

Fall 2019 – In this Issue:

- [Meet up with our Board members at SETAC Toronto!](#)
 - [Upcoming Winter Social Event](#)
 - [NorCal SETAC Annual Meeting Recap](#)
 - [Follow NorCal SETAC On Social Media](#)
 - [Submit Photos Of Your Research](#)
-

Meet up with our Board members at SETAC Toronto!

NorCal SETAC Board members welcome you to join us in Toronto for a brief Regional Chapter meeting, Tuesday, November 5th, at 2:30 pm in room 707. This information will also be posted near Registration. We look forward to seeing you there!

Upcoming Winter Social Event!

Stay tuned for details on our upcoming Winter Social Event in January 2020 at Dunloe Brewing! Registration will be available soon! We will host a special guest speaker, and beer and appetizers will be complimentary with registration. More details to come!

NorCal SETAC Annual Meeting Recap

#NorCalSETAC19 Conference Rewind Part I: Convening Leaders in Environmental Toxicology and Chemistry

Gathering colleagues and guests from the Bay Area to the Central Valley, the 28th Annual Meeting of NorCal SETAC was hosted with success in Sacramento this May 2nd and 3rd. With “After the Storm: Identifying Impacts and Sharing Discoveries” as this year’s theme, the 2019 conference brought together nearly 100 participants over the two days of Short Courses, Platforms, and Poster Sessions.

Below is a roundup of the opening welcome and plenaries hosted on the conference day (May 3rd):

Morning Welcome

Current NorCal SETAC President **Krista Hoffmann (CA DWR)** opened the events in California EPA’s Byron Sher Auditorium, warmly welcoming all back to our regional annual meeting. **Michelle Hornberger (USGS)** — who serves as our Regional Liaison between NorCal SETAC and SETAC North America — then gave an overview of the SETAC mission and its benefits to our membership community.

“We are growing beyond our tripartite model,” Hornberger said regarding SETAC’s historic focus serving government, academia, and industry professionals — which is now expanding into opportunities for collaboration with non-government organizations and other sectors. What hasn’t changed is SETAC’s focus on continuing education and student careers. Hornberger informed our attendees about resources like the **SETAC Young Environmental Scientists Meeting** ([YES2019](#)), held most recently in Belgium.

“We always like paying forward to causes we like to support,” says Hornberger, who with **Eric Van Genderen (IZA)** helped bring the 2018 SETAC North America Annual Meeting to Sacramento last fall. Hornberger closed with a reminder that the 2019 SETAC North America Annual Meeting — [#SETACToronto](#) — was fast approaching, and invited our NorCal community to submit proposals and make plans for Canada!

Women in Science Bring Plenary Power: Part I



The NorCal SETAC Board of Directors invited two talented leaders to lead off our annual meeting and speak on our “After the Storm” meeting theme. **Meredith Williams**, Acting Director of the **California Department of Toxic Substances Control (CA DTSC)**, spoke first, in an inspiring lecture packed with influences from James Baldwin, Aretha Franklin, and other cultural icons.

With “Facing the Storm: Climate, Chemicals, Comptox” as her talk title, Williams opened her slides with a satellite image of Cyclone Fani, which brought devastating floods to India that week. “Hard to argue these storms aren’t climate change related,” she remarked, immediately reminding us of the global scope and human facet of our scientific field, before poignantly bringing focus back to this past winter’s severe floods in the U.S. Midwest — and California’s own devastating wildfires.

Williams then dove into her core presentation, explaining the role of DTSC managing extreme events and monitoring and mitigation in California. “We are actually front-line responders,” Williams said of DTSC, whose staff are assigned to visit sites after disasters and look for household hazards. DTSC staff monitor benzene and other risks in water supply after wildfires, help collect household hazardous wastes, and assess arsenic-tainted sites like the Argonaut Mine Dam for environmental risks.

Referencing [Johan Rockström’s “Planetary Boundaries of Anthropogenic Impacts”](#), Williams turned to DTSC’s role in the frontier of environmental regulatory science. The human and natural environment today is exposed to a sea of chemicals, and DTSC staff “are looking for combinations of products and chemicals that could be harmful,” says Williams. Is the chemical necessary for the product to work as expected? What chemicals do we care about? What of PFOS and PFOA and groundwater standards? And carpets and rugs and other consumer products?

In closing, Acting Director Williams cited a favorite project facilitation model to describe the state of toxics information and regulation. Williams says when you first put a team together to solve a problem, “it’s really messy.” But teams have “get to storming” and get comfortable challenging each other, before reaching a norm of trust and finally performing “where you’re firing on all cylinders.”

In that sense, Williams alluded to the future of information disclosure, where regulators, industry, and academia can build trust and access to good data, gaining enough momentum where companies will disclose product information on their own. “I think norming is around the corner, and maybe performing.”

To reach this “performing” stage, Williams mentions DTSC programs like its [“Toxic Crusaders”](#), which give middle school students an opportunity to go into the lab and understand how scientists ask and answer environmental questions. By welcoming the public to participate and training future environmental scientists, we can “get more people in the choir” and work together and counter anti-science doubts.

“This is the time when we have to be courageous,” said Meredith Williams to the #NorCalSETAC19 audience, quoting renowned African American author James Baldwin.

Women in Science Bring Plenary Power: Part II

The second plenary was presented by **Kelly Moran**, president of **TDC Environmental**. With “After the Storm: Science Informs Solutions” as her title, Moran gave an insightful overview on the unsolved challenges in toxic chemicals monitoring, management, and mitigation.



Moran focused specifically on urban water as an unmet need. Although much of clean water regulations focuses on aquatic life beneficial uses, Moran reminded the audience that aquatic life protection does not

equal drinking water source protection. She noted that Californians often forget that sewer outflow and wastewater treatment outflow are drinking water sources in most other parts of the country — where water sources are downstream from another city's effluent.

From the perspective of drinking water supply, “persistence isn't the whole story, it's continuous discharges,” said Moran. In the past, large plumes and point sources were the problem, but today, it's diffuse sources — be they pesticides or consumer household products.

“There are toxic pollutants in your clothing too,” reminded Moran. Flea and tick treatments for your dog could wash off, flow to your WWTP, then flow right through to the environment. “Toxic pollutants also flow straight to storm drains,” she added, along with PCBs from building paint, biocides from metal construction materials, chemicals from treated wood released via drilling as examples, along with abraded materials from brake pads and tires. But Moran notes that urban runoff treatment are not a feasible mitigation method. “Systems need to be specifically designed for the chemical they're trying to get,” and it would be difficult to design mechanisms that catch all types of diffuse pollutants.

There is a perception issue as well. Referencing the work of Anna Sobek, Moran says we often place emphasis on chemicals that have already been discharged and regulated — yet these biases may lead to society to underestimate emerging contaminants as hazards of concern.

An alternative approach is to take a proactive view of chemicals as they are coming into use, so that we reduce the number of new diffuse sources. “We need to look out the windshield, forward,” encouraged Moran. She cited as one example how California DPR got ahead on fipronil, jumping on the science and management before it became an issue.

“How do we get to the future” was Moran's closing challenge to the audience. How can we better look at what's on the market, in terms of consumer product contents? What are advances in non-targeted chemical analysis, and identifying the chemicals causing harm. We also need to identify true sources of contaminants, not just the pathways, says Moran. We need to find the greatest contributors, while taking care to not assume and speculate.

“Products are starting to be designed to prevent pollution, and that's thanks to folks like those who are in this room,” said Moran. In closing, Moran encouraged the audience to network and collaborate across their organizational silos, commending staff who are making connections at their peer level.

“We learn a lot from working together,” Moran said. “Really reach out, and get to know the folks at the other agencies if you can.”

#NorCalSETAC19 Conference Rewind Part II: Identifying Impacts and Sharing Discoveries

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Below is a roundup of the platforms and posters presented on the conference day (May 3rd):

Methods and Detection

Graduate student **Gabriella Black (UC Davis)** presented “**Identifying estrogenic compounds with High Resolution LC/MS effects-directed analysis in California sewage sludge**” to lead off the day’s platforms. Black worked with wastewater treatment plants in California to analyze sewage sludge and screen for persistent estrogenic anthropogenic compounds. The research focused on consumer product chemicals (hairsprays, hair gels, etc.). Black notes that with existing methods, we can identify more than 100 unique compounds, including anti-wrinkle chemicals from clothing, antibiotics from soaps, and pesticides. But which are estrogenic is the question that requires answering.

NorCal SETAC Board Member **Candace Spier Bever (USDA)** presented another aspect of detection with her talk “**Rapid, sensitive and selective detection of deadly amatoxins by antibody-based bioanalytical methods.**” Amatoxin is an issue due to mushroom poisoning incidents in humans and pets, and new methods for detecting amatoxin would improve the accuracy of clinical diagnoses. Bever said the initial challenge was picking the appropriate media for analysis, which past research suggested amatoxin presence could be detected via urine. “We need antibody-based methods that clinics can use,” said Bever, who sought to create a “pregnancy test” for amatoxin detection. She says this exciting immunoassay method has great potential for technology transfer, one that can go beyond mushroom poisoning and be used to detect other toxins.

Graduate student **Wenting Li (UC Davis)** presented “**Quantitative analysis of PFASs in aqueous film forming foam bound to serum albumin protein.**” Li explored PFAS in aqueous foam-forming film — an important topic due to the essential use of firefighting foams. Li’s research focused on how PFAS bind to albumin protein, hoping to improve detection assays for these compounds.

At the Frontlines

Engineer **Stefan Cajina (SWRCB)** presented “**Santa Rosa’s Experience with Benzene in the Wake of the Tubbs Fire**” — a fascinating look into the work of the State Water Resources Control Board’s Division of Drinking Water. The Division regulates all public water systems in California, from trailer parks to big cities, implementing and enforces the federal and state Safe Drinking Water Acts. When there’s a disaster or emergency, DDW engages directly with water systems, Cal OES, first responders, and other agencies to ensure that drinking water is safe, or that consumers are notified and corrective actions are taken.

Cajina explained how this team kicked into action to examine suspected benzene contamination in a Santa Rosa neighborhood immediately after the 2017 wildfire. When residents returned a month after the fire, one Fountaingrove household noticed an odor in the tap water. Benzene was revealed in initial testing, and a Do Not Drink advisory was issued -- it would last a year for the affected area. “The City really got on it,” Cajina said of the public safety puzzle. More than 7,500 water samples over the year in an effort to determine the cause of the benzene contamination, and the City of Santa Rosa even analyzed water systems materials such as pipes, to see if they had been uptaking benzene.

In the end, the prevailing thought was that the benzene either resulted from thermal degradation of system components such as plastics, or entry of ash and debris into piping and equipment during the fire event. And in case benzene adhered to and was absorbed by some water system components, all service lines in advisory areas were replaced, and systematic flushing continued — and benzene results eventually tapered off. The exercise was a unique opportunity during an unprecedented situation, and offered lessons for agency managers on what procedures need to be in place, should this situation occur again.

Going from the micro to the macro, Senior Toxicologist **Claudio Sorrentino (DTSC)** presented “**Toxicology and Risk Assessment at DTSC: Making California a Better Place**” — a further overview of the duties of the California Department of Toxic Substances Control. “I personally find that the work we do is very meaningful,” said Sorrentino with a smile, as he reviewed the agency’s roles in site cleanup, permitting facilities, regulating safer products, and enforcement.

Sorrentino listed the types of questions that DTSC staff think about in their projects and tasks. Is a site safe? Can I build houses where people can live? If not, how badly contaminated is it? And in choosing the remedy, he listed the multitudes of considerations: long-term effectiveness and permanence; reduction of toxicity or volume through treatment; short-term effectiveness; implementability; and of course, cost. Within one site, you may have many receptors and variation in exposure, reminded Sorrentino — so your solution has to cover all receptors.

Sorrentino mentioned Sacramento’s own “Railyards” development as an example of remediation in action, but told the audience that DTSC work includes outreach with foreign governments via USAID.

“Our reach goes beyond California,” reminded Sorrentino,

Solutions and Tools Forward

Three talks concluded the day’s oral presentations. NorCal SETAC Vice President **Aniela Burant (CA DPR)** presented “**A Leach Rate Cap on Copper Antifouling Paints in California: A Regulatory Case Study**” — a fascinating look at how science is used to inform and update policy.

Antifouling paints are important for marine vessels for fuel efficiency, decrease damage, and prevention of invasive species. Copper is the primary biocide in antifouling paints. The California Department of Pesticide Regulation has regulatory authority of copper due to its use as a biocide. But copper is broad spectrum, and also toxic to non-target organisms: blue and mediterranean mussels, for example. California Toxics Rule has enforceable water quality standard for dissolved copper, since just a little bit of copper can create acute toxicity. Recreational marinas can be particularly susceptible, due to number of boats and the time they spend in these areas. Marinas are also protected from wave action, which reduces flushing. As such, some marinas have been 303(d) listed due to copper.

The rest of the tale demonstrated the process at DPR for re-evaluation, and how legislative and regulatory powers converged to prompt scientific input — and ultimately improving regulations that meet the needs of the environment, industry, and end users.

Graduate student **Olivia Wright (UC Davis)** offered another look into the search for environmental quality solutions, presenting “**An Assessment of Woodchip Bioreactor Performance for Pesticide Removal from Agricultural Tile Drainage.**” Wright explored how bacterial denitrification with woodchip substrates could be used to process fertilizers and pesticides and treat agricultural effluent. She presented a case study upstream of Elkhorn Slough in Monterey Bay area, and outdoor experiments comparing woodchip reactors versus treatments using duckweed versus pennywort. Additionally, she discussed controlled treatments in the laboratory using bench-scale version of woodchip reactors.

Finally, NorCal SETAC Past President **Lisa Hunt (American Rivers)** presented “**Development of a Data Visualization Tool for Pesticides and Water Quality**” — an ambitious effort from American Rivers focusing on the Central Valley of California.

The project objective is to develop an easy to use, accessible online tool to visualize and download data on pesticide use and impacts to water quality and ecological and human health in California. The target users would be professionals, agencies and consultants — but also non-experts like nonprofits, volunteer groups, and ag coalitions. If successful, the tool would help make water quality data more transparent and accessible, one of the goals of California Assembly Bill 1755. American Rivers is now developing a work plan with the Water Foundation, refining a variety of design objectives, and assessing the funding required to build and maintain such this interactive mapping tool.

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Welcome to the 28th
Annual Meeting of
the Northern California
Regional Chapter of the

**Society of
Environmental
Toxicology
And
Chemistry**

**NorCal
SETAC**

**After the Storm:
Identifying Impacts and Making Discoveries**

May 2-3, 2019
California EPA
Building
Meeting
Program:

PLENARY SPEAKERS:
Meredith Williams
Acting Director,
California DTSC
Kelly Moran
President,
TDC Environmental

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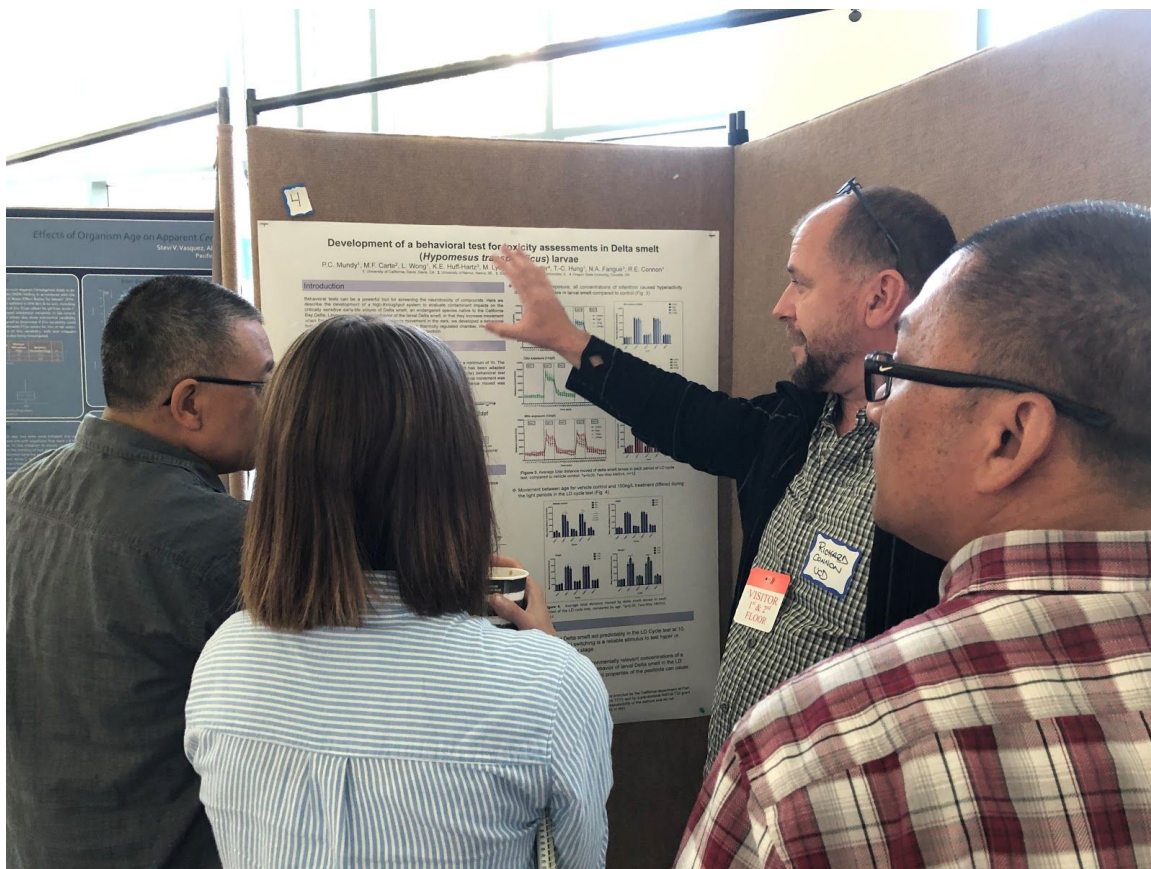
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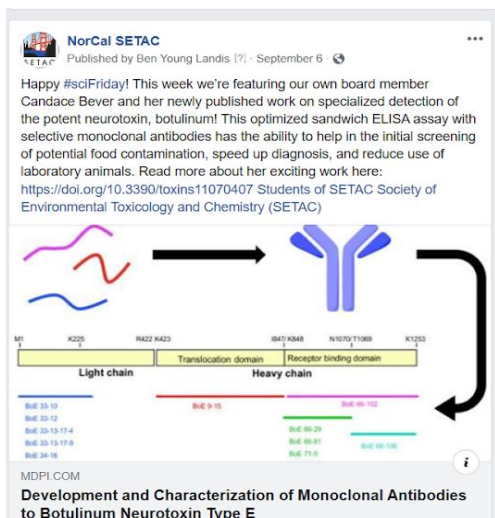
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Follow NorCal SETAC on Social Media!

Check out our #ScienceFriday posts every Friday on our Facebook (@NorCalSETAC1) and Twitter (@NorCalSETAC) pages for updates on exciting new science, outreach opportunities, student spotlights, and more! Here are some highlights of our posts so far:



NorCal SETAC
Published by Nick Santiago [?] · July 31 ·

NorCal SETAC Board Member Nick Santiago here! Looking forward to tonight's Science on Tap talk, "The Dead Do Tell Tales: Investigating Sea Otter Mortality Patterns" at the The Crepe Place! Great to learn about advancements in our broader field. See the event details below for how to attend. Thank you to UCSC Women in Science and Engineering for putting on this engaging community event.

Science on Tap*
July 31st @7:30 pm
Outdoor patio at The Crepe Place
2134 Soquel Ave
*Monthly pub talks put on by WiSE, hosted at The Crepe Place.

Submit Photos of Your Research!

Do you have photos of your exciting lab and field research that you want to share with the NorCal SETAC community? Do you even just want to show off the scenic beauty of Northern California? Now is your chance! NorCal SETAC is seeking lab and field research photos of environmental toxicology and chemistry related work done in the Northern California region that we may use on further newsletters, social media, and event advertisements. **If you would like to donate photos for NorCal SETAC promotional use, please submit using this [Google Form](#).**

Before submitting, it is very important that you are the owner/photographer of the photo, and that you hereby give permission for NorCal SETAC's promotional use of your work for all

future uses. Please make sure activities and research depicted in photos are not sensitive to your employer, client, research, etc., and that you're not violating any research safety or legal parameters.