

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



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

May 2015

Detailing activities February 6 – May 1

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Executive Director

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HIGHLIGHTS

News

SCCWRP Commission revises mission statement

The SCCWRP Commission at its March 2015 meeting updated SCCWRP's mission statement and strategic vision to reflect the agency's role as a scientific consensus-builder, a catalyst for translating science to action, and a respected source of research and knowledge within the water-quality management community. The document marks the first update to the agency's mission statement in 20 years.

The new mission statement reflects SCCWRP's expanded focus from a primarily marine science organization two decades ago to an interdisciplinary environmental agency that comprehensively studies marine ecosystems, coastal freshwater ecosystems and associated aquatic resources.



The new document also focuses on SCCWRP's role in fostering scientific consensus and stimulating the conversion of science to action – an expansion of SCCWRP's previous mission to communicate research findings and recommendations effectively to decision-makers and other stakeholders.

The revised mission statement was authored by a SCCWRP Commission subcommittee chaired by Commissioner Grace Hyde in consultation with SCCWRP staff.

To read SCCWRP's full mission statement, vision statement, goals and strategies, go to the [About SCCWRP](#) webpage. For more information about SCCWRP's mission statement, contact Dr. [Steve Weisberg](#).

California ELAP Expert Review Panel issues interim recommendations following first meeting at SCCWRP

A five-member advisory panel convened by SCCWRP to evaluate the state's Environmental Laboratory Accreditation Program (ELAP) unveiled a series of interim, short-term recommendations as the first step in a comprehensive, two-year review of the program.

The [California ELAP Expert Review Panel](#), which held its first meeting in March at SCCWRP, recommended that ELAP improve its communication strategy, form strategic new relationships with ELAP clients, and reenergize the state's Environmental Laboratory Technical Advisory Committee (ELTAC), which serves as a key ELAP adviser, liaison, and resource.

The panel also recommended that ELAP temporarily accept accreditation from its counterparts in other states that certify laboratories operating in California to help the program focus on laboratories most in need of review as it works to clear a backlog of pending accreditation reviews.

“You have an opportunity to be a model for other states,” panelist Stephen Arms told meeting attendees. “I hope through this process that other states look at what you’re doing and see opportunities to improve the process.”

ELAP program Chief Christine Sotelo said at the meeting that her staff appreciated the interim recommendations and would immediately begin work on implementing them. “We have the right group here to give us advice, and we appreciate the time you took,” Sotelo told the panel.

The panel issued its [interim, short-term recommendations](#) at the conclusion of a three-day meeting that ran March 17-19 at SCCWRP, in which the panel heard from ELAP staff, stakeholders and the environmental laboratory community about the state of the program, as well as opposing perspectives from more than a dozen organizations and individuals about how to improve it. ELAP is the accrediting body for California’s environmental science laboratories.



ELAP Expert Review Panel members, from left, Mitzi Miller, Jordan Adelson, David Speis, Stephen Arms and Lara Phelps discuss the status of California’s accreditation program for environmental laboratories during the first meeting of the panel, held March 17-19 at SCCWRP.



Judith Morgan, vice president and chief regulatory officer for ESC Lab Sciences, delivers a presentation to the California ELAP Expert Review Panel during its three-day meeting at SCCWRP in March.

The panel has scheduled two additional meetings this year – August 10-13 and October 14 – to continue its deliberations before delivering its comprehensive report in November.

The panel’s ultimate charge to develop long-term recommendations for how the accrediting body and its accreditation standards should be revamped, including whether the program should reestablish its affiliation with the National Environmental Laboratory Accreditation Program (NELAP).

For more information about the California ELAP Expert Review Panel and to be added to an email listserve to receive updates about panel activities, contact Dr. [Steve Weisberg](#).

SCCWRP leads Stormwater Monitoring Coalition kickoff event in Santa Monica Mountains

Members of the Southern California Stormwater Monitoring Coalition reviewed protocols for assessing the health of the region's streams during a SCCWRP-hosted training and intercalibration exercise on February 19 that kicked off the second cycle of the coalition's Regional Watershed Monitoring Program.

The kickoff event, which was held at Medea Creek in the Santa Monica Mountains near Agoura Hills, included opportunities to review bioassessment protocols and wetland assessment protocols.

Participants also learned how to identify evidence of hydromodification and to characterize channel engineering – two types of monitoring that are being added to the program's second, five-year cycle.

About 24 people participated, including a number of SCCWRP member agencies.

The [Stormwater Monitoring Coalition](#) is a multi-agency initiative to conduct the research necessary to improve stormwater management, in this case to comprehensively assess the health of Southern California's streams. The inaugural cycle of the coalition's regional monitoring program kicked off in 2009; from the lessons learned, participants developed and refined a second, five-year cycle that was launched in 2014.



Members of the Southern California Stormwater Monitoring Coalition review stream assessment protocols at Medea Creek in the Santa Monica Mountains, part of a day-long, SCCWRP-hosted training event that kicked off the second cycle of the Regional Watershed Monitoring Program.

Among the coalition's newest collaborators is the National Park Service, which runs the [Santa Monica Mountains National Recreation Area](#) where the training exercise was held.

For more information about the training event and the 2014 cycle of the SMC's Regional Watershed Monitoring Program, contact Dr. [Raphael Mazor](#).

SCCWRP's seventh biennial Symposium attracts 112 guests

SCCWRP's seventh biennial Symposium conference event that was held in February for its member agencies attracted 112 guests from more than 20 organizations.

All 14 SCCWRP member agencies were represented at the all-day, invitation-only event, plus the California Coastal Commission, San Francisco Estuary Institute, USC Sea Grant, Santa Monica Bay Restoration Commission and other local municipal agencies. The goal of the Symposium is to keep member agencies abreast of the latest research



Catherine Kuhlman, executive director of the California Ocean Protection Council and a SCCWRP commissioner, discusses how climate change will impact SCCWRP's 14 member agencies during the SCCWRP Symposium's plenary session, which kicked off the all-day event.



SCCWRP information systems manager Shelly Moore, left, helps Symposium attendees learn how to use a cellphone microscope at the agency's seventh biennial Symposium.

conducted at SCCWRP, and encourage interaction of staff with member agency scientists.

The seventh biennial Symposium, held February 26 at SCCWRP, began with a plenary session titled "Climate Change Effects on SCCWRP Member Agencies." Attendees rounded out their day by selecting from among 28 scientific presentations and demonstrations organized around eight thematic research areas: nutrients and eutrophication, contaminants of emerging concern, beach microbial water quality, wetlands, bioassessment, sediment quality, regional monitoring, and technologies and visualizations.

The PowerPoint presentations from the Symposium, as well as video recordings of many of the talks, are available for review by staff of SCCWRP's member agencies. To review the presentations, contact a [CTAG representative](#).

For more information about the Symposium, contact Dr. [Steve Weisberg](#).

Peruvian government scientist visits SCCWRP to learn about U.S. approach to protecting coastal ecosystems

A Peruvian government scientist interested in learning how U.S. researchers work to protect coastal marine environments visited SCCWRP on March 18, his only stop at an environmental research agency during his U.S. visit.

Biologist Christian Paredes of the [Instituto del Mar del Peru](#) said he appreciated the opportunity to learn about how SCCWRP collaborates with numerous government, university and private-sector partners to advance marine research. His Lima, Peru-based agency, which is tasked with protecting Peru's coastal marine ecosystems, does not have any collaborations with local universities – a shortcoming, he noted, that his SCCWRP visit has inspired him to change.

“The collaboration here is spectacular,” said Paredes, who runs a five-member ecotoxicology lab, the Laboratorio de Ecotoxicología Acuática. “This is a good way to solve problems.”

Paredes, who came to the U.S. primarily to visit family in San Francisco, made a special trip to Orange County to meet with SCCWRP scientists, he said. He was put in contact with SCCWRP through Dr. Robert M. Burgess of the U.S. Environmental Protection Agency's Atlantic Ecology Division in Rhode Island.

Paredes' six-hour SCCWRP visit

began with a tour of SCCWRP's facilities, followed by a series of one-on-one meetings with key SCCWRP scientists. The equipment and labs are very similar to Peru's facilities, Paredes observed, but the scientific advances that SCCWRP has made through collaboration and partnerships go far beyond Peru's present capabilities.



Peruvian government biologist Christian E. Paredes, center, gets a tour of a SCCWRP lab from Dr. Doris Vidal-Dorsch and Steve Bay during Paredes' six-hour visit to the agency to learn about how U.S. researchers work to protect coastal marine environments.

“We are a few people solving big problems,” Paredes said. “We want to collaborate more at home, notifying agencies and creating tools to engage these institutions.”

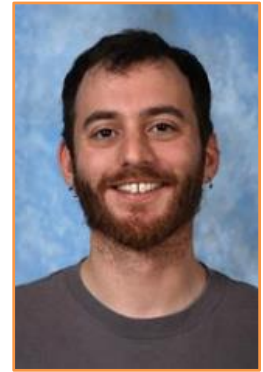
For more information about Paredes’ visit, contact [Steve Bay](#).

SCCWRP scientist featured in podcast on stream biomonitoring programs

SCCWRP freshwater biologist Dr. Raphael Mazor has been featured in a new podcast from the international [Society for Freshwater Science](#) discussing his research on biomonitoring of stream ecosystems.

The 19-minute podcast, part of the science group’s monthly “Making Waves” series, consists of an in-depth conversation between Mazor and host Eric Moody talking about his work and the challenges of creating effective biomonitoring programs for streams in California, including intermittent streams.

Mazor, a senior scientist at SCCWRP, specializes in using benthic macroinvertebrates, periphyton, and other aquatic organisms to develop and evaluate stream bioassessment programs in arid, Mediterranean-like climates.



Dr. Raphael Mazor

The podcast is [available](#) on the Society for Freshwater Science website. For more information, contact Dr. [Raphael Mazor](#).

SCCWRP Scenes



SCCWRP marine programs coordinator Dario Diehl, center, takes apart SCCWRP's autonomous underwater vehicle to demonstrate how it works during SCCWRP's seventh biennial Symposium, held February 26.



Attendees at the seventh biennial SCCWRP Symposium mingle between sessions. The invitation-only event brought together the staff of all 14 SCCWRP member agencies for a day-long event to learn about SCCWRP research.



Skyli McAfee, executive director of the California Ocean Science Trust, discusses how climate change will impact member agencies during the Symposium's plenary session.

PEOPLE

Honors and Awards

- None

Personnel

- **David Tsukada**, a senior research technician in the Chemistry Department, is retiring June 30 after a 37-year career at SCCWRP. He started at SCCWRP in 1978 when the agency was located in El Segundo; SCCWRP is only the second job he's held since graduating from California State University, Long Beach in 1975.
- **Dr. Xinping Yang**, an associate professor of resources and environmental sciences at Nanjing Agricultural University just east of Shanghai, began a year-long tenure as a SCCWRP visiting scientist in the Microbiology Department in April. She will split her time between SCCWRP and the ecology lab of Dr. Peter Bowler at the University of California, Irvine.
- **João Paulo Medeiros**, a Ph.D. student from the Marine and Environmental Sciences Centre at the University of Lisbon in Portugal, will begin a four-month tenure at SCCWRP on May 4. He will work principally with Drs. Eric Stein, David Gillett and Steve Weisberg, who serves on his Ph.D. Committee.
- **Kenny McCune**, a part-time laboratory assistant in the Biology Department, was promoted in February to a full-time research technician.
- **Lucy Mao**, a part-time laboratory assistant in the Microbiology Department, is being promoted effective May 14 to a full-time research technician.
- **Dr. Youwei Hong**, a visiting scientist in the Chemistry Department, left SCCWRP in March after an 11-month tenure. He is an assistant professor at the Institute of Urban Environment in Xiamen, China, part of the Chinese Academy of Sciences.



David Tsukada



Dr. Xinping Yang



João Paulo Medeiros



Kenny McCune



Lucy Mao

Commission

- No changes.

Commission's Technical Advisory Group

- **Eric Klein**, environmental use environmental planner for the County of San Diego Department of Public Works, has replaced **Nancy Stalnaker** as CTAG Representative for the San Diego County Watershed Protection Program. Stalnaker has moved to a different position within the program.
- **Liz Whiteman**, acting executive director of the California Ocean Science Trust, has replaced **Skyli McAfee** as CTAG Representative for the California Ocean Protection Council. McAfee will be leaving on May 11 for a new position heading the oceans program at The Nature Conservancy.



Eric Klein



Liz Whiteman

Staff Spotlight

João Paulo Medeiros – Ph.D. Student



João Paulo Medeiros

João Paulo Medeiros is a fourth-year Ph.D. student in marine sciences at the University of Lisbon in Portugal who is spending four months at SCCWRP working in the Biology Department on a genetic barcoding project. Medeiros, who arrives May 4, is investigating whether isolating and sequencing the DNA of tiny aquatic organisms from low-salinity areas improves effectiveness of ecological quality assessment tools. SCCWRP and other researchers have found that identifying organisms from these habitats using traditional taxonomic methods is challenging, which limits the utility of presently available assessment tools.

A native of the remote Azores islands about 850 miles west of Portugal, Medeiros grew up in the city of Angra do Heroísmo and earned his bachelor's in environmental engineering from the University of the Azores in 2002. He taught chemistry at his alma mater after graduation, but Medeiros realized there was no future for him there and moved to the mainland in 2005. His arrival in Lisbon got off to an unusual start: Medeiros took a job in a call center to pay his bills and then, a few months later, while performing karaoke at a Lisbon bar, he was serendipitously “discovered” by a young woman who was putting together a high-energy music act called Voz na Alma (Voice in the Soul). Despite never having had voice lessons, and despite having only dabbled in ballroom dancing, Medeiros became one of the group's six vocalists and the lead choreographer. He traveled across Portugal performing popular Portuguese songs at community festivals. “I was just a natural at it,” he said. He stayed with the group until its dissolution two years later, even after he had secured a full-time job working in an oceanography lab at the University of Lisbon. In 2009, Medeiros earned his master's in fisheries and aquaculture from the University of Lisbon.

For his Ph.D. program, Medeiros knew he wanted international representation on his advisory committee, which eventually led him to SCCWRP. Dr. Steve Weisberg became a member of his committee in 2011. “My first thought was: California – that's on the other side of the world!” Medeiros said. “But once I started looking at SCCWRP, I knew I would have good people to help me go where I want to go.” During Medeiros' tenure at SCCWRP, he's planning to finish his analysis of the DNA sequencing data for his low-salinity study and begin writing his dissertation. He leaves behind his dog and two cats in Lisbon.



João Paulo Medeiros, left, rides a camel along the beach in Morocco last year with his friend, Tiago Lara.

Partner Spotlight

Dr. Shane Snyder – University of Arizona



Dr. Shane Snyder

Dr. Shane Snyder is a University of Arizona professor of chemical and environmental engineering and co-director of the on-campus Arizona Laboratory for Emerging Contaminants (ALEC). A nationally recognized expert on environmental contaminants, Snyder oversees a 17-member lab that identifies, quantifies and studies known and unknown contaminants and works toward development of improved water treatment technologies. He has testified before the U.S. Senate regarding pharmaceuticals in receiving waters and has held numerous federal advisory appointments. Snyder also serves as a key consultant on water treatment technologies for water-strapped Singapore, spending about 10 weeks there every year.

A native of York, Penn., outside Harrisburg, Snyder's interest in water contamination began at a young age: When he was about 11, his parents learned the groundwater they'd been drinking for years was contaminated by a defunct gas station and a toxic landfill. The family moved, but his mother developed breast cancer, and his father later developed kidney cancer. "There was a lot of questions for me as to whether our tap water caused it," Snyder said. "That really influenced me and made me think about going to a strong grad school for pollution research." Snyder earned his bachelor's in chemistry from Thiel College in Pennsylvania in 1994 and his Ph.D. in environmental toxicology and zoology from Michigan State University in 2000. While doing Ph.D. field work at Nevada's Lake Mead, he was invited to start an R&D group for the Southern Nevada Water Authority; he ran the group for nine years. In 2009, he accepted an offer to become a faculty member at Harvard University and moved to Boston. But keenly aware the Harvard position wasn't tenured, Snyder reversed course less than a year later and accepted an invitation from the University of Arizona to become a fully tenured professor and ALEC's co-director. "It's a rotating door at Harvard – if you're not No. 1 in your field, you're out," Snyder said. Snyder also explained that the West is a better fit for his CEC research. "CECs are a bigger issue here because with limited rainfall and dilution, we must recycle water over and over again," he said.

Snyder has been interacting with SCCWRP since his Southern Nevada Water Authority days. Neither Nevada nor Arizona has an organization as effective as SCCWRP at building bridges between diverse groups in the water quality arena, Snyder said. "SCCWRP allows us to step back from the science and see how it impacts broader policies – that's rare," he said. In recent years, Snyder has worked closely with SCCWRP on the State of California's CEC expert advisory panels on recycled water and aquatic ecosystems, both panels led by SCCWRP.

Snyder lives in the Tucson suburb of Oro Valley with his wife, Erin, an aquatic toxicologist, and their three children, 8-year-old Ian and 3-1/2-year-old twins Gwen and Adele. Snyder's family accompanies him every summer to Singapore; so far, they've traveled to Thailand, Indonesia, Malaysia and Australia. Next summer, they're eyeing Myanmar.

Commissioner Spotlight

Hope Smythe – Santa Ana Regional Water Quality Control Board



Hope Smythe

Hope Smythe is the stormwater and enforcement division chief for the Santa Ana Regional Water Quality Control Board. She has been with the Riverside-based agency for the past 27 years, working to address water-quality issues spanning northern Orange County, western Riverside County and southwestern San Bernardino County. Smythe has served as a SCCWRP Alternate Commissioner since 2013.

The daughter of an Army lieutenant colonel, Smythe relocated nearly a dozen times as a child. She was born in Frankfurt, Germany, and has lived in Monrovia, Liberia; Seoul, South Korea; and several U.S. cities, including Fort Ord on Monterey Bay, where she graduated high school. She earned her bachelor's in chemistry from the University of California, Irvine in 1981, then spent five years working as a chemist for the Irvine environmental consulting firm UltraSystems. In 1985, longing to do environmental field work, Smythe enrolled in a master's program in environmental sciences at California State University, Fullerton, where she worked as a contractor on a project to evaluate ammonium levels in the Santa Ana River. The grant was funded by the Santa Ana regional board, which hired her as an environmental scientist in 1988, before she'd even graduated. She finished her master's three years later. In her early years at the Regional Board, one of her big focuses was working with commercial plant nurseries upstream to lower nutrient inputs to Newport Bay. In 1993, she became planning section chief, overseeing the agency's water quality control basin plan. In 2013, she left planning to become division chief for stormwater and enforcement. "Stormwater is where a lot of emphasis is going to be for the next few years," Smythe said. "It's an exciting time to be in this division."

Smythe first worked with SCCWRP in the late 1990s while evaluating discharges to Crystal Cove in Newport Beach. She said she appreciates SCCWRP's ability to resolve issues informally among regulated parties and regulators, without court action. "They're hearing our message at the same time we're hearing their message," Smythe said.

Smythe lives in Murrieta with husband Mark, who works with her at the Regional Board (he has her former job of inland planning chief), and two dogs, Gimli, a Shih Tzu, and Zoey, a pug mix. They have two daughters: Erin, 26, who graduates from veterinary school this spring, and Kiah, 24, a biomedical engineer for a San Diego biotech company. For fun, Smythe enjoys arts-and-crafts such as card-making and tole painting; almost all of the gifts she gives are handmade.



Hope Smythe with her family, from left, daughter Kiah, husband Mark, and daughter Erin on a sightseeing trip in Jamestown, Va., in 2013.

CTAG Spotlight

Eric Klein – County of San Diego Public Utilities Department



Eric Klein

Eric Klein is a land use environmental planner for the County of San Diego Public Utilities Department’s Stormwater Management Program. He oversees a number of compliance issues related to the County’s stormwater permit, and brings more than 20 years of experience working on water-quality issues. He joined CTAG in March 2015, replacing Nancy Stalnaker, who took on a new role within the County stormwater program.

A native of Albany, N.Y., Klein earned his bachelor’s in Natural Resource Conservation from the University of Florida in 1985, followed by a Master’s in Watershed Science from Colorado State University in 1989. His first job took him to Long Beach, where he worked for two years as a hydrogeologist for a company specializing in Phase II underground storage tank investigations. Then, he spent eight years working for the County of Orange Stormwater Program, under current CTAG Representative and Alternate Commissioner Chris Crompton. In 2000, he and his wife decided to buy a home in Escondido on an acre of land, prompting him to make the difficult decision to leave his job without having another lined up. “It was a leap of faith to quit my job to move, but I felt I was in a good position to get another job,” Klein said. Within three months, the County of San Diego snapped him up. He spent three years in stormwater and then, for the next 12 years, worked for the County division that oversees permitting and installation of septic systems and water wells. In January of this year, he returned to the stormwater division, his first love. “I’m happy to be back,” Klein said. “I like technical, science-oriented material, and I enjoy working on the complex issues that are common in stormwater management.”

Klein, who has been attending meetings at SCCWRP since he worked for the County of Orange in the 1990s, says he’s appreciative of the opportunity to have input on SCCWRP’s research agenda as a CTAG representative. SCCWRP plays a critical role in bringing together scientists, regulated parties and regulators to talk through technical issues, especially for complex areas like stormwater management, Klein said. “There’s a lot of money being spent on compliance, and we want to be doing it in as cost-effective a way as possible,” he said.

Much of Klein’s free time is spent playing music with [FreeMartin](#), an acoustic-electric band he and two friends formed in 2012. He’s [also a singer-songwriter](#) who sells his music on iTunes. Klein lives with his wife, Kathy, a mixed-media artist and owner of a business that specializes in cleaning dogs’ and cats’ teeth without anesthesia. The couple has two dogs, two cats, two goats and a horse.



Eric Klein, left, with his FreeMartin bandmates David Rees, center, and Kevin Gary. The acoustic-electric band performs mostly at local coffeehouses and bars.

COMMUNICATIONS

Journal Articles — Published

- [Evaluating alternative temporal survey designs for monitoring wetland area and detecting changes over time in California](#). 2015. LG Lackey and E.D. [Stein](#). *Journal of the American Water Resources Association* 51(2):388-399. DOI: 10.1111/jawr.12254.
- [Wetland Ecogenomics – The Next Generation of Wetland Biodiversity and Functional Assessment](#). 2015. JF Gibson, ED [Stein](#), DJ Baird, CM Finlayson, X Zhang, M Hajibabaei. *Wetland Science and Practice*, 32(1):27-32.
- [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* 49:1328-38.

Journal Articles — Published Online

- [Transcriptomic Effects-Based Monitoring for Endocrine Active Chemicals: Assessing Relative Contribution of Treated Wastewater to Downstream Pollution](#). 2015. D Martinovic-Weigelt, AC [Mehinto](#), GT Ankley, ND Denslow, LB Barber, KE Lee, RJ King, HL Schoenfuss, AL Schroeder, DL Villeneuve. *Environmental Science & Technology* dx.doi.org/10.1021/es404027n.

Journal Articles — Accepted

- Evaluating the adequacy of a reference site pool for ecological assessments in environmentally complex regions. In press. PR Ode, AC Rehn, RD [Mazor](#), KC [Schiff](#), ED [Stein](#), JT May, LR Brown, DB Herbst, D [Gillett](#), K Lunde, and CP Hawkins. *Freshwater Science*.
- Ocean acidification science needs for natural resource managers of the North American west coast. In press. AB Boehm, MZ Jacobson, MJ O'Donnell, M [Sutula](#), W Wakefield, SB [Weisberg](#) and E Whiteman. *Oceanography*.
- Core principles for a nearshore marine acidification monitoring network: linking chemistry, physics and ecological effects. In press. K [McLaughlin](#), SB [Weisberg](#), A Dickson, G Hofmann, J Newton, D Aseltine-Neilson, A Barton, S Cudd, RA Feely, IW Jefferds, L Jewett, T King, C Langdon, S McAfee, D Pleschner-Steele, and B Steele. *Oceanography*.
- Coastal acidification impacts on the pacific northwest shellfish industry and adaptation strategies implemented in response. In press. A Barton, S Cudd, SB [Weisberg](#), B Hales, G

Waldbusser, C Langdon, B Eudeline, RA Feely, J Newton, T Hill, IW Jefferds, T King, K [McLaughlin](#), and T Sawyer. *Oceanography*.

- Getting ocean acidification on decision makers' to-do lists: Dissecting the process through case studies. In press. SC Cooley, L Jewett, J Reichert, L Robbins, G Shrestha, D Weiczorek, and SB [Weisberg](#). *Oceanography*.

Technical Reports

- [Proposition 84 Grant Evaluation Report: Assessing Pollutant Reductions to Areas of Biological Significance](#). 2015. K [Schiff](#), J [Brown](#). Technical Report 858.
- [Areas of Special Biological Significance: Northern California Bioaccumulation Monitoring](#). 2015. N [Dodder](#), K [Schiff](#). Technical Report 857.
- [North Coast Areas of Special Biological Significance Regional Monitoring Program: First Year Results](#). 2015. K [Schiff](#), J [Brown](#). Technical Report 856.
- [Characterization of the rocky intertidal ecological communities associated with Northern California Areas of Special Biological Significance](#). 2015. PT Raimondi, M George, M Redfield, S Worden, R Williams, N Fletcher, L Anderson, D Lohse, R Gaddam. Technical Report 855.
- [Near-Coastal Water Quality at Reference Sites Following Storm Events](#). 2015. K [Schiff](#), J [Brown](#), S Trump, D Hardin. Technical Report 853.
- [South Coast Areas of Special Biological Significance Regional Monitoring Program Year 2 Results](#). 2015. 2015. K [Schiff](#), J [Brown](#). Technical Report 852.
- [Causal Assessment Evaluation and Guidance for California](#). 2015. K [Schiff](#), DJ [Gillett](#), A Rehn, M Paul. Technical Report 750.
- [Bioassessment Survey of the Stormwater Monitoring Coalition: Workplan for Years 2015 through 2019, Version 1.0](#). 2015. R [Mazor](#). Southern California Coastal Water Research Project. Technical Report 849.
- [Best Practices for autonomous measurement of seawater pH with the Honeywell Durafet pH sensor](#). 2015. T Martz, K [McLaughlin](#), SB [Weisberg](#). California Current Acidification Network (C-CAN).
- [Monitoring of constituents of emerging concern \(CECs\) in aquatic ecosystems: Pilot study design and QA/QC guidance](#). 2015. NG [Dodder](#), AC [Mehinto](#), KA [Maruya](#). Southern California Coastal Water Research Project. Technical Report 854.

Conference Presentations

[American Chemical Society 249th National Meeting – March 22-26, 2015 – Denver, CO](#)

- New environmental monitoring framework for contaminants of emerging concern (CECs) – K [Maruya](#), N [Dodder](#), A [Mehinto](#)
- Contaminants of emerging concern in effluent dominated coastal waterways in southern California – K [Maruya](#), N [Dodder](#), T Anumol, S Snyder, W [Lao](#), D [Tsukada](#), J Drewes

[International Association of Aquatic Animal Medicine 46th Annual Conference – April 6-10, 2015 – Chicago, IL](#)

- Non-targeted analysis of bioaccumulative contaminants in five sentinel marine mammal species off southern California – JM Cossaboon, NG [Dodder](#), SJ Chivers, DW Weller, K Danil, KA [Maruya](#), E Hoh

[American Geophysical Union Chapman California Drought Conference – April 20-22, 2015 – Irvine, CA](#)

- Drought Impacts Ecosystems – A [Sengupta](#) (panel rapporteur)
- Challenges, Needs, Gaps – D Feldman, A [Sengupta](#)

[Society of Environmental Toxicology and Chemistry \(SETAC\) Southern California Chapter 2015 Annual Meeting – April 21-23, 2015 – San Pedro, CA](#)

- Invited Plenary Speaker: Southern California Bight Regional Marine Monitoring – K [Schiff](#)
- Invited Plenary Speaker: Stormwater Monitoring Coalition Regional Watershed Monitoring – R [Mazor](#)

[Society of Environmental Toxicology and Chemistry \(SETAC\) Northern California Chapter 25th Annual Meeting – April 29-30, 2015 – Sacramento, CA](#)

- Adapting the SPEAR pesticide bioassessment index for use in California – L Hunt, M Liess, K Foit, R [Mazor](#), VH Resh
- Invited Short Course: Causal Assessment in California – D [Gillett](#) and K [Schiff](#)

Other Presentations

- Steve [Bay](#) gave a guest lecture titled "Impacts of Environmental Contaminants on Southern California Waters" at a Toxicology Seminar class at the University of Southern California on April 2 in Los Angeles, CA.
- John [Griffith](#) gave a talk titled "Digital droplet PCR as a Tool for Environmental Monitoring" at the Scripps Institution of Oceanography on February 6 in La Jolla, CA.

- Keith [Maruya](#) gave a presentation titled “Bioanalytical tools for environmental applications” at the University of Arizona on March 3 in Tucson, AZ.
- Raphael [Mazor](#) was featured in a Society of Freshwater Science [podcast on biomonitoring in streams](#) that was posted February 15.
- Raphael [Mazor](#) gave a presentation on the SMC stream survey program to the Los Angeles and San Gabriel River Monitoring Workgroups and the Santa Ana Regional Water Quality Control Board in February and March 2015 in Los Angeles, CA and Riverside, CA, respectively.
- Alvina [Mehinto](#) gave a presentation titled “Bioanalytical tools: using cell assays for chemical screening” at the University of Arizona on March 3 in Tucson, AZ.
- Eric [Stein](#) gave a presentation titled “Are we achieving no net loss? Tracking Wetland Status and Trends in California” to the California Water Quality Monitoring Council on February 23 in Sacramento, CA.
- Eric [Stein](#) gave a presentation to the San Diego Regional Water Quality Control Board on potential ambient effects of water reuse and recycling programs on February 11 in Mission Viejo, CA.
- Steve [Steinberg](#) presented a talk titled “Assessing Sea Level Rise Vulnerability for Coastal Wetlands” at the Orange County Regional Sea Level Rise & Coastal Impacts Workshop on February 23 at the University of California, Irvine.
- Ken Schiff presented an invited talk entitled “Southern California Bight Regional Monitoring” to the Canadian Oil Sands Innovation Association (COSIA) Conference in Banff, Canada on March 30

Professional Appointments

- Steve [Bay](#) was appointed to an expert panel to review the Long-term Management Strategy for Dredged Material in the Sacramento Delta.
- Steve [Steinberg](#) was elected to the Board of Directors of the Pacific Southwest Region of the American Society for Photogrammetry and Remote Sensing (ASPRS), the imaging and geospatial information society.
- Shelly [Moore](#) was elected to the Board of Directors of the Southern California Academy of Sciences.

Meetings & Workshops Held at SCCWRP

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Feb. 9	Southern California Wetlands Recovery Project	Stein
Feb. 10	Port of Los Angeles TMDL Coordination	Bay
Feb. 10	Bacterial Objective Scoping Meeting	State Water Board
Feb. 13	San Diego Agriculture Monitoring Integration	Mazor
Feb. 13	Seminar: Dr. Neil Saintilan – “Climate change and the management of freshwater and saline wetlands in Australia”	Weisberg
Feb. 17	Site Specific Objectives Coordination For Marina del Rey	Bay
Feb. 18	Beach Water Quality Work Group	State Water Board
Feb. 24	CEDEN (California Environmental Data Exchange Network) Member Agency Comment Sharing	Steinberg
Feb. 26	SCCWRP Seventh Biennial Symposium	Weisberg
March 3	Harbor Technical Workgroup	Bay
March 6	SCCWRP Commission	Weisberg
March 10	Stormwater Toxicity Intercalibration Workgroup	Vidal-Dorsch
March 13	Seminar: Dr. Clay Reber – “CellScope: Mobile phone-based, field-portable microscopy”	Weisberg
March 17-19	State of California Environmental Laboratory Accreditation Program (ELAP) Expert Review Panel	Weisberg
March 23-27	California Rapid Assessment Method (CRAM) Training	Stein
March 25-26	Causal Analysis/Diagnosis Decision Information System (CADDIS) Workgroup	Gillett
March 25	Southern California Wetlands Recovery Project	Stein

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
April 9	CTAG Wetlands Research Planning Workshop	Weisberg
April 13	Regional Water Quality Control Board, Wetland Restoration Planning	Schiff
April 14	Sediment Quality Objectives Planning	Bay
April 15	Harbor Technical Work Group	Bay
April 16	Southern California Society for Environmental Toxicology and Chemistry (SETAC) Technical Advisory Group	Greenstein
April 20	San Diego Reference Study Workgroup	Stein
April 20	State of California Environmental Laboratory Accreditation Program (ELAP) Staff and Stakeholders	Weisberg
April 21	San Diego Creek Causal Assessment Workgroup	Gillett
April 22	Episodic CRAM (California Rapid Assessment Method)	Stein
April 22	CTAG Publicly Owned Treatment Works (POTW) Subcommittee	Weisberg
April 27	Bight '13 Toxicology Technical Workgroup	Bay
April 29	Southern California Wetlands Recovery Project Science Advisory Panel	Stein
May 1	Seminar: Dr. Mike Denison – “Translation of toxicological mechanisms into bioassays for chemical detection and site characterization: Dioxin-like chemicals and endocrine disruptors”	Weisberg

Upcoming Commission/CTAG Meetings and Seminars

- SCCWRP will host the next [CTAG](#) meeting on Thursday, May 7 from 9 a.m. to 4 p.m.
- SCCWRP will host the next [Commission](#) meeting on Friday, June 5 from 9:30 a.m. to noon.
- SCCWRP’s [Spring 2015 Seminar Series](#) continues Friday, June 12 at 11 a.m. with a talk titled “Mapping species and habitats” by Chris Caldow of the Channel Islands National Marine Sanctuary. Note that this seminar was originally scheduled for April 10.

- SCCWRP's [Spring 2015 Seminar Series](#) concludes Friday, July 17 at 11 a.m. with a talk titled "Unraveling complex microbial interactions and exploring their influence on marine ecosystem structure and function" by Alexis Pasulka of the California Institute of Technology. Note that this seminar is a late addition to the Spring 2015 Seminar Series lineup.

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

[Emerging Contaminant Prioritization](#)

[Nonperennial Streams](#)

[Areas of Special Biological Significance](#)

Updates to Workplans and Advisory Committees

[Bioassessment Survey of the Stormwater Monitoring Coalition: Workplan for Years 2015-19](#)

[San Diego Bay Fish Consumption Study Technical Advisory Group](#)

[Flow Ecology Technical Advisory Committee](#)

[Regional Watershed Monitoring Bioassessment Workgroup](#)

[Surfer Health Study Workplan](#)

[Surfer Health Study Advisory Committee](#)

A. ENVIRONMENTAL ASSESSMENT METHOD/TOOL DEVELOPMENT

1. Chemistry Assessment

Highlight a. [Emerging Contaminant Prioritization](#)

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

Update: SCCWRP submitted [final deliverables](#) describing results from the statewide pilot CEC monitoring study, as well as Phase 2 for a special study monitoring CECs in rivers and estuaries of the Los Angeles region. Next, staff will finalize the study design for tissue monitoring as part of the Region 1 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: Staff drafted and submitted a journal manuscript describing new elements of a CEC monitoring framework, featuring *in vitro* screening bioassays. Next, researchers will apply bioanalytical screening methods to water samples from fish toxicity testing, as well as to sediment and tissue samples from lab and field studies.

Lead Investigator: [Maruya](#)

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 submitted journal manuscripts on the non-targeted analysis of DDT-related compounds in bottlenose dolphins (*Tursiops truncatus*), and on the role of non-targeted analysis for monitoring and assessment of CECs in receiving waters. Also, blubber samples from various marine mammals were extracted and analyzed by non-targeted analysis. Next, staff will continue analyzing non-targeted analysis data for the marine mammals.

Lead Investigator: [Dodder](#)

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

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

Update: Researchers compared analytical results for phenolic CECs using an immunoassay and traditional GC-MS, determining the utility of immunoassays for characterizing spiked water treatments in fish exposure experiments. Next, staff will incorporate immunoassays to quantify exposure levels in *Menidia* linkage experiments.

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: SCCWRP delivered final results for an international sediment comparison exercise, and completed preliminary work on a passive sampling technique for moderately hydrophobic current-use pesticides. Next, staff will design a passive sampling experiment to test contaminated sediment from Marina del Rey.

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: Microarray analysis of RNA samples for the hornyhead turbot PCB/PBDE exposure study has been completed, and data analysis to identify differences in gene expression among the treatment types is in progress. The results will be used to investigate whether PCB and PBDE exposure in the laboratory produces characteristic patterns of gene expression and how such patterns compare to gene expression in turbot collected in trawls. Extraction of RNA from amphipods (*Eohaustorius estuarius*) exposed to contaminant-spiked sediments has also been completed. Preparations are underway to analyze these samples for differential gene expression using Next Generation Sequencing. The results are geared towards developing a toxicant characterization model, to be used as a toxicity identification evaluation (TIE) tool for determining the responsible toxicants in sediment tests.

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 worked to prepare a paper for submittal to a peer-reviewed journal on this work. The ecosystem response model in rocky reef habitats successfully predicted the probability of finding individual species at unimpacted sites. 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 barcoding eDNA to the community quantified through typical morphological analysis. eDNA is the genetic material isolated from water samples (instead of the actual organisms itself) after being shed by the organisms living there.

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 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: The updated field book on the California Rapid Assessment Method for arid, episodic streams recently underwent final field testing. The hydrology attribute is the remaining area that needs additional refinement; this will be completed over the next quarter, at which time the field book will be distributed to the project's technical advisory committee in preparation for general release.

The nonperennial stream project is now complete. Staff prepared an internal document for the Regional Water Quality Control Board summarizing analyses of the hydrological and biological characteristics of nonperennial streams in the San Diego region, and generated a guidance document based on these findings. This guidance will be used to facilitate sampling of nonperennial streams in the SMC program. Staff is working to turn the documents prepared for the regional board into a journal article.

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: calibration and validation of the assessment index. Therefore, work on this project has been suspended.

Lead Investigators: [Stein](#)

Highlight

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 researchers at Arizona State University worked together on the external design of the field deployable instrument. This quarter, SCCWRP and Monterey Bay Aquarium Research Institute researchers analyzed results from experiments conducted to refine sample collection and pre-processing steps.

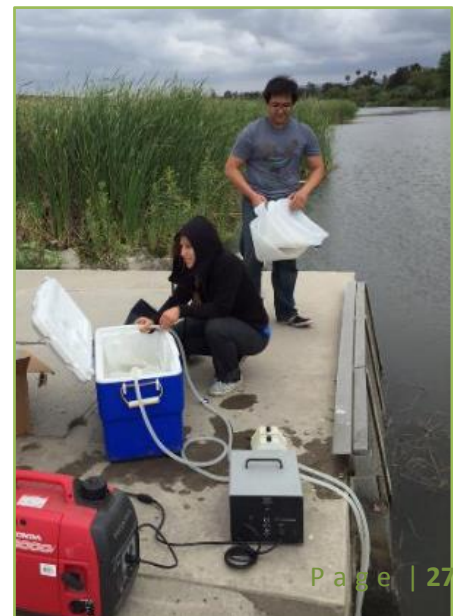
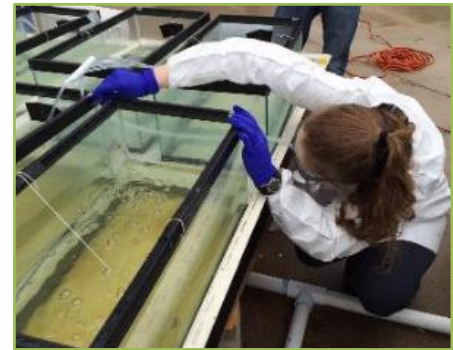
Lead Investigator: [Griffith](#)

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 winter experiments designed to gauge degradation of source-associated markers, fecal indicator bacteria, and pathogens in water. Researchers also continued to

SCCWRP is working to determine the relative degradation of source-associated DNA markers, fecal indicator bacteria and pathogens in response to sunlight exposure in various California water body types. Clockwise from top left, SCCWRP field technicians set up tanks filled with diluted sewage on the patio of Kerckhoff Marine Laboratory in Newport Beach; study partner Mia Mattioli checks on the water levels in the tanks; field technicians collect water from San Diego Creek in Irvine to fill the tanks; and study partner Jared Ervin collects a sample of diluted sewage water from a tank after it's been exposed to sunlight.



analyze sediment samples from mesocosm experiments from the previous quarter.

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 wrapped up their field campaign, recruiting over 500 surfers into the study and logging more than 5,000 exposure days this winter. Nearly one-third of these exposure days were during, or immediately following, wet weather. In addition, more than 800 samples were collected for analysis of fecal indicator bacteria, human and non-human source markers, or pathogens. Ultimately, researchers will assess if surfers' health risks increase when entering the ocean, whether this risk increases even more after it rains, and if this health risk correlates with the indicator bacteria currently being monitored. Researchers will assess if current water quality standards protect public health and, if not, what alternative thresholds could be developed using a quantitative microbial risk assessment (QMRA). This will be the first such application of a QMRA 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: Researchers received grant agreements from the State Water Resources Control Board, and are about to initiate work on this dry weather project. To help kick off the study, researchers met with staff from the RWQCB, City of Los Angeles and Port of Los Angeles, to hear what source tracking and remediation efforts had been conducted to date at the selected study site – Inner Cabrillo Beach.

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.

Update: Daily sampling and sample processing have been ongoing since January 6. Molecular analysis of the general and human-associated fecal indicators is in progress.

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, Calif.

Update: The principal investigators continued to plan the final field study scheduled to start in May in Monterey Bay, Calif.

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 [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 (ROM), and for validation of model output. The ROMS model will enable scientists to weigh the relative effects of nutrient inputs from anthropogenic versus natural sources. This modeling development work will continue over the next two quarters. In addition, SCCWRP successfully teamed with scientists from UCLA, UW and NOAA PMEL on a proposal to NOAA that will provide a broader base of funding for this project. The team received notice that the proposal was funded.

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 for the Santa Margarita River watershed, a watershed loading and estuarine water quality model is under development to establish assimilative capacity and 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. That fieldwork will continue over the next three quarters.

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: A guidance document to assist in the design and interpretation of sediment toxicity identification evaluation (TIE) studies is in preparation. Draft portions of the document are undergoing scientific peer review. 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 February 10, March 3, and April 15; topics included reviews of progress on integrated watershed and bioaccumulation model development. The HTWG Compliance Subgroup has developed a draft framework for assessing TMDL compliance with the direct effects SQO. Planning is underway for a public update meeting on TMDL activities, scheduled for June 16 in Wilmington.

Chemical analysis of 2013 fish and invertebrate tissue samples to support bioaccumulation-related studies in San Diego Bay is nearly complete and data QA review should occur next quarter. Planning is

underway for a June fishing derby in San Diego Bay; the derby will be used to obtain additional samples of sportfish representative of subsistence fishing activities in the Bay. These samples will be used to support evaluation of human health risk from seafood consumption using the SQO assessment framework. The San Diego Bay seafood consumption study has begun; the field survey crew has been trained and the survey tools have been developed. Interviews of anglers will commence May 4 and continue for approximately 12 months.

Lead Investigator: [Bay](#)

3. [Flow Criteria](#)

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

Update: SCCWRP has focused on four major work elements over the past quarter: (1) Staff continued to develop a series of watershed models that will be used to predict key flow metrics at ungaged streams. A total of 45 gaged catchments have been selected for model development that are distributed across Southern California, from Ventura through San Diego. Most of the models have been calibrated. Staff is in the process of developing the model selection tool, which will provide a mechanism to determine the most appropriate calibrated model from the “library” for computation of critical flow metrics at any ungaged site in the region. (2) The project team developed the first iteration hypothesis matrix that will guide the investigation of flow-ecology relationships. SCCWRP compiled bioassessment data from sites at or near gaged locations to help develop the flow-ecology relationships, which will continue over the next quarter. (3) SCCWRP held its second Technical Advisory Committee (TAC) meeting on March 4, 2015, to review the results of the stream classification and discuss the approach for developing the flow ecology relationships with the TAC. Finally, staff began discussions with the San Diego River watershed monitoring workgroup about using that watershed for the ELOHA (ecological limits of hydrologic alteration) demonstration project.

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 to automate calculation of the California Stream Condition Index (CSCI), which requires some complex computer algorithms. The first phase of this project, which began over the past quarter, involves coordination with the State Department of Information Technology on the details of the project scope. SCCWRP researchers continue to participate with staff from the San Diego Regional Water Quality Control 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 its region.

Lead Investigator: [Stein](#)

b. [Causal Assessment](#)

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

Update: SCCWRP is helping to 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 series of workshops are being conducted at SCCWRP. The most recent trainings were in February and April. At the February workshop, staff provided training to stakeholders directly involved with the San Diego Creek assessment on defining the case, identifying candidate causes, and selecting comparator sites portions of the causal assessment process. The April meeting focused on training stakeholders in developing candidate cause conceptual models. Finally, SCCWRP researchers were invited to teach a Short Course on Causal Assessment at the 2015 Annual Meeting of the Northern California Chapter for Society of Toxicology and Chemistry in Sacramento on April 29.

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.

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: The Contaminant Impact Assessment element completed its sampling of nearly 400 sites in 2013, and is approximately halfway through its data management and reporting. Sediment Toxicity and Trawl Technical Committees are writing their respective assessment reports, the Sediment Chemistry Technical Committee is completing data management, and the Benthic Infauna Technical Committee is conducting final quality assurance activities.

The Debris element continues making solid progress, nearly finishing the laboratory analysis of plastic particles in offshore sediments, conducting data management and analysis for debris in trawl nets and fish stomachs, and writing an assessment report for trash in the region's streams and rivers. The Microbiology element had a Planning Committee meeting in March and, because of the drought, decided to continue sampling a third year at beaches regionwide, measuring rapid indicators and host-specific markers. The Nutrient element is approximately halfway through its planned field efforts. Four of eight quarterly surveys to assess ocean acidification are now completed, and two of four special process studies designed to measure nutrient uptake and growth in plankton are also completed. The next acidification survey and special process study are scheduled for the next quarter.

Lead Investigator: [Schiff](#)

b. [Pollutant Sources Data Cataloging](#)

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](#)

Highlight 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 recently completed this project by publishing eight Technical Reports. The first Technical Report summarized the [post-storm water quality near reference sites](#), a one-of-a-kind data set ultimately used for deriving “natural water quality” thresholds to evaluate the status of ASBS conditions following wet weather discharges. The natural water quality thresholds were similar to, or lower than, most chemical objectives in the California Ocean Plan. The next series of six Technical Reports summarized the water quality, bioaccumulation, and biodiversity in ASBS from southern, central, and northern California (Technical Reports: South Coast [water quality](#), [bioaccumulation](#), [biodiversity](#); North Coast [water quality](#), [bioaccumulation](#), [biodiversity](#)). Overall, water quality in ASBS was reasonably good following storm events, with limited exceedance of natural water quality thresholds. Some of the most problematic constituents were: suspended solids in the north coast, trace metals and pesticides in the central coast, and nutrients in the south coast. The eighth and final report was an [evaluation of structural best management practices \(BMPs\)](#) that could be used to mitigate storm water pollutant

A number of structural best management practices (BMPs) for reducing pollutant loads in California’s Areas of Special Biological Significance are discussed in a newly released SCCWRP Technical Report. The BMPs evaluated include: (1) an oil-water separator at foot of the pier on Trinidad Bay in Humboldt County, right, that helps route pier runoff to an underground infiltration gallery, (2) a parking lot near Crystal Cove in Newport Beach, below left, that features a curb and gutter system made of porous pavement that is connected to an underground infiltration gallery and modular wetland treatment system, and (3) a grassy swale at Heisler Park in Laguna Beach, below right, that captures irrigation runoff.



discharges to ASBS. Based on 12 BMP types installed around the state using Proposition 84 Water Bond grants, the most effective BMPs were full capture devices such as diversions to sanitary sewer or underground infiltration galleries. However, these full-capture devices were relatively small, limiting their load reduction potential. Of the flow-through devices that can handle much larger volumes, simple swales appeared to be the most effective at reducing loads and achieving the lowest effluent concentrations. This information will likely be used by the SWRCB as it issues its next round of grant requests for stormwater BMPs.

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: SCCWRP has completed a final draft of a report summarizing the results of the first five years that has been reviewed by the SMC executive committee. A few additional analyses that explore alternative thresholds for nutrients and metals have been requested for final approval. SCCWRP is preparing a four-page fact sheet to accompany the report, which will be more effective for communication with general audiences. In addition, the SMC has completed and published a workplan to direct sampling for the next five-year survey. This workplan summarizes major changes from the previous survey, including: inclusion of nonperennial streams, improvements of trend detection through site revisits, and modifications of analytes. New analytes include hydromodification assessment, invasive vertebrates, hydrologic regime documentation, bioanalytic screens, and nontarget chemicals of emerging concern. SCCWRP has conducted two training events to cover both traditional and new protocols, and has developed some of the necessary information management infrastructure for new data types, such as templates for continuous flow data loggers, new field forms, and data entry tools.

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: This quarter, researchers made a presentation to stakeholders on the results of the dry weather stream reference study and will be submitting a draft of the report for stakeholder review in mid-May. Wet weather sampling began in October 2014 for the 2014-15 season, but because of the drought, no storms have been sampled; stakeholders and the Regional Board have decided to discontinue wet weather sampling and focus on the analyses of the study data – plus other existing data – collected thus far. The reference beach bacteria study, initiated in October 2014, will continue for the next 12 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

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 a draft of the final project report has been completed.

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 through plans to deploy the CellScope into a field setting this summer. SCCWRP staff have met with collaborators at USC Sea Grant to explore the utility of the CellScope in field data collection by scientists and potentially for the Community Harmful Algal Bloom Watch volunteer monitoring program. Software updated to the associated mobile app is being completed for deployment in summer 2015.

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 developed a mobile data collection platform for the San Diego Bay Fish Consumption Study to conduct field data collection from May 2015 through April 2016. The new application incorporates additional features to ensure data quality and redundancy while in the field. In addition to field forms and automated location information, the app also incorporates the option to acquire photographs as a component of the data record. Data are submitted to SCCWRP at the conclusion of each sample day for near real-time monitoring of study progress.

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 continued to build upon SCCWRP's relationship with Esri, the GIS software company located in Redlands, CA, to collaborate on the development of 3D visualization tools. Prototype web and desktop visualization tools have been developed to represent and interact with historic, current, and future hydrogeology of the Tijuana Estuary.

SCCWRP staff met with USC Sea Grant, USC Spatial Sciences Institute, USC Game Innovation Lab and University of Prince Edward Island, Canada, Climate Research Lab to share technologies and opportunities to collaborate and extend data visualization for environmental analysis.

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 final draft recommendations report was submitted to the project Technical Advisory Group for final review and approval on April 22.

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: Manuscripts continue to be revised and resubmitted for final acceptance in the special issue of *Estuarine, Coastal and Shelf Science*, expected to be released by July 2015.

Lead Investigator: [Howard](#)