SCCWRP Director's Report

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SPRING 2018 ISSUE

CEC panel informs proposed update to recycled water policy

The State Water Board will consider updating California's policy on monitoring contaminants of emerging concern (CECs) in recycled water as early as this year based on the findings of an expert advisory panel convened and facilitated by SCCWRP.

State Water Board staff is scheduled to release a draft policy amendment in the coming weeks that incorporates recommendations issued by California's CEC Recycled Water Advisory Panel; the draft amendment will undergo a 60-day public review period prior to coming before the Board, possibly this December.

Among the expert panel's recommendations, which have been published in a SCCWRP technical report, is expanding CEC monitoring requirements to incorporate use of commercially available bioanalytical cell screening assays.

This prototype technology, which SCCWRP and its partners are working to adapt for aquatic monitoring applications, has the potential to provide a rapid, cost-effective approach to comprehensively screen recycled water for major classes of bioactive contaminants, including unknown chemicals that exert similar biological impacts on aquatic organisms.

Because new CECs are constantly entering production while others are phased out, the expert panel also has recommended that the State Water Board inject more flexibility into its CEC monitoring requirements. A more adaptable monitoring framework would enable individual contaminants to be added to or removed from the State's priority CEC monitoring list, as researchers learn more about the potential health risks posed by individual emerging contaminants in recycled water.

Since the CEC Recycled Water Advisory Panel issued its original recommendations for recycled water monitoring in 2010, panelists have concluded that four additional CECs should be added to the State's priority monitoring list, while five others from the original list should be

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Cover photo: Water recycling is becoming more common in drought-prone California, including at this reverse osmosis purification plant run by the City of San Diego Public Utilities Department. The State Water Board is considering updating California's policy on monitoring CECs in recycled water.

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, May 10
CTAG quarterly meeting

Monday, May 14
Seminar: "Effects of microplastics in freshwater and marine ecosystems"

Friday, June 1
SCCWRP Commission meeting

dropped. The panel also has recommended that the CEC priority list be periodically revisited by independent experts.

Recycled water is sometimes placed into holding ponds, such as this one in Santa Clara County in Northern California, to allow the water to gradually infiltrate into groundwater. California's policy on how to monitor CECs in recycled water was recently revisited by an expert advisory panel facilitated by SCCWRP.

California's existing recycled water policy – originally unveiled in 2009 – requires recycled water to be monitored for eight priority CECs when the water is used for a handful of applications, including non-potable landscape irrigation and groundwater recharge for indirect potable reuse. SCCWRP also facilitated the panel's original deliberations.

If the State Water Board adopts the panel's updated recommendations for CEC monitoring, a list of seven priority CECs would continue to be monitored individually, plus recycled water agencies would be required to run two bioanalytical assays – the estrogen receptor assay and the aryl hydrocarbon receptor assay. SCCWRP and its partners have been at the forefront of adapting these assays for aquatic contaminant monitoring applications.

Prior to finalizing its recommendations in April, the panel circulated a draft of its recommendations for a 30-day public comment period. After some stakeholders expressed concerns that it would be premature to codify the bioanalytical tools in State policy, the panel revised its position, clarifying that the State should proceed slowly and not yet place any regulatory obligations on water recycling agencies based on their bioanalytical screening data.

For more information, contact Dr. Keith Maruya.

Bight '18 keeps focus on key issues of management concern

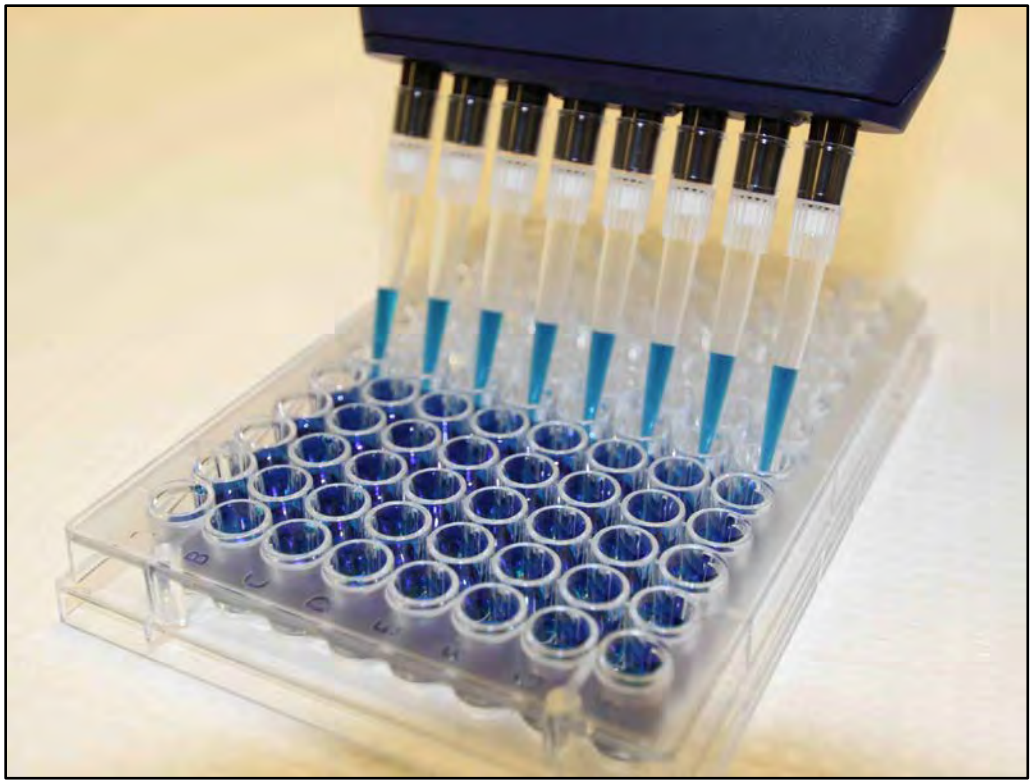
More than 80 environmental agencies will examine new and emerging developments in water-quality science and management during the 2018 cycle of the Southern California Bight Regional Monitoring Program, which initiates field sampling in July.

More than half of the studies planned for Bight '18 are new or have new components, ensuring the 24-year-old program remains responsive to pressing issues of management concern in coastal Southern California. Meanwhile, the study elements carried over from previous program cycles will enable Bight '18 to track trends in ecosystem health across time and space.

Bight '18 participants have been working collaboratively in recent months to finalize study designs for each of five main study elements, as well as to coordinate quality-assurance measures, including laboratory intercalibration exercises.

The design of each of the five Bight '18 study elements has been influenced by a number of emerging issues in environmental management:

» **Sediment Quality**: For the first time, Bight '18 will incorporate use of bioanalytical cell screening assays to screen for bioactive chemical contaminants in seafloor sediment and fish tissues. The addition of this screening step, which will be done alongside traditional sediment quality assessment methods, reflects the Bight program's commitment to using emerging technologies to glean additional insights about sediment contamination's ecosystem impacts. In April, a statewide panel of scientific experts recommended that bioanalytical assays be incorporated into routine monitoring of emerging



Bioanalytical cell screening assays will be used for the first time in the Southern California Bight Regional Monitoring Program to screen for bioactive chemical contaminants in seafloor sediment. Bight '18 participants have decided to test-drive this prototype technology as part of the program's commitment to examine new and emerging developments in environmental science.

contaminants in recycled water statewide (see previous article in this Director's Report), underscoring the growing importance of this prototype tool for contaminant monitoring. In addition, the Sediment Quality element will track chemical contaminants that have bioaccumulated in sport fish, and measure an expanded list of emerging contaminants, including PBDEs, pyrethroids, fipronils and neonicitanoids.

» **Ocean Acidification**: In addition to tracking changes to Bight seawater chemistry resulting from ocean acidification and hypoxia, Bight '18 will for the first time seek to document the relationship between the chemical changes and effects on vulnerable, shell-forming organisms. Understanding the relationship between chemistry and biology is key to interpreting a growing body of data on ocean acidification's impacts in the Bight, especially the outputs of a computer model being developed by SCCWRP and its partners that quantifies changes to seawater chemistry along the North American West Coast.

» **Harmful Algal Blooms**: This new Bight '18 study element will focus on understanding the long-term impacts of marine and freshwater blooms that are becoming more severe, frequent and longer-lasting. While water-quality managers have traditionally focused on managing the immediate impacts of these ecologically disruptive events, Bight '18 will examine how toxins produced by some types of blooms can be transported through waterways and linger in seafloor sediment, potentially impacting the health of marine organisms for months, including shellfish consumed by humans.

» **Trash**: New to the Bight '18 trash monitoring element will be test-driving a series of standardized methods for quantifying the levels and types of trash found in urbanized streams; this work will be done in partnership with the Southern California Stormwater Monitoring Coalition. Development of reliable trash-surveying capabilities is crucial as California and its municipalities seek to document the effectiveness of aggressive new trash reduction and control programs being rolled out statewide.

» **Microbiology**: This Bight '18 study element will examine the relevance and reliability of using coliphage viruses to track microbial water quality at Southern California beaches. With the U.S. Environmental Protection Agency slated to issue guidance in the coming months on how water-quality managers can begin using coliphage to track microbial contamination, Southern California water-quality managers will need to understand how traditional *Enterococcus* bacteria-based methods for detecting microbial contamination compare to the new coliphage-based approach.

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The Southern California Bight Regional Monitoring Program, which has been facilitated by SCCWRP since its inception in 1994, examines the health of about 1,500 square miles of Southern California's coastal waters. Both regulated and regulatory agencies, as well as non-governmental and academic organizations, come together to collaboratively design the study and interpret findings.

Southern California's environmental management communities relies on the Southern California Bight Regional Monitoring Program to better direct resources and to maintain focus on the areas and issues that pose the greatest threats to ecosystem integrity.

For more information, contact Dr. Karen McLaughlin

Management impacts of stream biointegrity policies explored in new SMC report

The Southern California Stormwater Monitoring Coalition (SMC) has released a comprehensive new report chronicling how the region's stream management community will potentially be impacted by new and proposed changes to statewide policies governing the health of streams.

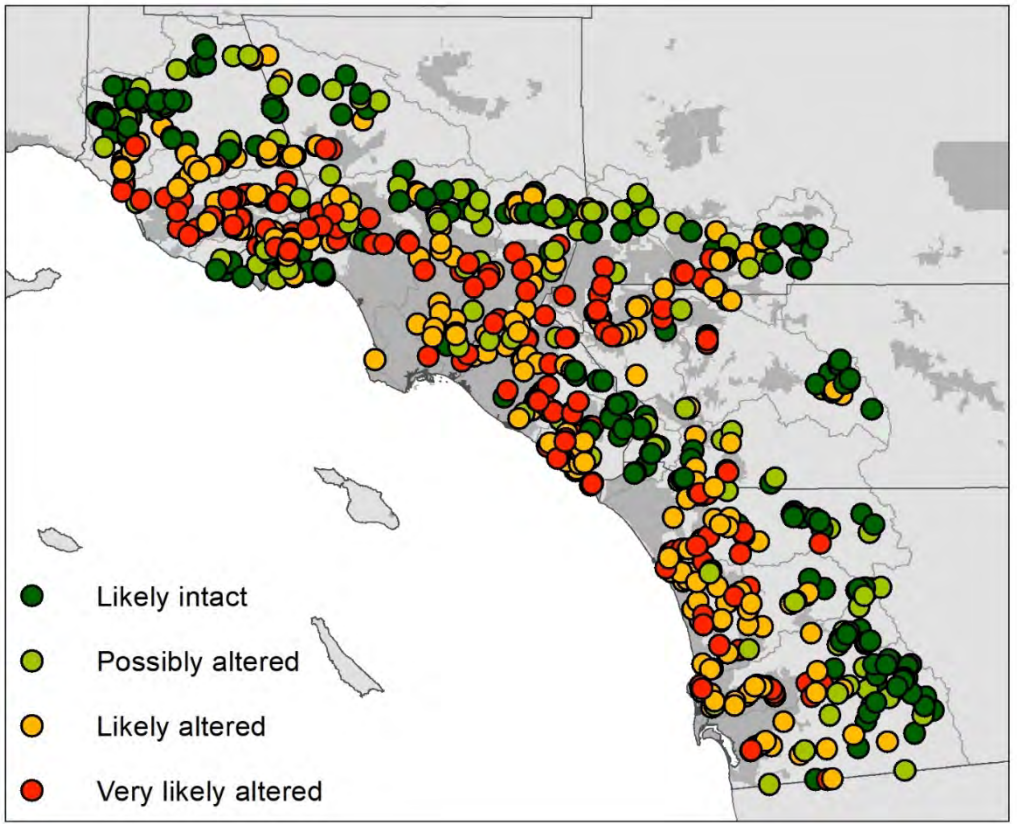
The 2017 Report on the SMC Regional Stream Survey, published in March as an SMC technical report, is a forward-looking analysis intended to help SMC members and other stream managers prepare for anticipated changes in the regulatory landscape.

The 22-page report provides in-depth analysis of how streams in coastal Southern California are evaluated and scored using a suite of new stream monitoring tools co-developed by SCCWRP. A number of these tools form the technical backbone of stream biointegrity policies under development in California.

By showcasing how California stream biointegrity tools are applied in the South Coast region, the SMC becomes better-positioned to influence policy development and ensure Southern California stream data sets get used in the development of new stream biointegrity tools.

Prominent in the report is a detailed overview of the Algal Stream Condition Index (ASCI), a quantitative scoring tool that uses algal communities in streambeds to assess overall stream health. Expected to be released for public review this summer, the ASCI is designed to complement the already-released California Stream Condition Index (CSCI), which relies on the condition of bottom-dwelling invertebrates to score stream health. The ASCI and CSCI will provide the technical underpinnings for a proposed statewide stream biointegrity-biostimulatory policy.

The SMC's analysis of the new ASCI scoring tool showed that in certain Southern California watersheds – such as Calleguas Creek, Lower Santa Ana and Central San Diego – few sites scored in the healthy range. These low ASCI scores could lead to increased management scrutiny over how to mitigate the factors that lead to ecologically disruptive algal growth, such as reducing nutrient inputs, the SMC concluded.



An analysis of the Algal Stream Condition Index (ASCI) scoring tool by the Southern California Stormwater Monitoring Coalition (SMC) found that streams that scored low with the ASCI are found predominantly in the urban or agricultural areas of coastal Southern California, while streams with high scores tend to be clustered in the mountain regions. These insights are among the findings published in a new SMC report intended to help stream managers understand the implications of new and proposed changes to statewide stream policies.

The SMC report also examined a new computer modeling tool co-developed by SCCWRP that predicts the degree to which stream biointegrity scores are likely to be limited, or "constrained," by urban and agricultural development. The SMC's analysis of the landscape modeling tool found that about 11% of the region's stream-miles are likely constrained, while 12% are likely unconstrained. The SMC concluded that low-scoring stream sites that are relatively unconstrained could become strategic targets for focusing proportionately more restoration efforts and resources, with stream managers likely to get more bang for the buck at these sites.

The SMC report also chronicled a change to the way that California streams are scored and placed on a federal list of impaired California water bodies. Last year for the first time, CSCI scores were used in a consistent fashion statewide as a line of evidence to help determine placement on the list. As a result, 44 South Coast streams were designated as impaired, while another 76 South Coast streams were placed into a newly created category

indicating they met all of their beneficial-use requirements.

SMC members are using the report's findings to bring greater awareness to the management implications of new and proposed changes to statewide stream policies, enabling stream managers to more effectively plan, allocate resources and set priorities.

For more information, contact Dr. Raphael Mazor.

Stream food webs to be examined in study to better integrate stream assessment tools

SCCWRP and its partners have launched a three-year effort to better integrate stream condition assessment tools in California by examining how ecological stress alters the complexity and interconnectedness of stream food webs.

The study, which began field sampling in April, will use advanced computational approaches to analyze the food-web relationships between bacteria, algae and bottom-dwelling invertebrates.

Researchers' goal is to understand how these three pillars of stream food webs are being altered as streams experience increasing ecological degradation. Such insights will help researchers build a more holistic, integrated understanding of stream ecosystem functioning.

Researchers are particularly interested in using bacteria to discern subtle changes in stream health. Especially in urbanized settings, existing bioassessment tools often are unable to distinguish subtle gradients in stream condition.

SCCWRP and its partners have worked for the past two decades to adapt benthic invertebrates and algae as biological indicators of stream condition, but have done comparatively little work on bacteria because these microbial communities cannot be readily observed and classified via traditional taxonomic means.

However, during development of the soon-to-be-finalized Algal Stream Condition Index quantitative scoring tool, SCCWRP and its partners showed that stream algae could be reliably identified via DNA sequencing. Like bacteria, stream algae have traditionally been difficult to identify visually.

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 more holistic insights into a stream's overall ecological health. Stream managers already collect bacteria as part of their routine algae sampling programs.

Researchers will apply the same DNA-based identification approach used with algae to identify stream bacteria. Stream bacteria already are captured as part of routine algae sampling programs, including by the Southern California Stormwater Monitoring Coalition, but the bacteria samples traditionally weren't analyzed to understand community composition and structure.

Stream bacterial communities have the potential to provide a key additional line of evidence that could improve watershed managers' confidence in routine stream condition assessments.

Bacteria, along with algae, form the base of stream food webs and play an essential role in mediating biogeochemical cycling processes; indeed, bacterial communities drive ecosystem function more than invertebrate and algal communities.

During the study, researchers will seek to quantify the food web structure of streams and determine how it changes in response to environmental stress.

Researchers already have applied a computationally advanced "network analysis" approach to existing stream algae and invertebrate data to show that the complexity and interconnectedness of the food web decreases as a function of stress. Researchers will seek to incorporate the structure and composition of bacterial communities into this network analysis.

Researchers are interested in examining how changes in the bacterial community correspond to other environmental changes, such as the introduction of an excess nutrient supply. This could allow stream bacteria to serve as a diagnostic tool for tracking specific environmental changes.

An advisory workgroup has been formed that includes participation by local, state and federal wetland managers, water-quality regulators, and academic researchers.

Preliminary results are expected as early as this year; the final report is scheduled to be published in 2020.

For more information, contact Dr. Joshua Steele.

Updates by Thematic Area

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

BIOASSESSMENT

Effort launched to adapt ephemeral stream bioassessment tools for oil spill monitoring

SCCWRP and its partners have kicked off a study examining whether bioassessment tools being developed to assess the health of ephemeral streams also can be used to assess ecological damage from oil spills in California.

The California Department of Fish and Wildlife's Oil Spill Prevention and Response Team is interested in adapting the 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.

The study, which kicked off in March, involves collecting terrestrial arthropods and bryophytes from reference sites and oil spill sites, then determining whether community structure and composition are altered by oil spills.

SCCWRP and its partners are working to adapt ephemeral stream bioassessment tools to assess ecological damage from oil spills in dry streambeds sites across California, including at this San Joaquin Valley oil production field, above.

Causal assessment tools being tested in pair of case studies

SCCWRP and its partners have initiated a pair of case studies to demonstrate a set of new causal assessment tools designed to rapidly narrow potential causes of degraded ecological condition in streams and estuaries.

The first case study, which kicked off in late 2017, will focus on degraded streams in San Diego, and is intended to help make the screening-level tools more responsive to changes in hydrological flow patterns.

The second case study, which kicked off in March in partnership with the Santa Ana Regional Water Quality Control Board, will examine how to integrate the tools into routine stream monitoring programs.

The screening-level causal assessment tools being tested draw upon a standard list of possible stressors that either can be rapidly eliminated from consideration, or identified as a possible cause of impairment based on as a standard set of evidence types.

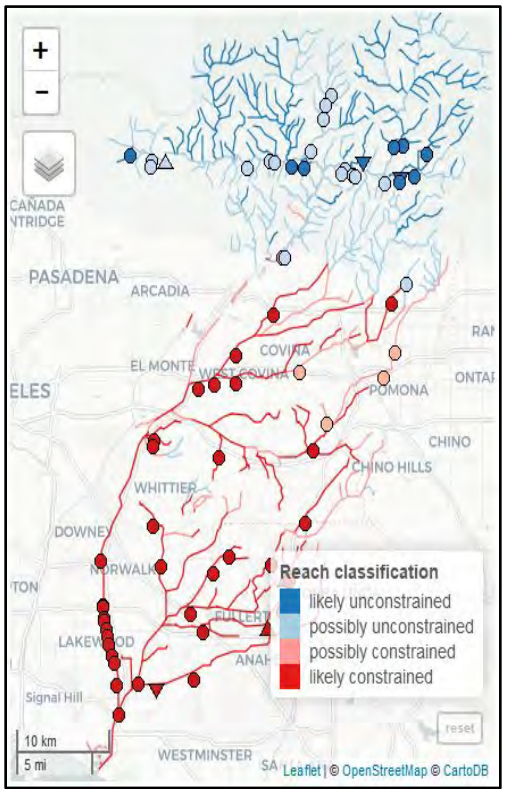
This screening-level step is intended to serve as the first tier of a proposed three-tiered framework for conducting causal assessments in streams and estuary environments in California, with subsequent tiers providing more intensive and stressor-specific analysis.

New interactive mapping app helps visualize chances of improving stream condition

SCCWRP and its partners have developed a web-based interactive mapping program to help stream managers visualize where in the San Gabriel River watershed they are more vs. less likely to find success in improving stream condition.

The Stream Classification and Priority Explorer (SCAPE) web app, unveiled in April in beta form, maps data generated by a new computer modeling tool that predicts the degree to which stream biointegrity scores are likely to be limited, or "constrained," by urban and agricultural development. This landscape models tool also was co-developed by SCCWRP.

San Gabriel River watershed managers will be able to use the web app to determine where they should direct resources to get the biggest bang for the buck.



The Stream Classification and Priority Explorer (SCAPE) is a web app that helps stream managers visualize how stream biointegrity scores in a watershed are likely to be limited, or "constrained," by urban and agricultural development. SCCWRP and its partners developed the app initially for use in the San Gabriel River watershed.

Various management scenarios can be run through the mapping app, which then automatically re-calculates how ranges of likely stream biointegrity scores – as assessed through the California Stream Condition Index quantitative scoring tool – are expected to change based on local landscape constraints.

SCCWRP and its partners are using the San Gabriel pilot project to evaluate how the web app could be scaled up for use in watersheds across coastal Southern California.

Algae-based stream scoring tool to be finalized this fall

An assessment tool that will score the ecological health of California wadeable streams by analyzing algal communities is scheduled to be finalized and published as early as this fall.

The Algal Stream Condition Index (ASCI) will complement the California Stream Condition Index (CSCI) by providing an additional line of evidence for conducting stream bioassessments, and will help form the technical foundation for a proposed statewide stream biointegrity-biostimulatory policy.

An expert science panel is scheduled to review and provide final feedback on the ASCI this summer; public comments also will be solicited.

The ASCI will make use of algae taxonomy data obtained via both DNA sequencing methods and via traditional morphological analysis under a microscope.

The work builds off algae-based stream scoring tools known as Algal Indices of Biotic Integrity, which SCCWRP co-developed about five years ago for use in coastal Southern California.

ECOHYDROLOGY

EPA Pacific Northwest stream tool being tested in Southwest

SCCWRP and its partners have launched a study to investigate whether a stream management tool that can rapidly distinguish intermittent streams from ephemeral streams in the Pacific Northwest is feasible for application in the U.S. Southwest.

The tool, developed by the U.S. Environmental Protection Agency, Region 10, determines a stream's flow duration based on easily observed field indicators, such as presence of wetland vegetation and certain families of aquatic insects.

Streams that are intermittent vs. ephemeral have different regulatory requirements in some cases, making it important that streams are classified correctly. Intermittent streams are defined as streams that have sustained seasonal flows from snow melt and groundwater, whereas ephemeral streams only experience brief surface flows from runoff.

Site selection and field training began in March. SCCWRP and its partners will test the Pacific Northwest tool in coastal and desert streams in California, as well as streams in Arizona and New Mexico.

SCCWRP and its partners will evaluate whether a tool that rapidly distinguishes intermittent streams from ephemeral streams in the Pacific Northwest can be used in the arid Southwest, such as this Riverside County creek, above. The creek is classified as a perennial stream, so researchers want to know if the Pacific Northwest tool correctly rules out the stream as neither intermittent nor ephemeral.

EUTROPHICATION

Science tools for proposed biointegrity-biostimulatory policy to be released this summer

SCCWRP and its partners will begin soliciting public comments this summer on a series of new scientific tools and synthesis reports that will form the technical backbone for a proposed statewide stream biointegrity-biostimulatory policy.

The State Water Board intends to use the science products to craft a regulatory program that better protects the biological integrity of California's wadeable streams and that more effectively restricts nutrients from stimulating excess algal growth.

Products scheduled for release this summer include:

» **Algal Stream Condition Index (ASCI),** a scoring tool that uses algae in streambeds to evaluate stream health.

» **Biological Condition Gradient,** a modeling analysis of California streams intended to help managers set numeric biostimulatory targets based on how benthic invertebrate and algal communities respond to increasing stress.

» **Developed landscapes models,** a computer modeling tool that predicts the degree to which stream biointegrity scores are likely to be limited, or "constrained," by urban and agricultural development.

» **Biostimulatory stress-response models and synthesis,** a series of reports that chronicles the empirical modeling approach being proposed to link stream biointegrity endpoints to eutrophication endpoints, including benthic algal biomass, organic matter content and nutrient loading targets.

Set of models built for establishing nutrient loading targets for Santa Margarita River

SCCWRP and its partners have finished assembling an integrated toolkit of mechanistic computer models and empirical statistical models that water-quality managers can use to optimally protect biological integrity and human uses in the lower mainstem of the Santa Margarita River.

The work, completed in April, is part of a three-year project to develop scientifically defensible nutrient loading targets for reducing eutrophication in the lower Santa Margarita River watershed.

The Santa Margarita River watershed, which spans Riverside and northern San Diego Counties, has been grappling with algal proliferation and low dissolved oxygen as a result of excess nutrient and organic matter inputs.

This fall, researchers will begin developing receiving-water models for the river's upper mainstem that will be connected to the lower mainstem models, enabling researchers to predict the degree to which nutrient load reductions and other management strategies would reduce eutrophication.

This work serves 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.

Study to explore optimal methods for monitoring cyanotoxins

SCCWRP and its partners will seek to develop more robust field methods for monitoring cyanotoxins in aquatic environments during a new study kicking off this summer in the Los Angeles region.

The three-year study involves deploying passive sampling devices for several days to weeks to measure the integrative, average concentration of toxins present. Passive samplers are simple, easy-to-deploy devices that absorb organic contaminants over time, enabling them to capture evidence of toxic cyanobacterial blooms that may be quickly flushed out of water bodies.

Researchers will evaluate the performance of two types of passive sampling devices – resin-based Solid Phase Adsorption Toxin Tracking (SPATT) devices, which SCCWRP has helped transition into use for routine monitoring, and film-based devices, which have the potential to provide more quantitative measurements of toxin levels. SCCWRP has been working to adapt film-based passive samplers for sediment contamination monitoring as well.

Researchers are interested in using passive sampling devices to provide additional insights into the dynamic nature of cyanotoxin-producing bloom events. By contrast, analyzing water samples collected in the field is able to provide concentration data for a single point in time.

Cyanotoxins threaten the health of wildlife, domestic pets, livestock and humans who come into contact with them.

CLIMATE CHANGE

Researchers assessing biological impacts of ocean acidification in the Salish Sea

SCCWRP and its partners have launched an effort to assess the vulnerability of marine calcifying communities in the

Pteropods, or sea snails, are sentinel indicators of the biological impacts of ocean acidification. SCCWRP is taking part in a study to assess the vulnerability of pteropods and other marine calcifying communities to ocean acidification in the Pacific Northwest's Salish Sea.

Pacific Northwest's Salish Sea to ocean acidification, including whether land-based pollution sources are exacerbating acidification's biological impacts.

The goal is to develop locally derived biological assessment endpoints for interpreting the chemistry data coming out of computer models that predict ocean acidification conditions in the Salish Sea. The Salish Sea, which encompasses Puget Sound, straddles the Washington-Canada border.

The project dovetails with a broader computer modeling effort to understand how marine communities all along the North American West Coast will be impacted by ocean acidification, and the degree to which land-based pollution sources are exacerbating acidification and hypoxia conditions. Researchers intend to compare the technical approaches used in the Salish Sea to those being used in the Southern California Bight and the San Francisco coastal region.

Resolution of West Coast acidification model being increased to improve accuracy

West Coast researchers working to develop a computer model that predicts how the region's coastal waters will be affected by ocean acidification and hypoxia (OAH) have decided to increase the resolution of the model grid to more accurately estimate environmental conditions.

Instead of modeling OAH's impacts in the Southern California Bight using a 1-kilometer grid, a grid size of 300 meters will be used. The higher resolution will add about three months to the time required to run the computationally intensive model.

Modelers, including at SCCWRP, have determined that the higher resolution is necessary to adequately capture how nutrients are transported to and through coastal ocean water.

The modeling work involves coupling West Coast physical and biogeochemical ocean models together to understand the roles of global carbon dioxide emissions, natural upwelling processes and nutrients introduced via wastewater effluent, stormwater runoff and atmospheric deposition in driving coastal ocean acidification.

SEDIMENT QUALITY

New study probes origins of legacy sediment contaminants that bioaccumulate in fish

SCCWRP and its partners have launched a two-year study to investigate whether legacy contaminants that occur in the tissue of fish in San Diego Bay are coming exclusively from contaminated sediment at the site or at least partially from somewhere else.

The study, launched in March, will probe the veracity of a common assumption in sediment management that all legacy chemical contaminants that have bioaccumulated in fish tissue at a site originate with contaminated sediment at the site.

A passive sampling device consisting of rings of polyethylene sheets is deployed into San Diego Bay on a mooring. The device, which measures the concentration of legacy contaminants like PCBs and DDTs in the water column, is being used for a study examining the origins of contaminants found in San Diego Bay fish.

Although now-banned chemical contaminants like PCBs and DDTs that have stuck to sediment particles are known to gradually dissolve back into the water column, it is unclear if these contaminants also are being spread extended distances through the water column. Understanding how far sediment-associated contaminants can travel is key to setting realistic targets for sediment clean-up programs.

The study will use passive sampling technology to compare the dissolved concentration of sediment-associated contaminants found in three places – just beneath the surface sediment layer, just above the surface layer, and in the water column.

CONTAMINANTS OF EMERGING CONCERN

Effort launched to better characterize linkage between bioassays and biological impacts in fish

SCCWRP and its partners are launching a new round of exploratory work on bioanalytical cell screening technology to better understand how these assays can be adapted to provide early evidence that bioactive chemical contaminants in aquatic environments are potentially triggering adverse biological impacts in fish.

Researchers' goal is to understand the relationship, or linkage, between how bioanalytical assays respond to exposure to bioactive CECs, and how living fish respond to exposure to the same contaminant levels. This work will pave the way for developing bioscreening thresholds for endocrine-disruptor cell assays that are sufficiently protective of fish health.

Researchers have begun planning a laboratory exposure study that will better define the linkage between an assay known as the glucocorticoid receptor assay, and corresponding biological impacts to the estuarine silverside fish species *Menidia beryllina*. Glucocorticoids are a class of endocrine-disrupting CECs commonly found in aquatic systems that

can adversely impact metabolism and growth of juvenile silversides.

Separately, researchers in May will launch a field exposure study that will track biological impacts to fathead minnow fish from exposure to CECs. The fish will be exposed to flowing Los Angeles River water in real time by housing them in mobile exposure chambers set up along the riverbank.

ADDITIONAL RESEARCH

Study launched to develop standardized approaches for tracking trash in watersheds

SCCWRP and its partners have kicked off a three-year study to develop standardized statewide approaches for tracking the levels and types of trash found in watersheds.

Researchers' goal is to identify rigorous but cost-effective trash monitoring methods that can be used across California to assess the long-term effectiveness of various trash management programs, including by the State Water Board.

A field crew counts and classifies trash particles in the Los Angeles River as part of the Southern California Bight 2013 Regional Monitoring Program. SCCWRP and its partners have kicked off an effort to bring statewide standardization to how trash is tracked in watersheds.

During the study, which kicked off in April, trash monitoring methods developed by the Southern California Stormwater Monitoring Coalition (SMC) will be compared to those used by the Bay Area Stormwater Management Agencies Association and California's Surface Water Ambient Monitoring Program.

Researchers also will explore how unmanned aerial systems, or drones, might be used to efficiently quantify levels and types of trash in watersheds.

New SCCWRP Publications

Journal Articles (Published)

Beck, M.W., K. Cressman, C. Griffin, J. Caffrey. 2018. Water quality trends following anomalous phosphorus inputs to Grand Bay, Mississippi, USA. *Gulf and Caribbean Research* 29:1-14.

Feely, R.A., R.R. Okazaki, W.J. Cai, N. Bednaršek, S.R. Alin, R.H. Byrne, and A. Fassbender. 2018. The combined effects of acidification and hypoxia on pH and aragonite saturation in the coastal waters of the California current ecosystem and the northern Gulf of Mexico. *Continental Shelf Research* 152:50-60.

Mehinto, A.C., K.J. Kroll, B.S. Jayasinghe, C.M. Lavelle, D. Vandervort, O.K. Adeyemo, S.M. Bay, K.A. Maruya, N.D. Denslow. Linking in vitro estrogenicity to adverse effects in the inland silverside (Menidia beryllina). *Environmental Toxicology and Chemistry* 37:884-892.

Pelletier, M.C., D.J. Gillett, A. Hamilton, T. Grayson, V. Hansen, E.W. Leppo, S.B. Weisberg, and A. Borja. 2018. Adaptation and application of multivariate AMBI (M-AMBI) in US coastal waters. *Ecological Indicators* 89:818-827.

Steele, J.A., A.D. Blackwood, J.F. Griffith, R.T. Noble, K.C. Schiff. 2018. Quantification of pathogens and markers of fecal contamination during storm events along popular surfing beaches in San Diego, California. *Water Research* 136:137-149.

Wall-Palmer, D., A.K. Burridge, E. Goetze, F.R. Stokvis, A.W. Janssen, L. Mekkes, M. Moreno-Alcántara, N. Bednaršek, T. Schiøtte, M.V. Sørensen, and C.W. Smart. 2017. Biogeography and genetic diversity of the atlantid heteropods. *Progress in Oceanography* 160:1-25.

Journal Articles (Online)

Arthington, A., J. Kennen, E.D. Stein, and J.A. Webb. 2018. Recent advances in environmental flows science and water management – Innovation in the anthropocene. *Freshwater Biology* DOI:10.1111/fwb.13108.

Bajer, P.G, M.W. Beck, P.J. Hundt. 2018. Effect of non-native versus native invaders on macrophyte richness: are carp and bullheads ecological proxies? *Hydrobiologia* DOI:10.1007/s10750-018-3592-1.

Bausch, A.R., M.A. Gallego, J. Harianto, P. Thibodeau, N. Bednaršek, J.N. Havenhand, and T. Klinger. 2018. Influence of bacteria on shell dissolution in dead gastropod larvae and adult Limacina helicina pteropods under ocean acidification conditions. *Marine Biology* 10.1007/s00227-018-3293-3.

Clatterbuck, C.A., R.L. Lewison, N.G. Dodder, C. Zeeman, K. Schiff. 2018. Seabirds as regional biomonitors of legacy toxicants on an urbanized coastline. *Science of the Total Environment* DOI:10.1016/j.scitotenv.2017.11.057.

Howard, J.K.I., K.A. Fesenmyer, T.E. Grantham, J.H. Viers, P.R. Ode, P.B. Moyle, S.J. Kupferburg, J.L. Furnish, A. Rehn, J. Slusark, R.D. Mazor, N.R. Santos, R.A. Peek, and A.N. Wright. 2018. A freshwater conservation blueprint for California: prioritizing watersheds for freshwater biodiversity. *Freshwater Science* DOI:10.1086/697996.

Jonker, M.T.O., S.A. van der Heijden, D. Adelman, J.N. Apell, R.M. Burgess, Y. Choi, L.A. Fernandez, G.M. Flavetta, U. Ghosh, P.M. Gschwend, S.E. Hale, M. Jalalizadeh, M. Khairy, M.A. Lampi, W. Lao, R. Lohman, M.J. Lydy, K.A. Maruya, S.A. Nutile, A.M.P. Oen, M.I. Rakowska, D. Reible, T.P. Rusina, F. Smedes, Y. Wu. 2018. Advancing the use of passive sampling in risk assessment and management of contaminated sediments: Results of an international ex situ passive sampling inter-laboratory comparison. *Environmental Science and Technology* DOI: 10.1021/acs.est.7b05752.

Kennen, J., E.D. Stein, and J.A. Webb. Evaluating and managing environmental water regimes in a water-scarce and uncertain future. *Freshwater Biology* DOI:10.1111/fwb.13104.

Kessouri, F., C. Ulses, C. Estournel, P. Marsaleix, F. D'Ortenzio, T. Severin, V. Taillandier, P. Conan. 2018. Vertical mixing effects on phytoplankton dynamics and organic carbon export in the western Mediterranean Sea. *Journal of Geophysical Research: Oceans* 123:1647-1669.

Parks, A.N., M.G. Cantwell, D.R. Katz, M.A. Cashman, T.P. Luxton, K.T. Ho, and R.M. Burgess. 2018. Assessing the release of copper from nanocopper-treated and conventional copper-treated lumber into marine waters: (1) Concentrations and rates. *Environmental Toxicology and Chemistry* DOI: 10.1002/etc.4141.

Sengupta, A., S.K. Adams, B.P. Bledsoe, E.D. Stein, K.S. McCune, and R.D. Mazor. 2018. Tools for managing hydrologic alteration on a regional scale: Estimating changes in flow characteristics at ungauged sites. *Freshwater Biology* DOI: 10.1111/fwb.13074.

Book Chapters

Collins, J. and E.D. Stein. 2018. California Rapid Assessment Method for wetlands and riparian areas (CRAM). in: J. Dorney, R. Savage, R. Tiner, and P. Adamus (eds.), *Wetland and Stream Rapid Assessments: Development, Validation, and Application*. Elsevier Publishers. Amsterdam, The Netherlands.

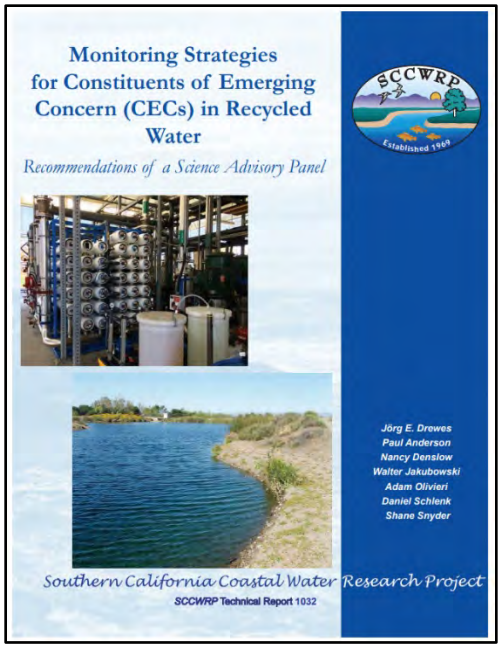
Schiff, K., K. McLaughlin, S. Moore, Y. Cao. 2018. Southern California Bight. in: C. Sheppard (ed.), *World Seas: An Environmental Evaluation, Vol I: Europe, The Americas and West Africa, 2nd edition*. Elsevier. London UK.

Technical Reports

Drewes, J.E., P. Anderson, N. Denslow, W. Jakubowski, A. Olivieri, D. Schlenk, S. Snyder. 2018. Monitoring strategies for chemicals of emerging concern (CECs) in recycled water: Recommendations of a Science Advisory Panel. Technical Report 1032. Southern California Coastal Water Research Project. Costa Mesa, CA.

Kacev, D., D.J. Gillett, A. Freire de Carvalho, C. Cash, S. Walther, C. D. Larsen, A. Thompson, L. Thompson, N. Bowlin, K. Goodwin, and E.D. Stein. 2018. Assessment of ichthyoplankton metabarcoding for routine monitoring. Technical Report 1031. Southern California Coastal Water Research Project. Costa Mesa, CA.

Maruya, K.A., A.C. Mehinto, W. Lao, R. Sutton, T. Jabusch, J. Sun, D. Lin, J. Davis,



An expert panel convened by SCCWRP to recommend updates to California's policy on monitoring CECs in recycled water has published its final report.

R. Fadness. 2018. Pilot monitoring of constituents of emerging concern (CECs) in the Russian River watershed (Region 1). Technical Report 1020. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R., M. Beck, and J. Brown. 2018. 2017 Report on the Stormwater Monitoring Coalition Regional Stream Survey. Technical Report 1029. Southern California Coastal Water Research Project. Costa Mesa, CA.

Stein, E.D., J. Taylor, A. Sengupta, S.M. Yarnell. Evaluating the effect of changes in flow and water temperature on stream habitats and communities in the Los Angeles/Ventura Region. 2018. Technical Report 1034. Southern California Coastal Water Research Project. Costa Mesa, CA.

Quarter in Review

Conference Presentations

Bay, S.M. Development and implementation of a sediment quality assessment framework for protection of benthic communities in bays and estuaries. Southern California Society of Environmental Toxicology and Chemistry Annual Conference. April 12-12, 2018. Los Angeles, CA.

Bednarsek, N., B. Carter, R. McCabe, R.A. Feely, and M.A. Sutula. Temperature and acidification impact pteropod distribution along the California Current Ecosystem. Ocean Sciences Meeting. February 18-22, 2018. Portland, OR.

Drewes, J.E., P. Anderson, N. Denslow, A. Olivieri, W. Jakubowski, D. Schlenk, S. Snyder, K. Maruya, C. Waggoner. Findings of the 2018 Science Advisory Panel on CECs in Recycled Water. WateReuse California Annual Meeting. March 25-27, 2018. Monterey, CA.

Gillett, D.J. A New Generation of Bioassessment Tools. Multi-Agency Rocky Intertidal Network Annual Meeting. March 23, 2018. San Pedro, CA.

Kessouri, F., J.C. McWilliams, D. Bianchi, L. Renault, C. Deutsch, H. Frenzel. Submesoscale modeling of the biogeochemical dynamics in the California Current Ecosystem. Ocean Sciences Meeting. February 18-22, 2018. Portland, OR.

Mazor, R.D. Setting flow targets to maintain ecological health in the face of flow alteration. California State University Water Resources and Policy Institute Annual Conference. April 5, 2018. Palm Springs, CA.

Mazor, R.D. and E.D. Stein. Overview of the bioassessment survey of the Stormwater Monitoring Coalition. Los Angeles Regional Water Quality Control Board. February 2, 2018. Los Angeles, CA.

Mehinto, A.C., K.A. Maruya. Pilot testing cell-based receptor assays to screen for emerging contaminants and assess risks in aquatic ecosystems. SETAC North America Focused Topic Meeting on High-throughput Screening and Environmental Risk Assessment. April 16-18, 2018. Durham, NC.

Moore, S. and H. Wyer. Monitoring challenges in coastal environments. 6th International Marine Debris Conference. March 12-16, 2018. San Diego, CA.

Moore, S. and H. Wyer. Opportunities, considerations, and challenges in debris monitoring within coastal environments. 6th International Marine Debris Conference. March 12-16, 2018. San Diego, CA.

Stein, E.D. Managing stream channel erosion and deposition: Development of tools for hydromodification assessment and management. International Erosion Control Association Annual Conference. February 11, 2018. Long Beach, CA.

Stein, E.D. Establishing environmental flows for California streams. California State University Water Resources and Policy Institute Annual Conference. April 5, 2018. Palm Springs, CA.

Conference Posters

Bednarsek, N., B. Carter, R.A. Feely, K. Naish. Biogeochemical importance and genetic variability of pteropods in the North Pacific and Gulf of Alaska. Ocean Sciences Meeting. February 18-22, 2018. Portland, OR.

Other Presentations

Bay, S.M. Assessment framework for human health SQO. Central Valley Regional Water Quality Control Board. February 12, 2018. Rancho Cordova, CA.

Bay, S.M. Human health SQO assessment: Technical basis and application. Santa Ana Regional Water Quality Control Board. April 24, 2018. Riverside, CA.

Mazor, R. Assessment methods for episodic streams presentation and training. Arizona Department of Environmental Quality. March 26-28, 2018. Phoenix, AZ.

Maruya, K. Effects-directed monitoring of emerging contaminants. University of California, Santa Barbara, Bren School of Environmental Science and Management. April 23, 2018. Santa Barbara, CA.

Mehinto, A. Screening for CECs in water and sediment from the Russian River watershed. California North Coast Regional Water Quality Control Board. February 8, 2018. Santa Rosa, CA.

Mehinto, A. Development of glucocorticoid bioanalytical screening assay. Regional Monitoring Program Exposure and Effect Workgroup. April 11, 2018. Richmond, CA.

Mehinto, A. Using cell-based bioscreening tools to assess occurrence and impact of contaminants in the aquatic environment. University of California, Riverside. April 27, 2018. Riverside, CA.

Moore, S. Debris in Southern California: From the rivers to the sea. Chapman University Society and the Environment class. April 4, 2018. Orange, CA.

Schiff, K. Climate change and water quality management. San Diego Regional Water Quality Control Board staff symposium. March 15, 2018. San Diego, CA.

Schiff, K. Water Quality Workshop. California Association of Sanitation Agencies Strategic Planning. March 7, 2018. Valley Springs, CA.

Schiff, K. Improving Stormwater Permit Approaches to Monitoring, Evaluation, Tracking, and Reporting. US EPA Workshop. March 21-22, 2018. Oakland, CA.

Stein, E.D. Assessing Environmental Flows in Southern California. University of California, Davis California Water Policy Seminar Series. February 7, 2018. Davis, CA.

SCCWRP Personnel Notes

Commission

Jayne Joy, who joined the Santa Ana Regional Water Quality Control Board in November 2017 as Assistant Executive Officer, was appointed Alternate Commissioner in February, filling a vacancy.

James Herberg, General Manager of the Orange County Sanitation District, replaced Dr. Bob Ghirelli in February as Commissioner. Ghirelli served on the Commission for 19 years.

Deborah Smith, who recently was promoted to Executive Officer for the Los Angeles Regional Water Quality Control Board, was elevated to Commissioner in March. Smith replaced Sam Unger, who retired after a nearly eight-year tenure as Commissioner. Smith previously served as Alternate Commissioner for 19 years.

New Faces

Dr. **Amy Zimmer-Faust**, who just completed a two-year postdoctoral fellowship at the U.S. Environmental Protection Agency's National Health and Environmental Effects Research Laboratory in Newport, Oregon, will join SCCWRP on May 8 as a Scientist in the Microbiology Department.

Dana Shultz, who just completed a master's in ocean science at the University of California, Santa Cruz, joined SCCWRP in March as a Research Technician in the Biogeochemistry Department.

Scientific Leadership

Dr. **Nina Bednaršek** has been awarded the 2018 Salish Sea Science Prize for her work on the effects of ocean acidification on pteropods. The award was presented by the SeaDoc Society, a program of the Karen C. Drayer Wildlife Health Center at the University of California, Davis.

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

Dr. **Keith Maruya** co-organized and moderated the 2018 Annual Meeting of the Southern California Chapter of the Society of Environmental Toxicology and Chemistry, held April 12-13, 2018 in Los Angeles, California.

Shelly Moore co-chaired a session titled "The importance of oceanic subtropical gyres as debris accumulation zones and how they affect ocean life" at the 6th International Marine Debris Conference, held March 12-16, 2018 in San Diego, California.

Ken Schiff has been named Associate Editor for the journal *Marine Pollution Bulletin*.

Ken Schiff facilitated a special session titled "Improvement in receiving water beneficial uses from stormwater treatment" at the North American Society of Toxicology and Chemistry Annual Conference in November 2017.

Dr. **Valentin Vasselon**, a Postdoctoral Researcher at the French National Institute for Agricultural Research, joined SCCWRP in April as a Visiting Scientist in the Biology Department. He will work at SCCWRP for about a month.

Transitions

Dr. **Fayçal Kessouri**, who has been working since 2016 as a joint postdoctoral researcher at the University of California, Los Angeles and SCCWRP, joined SCCWRP in April as a Scientist in the Biogeochemistry Department.

Maddie Griffith, who has been working since 2010 as a Laboratory Assistant in the Microbiology Department, was promoted to Research Technician in April.

Miranda Roethler, who has been working since June 2017 as a Laboratory Assistant in the Biogeochemistry Department, was promoted to Research Technician in April.

Departures

Dr. **Steven Steinberg**, Principal Scientist for SCCWRP's Information Management & Analysis Department, left SCCWRP in March to take a new job as the Geographic Information Officer for the County of Los Angeles.

Dr. **Olivia Rhoades**, who has worked since July 2017 as a joint postdoctoral researcher for the California Ocean Science Trust and SCCWRP, left in March for a new job opportunity.

SCCWRP COMMISSIONER SPOTLIGHT

Engineer pivots from regulated party to regulator

Until she joined the Santa Ana Regional Water Quality Control Board six months ago, Jayne Joy had never served as a water-quality regulator. For the past 33 years, she worked on the other side of the fence, managing water-quality compliance issues for regulated agencies.

Jayne Joy

Even so, the transition in fall 2017 felt seamless for her.

"I've always felt like I've been a regulator," said Joy, Assistant Executive Officer for the Santa Ana Regional Board. "I've spent my career understanding regulations and explaining them to others and providing guidance on how to come into compliance with them."

Joy was appointed Alternate Commissioner in February, replacing Hope Smythe, who became Commissioner following Commissioner Kurt Berchtold's retirement last year. As the No. 2 in command at the Regional Board, Joy oversees three divisions – Stormwater and Wastewater Permits, Planning, and Site Cleanup – and serves as lead for the enforcement unit.

Before joining the Santa Ana Regional Board, Joy worked for 17 years as Environmental and Regulatory Compliance Director for the Eastern Municipal Water District, based in Perris. Her main job was advising upper management on compliance and permitting issues for a water district spanning 542 square miles of the Inland Empire.

"Of all the regulatory agencies I worked with, the Santa Ana Regional Board was always my favorite," said Joy, a chemical engineer by training. "They work very collaboratively as a team to come up with sound solutions. That's how I like to work."

Jayne Joy chats with a fellow member of Idyllwild's artist community while standing next to her easel during a 2017 outdoor painting event. Joy is an amateur oil painter who focuses on faces and landscapes.

Jayne Joy, P.E.

Job: Assistant Executive Officer, Santa Ana Regional Water Quality Control Board (2017-present)

SCCWRP role: Commissioner (started February 2018)

Prior jobs: Environmental and Regulatory Compliance Director, Eastern Municipal Water District (2001-17); Environmental Engineering Division Head, Camp Pendleton Marine Corps Base (1992-2001); Environmental Engineer, WW Engineering & Science in Michigan (1990-92); Environmental Engineer, Camp Pendleton Public Works Office (1985-1990)

Education: B.S. chemical engineering, University of California, San Diego (1984)

Residence: Idyllwild

Family: Son James, an electrical engineer, and daughter Catie, a marriage and family counselor; two grandchildren

Hometown: St. Clair Shores, a suburb of Detroit, Michigan

Hobbies: Hiking; oil painting; reading; going to art museums and plays

Before the water district, Joy worked for 14 years in environmental compliance for the Camp Pendleton Marine Corps Base, rising to become Environmental Engineering Division Head for the base's Environmental Security Office. She started as an Environmental Engineer on the base in 1985, her first job out of college.

"I'm a firm believer in regulations," Joy said. "If thery're not there, things won't get done. We've got to make sure the earth stays balanced, that we're managing our population growth."

Joy is particularly excited about serving on the Commission because of SCCWRP's relentless focus on science first, then policy.

"SCCWRP looks at things from a purely science point of view," Joy said. "We get a better product and better outcomes, and then we can develop policy around it."

Joy is planning to move to Riverside to be close to her new job, but for now is living in her cabin in Idyllwild – a place where she's also planning to retire.

As an amateur oil painter, Joy has a particular affinity for Idyllwild's artist community. She specializes in painting faces and landscapes, and has sold a few of her pieces.

CTAG SPOTLIGHT

Researcher trades academia for management

Dr. Jun Zhu completed his Ph.D. in environmental sciences in 2010 with every intention of going into academic research and teaching.

Dr. Jun Zhu

But as he was finishing a two-year postdoc at UC Santa Barbara in 2013, he recalls being suddenly drawn to an Environmental Scientist position with the Los Angeles Regional Water Quality Control Board; he can't even recall how he first heard about the job opening.

Although the position entailed no academic research, Zhu loved the idea of applying research to solve real-world environmental problems. Five years later, Zhu has no regrets about his abrupt about-face.

"I realized that direct, real-life problems is something I'd rather work on," said Zhu, now Senior Environmental Scientist for the L.A. Regional Board. "The public may not know too much about academic research, but protecting water quality is something that's tangible and important to people."

Zhu was appointed to CTAG in December 2017 after being promoted to Senior Environmental Scientist; he replaced Michael Lyons, who retired. In his new role, Zhu serves as the L.A. Regional Board's Surface Water Ambient Monitoring Program (SWAMP) Coordinator. He also serves as the lead permit writer for dredging and sediment contamination-related issues.

While Zhu has found his calling in water-quality management, he has not left academia altogether. Since 2011, he has worked as a remote, part-time lecturer for the University of Massachusetts, Boston, his alma mater. He teaches online courses about the global environment and geographic information systems (GIS).

Dr. Jun Zhu, left, and his parents explore Tasmania, Australia in 2016. Zhu has long been drawn to seeing landscapes around the world.

Jun Zhu, Ph.D.

Job: Senior Environmental Scientist, Los Angeles Regional Water Quality Control Board (2017-present)

SCCWRP role: CTAG Representative (started December 2017)

Other jobs: Lecturer, online environmental science courses, University of Massachusetts, Boston (2011-present); Environmental Scientist, L.A. Regional Board (2013-17); Postdoctoral Scholar, Bren School of Environmental Science and Management, University of California, Santa Barbara (2011-13)

Education: Ph.D. environmental sciences, University of Massachusetts, Boston (2010); M.S. physical geography, East China Normal University (2003); B.S. geography, East China Normal University (2000)

Residence: Hollywood

Family: Parents Quanlin, a retired business owner, and Xiaojun, a retired school teacher

Hometown: Shanghai

Hobbies: Skiing; hiking; going to farmers markets and the beach

Zhu's academic research background has been an asset throughout his career. As SWAMP Coordinator, he's responsible for reviewing and managing multiple studies in the L.A. region. And through his participation in the 2018 cycle of the Southern California Bight Regional Monitoring Program, he's part of a collaborative effort to shape study designs and interpret data.

"I enjoy being part of the dialogue and collaborations at SCCWRP," Zhu said. "It's very rare to see different groups of stakeholders sitting down and figuring out this region-wide monitoring effort."

Zhu's interest in the environmental sciences was motivated by his lifelong love of landscapes and geography.

As a child growing up in Shanghai, he loved traveling to see different parts of China. Now, as an adult, he loves traveling all around the world. In recent years, he's visited Iceland, Norway, Sweden, Denmark, Switzerland, Australia, New Zealand and Japan.

Although his parents still live in Shanghai, Zhu remains close to them, and they visit him regularly at his home in Hollywood.

SCCWRP PARTNER SPOTLIGHT

Researcher passionate about applied science

When Dr. Valentin Vasselon started college in France a decade ago, he enrolled in a technical school and planned to become an environmental lab technician.

Dr. Valentin Vasselon

But he quickly fell in love with learning and, at the urging of mentors, just kept going – pursuing a bachelor's, then a master's, and finally a Ph.D. in biodiversity, ecology and the environment.

As he reached the end of his Ph.D. at Grenoble Alpes University in France, he also became passionate about applying academic research to real-world applications.

"I was producing knowledge without application," recalled Vasselon, now a postdoctoral researcher for the French National Institute for Agricultural Research. "I wanted to see how what I do is useful to environmental agencies, to interact with people to understand their problems and solve them with new approaches."

Vasselon joined SCCWRP in mid-April as a Visiting Scientist in the Biology Department, where he'll examine how molecular approaches to stream biomonitoring in France compare to U.S. approaches. Vasselon's postdoctoral adviser, Dr. Agnes Bouchez, is a long-time SCCWRP partner on stream biomonitoring work.

"Even if we use the same terminology, we don't necessarily have the same constraints and operate at the same scales," said Vasselon, who will work at SCCWRP for about a month.

Vasselon's Ph.D. work, which he's continued into his postdoc, focuses on examining the community composition of diatoms growing on rocky streambed surfaces as a way to gauge the overall ecological condition of a stream site. Instead of identifying the diatoms under a microscope, the diatoms' DNA is isolated and sequenced via a technology known as metabarcoding, which has the potential to offer a rapid, cost-effective alternative to traditional taxonomic identification.

Dr. Valentin Vasselon conducts sampling of diatoms in a streambed in the French island community of Mayotte, off the eastern coast of Africa. A young Mayotte boy checks in on him.

Valentin Vasselon, Ph.D.

Job: Postdoctoral Researcher, French National Institute for Agricultural Research (2018-present)

SCCWRP role: Visiting Scientist (started in mid-April)

Education: Ph.D. biodiversity-ecology-environment, Grenoble Alpes University (2017); M.S. microbial ecology, Claude Bernard Lyon 1 University (2013); B.S. science-technology-health, Claude Bernard Lyon 1 University (2011); technical degree in biology and environment, Jean Monnet University (2009)

Residence: Costa Mesa (Permanent residence: Thonon-les-Bains in eastern France)

Family: Wife Amélie, a student studying business administration; cat Grosminet

Hometown: Saint-Étienne in eastern central France

Hobbies: Fishing; running; hiking, tennis; gardening

Vasselon originally developed the diatom bioindicators for use in France's Department of Mayotte, a small, densely populated set of islands off the southeastern coast of Africa under French control. Vasselon is now working to adapt the bioindicators for use in mainland France.

"I collaborate with scientists all over Europe – it's the best way to solve problems," Vasselon said.

Vasselon grew up in the eastern central French town of Saint-Étienne. His family was passionate about recreational fishing, and it shaped his love of the outdoors.

When he's not working, Vasselon still loves to fish and hike around his home in Thonon-les-Bains, a town along the French-Swiss border just outside Geneva.

Vasselon has visited California previously, but not Southern California; the place he's most looking forward to seeing during his visit is Death Valley. His wife, Amélie, also is planning to join him for 10 days.

SCCWRP STAFF SPOTLIGHT

Environmentalist studying climate change impacts

Jennifer Taylor's desire to protect the environment dates back to childhood. Growing up in an environmentally conscious household in Wellesley outside Boston, Taylor learned from her parents about the importance of being good environmental stewards.

Jennifer Taylor

Taylor's mother, an industrial hygienist, taught her about toxicants and other workplace hazards. Her father, who volunteered on local wetland and conservation groups in her hometown of Wellesley, Mass., taught her to value the natural ecosystems in her community.

In one particularly poignant story from childhood, Taylor recalls how her front lawn was the only one on the block that wasn't perfectly manicured.

"We had weeds and crabgrass because my parents didn't want to use any pesticides," said Taylor, now a D.Env. candidate at UCLA. "It made me aware of how much we as humans can impact our environment."

Taylor started in July 2017 as a Senior Research Technician in the Biology Department, part of the final two years of her UCLA doctoral program. SCCWRP's Dr. Eric Stein is an alum of the same program, which places students into full-time jobs to complete their studies and doctoral dissertation.

Taylor is part of the SCCWRP team that is investigating how climate change is impacting stream flows and how biological communities are affected by these changes. She also may look at how climate change will impact wetlands and estuaries.

Jennifer Taylor explores Zion National Park in Utah in 2015 with boyfriend Ben, a Ph.D. student in biostatistics at UCLA.

Jennifer Taylor, D.Env. Candidate

Job: Senior Research Technician, Biology Department

Started: July 2017

Prior jobs: Solar Hot Water Consultant/Project Manager, BEAM Engineering in Boston (2011-13)

Education: D.Env. student in environmental science and engineering, University of California, Los Angeles (2015-19); M.S. environmental health science, UCLA (2015); B.S. environmental science and B.A. psychology, University of Massachusetts, Amherst (2011)

Residence: Huntington Beach

Family: Parents Marc, a cybersecurity analyst, and Anita, an industrial hygienist; boyfriend Ben, a Ph.D. student in biostatistics at UCLA

Hometown: Wellesley, Massachusetts

Hobbies: Hiking, backpacking, yoga, swimming, traveling, going to the beach

"I've always loved coastal habitats, so this is a perfect fit for my research interests," Taylor said.

As for her long-term career plans, Taylor says she aspires to work as a scientist in the policy arena, combining her interest in science with furthering management goals.

"There is a pretty large gap between bench scientists and the people studying policy and setting regulations," Taylor said. "I want to help make that gap smaller."

After double-majoring in environmental science and psychology at the University of Massachusetts, Amherst, Taylor took two years off school to work as a solar hot water consultant for a renewable energies startup in Boston. She did outreach to local businesses about the feasibility of installing water tanks that can be heated with solar power.

In her free time, Taylor enjoys traveling with her boyfriend, Ben. They've been on backpacking, kayaking and canoeing trips across the western U.S. Last year, they traveled to Costa Rica and London.

SCCWRP SCENES

Bonding over ice

SCCWRP staff bonded over a night of professional ice hockey during a SCCWRP-sponsored trip to an Anaheim Ducks game on the evening of April 4. The game, which was held at the Honda Center in Anaheim, featured the hometown Ducks battling the Minnesota Wild. The Ducks won the game 3-1.

Clockwise from top: SCCWRP's vantage point during the Anaheim Ducks vs. Minnesota Wild hockey game at the Honda Center in Anaheim; SCCWRP's Dana Shultz, left, with SCCWRP's Ken Schiff and wife Maureen; SCCWRP's Christina Rivas, left, Dr. Alvina Mehinto and Dr. Nikolay Nezlin; and, from left, SCCWRP's Amber Jolly, Miranda Roethler, Brianna Feld and Cody Fees.