

**SOUTHERN CALIFORNIA COASTAL WATER RESEARCH PROJECT**  
*A Public Agency for Environmental Research*



**Quarterly Director's Report  
to the SCCWRP Commission**

**February 2015**

*Detailing activities November 8, 2014 – February 5, 2015*

**Stephen B. Weisberg, Ph.D.**  
**Executive Director**

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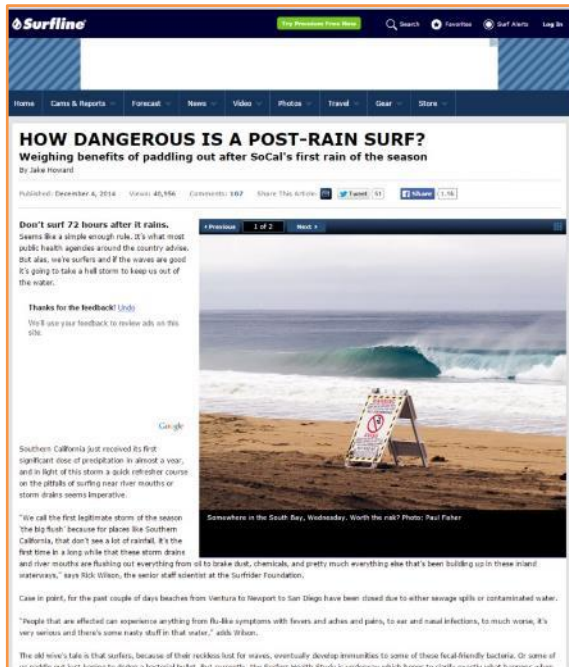
# HIGHLIGHTS

## News

### SCCWRP's Surfer Health Study gets strong media coverage as full study kicks off

A SCCWRP study that will ascertain how the health of surfers during Southern California's rainy winter months is impacted by stormwater runoff has generated extensive coverage by mainstream media and surfing news outlets.

In December, the Santa Ana-based Orange County Register newspaper published [a lengthy piece on the Surfer Health Study](#) and the range of ways that local surfers have dealt with the uncertainty that surrounds the three days following rainfall.



Surflife has published a story about the Surfer Health Study that has been viewed more than 40,000 times.

Huntington Beach-based surfing news site Surflife, meanwhile, referenced the study in [an online story](#) that generated more than 100 comments and was viewed more than 40,000 times. And the San Clemente-based surfing organization Surfrider Foundation, which is a study partner, published [a blog post](#) from senior staff scientist Rick Wilson about the purpose and goals of the study.

The [Surfer Health Study](#), which began with a pilot study that launched in December 2013, is focused on assessing whether microbes carried by runoff that flows through storm drains to the ocean are making surfers sick. The full study kicked off on December 1, 2014; the findings will be published in 2016.

For more information, contact lead study author [Ken Schiff](#).

### SCCWRP finalizes design of five-year study to monitor for CECs statewide

SCCWRP has finalized the design of a multi-year pilot study that will allow California to begin monitoring for contaminants of emerging concern (CECs) in receiving waters statewide.

The State's CEC expert advisory panel, facilitated by SCCWRP, helped guide the design of the statewide study. The panel's final planning meeting was held at SCCWRP in December, providing a final opportunity to receive input from stakeholders about the study's design. Prior public planning meetings were held in September 2013 and May 2014.

In early February, a report that describes details of the CEC monitoring study is expected to be released. The study will take five years to complete providing California with its first geographically diverse snapshot of the prevalence and impacts of CECs on the environment.

SCCWRP designed the study in consultation with the state's CEC expert advisory panel. This panel was originally put together by SCCWRP in 2010 to develop CEC monitoring recommendations for recycled water; the State Water Board adopted the panel's recycled-water recommendations in 2013.

Documents related to the CEC environmental monitoring study are available on [the project's webpage](#). For more information, contact Dr. [Keith Maruya](#).

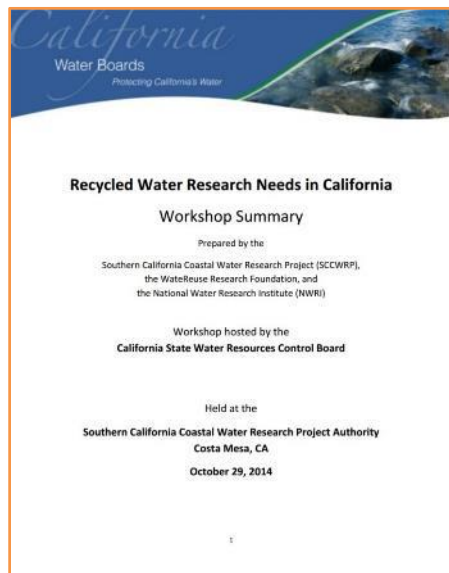


Treated effluent is released into the highly channelized Los Angeles River. SCCWRP has designed a study that will monitor for CECs in this type of environment.

### State report sums up workshop held at SCCWRP on recycled water research needs

The State Water Board has published a report summarizing a day-long workshop on recycled water research needs that was held at SCCWRP in October.

The workshop on Recycled Water Research Needs in California brought together 57 invited leaders from stormwater, wastewater treatment and drinking water entities, as well as staff from the State Water Board and its Regional Boards.



The workshop culminated with informal voting by participants on where they saw the greatest research needs. Participants identified ambient water effects and human health concerns as high-priority research areas. Topping this list were topics including changes in stream flow due to changing water use and the impacts of constituents of emerging concern. Other important topics such as performance reliability, training and certification of treatment plant operators, and social acceptance of direct potable reuse were also identified.

SCCWRP collaborated with two of the nation's leading recycled water organizations – the National Water Research Institute (NWRI) and the WaterReuse Research Foundation (WRRF) – in developing the technical foundation materials and presentations

for the workshop.

The [full workshop summary](#) may be viewed on the State Water Board's website. For more information, contact Dr. [Steve Weisberg](#).

### **SCCWRP scientist wins visiting-scholar fellowship from Australia's University of Melbourne**



Dr. Ashmita Sengupta

SCCWRP hydrogeologist Dr. Ashmita Sengupta has won a competitive grant from the University of Melbourne's engineering school to visit the university next year as a MERIT Visiting Scholar.

Sengupta plans to spend approximately one week at the University of Melbourne in summer 2015 interacting with faculty and delivering a seminar talk on water management in drought-prone areas. The MERIT Visiting Scholar program, sponsored by the [Melbourne School of Engineering](#), is awarded to scholars of exceptional international distinction, according to program officials.

Sengupta's research at SCCWRP focuses on applying modeling techniques to evaluate and improve the efficacy of Integrated Water Resource Management (IWRM) strategies, evaluate tradeoffs, and biological responses due to watershed activities.

Sengupta was nominated for the award by research collaborators at the University of Melbourne. SCCWRP became a collaborator with the University of Melbourne through both entities' participation in the University of California, Irvine's Water Partnerships for International Research and Education ([UCI Water-PIRE](#)), an initiative funded by the National Science Foundation that seeks to strengthen collaboration between leading water-productivity researchers in southeastern Australia and the southwestern United States.

Sengupta, along with Dr. [Eric Stein](#) and Dr. [Martha Sutula](#), represents SCCWRP in the two-nation partnership; they are working with Australian researchers on how to effectively capture and reuse water runoff and restore urban watersheds to more natural states.

For more information, contact Dr. [Ashmita Sengupta](#).

### **SCCWRP scientist featured in special magazine issue on women in oceanography**

SCCWRP biological oceanographer Dr. Meredith Howard has been featured in a special issue of The Oceanography Society's magazine that examines the contributions and progress made by women in the field of oceanography over the past decade.

The special issue, “Women in Oceanography: A Decade Later,” chronicles efforts to bring gender balance to a profession dominated by men. A one-page autobiographical essay penned by Howard for the magazine discusses her journey to becoming an oceanographer and how she’s been able to find a proper work-life balance.

The Oceanography Society, based in Washington, D.C., published the “Women in Oceanography: A Decade Later” issue as a supplement to its December 2014 magazine. It [may be viewed for free online](#); Howard’s autobiographical essay appears on Page 141 of the magazine.

For more information, contact Dr. [Meredith Howard](#).



Dr. Meredith Howard

*SCCWRP Scenes*



SCCWRP field technicians perform beach sampling at Leo Carrillo State Beach near the Los Angeles-Ventura County border. One important outcome of this study is establishing the statistical basis for scientific statements about the presence, or lack of presence, of human fecal markers. This information is critical for new approaches to site-specific objectives such as Quantitative Microbial Risk Assessments (QMRA).

# PEOPLE

## Honors and Awards

- SCCWRP has received a **Certificate of Recognition** from the Algalita Foundation, a nonprofit organization that conducts research and raises awareness about marine debris. SCCWRP was recognized for providing scientific support and guidance to Algalita as it developed its research expeditions. The award was presented on November 8 as Algalita celebrated its 20th anniversary.
- Dr. Steve Steinberg has won the annual **Ocean Leadership Award** from the West Coast Governors Alliance on Ocean Health. Steinberg, who serves as co-chair of the West Coast Ocean Data Portal Workgroup, received the award at the workgroup's annual meeting November 3-4.
- SCCWRP received one of three **Outstanding Poster Awards** at the Esri Ocean GIS Forum held November 5-7, for the agency's poster on developing a geospatial tool that can quantify how pollutants from effluent and runoff are impacting water quality in the Southern California Bight. The poster is based on a book chapter that SCCWRP has written for Esri's upcoming publication, *Ocean Solutions, Earth Solutions*.
- SCCWRP scientists who co-authored a series of recent papers on the use of quantitative PCR in quantifying microbial water contamination have received the U.S. Environmental Protection Agency's 2013 **Scientific and Technological Achievement Award**. The EPA Level II recognition was awarded in the category of Monitoring and Assessment Methods.



SCCWRP Deputy Director Ken Schiff, left, accepts the agency's Certificate of Recognition from the Algalita Foundation in November. Captain Charles Moore, Founder and Research Director of Algalita, is at right.

## Personnel

- Dr. **Neil Saintilan**, a visiting scientist from the Australian state of New South Wales, joined SCCWRP in mid-November for a three-month tenure. He is a Fulbright Scholar in Climate Change and Clean Energy who is studying the capacity of tidal wetlands to capture atmospheric carbon and store it for long periods in wetland soils. He is working with Dr. Eric Stein in the Biology Department.



Dr. Neil Saintilan



- Laboratory assistants **Lorianne Emler** and **Alexandra Shaffer** were promoted in December and January, respectively, to research technicians in the Biogeochemistry Department.
- Dr. **Chris Solek**, a scientist in the Biology Department, left SCCWRP in January after a nearly eight-year tenure. He took a job with the Council for Watershed Health in Los Angeles.
- **Mark Engeln**, a research technician in the Biology Department since 2013, is leaving Feb. 13 to take a bioinformatics position at the University of Southern California.



Lorianne Emler



Alexandra Shaffer

### *Commission*

- Alternate Commissioner **Gary Hildebrand** of the Los Angeles County Flood Control District has been promoted to Commissioner, replacing Massood Eftekhari, who took another job within the Los Angeles County Department of Public Works.



Gary Hildebrand



Angela George



Dr. Peter Vroom

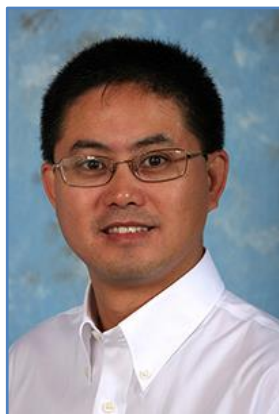
- CTAG Representative **Angela George** of the Los Angeles County Flood Control District has been promoted to Alternate Commissioner, replacing Hildebrand in that role.
- **Dr. Peter Vroom** of the City of San Diego has been appointed as Alternate Commissioner, replacing Tim Stebbins. Stebbins will continue to serve as the City's CTAG Representative.

### *Commission's Technical Advisory Group*

- **Paul Alva** of the Los Angeles County Flood Control District has replaced Angela George as CTAG Representative. George is now Alternate Commissioner.

## Staff Spotlight

### Dr. Wenjian “Wayne” Lao – Chemist



Dr. Wenjian Lao

Dr. Wayne Lao is a senior research technician in SCCWRP’s Chemistry Department. His research focuses on instrumental analysis of environmental samples using gas chromatography/mass spectrometry (GC/MS). Recently he has been developing several analytical methods for current-use pesticides (e.g., pyrethroid and fipronil) as well as contaminants of emerging concern (e.g., flame retardants, musks and alkylphenols). Lao also has been working on development of passive sampling techniques using solid-phase microextraction (SPME) and polyethylene film for analyzing hydrophobic organic compounds in bulk and sediment interstitial water phases.

After graduating from China's Xi'an Shiyou University with an undergraduate chemistry degree in 1990, Lao joined a geochemical exploration crew with the Chinese National Petroleum Corporation's Bureau of Geophysical Prospecting.

There, he contributed to the design of a soil gas sampler and developed a rapid, onsite analytical method for light hydrocarbons in soil gas used in geochemical petroleum prospecting. Following this successful method development, Lao was appointed as head of the Instrumental Analysis Department in 1992 and worked in many promising oilfields. Then, from 1995 to 2000, he pursued his master's and doctoral degrees in analytical chemistry at the Lanzhou Institute of Chemical Physics within the Chinese Academy of Sciences (CAS). Soon after, he joined the Research Center for Eco-Environmental Sciences of CAS in Beijing, and was involved in a “Chinese 973 project” to evaluate soil contamination in the city of Beijing. Lao came to the U.S. as a postdoctoral researcher, first at Vanderbilt University and later at Mississippi State University.

He moved to the West Coast in 2005 when he accepted a post-doctoral position at the University of California, Riverside, in the lab of SCCWRP partner Jay Gan. During this period, he worked on chiral separation and enantioselectivity of herbicides and rodenticides, as well as mitigation of pyrethroid runoff from an Orange County nursery. Wayne joined SCCWRP in 2006. His research background has critical importance for evaluating contaminated marine sediment throughout California.

Beyond his professional interests, he values “the opportunity to combine my scientific interests at SCCWRP with my fishing hobby,” he said. In his spare time, Lao also enjoys swimming and playing ping-pong and poker. A proud resident of Irvine, he lives with his wife, Ying Chu, and their two children, Jason, a tenth-grader, and Reyna, a third-grader.



Dr. Wenjian Lao, right, with his family at the San Diego Zoo Safari Park.

## Partner Spotlight

### Dr. Neil Saintilan – Macquarie University



Dr. Neil Saintilan

Currently a visiting Fulbright Scholar in Climate Change and Clean Energy at SCCWRP, Dr. Neil Saintilan is transitioning from his role as a senior principal research scientist in the New South Wales government’s environmental agency to Macquarie University in Sydney, as a professor and chair of the Environmental Science Department. In the New South Wales Office of Environment and Heritage, Saintilan worked as the theme leader for water and wetlands, coordinating advice concerning river and wetland management across Australia’s most populous state. His scientific team conducted research to support improved aquatic ecosystem management, including design of environmental flows for the maintenance of wetland health, development of floodplain management plans, assistance with EPA prosecutions, reserve system planning with the National Parks, and research on climate change impacts and adaptation. Upon his return to Australia in mid-February, Saintilan will join Macquarie University, which boasts one of Australia’s top three-ranked environmental science research programs.

Originally from Sydney, Saintilan received his bachelor’s degree in biology and geography and his Ph.D. in biogeography, both from the University of Sydney. He began his career as an academic, taking a faculty position at Australian Catholic University, where he led implementation of the Bachelor of Environmental Science program for more than 12 years. However, he felt a lack of familiarity with the workforce that his students were being trained to enter. In 2006, the opportunity to join the New South Wales government offered him the ability to develop a better understanding of science needs within the policy and management sector. “I always intended to return to the academic world, and to bring with me the perspectives gained from time in the industry,” he said.

Dr. Saintilan primary collaborator at SCCWRP is Dr. Eric Stein, whom he met through the Society of Wetland Scientists. Saintilan came to SCCWRP in November 2014 to study the capacity of tidal wetlands to capture atmospheric carbon and store it for long periods in wetland soils – an area that Saintilan calls a “neat nexus” between climate change adaptation and mitigation. SCCWRP was a natural choice for where he would work, he said. “Both organizations were tasked with bringing best available science to real management questions,” he said. Saintilan is being co-hosted by Chapman University in Orange, in partnership with the Tijuana River National Estuarine Research Reserve.

Saintilan’s family came to visit him this winter in Southern California, remarking that a SoCal winter closely resembles summer, Saintilan said. His wife, Megan, is an elementary school teacher, and their 20-year-old twin daughters, Chloe and Phoebe, are studying marketing and law, respectively. Their son, Christopher, is in high school and wants to be a pilot.



Dr. Neil Saintilan, second from left, with his family at the Grand Canyon.

## Commissioner Spotlight

### Dr. Peter Vroom – City of San Diego Public Utilities Department



Dr. Peter Vroom

Dr. Peter Vroom was appointed in May 2014 as Deputy Director for the City of San Diego Public Utilities Department. His work consists of managing the Environmental Monitoring and Technical Services (EMTS) Division, which is responsible for monitoring and assessing the marine environment, as well as reservoirs, the water distribution system, recycled water, and wastewater treatment facilities for regulatory compliance.

After attending high school in Palo Alto, Vroom earned a bachelor's in biology from the University of Puget Sound in Tacoma, Wash. He then earned a master's and doctoral degree in botanical sciences from the University of Hawaii at Manoa. While there, he gained experience as a teaching assistant, conducted research on biofouling with the Office of Naval Research, and began collecting rare algal specimens for the Bishop Museum. He remained in Hawaii as a post-doctoral researcher with the National Oceanic and Atmospheric Administration (NOAA), continuing his algal sampling and taxonomy work. Over the next eight years, he took on other marine ecology and botany research positions with NOAA, including being responsible for establishing benchmarks of reef health in relatively undisturbed tropical environments. His team used SCUBA to survey more than 40 Pacific islands, many of which are uninhabited and possess the healthiest reef systems remaining on the planet. Vroom transferred to the City of San Diego's EMTS Division in May 2011. Always one to keep busy, he still serves as an affiliate graduate faculty member for the University of Hawaii, does part-time work with NOAA, curates the marine algae collection at the San Diego Natural History Museum, and serves as co-owner of a Washington, D.C.-based textile design company called nettle+fin that creates fabric patterns based on organismal biology.

Vroom began interacting with SCCWRP in 2012. He values the inclusiveness and neutrality of the organization. "SCCWRP provides a neutral forum for people to learn about all sides of issues and encourage sound science-based decisions," he said. SCCWRP also helps the City of San Diego put marine data into regional context, which greatly improves the understanding of larger-scale natural variation, he said. Vroom is a member of the Southern California Bight Regional Monitoring Program (Bight'13) Planning Committee and the aerial kelp survey program. Vroom also is a member of Southern California Association for Marine Invertebrate Taxonomists (SCAMIT) alongside several SCCWRP staff members. As a Commissioner, he also participates on the Personnel and Finance Committee.

Peter lives in the Pacific Beach neighborhood of San Diego with his partner, Trent, who owns a skincare business. When work fails to keep him busy, he enjoys cooking and having friends over for dinner, relaxing in the garden, and going on car trips to explore all that California has to offer.



Dr. Peter Vroom with partner Trent.

## CTAG Spotlight

### Stan Asato – City of Los Angeles



Stan Asato

Stan Asato joined CTAG in early 2014, replacing retiree Dr. Gerry McGowen. Asato is the Acting Biology Section Laboratory Manager for the City of Los Angeles Bureau of Sanitation's Environmental Monitoring Division (EMD). He supervises the Boat Operations, Microbiology, Ocean Assessment, and Toxicity Testing Units. His responsibilities range from staffing and budgeting to monitoring treatment plant effluent toxicity, bacterial levels along the shoreline, and the biological community in receiving waters including Santa Monica Bay, the Los Angeles River, and Los Angeles Harbor.

Raised in West L.A., Asato feels very fortunate to have grown up in the 1960s. In his youth, he enjoyed exploring and collecting aquatic animals from Ballona Creek, Dana Point, and Palos Verdes (some as “pets,” and some for dinner). Inspired by his early experiences and popular marine biology-focused television programs, he went on to earn a bachelor's degree in marine biology from California State University, Long Beach. While an undergraduate, he took a Marine Benthic Invertebrates course with Dr. Donald Reish. Dr. Reish agreed to be his master's thesis advisor, and Asato completed his degree in 1989. He joined the EMD's Ocean Assessments and Toxicity Testing Units as a water biologist responsible for field work, benthic sorting, basic marine organism identification, and toxicity testing. He was promoted in 1996, and again in 2003 to Toxicity Testing and Microbiology Supervisor.

During his time with the City, he began attending meetings at SCCWRP regarding toxicity testing policy, new test procedures, and protocol standardization. He also participated in the Bight '98 program, his first exposure to sediment toxicity testing. He started interacting more with Toxicology Department staff members, especially Steve Bay, Darrin Greenstein, and Doris Vidal-Dorsch, but has known others, including Dario Diehl and Ken Schiff, since his college days. “SCCWRP has benefitted the work of our agency by supplying support in many of our monitoring programs, including water quality, sampling, interpretation of data, and assistance in special studies,” he said. In recent years, Stan also began occasionally attending CTAG meetings as an alternate. He now values the opportunity as a CTAG member to have a bigger influence on SCCWRP's research directions and meet with other CTAG representatives.

Stan currently lives in Huntington Beach with his wife, Kelly, a licensed social worker, and their two daughters, Kalia, a college student, and Melia, a high school senior. His hobbies include scuba diving, surfing, and paddling stand-up paddleboards and outrigger canoes. He also enjoys planning vacations around these ocean recreation activities.



Stan Asato, third from left, with his family, from left, daughter Kalia, wife Kelly, and daughter Melia.

# COMMUNICATIONS

## *Journal Articles — Published*

- [Correspondence of biological condition models of California streams at statewide and regional scales](#). 2015. JT May, LR Brown, AC Rehn, IR Waite, PR Ode, RD [Mazor](#), KC [Schiff](#). *Environmental Monitoring and Assessment* 187:4086.
- [Effect of ecological group classification schemes on performance of the AMBI benthic index in US coastal waters](#). 2015. DJ [Gillett](#), SB [Weisberg](#), T Grayson, A Hamilton, V Hansen, EW Leppo, MC Pelletier, A Borja, D Cadien, D Dauer, R Diaz, M Dutch, JL Hyland, M Kellogg, PF Larsen, JS Levinton, R Llansó, LL Lovell, PA Montagna, D Pasko, CA Phillips, C Rakocinski, JA Ranasinghe, DM Sanger, H Teixeira, RF Van Dolah, RG Velarde, KI Welch. *Ecological Indicators* 50:99-107.
- [Droplet digital PCR for simultaneous quantification of general and human-associated fecal indicators for water quality assessment](#). 2014. Y [Cao](#), MR [Raith](#), JF [Griffith](#). *Water Research* 70:337-349.

## *Journal Articles — Published Online*

- [Governance issues in developing and implementing offsets for water management benefits: Can preliminary evaluation guide implementation effectiveness?](#) 2015. DL Feldman, A [Sengupta](#), L Stuvick, ED [Stein](#), V Pettigrove, M Arora. *WIREs Water* 10.1002/wat2.1061.
- [Nontargeted biomonitoring of halogenated organic compounds in two ecotypes of bottlenose dolphins \(\*Tursiops truncatus\*\) from the Southern California Bight](#). 2015. NJ Shaul, NG [Dodder](#), LI Aluwihare, SA Mackintosh, KA [Maruya](#), SJ Chivers, K Danil, DW Weller, E Hoh. *Environmental Science and Technology* 10.1021/es505156q.
- [Using performance reference compound-corrected polyethylene passive samplers and caged bivalves to measure hydrophobic contaminants of concern in urban coastal seawaters](#). 2015. AS Joyce, MS Pirogovsky, RG Adams, W [Lao](#), D Tsukada, CL Cash, JF Haw, KA [Maruya](#). *Chemosphere* 10.1016/j.chemosphere.2014.12.067.
- [A tiered assessment framework to evaluate human health risk of contaminated sediment](#). 2015. BK. Greenfield, AR Melwani, SM [Bay](#). *Integrated Environmental Assessment and Management* 10.1002/ieam.1610.
- [An assessment of the transport of Southern California stormwater ocean discharges](#). 2014. PA Rogowski, E Terrill, K [Schiff](#), SY Kim. Elsevier. *Marine Pollution Bulletin* dx.doi.org/10.1016/j.marpolbul.2014.11.004.

- [Small drains, big problems: the impact of dry weather runoff on shoreline water quality at enclosed beaches](#). 2014. MA Rippy, R Stein, BF Sanders, K Davis, K [McLaughlin](#), JF Skinner, J Kappeler, SB Grant. *Environmental Science & Technology* dx.doi.org/10.1021/es503139h.

### *Journal Articles — Accepted*

- None this quarter

### *Technical Reports*

- [Linking nutrients to alterations in aquatic life in California wadeable streams](#). 2014. E [Fetscher](#), M [Sutula](#), A [Sengupta](#), N Detenbeck. Technical Report 834.
- Rainfall runoff model of Jackson Creek catchment. 2014. M Arora, A Dey, A [Sengupta](#), V Pettigrove. University of Melbourne-CAPIM Technical Report 53.
- [Southern California Stormwater Monitoring Coalition 2014 Research Agenda](#). 2014. K Schiff, ED Stein, S Aminzadeh, A Boehm, G Hildebrand, L Honeybourne, I Nasser, P Ode, S Taylor, D Senn, J Smith, C Sommers, E Strecker. Technical Report 828.
- [Assessing Areas of Special Biological Significance Exposure to Stormwater Plumes Using a Surface Transport Model](#). 2014. P Rogowski, E Terrill, L Hazard, K Schiff. Technical Report 817.
- [Areas of Special Biological Significance: Bioaccumulation Monitoring](#). 2014. N Dodder, W Lao, D Tsukada, D Diehl, K Schiff. Technical Report 816.

### *Conference Presentations*

#### SETAC North America 35<sup>th</sup> Annual Meeting – November 9-13, 2014 – Vancouver, Canada

- (Session) Advanced analytical methods for contaminant discovery – N [Dodder](#) (Chair)
- Laboratory intercomparison of cell bioassays for screening of recycled water – A [Mehinto](#), K [Maruya](#), A Jia, S Snyder, N Denslow, S Jayasinghe, D Schlenk, J Crago, S Westerheide, C Menzie
- Establishing quantitative linkages between *in vitro* cell assays, molecular biomarkers, and traditional toxicity endpoints in the estuarine inland silverside (*Menidia beryllina*) – AC [Mehinto](#), SB Jayasinghe, KY Kroll, S [Bay](#), K [Maruya](#), N Denslow
- Newly identified persistent and bioaccumulative organic contaminants with anthropogenic sources in Southern California Bight: importance and prioritization – SA Mackintosh, E Hoh, NJ Shaul, L Aluwihare, N [Dodder](#), K [Maruya](#), D Weller, S Chivers

- Non-targeted analysis of natural and anthropogenic halogenated organic compounds in two ecotypes of Southern California bottlenose dolphins – NJ Shaul, L Aluwihare, E Hoh, SA Mackintosh, N [Dodder](#), K [Maruya](#), D Weller
- Incorporating performance reference compounds (PRCs) for passive sampling of organic contaminants using solid phase microextraction (SPME) – W [Lao](#), D [Tsukada](#), K [Maruya](#)
- A tiered, integrated biological and chemical monitoring framework for contaminants of emerging concern (CECs) in aquatic ecosystems – K [Maruya](#), N [Dodder](#), A [Mehinto](#), D Tadesse, R Breuer, K Larsen
- Using polyethylene passive samplers and caged bivalves to measure hydrophobic contaminants of concern in Santa Monica Bay and Los Angeles Harbor, USA – AS Joyce, MS Pirogovsky, W [Lao](#), D [Tsukada](#), RG Adams, CL Cash, JF Haw, KA [Maruya](#)
- Differentiating fishing from water quality impacts to marine rocky reefs – K [Schiff](#)
- Water quality in Marine Protected Areas – K [Schiff](#)
- (Poster) Application of a custom-designed microarray to examine the transcriptome of hornyhead turbot exposed to environmental mixtures of PCBs and PBDEs – A [Mehinto](#)
- Quantitative linkages between in vitro assays, molecular biomarkers and traditional toxicity endpoints using the inland silverside *Menidia beryllina* – A [Mehinto](#)
- Interlaboratory comparability of microarray data – D [Vidal-Dorsch](#)
- Application of the California Sediment Quality Objectives Human Health Assessment Framework – D [Vidal-Dorsch](#)
- (Poster) Toxicity identification evaluation techniques for determining sediment grain size as a confounding factor in testing with *Eohaustorius estuarius* – D [Greenstein](#)
- How can we enhance access and use of sediment toxicology data? – S [Bay](#)

#### **California Aquatic Bioassessment Workgroup Annual Meeting – November 18-19, 2014 – Davis, CA**

- Special session on multi-indicator integration – E [Stein](#) (Organizer)
- Application of EPA's Healthy Watersheds Initiative concepts enhances protection of California's streams and watersheds – PR Ode, E [Stein](#)
- Relating multiple indicators to beneficial uses: Are we making the connections? – C Solek, B [Fetscher](#)
- Benthic cyanotoxin production in California streams – B [Fetscher](#), M [Howard](#), R Stancheva, R Kudela, ED [Stein](#), MA [Sutula](#), LB Busse



[Canadian Aquatic Biomonitoring Network \(CABIN\) 2014 Science Forum – December 2-3, 2014 – Guelph, Ontario, Canada](#)

- Application of eDNA and metabarcoding to routine stream and wetland biomonitoring programs in California – E [Stein](#)

[American Geophysical Union Fall Meeting 2014 – December 15-19, 2014 – San Francisco, CA](#)

- The onset of a novel pollutant offset: A case study for diverse pollutant scheme in Australia – A [Sengupta](#)

*Other Presentations*

- Eric [Stein](#) gave a guest lecture on "Bioassessment approaches, tools, and future directions" for the California State University, Long Beach Environmental Studies Program on November 6 in Long Beach, CA.
- Eric [Stein](#) gave a talk on "Historical ecology of the Los Angeles basin" at the Ecology of the Los Angeles River Watershed Symposium at California State University, Northridge on November 7 in Northridge, CA.
- Keith [Maruya](#) gave a webinar presentation titled "Passive sampling methods (PSMs) for organic contaminants in sediments: State of the science" for the National Institute of Environmental Health Sciences Superfund Research Seminar Series on Porewater Concentrations and Bioavailability on November 19.
- Steve [Steinberg](#) presented for GIS Day at Palomar College about his professional journey to SCCWRP and SCCWRP's activities in information analysis and management on November 19 in San Marcos, CA.
- Eric [Stein](#) gave a presentation on estuary research in Southern California at the Central Coast Wetlands Workgroup meeting on December 9 at Moss Landing Marine Labs in Moss Landing, CA.
- Nathan [Dodder](#) gave a presentation titled "The Southern California Coastal Water Research Project (SCCWRP)" to the Scripps Center for Oceans and Human Health on December 10 in La Jolla, CA.
- Keith [Maruya](#) gave a webinar presentation titled "Statewide pilot study on CEC monitoring in aquatic ecosystems" to the State's Surface Water Ambient Monitoring Program Bioaccumulation Oversight Group on December 12.
- Eric [Stein](#) and Raphael Mazor gave presentations to the Department of Fish and Wildlife on the Stormwater Monitoring Coalition's stream survey on December 19 in Long Beach, CA.

- Eric [Stein](#) gave a talk on "In-stream benthic invertebrate biodiversity" at the Greater Los Angeles Biodiversity Workshop on January 23 at the Los Angeles Museum of Natural History in Los Angeles, CA.

### *Professional Appointments*

- Martha [Sutula](#) was appointed to the Seagrass Experiment Fish Enhancement Program Science Advisory Panel.
- Ken [Schiff](#) was appointed to the California Stormwater Quality Association 2015 Annual Meeting Planning Committee.
- Steve [Steinberg](#) was appointed to the organizing committee for the 21st California Geographic Information Systems Conference to be held at the Sacramento Sheraton, June 1-3, 2015.
- John [Griffith](#) was appointed to the organizing committee for the University of North Carolina, Chapel Hill Water Institute's Water Microbiology Conference.

### *Meetings & Workshops Held at SCCWRP*

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Nov. 13	SCCWRP Commission's Technical Advisory Group	<a href="#">Weisberg</a>
Nov. 14	Harbor Technical Workgroup	<a href="#">Bay</a>
Nov. 17	Bight '13 Areas of Special Biological Significance Committee	<a href="#">Schiff</a>
Nov. 17	Southern California Association of Marine Invertebrate Taxonomists	<a href="#">SCAMIT</a>
Nov. 18	Sediment Quality Objectives Plan Development – Briefing for Non-Governmental Organizations	<a href="#">Bay</a>
Nov. 18	Bight '13 Chlorophyll Subcommittee	<a href="#">Sutula</a>
Nov. 19	California Beach Water Quality Workgroup	<a href="#">California Water Quality Monitoring Council</a>
Nov. 20	Sediment Quality Objectives Advisory Committee	<a href="#">Bay</a>
Nov. 21	Seminar: Dr. Ellen Hanak – “Paying for Water in California”	<a href="#">Weisberg</a>

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Nov. 24	Southern California Stormwater Monitoring Coalition Bioassessment Workgroup	<a href="#">Mazor</a>
Dec. 1	Santa Margarita River Estuary Technical Advisory Committee	<a href="#">Stein</a>
Dec. 2	Bight '13 Trawl Committee	<a href="#">Schiff</a>
Dec. 3	Southern California Wetlands Recovery Project – Managers Meeting	<a href="#">California Coastal Conservancy</a>
Dec. 5	SCCWRP Commission	<a href="#">Weisberg</a>
Dec. 9	Nutrient Objectives Stakeholders Meeting	<a href="#">Sutula</a>
Dec. 11	Bight '13 Chlorophyll and Ocean Acidification Subcommittee	<a href="#">Sutula</a>
Dec. 11	Statewide Contaminants of Emerging Concern Pilot Study Preparation	<a href="#">Maruya</a>
Dec. 12	Seminar: Dr. Robert Miller – “Demonstrating an Effective Marine Biodiversity Observation Network in the Santa Barbara Channel”	<a href="#">Weisberg</a>
Dec. 15	Statewide Contaminants of Emerging Concern Pilot Study Panel	<a href="#">Maruya</a>
Dec. 16	Bight '13 Contaminant Impact Assessment Committee	<a href="#">Schiff</a>
Dec. 17	San Diego Creek Causal Assessment Workshop	<a href="#">Gillett</a>
Jan. 5	San Diego Regional Board Wetlands Planning	<a href="#">Schiff</a>
Jan. 8	California State University Northridge – Urban Water	<a href="#">Stein</a>
Jan. 9	Seminar: Dr. Joe Carlin – “Modern Sedimentation in Coastal Environments: Integrating the Sediment Record and Sediment Processes to Understand how Coastal Systems Respond to Natural and Anthropogenic Events”	<a href="#">Weisberg</a>
Jan. 13	Esri Data Visualization for the National Estuarine Research Reserve System	<a href="#">Steinberg</a>
Jan. 15	Bio-Integrity Stakeholder Meeting	<a href="#">State Water Board</a>

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Jan. 15	Sea Level Rise California Landscape Conservation Cooperative	<a href="#">Stein</a>
Jan. 20	Stormwater Research Planning	<a href="#">Stein</a>
Jan. 21	San Diego RWQCB Biological Objectives Development for Triennial Basin Planning	<a href="#">Mazor</a>
Jan. 23	SCCWRP Commission’s Technical Advisory Group – Information Management Research Planning	<a href="#">Weisberg</a>
Jan. 26	Harbor Technical Workgroup Compliance Committee	<a href="#">Bay</a>
Jan. 26	SCCWRP Commission’s Technical Advisory Group – Nutrients Subcommittee	<a href="#">Sutula</a>
Jan. 28	Southern California Association of Marine Invertebrate Taxonomists	<a href="#">SCAMIT</a>

*Upcoming Commission/CTAG Meetings and Seminars*

- SCCWRP will host the next [CTAG](#) meeting on Thursday, February 5 from 9 a.m. to 4 p.m.
- SCCWRP will host the next [Commission](#) meeting on Friday, March 6 from 9:30 a.m. to noon.
- Dr. Neil Saintilan, a SCCWRP visiting scientist and incoming chair of the Environmental Science Department at Australia’s Macquarie University, will give a talk titled “Climate change and the management of freshwater and saline wetlands in Australia” on Friday, February 13 at 11 a.m. as part of SCCWRP’s [Spring 2015 Seminar Series](#).

# PROJECTS

**Note:** The following progress updates describe accomplishments for each of SCCWRP's projects over the past quarter. Find more details about each project in SCCWRP's [2014-15 Research Plan](#).

## ***Projects with significant activity this quarter***

[Non-Targeted Analysis](#)

[Nonperennial Streams](#)

[Causal Assessment](#)

[Stormwater Monitoring Coalition \(SMC\) Regional Monitoring](#)

## ***Completed project***

[Atmospheric Deposition of Nutrients to Coastal Watersheds](#)

## **A. ENVIRONMENTAL ASSESSMENT METHOD/TOOL DEVELOPMENT**

### **1. Chemistry Assessment**

#### **a. [Emerging Contaminant Prioritization](#)**

Purpose: Enhance availability of emerging contaminant occurrence data to enable continued prioritization within the state

Update: SCCWRP hosted the third and final public meeting for the statewide pilot CEC monitoring study December 15-16, and submitted final project deliverables including the final report to the State Water Board. Also, researchers continued to analyze high priority CECs in sediment and fish tissue samples from watersheds throughout the region. Next, they will complete CEC analyses for sediment and fish tissue samples and begin designing a regional pilot CEC monitoring study.

Lead Investigator: [Maruya](#)

#### **b. [Bioanalytical Screening Tools](#)**

Purpose: Evaluate and optimize bioanalytical methods for monitoring CECs in recycled water and ambient waters that receive treated wastewater effluent and/or stormwater discharge

Update: Scientists completed bioanalytical and chemical analysis for a round-robin exercise to assess *in vitro* screening bioassays for recycled water applications. A manuscript describing the results was

submitted for publication. Next, researchers will continue bioanalytical screening of sediment and tissue extracts from lab experiments and selected coastal habitats.

Lead Investigator: [Maruya](#)

Highlight

#### c. [Non-Targeted Analysis](#)

Purpose: Develop analytical methods for identifying unknown contaminants of emerging concern (CECs) in tissue, sediment, and water samples

Update: Staff and collaborators published a manuscript on the [non-targeted analysis of bottlenose dolphin blubber](#). More than 300 persistent and bioaccumulative compounds were identified in blubber from two ecotypes of common bottlenose dolphins (*Tursiops truncatus*) sampled in the Southern California Bight. Of identified compounds, 86% are not currently monitored, including 133 known anthropogenic chemicals. Compounds related to dichlorodiphenyltrichloroethane (DDT) were the most abundant. Another 100 compounds had only partial structural characterization and unknown sources. A second manuscript on bird eggs has been peer-reviewed and is under revision. Five marine mammal species were selected for the next project phase, and sample processing has commenced. Over the next quarter, staff and collaborators will begin instrumental analysis.

Lead Investigator: [Dodder](#)

#### d. [Analytical Methods for Emerging Contaminants](#)

Purpose: Develop analytical methods for priority contaminant of emerging concern (CEC) analytes

Update: Researchers completed analysis of CECs in spiked water samples from a linkage study with the freshwater fish *Menidia*. Next, researchers will refine methods for phenolic CECs, and utilize the improved methods to analyze water, sediment, and tissue samples collected for pilot CEC monitoring studies.

Lead Investigator: [Maruya](#)

#### e. [Passive Samplers](#)

Purpose: Evaluate whether passive samplers can be used in coastal sediments to monitor water quality and predict bioaccumulation and sediment toxicity

Update: A database containing passive sampler results from field deployments in 2010 and 2013 on the Palos Verdes Shelf (PVS) was completed and submitted to the EPA contractor. Next, researchers will analyze the results of an international sediment comparison exercise, and complete a preliminary investigation into a passive sampling technique for moderately hydrophobic current-use pesticides.

Lead Investigator: [Maruya](#)

## 2. Toxicity Assessment

### a. [Molecular Tools for Toxicity Identification Evaluation](#)

Purpose: Develop new methods for evaluating sediment toxicity via gene microarrays that reveal molecular-level responses in sentinel organisms (e.g., marine fish and invertebrates)

Update: A poster describing the results of the amphipod microarray interlaboratory comparison study was presented at the SETAC annual meeting in Vancouver in November. Reanalysis of RNA samples for the hornyhead turbot PCB/PBDE exposure study is in progress; additional QA issues with the microarray sample analyses have arisen, which are delaying progress of the study. Laboratory exposures of amphipods (*Eohaustorius estuarius*) to contaminant-spiked sediments have been completed, and tissue samples are in the process of being prepared for gene expression analysis. The differential gene expression results will be used to develop a toxicant characterization model for use as a toxicity identification evaluation tool for investigating the cause of toxicity to amphipods (*E. estuarius*).

Lead Investigator: [Bay](#)

## 3. Biological Assessment

### a. [Rocky Reefs](#)

Purpose: Develop an assessment index to interpret the ecological integrity of rocky reefs

Update: Researchers at SCCWRP, Occidental College, and the Ocean Science Trust are close to submitting a peer-reviewed publication on this work. The ecosystem response model in rocky reef habitats successfully predicted the probability of finding individual species at an unimpacted site. Missing species at impacted sites indicate a decline in ecological integrity, and were correlated to human-induced pressures such as fishing or water quality.

Lead Investigator: [Schiff](#)

### b. [DNA Barcoding](#)

Purpose: Assess the efficacy of DNA barcoding for rapidly identifying marine and freshwater benthic invertebrate and algal species

Update: Scientists continued to analyze data comparing in-stream community composition based on eDNA to the community quantified through typical morphological analysis.

Lead Investigator: [Stein](#)

### c. [Cyanobacteria](#)

**Purpose:** Increase understanding of environmental drivers for cyanobacterial bloom occurrence and toxin production in streams and wetlands

**Update:** The project's technical advisory committee met this quarter to further establish a statewide strategy for addressing monitoring, assessment, and reporting needs for cyanotoxins. The committee expects to complete a draft strategy document in May and a finalized document in September. Scientists also continued correlative analysis

Cyanobacteria blooms proliferate in the water along Lake Hodges Dam in San Diego County, right. SCCWRP is working to quantify the types and concentrations of the cyanotoxins they produce.



Planktonic cyanobacteria form wavy green patterns in the water, left, at San Diego County's Santee Lake. SCCWRP is investigating potential drivers of cyanotoxin production, including nutrients.

of potential drivers of cyanotoxin production in streams, and cyanotoxin effects on benthic macroinvertebrate communities. SCCWRP and collaborators are preparing a Cyanotoxin Report synthesizing all cyanotoxin studies conducted across a wide variety of waterbodies in the past three years. Planning for the upcoming 2015 field sampling season is underway in partnership with the San Diego and Santa Ana Regional Water Quality Control Boards.

Lead Investigators: [Fetscher](#), [Howard](#)

### d. [Nonperennial Streams](#)

**Purpose:** Develop and test bioassessment tools for use in two types of nonperennial water bodies: arid/episodic and intermittent streams

**Update:** For the arid/episodic stream project, researchers completed a draft updated field book on the California Rapid Assessment Method with modifications for arid, episodic streams. It is currently being field-tested at selected sites throughout the region. They expect to distribute the final draft to the project's technical advisory committee in March. The nonperennial streams project is nearly complete,

Highlight



and a draft report has been sent to the San Diego Regional Water Quality Control Board for review. It contains four components: 1) Guidance on assessing the condition of nonperennial streams; 2) Predictions of stream flow in the San Diego region under different climatic regimes; 3) Hydrologic conditions of nonperennial streams in the San Diego Region; and 4) Biological conditions of nonperennial streams in the San Diego region. The report builds off of earlier research conducted by SCCWRP by expanding the number of nonperennial reference sites, and including algae indicators. Upon its completion, nonperennial streams will be included in the 2015-2019 SMC regional monitoring program.

Lead Investigator: [Stein](#)

#### e. [Soft-bottom Benthos](#)

Purpose: Develop and calibrate benthic indices for the mesohaline environment of San Francisco Bay

Update: The San Francisco Regional Monitoring Program decided not to fund the second phase of this project: the calibration and validation of the assessment index. Therefore, work on this project has been suspended.

Lead Investigators: [Stein](#)

### 4. Microbiological Assessment

#### a. [Rapid Water Quality Indicators](#)

Purpose: Develop and test application of rapid methods for enumerating indicator bacteria at high-risk beaches

Update: SCCWRP and Monterey Bay Aquarium Research Institute researchers conducted experiments to refine sample collection and pre-processing steps. This quarter, SCCWRP is working with researchers at Arizona State University on the external design of the field deployable instrument.

Lead Investigator: [Griffith](#)

#### b. [Microbial Source Tracking and Identification](#)

Purpose: Develop and implement protocols for identifying microbial contamination sources to beaches throughout the state

Update: The research team conducted its autumn experiments designed to gauge degradation of source-associated markers, fecal indicator



SCCWRP field technicians set up floating frames in Irvine's San Joaquin Marsh that will house dialysis bags filled with diluted sewage and animal feces. The work is part of a project to determine how DNA-based human fecal bacterial markers degrade in response to sunlight in various California water body types. The dialysis bags allow for nutrient and water exchange only; the contents of the bag – including the human source markers and pathogens – cannot escape.

bacteria, and pathogens in sediment. Researchers also continued to analyze water samples collected during the summer. This quarter, the team will deploy its winter experiments.

Lead Investigator: [Griffith](#)

### c. [Wet Weather Epidemiology](#)

Purpose: Quantify the risk of illness in surfers from water contact recreation following storm events

Update: SCCWRP researchers and collaborators at UC Berkeley and the Surfrider Foundation launched the new epidemiology study December 1 in San Diego. The study team has already recruited more than 400 surfers and, utilizing cell phone apps and customized software, they are reporting their surfing and health information on a daily basis. To complement the human health information, the study team is collecting daily water quality samples at two sentinel beaches, Ocean Beach and Tourmaline Surfing Park. In addition, pathogens are being collected from runoff at the two sentinel beaches each rainstorm to assess exposure. After the field collection ends March 31, researchers will compare surfers' health when they enter the ocean following rainstorms to when it is not raining. Based on the water quality measurements, researchers will also assess if current water quality standards protect public health. In addition, the study team will use the human health information and pathogen measurements in a quantitative microbial risk assessment (QMRA), the first such application at a marine beach following wet weather.

Lead Investigator: [Schiff](#)

### d. [Quantitative Microbial Risk Assessment \(QMRA\)](#)

Purpose: Apply QMRA to characterize the risk of illness to swimmers at a southern California marine beach impacted by nonhuman sources of fecal indicator bacteria

Update: Study commencement awaits a final grant agreement with the State Water Resources Control Board.

Lead Investigator: [Schiff](#)

### e. [QMRA Efficacy in Assessing Water Quality](#)

Purpose: Develop a guidance document to aid water-quality regulators and stakeholders in determining whether sources of fecal indicator bacteria at a beach are predominantly human or non-human.



SCCWRP field technicians sample at Leo Carrillo State Beach near the Los Angeles-Ventura County border. This study will help assess whether fecal indicator bacteria at the beach are coming from predominantly non-human sources, an important trigger for quantitative microbial risk assessments.

Update: Field and laboratory crews were trained this quarter and daily sampling commenced on January 6.

Lead Investigator: [Cao](#)

## **5. Biogeochemical Cycling Assessment**

### **a. [Harmful Algal Blooms](#)**

Purpose: Improve understanding of conditions leading to *Pseudo-nitzschia* blooms and toxin production in Monterey Bay and San Pedro, California

Update: The principal investigators continued planning for the 2015 field season scheduled to launch this spring in Monterey Bay.

Lead Investigator: [Howard](#)

### **b. [Ocean Acidification](#)**

Purpose: Improve ocean acidification monitoring capacity for the U.S. West Coast

Update: SCCWRP researchers, in cooperation with the California Current Acidification Network (C-CAN), have completed a “how-to” manual standardizing acidification monitoring practices for land-based sites, and are working on a Best Practices Manual for use of Durafet™ pH sensors. Further, researchers have submitted a manuscript analyzing data from a Durafet™ pH sensor intercomparison study to assess performance of these sensors in nearshore environments. Finally, researchers are continuing work with the [Bight '13](#) offshore water quality team (acidification subcommittee) to pilot improved acidification monitoring practices among SCCWRP member agencies. Sampling for this pilot program began in May 2014 and a subcommittee meeting was held in December 2014 to review early results. Sampling will continue through 2016.

Lead Investigator: [McLaughlin](#)

### **c. [Coastal Ocean Nutrient Modeling](#)**

Purpose: Evaluate the relative roles of anthropogenic and natural oceanographic nutrient input sources on hypoxia and acidification in Southern California

Update: SCCWRP researchers began compiling and processing data for terrestrial and atmospheric inputs into the Regional Oceans Model (ROMs) and for validation of model output. This work will continue over the next two quarters.

Lead Investigator: [Sutula](#)

## **B. TECHNICAL SUPPORT FOR MANAGEMENT/REGULATORY PROGRAMS**

### **1. Nutrient Objectives**

### **a. Nutrient Objectives in Streams and Lakes**

Purpose: Provide technical support for state nutrient objectives program by developing: (1) condition assessment tools (eutrophication indicators and range at which adverse effects occur), and; (2) models to link eutrophication indicators to nutrients and other environmental co-factors

Update: Researchers completed a science plan describing technical activities to support decisions on wadeable streams nutrient objectives. The plan was reviewed by the statewide regulatory and stakeholder advisory groups. The Wadeable Stream Science Panel will convene next quarter to review the science plan and work will continue on statistical models describing the relationship between algal abundance, nutrient concentrations, and site-specific factors. In a TMDL case study in the Santa Margarita River watershed, a watershed loading and estuarine water quality model is under development to establish allowable nutrient loads. Sampling to develop nutrient linkage models for the River began this month and will continue over the next two quarters.

Lead Investigator: [Sutula](#)

### **b. Nutrient Objectives in Estuaries**

Purpose: Technical support for state nutrient objectives program by developing estuarine eutrophication indicators related to algae, nutrients, and dissolved oxygen

Update: Researchers are preparing a manuscript based on the results of field experiments quantifying the effect of macroalgae on seagrass. In addition, fieldwork continues for documenting the natural background levels of dissolved oxygen, macroalgae, and phytoplankton in bar-built estuaries, which are closed to the ocean by sandbars during portions of the year.

Lead Investigator: [Sutula](#)

## **2. Sediment Quality Objectives (SQOs)**

Purpose: Provide technical support for implementing an assessment framework evaluating the indirect effects of bay and estuarine sediment contamination on human health

Update: Researchers continued work on a case study applying SQOs to a TMDL for sediment and tissue contamination in Los Angeles/Long Beach Harbor. Meetings of the Harbor Technical Workgroup (HTWG) were held on November 14 and January 26; topics included integrated watershed and bioaccumulation model development, and development of a TMDL compliance assessment framework based on benthic community SQO results. Future HTWG meetings are planned for February 10 and March 3 to continue discussions. An SQO advisory committee meeting was held on November 20, with discussion focused on Tier I analysis methods and application of the tiered assessment approach.

Bioaccumulation-related studies in San Diego Bay are making good progress. Sportfish collection was successfully completed in December; samples of spotted sand bass were obtained from three regions of San Diego Bay. Chemical analysis of fish and invertebrate tissue samples collected in 2013 from San

Diego Bay are nearing completion. Development of a work plan and survey instrument are in progress for quantifying seafood consumption rates in San Diego Bay.

Lead Investigator: [Bay](#)

### **3. [Flow Criteria](#)**

Purpose: Define the relationship between stream flow and biological community impacts as measured by benthic macroinvertebrate communities

Update: The project team has been focused on two major work elements. First, they continued to develop a series of watershed models that will be used to predict key flow metrics at ungauged streams. This involved selecting 45 gauged catchments distributed across Southern California (from Ventura to San Diego) for model development. Over the past quarter, the team also compiled and cleaned up daily flow records to assist with model calibration. Over the next quarter, they will develop and run models for each gauged catchment. Resultant daily flow data will be used to develop a classification model, which will allow any stream segment in the region to be paired with the most appropriate model(s) for computation of critical flow metrics. Second, the project team continued to develop a hypothesis matrix that will guide investigation of flow-ecology relationships. The team will next refine hypotheses and begin to test them using both gauged and modeled flow data. An upcoming technical advisory committee meeting for the project has been scheduled for March 4.

Lead Investigator: [Stein](#)

### **4. Modeling**

#### **a. [Modeling of BMPs](#)**

Purpose: Develop a toolkit of linked models that will optimize BMP density, type and location at a watershed scale

Update: Researchers continued developing a decision support tool to optimize water resource management in the Maribyrnong River and Jackson Creek Watersheds in Australia. This involved exploring new indicators, such as urban connectivity to refine pollutant load estimates, for integration into the decision support tool. A report was submitted to the Australian EPA, and research on this work was also published as a [focus article](#) in a journal.

Lead Investigator: [Sengupta](#)

#### **b. [Stressor Response Modeling](#)**

Purpose: Begin developing linked stressor-response models that managers can routinely use for protecting estuaries

Update: Researchers continued estuarine model setup and parameterization for the Santa Margarita estuary and other selected estuaries in Southern California.

Lead Investigator: [Sengupta](#)

## 5. Freshwater Biological Objectives

### a. [Analysis of Biological Thresholds](#)

Purpose: Continue developing the technical foundation for biological objectives, after previously helping to develop the technical foundation for bio-objectives based on benthic macroinvertebrate indicators.

Update: Researchers worked with State Water Board staff to develop a new project, automating calculation of the California Stream Condition Index (CSCI), which requires some complex computer algorithms. Work on the CSCI automation should begin next quarter. In the interim, addressed specific CSCI calculation issues associated with sites along the US-Mexico border, where a portion of the drainage area is in Mexico. In addition, SCCWRP researchers participated in several meetings with staff from the San Diego Regional Water Board to discuss technical issues that will need to be addressed in order for the San Diego Board to move forward with development of bio-objectives for their region. Finally, researchers submitted a manuscript describing the CSCI, which is currently under review by the journal *Freshwater Science*.

Lead Investigator: [Stein](#)

### b. [Causal Assessment](#)

Purpose: Develop guidance and training for assessing causative stressors affecting the biology of streams.

Update: Researchers are helping conduct a multi-site, stream reach-scale approach to causal assessment in San Diego Creek in Orange County. This project is evolving the CADDIS causal assessment framework beyond its current single-site scale limitations to better deal with chronic nonpoint source stressors found throughout Southern California. This element of the project will also include technology transfer and training for Santa Ana Regional Water Quality Control Board staff and watershed stakeholders in the San Diego Creek watershed. As part of this training, a workshop was held at SCCWRP in December where staff provided instruction on conducting and interpreting a causal assessment for stakeholders directly involved with the San Diego Creek assessment, as well as interested CTAG members and their staff.

Researchers have continued to develop appropriate post-causal assessment actions for the San Diego River Watershed in San Diego County. These efforts focus on stressors already identified as a likely cause of impairment (synthetic pyrethroid pesticides and elevated conductivity) and stressors identified as indeterminate (altered physical habitat and elevated nutrients) during the original causal assessment. Researchers have developed a new assessment tool for pyrethroids and other potentially toxic chemicals that uses Toxicity Identification and Evaluation (TIE) data. Researchers also simplified conceptual models for the different elements of physical habitat-based impairments (loss of complex habitat, loss of shallow water habitat, altered food sources, low dissolved oxygen, increased water

Highlight

temperature, and smothering), ultimately improving clarity and providing a more definitive diagnoses for this stressor.

Lead Investigator: [Gillett](#)

## **C. REGIONAL MONITORING**

### **1. Regional Marine Monitoring**

#### **a. [Southern California Bight Regional Monitoring Program](#)**

Purpose: Coordinate the Bight '13 Program to monitor regional environmental conditions

Update: All five elements continue to make substantial progress. The Contaminant Impact Assessment received preliminary results, including conclusions and recommendations, from the Sediment Toxicity and Trawl Technical Committees in December. These Technical Committees will now begin writing reports to be released this summer. In addition, participating labs completed chemical analysis and species identification in biological samples from approximately 400 sites, and these technical committees are currently compiling data and initiating the quality assurance process. Samples to assess food web bioaccumulation in marine birds are being analyzed now and should be completed by spring.

The debris element continues to focus on data management and analysis. The microbiology element continues to sample discharges at contaminated beaches to characterize the prevalence of human waste. Although dry weather sampling was completed successfully, wet weather sampling continues this winter to make up for last winter's drought. The nutrient element continues to analyze samples from a series of rate process studies – *in situ* experiments designed to measure nutrient uptake and growth in plankton – at two POTW outfalls offshore (OCSD and LACSD) and two reference locations. Nutrient sample analyses will continue over the next quarter.

Lead Investigator: [Schiff](#)

#### **b. [Pollutant Sources Data Cataloguing](#)**

Purpose: Continue compiling long-term pollutant mass emission estimates from different sources to assess relative inputs and track trends in response to management actions

Update: All mass emission databases have been updated.

Lead Investigator: [Stein](#)

#### **c. [Areas of Special Biological Significance \(ASBS\)](#)**

Purpose: Evaluate BMP projects for reducing pollution inputs to ASBS and report to the California Legislature on success of the Proposition 84 water bond program

Update: Researchers completed data compilation and initiated load reduction estimates from 29 bond-funded BMPs installed by ASBS water bond grantee sites. An assessment of each BMP's effectiveness for

reducing stormwater pollutant loads to ASBS will be concluded next quarter. In a complimentary effort, staff completed water quality data analysis from more than 77 storm events at coastal reference locations throughout the state. These data were compared to similar data collected at coastal sites near ASBS discharges statewide. Results indicate that most ASBS are below natural water quality guidelines established by the reference sites. Technical reports for the reference and discharge sites will also be finalized next quarter.

Lead Investigator: [Schiff](#)

## 2. Regional Watershed Monitoring

### a. [Stormwater Monitoring Coalition \(SMC\) Regional Watershed Monitoring](#)

Purpose: Support implementation of the SMC's regional watershed monitoring program for Southern California's coastal streams and rivers

Update: The project report on the first five years of the Regional Watershed Monitoring program has been completed and should be approved for release by the SMC Executive Committee in March 2015. Over the past quarter, researchers worked with the technical workgroup on a short fact sheet summarizing key findings to accompany release of the five-year report. In addition, researchers and collaborators finalized the work plan for the 2015-2019 survey. Major changes from the previous survey include: expansion of the program to include nonperennial streams, addition of a 30% revisit of previously sampled sites to improve trend estimates, and modifications to the indicators measured at each site. New indicators include: bioanalytical screening for chemicals of emerging concern, vertebrate observations, hydrologic state characterization, a channel engineering checklist, and hydromodification indicators. Sampling for water column toxicity, metals, and pyrethroids have been eliminated due to their lack of response in the previous five-year survey. Finally, researchers are working on developing new data templates and data entry tools to accommodate the new indicators.

Lead Investigator: [Stein](#)

### b. [Background Concentrations of Contaminants in San Diego Reference Streams](#)

Purpose: Derive natural, background-level numeric targets for bacteria, nutrients and heavy metals from unimpacted streams

Update: Researchers are continuing to write reports from the dry weather sampling program. Wet weather sampling began this quarter for the 2014-15 season. The reference beach bacteria study, initiated in October 2014, will continue for the next 18 months.

Lead Investigator: [Sutula](#)

### c. [Atmospheric Deposition of Nutrients to Coastal Watersheds](#)

Purpose: Refine measurement techniques and estimate rates of atmospheric nutrient deposition in Southern California watersheds

Highlight

Completed  
Project



Update: With publication of the [technical report](#) last quarter, this project is complete. Researchers are now working on a manuscript for journal submission.

Lead Investigator: [McLaughlin](#)

### **3. Regional Wetland Monitoring**

#### **a. [Wetlands Status and Trends](#)**

Purpose: Develop tools for tracking wetland conditions and support implementation of state and national wetland monitoring programs

Update: The three mapping teams have completed all 110 plots for the pilot implementation. Results of the pilot mapping are currently being analyzed, and the final project report will be completed over the next quarter.

Lead Investigator: [Stein](#)

#### **b. [Depressional Wetlands](#)**

Purpose: Develop and test assessment tools and a monitoring approach for depressional wetlands throughout the state

Update: Researchers continued working on the final project report, which will summarize refinements made to the sampling protocols, report on ambient condition of depressional wetlands, and compare results from the different regions sampled as part of this project.

Lead Investigator: [Stein](#)

## **D. INFORMATION MANAGEMENT AND ANALYSIS**

### **1. [Mobile Data Acquisition Technologies](#)**

Purpose: Extend the capabilities of field sampling programs using smart phone applications, image capture devices, and wireless sensors

Update: Researchers have been working on extending the mobile platform to include support for low-cost, Bluetooth wireless water quality probes. Prototype probe configurations and mobile application software for bench-top and field examples are being developed for a demonstration workshop at the SCCWRP Symposium this spring.

Lead Investigator: [Steinberg](#)

### **2. [Seamless Data Sharing](#)**

Purpose: Facilitate data collection and submission to, as well as access data and analytical results from, a common server for use by the scientific and management communities

Update: Researchers successfully completed the data management system for the Surfer Health Study, including receiving and sharing weekly data and reports with collaborators at UC Berkeley. This same platform will be extended in the coming months for the San Diego Bay Fish Consumption Study.

Lead Investigator: [Steinberg](#)

### **3. Dynamic Data Processing and Visualization**

Purpose: Develop data visualization and geospatial visualization capabilities to support projects across SCCWRP's research portfolio and enhance management communication tools

Update: Researchers have developed a prototype web-based 3D visualization tool using the R-platform to extend the data processing capabilities available to our online calculator tools. SCCWRP researchers also initiated a relationship with the GIS software company Esri in Redlands, CA to collaborate on the development of 3D visualization tools. This collaboration will use the ArcGIS Online platform to visualize the historic, current, and future hydrogeology of the Tijuana Estuary.

Lead Investigator: [Steinberg](#)

### **4. San Diego Integrated Water Resource Data Management System**

Purpose: Develop recommendations and specifications for the future development of a web-based water data management system for the San Diego County region

Update: The initial draft recommendations report was submitted to the project Technical Advisory Group for review. Review in public meetings was completed this quarter and revisions to the document will be made next quarter prior to final release.

Lead Investigator: [Steinberg](#)

## **E. MEMBER AGENCY SUPPORT**

### **1. Effects of Ocean Outfall Diversion on Nutrient Cycling**

Purpose: Assess changes in the Newport Coast nearshore waters related to nitrogen cycling and primary production resulting from diversion of the Orange County Sanitation District (OCSD) ocean outfall

Update: Manuscript reviews were completed and are currently in revision for the special issue of *Estuarine, Coastal and Shelf Science*.

Lead Investigator: [Howard](#)