

Southern California Coastal Water Research Project Authority

Quarterly Director's Report To the SCCWRP Commission

May 2014

(Detailing activities February 7 – May 8, 2014)



**Stephen B. Weisberg
Executive Director**

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HIGHLIGHTS

News:

Commission's five-year strategic planning meeting held May 1

The SCCWRP Commission periodically holds a strategic planning meeting to assess the long-term direction of the organization. Previous strategic planning meetings have always resulted in constructive growth of the agency including adding new member agencies, setting organizational goals, and authorizing the search for SCCWRP's current facility. In preparation for the May 1 meeting, the Commission asked an expert panel, comprised of national research laboratory directors, to conduct an organizational review of SCCWRP in February. The [May 1 meeting](#) addressed recommendations from the expert panel. Topics included an updated mission statement and revised CTAG Charter, plus a review of the agency funding model. Adding recycled water as a potential new research area was also discussed. For additional information on the strategic planning process, please contact [Dr. Steve Weisberg](#).

SCCWRP's DNA barcoding research featured in special issue of *Freshwater Science*

[Dr. Eric Stein](#), [Dr. Raphael Mazor](#), and [Bryan White](#) of the SCCWRP Biology Department contributed to a special series on "Molecular Approaches in Freshwater Ecology" released in this month's issue of the journal [Freshwater Science](#). DNA barcoding represents a new molecular tool for rapidly identifying biological specimens collected for environmental monitoring using a short gene sequence from a standardized position in the genome, rather than traditional visual identification. Three articles co-authored by SCCWRP scientists in collaboration with partners at the US Environmental Protection Agency, Stroud Water Research Center, and the Canadian Centre for DNA Barcoding, include:



- [“Comparison of four species-delimitation methods applied to a DNA barcode data set of insect larvae for use in routine bioassessment,”](#)
- [“Cryptic biodiversity in streams: a comparison of macroinvertebrate communities based on morphological and DNA barcode identifications,”](#) and
- [“Does DNA barcoding improve performance of traditional stream bioassessment metrics?”](#)

For more information about this research area, please contact [Dr. Eric Stein](#).

Former SCCWRP “surf scientist” Terry Hendricks honored by community (4/30)

Dr. Tareah J. Hendricks, a physicist and oceanographer who worked at SCCWRP for 23 years, passed away in June 2013. Remembered for his surfing prowess, knowledge of surf science, and kneeboard and surfboard design, a paddle-out honoring Hendricks last summer drew more than 150 people. This year, a plaque dedicated to Hendricks was embedded in the Swami’s Beach walkway in Hendrick’s hometown of Encinitas. Hendricks began working part-time at SCCWRP in December 1970 and exited as the lead oceanography scientist in December 1993. Prior to joining SCCWRP, he obtained his BS degree from the University of California at Berkeley with "highest honors" in physics and a PhD from the University of California at San Diego as a National Science Foundation fellow in 1967. His research at SCCWRP involved modeling contaminant dispersion from outfalls, sediment movement, and current velocity in the nearshore shelf and submarine canyons. For more information on former SCCWRP staff members, please visit: <http://www.sccwrp.org/AboutSCCWRP/FormerStaff.aspx>.



Hendricks on a SCCWRP research vessel in the 1970s (left); Hendricks with a combined kneeboard and hydrofoil design in 2012 (right)



New SCCWRP fact sheet on stream bioassessment

SCCWRP released its ninth in a series of [fact sheets](#) on topics of interest to environmental managers in Southern California. The most recent features general information about [stream bioassessment](#) and describes what SCCWRP is doing to support monitoring and management efforts. All SCCWRP fact sheets are available electronically and printed copies can be requested by contacting [Karen Setty](#). For more information on stream bioassessment, please contact [Dr. Eric Stein](#) or [Ken Schiff](#).

SCCWRP Scenes:



Photo credit: Dario Diehl

Researchers work through the night from SCCWRP's mobile lab to process samples from a 36-hour water quality study related to the San Diego wet weather beach epidemiology pilot project.

PEOPLE

Honors and Awards:

- Nothing to report.

Personnel:

- Mariana Alonso, a postdoctoral researcher from Brazil, began at SCCWRP on April 7 and will stay for six months, hosted by Drs. Keith Maruya and Nathan Dodder of SCCWRP's Chemistry Department. She will work on non-targeted contaminant analysis in marine mammal tissue.
- Dr. Yong-wei Hong, a guest researcher from the Chinese Academy of Sciences joined SCCWRP beginning April 17 for one year. Hosted by Dr. Keith Maruya of SCCWRP and Dr. Jay Gan at UC Riverside, his research will focus on passive sampling applications.
- Dr. Julia Coates, a joint postdoctoral researcher working with SCCWRP and the California Ocean Science Trust, will be leaving in mid-June to begin a permanent position with the California Department of Fish & Game in Santa Barbara.



Alonso



Hong



Waldmann

Commission:

- Clare Waldmann was appointed as the Alternate Commissioner for the California Ocean Protection Council.

Commission's Technical Advisory Group:

- Dr. Jeff Armstrong was appointed to CTAG representing the Orange County Sanitation District, replacing Ron Coss.
- Nancy Stalnaker was appointed to CTAG representing the County of San Diego Department of Public Works, replacing Jo Ann Weber.



Armstrong



Stalnaker

Spotlight on Staff:

Dr. Mariana Alonso — Postdoctoral Researcher

Dr. Mariana Alonso is a research marine biologist specializing in the ecotoxicology of marine mammals. She is visiting SCCWRP for six months (starting in April 2014) as a postdoctoral researcher. Her work at SCCWRP will involve [non-targeted analysis](#) of marine mammal samples from the US and Brazilian coastlines.

Alonso is from São Paulo, Brazil. She did her undergraduate work at the University of Santa Cecilia in biological sciences and environmental management, and received her Master's degree in geological and chemical oceanography from the University of São Paulo. During her graduate work, she began focusing on contaminants from marine pollution in the blubber of cetaceans (dolphins and whales). She found this interesting because dolphins are a good biological indicator species, often living more than 60 years near urbanized coastlines and consuming seafood daily. However, they currently experience high mortality relative to their birth rate. La Plata or Franciscana dolphins, in particular, are suffering a population decline in Brazil partly due to incidental catch in gill nets. Alonso moved to Rio de Janeiro for her PhD program at the Federal University of Rio de Janeiro. Since graduating, she completed a postdoctoral research assignment in the Antarctic and is currently sponsored by the Brazilian Council of Research. When finished at SCCWRP, she will continue her postdoctoral research working with SCCWRP collaborator Dr. Eunha Hoh at San Diego State University.



At SCCWRP, Alonso will work with Drs. Keith Maruya and Nathan Dodder in the Chemistry Department to analyze natural and synthetic halogenated compounds in blubber and compare dolphins from the South Atlantic Ocean to bottlenose dolphins in the North Atlantic. SCCWRP collaborators from San Diego State University will perform gas chromatography/mass spectrometry, helping to distinguish natural, helpful

compounds, some of which have positive antibiotic effects, from harmful synthetic compounds.



Alonso came to the right place for research and recreation, as her hobbies include surfing, diving, board sports, climbing, hiking, and whale watching. She currently lives in Costa Mesa and enjoys sightseeing around California on the weekends, having already spotted killer whales in Monterey Bay.

For more information on Dr. Alonso and her research, please visit:

<http://www.sccwrp.org/AboutSCCWRP/SCCWRPStaff/AlonsoMariana.aspx>.

Spotlight on Partners:

Dr. Adam Olivieri – EOA, Inc.

Dr. Adam Olivieri, PE is the vice president of EOA, Inc., an environmental consulting firm based in Oakland, California. He oversees a range of projects in areas such as NPDES permit compliance, pretreatment program development, wastewater reclamation, risk assessment, urban runoff, and regulatory program development and analysis. He has extensive experience in the areas of microbial risk assessment and applying models to engineering and public policy decisions. As such, he participates on many national technical review panels.



Adam grew up in Connecticut. Originally interested in structures and construction, he built his first house as a senior in high school. While earning his BS and MS degrees in civil engineering from the University of Connecticut, he noticed and was intrigued by a river changing colors. A class in water and wastewater piqued his interest and led him to expand his studies into infectious diseases and microbial risk assessment. Adding a human element to his engineering background, he moved to California (with his soon-to-be wife) to pursue a Master's and Doctorate of Public Health focused on environmental health sciences at the University of California, Berkeley. He then spent 11 years as a water resources control engineer with the San Francisco Regional Water Quality Control Board before cofounding EOA in 1985.

Adam has been working with Dr. Keith Maruya of SCCWRP's Chemistry department since 2009. He served on both of the State Water Board's Scientific Advisory Panels for Contaminants of Emerging Concern (CECs), formed to provide recommendations on how knowledge of CECs should influence regulatory activities related to recycled water applications and ambient surface waters, respectively. Ongoing follow-up activities stemming from the panels' recommendations include development of a [statewide CEC monitoring plan](#) and [bioanalytical screening methods](#). He enjoys working with SCCWRP, citing reasons such as intelligent people and good questions. He notes, "If it wasn't fun, I wouldn't do it."



Olivieri lives with his wife in Oakland. His son works as an engineer in nearby San Francisco, while his daughter trekked back to the East Coast to work as a physician's assistant at Boston Medical

Center. Olivieri's after-work activities range from martial arts instruction, backpacking, and bicycling trips in Italy to restoring an 1891 Victorian house in Alameda, California together with his father and son. For more information on Dr. Olivieri and his work, please visit: <http://www.eoainc.com/>.

Spotlight on Commissioners:

Halla Razak – City of San Diego Public Utilities Department



Halla Razak is the Director of the City of San Diego Public Utilities Department and is responsible for daily operation of the City’s water, wastewater, and regional wastewater sub-system, as well as planning to ensure the future reliability of these services. These City systems provide water, recycled water, and wastewater services to more than 1.3 million customers. Under her leadership, the Public Utilities Department is currently developing a unique water reuse program that will help increase water supply reliability for the future of San Diego while also ensuring environmental protection of the ocean environment.

Razak holds a Bachelor of Science degree in civil engineering from the University of Dayton and a master’s degree in engineering from San Diego State University. She worked for 18 years as Chief Deputy Director of the City of San Diego’s Engineering and Capital Projects Department.

Prior to rejoining the City of San Diego about eight months ago, she worked for eight years as the Colorado River Program Director for the San Diego County Water Authority. An active member of several professional water and wastewater associations, Halla loves public service. She seeks to manage an effective and efficient operation while providing excellent customer service.

Having just joined the SCCWRP Commission in November 2013, Halla is looking forward to getting to know and work with her fellow Commissioners and SCCWRP on areas of mutual interest concerning management of Southern California’s coastal waters and watersheds. However, she is already impressed with the pivotal role SCCWRP plays providing the scientific foundation for many coastal management decisions, as well as the strong collaborative relationships that SCCWRP has forged with and among its member agencies. The City’s Public Utilities Department has a long history of working collaboratively with SCCWRP on many issues, including most components of the [Southern California Bight Regional Monitoring Program](#), [water quality compliance in offshore waters](#), sediment mapping, emergent contaminants, microbial source identification and tracking, and others. Halla is especially eager to discuss and encourage SCCWRP to take on potable reuse as new research focus at upcoming strategic planning meetings. This area of research is of critical importance as the City of San Diego’s Public Utilities Department embarks on its new “Pure Water San Diego” program to develop a locally controlled, cost-effective, drought-proof, and environmentally friendly water source.

Razak resides in San Diego with her husband Nagy and children Lara and Rami. For more information on the Public Utilities Department, please visit <http://www.sandiego.gov/publicutilities/>.

Spotlight on CTAG:

Nancy Stalaker – County of San Diego Department of Public Works



Nancy Stalaker is a new program coordinator in the San Diego County Watershed Protection Program. The program functions include flood control, managing stormwater pollutants from residential and commercial properties, improving water conservation and best practices, and controlling runoff from land development and construction projects. She joined CTAG in April 2014.

Nancy grew up in Temple City, CA (in Los Angeles County) with four sisters and two brothers. As a child, she learned to love camping, since the family exceeded the typical hotel room occupancy rate. She attended college at the University of California, Santa Barbara and graduated from California State University, Fullerton with a bachelor's degree in biological science. She loves living in San Diego, where she relocated after college. Stalaker spent most of her career at the San Diego County Department of Agriculture, most recently as the supervising agricultural standards inspector. This involved enforcing laws in areas including organic labeling, farmers markets, egg quality, pesticide regulations, and agricultural water quality. She recently switched from regulator to regulated party. She is thankful to work in watershed protection, especially in the planning and monitoring division, because its challenges involve both creativity and science.

Stalaker recently began working on two projects with SCCWRP. The [regional water data management project](#), funded by a Proposition 84 grant, will design an online system to provide access to all current data on water management efforts. Stalaker has the pleasure of working with Marlene Hanken and Steve Steinberg from the SCCWRP Information Management & Analysis Department. Likewise, she is working with Dr. Martha Sutula of SCCWRP's Biogeochemistry Department on another Prop 84 project to develop [nutrient targets](#) protective of beneficial uses for the Santa Margarita River and Estuary. Stalaker says, "I'm honored to work with an impressively brilliant, top-notch research team." She also watches and appreciates the research SCCWRP is conducting for the [surfer epidemiology study](#) in San Diego.

Stalaker has three daughters and loves spending time with her family, siblings, and many nieces and nephews. She enjoys the outdoors, camping, hiking, and bird watching. Her love of water extends beyond work to swimming, boogie boarding, skiing, and fishing.



COMMUNICATIONS

Journal Articles – Published:

- [Refocusing mussel watch on contaminants of emerging concern \(CECs\): The California pilot study \(2009 – 10\)](#). 2013. KA [Maruya](#), NG Dodder, RA Schaffner, SB Weisberg, D Gregorio, S Klosterhaus, DA Alvarez, ET Furlong, KL Kimbrough, GG Lauenstein, JD Christensen. *Marine Pollution Bulletin* 81:334–339.
- [Occurrence of contaminants of emerging concern along the California coast \(2009–10\) using passive sampling devices](#). 2013. DA Alvarez, KA [Maruya](#), NG Dodder, W Lao, ET Furlong, KL Smalling. *Marine Pollution Bulletin* 81:347–354.
- [The mussel watch California pilot study on contaminants of emerging concern \(CECs\): Synthesis and next steps](#). 2013. KA [Maruya](#), NG Dodder, SB Weisberg, D Gregorio, JS Bishop, S Klosterhaus, DA Alvarez, ET Furlong, S Bricker, KL Kimbrough, GG Lauenstein. *Marine Pollution Bulletin* 81:355–363.
- [Occurrence of contaminants of emerging concern in mussels \(*Mytilus* spp.\) along the California coast and the influence of land use, storm water discharge, and treated wastewater effluent](#). 2013. NG [Dodder](#), KA [Maruya](#), PL Ferguson, R Grace, S Klosterhaus, MJ La Guardia, GG Lauenstein, J Ramirez. *Marine Pollution Bulletin* 81:340–346.
- [Development and comparison of stream indices of biotic integrity using diatoms vs. non-diatom algae vs. a combination](#). 2013. AE [Fetscher](#), R Stancheva, JP Kociolek, RG Sheath, ED Stein, RD Mazor, PR Ode, LB Busse. *Journal of Applied Phycology* 26:433-450.
- [Passive sampling in contaminated sediment assessment: Building consensus to improve decision-making](#). 2013. TF Parkerton, KA [Maruya](#). *Integrated Environmental Assessment and Management* 10:163–166.
- [Passive sampling methods for contaminated sediments: State of the science for organic contaminants](#). 2013. MJ Lydy, PF Landrum, AMP Oen, M Allinson, F Smedes, AD Harwood, H Li, KA [Maruya](#), J Liu. *Integrated Environmental Assessment and Management* 10:167–178.
- [Selecting the optimum plot size for a California design-based stream and wetland mapping program](#). 2013. LG Lackey, ED [Stein](#). *Environmental Monitoring and Assessment* 186:2599-2608.
- [Does DNA barcoding improve performance of traditional stream bioassessment metrics?](#) 2014. ED [Stein](#), BP White, RD Mazor, JK Jackson, JM Battle, PE Miller, EM Pilgrim, BW Sweeney. *Freshwater Science* 33:302-311.

- [Benchmarking organic micropollutants in wastewater, recycled water and drinking water with in vitro bioassays](#). 2013. BI Escher, M Allinson, R Altenburger, PA Bain, P Balaguer, W Busch, J Crago, ND Denslow, E Dopp, K Hilscherova, AR Humpage, A Kumar, M Gimaldi, BS Jayasinghe, B Jarosova, A Jia, S Makarov, KA [Maruya](#), A Medvedev, AC Mehinto, JE Mendez, A Poulsen, E Prochazka, J Richard, A Schifferli, D Schlenk, S Scholz, F Shiraishi, S Snyder, G Su, JYM Tang, B van der Burg, SC van der Linden, I Werner, SD Westerheide, CKC Wong, M Yang, BHY Yeung, X Zhang, FDL Leusch. *Environmental Science & Technology* 48:1940–1956.
- [Passive sampling methods for contaminated sediments: Practical guidance for selection, calibration, and implementation](#). 2013. U Ghosh, SK Driscoll, RM Burgess, MTO Jonker, D Reible, F Gobas, Y Choi, SE Apitz, KA [Maruya](#), WR Gala, M Mortimer, C Beegan. *Integrated Environmental Assessment and Management* 10:210–223.
- [The use of sediment toxicity identification evaluation methods to evaluate clean up targets in an urban estuary](#). 2013. DJ [Greenstein](#), SM Bay, DL Young, S Asato, KA [Maruya](#), W Lao. *Integrated Environmental Assessment and Management* 10:260–268.
- [Comparison of four species-delimitation methods applied to a DNA barcode data set of insect larvae for use in routine bioassessment](#). 2014. BP [White](#), EM Pilgrim, LM Boykin, ED Stein, RD Mazor. *Freshwater Science* 33:338-348.
- [Cryptic biodiversity in streams: a comparison of macroinvertebrate communities based on morphological and DNA barcode identifications](#). 2014. JK Jackson, JM Battle, BP [White](#), EM Pilgrim, ED Stein, PE Miller, BW Sweeney. *Freshwater Science* 33:312-324.
- [Detection limits and cost comparisons of human-and gull-associated conventional and quantitative PCR assays in artificial and environmental waters](#). 2014. TE Riedel, AG Zimmer-Faust, V Thulsiraj, T Madi, KT Hanley, DL Ebentier, M Byappanahalli, B [Layton](#), M Raith, AB Boehm, JF Griffith, PA Holden, OC Shanks, SB Weisberg, JA Jay. *Journal of Environmental Management* 136:112-120.
- [Calculating the diffusive flux of persistent organic pollutants between sediments and the water column on the Palos Verdes Shelf Superfund Site using polymeric passive samplers](#). 2014. LA Fernandez, W [Lao](#), KA [Maruya](#), RM Burgess. *Environmental Science & Technology* 48:3925-3934.
- [Development, comparison, and validation using ELISAs for the determination of domoic acid in California sea lion body fluids](#). 2014. EL Seubert, MDA [Howard](#), RM Kudela, TN Stewart, RW Litaker, R Evans, DA Caron. *Journal of the Association of Official Analytical Chemists* 97:345-355.
- [Biological responses of marine flatfish exposed to municipal wastewater effluent](#). 2014. DE [Vidal-Dorsch](#), SM Bay, DJ [Greenstein](#), ME Baker, G Hardiman, JA Reyes, KM Kelley, D Schlenk. *Environmental Toxicology and Chemistry* 33:583-591.

- [Is DNA barcoding actually cheaper and faster than traditional morphological methods? Results from a survey of freshwater bioassessment efforts in the United States](#). 2014. ED [Stein](#), MC Martinez, S Stiles, PE Miller, EV Zakharov. *PLoS ONE* 9:e95525.
- [Effect of submarine groundwater discharge on bacterial indicators and swimmer health at Avalon Beach, CA, USA](#). 2014. VM Yau, KC [Schiff](#), BF Arnold, JF Griffith, JS Gruber, CC Wright, TJ Wade, S Burns, JM Hayes, C McGee, M Gold, Y Cao, AB Boehm, SB Weisberg, JM Colford Jr. *Water Research* 59:23-36.
- [Was the Clean Water Act effective?](#) 2014. K [Schiff](#). *Marine Pollution Bulletin* 81:1-2.

Journal Articles — Published Online:

- [Integrating intermittent streams into watershed assessments: applicability of an index of biotic integrity](#). 2014. RD [Mazor](#), ED Stein, PR Ode, K Schiff. *Freshwater Science* DOI 10.1086/675683.
- [Gene networks and toxicity pathways induced by acute cadmium exposure in adult largemouth bass \(*Micropterus salmoides*\)](#). 2014. AC [Mehinto](#), MS Prucha, RC Colli-Dula, KJ Kroll, CM Lavelle, DS Barber, CD Vulpe, ND Denslow. *Aquatic Toxicology* DOI 10.1016/j.aquatox.2014.04.004.
- [Which coastal and marine environmental contaminants are truly emerging?](#) 2014. KA [Maruya](#), NG Dodder, CL Tang, W Lao, D Tsukada. *Environmental Science and Pollution Research* DOI 10.1007/s11356-014-2856-1.

Journal Articles — Accepted:

- Patterns and potential drivers of declining oxygen content along the Southern California coast. JAT Booth, CB Woodson, F Micheli, SB [Weisberg](#), M Sutula, S Bograd, A Steele, J Schoen, LB Crowder. *Limnology and Oceanography*.

Technical Reports:

- [Watershed Loading, Hydrodynamic, and Water Quality Modeling in Support of the Loma Alta Slough Bacteria and Nutrient TMDL](#). 2013. PF Wang, M [Sutula](#), B Chadwick, W Choi. Technical Report 666. Southern California Coastal Water Research Project. Costa Mesa, CA.
- [Newport Bay Watershed monitoring evaluation](#). 2014. KC [Schiff](#), AE Fetscher, MM Hanken. Technical Report 815. Southern California Coastal Water Research Project. Costa Mesa, CA.
- [Areas of Special Biological Significance: Bioaccumulation monitoring](#). 2014. N [Dodder](#), W Lao, D Tsukada, D Diehl, K Schiff. Technical Report 816. Southern California Coastal Water Research Project. Costa Mesa, CA.

- [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. Southern California Coastal Water Research Project. Costa Mesa, CA.
- [Characterization of the Rocky Intertidal Ecological Communities Associated with Southern California Areas of Special Biological Significance: Phase II](#). 2014. P Raimondi. Technical Report 818. Southern California Coastal Water Research Project. Costa Mesa, CA.

Conference Presentations:

2014 American Society of Limnology and Oceanography and the American Geophysical Union Ocean Sciences Meeting — February 2014

- [Anthropogenic nutrient sources rival natural sources on small scales in the coastal waters of the Southern California Bight](#) — MDA [Howard](#), M Sutula, J Smith, DA Caron, Y Chao, JD Farrara, H Frenzel, B Jones, G Robertson, K McLaughlin, B Seegers
- Unraveling the impacts of wastewater effluent on coastal nitrogen cycling: Lessons from the Southern California Bight — K [McLaughlin](#), MDA Howard, NP Nezlin, CDA Beck, G Robertson
- Impact of submerged wastewater effluent on dissolved oxygen: Assessment strategy — N [Nezlin](#), C Beegan, J Gully, M Mengel, G Robertson, A Steele, S Weisberg

American Society for Photogrammetry and Remote Sensing (ASPRS) 2014 Annual Conference — March 2014

- [Implementing mobile devices as field computers for environmental data acquisition](#) — SJ [Steinberg](#), L Cooper, P Smith, A Santana, C Gruebele

20th Annual California GIS Conference — April 2014

- [Developing a water quality index for Southern California reef habitats](#) — S [Steinberg](#), R Schaffner, K Schiff
- (Keynote) Geospatial education, career development and mentoring — S [Steinberg](#)

Society of Environmental Toxicology and Chemistry (SETAC) Southern California Chapter — April 2014

- Biological and physiological condition of juvenile California halibut (*Paralichthys californicus*) in Mission Bay, San Diego, CA — KL Stolzenbach, RS Kaufmann, S Morrison, B O'Shea, D Schlenk, W [Lao](#)

Society of Environmental Toxicology and Chemistry (SETAC) Northern California Chapter — May 2014

- (Short course) Causal assessment — S Norton, S Hagerthey, K [Schiff](#)

National Monitoring Conference: Working Together for Clean Water — April/May 2014

- [Application of EPA's Healthy Watersheds Initiative concepts enhances protection of California's streams and watersheds](#) — PR Ode, ED [Stein](#), L Webber, T Fleming
- [A high quality cellphone-based portable microscope for streamside data collection](#) — SJ [Steinberg](#), B Fetscher
- Epidemiology studies of swimming-associated illness at beaches with non-point sources of fecal pollution — Y [Cao](#), K Schiff

2014 Water Microbiology Conference: Microbial Contaminants from Watersheds to Human Exposure — May 2014

- [Cross-laboratory comparison of a duplex digital PCR assay for simultaneous quantification of *Enterococcus* spp. and human fecal-associated HF183 marker](#) — Y [Cao](#), M Raith, T Madi, M Larenas, J Griffith

Other Presentations:

- Nathan [Dodder](#) gave a presentation entitled “Trend detection and enhanced cataloguing of bioaccumulative chemicals in Southern California dolphins” at the 2014 Annual California Stranding Network Meeting on February 7 in La Jolla, CA.
- Karen [McLaughlin](#) presented a talk on “Ocean acidification and changing the ocean chemistry” at the City of Newport Beach Water Quality and Coastal Tidelands Committee Meeting on February 13 in Newport Beach, CA.
- Alvina [Mehinto](#) gave a seminar entitled “Application of transcriptomics technology in the field” at the University of California, Riverside on February 19.
- Eric [Stein](#) gave a talk entitled “Informing management decisions through regional monitoring and assessment” at the State Water Board’s 2014 Statewide Watershed Management Forum on February 25 in Riverside, CA.
- Eric [Stein](#) gave a talk entitled “Using aquatic community composition as a tool for evaluating stream condition and influencing management actions” at the University of Southern California Biodiversity and Environment Science and Social Hour on February 25 in Los Angeles, CA.
- Steve [Bay](#) gave a presentation entitled “Environmental assessment resources and research in Southern California coastal waters” at an oil spill response planning meeting hosted by the National Oceanic and Atmospheric Administration on March 6 in Long Beach, CA.
- Larry [Cooper](#) presented a “History of Beach Watch” at the State Water Resources Control Board on March 7 in Sacramento, CA.

- Alvina [Mehinto](#) gave a presentation entitled “Development of bioassays for environmental monitoring and assessment” at the Oceans and Human Health Grantees Meeting on March 27 in San Diego, CA.
- Nathan [Dodder](#) gave a presentation entitled “Broader impacts of SCOHH non-targeted analysis and natural halogenated product research” at the Oceans and Human Health Grantees Meeting on March 27 in San Diego, CA.
- Blythe [Layton](#) presented a webinar entitled “Source Identification Protocol Project” for the Orange County Stormwater Program’s Water Quality Monitoring and Science Task Force on April 15.
- Steve [Steinberg](#) gave a presentation entitled “Developing a water quality index for Southern California reef habitats” at a technical meeting of the Southwest US Region of ASPRS: Geospatial Information Society hosted by San Diego State University, April 18 in San Diego, CA.
- Steve [Steinberg](#) gave an invited presentation on “Mobile applications for environmental data collection” at BAE Systems on April 18 in San Diego, CA.
- Ken [Schiff](#) gave a presentation entitled “Evaluation of Newport Bay Watershed monitoring programs” to the Santa Ana Regional Water Quality Control Board on April 25 in Fountain Valley, CA.
- Keith [Maruya](#) gave a presentation entitled “Monitoring of chemicals of emerging concern in California’s water resources” at the San Diego Regional Water Quality Control Board on May 6 in San Diego, CA.

Professional Appointments:

- Raphael [Mazor](#) was appointed secretary for the California chapter of the Society for Freshwater Science.
- Martha [Sutula](#) was appointed to the Coastal and Estuarine Research Federation Governing Board.

Meetings & Workshops Held at SCCWRP:

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Feb 12	Harbor Technical Workgroup — Total Maximum Daily Load Coordination for Ports of Los Angeles and Long Beach	Bay
Feb 13	Commission’s Technical Advisory Group (CTAG)	Weisberg

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Feb 14	Tijuana River National Estuarine Research Reserve: Temporal Investigation of Marsh Ecosystems	Solek
Feb 18	Microbial Source Tracking Marker Degradation Study	Griffith
Feb 18	Marine Protected Area Tribes Meeting	California Ocean Protection Council
Feb 19	Beach Water Quality Work Group	Weisberg
Feb 25	Bight '13 Contaminant Impact Assessment: Toxicology Committee	Bay
Mar 3	Bight '13 Marine Protected Areas/Rocky Reef Planning Committee	Schiff
Mar 4	Southern California Stormwater Monitoring Coalition: Bioassessment Workgroup	Mazor
Mar 6	Flow Ecology Project Advisory Committee	Stein
Mar 7	SCCWRP Commission	Weisberg
Mar 10	Headwaters to Ocean (H2O) Program Committee	Solek
Mar 11	Water Quality Compliance Assessment for Offshore Outfalls	Weisberg
Mar 11	Bight '13 Nutrients: Mooring Subcommittee	Orange County Sanitation District
Mar 12	Harbor Technical Work Group: Compliance Focus Group	Bay
Mar 12	Bight '13 Marine Protected Areas/Rocky Reef Planning Committee	Schiff
Mar 13	Newport Bay Watershed Model Monitoring	Schiff
Mar 26	Bio-objectives Stakeholder Meeting	State Water Resources Control Board
Mar 31	Environmental Bioscreening	Maruya

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Apr 2	Southern California Wetlands Recovery Project	California State Coastal Conservancy
Apr 3	Statewide CEC Monitoring Prioritization Pilot Study	Maruya
Apr 3	Nontargeted Analysis	Maruya
Apr 7-11	California Rapid Assessment Method Training	Solek
Apr 9	Commission's Technical Advisory Group (CTAG): Charter Committee	Weisberg
Apr 11	Seminar: Dr. Dave Smith — " Status and future of water recycling in California "	Weisberg
Apr 14	Bight '13 Executive Advisory Committee	Schiff
Apr 14	Commission's Technical Advisory Group (CTAG): Sediment Quality Objectives Research Planning	Weisberg
Apr 15	Harbor Technical Workgroup — Total Maximum Daily Load Coordination for Ports of Los Angeles and Long Beach	Bay
Apr 16	Water Quality Compliance Assessment for Offshore Outfalls	Weisberg
Apr 17	Southern California Association of Marine Invertebrate Taxonomists	LA County Sanitation Districts
Apr 17	Harbor Technical Work Group: Compliance Focus Group	Bay
Apr 21	Bight '13 Contaminant Impact Assessment: Trawl Committee	Schiff
Apr 21	Gulf of Mexico Research Initiative Proposal Coordination	Bay
Apr 23	Bio-objectives Stakeholder Meeting	State Water Resources Control Board
Apr 25	Bacterial Objectives Outreach	State Water Resources Control Board
Apr 29	Commission's Technical Advisory Group (CTAG): Bio-objectives Research Planning	Weisberg

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
Apr 29	Agilent Tapestation Demonstration	Mehinto
Apr 30	Causal Analysis/Diagnosis Decision Information System (CADDIS) Planning	Santa Ana Regional Water Quality Control Board
May 1	SCCWRP Commission Strategic Planning Meeting	Weisberg
May 2	Statewide Contaminants of Emerging Concern (CEC) Monitoring Panel Meeting	Maruya
May 2	Seminar: Dr. Lisa Levin — “Hypoxia, hypercapnia, and other influences on oxygen minimum zone benthos”	Weisberg
May 5	Bight '13 Marine Protected Areas/Rocky Reef Planning Committee	Schiff
May 6	Commission’s Technical Advisory Group (CTAG) – Publicly Owned Treatment Works (POTW) Subgroup	Weisberg

Upcoming Commission/CTAG Meetings and Seminars:

- SCCWRP will host the next [CTAG](#) meeting on Thursday, May 15 from 9:00 to 4:00.
- SCCWRP will host the next [Commission](#) meeting on Friday, June 6 from 9:30 to 12:00.
- The next SCCWRP [Seminar](#), “The Nature Conservancy: Organizational overview & outline of engagements in the south coast,” will be presented by Dr. Sophie Parker and Lily Verdone on Friday, June 13 from 11:00 to 12:00.

PROJECTS

Note: The following progress updates describe accomplishments for each of SCCWRP's projects in the last quarter. Find more details about each project in SCCWRP's [2013–2014 Research Plan](#).

Projects with significant activity this quarter:

[Molecular Tools for Toxicity Identification Evaluation](#)

[Wet Weather Epidemiology](#)

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

[Historical Ecology of Wetlands](#)

[Newport Bay Watershed Model Monitoring](#)

New Project:

[San Diego County Water Data Management Planning](#)

A. ENVIRONMENTAL ASSESSMENT METHOD/TOOL DEVELOPMENT

1. Chemistry Assessment

a. [Analytical Methods for Toxaphene](#)

Purpose: Develop analytical methods for quantifying toxaphene residues in environmental sample extracts

Update: SCCWRP staff completed analysis of intercalibration samples of fish tissue and spiked marine sediments. Over the next quarter, staff will compile results from the other participating labs.

Lead Investigator: [Maruya](#)

b. [Non-Targeted Analysis](#)

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

Update: Researchers continued to work with academic collaborators to prepare two manuscripts, one on the analysis of cetacean blubber samples and the second on the analysis of black skimmer eggs. A new collaboration began with Dr. Mariana Alonso, a visiting post-doctoral researcher at SCCWRP. Her project will use non-targeted analysis to identify non-routine contaminants in marine mammals.

Lead Investigator: [Dodder](#)

c. [Passive Samplers](#)

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

Update: Processing continues for passive samplers from the phase II deployment (September 2013) of the Palos Verdes Shelf Superfund site assessment. Next, researchers will begin ex-situ analysis of sediments as part of an international round-robin exercise.

Lead Investigator: [Maruya](#)

d. [Emerging Contaminant Prioritization](#)

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

Update: SCCWRP staff initiated processing of sediment and fish tissue samples for pharmaceuticals and personal care products (PPCPs). In addition, SCCWRP released draft targeted and special study requirements for the State Water Board, which is developing a statewide pilot contaminant of emerging concern (CEC) monitoring plan. Review of the draft plan was the topic of a Technical Advisory Committee meeting held at SCCWRP on May 2. Next, SCCWRP and collaborators will finalize sample protocols for perfluorinated chemicals (PFCs) and draft a quality assurance project plan for the statewide pilot CEC monitoring study.

Lead Investigator: [Maruya](#)

e. [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: SCCWRP completed bioanalysis of recycled water samples from California and Arizona utilities as part of a round-robin exercise among project team members. Next, researchers will compile results from the exercise, and draft and submit the final project report for recycled water applications. In addition, they will initiate bioanalysis of sediment and tissue extracts from the Southern California marine environment.

Lead Investigator: [Maruya](#)

2. Toxicity Assessment

b. [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)

Highlight

Update: Statistical analysis of amphipod microarray interlaboratory study was completed. There was a high level of agreement among laboratories when a threshold of two-fold induction/inhibition was used to identify differentially expressed genes. Greater standardization of sample preparation and analysis methods is needed to improve data comparability. A draft manuscript describing the results has been prepared and is under internal review. Statistical analysis of gene expression microarray analyses of hornyhead turbot liver samples is underway. The liver samples came from recent field collections off Palos Verdes and Dana Point, plus a laboratory experiment exposing turbot to PBDEs and PCBs. Preliminary results indicate some differences between PCB- and PBDE-induced gene responses. Data analysis continues, aimed at identifying gene sets where expression is specific to unique classes of contaminants.

Lead Investigator: [Bay](#)

3. Biological Assessment

a. [Rocky Reefs](#)

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

Update: SCCWRP researchers continued calibrating and validating ecosystem models to predict biological richness. Predictive ecosystem models were adapted from SCCWRP's stream modeling approaches, signifying the first time these types of models have been applied in rocky reef habitats. These ecosystem models will ultimately be used to assess impacts from water quality and fishing.

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: First, sequence data for the approximately 100 environmental DNA (eDNA) samples collected in the fall was received from the US Environmental Protection Agency (EPA) lab in Cincinnati. Staff are currently analyzing the data and comparing it to the traditional morphology-based taxonomy data to determine how well eDNA (extracted from the water column) can be used to quantify the in-stream community composition. Second, SCCWRP sent marine invertebrate samples subjected to different preservation techniques to the EPA lab for sequencing in order to identify optimal sample preservation strategies. Finally, analysis of the results for the San Gabriel River pilot study to evaluate the effect of barcoding on bioassessment metric sensitivity has been suspended due to insufficient funding to continue this project.

Lead Investigator: [Stein](#)

c. [Cyanobacteria](#)

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

Update: Initiation of sample analyses for streams, lakes, and estuaries will likely be delayed until the next fiscal year.

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, SCCWRP researchers continue to conduct fieldwork at highly ephemeral stream sites throughout Southern California. These data are being used to analyze the performance of proposed rapid indicators for these systems. In addition, work done to identify flow metrics at gauged ephemeral stream sites will help inform ephemeral stream classification. For the non-perennial stream project, eight sites were sampled in late March for benthic invertebrates and algae. Of the 14 sites with water level loggers, six streams were dry or had insufficient flow for sampling. The eight sampled sites were revisited in April.

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 researchers coordinated a laboratory intercalibration exercise last quarter to gauge the effectiveness of qPCR training in December. The results were presented to participants in March and most labs performed well, authorizing them to begin analyzing samples collected as part of the Bight '13 microbiology effort. Next quarter, SCCWRP will be assisting the laboratories that performed less well in the intercalibration exercise in order to make them more proficient.

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 submitted four individual reports detailing the results of source identification studies from Doheny State Beach, Topanga State Beach, Arroyo Burro Beach, and Cowell Beach. These four case studies were the foundation of the source identification manual adopted by the State Water Board in January. In addition, the research team held a planning meeting for a new project designed to elucidate degradation rates of microbial source identification markers in the environment. Next quarter, the research team will submit their final report for the Source Identification Protocol Project and initiate fieldwork for the marker degradation project.

Lead Investigator: [Griffith](#)

c. 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, including site selection, awaits a final grant agreement with the State Water Resources Control Board.

Lead Investigator: [Schiff](#)

d. Wet Weather Epidemiology

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

Update: SCCWRP successfully completed a pilot study this winter to assess the feasibility and need for a larger, more rigorous study. Researchers sampled water quality from both targeted beaches (Ocean Beach and Tourmaline Surfing Park) for all three targeted storm events, including an intensive 36-hour water quality study during the largest storm of the year in February. Researchers also achieved their goal to recruit between 100 and 200 surfers; 197 are currently enrolled, split roughly evenly between on-the-beach and online recruitment. The enrolled surfers' health is being tracked for 12 weeks using a smart phone application downloaded from the iTunes or Google Play store. Researchers currently have over 1,200 person-weeks of exposure information. A final decision on whether to undertake the full-scale study will be made in June following an assessment of health impacts and human contributions to water quality impairments.

Highlight



Photo credit: Yiping Cao

Dr. John Griffith gathers information on potential sources of microbial contamination to beaches to inform the San Diego area wet weather epidemiology study.

Lead Investigator: [Schiff](#)

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: Sampling for the spring 2014 season began this quarter.

Lead Investigator: [Howard](#)

b. [Coastal Hypoxia](#)

Purpose: Investigate trends in oxygen conditions in Southern California waters and assess the relative importance of natural versus anthropogenic drivers

Update: A manuscript describing the status and trends in quarterly discharger dissolved oxygen data was accepted for publication in *Limnology and Oceanography*. Researchers also continued to work on a review paper synthesizing drivers for hypoxia in upwelling-dominated systems.

Lead Investigator: [Sutula](#)

c. [Ocean Acidification](#)

Purpose: Improve ocean acidification monitoring capacity for the US West Coast

Update: SCCWRP researchers are presently working through the California Current Acidification Network (C-CAN) to develop how-to manuals that will help standardize acidification monitoring practices. As part of that effort, SCCWRP is analyzing data from a Durafet™ pH sensor intercalibration study to help develop a best practices manual. Researchers are also working with the Bight '13 offshore

water quality team (see project [Southern California Bight Regional Monitoring Program](#)) to pilot improved acidification monitoring practices among the SCCWRP member agencies. Sampling for this pilot program is scheduled to begin in May.

Lead Investigator: [McLaughlin](#)

d. [Causal Modeling](#)

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

Update: A report on the 2-day modeling workshop held in December 2013 was completed and will be distributed through the Stanford University Center for Ocean Solutions. The workshop identified the preferred modeling approach for linking dynamic oceanographic and nutrient biogeochemical cycling. Scoping will begin next quarter, in collaboration with UCLA, for initiating this linked causal modeling in the Southern California Bight.

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 eutrophication indicators related to nutrient concentrations, algal/phytoplankton biomass, cyanobacteria/cyanotoxins, and algae and macroinvertebrate taxonomy

Update: The report summarizing analysis to identify thresholds in the relationship between nutrients, algal biomass, and indicators of aquatic life use (benthic invertebrate and algal community composition) was submitted to CTAG last quarter and is also under review by Environmental Protection Agency external peer reviewers. Next quarter, the State Water Resources Control Board will initiate a stakeholder workgroup to provide feedback on nutrient objectives development. In a TMDL case study in the Santa Margarita River watershed, sampling is underway to gather data to support modeling of nutrient targets.

Lead Investigator: [Sutula](#)

c. [Nutrient Objectives in Estuaries](#)

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

Update: Researchers continue preparing a manuscript based on the results of field experiments quantifying the effect of macroalgae on seagrass. In addition, researchers held the first expert workgroup meeting to support development of a Nutrient Numeric Endpoints assessment framework for San Francisco Bay. Fieldwork continues to document 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: First, the Harbor Technical Workgroup (HTWG) met February 12, March 12, April 15, and April 17. At these meetings, the HTWG reviewed study designs for modeling watershed loadings and measuring tissue contaminants in fish and invertebrates, and developed draft guidance for the use of SQOs in TMDL compliance. Summaries of accomplishments are in development for a meeting on May 30 to review HTWG progress. Second, researchers completed initial assessment of multiple subregions within five California bays using the draft human health SQO assessment framework. Internal review of the results, in progress, will ultimately identify refinements to the SQO data interpretation framework.

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 first external advisory committee meeting for the project took place on March 6, which included 31 participants representing technical experts, agency staff, and municipalities. The project team presented the work plan and received input during the meeting to help refine the overall project scope. Following the advisory committee meeting, the work plan and quality assurance project plan were finalized and submitted to the State Water Board for review and approval. Sites were also selected for supplemental fieldwork during the past quarter. Two site types were targeted including reference sites with long-term flow data and hydrologically modified sites with no flow data. Following field reconnaissance, 30 sites were selected for sampling, which began the last week of April.

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: SCCWRP researchers continued developing a decision support tool to optimize water resource management in the Maribyrnong River and Jackson Creek Watersheds in Australia.

Lead Investigator: [Sengupta](#)

b. [Stressor Response Modeling](#)

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

Update: SCCWRP researchers continued estuarine model setup and parameterization for the Santa Margarita estuary.

Lead Investigator: [Sengupta](#)

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 Bight'13 elements are making tremendous progress. After one of the most successful sampling surveys in the history of the Bight program, the contaminant impact assessment (CIA) element has completed analysis of toxicity samples, is nearing completion of chemical analyses, and is identifying species in biological samples from approximately 400 sites. Samples to assess bioaccumulation through the food web are being distributed to participating labs this month.

The debris element has collected samples and is beginning data analysis from over 300 sites, half from streams and the other half from the ocean, in order to link land- and sea-based debris. Researchers are also measuring plastic in the stomachs of over 1,400 fish for a dedicated study to examine debris effects in wildlife.

The microbiology element continues to sample discharges to contaminated beaches to characterize the prevalence of human waste contributions. The number of active discharges is decreasing because of this winter's drought. For the Marine Protected Area element, both a fishing pressure index and a water

quality index have been developed and placed in a GIS format. The nutrient element has completed final study design and initiated quality assurance activities so fieldwork can begin late this quarter.

Lead Investigator: [Schiff](#)

b. [Pollutant Sources Data Cataloguing](#)

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

Update: SCCWRP researchers completed compilation of POTW self-monitoring data through 2012 as well as monitoring data from smaller point source discharges for the 2010 index year. Data analysis for the 2010 comparative mass emissions report will begin over the next quarter.

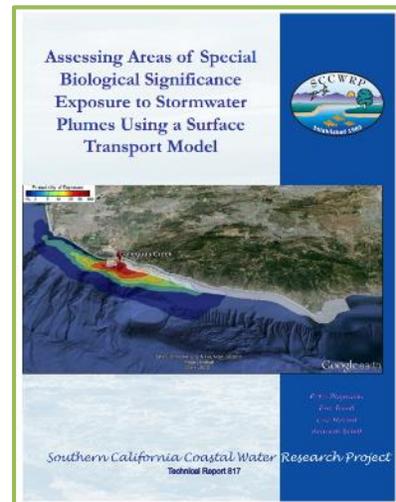
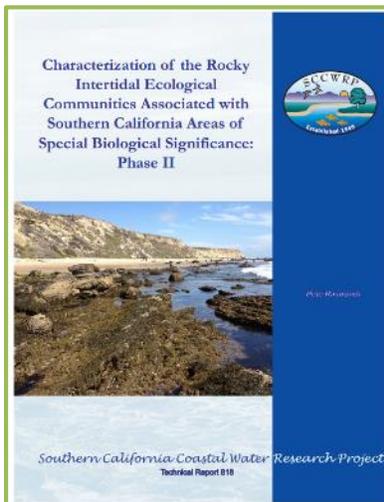
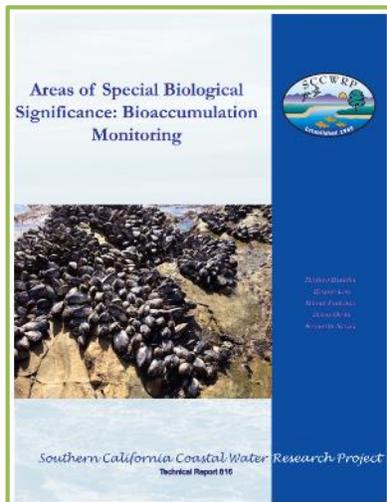
Lead Investigator: [Stein](#)

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: SCCWRP continues compiling data to assess load reductions from bond-funded improvements as the 14 ASBS water bond grantees complete monitoring activities. SCCWRP has also continued coordinating sampling at reference sites throughout the state during multiple storm events. This quarter, researchers completed assessments of [bioaccumulation](#) and [rocky intertidal community](#) effects due to ASBS stormwater discharges in Southern California. Finally, in collaboration with the Southern California Coastal Ocean Observing System (SCCOOS), SCCWRP jointly released a report modeling the [extent of stormwater plumes in ASBS surface waters](#).

Highlight



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: Chemistry, toxicity, and biological community sample processing and data analyses from the fifth year of sampling continue. Planning for the upcoming sampling season is also ongoing.

Lead Investigator: [Schiff](#)

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: Sampling continues for the third year of wet and dry weather monitoring in reference streams for nutrients, metals, and bacteria. The beach bacteria study remains delayed and will begin in fall 2014.

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: Researchers continued data analysis.

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 project team completed an inter-mapper variability exercise over the past quarter. Results of the analysis indicated that independent teams can produce overall aerial estimates within 6% of each other and consistently classify 80% of the polygons. The areas of greatest discrepancy between mapping



Photo credit: Liesl Tiefenthaler

Markus Endter collects data for the San Diego reference streams study.

teams are being investigated to inform modifications to the mapping protocols and standard operating procedure (SOP) to improve consistency. Researchers expect to finalize the SOP and quality assurance project plan next quarter, and will then begin the pilot implementation portion of the project.

Lead Investigator: [Stein](#)

b. [Depressional Wetlands](#)

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

Update: Taxonomic identification of benthic invertebrates and diatoms from dozens of depressional wetlands continues. Once completed, researchers will be able to analyze the entire Southern California data set from 2011–2013. In addition, plans were finalized with the San Francisco Regional Water Quality Control Board (and contractors) for sampling in the San Francisco Bay Area beginning in late April/early May 2014. The draft Standard Operating Procedures (SOP) for application of field methods in depressional wetlands was reviewed and approved by the Surface Water Ambient Monitoring Program (SWAMP) review panel, pending some minor final edits. Once completed, this will become an official SWAMP SOP.

Lead Investigator: [Stein](#)

c. [Historical Ecology](#)

Purpose: Establish a framework for compiling historical data on watershed and wetland conditions, and evaluate changes in response to land use modification and resource management efforts

Update: The north San Diego Lagoon historical ecology draft report has been completed and sent to the technical advisory committee for their review. Data analysis for the regional t-sheet mapping project has also been completed. Analysis results regarding the historical extent and distribution of coastal wetlands and loss/type conversion since ca. 1870 were presented to the Wetland Recovery Project Managers Group on April 2. Historically, more than 25,000 ha (61,776 acres) of coastal wetlands existed between Point Conception and the US-Mexico border. Of the 331 coastal systems analyzed, 75% were less than 100 ha (\approx 250 acres) in size. Overall wetland area (intertidal + subtidal) has declined by 37% since 1870, but the distribution has shifted from 35% subtidal to 71% subtidal. This translates to 72% of estuarine wetlands being converted to subtidal habitat, such as deepwater marinas and harbors. The project team is currently working on final project report and updating the t-sheet website. Finally, the project team has completed most of the data compilation for the Tijuana River Valley historical ecology project.

Lead Investigator: [Stein](#)

Highlight

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: SCCWRP has continued to develop mobile-compatible data collection devices to mesh with its mobile strategy. This quarter, an updated version of the CellScope was developed in collaboration with UC Berkeley and will begin further field testing. Researchers also made progress developing a Bluetooth water quality probe for integration with mobile apps.

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: SCCWRP has been working to improve and modernize the Beach Watch data system originally developed over a decade ago. The new data submission software is undergoing testing and refinement and will be deployed to participating coastal counties through the early summer. Associated server-side improvements are simultaneously being completed at SCCWRP to receive data for Beach Watch.

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: Release of the newly developed "Safe to Drink" data portal on the California Water Quality Monitoring Council website is still pending.

Lead Investigator: [Steinberg](#)

4. **San Diego County Water Data Management Planning**

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

Update: After three successful meetings of the advisory workgroup, researchers compiled a list of major data uses. They also developed and tested a web-based "needs assessment" survey to gauge the water data management and access needs of stakeholders. At present, invitations are being extended to representatives from a diverse range of stakeholders involved in the collection, quality assurance/quality control, management, and analysis of water data. After these individuals complete

New
Project

the survey, they will be invited to participate in stakeholder meetings throughout the summer and fall to discuss their data needs and requirements in depth.

Lead Investigator: [Steinberg](#)

E. MEMBER AGENCY SUPPORT

2. [Quality Assurance for Offshore Monitoring](#)

Purpose: Prepare method quality objectives (MQOs) for quality assurance of regional and statewide ocean monitoring data

Update: SCCWRP continues to work with the Bight '13 technical working groups to evaluate and agree upon data quality objectives for biological sampling, such as trawl-caught fish or benthic infauna. Early results indicate that member agencies are able to routinely achieve the high levels of quality assurance set by data quality objectives.

Lead Investigator: [Schiff](#)

4. [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 preparation continues for a special issue of *Estuarine, Coastal and Shelf Science*.

Lead Investigator: [Howard](#)

5. [Newport Bay Watershed Model Monitoring](#)

Purpose: Facilitate a critical review of current monitoring efforts in the Newport Bay Watershed to improve effectiveness, cost-efficiency, and data synthesis

Update: Researchers facilitated a stakeholder meeting in February to review the [final report](#), which SCCWRP released in April. The report release coincides with the upcoming renewal of the Orange County Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) permit. The Newport Bay Watershed is one of the most intensely monitored watersheds in Southern California with over 30,000 individual analyses per year in roughly 300 kilometers of stream miles. In general, current monitoring practices have effectively shown improvements corresponding to management actions over the last four decades. However, monitoring efficiency and reduced costs could be gained into the future can by optimizing sampling frequency, dropping measurements that provide redundant information, and using new technology for enhanced monitoring approaches. This information was presented to the Santa Ana Regional Water Quality Control Board at their public meeting on April 25.

Highlight

Lead Investigator: [Schiff](#)

6. Water Quality Compliance Assessment for Offshore Outfalls

Purpose: Develop a shared water quality compliance assessment protocol for coastal southern California publicly owned treatment works

Update: SCCWRP researchers continue to work with the member agencies on two manuscripts. The first, capturing rationale for use of CDOM to identify plume location, has been reviewed by all participants and is nearly ready for journal submission. The second, detailing development of the assessment algorithm for dissolved oxygen, is undergoing some minor fine-tuning based on feedback from the last project meeting March 11. SCCWRP researchers are also refining a compiled version of MATLAB code that runs the plume detection algorithm to include a coldwater entrainment module.

Primary Investigator: [Weisberg](#)