SoCal
SETAC News
Society of Environmental Toxicology and Chemistry
Southern California Chapter
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FEATURE ARTICLE

Using Traditional Ecological Knowledge to Ensure the Future of Our Planet

Miyiiha, my name is Gabrielle (Rocha) Crowe, I am the Vice Chair and the Secretary of Environmental Services for the Gabrielino-Shoshone Nation of Southern California. I am also a Cultural and Environmental Education Consultant. As a tribal scientist, I have spent the last 17 years working as an environmental educator, leading Chaparral to Ocean Science Schools, as a naturalist on whale watching trips, leading snorkeling groups at Pimu (Catalina Island), Limu (Santa Cruz Island), and Advanced Floating Laboratory trips on a research vessel. I am the granddaughter of the late Chief Y'Anna Vera Rocha, who was a warrior for our environment. It is a privilege and an honor to be working in my field and to provide traditional ecological knowledge to different state agencies and various organizations.

Educating our youth is of the utmost importance. This work is very rewarding but there are barriers to entry. Historically indigenous people have been left out of the conversation in regards to anything happening on our ancestral lands. Our engagement is sought out in the forms of consultation letters or emails that many tribal governments are spread too thin to be able to respond to in a timely manner. If we have somehow responded in the time period provided, we often realize that our involvement is merely a box to be checked rather that the start of a meaningful reciprocal relationship. The past two and a half years of the pandemic have been challenging to many people, especially those in the tribal community. We have lost elders and community members, and we have also lost a sense of community and celebratory connection. The Earth Mother is feeling that disconnect as well.

Recently I was a presenter at the California Stakeholder DDT+ Research Needs Workshop. Many times I am asked to speak about issues and share traditional ecological knowledge, and I am often asked about what can be done to fix the problem (DDT+ pollution, off-shore oil drilling, etc.). I don't have a quick fix, I just know that if we can use the knowledge that sustained indigenous people in California for thousands of years, we can try to save what is left and restore it for the next seven generations. In the time since

A view of the southern California coastline. (Photo:Gabrielle Crowe)

President's Corner

Andrea Bonisoli-Alquati

Hello, SoCal SETAC! The chilly, rainy weather of the last few days reminds us that Fall is upon us.

Ahead of this, late last month we had a delightful Fall Dinner Meeting. Shelly Moore of the Moore Institute for Plastic Pollution Research provided an overview of the scope and magnitude of plastic pollution, and of her extensive past and current research. There is no end in sight for the plastic pollution crisis. But reasons for hope also abound, with growing public awareness and progress in research and monitoring among them. The Moore Institute exemplifies those reasons for hope.

Cont. on page 3

INSIDE THIS EDITION

FEATURE ARTICLE (continued)

colonization, many different species of plants and animals have been introduced and have outcompeted native species for resources. Most prevalent of these have been non native grasses and wild mustard. When these species go dormant the threat of fire danger is increased. Although fire is not always detrimental, a native plant species called chamise (Adenostoma fasciculatum) actually requires a fire occurrence in order to germinate. An example of methods for sustainability would be allowing the practice of cultural burnings. If tribal community members are allowed to burn invasive non native plant species, the risk of major wildfire decreases.

This fight is personal for me as I have three children and the work I am doing today is ensuring that they will have a better future. While the issues dealing with major types of pollution (oil, plastic straws, gyres) are usually at the forefront, we need to be looking at ways to reduce micro plastics in our oceans while increasing sustainability. My ancestors created villages close to freshwater and the Pacific Ocean. It makes me incredibly sad that we are not able to participate in many of our cultural gathering practices in the ocean and in our rivers due to pollution. There have been many changes to the ocean environment during my lifetime, specifically in my observations during the last 17 years as an environmental educator. Turbidity changes have been a noticeable difference as visibility has decreased in many of my favorite snorkeling spots. There has been a decrease in the number of species that I have observed in these areas may be due to visibility, but I believe that there may also be other underlying issues.

Oceanic acidity has been steadily increasing which is catastrophic for many species which require calcium carbonate in the water in order to develop shells for protection. A historically significant species to indigenous people in California is abalone. Abalone was/is used for food, currency, jewelry, and in spiritual practices. As the indigenous population steadily decreased along coastal waters, the abalone population was decimated due to overfishing as many people were not aware of the cultural significance and the philosophy of environmental reciprocity. As a result of that, abalone became nearly extinct. Recently, there has been an effort to reintroduce the abalone into its oceanic habitat. In a perfect world, this species would multiply again to the extent of being as plentiful as it once was.

I'm cautiously optimistic as I fear with the higher oceanic acidic content, other microscopic pollutants, and the aforementioned turbidity, that the reintroduced species might not thrive in this hostile environment. This along with the fact that many people are still poaching abalone along our coast from Palos Verdes to Dana Point, reduces the possibility of our animal relatives surviving, let alone flourishing.

We need to be a voice to our animal and plant relatives in our waters. I am grateful to members of your society who are doing research and are allies to our planet. I also ask that you will take on the responsibility of being allies to indigenous people as well. Lift up our voices and seek out traditional ecological knowledge. We were the first stewards of this land and it is our responsibility and obligation to continue this legacy and reciprocal relationship with the Earth Mother, she needs us.

Gabrielle teaching a group of young children. (Photo: Gabrielle Crowe)

Aweeshkone xaa.

Gabrielle enjoying the beauty that the ocean has to offer. (Photo: Gabrielle Crowe)

President's Corner, con.

They recently gained accreditation for analyzing microplastics in drinking water, one of the first California laboratories to do so. They are also spearheading open science and citizen science efforts, and researching stormwater transport of microplastics in our region. They are of course not alone in these efforts, as many other scientists are collaborating, including other members of our chapter. Wherever we look, SoCal SETAC scientists are leaving a mark on understanding and addressing plastic pollution. It is one of the reasons why I choose to be hopeful.

With Fall also comes what is arguably the biggest event in our field, the SETAC North America Annual Meeting. I am excited to be heading to Pittsburgh, and I imagine many of you also are. In this issue of the Newsletter you will find a list of the contributions by members of our Chapter. The talks and posters span many sessions across all tracks of the scientific program. We hope that the list will showcase the good work of our Chapter members and help you plan your attendance. If you will be in Pittsburgh, remember that we will have a SoCal SETAC social gathering on Wednesday, November 16. You can find details later in the Newsletter. And if you are not headed to Pittsburgh, perhaps the list will make you miss the event less – although I suspect it may make you miss it even more!

Some welcome changes will come to our Chapter in the near future, as we revamp our social media presence. We hope that, as a result, our social media channels will complement and expand on the content we share with you through the Newsletter. We look forward to engaging with you on a variety of platforms. Feel free to let us know what you think.

Our Feature Article in this issue aims to bring forward an even more substantial change – a change of perspective. Scientific knowledge is crucial to understanding the scope of pollution issues, and to implement their monitoring and assessment. Progress in science then spurs awareness, directing public and regulatory attention. But to extricate ourselves from the intersecting global crises of climate and pollution, something more than technological or regulatory fixes is required. The Feature Article makes a compelling case for the contribution of diversity and cultural changes to solving those issues. Penned by Gabrielle Crowe of the Gabrielino-Shoshone Nation of Southern California, the article points a way forward through education, stewardship of the land and its inhabitants, and a renewed sense of connection with our planet. As the author points out, this is not so much about solving a specific issue. Rather, it is about instilling new meaning in our research endeavors, in our fights, in our lives. It is about listening to and amplifying the voices of indigenous peoples, who have been reliable stewards of the land for the longest time. I am honored that the Newsletter is hosting the voice of Gabrielle Crowe.

Shelly Moore gives a talk at the 2022 SoCal SETAC Fall Dinner Meeting.

MEET THE BOARD

Nancy Torres

University of San Diego, M.S. Candidate

Nancy in the field sampling in the Tijuana River Estuary.

Hi! I'm Nancy Torres and I'm a 2021-2023 Student Member for the SoCal SETAC Board.

I was born and raised in the greater Los Angeles area before pursuing my Bachelor's at UC Santa Barbara. I greatly attribute this to the Upward Bound program, which supports underrepresented, low-income students in preparing for college applications. The beautiful region of Santa Barbara brought me closer than ever to nature with its coastal environment, plentiful open green space, and mountains. I took my first Environmental Studies course and never looked back. I couldn't believe there were so many environmental issues in the world that we weren't all working together to solve, especially with climate change.

Although I knew I love the environmental science major, I didn't know what this meant career-wise. Fortunately, I found support through the McNair Scholars program, which introduces underrepresented, low-income students to the research field and prepares them to pursue graduate school. My first project was in microbial oceanography with the Valentine Lab. My research interests expanded into the ecotoxicology world in a Research Experience for Undergraduates summer program with the Shanks Lab at the Oregon Institute for Marine Biology. I analyzed the populations of Pseudo-nitzschia which can produce the neurotoxin, domoic acid, along Coos Bay Estuary. I was especially engaged with this project because it allowed me to connect to the community, informing future fisheries management on which areas were safe to fish from.

I continue to engage the community with my career now in the San Diego region. I learn how to best integrate collaboration and community voices into my Master's project at the University of San Diego with the Margaret A Davidson fellowship's guidance. I am assessing the ecosystem health of the Tijuana River Estuary through its historical and current contaminant concentrations, which can benefit from binational solutions with affected communities on both sides of the border. Being the only ecotox student in my program, I am grateful to have found the supportive SoCal SETAC community to connect on similar efforts.

Outside of science, I love staying active with my favorite fitness studio, exploring new trails, and vibing to live music. I travel when my schedule allows, connecting with both my roots/culture in the LA area and Mexico as well as other beautiful, new places in the world I have yet to see. I also work part-time as the Climate Equity intern for the San Diego Foundation, which provides grantmaking to nonprofit organizations, strengthens the region's leadership, and advances philanthropy. I've greatly enjoyed my role on the SoCal SETAC Board and am excited to continue until 2023!

Nancy by the Amalfi Coast during a summer abroad program

STUDENT CORNER

Graduate Student Research Grant Award Recipient: Svenja Kling

Interview by ***Jenna Wiegand***

Svneja Kling, Graduate Student Research Awardee

1) Tell us about yourself and what led you to where you are today.

I grew up in Mannheim in the southwest of Germany but have always loved the ocean. My family used to go on a beach vacation once a year and those were always the happiest times for me when I was little. I love science and exploring, so I decided to my BSc in Biosciences at the University of Heidelberg. During that time, I also got the opportunity to study a year abroad at the University of Guelph, Canada. For my undergrad research, I studied the evolution of cell types in sponges at the European Molecular Biology Laboratory EMBL). This research got me interested in studying animal development, as well microscopy and imaging. In Germany it is mandatory to do a masters before starting your PhD. I decided to stay in Heidelberg for my MSc in Molecular Biosciences, majoring in Developmental and Stem Cell Biology. I mainly worked in the lab of Suat Özbek and studied the mechanical properties of the ECM in the freshwater polyp *Hydra.* During my master studies, we had lab rotations in a variety of labs, and one was allowed to be external. I applied to labs where I could combine my research interests of developmental, molecular and marine biology. This ultimately led me to the Hamdoun lab, and I chose to come back here for my PhD.

2) What is your research on and what drew you to it?

My current research is how toxicants and pollutants can affect body axis formation in early embryonic development. My lab works on sea urchins, which are a classical model organism in developmental biology. Although sea urchins are radial symmetric, their pluteus larvae exhibit all three major body axes. A lot of toxicants disrupt correct patterning of the body axes during development, but often the exact mechanisms involved are not known.

I am currently developing a high-throughput assay to screen for perturbations in gene expression of developmental axis regulators. This assay can serve to identify the pathways targeted by a toxicant, rather than just observing the phenotypic effects on axis formation. I am planning to screen with marine pollutants that are insufficiently characterized in embryonic development.

I am making use of a method called Hybridization Chain Reaction (HCR), with which it is possible to visualize gene expression patterns. My lab has been working on automating this method and upscaling it to a plate format. With my research, I thus combine my interest in imaging, development, and marine biology and create an applicable use in toxicology.

3) What are your passions and hobbies outside of school?

I love being in the water and now that I am so close to the ocean everyday, I am trying to make the most of it! I usually go for a swim around the pier or a surf in the morning before work. I also enjoy snorkeling and scuba diving, especially in the summer months. On land, I like hiking, playing tennis and I read a lot of books. When I find the time, I also enjoy making food and trying out new recipes.

STUDENT CORNER

Undergraduate Student Research Grant Award Recipient: Tina Tran

Interview by ***Jenna Wiegand***

Tina Tran, Undergraduate Student Research Awardee

1) Tell us about yourself and what led you to where you are today.

My name is Tina Tran, and I am a first-generation college student. I was born and raised in San Diego and volunteered a lot as a kid, which sparked my interest in environmental sciences. I was first introduced to pollution and the effects of pollution through an I Love A Clean San Diego beach cleanup when I was in 4th grade. Ever since then, I have wanted to understand how we can mitigate pollution, specifically plastic pollution, and what alternatives we can use in place of plastic. During my senior year of high school, I had the opportunity to intern with Dr. Eunha Hoh in the School of Public Health at San Diego State University and learned about thirdhand smoke. Then, when I came back onto campus during my second year of my undergraduate degree, I reconnected with Dr. Hoh, and asked if I could get more involved in her lab to gain more experience. I started off learning more about the microfiber parent project in her lab, and then I was tasked to create my own project to study secondhand microfibers.

2) What is your research on and what drew you to it?

My research is on identifying chemicals that are in secondhand, dyed cotton-polyester microfibers using non-targeted analysis. I have always had an interest in understanding microplastic interactions within the environment since I was a high school student, and not only how harmful they are, but also the way they break down. I was drawn to this project because the fast fashion industry is very big right now, and a lot of the manufactured clothing is made from synthetic fibers. When we wash our clothes, many of these microfibers do not get filtered out, and they may be released to the ocean. I know that microfibers are physically harmful, but I do not know much about how they are chemically harmful. There is also not much data out there on chemicals that can leach from microfibers.

3) What are your passions and hobbies outside of school?

Outside of school I really enjoy trying various new food dishes from different cultures and learning about what ingredients are used in the food. I really enjoy cooking and baking too and giving them to my family and friends. I am always interested in learning, so I love exploring different places like restaurants, museums, parks, and even neighborhoods within an area. I feel like I can learn so much about the history of an area by being in it. Another passion I have is gardening and pruning plants. I enjoy learning about how different agricultural practices can enhance the soil, and how different plants require different amounts of care.

2022 SETAC North America – 43rd Annual Meeting: Bridging Innovation and Sustainability

Presentations by SoCal SETAC Members

The 2022 SETAC North America 43rd Annual Meeting is being held from Nov 13-17, 2022 in Pittsburgh, PA. A number of our members will be in attendance, with many presenting across a variety of topics. A list of presentations by chapter members is available below.

November 14th

Session: Advancing Aquatic Toxicity Test Methods: Considerations for Culturing, Testing and Data Analysis Test Methods

Session ID: 2.02.T
Title: Historical Test Variability for the Ceriodaphnia dubia Chronic Method: The California Experience
Presenter: Darrin Greenstein

Session: In the neighborhood and out to sea: Shedding light on tire wear microplastics.

Session ID: 4.13.P
Title: Determining the Leaching Potential and Chemical Profiles of Tire Wear Particles in Aquatic Conditions
Presenter: Maggie Stack

November 15th

Session: Freshwater Salinization: Causes, Effects and Working Towards Solutions

Session ID: 2.08.T
Title: Impacts of Salinity on Pesticide Toxicity in Fish
Presenter: Daniel Schlenk

Session: Advancing Aquatic Toxicity Test Methods: Considerations for Culturing, Testing and Data Analysis Test Methods

Session ID: 2.02.T
Title: Merging Alternative Toxicity Methods and Passive Sampling Towards Improved Stormwater Assessment
Presenter: Nicholas Hayman

November 15th (con.)

Session: Non-invasive techniques to biomonitor exposure and/or effects from anthropogenic pollutants in wildlife

Session ID: 3.03.T
Title: Decentralizing ecosystem toxicology to evaluate mercury burden across neotropical biota in the Peruvian Amazon
Presenter: Caroline Moore

Session: Engineering, Remediation and Restoration

Session ID: 6.06.P
Title: Water Quality Impacts on Sorbent Efficacy for PFAS Treatment of Groundwater in the Lab and Field
Presenter: Nicholas Hayman

November 16th

Session: Fate and Effects of Chemicals from Stormwater Runoff

Session ID: 2.07.P
Title: Effects of Low Dose Bifenthrin Exposure on Culex quinquefasciatus Pyrethroid Resistance
Presenter: Nathan Sy

Session: Aquatic Toxicology, Ecology and Stress Response

Session ID: 2.14.P
Title: Effects of Tetrabromobisphenol A (TBBPA) on Downstream Regulatory Element Antagonistic Modulator (DREAM)-regulated Transcription in Adult Zebrafish, Danio rerio
Presenter: Kameron Wong

Session ID: 2.14.P
Title: Toxicity of 10 PFAS Compounds to Five Standard Marine Species
Presenter: Nicholas Hayman

November 17th

Session: Enhanced Strategies and Best Practices for Identifying and Evaluating Endocrine System Adverse Effects

Session ID: 1.05.P
Title: Investigating largemouth bass intersex in an urban wastewater dominated river
Presenter: Victoria McGruer

November 17th (con.)

Session: Microplastics in the Environment and Risk Assessment: A One Health Perspective

Session ID: 5.13.P
Title: Characterization and Quantification of Microplastic Concentrations in the Benthic and Pelagic Habitats of the San Pedro Shelf
Presenter: Samiksha Singh

Session ID: 5.13.P
Title: Analysis of Lab Weathered Microplastics Using Attenuated Total Reflection Fourier- Transform Infrared Spectroscopy (ATR-FTIR)
Presenter: Shannon Tarby

Session ID: 5.13.P
Title: Microplastic Taxonomy: Harmonizing Microplastic Classification
Presenter: Kara Wiggin

Session ID: 5.13.P
Title: Microplastics as Vectors of Human Pathogens to Shellfish Bound for Human Consumption
Presenter: Kara Wiggin

Session: Risk assessment for low risk / reduced risk pesticides

Session ID: 5.16.P
Title: Does Pesticide Use Influence Phenology and Fitness of California Birds? A Study Using Citizen Science Data
Presenter: Yu Zhong Zhang

Come hang out with SoCal SETAC in Pittsburgh!

SETAC Pittsburgh SoCal SOCIAL*
Wednesday, November 16th at 7 pm

Olive or Twist
140 6th St.
Pittsburgh, PA 15222
(412) 225-0525
https://www.olive-twist.com/
**an informal, no-host gathering*

We can't wait to see you there!

November 2022

November 7-10
ICRP 2021+1 - 6th International Symposium on the System of Radiological Protection.
https://icrp2021.com

November 13-17
SETAC North America 43rd Annual Meeting. Pittsburgh, PA, USA (virtual attendance available)
https://pittsburgh.setac.org/

November 14-17
California DDT+ Research Needs Assessment Listening Session (virtual)
https://dornsife.usc.edu/uscseagrant/california-stakeholder-ddt-research-needs-workshop/

January 2023

January 3-7
The Society for Integrative & Comparative Biology Annual Conference 2023. Austin, TX, USA
https://www.xcdsystem.com/sicb/program/5X9OIbU/index.cfm?pgid=381

January 19
CASQA Quarterly Meeting | Annual Regulatory Update (virtual)
https://www.casqa.org/events/quarterly-meetings-webcasts

March 2023

March 5-8
38th Annual WateReuse Symposium. Atlanta, GA, USA
https://watereuse.org/news-events/conferences/2023-watereuse-symposium/

March 7-9
National Environmental Justice Conference and Training Program, Washington DC, USA
https://thenejc.org/

March 9-23
Society of Toxicology (SOT) 62nd Annual Meeting and ToxExpo. Nashville, TN, USA
https://www.toxicology.org/events/am/AM2023/index.asp

April 2023

April 24-28
13th National Monitoring Conference. Virginia Beach, VA, USA
https://www.nalms.org/2023nmc/

April 30 – May 4
SETAC Europe 33rd Meeting, Dublin, Ireland (virtual attendance available)
https://europe2023.setac.org/

June 2023

June 3-7
Society for Freshwater Science Annual Meeting, Brisbane, Australia
https://freshwater-science.org/save-dates-june-3-7-in-brisbane-australia

Have you checked out the Student Resources Page on the SoCal SETAC Website?

This page is available to help students find resources that will assist them in continuing to learn and engage with community and prepare for the next steps. Check it out and please email Leslie Nanninga, lnanninga@sandiego.gov if you have any additional resources or tips to share!
https://www.socal-setac.org/student-resources

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Don’t forget to follow us on social media to stay update to date on SoCal SETAC!

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