

1st Annual Water Quality Science Symposium - Abstracts

Presented by SWAMP June 29, 2016

Welcome, Introductions, and Keynote Address (9:00-9:30)

(30 mins) California's dwindling water supply and repeated droughts have highlighted the need for consumers, businesses, utilities, and government to better manage this precious resource. However, the development of innovative and effective policies, technologies, and business solutions in the water sector is currently limited by the fragmented nature of water data across all sectors. Water system stakeholders need a way to proactively share information, tools, insights, and solutions. Recent advances in cloud technologies and data science can help to dramatically improve the effectiveness of water management, including increased capabilities for improving operations (e.g. jointly managing water and energy resource use), real-time system monitoring (e.g. leak loss detection), and in-depth program evaluation (e.g. estimating socioeconomic impacts of rate designs). These insights are fueled by data – the more accessible, reliable, and comprehensive the data are, the greater the potential for optimizing our water systems locally, nationally, and globally. While it is easy to envision a future of opportunity, we must first address the immediate challenges inherent to leveraging data from multiple, fragmented sources. The central challenge to this effort is the fact that the source data spans multiple formats and levels of security, from highly aggregated publicly available data to extremely granular and sensitive data. This presentation will explore the: (1) value of improved access to water and energy utility data; and (2) specific technology, policy, and legal requirements and concerns that have prevented the release of data.
Speaker: *Frank Loge, University of California, Davis*

(15 mins) **How Watershed Monitoring Programs and Data Science Can Help Programs with Decision Making**

Speaker: *Greg Gearheart, State Water Resources Control Board*

(15 mins) **Integrating monitoring to better understand patterns and trends in contamination and toxicity in California watersheds**

The Stream Pollution Trends Monitoring Program (SPoT) has been monitoring contamination associated with toxicity at 100 freshwater stations throughout California since 2008. A summary of findings from the first seven years of the program has shown increasing trends in detections of current use pesticides, decreasing trends in legacy organic contaminants, and stable concentrations of most key metals. This talk will illustrate the benefit of integrating monitoring to better understand emerging threats to surface water quality in California.

Speaker: *Brian Anderson, University of California, Davis*

NETWORKING BREAK (15 minutes)

SESSION (10:30-11:50)

(30 mins) **Department of Pesticide Regulation (DPR) Surface Water Monitoring Program Overview**

The Department of Pesticide Regulation (DPR) Surface Water Monitoring Program monitors pesticide concentrations in surface waters receiving agricultural and urban runoff throughout California. Monitoring data is utilized to evaluate the current status

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of pesticide contamination. DPR evaluates the spatial distribution and temporal trends in concentrations to identify pesticides of concern. Once a pesticide has been identified as a problem, DPR attempts to identify effective strategies to mitigate the issue.

Speaker: *Robert Budd, California Department of Pesticide Regulation*

(30 mins)

Bioaccumulation in California

"Bioaccumulation" is the uptake of toxic chemicals by animal species. In California waters, many chemicals of concern bioaccumulate in aquatic food webs and can threaten the health of humans and wildlife. SWAMP began a program of systematic, statewide bioaccumulation monitoring in 2007 that has included extensive monitoring of sport fish across all of the major types of water bodies. Contaminants that reach levels of concern in California waters include mercury, algal toxins, PCBs, selenium, and DDT. Many other contaminants are present at levels of low concern. Many contaminants of emerging concern also bioaccumulate, but the level of concern is unclear due to incomplete information.

Speaker: *Jay Davis, San Francisco Estuary Institute*

(20 mins)

Aggregating Municipal and State Open Data for Water Quality Investigations – Winner – Water Board’s 2016 Data Innovation Challenge

This session will present the tool that won the Water Board’s 2016 Data Innovation Challenge, which integrates data from Orange County’s regional stormwater monitoring program and the Water Boards’ Stormwater Multiple Application and Reports Tracking System to target likely stressors to local water bodies. The presenters will discuss how the tool is being used currently, the benefits of its current use and future plans to enhance the tool.

Speakers: *Grant Sharp and Eric Bollens, Orange Co. Public Works/CloudcCompli*

NETWORKING LUNCH AND POSTER SESSION 11:50-1:00

There are many restaurants in the vicinity of the EPA Building, please try to allow time to visit the posters and booths set up on the 2nd Floor Mezzanine

BIOASSESSMENT SESSION 1:00- 2:30

(10 mins)

Bugs, Fish and Algae, oh my...

Twenty years of bioassessment in California has produced a thriving program that has transformed the way water quality monitoring is conducted in the state and that supports growing opportunities for data applications, partnerships and collaborations.

Speaker: *Andrew Rehn, CDFW*

(15 mins)

Using Biological and Habitat Indices Together for Bioassessment of California Streams

Three ecological indices currently used to assess stream condition in California are used in conjunction to produce more complete assessments of stream health than provided by any single index alone.

Speaker: *Andrew Rehn, CDFW*

(15 mins)

Benthic Algae as a Tool for Bioassessment and Nutrient Monitoring in California

As primary producers, algae comprise a key component of the base of aquatic food webs, and are ecologically important in numerous ways. Because they are highly

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responsive to water quality (especially nutrients), they can be used, alongside bugs, as water-quality indicators to provide a more comprehensive view of stream condition than bugs alone.

Speaker: *Betty Fetscher, San Diego Regional Board*

(20 mins)

How Can the Water Boards Use Bioassessment Data?

Bioassessment can provide useful information in support of Water Board regulatory programs (e.g. stormwater, 401, TMDL) and regional and statewide biological integrity policies.

Speaker: *Raphael Mazor, SCCWRP*

(15 mins)

Data Integration and Healthy Watershed Assessments

Central Coast web tools are used to view and integrate multiple data types in an interactive web framework that assesses watersheds for health. It provides access to underlying data for management decision-making and can serve as a model for development of web applications elsewhere.

Speaker: *Karen Worcester, Central Coast Regional Board*

(15 mins)

Question and Answer

Speakers will be available to take questions from the audience

NETWORKING BREAK (15 MINUTES)

SESSION 2:45-4:10

(30 mins)

Applications and Limitations of Bioassay Methods For Contaminants of Emerging Concern in Environmental Monitoring

Environmental matrices contain an ever-expanding variety of contaminants of emerging concern (CECs), many of which remain to be identified. While instrumental analysis methods allows detection and quantitation of targeted chemicals of interest, these methods have some limitations, including relatively high cost, time for analysis, inability to identify non-target chemicals and they are not able to provide any information about the potential health impacts of a sample or complex mixtures of contaminants. Inclusion of mechanism-based in vitro bioassays in environmental monitoring complements instrumental analysis approaches by providing high-throughput approaches for the detection of toxic chemicals, chemical mixtures and unknown toxic chemicals, information on chemical and chemical mixture effects on biological endpoints and avenues in which to identify unknown or new classes of CECs. This presentation will describe cell-based bioassays for several classes of CECs and discuss the applications and limitations of bioassays with respect to environmental monitoring and water quality assessment.

Speaker: *Mike Denison*

(25 mins)

Assessments Satellite Monitoring for Cyanobacteria in Large Waterbodies across California

Imagery from the MERIS satellite, available from 2002-2012, can be used to estimate cyanobacteria concentrations in large waterbodies. This data is being evaluated to

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assess the status and trends of cyanobacteria concentrations in 255 large waterbodies in and upstream of California, including a detailed analysis of 20 waterbodies. The project goals are to: demonstrate how satellite analysis can be used to track cyanobacteria in large waterbodies, understand seasonal and annual trends of cyanobacteria across California's large waterbodies, and to inform public policy decisions related to management of cyanobacteria and potential threats to animal and human health.

Speaker: *Randy Turner, SFEI*

(15 mins)

Data Challenge Runner up- Center for Water Energy Efficiency's Tool to Visualize Energy Savings Associated with Water Conservation

In April 2015, Governor Brown mandated a 25 percent statewide reduction in water use by urban water suppliers across the state (relative to 2013 levels) with differentiated conservation targets for utilities with varying levels of baseline per capita usage (Executive Order B-29-15). The more than 400 public water agencies affected by the regulation were also required to report monthly progress towards the conservation goal to the State Water Board. This application uses the reported data to visualize how different water utilities have responded to this mandate. In addition to displaying a summary of water use relative to the conservation target for each district, we also calculate the electricity savings associated with the reduced demand on water infrastructure services using estimates of average energy intensity per hydrologic region. We then convert the electricity savings into avoided greenhouse gas (GHG) emissions based on the emissions factor specific to the water utility's regional electricity provider. We can view the total water, energy, and GHG savings aggregated at the state level, as well as for each of the individual water utilities. One of the significant findings is that the electricity savings associated with the observed achievements in water conservation is roughly equivalent to the total *first-year* electricity savings estimated for all of the energy IOU efficiency programs implemented in the period from July through September 2015 (the period where data was available for both initiatives). In addition, the water conservation-related GHG savings over the entire period of the mandate (June 2015 through February 2016), represent the equivalent of taking about 50,000 cars off the road for a year. In addition to the water conservation data, we prepared a few summary tables of the most common water quality testing and stormwater violation data for each utility. This data demonstrates how additional data could be integrated into the application to enrich the summary reports for each utility.

Speaker: *Frank Loge, University of California, Davis*

(45 mins)

How to Better Integrate Science, Data (from Monitoring), and Program Needs for More Effective Work - Panel

Moderator: *Lori Webber, State Water Resources Control Board*

(5 mins)

Next Events and Adjourn