SOUTHERN CALIFORNIA COASTAL WATER RESEARCH PROJECT

A Public Agency for Environmental Research

Quarterly Director's Report to the SCCWRP Commission

August 2014

Detailing activities May 9 – August 7, 2014

Stephen B. Weisberg, Ph.D.

Executive Director

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HIGHLIGHTS

News:

SCCWRP receives Earth Day award

The Southern California Coastal Water Research Project (SCCWRP) has received an award honoring its accomplishments in coastal environmental protection from Philadelphia Insurance Companies (PHLY). Each year, PHLY staff celebrates Earth Day by awarding money to help support an organization whose mission focuses on improving the natural environment. SCCWRP was nominated by the insurance company's local office, which handles SCCWRP's account. For more information, contact SCCWRP Administrative Officer Bryan Nece.

Ken Schiff, center, accepts a Certificate of Commendation from the Orange County Sanitation District's Troy Edgar, left, and Jim Herberg.

SCCWRP recognized by Orange County Sanitation District on district's 60th anniversary

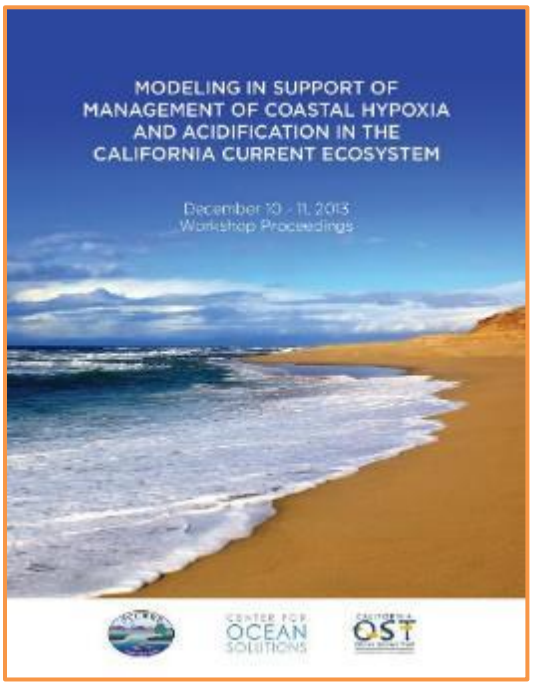
In 2014, the Orange County Sanitation District (OCSD) is celebrating 60 years of service to the residents and businesses of Orange County, California. Special activities throughout the year to mark the occasion will include board member and elected official recognition events, a salute to sister agencies and community partners, staff appreciation events, and media outreach. Formed in 1954, OCSD was one of SCCWRP's founding member agencies in 1969. OCSD recognized SCCWRP as a key and valued partner in service to the community at the Board of Directors meeting on May 28. For more information, contact SCCWRP Deputy Director Ken Schiff.

West Coast Ocean Data Portal receives award

Dr. Steven Steinberg, the head of SCCWRP's Information Management and Analysis Department, also serves as Co-Chair of the West Coast Ocean Data Portal Action Coordination Team. The West Coast Ocean Data Portal is a project of the West Coast Governors Alliance on Ocean Health (WCGA) to better inform regional resource management, policy development, and ocean planning. Launched in January 2014, the collaborative portal involves dozens of state and federal agencies, organizations and tribes from the West Coast. In May, the WCGA was selected from among more than 100,000 nominees to receive the Oceans Special Achievement in Geographic Information Systems (GIS) or SAG award from Esri, an industry-leading

GIS software company, in recognition of its leadership, outstanding work with GIS technology, and innovation in advancing ocean health and awareness. Representatives from the WCGA received the award at Esri's International User Conference in July. Previous winners of this award include the Duke University Marine Geospatial Ecology Lab and the National Oceanic and Atmospheric Administration Biogeography Program. For more information, contact Dr. Steinberg.

Researchers make recommendations on ocean hypoxia/acidification modeling



A group of leading ocean academic researchers, state and federal managers and industry representatives has recommended that as scientists work toward creating hypoxia/acidification models that address West Coast management needs, they should start by using existing models and data and then collect additional observational data in support of model refinement.

At a two-day modeling workshop held in December 2013 at the Southern California Coastal Water Research Project Authority headquarters in Costa Mesa, participants also agreed on the importance of assembling a community of modelers, observation researchers and managers to compare models and outcomes in a focused geographical region. The emphasis should be on collaboration that leads to integrated approaches, the participants noted.

Workshop participants also recommended focusing on local anthropogenic nutrient inputs to improve the modeling baseline that will be needed to gauge regional susceptibility to hypoxia/acidification.

The workshop proceedings were released in July 2014 in a 22-page document titled "Modeling In Support of Management of Coastal Hypoxia and Acidification in the California Current Ecosystem."

The authors of the workshop proceedings are Dr. Martha Sutula, head of SCCWRP's Biogeochemistry Department; Dr. Meredith Howard, SCCWRP senior scientist; Dr. Larry Crowder, science director for the Center for Ocean Solutions; and Skyli McAfee, executive director for the California Ocean Science Trust.

The full report is on the Center for Ocean Solutions website. For more information, contact Dr. Martha Sutula.

SCCWRP Scenes:

Lab technician Allison Orr retrieves dialysis bags filled with diluted human sewage from the San Joaquin Marsh in Irvine during a pilot study that ran from July 14 to July 18 to determine how DNA-based bacterial fecal markers degrade under variable freshwater conditions. The dialysis bags allow for nutrient exchange only; the contents of the bag cannot escape.

SCCWRP staff take part in a lunchtime World Cup soccer tournament that was played in parallel with the real World Cup. Players were divided into four teams: European Union, Mexico, Asia and USA.

Photo credit: Cristina Martinez

PEOPLE

Honors and Awards:

- SCCWRP received a Certificate of Commendation from the Orange County Sanitation District on May 28 in recognition of SCCWRP's work to protect public health and the environment and for its collaborative approach to environmental research and water management.

Personnel:

Beck

Martindale

- **Carly Beck**, a research technician in the Biogeochemistry Department for the past six years, was promoted on July 1 to senior research technician.
- **Scott Martindale**, a former newspaper journalist, joined SCCWRP on July 7 as the agency's new Communications Specialist.
- Martindale replaces **Karen Setty**, SCCWRP's science writer for nearly seven years, who left Aug. 8 to begin maternity leave and pursue new professional opportunities.
- **Becky Schaffner**, a senior research technician in the Information Management and Analysis Department, left on June 20 to take a job in Maine as GIS coordinator for the state's Department of Environmental Protection.

Commission:

- **Massood Eftekhari** was appointed as the Commissioner for the Los Angeles County Flood Control District on June 6, replacing Commissioner **Gail Farber**.

Eftekhari

Commission's Technical Advisory Group:

- Nothing to report.

Spotlight on Staff:

Scott Martindale – Communications Specialist

Scott Martindale is SCCWRP's new communications specialist, replacing science writer Karen Setty. Scott will prepare SCCWRP's quarterly director's reports, oversee the editing and production of SCCWRP's newly redesigned annual report, and manage the SCCWRP website and other publications. He also will attend SCCWRP Commission and CTAG meetings and serve as a communications liaison between SCCWRP and its member agencies. He started on July 7.

Scott grew up in the San Francisco Bay Area. In high school in the late 1990s, he enrolled in a biotechnology ROP course that transformed his relationship with science. For the next six summers, all throughout college, he worked as a laboratory assistant for FibroGen, a Bay Area biotech company working to develop novel therapeutics to treat fibrotic disease. He majored in biology as an undergraduate at the University of Southern California, then decided to switch gears and pursue his love of writing via a master's degree in journalism, also from USC. Before he graduated, the Santa Ana-based Orange County Register – a top 25 U.S. newspaper – hired Scott as a part-time reporter. Scott excelled at this major metropolitan daily and was hired as a full-time staff writer upon graduation. During his eight years at the Register, Scott was assigned to progressively more complex stories and investigative projects on numerous beats, including city government, K-12 education and higher education. Among his varied projects, Scott profiled cutting-edge university researchers, compiled and analyzed salary and benefits data for public educators, co-developed a comprehensive ranking system for all of Orange County's public schools, and investigated and reported on a variety of unlawful, unethical and fraudulent activities.

SCCWRP offered Scott an opportunity to return to a science-oriented environment and apply his skills as a professional communicator to a new challenge. He's energized about translating SCCWRP's important scientific work into accessible, engaging prose, and he looks forward to taking SCCWRP's exceptional scientific publications and written communications to the next level. Scott also is excited about working in the public sector, as he's long been drawn to serving others and helping people to understand and interact with the world around them.

Scott feeds a hungry goat at the OC Fair.

Scott lives in Anaheim within walking distance of his favorite place to hang out, Disneyland, a masterpiece of immersive, themed design and a fun place for him to people-watch and connect with friends. Scott also enjoys reading newspapers – the old-fashioned, printed kind! – and giving back to his profession through journalism mentoring and volunteering.

Spotlight on Partners:

Mike Klinefelter – Environmental Consultant

Mike Klinefelter is an environmental consultant specializing in wetland delineation and functional assessment, regulatory permitting, mitigation monitoring, and geographic information systems (GIS). His professional services focus on accurate and efficient assembly and assessment of environmental data, particularly relating to aquatic resources and sensitive species, for compliance with state and federal regulations (e.g., Clean Water Act, California Fish and Game Code, Federal Endangered Species Act, and State Endangered Species Act). He also teaches GIS and GPS classes at UC Riverside and UC San Diego Extensions. His environmental consulting work centers on Southern California and arid regions of the Southwestern US.

Mike entered the environmental field later in life. Having served in the US Coast Guard for four years, he also worked in the construction industry as a carpenter and general contractor, and for several years as a professional ski patroller. An avid surfer, skier, backpacker, and hang glider, Mike always had a passion for the outdoors. While working in construction, he became keenly aware of changing environmental regulations and policies. In 1994, he returned to school to earn his bachelor's and master's degrees from the University of California Riverside's Environmental Sciences Department. He began using GIS for environmental assessment while obtaining his master's degree.

Mike has been working with Drs. Eric Stein and Chris Solek of SCCWRP's Biology Department on stream and wetland projects since 2003. He serves on the technical advisory committee for SCCWRP's project to improve assessment tools for California's episodic streams. He also served on the Southern California regional team for SCCWRP's project to develop the California Rapid Assessment Method (CRAM). In 2008, he began assisting Dr. Chris Solek and several other CRAM trainers with coordinating and implementing the CRAM training program in Southern California. Mike has co-taught numerous CRAM classes at SCCWRP and other locations. Working with SCCRWP has provided a unique opportunity to be involved in cutting-edge research while still working as a consultant.

Mike lives in Murrieta, California with his wife Kathy who teaches kindergarten. His two daughters, Kristen and Colleen, are both recent graduates of UC Santa Barbara. During his free time, he still enjoys hiking, backpacking, skiing, and fly-fishing in the Sierra Nevada Mountains. Of late, he took up learning to fly remote-controlled model aircraft as both a hobby and for work applications to acquire aerial photography for mapping and environmental monitoring.

Spotlight on Commissioners:

Tully Clifford – Ventura County Watershed Protection District

Tully Clifford is director of the Ventura County Watershed Protection District, a division of the county's Public Works Agency. Tully manages a 140-employee group that works to protect property and the public from damage caused by flood and storm waters, and also to keep waterways safe and healthy. Tully serves as a SCCWRP Alternate Commissioner alongside Commission Vice Chair Gerhardt Hubner, who is one of Tully's deputy directors at the Watershed Protection District.

A native of Calgary in Alberta, Tully attended the Royal Military College of Canada and earned his bachelor's in civil engineering. He spent nine years in the military, becoming commander of the Canadian Armed Forces' 33rd field engineering regiment. Afterward, he held numerous jobs in the civil engineering arena, including working for the Michelin tire company and the 1988 Winter Olympics organizing committee in Calgary. Along the way, he picked up a master's in civil engineering and an MBA, both from the University of Calgary. Tully relocated to California in 2003, when he was hired as Santa Barbara's city traffic engineer, a job he held for about four years. He also spent about four years as Solvang's public works director and a year in Scottsdale, Ariz., helping to set up the city's traffic engineering division. In 2010, eager to show his wife Elizabeth – a Santa Barbara native – what it was like to experience the four seasons in Canada, he took a job as city manager of Crowsnest Pass, about three hours south of his hometown. The first winter, the area received 20 feet of snow. In September 2012, Tully returned to California to take his present job. He was not only grateful to come back to the milder weather, but also to be able to focus full time on water management, an area that has long fascinated him. "It has a direct impact on quality of life," Tully says. "We want safe, healthy, productive watersheds."

Tully has taken a growing interest in the research being done at SCCWRP and how it can be used to guide decision-making by his staff. He's been reading the work produced by SCCWRP scientists and has committed to playing a more active role as an alternate commissioner. The research coming out of SCCWRP, he says, is more valuable than what he's had available in other places he's worked. "It doesn't compare – it's far superior," he says. "The results coming out of SCCWRP are scientifically based, but applicable to the work we do every day."

Tully kayaks in Kauai, Hawaii.

Tully and his wife have six grown children, four grandchildren and two 90-pound rescue dogs named Cali and Bella. They live in Oak View in Ventura County and frequently visit the Central Coast, where they have a second home in Orcutt near Santa Maria. Tully enjoys golfing, and his newest hobby is kayaking in local lakes and oceans with his wife and their two dogs; they recently purchased special, large kayaks so Cali and Bella can join them on their adventures.

Spotlight on CTAG:

Greg Gearheart – California State Water Resources Control Board

Greg on a self-described "crazy kayak adventure" in Guatemala.

Greg Gearheart is a senior water resources control engineer for the California State Water Resources Control Board. He serves as a program manager for the board's Storm Water Section in Sacramento and is currently overseeing a number of projects, including a stormwater strategic initiative. He joined CTAG in spring 2014, replacing Mariela De La Paz Carpio-Obeso.

The son of an environmental resource engineering professor at Humboldt State University, Greg grew up in Arcata along the Northern California coast. He developed a fast appreciation for the ocean and Arcata's dramatic coastline, with its soaring bluffs that plunge into rough ocean waters below. "It's just a powerful place to be," says Greg, an avid surfer in high school. "The water and the smell of salt water – it has a connection for me." Greg graduated in 1992 from Humboldt State with a bachelor's in environmental engineering, a program that prepared him well to find work in water management. He spent seven years with the San Diego Regional Water Quality Control Board, then moved to the San Francisco regional board for 1-1/2 years and finally took a position with the State Water Board in Sacramento, where he's been since 2000. The opportunity to work toward the protection of California's waters is a rewarding profession, Greg says – one that's hooked him from Day 1. "It's really hard to leave because the mission of this organization is powerful and pretty well-supported all of the time," he says.

Greg has been interacting with SCCWRP on and off for the past two decades. He was first introduced to SCCWRP while working for the San Diego Regional board in the mid-90s. During contentious standoffs between state regulators and local water managers, Greg says he was consistently impressed with the way SCCWRP brought the two sides together – face to face – for rational discussion. "I remember going to the meetings and saying, here's the enemy, and we're sitting across from them," Greg says. "It was transformative, so to speak." Later, as Greg was tasked with helping the State Water Board expand its research collaborations in Southern California, he developed a deeper appreciation and understanding of SCCWRP's research agenda and its reputation for objectivity and independence, he says. Most recently, he's collaborated with SCCWRP's Eric Stein on hydromodification and stormwater projects.

Greg dines in Guatemala with a retired water board colleague.

Greg loves spending time at the ocean in his spare time. In landlocked Sacramento, he's learned to treat the American River as a substitute, he says. "I miss not being by the ocean," Greg says. "I'd do open water swimming every day after work if I could."

COMMUNICATIONS

Journal Articles — Published:

- Integrating intermittent streams into watershed assessments: Applicability of an index of biotic integrity. 2014. RD Mazor, ED Stein, PR Ode, K Schiff. *Freshwater Science* 33:459-474. DOI: 10.1086/675683.

- Patterns and potential drivers of declining oxygen content along the Southern California coast. 2014. JAT Booth, CB Woodson, M Sutula, F Micheli, SB Weisberg, SJ Bograd, A Steele, J Schoen, LB Crowder. *Limnology and Oceanography* 59:1127–1138. DOI:10.4319/lo.2014.59.4.1127.

- How much is too much? Identification of the benchmark of adverse effects by bloom forming macroalgae on macrobenthic faunal abundance, diversity, and community composition. 2014. L Green, P Fong, M Sutula. *Ecological Applications* 24:300–314. DOI:10.1890/13-0524.1.

- A regional survey of the extent and magnitude of eutrophication in Mediterranean estuaries of Southern California, USA. 2014. K McLaughlin, M Sutula, L Busse, S Anderson, J Crooks, R Dagit, D Gibson, K Johnston, L Stratton. *Estuaries and Coasts* 37:259–278. DOI:10.1007/s12237-013-9670-8.

Journal Articles — Published Online:

- None

Journal Articles — Accepted:

- None

Technical Reports:

- Southern California Stormwater Monitoring Coalition 2014 Research Agenda. 2014. K Schiff, ED Stein, S Aminzadeh, A Boehm, G Hildebrand, L Honeybourne, I Nasseri, P Ode, S Taylor, D Senn, J Smith, C Sommers, E Strecker. Technical Report 828.

- Modeling In Support of Management of Coastal Hypoxia and Acidification in the California Current Ecosystem. 2014. M Sutula, M Howard, L Crowder, S McAfee. Technical Report 829.

Conference Presentations:

CLE International: California Wetlands: Insights from Policy Makers & Regulators – May 5-6, 2014 – San Francisco

- Stream Monitoring and Assessment in California – ED Stein

American Society for Microbiology 2014 Water Microbiology Conference: Microbial Contaminants from Watersheds to Human Exposure – May 5-7, 2014 – Chapel Hill, NC

- Droplet Digital PCR Quantification of Human Adenoviruses – Y Cao, MR Raith, JF Griffith
- Inter-lab comparison of in situ automated qPCR for Enteococcus versus commercial benchtop instruments – BA Layton, K Yamahara, A Cox, K Goodwin, W Nilsson, M Strom, C Scholin, J Griffith

American Society for Microbiology 114th General Meeting – May 17-20, 2014 – Boston, MA

- *(Poster presentation)* Droplet digital PCR quantification for human Adenovirus – Y Cao, MR Raith, JF Griffith

Joint Aquatic Sciences Meeting 2014: Bridging Genes to Ecosystems: Aquatic Science at a Time of Rapid Change – May 18-23, 2014 – Portland, OR

- *(Workshop)* Wetland EcoGenomics Analysis Network (WEGAN) – M Hajibabaei, D Baird, M Finlayson, J Gibson, ED Stein
- *(Special session)* Environmental DNA Applications for Aquatic Ecosystems – M Hajibabaei, E Pilgrim, ED Stein
- Integrative Assessment of Freshwater Depressional Wetland Condition in California – ED Stein
- *(Special session)* Ecology and management of temporary streams – RD Mazor, M Bogan, T Datry, T Schriever, C Leigh, J Davis
- Technical Obstacles and Solutions for the Management of Temporary Streams: What Are Western States Doing, And How Can Researchers Help? – RD Mazor , P Ode, ED Stein, M Denton
- Small streams as widespread sources of benthic cyanotoxin production in California – B Fetscher
- Can We Merge Traditional Morphological and Molecular Taxonomic Methods for Use in Marine Benthic Assessment Programs? – D Gillett

Headwaters to Ocean H20 Conference 2014 – May 27-29 – San Diego

- How Open is Open? How Closed is Closed? Classification of Estuarine Mouth Closure Patterns: Implications for Restoration and Management – ED Stein
- Southern California Coastal Wetlands Change Assessment: What has Happened Between 1870 and 2005? – ED Stein

Delta Science Program 2014 Environmental Data Summit – June 5, 2014 – Davis, CA

- The California Environmental Data Exchange Network (CEDEN): A Statewide Water Quality Monitoring System for California — S Steinberg

National Association of Remedial Project Managers 2014 Training Program – June 16-20, 2014 – Atlanta, GA

- Passive sampling methods for managing contaminated sediments: State of the science – KA Maruya

Other Presentations:

- Steve Bay gave a presentation titled "San Diego Bay Bioaccumulations Study Overview" at the San Diego Regional Water Quality Control Board's meeting on San Diego Bay studies on July 30 in San Diego, CA.
- Yiping Cao gave an invited lecture presentation titled "Detecting Human Pathogenic Viruses, Bacteria, and Protozoans" at the University of California, Irvine's Undergraduate Partnerships for International Research and Education (PIRE) Program Down Under on June 26 in Irvine, CA.
- Yiping Cao gave an invited talk titled "Small size, big power: Application of digital PCR in water quality monitoring" at the U.S. Environmental Protection Agency on May 1 in Cincinnati, OH.
- Julia Coates and Ken Schiff gave a presentation titled "Development of a Rocky Reef Health Index" to the California Water Quality Monitoring Council on May 28 in Costa Mesa, CA.
- Nathan Dodder gave a presentation titled "Southern California CEC Surveys, Monitoring Prioritization, and Advanced Measurement Technology" at the 2014 Southern California Environmental LC/MS/MS Discussion Group of the Orange County Water District on May 22 in Fountain Valley, CA.
- Ken Schiff gave a presentation titled "Monitoring in the Newport Bay Watershed" to the Newport Bay Conservancy on June 28 in Newport Beach, CA.
- Ken Schiff gave a presentation titled "Surfer Health Study" to the San Diego Surfrider Chapter on July 16 in San Diego, CA.
- Ken Schiff gave a presentation titled "Beach Health Studies" to the Los Angeles County Department of Public Works on July 24 in Alhambra, CA.
- Eric Stein taught two section of the federal interagency wetland mitigation banking and in-lieu fee program training June 24-26 in Shepherdstown, WV.
- Steve Steinberg gave a presentation titled "San Diego Bay Fish Consumption Study Overview" at a public information meeting at the San Diego Regional Water Control Board on July 30 in San Diego, CA.
- Steve Steinberg provided a briefing to NOAA Response & Restoration staff titled "Mobile Electronic Data Capture of Sampling Data" via WebEx on August 1.
- Martha Sutula attended a meeting of the Louisiana Coastal Wetland Restoration Sediment Diversion Expert Panel April 29-May 1 in New Orleans, LA.

- Martha Sutula gave a presentation titled "Progress on Development of a Nutrient Assessment Framework for San Francisco Bay" to the San Francisco Bay Nutrient Management Steering Committee on June 25 in Oakland, CA.

- Martha Sutula gave a presentation titled "Overview of Technical Elements Supporting Nutrient Objectives in Wadeable Streams" at the State Nutrient Objectives Stakeholder meeting on June 13 in Sacramento, CA.

- Steve Weisberg presented a talk titled "How Effective is Southern California's Water Quality Management?" as part of the "Toward a Sustainable 21st Century" series at the University of California, Irvine on May 27 in Irvine, CA.

- Steve Weisberg gave a talk about the connections between water quality and marine protected area management monitoring programs to the Ocean Protection Council's Scientific Advisory Team on June 11 in Oakland, CA.

Professional Appointments:

- Steve Steinberg was elected to the Board of Directors of the California Geographic Information Association (CGIA).
- Ken Schiff was appointed to the San Diego Integrated Regional Water Management Advisory Committee.
- Eric Stein and Martha Sutula were appointed to the newly recreated Southern California Wetland Recovery Project Science Advisory Panel.

Meetings & Workshops Held at SCCWRP:

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
May 9	Statewide CEC Monitoring Stakeholders	Maruya
May 13	Bight'13 Toxicology Committee	Bay
May 13	CTAG Member Agency Historical Monitoring Data Project Subcommittee	Schiff
May 14	Harbor Technical Workgroup — Total Maximum Daily Load (TMDL) Coordination for Ports of Los Angeles and Long Beach	Bay
May 15	SCCWRP Commission's Technical Advisory Group (CTAG)	Weisberg
May 21	California Beach Water Quality Workgroup (BWQW)	Weisberg

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
May 28	California Water Quality Monitoring Council (WQMC)	Weisberg
May 28	Southern California Association of Marine Invertebrate Taxonomists (SCAMIT)	SCAMIT
May 29	Southern California Stormwater Monitoring Coalition (SMC) Regional Monitoring Planning	Stein
May 29	Bight'13 Chemistry Committee	Dodder
June 2	Southern California SETAC (Society of Environmental Toxicology and Chemistry) Technical Assessment Group	Greenstein
June 2	American Institute of Chemical Engineers (AIChE) UC Irvine Chapter	Maruya
June 3	California Coastal Commission Marine Debris Group	Coastal Commission
June 3	Heal the Bay (HTB) Beach Modeling Group	Heal the Bay
June 4	Southern California Wetlands Recovery Project (SCWRP) Wetland Managers Group (WMG)	SCWRP
June 6	SCCWRP Commission	Weisberg
June 10	Bight '13 Trawl Committee	Schiff
June 12	U.S. Army Corps of Engineers (USACE) California Coastal Sediment Master Plan Public Outreach and Plan Formulation	USACE
June 13	Seminar: Dr. Sophie Parker and Lily Verdone – "Organizational Overview & Outline of Engagements in the South Coast"	Weisberg
June 16	City of Dana Point LO1SO2 Infiltration/Diversion Project	Layton
June 24	Conductivity, Temperature and Depth (CTD) Compliance Assessment Workgroup	Weisberg
June 26	CTAG Sediment Quality Objectives (SQO) Workshop	Bay
July 17	CTAG Nutrient Numeric Endpoint (NNE) Planning	Sutula

Date	Meeting	SCCWRP Contact/ Sponsoring Agency
July 23	Southern California Stormwater Monitoring Coalition (SMC) Bioassessment Workgroup	Mazor
July 25	California State University, Fullerton Upward Bound high school student tour	Bay
July 28	Bight '13 Trawl Committee	Schiff
July 29	CTAG Public Owned Treatment Works (POTW)	Weisberg
July 29	Southern California Wetlands Recovery Project (SCWRP) Wetland Managers Group (WMG)	SCWRP
July 31	Southern California Bight Kelp Monitoring Consortium	Schiff
July 31	State Water Resources Control Board (SWRCB) Methylmercury Environmental Justice Nongovernmental Organization (NGO) Stakeholders	SWRCB
July 31	State Water Resources Control Board Stormwater Stakeholders	SWRCB
Aug. 6	State Water Resources Control Board (SWRCB) Sediment Quality Objectives (SQO) Stakeholder Advisory Committee	Bay
Aug. 7	Harbor Technical Workgroup — Total Maximum Daily Load Coordination for Ports of Los Angeles and Long Beach	Bay

Upcoming Commission/CTAG Meetings and Seminars

- SCCWRP will host the next CTAG meeting on Thursday, August 14 from 9 a.m. to 4 p.m.
- SCCWRP will host the next Commission meeting on Friday, September 5 from 9:30 a.m. to noon.
- Dr. Meenakshi Arora of the University of Melbourne will kick off SCCWRP's Fall 2014 Seminar Series on Friday, August 22 at 11 a.m. with a presentation titled "Water Resource Management in Australia: Quantity and Quality Perspectives."

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 2014-15 Research Plan.

Projects with significant activity this quarter

Molecular Tools for Toxicity Identification Evaluation

Rocky Reefs

Nonperennial Streams

Stormwater Monitoring Coalition (SMC) Regional Watershed Monitoring

Wetlands Status and Trends

Sediment Quality Objectives

Dynamic Data Processing and Visualization

A. ENVIRONMENTAL ASSESSMENT METHOD/TOOL DEVELOPMENT

1. Chemistry Assessment

a. Emerging Contaminant Prioritization

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

Update: Staff and collaborators continued processing sediment and fish tissue samples and generated preliminary results for selected pharmaceuticals and personal care products (PPCPs). In addition, staff began drafting the quality assurance project plan for the statewide pilot CEC monitoring study, and investigating alternative sample processing protocols for perfluorinated chemicals (PFCs). Next, staff will finalize PFC protocols and begin analysis of samples from selected freshwater, estuarine and marine locales. A stakeholders' midterm meeting was held May 9 at SCCWRP.

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 completed data analysis of recycled water samples from California and Arizona utilities as part of a round-robin exercise among project team members, and reached a milestone by submitting the final report for recycled water applications to the State Water Resources Control Board. Next, researchers will begin to analyze extracts from sediment and tissue from selected coastal habitats.

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 continued to work with academic collaborators to document results for cetacean blubber and bird (black skimmer) eggs. A coordination meeting was held May 20 with Dr. Eunha Hoh of San Diego State University. Staff will perform comparative non-targeted analysis of cetacean samples from the western Atlantic utilizing both SCCWRP and SDSU laboratories.

Lead Investigator: Dodder

d. Analytical Methods for Emerging Contaminants

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

Update: Staff completed analysis of intercalibration data of fish tissue and spiked marine sediments. Staff will next begin optimization of preparative and instrumental methods for selected high-priority CECs.

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: Processing continued for more than 100 passive samplers deployed in 2013 on the Palos Verdes Shelf (PVS). In addition, passive sampler analysis was initiated for sediments prepared as part of an international laboratory intercomparison exercise. Next, staff will complete the analysis of PVS samplers and the first round of sediment intercalibration samples.

Lead Investigator: Maruya

2. Toxicity Assessment

Highlight

a. Molecular Tools for Toxicity Identification Evaluation

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

Update: A draft manuscript describing the results of the amphipod microarray interlaboratory comparison study has been submitted to a journal for review. Statistical analysis of gene expression microarray results for the hornyhead turbot PCB/PBDE exposure study has been delayed due to the discovery of data quality deviations with the sample analyses. This issue was likely caused by improper sample preparation, and staff is working with the service laboratory to correct the issue. The samples will probably need to be reanalyzed over the next quarter to complete the study. Laboratory exposures of amphipods (*Eohaustorius estuarius*) to contaminant-spiked sediments are in progress. The gene expression of the surviving amphipods will be measured using a microarray developed by SCCWRP; the results will be used to develop a toxicant characterization model for use as a toxicity identification evaluation tool.

Lead Investigator: Bay

3. Biological Assessment

Highlight

a. Rocky Reefs

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

Update: SCCWRP researchers completed calibration and validation of an ecosystem response model in rocky reef habitats, one of the first such models to predict biological richness in these incredibly productive ecosystems. Based on a variety of physical variables including water temperature, reef substrate, and depth, the model successfully predicted the probability of finding individual species at an unimpacted site. Missing species can be correlated to impacts from human-induced pressures such as fishing or water quality. The model and its application were presented to the Bight'13 Marine Protected Area Committee in May and to the California Water Quality Monitoring Council in June for potential use in the council's "Health Ocean" web portal. Researchers at SCCWRP, Occidental College and the Ocean Science Trust are finishing a peer-reviewed publication on this project.

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: The U.S. Environmental Protection Agency (EPA) lab in Cincinnati completed processing of the sequence data for the approximately 100 environmental DNA (eDNA) samples collected in the fall. Staff are currently analyzing the data to compare community composition based on eDNA to the community

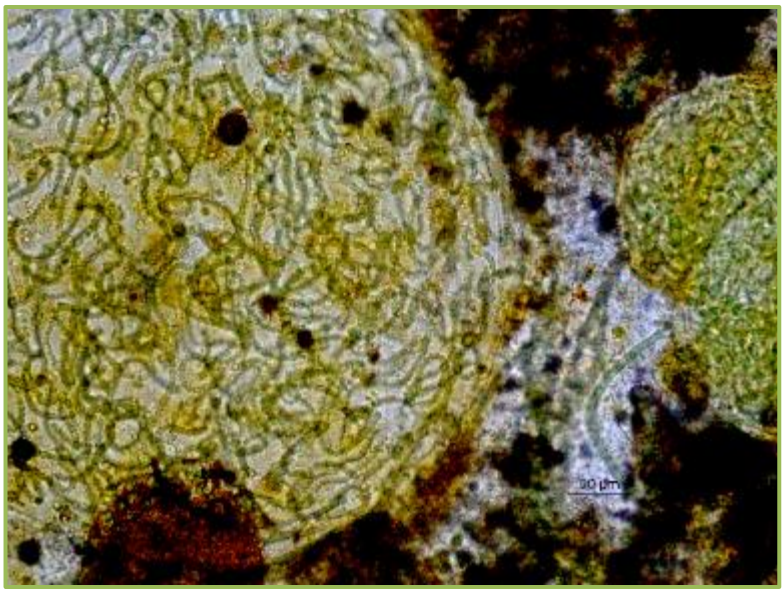
document through typical morphological analysis. The manuscript on application of eDNA to detect the invasive New Zealand mud snail was completed and submitted for journal review.

Lead Investigator: Stein

c. Cyanobacteria

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

Update: Processing has been completed for all benthic samples collected from wadeable streams for microcystins, such that data are now available for nearly 400 reaches since project inception. One-third of reaches exhibited detectable levels of microcystins, based on one-time sampling, with concentrations spanning four orders of magnitude throughout the state. Interestingly, some of the highest concentrations were observed in stream reaches in natural areas subject to minimal anthropogenic disturbance. Results were presented at the Joint Aquatic Sciences Meeting in May. Next steps for streams include correlative analysis of potential drivers of cyanotoxin production and effects on benthic macroinvertebrate communities. The 2014 samples from depressional wetlands are being analyzed in preparation for writing the final project report. A number of early season blooms have been reported, and *ad hoc* sampling in San Diego and Riverside is being conducted in conjunction with the San Diego Regional Water Quality Control Board and the University of Southern California.



A cynanobacterium called Nostoc, pictured at 200x magnification, is hypothesized to be a major cyanotoxin producer in this region, especially in less anthropogenically impacted stream reaches. Nostoc tends to dominate the soft-algal community in such areas.

Lead Investigators: Fetscher, Howard

Highlight

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, field work was completed for study sites located throughout Southern California. Data analysis is ongoing, and a revised field manual for rapid assessment of arid, episodic stream condition is being drafted. For the non-perennial stream project, the stream flow duration modeling was completed for the San Diego region. This model provides estimates of the probability that a given stream reach will be flowing during several index months (March, May, and September). This output can be used to determine likelihood of perennial vs. non-perennial flow during normal, wet or dry years.

Lead Investigator: Stein

e. Soft-bottom Benthos

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

Update: The first part of developing a benthic assessment index for the mesohaline portions of the San Francisco Bay estuary entailed (1) defining the geographic extent of the mesohaline portion of the estuary, i.e. where the index would be applicable, (2) aggregating all available benthic biotic and abiotic data from that region into a single relational database, i.e. the data used to calibrate and validate the index, and (3) developing a reference definition for that can be used in assessing the habitat, i.e. the biological endpoint that sets expectations for healthy/clean habitat. All three of these tasks have been completed and briefly synthesized into an interim report delivered to the San Francisco Estuary Institute, along with a copy of the database. Funding to support the second part of the project – the calibration and validation of the assessment index itself – is presently being reviewed and is expected to be delivered to SCCWRP before the end of 2014. Work on the index will begin when the funding is approved and should be completed by mid-2015.

Lead Investigators: Stein; Gillett

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 worked with the laboratories that performed less well in the laboratory intercalibration exercise held in December to help make them more proficient. SCCWRP and other researchers involved in developing technology to automate rapid measurement of water quality indicators are planning to hold an initial meeting at the Monterey Bay Aquarium Research Institute.

Lead Investigator: Griffith

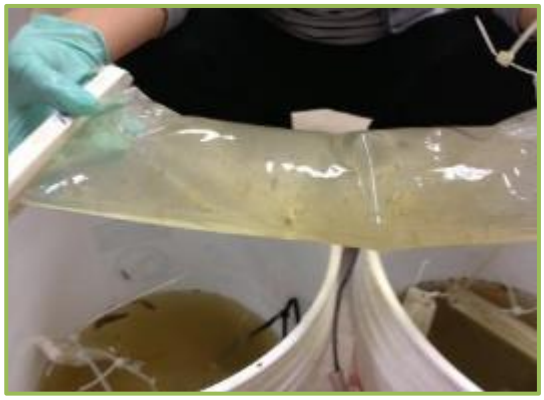
b. Microbial Source Tracking and Identification

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

Update: The research team has submitted the final report for the Source Identification Protocol Project. In addition, the team initiated fieldwork for the marker degradation project. Next quarter, the team will complete dry-weather field work for the degradation study and begin laboratory analysis of samples collected during the summer.

Lead Investigator: Griffith

Lab assistant Cuper Ramirez, right, retrieves dialysis bags filled with diluted sewage after the bags sat undisturbed in the San Joaquin Marsh in Irvine for three days as part of a pilot study in July to determine how DNA-based bacterial fecal markers degrade under variable freshwater conditions.



Dr. Yiping Cao, above, displays a dialysis bag filled with sewage at 5% concentration during the fecal marker degradation pilot study. The dialysis bag allows for nutrient exchange only; the contents cannot escape.

c. Wet Weather Epidemiology

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

Update: After an intense winter season, SCCWRP researchers and collaborators at UC Berkeley and the Surfrider Foundation completed a first-of-its-kind Pilot Study to assess the feasibility and applicability of conducting a wet weather epidemiology study. Nearly 1,200 person-weeks of exposure information were collected, and 2,200 sample analyses were completed in May. The final conclusion was that a wet weather epidemiology study that focuses on surfers following storm events is both feasible and applicable. This conclusion was adopted by the project Advisory Committee at its meeting June 10 at the San Diego Regional Water Quality Control Board. SCCWRP and collaborators are now initiating the next step of refining the study design based on improvements identified during the pilot. Sampling is expected to begin in December.

Lead Investigator: Schiff

d. Quantitative Microbial Risk Assessment (QMRA)

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

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

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 spring 2014 concluded this quarter; another sampling event is planned for spring 2015.

Lead Investigator: Howard

b. Ocean Acidification

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

Update: Staff is 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. Staff also is working with the Bight '13 offshore water quality team to pilot improved acidification monitoring practices among the SCCWRP member agencies. Sampling for this pilot program began in May and will continue through next year.

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: A report on the two-day modeling workshop held in December 2013 was completed and distributed through the Stanford University Center for Ocean Solutions. Scoping began this 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 (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: The report summarizing analysis to identify thresholds in the relationship between nutrients, algal abundance and indicators of aquatic life (benthic invertebrate and algal community composition) has been submitted to CTAG and is under review by Environmental Protection Agency external peer reviewers. A final version of the report will be available next quarter. This quarter, the State Water Resources Control Board initiated a stakeholder workgroup to provide feedback on nutrient objectives development. Stakeholder input on the wadeable streams science plan will be solicited next quarter. In a TMDL case study in the Santa Margarita River watershed, a watershed loading and estuarine water quality model is under development to establish allowable nutrient loads. Sampling to develop nutrient linkage models will begin in November 2014.

Lead Investigator: Sutula

b. Nutrient Objectives in Estuaries

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

Update: Researchers are continuing to prepare a manuscript based on results of field experiments quantifying the effect of macroalgae on seagrass. In addition, researchers held a series of conference calls with estuarine experts to develop the San Francisco Bay Nutrient Assessment Framework. Fieldwork is continuing 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

Highlight

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: Staff continued work focused on a case study evaluating tissue contamination in Los Angeles/Long Beach Harbor. The Harbor Technical Workgroup (HTWG) met May 14, May 30 and August 7. The HTWG Executive Advisory Committee (EAC), which included representatives of the Ports of Los Angeles and Long Beach, Los Angeles Regional Water Quality Control Board, and State Water Resources Control Board endorsed the activities of the HTWG and approved the proposed future activities of the

group. In addition, staff is preparing a report that assesses California bays using the draft human health SQO assessment framework. Partial results from the study indicate that a tiered assessment approach is effective for screening (Tier 1) sites and evaluating sediment quality related to human health impacts. Statewide, PCB-related related impacts were identified at most locations, while impacts related to DDTs, chlordanes, and dieldrin were rare. Staff also initiated a study quantifying the flip side of indirect-effect risk evaluation for human health: seafood consumption rates. The study will occur in San Diego Bay and will examine a variety of sociospatial factors affecting consumption rates, including where fish are caught, by which demographic and economic groupings, how fish are prepared and consumed, and in what quantities. These data on consumption can then be combined with fish tissue contamination results to evaluate risk-based human consumption guidelines.

Lead Investigator: Bay

3. Flow Criteria

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

Update: The project team has been working in three main areas: (1) The team completed the hydrologic stream classification for the State of California with USGS partners. This work used data from 160 reference (i.e. minimally impacted) stream gages to organize streams in the state into nine categories based on their inherent flow properties. Stream classes are defined mainly by differences in precipitation, elevation and surficial geology. The flow ecology relationships for each of these stream classes may vary; the focus of this project is on the predominant classes in Southern California. (2) The team completed the majority of the stream hydrologic variability analysis, which involved calculating approximately 200 stream flow metrics for streams throughout the state for both altered and unaltered streams. The team is analyzing which metrics are the most sensitive to different anthropogenic land use changes. The results of this analysis will inform the team's prioritization of metrics for the flow-ecology analysis. (3) The team conducted additional bioassessment work at 26 new sites in Southern California where long-term gage (flow) data have already been collected but where bioassessment data from previous monitoring were lacking. The majority of these sites were unaltered sites that will help anchor subsequent statistical analysis and mechanistic modeling. In preparation for the sampling effort, the team revised the project QAPP based on comments from state water board staff.

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 Jacksons Creek watersheds in Australia. The researchers met with stakeholders in Australia to develop an offset framework. Researchers are processing data and setting up a watershed scale model to establish stressor sources in Jacksons Creek.

Lead Investigator: Sengupta

b. Stressor Response Modeling

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

Update: Staff continued estuarine model setup and parameterization for the Santa Margarita estuary. Researchers have developed the bathymetry for all estuaries in Southern California. The researchers also have compiled data for the SMR estuary, and are calibrating and validating the SMR estuary hydrodynamics.

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: No activity

Lead Investigator: Stein

Highlight

b. Causal Assessment

Purpose: Develop a framework that offers guidance on how to respond to studies that assess causative stressors affecting the biology of streams.

Update: SCCWRP has partnered with San Diego city, county and regional water officials, plus Tetra Tech, to develop appropriate post-causal assessment actions for the two primary stressors identified during the San Diego River CADDIS (Causal Analysis/Diagnostic Decision Information System) case study: synthetic pyrethroid pesticides and physical habitat. SCCWRP developed a draft version of a new assessment tool for pyrethroids that makes use of Toxicity Identification and Evaluation (TIE) data. When completed, this assessment tool could be used for any toxic compound considered by a TIE, not

just pyrethroids. Staff is refining the physical habitat stressor conceptual model to improve clarity and discern ways that altered habitat can negatively influence stream biota. One tool that shows promise is utilizing the presence or absence of specific invertebrate taxa as a diagnostic indicator (often referred to as indicator taxa) of altered physical habitat. Based on needs from stakeholders, SCCWRP has recently initiated a multi-site, stream reach-scale approach to causal assessment. This approach will evolve the CADDIS causal assessment framework beyond its current limitations. This element of the project will also include technology transfer and training Santa Ana Regional Water Quality Control Board staff and watershed stakeholders in the San Diego Creek watershed.

Lead Investigator: Gillett

C. REGIONAL MONITORING

1. Regional Marine Monitoring

a. Southern California Bight Regional Monitoring Program

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

Update: All five Bight'13 elements continue to make 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 food web bioaccumulation in marine birds are being distributed to participating labs this month.

The debris element has collected trash and plastic samples from over 300 sites, half from streams and the other half from the ocean, in order to link land- and sea-based debris. In addition, researchers have finished measuring plastic in the stomachs of over 1,400 fish for a dedicated study to examine debris effects in wildlife. The current focus is now on data management and analysis.

The microbiology element continues to sample discharges at contaminated beaches to characterize the prevalence of human waste. While dry weather sampling is successfully moving forward, less than 20% of the planned wet weather samples were collected because of last winter's drought. The Planning Committee will meet in fall to review progress and decide future wet weather activities. In the meantime, SCCWRP researchers have posted an automated web tool for increasing the ease, speed and consistency of results from molecular laboratory analysis.

The nutrient element completed final study design and pre-survey quality assurance activities. Field work is set to begin this fall as a series of rate process studies, *in situ* experiments designed to measure nutrient uptake and growth in plankton, the two POTW outfalls (OCSD and LACSD) offshore and two reference locations.

Lead Investigator: Schiff

b. Pollutant Sources Data Cataloguing

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

Update: Effluent data for the four large POTWs were compiled and distributed to the respective agencies for final review and checking. Edits and corrections from the four large POTWs will be used to produce the final data synthesis. Monitoring data from small POTWs, power generating stations and oil platforms for the 2010 index year have been compiled and entered into the master database. Following QA checks, staff will be begin analysis for the 2010 comparative mass emissions.

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 researchers have also been compiling water quality data at reference sites throughout the state collected during multiple storm events. These data are being compared to similar data collected at sites located near ASBS discharges. Meetings with south coast, central coast, and north coast regional monitoring groups are scheduled for August to review results.

Lead Investigator: Schiff

2. Regional Watershed Monitoring

a. Stormwater Monitoring Coalition (SMC) Regional Watershed Monitoring

Highlight

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

Update: The first phase of the Regional Watershed Monitoring program is coming to a successful close after five years of collaborative effort with SMC member agencies. Researchers collected over 500 samples from 7,000 km of stream miles located in 17 major watersheds between the Ventura and Tijuana rivers. Results indicated that only 13% of Southern California's wadeable streams were biologically intact. The most pervasive and highest-risk stressors were nutrient levels and habitat degradation. Traditional toxicants, such as trace metals or pesticides, were less pervasive and less correlated to biological community degradation. Two new elements of the program tested – trend analysis and non-perennial stream assessment – were deemed feasible and thus can be considered for inclusion in the next five-year sampling program. Trends in biological condition across the five years of surveys (either improving or degrading) were not apparent. Next quarter, a final report is due out, as well as a draft workplan covering the second five-year program (2015-19).

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: Sampling is continuing for the third year of wet and dry weather monitoring in reference streams for nutrients, metals and bacteria. Dry weather sampling will be concluded next quarter. 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

Highlight

a. Wetlands Status and Trends

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

Update: Staff completed the statewide sample draw of 2,000 plots that will be used for the status and trends program. Project partners are mapping 110 of these plots as part of the pilot implementation program. Each plot will be mapped based on 2005 and 2010 imagery, allowing for preliminary estimates of wetland change over this time period. Staff also met with the State Water Resources Control Board, California Natural Resources Agency, Department of Fish and Wildlife and Department of Water Resources to develop plans for transitioning the program to agency implementation beginning in the next fiscal year. Additionally, as researchers work toward developing a complete picture of Southern California's eelgrass habitat and how it's changing over time, staff is creating a system to track eelgrass habitat extent and condition. Information on 56 individual eelgrass mitigation projects was uploaded to the California EcoAtlas, and survey data (maps) of eelgrass distribution from bays and lagoons for multiple coastal systems in California have been incorporated into the database. Work continues on improving EcoAtlas web interface and querying tools for accessing data on eelgrass resources.

Lead Investigator: Stein

b. Depressional Wetlands

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

Update: Field work for the San Francisco Bay Area wetlands was completed over the past quarter. Staff is working to analyze the 2011-13 data in preparation for writing the final project report.

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: No activity this quarter.

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: None

Lead Investigator: Steinberg

Highlight

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: Municipal stormwater programs spend millions each year managing urban runoff, but much of this information remains as raw data and is not thoroughly evaluated, and the complexity impedes its usefulness for decision-making. Staff has initiated a project to improve communication strategies for stormwater managers by creating a web-based stormwater "dashboard." This dashboard intends to distill the most important information managers need to make rapid decisions and track results. The first part of this project is interviewing regulated and regulatory stormwater managers across the state to help identify the most pertinent information necessary for communicating in the dashboard.

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 web-based "needs assessment" survey was completed to gauge the water data management and access needs of stakeholders. Invitations were sent to 114 representatives from a diverse range of stakeholders involved in the collection, quality assurance/quality control, management, and analysis of water data. Responses were received from 70 individuals representing 53 unique organizations. Building upon these data, the first stakeholder meeting was held July 31 to further discuss and prioritize these data needs and requirements.

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: *Estuarine, Coastal and Shelf Science* has agreed to dedicate a special issue of the journal to outcomes from the diversion study. Manuscript preparation continued this quarter.

Lead Investigator: Howard