.J., A.S. Parks, S.M. Bay. In press. Using spatial and temporal variability data to optimize sediment toxicity identification evaluation (TIE) study designs. *Integrated Environmental Assessment and Management.*

Technical Reports

Lowe, J., E.D. Stein, E. Beller, J. Collins, M. Cooper, J. Crooks, H. Dennis, C. Doughty, G. Gauthier, J. Gonzalez, K. Kalchmayr, S. Kelly, K. McKnight, A. Richey, A. Robinson, E. Sloane, M. Sutula, C. Whitcraft. 2018. Wetlands on the edge: The future of southern California's wetlands: Regional strategy 2018. Technical Report 1055. California State Coastal Conservancy. Oakland, CA.

Rehn, A.C., R.D. Mazor, P.R. Ode. 2018. An index to measure the quality of physical habitat in California wadeable streams. Technical Report 1053. Surface Water Ambient Monitoring Program. Sacramento, CA.

Quarter in Review

Conference Presentations

Afrooz, A.R.M.N. Estimating BMP effectiveness. California Stormwater Quality Association (CASQA) Annual Conference. October 15-17, 2018. Riverside, CA.

Afrooz, A.R.M.N. Bioretention soil media specification for stormwater treatment: What we have learned so far? California Stormwater Quality Association (CASQA) Annual Conference. October 15-17, 2018. Riverside, CA.

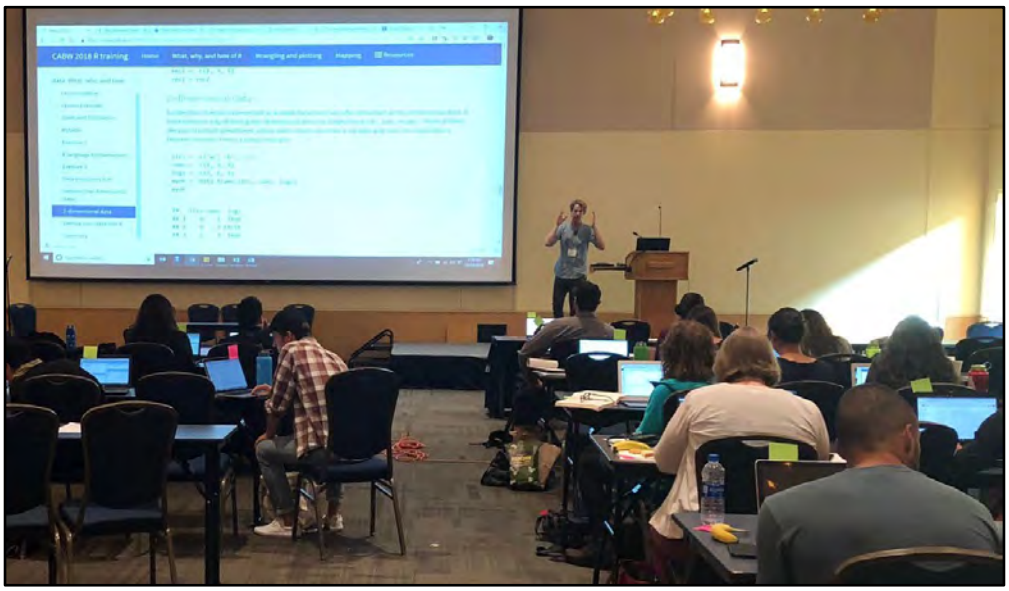
Beck, M. Actionable bioassessment data: Using visualization to bridge the research-management divide. California Aquatic Bioassessment Workgroup and California Society of Freshwater Science Annual Meeting. October 24, 2018. Davis, CA.

Kranner, B., A.R.M.N. Afrooz, A.B. Boehm. California Stormwater Quality Association (CASQA) Annual Conference. October 15-17, 2018. Riverside, CA.

Maruya, K. Staged development of a bioscreening toolbox for recycled and ambient water monitoring and assessment. International Water Association Regional Conference on WateReuse in Southeast Asia. October 30-November 2, 2018. Phuket, Thailand.

Mazor, R.D. Moving beyond compliance: The stream survey of the Stormwater Monitoring Coalition. California Stormwater Quality Association (CASQA) Annual Conference. October 16, 2018. Riverside, CA.

Mazor, R.D. The next 25 years of freshwater and bioassessment research in California: Perspectives from California's higher education institutions. California Aquatic Bioassessment Workgroup and California Society of Freshwater Science Annual Meeting. October 24, 2018. Davis, CA.



SCCWRP's Dr. Marcus Beck delivers a talk on using data visualization tools to bridge the research-management divide during the California Aquatic Bioassessment Workgroup and California Society of Freshwater Science Annual Meeting, held in October at the University of California, Davis.

Schiff, K. Models for quantifying water quality data: Water quality scoring. Panel on data driven decision making. California Stormwater Quality Association (CASQA) Annual Conference. October 15-17, 2018. Riverside, CA.

Schiff, K. R. Mazor, N. Afrooz, M. Beck. Turning data into information: the SMC's Water Quality Index. California Stormwater Quality Association (CASQA) Annual Conference. October 15-17, 2018. Riverside, CA.

Schiff, K. Southern California Bight regional marine monitoring. Panel on regional monitoring programs for watershed compliance. California Stormwater Quality Association (CASQA) Annual Conference. October 15-17, 2018. Riverside, CA.

Stein, E.D. The changing nature of environmental flows. 2018 State of the Los Angeles River Watershed Symposium. September 27, 2018. Los Angeles, CA.

Stein, E.D. Establishing environmental flow targets in complex environments. International Symposium on Ecohydraulics. August 23, 2018. Tokyo, Japan.

Stein, E.D. Establishing environmental flows for California streams. California Stormwater Quality Association (CASQA) Annual Conference. October 16, 2018. Riverside, CA.

Stein, E.D. Challenges of managing complex monitoring data. California Stormwater Quality Association (CASQA) Annual Conference. October 16, 2018. Riverside, CA.

Conference Posters

Taylor, J. Managing streamflow to support aquatic species in consideration of climate change and new water management practices. 2018 State of the Los Angeles River Watershed Symposium. September 27, 2018. Los Angeles, CA.

Other Presentations

Beck, M. Tool for identifying constraints on stream biointegrity. State Water Board Biointegrity/Biostimulatory Stakeholder Advisory Group. September 24, 2018. Sacramento, CA.

Bednarsek, N., et al. Synthesis of thresholds of ocean acidification effects on pelagic molluscs. California Ocean Acidification and Hypoxia Science Task Force. August 2018. Via webinar.

Maruya, K. Evolution of passive sampling for organic contaminants in aquatic systems. National Gyeongsang University, Korea Institute of Ocean Science and Technology and Seoul National University (three repeat presentations). September 20-21, 2018. South Korea.

Mazor, R.D. Workshop on methods for assessing ephemeral and episodic streams. August 13-15, 2018. Palm Springs, CA.

Mehinto, A. Using cell assays to screen for contaminants and assess ecological risks. Korea Institute of Ocean Science and Technology and Gyeongsang National University (two repeat presentations). September 20-21, 2018. South Korea.

Schiff, K. Technologies for tracking wastewater plumes. Workshop on wastewater plume tracking for the San Diego region. San Diego Regional Water Quality Control Board. September 21, 2018. San Diego, CA.

Stein, E.D. Briefing on recent developments in the science and implementation of environmental flows. San Diego Regional Water Quality Control Board. Sept 19, 2018. San Diego CA.

Stein, E.D. Module instructor. Environmental flows and urban water management. Ridge to Reef Climate and Life Summer Institute. August 22-28, 2018. Irvine, CA.

Stein, E.D. Modeling the effects of sea level rise on coastal wetlands in support of the newly released Wetland Recovery Project Regional Wetland Recovery Strategy. Wetland Recovery Project Directors Group. October 18, 2018. San Diego, CA.

Weisberg, S. Microbiological techniques available for investigating homeless bacterial contributions to stream water quality. State Water Board Water Quality Coordinating Committee. October 23, 2018. Sacramento, CA.

SCCWRP Personnel Notes

Commission

David Smith, Manager of the Water Quality Assessment Section for U.S. Environmental Protection Agency, Region 9, was appointed Alternate Commissioner in October, replacing Janet Hashimoto, who has taken an Intergovernmental Personnel Act assignment with the Hawaii Department of Health. Hashimoto served as an Alternate Commissioner for 28 years.

Promotions

Peter Chen, a part-time Laboratory Assistant in the Microbiology Department since June, was promoted in August to Research Technician.

Jordan Golemo,a part-time Laboratory Assistant for Cross-Departmental Technical Support since November 2017, was promoted in August to Research Technician.

Minna Ho, a part-time Laboratory Assistant in the Biogeochemistry Department since November 2017, was promoted in September to Research Technician.

Ellie Wenger, a part-time Laboratory Assistant since June, was promoted in August to Research Technician in the Chemistry Department.

Scientific Leadership

Steve Bay has been appointed co-chair of a session titled "Advances in Sediment Quality Assessment for Regulation and Management" at the 39th Annual Meeting of the Society of Environmental Toxicology and Chemistry, to be held November 4-8, 2018 in Sacramento, California.

Dr. **Marcus Beck** organized and co-chaired a special session titled "Data visualization in bioassessment" at the California Aquatic Bioassessment Workgroup and California Society of Freshwater Science Annual Meeting on October 24 in Davis, CA.

Dr. **Marcus Beck** has been asked to serve on a technical workgroup for a project that involves a comparative analysis of ecological processes and patterns across coastal bays and estuaries, sponsored by the Smithsonian Institution and the National Oceanic and Atmospheric Administration.

Dr. **Nina Bednarsek** has been named to the master's thesis committee of Cornell University student Sage Mitchell.

Dr. **Keith Maruya** co-chaired a session titled "Recent advancements in environmental passive sampling approaches" at the Society of Environmental Toxicology and Chemistry's Asia-Pacific Conference, held September 16-19, 2018 in Daegu, Korea.

Dr. **Keith Maruya** has been appointed Past President for the Southern California chapter of the Society of Environmental Toxicology and Chemistry.

Dr. **Raphael Mazor** co-chaired a special session titled "The next 25 years of freshwater and bioassessment research in California: Perspectives from California's higher education institutions" at the California Aquatic Bioassessment Workgroup and California Society of Freshwater Science Annual Meeting on October 24, 2018 in Davis, CA.

Dr. **Alvina Mehinto** co-chaired a session titled "Aquatic ecotoxicology: Recent advances" at the Society of Environmental Toxicology and Chemistry's Asia-Pacific Conference, held September 16-19, 2018 in Daegu, Korea.

Ken Schiff moderated a conference session titled "Big Data and Sensor Based Monitoring, Control, and Operation" at the American Society of Civil Engineers Conference on Low Impact Development, held August 12-15, 2018 in Nashville, Tennessee.

Departures

Dr. **Meredith Howard,** a Senior Scientist in the Biogeochemistry Department since 2007, left SCCWRP in October to take a position with the Central Valley Regional Water Quality Control Board in Northern California.

Marlene Hanken, a Senior Research Technician for Cross-Departmental Technical Support since 2010, left SCCWRP in October.

SCCWRP COMMISSIONER SPOTLIGHT

EPA manager worked as scientist, then attorney

For Ellen Blake, becoming an attorney was a means to an end – and her "end" has always been water-quality protection.

Ellen Blake

Before she began working as an attorney in 2011, Blake served for nearly nine years as an Environmental Scientist for the U.S. Environmental Protection Agency, Region 9. She earned her law degree as a full-time UC Hastings student even as she continued to work part time as an Environmental Scientist.

Then, within months of graduation, Blake transferred to Region 9's Office of Regional Counsel, where she spent seven years as a Senior Attorney in the Water Law Section, enforcing the Clean Water Act and counseling state and local agencies on water-quality compliance issues.

"EPA Region 9 has always been the perfect place for me, stretching me in all the right ways and keeping me learning," Blake said. "Whether it's practicing law or working for the Water Division, the thing that's really rewarding for me is getting to work with our state and local partners."

In April, Blake left the Office of Regional Counsel to return to Region 9's Water Division as Assistant Director of the Ecosystems Branch. She oversees a 50-person staff that handles water-quality standards, Total Maximum Daily Loads, stormwater permitting, and wetlands, among other areas. She replaced Nancy Woo, a former SCCWRP Commissioner who retired.

"The skills and knowledge I gained as an attorney, I'm still using now," Blake said. "Being able to go deep on the law side was great, but now that I'm back in the Water Division, I love being able to think about the broad picture and focus on how wide our swath of work is."

Ellen Blake hikes the Chilnualna Falls Trail during a 2015 trip to Yosemite National Park.

Ellen Blake, J.D.

Job: Assistant Director, Ecosystems Branch, Water Division, U.S. Environmental Protection Agency, Region 9

SCCWRP role: Commissioner (started April 2018)

Prior jobs: Senior Attorney, Water Law Section, EPA Region 9 Office of Regional Counsel (2011-18); Environmental Scientist, EPA Region 9 Water Division (2002-11); Project Scientist, LAW Engineering and Environmental Services in San Diego (2001-02); Urban Technician, Warren County Soil and Water Conservation District in Ohio (1997-2001)

Education: J.D., University of California Hastings College of the Law (2010); M.S. environmental science, University of Cincinnati (2001); B.S. biology, Wright State University (1994)

Residence: San Francisco

Hometown: Wilmington, Ohio

Hobbies: Visiting museums and artist studios; hiking; attending old-school bluegrass and new folk music festivals; bike riding in Golden Gate Park; visiting wine country

Blake, a native of Ohio, has always had a love for nature. As an undergraduate at Ohio's Wright State University, she took a winter job working at the Grand Canyon as an interpretive park ranger. After graduating, she spent four years working doing environmental education and overseeing local sediment/erosion regulations for a soil and water conservation district in Ohio.

In 2001, she moved to California to be closer to her sister, taking a job as an environmental consultant in San Diego. A year and a half later, she was hired by EPA Region 9 in San Francisco.

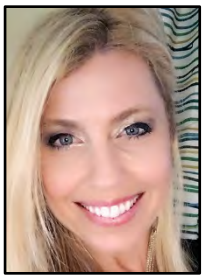
Blake has known about SCCWRP since she worked as a Region 9 attorney; she remembers citing SCCWRP research in legal documents. Now, she looks forward to contributing actively to SCCWRP and providing a federal perspective on water-quality issues.

Blake lives in San Francisco a stone's throw from Golden Gate Park. She loves being part of the city's lively arts scene, from touring artist studios to serving as a volunteer for events like city's annual bluegrass music festival. She also enjoys hiking and visiting wine country.

CTAG SPOTLIGHT

Biologist finds calling in regulatory compliance

Lisa Haney began her career in the wastewater treatment sector nearly two decades ago as a marine biologist, where her job duties included taxonomic identifications, managing environmental data sets, and taking part in outfall inspection dives.



Lisa Haney

But early into her career with the Sanitation Districts of Los Angeles County, Haney was invited to serve as a POTW representative on a stakeholder committee assisting with development of statewide Sediment Quality Objectives regulatory targets for enclosed bays and estuaries in California.

She remembers feeling an instant connection to this work – so much so that in 2010, she decided to leave LACSD to take a compliance-focused Senior Environmental Specialist job with the Orange County Sanitation District (OCSD).

"I really wanted to apply my technical expertise to something at a larger scale," Haney said. "I love being at the transition point where science affects policy, where we're all working together to understand what is achievable from a science perspective."

Haney was promoted to Regulatory Specialist at OCSD in 2017, after working as a Senior Environmental Specialist for seven years. Her main role is to ensure OCSD is proactively engaging with regulators and other managers on water policies and issues that could impact sanitation agencies.

One of Haney's recent OCSD projects was an eight-month pilot study with the State Water Board to develop methods for quantifying the amount of stormwater that is being captured and reused in California. Haney looked at how to quantify stormwater entering OCSD-managed facilities and infrastructure.

Lisa Haney explores Idyllwild in the San Jacinto Mountains with her sons Ty, left, and Ryan in June 2018.

"Eventually, we expect the State to be asking everyone to quantify their stormwater," Haney said. "This was our first attempt at a small scale to figure out how we could go about doing this."

Haney has been interacting with SCCWRP for nearly two decades, including participating in both the 2003 and 2008 cycles of the Southern California Bight Regional Monitoring Program.

As a CTAG representative, Haney is hoping to better connect the broader sanitation community to SCCWRP. She holds leadership roles in both the California Association of Sanitation Agencies and the Southern California Alliance of POTWs.

"SCCWRP is doing independent research that is not only valuable in Southern California, but throughout the whole state," she said. "Everyone can benefit from seeing this science before it comes to the policy groups."

Before starting her sanitation career, Haney worked for two years as a science teacher and curriculum developer at a private school in Los Angeles.

"I loved teaching, but I feel like I've never stopped," Haney said. "Now I'm teaching managers and regulators about science."

Lisa Haney

Job: Regulatory Specialist, Environmental Compliance, Orange County Sanitation District (2017-present)

SCCWRP role: CTAG Representative

Prior jobs: Senior Environmental Specialist, OCSD (2010-16); Marine Biologist II, Sanitation Districts of Los Angeles County (2001-10); Director of Programs in Ecology, Shalhevet private school in L.A. (1999-2001); Genetics Research Technician, Specialty Laboratories in Santa Monica (1998-99); Adjunct Faculty Member, University of Charleston in South Carolina (1994-95)

Education: M.S. equivalency, Marine Science, University of Charleston (1998); B.S. Zoology, Northern Arizona University (1994)

Residence: Irvine

Family: Sons Ty, 14, and Ryan, 11; a cat

Birthplace: Bethesda, Maryland

Hobbies: Tent camping; hiking; visiting national parks; boat diving

SCCWRP PARTNER SPOTLIGHT

Postdoc's work on HABs sparked by sick sea lions

Dr. Jayme Smith first became interested in harmful algal blooms (HABs) research while volunteering at an Orange County marine mammal rescue center in college.

Dr. Jayme Smith

At the time, Smith was planning to pursue a career as a marine mammal researcher. But as she helped care for sea lions and other animals, she learned that many were being sickened by a HABs toxin known as domoic acid – commonly found in Southern California coastal waters in the spring.

The more Smith learned about HABs, the more convinced she was that she'd found her niche.

"I became really fascinated by how these phytoplankton communities are shaped," said Smith, whose Ph.D. research at USC focused on HABs in the Southern California Bight. "Different species can dominate blooms each year – some toxic and some non-toxic, and toxic species have the ability to turn on and off toxin production. These factors have huge implications for how destructive blooms can be to an ecosystem."

Smith, who earned her Ph.D. in August, joined SCCWRP in October as a joint postdoctoral researcher. She will split her time between SCCWRP's Biogeochemistry Department and the USC lab of Dr. David Caron, where she earned her doctorate. Caron is a close SCCWRP collaborator.

Smith will continue her research on marine HABs, and also expand to study freshwater HABs, including how freshwater HAB toxins can be transported to the coastal marine environment.

Dr. Jayme Smith enjoys a view of the Southern California Bight from Santa Cruz Island during an October trip. Smith and her husband, Jerren, are planning to eventually visit all of the Channel Islands accessible to the public.

Jayme Smith, Ph.D.

Job: Joint Postdoctoral Researcher, University of Southern California and SCCWRP Biogeochemistry Department (started October 2018)

Prior jobs: Teaching Assistant, USC (2012-13); Adjunct Instructor, Vanguard University of Southern California (2010-12, 2017); Science Instructor, Biola University homeschooling program (2010-11); Laboratory Technician, Monarch Labs in Irvine (2009-10)

Education: Ph.D. biology, University of Southern California (2018); B.S. biological sciences, Vanguard University of Southern California (2009)

Residence: Seal Beach

Family: Husband Jerren, a high school science teacher; a ball python and a betta fish

Hometown: Huntington Beach

Hobbies: Indoor rock climbing; hiking; going to the beach; camping; helping run husband's dog-sitting business

Smith has been collaborating with SCCWRP since she began her Ph.D. program in 2012. One of her first projects was participating in a SCCWRP-facilitated study examining the ecosystem effects of temporarily diverting wastewater effluent discharge from one Orange County Sanitation District outfall pipe to another closer to shore. A few years later, she led a similar effluent diversion study for the City of Los Angeles, a SCCWRP member agency.

"I'm really looking forward to being at SCCWRP because the research we're doing directly informs policy; this makes my work feel really meaningful," Smith said.

Before Smith began her Ph.D. program, she took a few years off school to work. She spent about two years as a lab technician for an Irvine company that produces medical-grade, sterilized maggots for wound cleaning.

She also worked at Biola University as a science lab instructor for homeschooled high school students, and returned to her alma mater, Vanguard University, to work as an undergraduate lab instructor for chemistry and physical science courses.

In her spare time, she helps her husband, Jerren, run a small dog-sitting business. They host one to two dogs at their home at a time; they also make house calls on weekends.

SCCWRP STAFF SPOTLIGHT

Scientist drawn to study impacts of moving water

Dr. Kris Taniguchi-Quan first fell in love with hydrology and geomorphology as a San Diego State junior.

Dr. Kris Taniguchi-Quan

She had been planning to focus her studies on ecology, but during a class field trip to the Tijuana River estuary near the U.S.-Mexico border, Taniguchi-Quan found herself in awe of the volume of trash and sediment the river was transporting to the coastal zone.

"That was the first time it clicked for me – the physics of water and how it can alter landscapes," Taniguchi-Quan recalled. "I wanted to learn everything I could about why this was happening."

Although she didn't realize it at the time, she'd spend all four years of her Ph.D. program at San Diego State and UC Santa Barbara studying the hydrology of the Tijuana River watershed.

Taniguchi-Quan, a hydrologist who models how flow patterns impact the health of aquatic ecosystems, joined SCCWRP as a Scientist in the Biology Department in June – just two days after successfully defending her Ph.D. dissertation.

Taniguchi-Quan's Ph.D. work focused on developing interconnected computer models that explain how stream channels in the Tijuana River watershed become eroded. She then used the models to predict how various management interventions would alter the trajectory of these impacts. The Tijuana River watershed straddles the U.S.-Mexico border, with much of the impacts hitting Mexicans who live along the steep banks of the erosion-prone river.

Dr. Kris Taniguchi-Quan goes hiking with husband An in Anza-Borrego Desert State Park's slot canyon in 2017.

"The residents are saying we need to channelize the stream and pave the roads, but funding is limited," Taniguchi-Quan said. "So if we can understand what actions will be effective, managers can target their resources."

Taniguchi-Quan became interested in applied science when she worked in summer 2012 as a research fellow on a hydromodificaton management plan for the County of San Diego.

The following year, she worked at SCCWRP as a student researcher under Dr. Eric Stein, where she focused on characterizing the region's reference streams based on hydrologic flow variables. The summer experience cemented her desire to work at SCCWRP on a permanent basis.

"SCCWRP is just a perfect fit for me – it's everything I want to do, and I already know I like the work environment here," Taniguchi-Quan said.

In her spare time, Taniguchi-Quan enjoys running with her dogs and taking them to dog beaches.

"Mainly they pull me," she explained.

Kristine Taniguchi-Quan, Ph.D.

Job: Scientist, SCCWRP Biology Department (started June 2018)

Prior jobs: Teaching associate, San Diego State University (2014-2018); student researcher, SCCWRP Biology Department (summer 2013); research analyst, Sagient Research data intelligence firm (2012); environmental fellow, Edna Bailey Sussman Foundation (2012)

Education: Ph.D. geography, San Diego State University and University of California, Santa Barbara (2018); M.S. geography, San Diego State (2014); B.S. environmental sciences, San Diego State (2011)

Residence: Costa Mesa

Family: Husband An, a financial analyst; dogs Henney, a husky, and Sunny, a Labrador mix

Hometown: Torrance

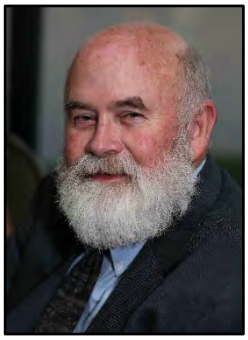
Hobbies: Running; hiking; taking her dogs to the beach

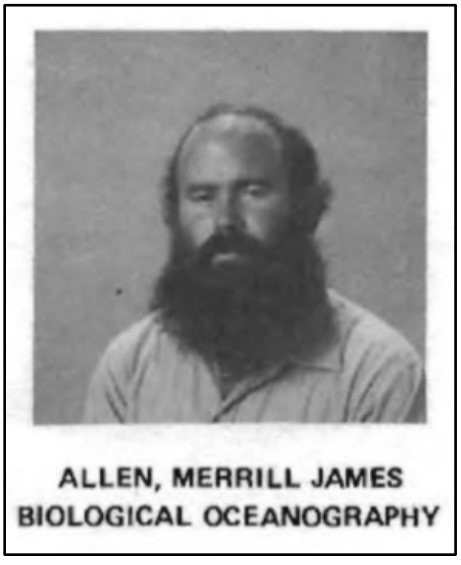
SCCWRP SCENES

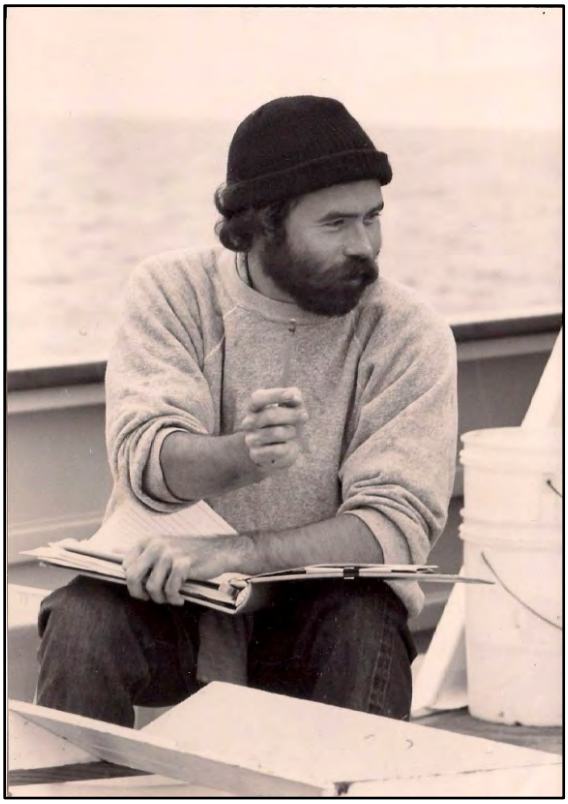
Remembering one of our own

Dr. M. James Allen, a fish biologist who worked at SCCWRP for 22 years and served as Principal Investigator for the Fish Biology Department, passed away September 2, 2018. Allen played a pivotal role in SCCWRP's growth and development, working at SCCWRP for six years in the 1970s and returning for 16 years beginning in the 1990s. He helped develop the scientific otter trawl, a field method still used today, and helped design and implement the flagship Southern California Bight Regional Monitoring Program. His pioneering work to define the trophic structure for Southern California fish communities four decades ago helped build a foundational understanding of contaminant bioaccumulation pathways that is still used today.

SCCWRP will host a celebration of Allen's life on November 14, 2018 at 6 p.m. in the Large Conference Room. The event is open to the public; RSVPs are requested. For more information and to RSVP, contact Shelly Moore.







Clockwise from top left, Dr. M. James Allen in 2007; Allen examining a fish collected during a 2010 trawl survey; Allen on a research vessel during a 1970s SCCWRP field survey; and Allen as a first-year Ph.D. student in biological oceanography at the University of California, San Diego in 1977.