MISSION STATEMENT

Serving the Chesapeake-Potomac Region (Maryland, DC, Virginia, and West Virginia), our chapter of SETAC North America (SNA) provides a professional forum for individuals from private industry, academia, and government agencies who are engaged in the study and analysis and solutions for environmental problems, management and regulation of natural resources, and/or research and development. We facilitate networking and educational opportunities for scientific professionals, mentoring and career guidance for students, and environmental education and outreach for the public.

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Assistant Editors: Scott Lynn

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Event Planning Committee
Organizing event themes, agenda, keynote speakers, and logistics. Committee Chair: Darci Ferrer
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Student Outreach Committee
Increasing student involvement and participation in society at large. Committee Chair: Laura Robertson
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THE PRESIDENT’S CORNER

As the Wash. DC area summer heat gives way to autumn’s weather, CPRC Board and committee members have been preparing for the 7th SETAC World Congress / 37th SETAC North America Annual meeting in Orlando Florida with the following activities.

The 2nd Annual Student’s Virtual Poster Contest is gaining momentum as the numbers of entries have doubled in only 1 year: from 3 to 6! Deadline for this contest is early so that judges can provide comments and suggestions back to the students in time for them to incorporate changes to their poster before printing and presenting at the national meeting. Awards will be presented at the November SETAC National meeting to the top graduate and undergraduate students as well as for the poster voted most popular by our members. As a bonus this year, SETAC NA is contributing an additional $100 for the graduate and undergraduate awards. Find out who the winners are and see their posters on our website and be ready to spread the word next summer/fall: help us reach the goal of more than a baker’s dozen for the 3rd Annual contest!

For over 16 years, CPRC has presented our own annual Student Travel cash award to help defray costs to the national meetings, and we aim to continue that tradition. This award recognizes student members for their overall achievements and qualifications as well as their presentation submitted to SETAC NA meetings. Deadlines for submissions are mid Oct. with $500 prizes to be awarded to 2 students in Nov., just in time for Orlando.

Many of our members are presenting at the Orlando meetings and I would urge you to attend presentations or stop by their posters during the breaks – especially those of student members. We have all been there at some time – those early years in our career. To make it easier for you, mark your calendars for posters on Tues by Tim Iannuzzi (TP 224) and Tyler Frankel (TP280); Wed Veronica Pereira (WP219) and James Sanders (WP027); and Thurs by Alex MacLeod (RP217); and for platform presentations from Hilda Fadaei (#331, Tues 4 pm) and Laina Lockett (#438, Wed 10:40 am). Check out our website for many more CPRC presentations.

While you are enjoying your breaks, please take time to stop by our Sponsors’ booths, and introduce yourselves. Their financial contributions and membership support allow us to offer many of our committee and student activities and awards. Thank you!

Be sure to join us at our chapter meeting in Orlando, on Tues Nov 8th, 1-2 pm at the St Johns 28. This meeting is open to all, members and non-members – no registration required. In addition to interacting with the Board and other members, we will officially be recognizing our contest winners, and discussing our Chapter’s accomplishments in 2016 and our plans for the future. This is a very energetic and committed group of members, we are always open to ideas for new activities and opportunities for our members.
In addition to events related to SETAC NA, CPRC has an annual Fall/Winter dinner. This year’s dinner is Oct 19th at Busboys and Poets in Takoma Park, Wash DC. Our “Supper Speaker” is Sam Droegoe from the USGS Patuxent Wildlife Research Center who will present work and photographs on native bees. If you can’t make it, make sure to check out our Spring Newsletter for a review of this event, and all the latest buzz (sorry!) for next year’s dinner.

Speaking of which, the Events Committee, assisted by Student and Communication Steering Committees, are busy gearing up for our 2017 CPRC Annual Spring Meeting to be held in April in historic downtown Annapolis, MD. Details on keynote speaker, workshop activity, and science meeting agenda will begin to appear very soon on our [website](#).

Nominations for the Board and Vice President are now open until December 1st. If you, or anyone you know may be interested in being nominated, check position requirements and roles on our website, contact current board members or officers to get additional insight, and put your name in. If you have never taken on a “leadership” role, or if you want help out this Chapter, this is a perfect opportunity... so take it!

In fact I would encourage you to actively participate this coming year: run for a board position, volunteer on one or more of our steering committees, help as a judge for one of our competitions. You’ll be amazed how much gets accomplished when you join in!

Before I move on to the role of Past President at the end of the calendar year, I do have a few more notes to add. Lance Yonkos’ and Laura Robertson’s terms as Board members end in December, and I would like to recognize them for their contributions to Annual meetings, conference calls, judging competitions, and for their continual encouragement and effective leadership of the Student Committee, participating in Happy Hours, initiating the 1st and 2nd annual virtual poster contest, and facilitating our growing student mentoring program – and I could go on. Many, many thanks!

Congratulations to both Sharon Hartzell and Hilda Fadaei for successfully transitioning from “professional” graduate student to the professional world! Despite her transitioning to a new career in NYC, we are very fortunate that Sharon has agreed to stay on as executive CPRC secretary. Hilda has been active as a student member coordinating easels for our meetings, and taking the helm as editor of this Newsletter. As she moves on to Chicago in her new career, I will miss her positive energy, efficiency and friendship and will look forward to catching up with her at SETAC National meetings. Thanks also to Elyssa Arnold (Past President) and Darci Ferrer (incoming President) for this past year – I have been extremely lucky as their friendship and organizational expertise have kept me on track and honest. Finally, you need to know that all the Board, executive officers, and committee members are dynamic and efficient in keeping things moving forward; they are always ready to try something new to provide student and non-student members opportunities to interact, learn and collaborate in the true spirit of SETAC. This is truly an amazing regional chapter. Thank you.

Paula Henry, CPRC President
THE 2016 CPRC SETAC ANNUAL SPRING MEETING

By Paula Henry

Our CPRC SETAC 2016 Annual Spring Meeting was held at the Darden School of Business at the UVA in Charlottesville, VA. This is the first year in a long time that we travelled to the southern part of our region in an effort to cover the whole Chesapeake-Potomac Region, and as a “first”, it was a success. The facilities were great – wonderful staff, with enough space for everything and, thanks to Ben Burrus, the AV equipment worked out very well. We will definitely keep this venue on our list for future meetings.

Sunday afternoon, Dr Paul Wagner, senior ecologist at the US ACE Institute for Water Resources, gave a workshop presenting the latest data and policies on climate change with an emphasis on global sustainability. Afterwards, most of us met up at Sedona Tap house where the beer and food were thoroughly enjoyed. While some of us continued to discuss science, others caught up with old friends and colleagues, and a few left early to practice their presentations, just one more time!

Monday consisted of a full day of presentations, with topics ranging from triclosan, mercury and microplastics to Fred Pinkney’s talk on transforming a vacant lot to an urban garden (see the photo). This year, with a lot of help from the Student Steering Committee and and their members, the student-mentor lunch event initiated last year was broadened beyond sharing food, to matching mentors and students up for the whole day. It worked, and also generated a whole list of new ideas for next year. Great job!

The keynote address was entitled “Science, Technology and Values – what the next President can do in the first year”. Initially presented as a conversation between Elyssa Arnold, Risk Assessment Process Leader at the US EPA and Dr. William Antholis, Director of the Miller Center at UVA, Dr. Antholis reflected on his past experiences while working in the White House, particularly during the initial weeks of a new administration, and offered his assessment of the current state of science and technology. The conversation was quickly opened to include the audience – students, university professors, environmental consultants, government researchers and resource managers – asking questions on Dr. Antholis’ views on the Paris Summit on Global Warming, the role of scientists in policymaking and communicating with the public, as well as for suggestions for the up and coming future scientists in the room. Following this, we were very fortunate to have Mary Reiley, past president of SETAC NA, present updates on activities at the national level and opportunities for SETAC members. The day ended with the Board, along with generous contribution from
EnSafe, presenting the winning student awards for their presentations – a three way tie for first prize in Platform presentations (Alex, Sharon and Dana) with Tyler Frankel winning first, TD Teears 2nd, and Laina Lockett 3rd prizes for their posters.

Based on feedback we received, a good time was had by all. Thanks to everyone (Mark, Lance, Darci, Elyssa, Ben, Teri, to name just a few) who helped make this meeting run smoothly. It was a lot of work, but we are already looking towards expanding our meeting location again within the next few years, possibly into the West Virginia part of our region—so stay tuned!

**STUDENT PRESENTATION AWARDS**

Name: Dana Armstrong  
University: University of Maryland, College Park  
Department: Marine-Estuarine-Environmental Sciences  
Type of Degree: Ph.D.  
Award: Tied 1st Place Platform ($100)

Dana is a PhD student of UMD-College Park majoring in Environmental Chemistry. She earned her MS from UMD as well in the same field. She received her BS in Environmental Science from Drexel University. Prior to starting graduate school, Dana worked in the environmental consulting industry for 5 years.

**Title:** Influence of Different Wastewater Solids Treatment Methods on Concentrations of Triclosan, Triclocarban, and their Transformation Products in Biosolids

Triclosan (TCS) and triclocarban (TCC) are persistent and toxic antimicrobials commonly found in personal care products. Extensive use of these compounds has led to their presence in wastewater treatment (WWT) solids and eventual release into the environment via land application of biosolids. This is of environmental significance due to the endocrine disrupting properties of the two compounds as well as microbial resistance concerns. During WWT, TCS and TCC are only partially degraded with the extent dependent on treatment processes employed. This research compares the influence of two different sludge treatment processes at a municipal WWT facility on concentrations of TCS, TCC, and their degradation products. Beginning in October 2014, the treatment facility began the transition from treating sludge via liming to treatment via thermal hydrolysis/anaerobic digestion (TH-AD). Limed biosolids samples collected between 2011 and 2015 and TH-AD treated biosolids samples collected between 2014 and 2015 were analyzed for TCC, TCS, 5 TCC degradation products, and 3 TCS degradation products. Results indicate a significant increase in concentrations of TCS and its two detected degradation products [methyltriclosan (MeTCS) and 2,4-dichlorophenol (2,4-DCP)] due to the TH-AD process. Concentrations of TCC were significantly reduced during TH-AD treatment when compared to the liming process. Data for two TCC degradation products (4-
chloroaniline and 3,4-dichloroaniline) is currently being finalized and the remaining 3 TCC degradation products analyzed were not detected. Additionally, sludge samples were collected from each individual step of the TH-AD treatment process. Results show that TCS, MeTCS, and 2,4-DCP increased during AD by approximately 58%, 30%, and 95%, respectively. Conversely, TCS was reduced by approximately 98% during the TH process. This study demonstrates the large influence that different sludge treatment types can have on emerging pollutants in the WWT process and the amount eventually released into the environment through biosolids application.

Name: Sharon Hartzell
University: University of Maryland, College Park
Department: Environmental Sciences and Technology
Type of Degree: M.S.
Award: Tied 1st Place Platform ($100)

Sharon Hartzell recently completed her Master's degree in Environmental Science and Technology at the University of Maryland, College Park. She has enjoyed working on sediment issues in the Baltimore Harbor region for the past two years and is now working with the EPA in New York City.

Title: Quantitative Analysis of PAHs in Sediment Pore Water Using an Antibody-Based Biosensor, And Correlation with Sediment Toxicity Test Results

Sediments from Bear Creek near Baltimore, Maryland were assessed for contamination with polycyclic aromatic hydrocarbons (PAHs) and toxicity to benthic organisms. Both surface (0-2 cm) and core (partitioned to 0-10 cm, 10-20 cm, 20-30 cm, 30-40 cm, 40-60 cm, and 60-80 cm segments) samples were collected from the site, and ten-day acute sediment toxicity tests were conducted to develop a spatial array and depth profile of toxicity within the study area. Results from this study demonstrate the continued toxicity of surface sediments, and increasing toxicity at depth within sediment cores. The study also measured PAHs in sediment pore water from surface and core samples using an antibody-based biosensor that is sensitive to 3- to 5-ring PAHs. The biosensor was able to detect PAH concentrations between 0.37 μg/L and 130 μg/L. Results from the biosensor demonstrate PAH concentrations in sub-surface sediments that were, in some cases, more than 20-fold higher than those at the surface. This study demonstrates that surface toxicity and contaminant concentrations in Bear Creek sediments are not characteristic or predictive of toxicity or of contamination at depth. PAH biosensor results were compared with a laboratory-based GC/MS method, which analyzed for a suite of 27 common PAHs in a subset of samples. Even at low concentrations, GC/MS and biosensor results showed a positive correlation, indicating that this system shows promise as a rapid and cost-effective tool for assessing sediment contamination and predicting consequent toxicity. Results from this study advance our understanding of the spatial extent of toxicity in Bear Creek, and provide relevant information for future pollution management decisions in the area.
Title: Complications and Considerations of Assessing Intersex in Wild Fish Populations

Observation of male fish with testicular oocytes (TO) has been used as a biomarker of endocrine disruption and potentially of population-level adverse impact. Variability in method of testicular tissue collection (lethal vs. non-lethal) and amount of tissue analyzed through histology complicate interpretation of results. It is paramount to understand the implications of tissue collection and analysis methods when designing an investigation to allow comparability with existing scientific literature. Similarly, correlation with other endocrine disruption-associated endpoints (e.g., plasma vitellogenin, gonadosomatic index) should be carried out with an understanding of the inherent variability and limitations of TO detection. With few exception correlations should be investigated at the level of populations rather than individuals. Perspectives will be presented from extensive graduate research using largemouth bass (Micropterus salmoides) and smallmouth bass (Micropterus dolomieu) data from multiple methods of tissue collection and analysis.

Student Presentation Award Winners: L to R: Dana, Sharon and Alex
Name: Tyler Frankel
University: University of Maryland, College Park
Department: Animal and Avian Sciences
Type of Degree: Ph.D.
Award: 1st Place Poster ($100)

Tyler is a 3rd year Ph.D. candidate at the University of Maryland, College Park. His research focuses on examining the effects of endocrine disrupting chemicals on the reproduction of freshwater fish species, with a particular interest in effects on reproductive behavior.

**Title:** The Effects of a Human Contraceptive, Levonorgestrel, On the Anal Fin Morphology and Reproductive Behavior of the Eastern Mosquitofish (*Gambusia holbrooki*)

Historically, endocrine disrupting chemical research has focused on environmental androgens, estrogens, and thyroid hormones. Recent efforts have begun to examine the effects of gestagens, which include endogenous progestogens and synthetic progestins, on aquatic wildlife. Gestagens have been measured in human wastewater effluent and agricultural runoff, and a limited number of lab exposure studies have demonstrated profound effects of these chemicals on reproduction, morphology, and physiology. However, little work has been done to examine the impacts of short-term progestin exposure on reproductive biology, and no studies have examined effects on reproductive behavior. Thus, we exposed adult eastern mosquitofish (*Gambusia holbrooki*) to two concentrations of levonorgestrel (LNG), 10 ng/L and 100 ng/L, and an EtOH control using a static replacement system, and examined the effects on anal fin development, morphology, and reproductive behaviors. Exposure to LNG at both concentrations caused morphological masculinization of the female anal fin into a male-like gonopodial structure, and at 100 ng/L caused the hypermasculinization of males. LNG exposure at 100 ng/L also caused decreases in attending and gonopodial thrust behaviors in paired interaction trials, indicating an overall decreased interest in courtship and mating. Results from this study provide further evidence that the human progestin, LNG, functions as an environmental androgen, causing rapid effects on morphology and behavior in a viviparous species. As this is the first time the effects of LNG on behavior have been examined in mosquitofish, our results also highlight the importance of examining reproductive behavior as an endpoint for endocrine disruption testing.

Name: Thomas D. Teears
University: James Madison University
Award: 2nd Place Poster ($75)

**Title:** Water Quality Effects on Mortality of Brook Trout (*Salvelinus fontinalis*) Eggs/Alevins in Aquaculture and Deep Springs along South River, Waynesboro, VA
The restoration of brook trout in Virginia's streams is of significant importance and aquaculture may play a major role in restoring brook trout fisheries. A series of experiments were performed to evaluate the potential for hatching brook trout at the Montebello Fish Culture Station (MFCS) as well as in deep springs along the South River in Waynesboro. “Green” brook trout eggs were hatched in three deep springs in South River, Waynesboro, MFCS spring, and Paint Bank Fish Hatchery (PBFH) hatch house. The results were total mortality in all treatments except for PBFH hatch house (81% “eye-up”). To test whether nitrogen gas saturation affected mortality, “eyed” brook trout eggs were tested for 28 days at the same three springs in South River with eggs also hatched in ponds 1-6 at MFCS to determine whether as nitrogen gas saturation decreased due to aeration from water falling from pond to pond, the mortality would decrease as well. The results indicated that although the South River springs have optimal temperature, hardness and alkalinity for the hatching of brook trout eggs, the nitrogen gas saturation was detrimental to egg hatch (average morality of 30.5%, average nitrogen saturation 108.8%). The lowest mortality was found to be in the MFCS downstream ponds 3-6 (average mortality 5.5%) where average nitrogen gas saturation is 103.1%. Upstream MFCS ponds 1 and 2 had mortality of 20.6% and 11.1% with nitrogen levels of 105.5% and 104.9% respectively. For all treatments, there was a positive linear regression between nitrogen gas saturation and mortality ($R^2 = 0.59, p < 0.01$). South River deep springs and MFCS may be more effective in hatching brook trout eggs if the water could be degassed to remove nitrogen gas saturation.

Name: Laina Lockett  
University: Towson University  
Department: Environmental Science and Studies  
Type of Degree: M.S.  
Award: 3rd Place Poster ($50)

Laina Lockett is interested in continuing to work in the field of ecotoxicology by pursuing a Ph.D. at Rutgers University in Ecology & Evolution. She hopes to expand her knowledge by using reptiles and amphibians to model the effects of toxicants and examine how they impact organismal physiology.

**Title:** An Examination of the Impacts of Temperature to Standard Toxicological Protocols Using Pyraclostrobin and *Daphnia magna*

The Organization for Economic Co-operation and Development (OECD) provides standardized guidelines for testing pesticide toxicity. For aquatic invertebrates, the cladoceran *Daphnia magna* is used as a model organism and exposed to a range of chemical concentrations at a constant and optimal temperature for 48 hours (acute) or 21 days (chronic). The guidelines for these tests simplify experimental design and allow for straightforward data analysis to inform environmental regulations. Although these tests hold value, they do not consider fluctuations and variations in other environmental factors that are commonly experienced in nature. One additional stressor that is important to consider is temperature. Climate change is causing
larger ranges and fluctuations of temperatures than previously experienced in the recent past. Organisms exposed to pesticides in natural water bodies are likely to also experience non-optimal temperatures. In this study, *D. magna* were used as a model organism to test the toxicity of the fungicide pyraclostrobin under different temperature regimes. Pyraclostrobin is a strobilurin fungicide used nationally to combat 19 fungal diseases that impact crops. The objectives were to (1) determine how elevated temperatures alter the response of *D. magna* to pyraclostrobin, (2) evaluate how diet impacts response to temperature and (3) determine long term impacts of continued elevated temperatures in combination with pesticide stress. To address these goals, we conducted a series of studies including an acute temperature study, an acute feeding and temperature study as well as a chronic study combining temperature and pyraclostrobin as stressors to *Daphnia magna*. In the absence of food, it was found that *D. magna* do not have high survivorship outside of their suggested culturing temperature. We then found that *D. magna* can survive elevated temperatures if they are fed (OECD standard acute protocols do not include a feeding regiment.) When pyraclostrobin is introduced to the test environment, toxicity increases with increasing temperature. These results suggest a synergistic response to the combination of temperature and pyraclostrobin and suggest that results from guideline studies may not be protective under natural environmental conditions.

**LOOKING FOR A FELLOWSHIP?**

**Freeman Family Fellowship**

William & Mary’s School of Marine Science at the Virginia Institute of Marine Science (VIMS) is pleased to announce the availability of the Freeman Family Fellowship. The fellowship will support an exceptional doctoral track student to study marine plastic pollution by providing up to five years of support ($50,000/year) to cover associated student tuition, stipend, allowance for health insurance, research and public outreach expenses. VIMS has 90 graduate students and nearly 60 faculty on its campus in Gloucester Point, VA (USA), which is adjacent to the Historical Triangle (Yorktown, Williamsburg and Jamestown) and about 160 miles south of Washington DC. If interested, please contact Dr. Rob Hale, Professor, Department of Aquatic Health Sciences (hale@vims.edu; 804 684-7228) and read more about admission to the School of Marine Science at: [http://www.vims.edu/education/graduate/admissions/](http://www.vims.edu/education/graduate/admissions/)
LOVE THE NEWSLETTER? WE NEED AN EDITOR

Here is a chance to get involved with your local chapter. We are looking for a new Editor to help with our twice-yearly newsletter, and it might be you! Our past editors include both students and professionals. Interested? Please email us at cprc.setac@gmail.com.

Thank you to Hilda Fadaei who has done a wonderful job of coordinating and editing the newsletter for the past few years! Hilda is graduating and leaving the area to begin her post-graduate career soon. Thanks for the great newsletters and good luck, Hilda!

CPRC FALL DINNER

CPRC SETAC’s 2016 Fall Dinner was held Oct 19th in Takoma, D.C. With 21 members, the dinner was well attended. Our guest speaker from USGS, Sam Droege, talked about his work with native bees.
COMING SOON... 2017 CPRC ANNUAL SPRING MEETING

Chesapeake Potomac Regional Chapter (CPRC) of the Society of Environmental Toxicology and Chemistry (SETAC)

Planning of the 2017 Annual Spring Meeting to be held in Annapolis, MD is under way! Check the CPRC website for updates.

https://cprcsetac.wordpress.com/
Summer Fun with CPRC Members!

Daughter, Eileen, and I spent a week in Cuzco and Machu Pichu touring and doing community service with Challenge Peru. Not your typical Machu Pichu pic; but my favorite of the trip! Mind you, Eileen is 5’2”!!

Mary Reiley

A few colleagues and I volunteered at the YMCA Thingamajig Invention Convention in July, hosting an activity that taught kids about the chemistry that goes into making soap.

Darci Ferrer

It was a lot cooler in August in the Arctic.

Ian Hartwell
Conference at Philadelphia and after conference tea time!  

Qi Yao

CPRC SETAC Treasurer and Senior Scientist at Integral Consulting, Matt Behum, is seen collecting white perch from a gill net set in the Berry’s Creek Study Area (BCSA) Superfund Site in the Meadowlands of New Jersey. The fish collection was part of the annual biota baseline study led by Integral in support of the BCSA Remedial Investigation and Feasibility Study.

Overlooking Kotor, Montenegro after visiting Nikola Tesla’s homeland in Belgrade, Serbia. July 2016

David Kent
RECENT GRADUATE STUDENT RESEARCH HIGHLIGHT:
UNEARTHING LEGACY CONTAMINANTS IN BEAR CREEK

By Sharon Hartzell, Master Student, University of Maryland, College Park

For over a century, Sparrows Point was a symbol of industry for the Baltimore region and beyond – in fact, by the mid-20th century the plant was the largest steel mill in the world. Under ownership by Bethlehem Steel, the mill produced material that helped make the Golden Gate Bridge and the Chesapeake Bay Bridge, and was central to shipmaking for World War II (Baltimore Sun, 2013). Though the mill has ceased production, its legacy of environmental pollution remains – and now that the Sparrows Point peninsula is slated for redevelopment by a new owner, understanding the nature and extent of that pollution has gained new importance. My thesis research with Dr. Lance Yonkos at the University of Maryland focused on delineating the spatial extent and depth of toxicity and potentially related contaminants in Bear Creek, a tributary of the Patapsco River on whose banks the steel furnaces have churned since 1889. Through our contaminant mapping project, we aimed to build a foundation of data that can better inform future management decisions at the site.

It’s hardly breaking news that Bear Creek is polluted from a legacy of steelmaking. If you ask anyone who has lived in the vicinity of the mill, they will recount stories of being wary of swimming in the waters near Sparrows Point. In 1997, researchers mapped contaminants in the Baltimore Harbor system as a whole, and found elevated levels of heavy metals and organic contaminants in Bear Creek in particular (Baker et al., 1997). Meanwhile, toxicity testing discovered that Bear Creek sediments had lethal effects on benthic organisms that make their home in estuarine sediments (McGee et al., 1999). Toxicity has remained in the intervening decades, but researchers have only probed contaminant concentrations and effects to organisms in a limited number of areas. My research probed contaminant concentrations down the channel, where Bear Creek opens to the Patapsco River, as well as up the creek, where the shores opposite the mill are lined with residential properties and boating docks.

Though historical knowledge may deter some residents from swimming directly off the shore of the former steel mill, Bear Creek as a whole still remains a hub of recreation for Dundalk, MD inhabitants with waterfront real estate. In the course of collecting samples for my research, I observed fishermen both casting lines from the shore and wading in the creek, and recreational boaters on the water. However, the creek’s safety has remained an open question. At a public meeting I attended in early 2016, one community...
member asked a human health risk assessor working on the site whether he would let his granddaughter swim in Bear Creek’s waters. While the conclusion to this question may still not be clear, my research attempts to lay the foundation for a future answer.

In the summer of 2015, we set sail from Merritt Point Park in Dundalk to collect the foundational samples for my project. We collected sediments arranged in a grid spanning the length and width of the channel, surrounding a potential hub of toxicity where Tin Mill Canal, which drains much of the Sparrows Point property, empties into the Creek. After running ten-day toxicity tests on the sediments and measuring them for heavy metals and polycyclic aromatic hydrocarbons (PAHs), we could see clear spatial patterns in the data. Surface sediments produced the most lethality and had the highest contaminant concentrations closest to Sparrows Point, and particularly at Tin Mill Canal; sites E1 and F1, located closest to the canal outfall, had 0% and 1% amphipod survival, respectively.

Throughout the system, we found levels of zinc, chromium, nickel, copper, PAHs, total petroleum hydrocarbon (TPH) and several other compounds that exceeded sediment benchmarks for ecological effects. While it was impossible to assign responsibility for the toxicity to any one compound, nickel, chromium, PAHs, and TPH showed the strongest correlations between toxicity and contaminant concentration. Toxicity and contamination generally coincided in the near-shore areas; however, some of the highest metal concentrations were found in the northern reaches of the creek, in the A and B transects.

Complex dynamics are at play within sediment systems that govern contaminant bioavailability. In particular, the oxidation state of the metals in question plays a large part in determining whether or not they are bioavailable. One part of my research assessed metal concentrations in sediments using handheld XRF, which shows promise for rapid pollutant mapping; however, without the ability to determine oxidation states of the metals it measures, XRF is of limited use for investigating bioavailability. Luckily, our analytical technique for measuring organic compounds was much more helpful in determining bioavailability. We used an antibody-based biosensor developed at the Virginia Institute of Marine Science to measure PAH concentrations in sediment pore water, thought to be the most bioavailable portion of sediment contamination (Spier et al, 2011). By using the biosensor, we established a strong correlation between total
sediment PAH concentrations and those present just in the sediment pore water, and showed that each are strongly correlated with amphipod mortality. In the end, we determined that multiple contaminant classes may be responsible for eliciting toxic responses, through additive or synergistic effects – though the organic constituents, including bioavailable PAHs in sediment pore water, are exceptionally likely culprits.

One other advantage provided by the PAH biosensor, aside from the ability to investigate bioavailability, is the fact that it is rapid and easy to use. Part of my project involved assessing PAHs in sediment pore water using the more traditional gas chromatography-mass spectrometry approach, and compared to the biosensor, the preparation and analysis took much longer and required a much larger volume of sediment. Without the biosensor, I most likely would not have been able to undertake one of the most interesting parts of my study – the exploration of contamination at depth. Using a homemade sediment coring device, my research team took 80-cm cores from multiple locations in the Bear Creek system. These cores were segmented into 10 and 20-cm pieces, which we assessed through toxicity testing and using the PAH biosensor.

In general, the investigation of sediment cores showed that toxicity in the sediments on the very surface (top 2 cm) is not reflective of toxicity at depth. Each core showed a unique pattern, but within the system a less toxic sediment layer typically overlaid more acutely toxic sediments deeper within the system. The biosensor results showed a similar pattern, with low levels of PAHs in pore water found at the surface, while concentrations at depth were many times higher. It’s possible that less toxic surface sediments reflect a recent decline in input of contaminants, now that the mill is defunct. Improvements could also reflect biological transformations within the top sediment layer. Alternatively, the lateral transport of sediments throughout the creek may result in some of the irregularities.

So, what did we learn? Core testing shed light on an important and previously unexplored aspect of Bear Creek toxicity: the situation below the surface. While subsurface sediments are not currently posing a risk, future dredging or redevelopment in the channel may change the availability of these contaminants. In light of the planned redevelopment, subsurface data are critical for assessing risk under different development scenarios. In addition, the assessment of contamination and toxicity shed light on the importance of including multiple lines of evidence in examining contaminated ecosystems. Though multiple contaminants are correlated with toxicity, the direct cause is unknown and may be a combination of effects from various compounds. In this
case, risk assessments based only on chemical data would be incomplete without also exploring toxicity. No one is sure yet what the future of Sparrows Point will hold, but we can hope for a future where risks are understood, contamination is remediated, and residents can swim in Bear Creek without fear.

References:


**NEWS FROM THE NORTH AMERICA STUDENT ADVISORY COUNCIL (NASAC)**

*By Alex MacLeod*

As the student community of NASAC grows and gains more student perspectives, we have been faced with several challenges, aspirations, and accomplishments. This year we have gained approval of the standard operating procedure for electing regional chapter (RC) student representatives, uniting all RCs across North America. We have been soliciting feedback from the students of SETAC-NA at RC annual meetings on the importance of having a general student vote for the SNA Board of Directors (BoD) or a NASAC Chair vote on the BoD, in preparation for a student-wide survey to firm up interest. We gained approval of sustained SNA support for one NASAC leader to travel to SETAC Europe and successfully hosted the first Young Environmental Scientists (YES) meeting in North America. We hope you enjoy the programming for students at the SNA Orlando meeting, and engage with SNA’s students in Scientific Advisory Groups!

Whether you’re an undergraduate, a graduate student or a professional in a postdoctoral fellowship, be sure to plan to attend the student events. Take the opportunity to network with other students and get
involved at the Student Corner in the Exhibit Hall. We’ve planned events that are informal, interactive and inexpensive. More information at [https://orlando.setac.org/program/student-activities/](https://orlando.setac.org/program/student-activities/)

**Communication and collaboration: A scientist’s guide to improving professional presence and leadership in any setting**

1:00–5:00 p.m. Sunday | Room 255DEF | Pre-registration is required

This year’s leadership professional training course at the World Congress will focus on understanding how emotional intelligence can build confidence, enhance professional presence, and develop influence – important skills for scientists in any career (e.g., project management, research collaboration, running a lab or mentoring students).

**Meet NASAC Members**

7:30–9:30 p.m. Sunday & 6:00–6:30 p.m. Monday to Wednesday | Student Corner

Meet SETAC North America Student Advisory Council (NASAC) members at the Student Corner in the exhibit hall. Stop by during the opening reception and poster socials to chat with your NASAC representatives, learn more about what we do and how you can become more involved with student activities in SETAC. We would love to meet you and hear your thoughts on your SETAC student experience!

**Student/Mentor Dinner**

6:45–9:45 p.m. Monday | Rosen Plaza Hotel | Pre-registration is required

After the platform sessions on Monday, plan to attend the Student/Mentor dinner at the Rosen Plaza Hotel. You can’t afford to miss this opportunity to mingle and dine with a variety of SETAC members! Your participation will strengthen your networks within SETAC and provide a valuable opportunity to discuss scientific topics and career experiences with mentors. Buses will leave the conference hotel promptly at 6:45 p.m. for the brief drive to the Rosen Plaza Hotel and will return at 9:45 p.m. A cash bar will be available.

**Reddit Ask Me Anything**

2:00 p.m.–4:00 p.m. Monday | Student Corner

NASAC is hosting the second Reddit Ask Me Anything event, where anyone in the world can ask a question in our fields of science. Students will work with experts and established researchers at the student corner to answer these questions. NASAC is seeking volunteers to work with a student facilitator to answer questions submitted during the AMA. There is no Reddit experience required! Bring a cup of coffee and a sense of humor, and use this opportunity to get to know some of the bright young researchers working in the society. Contact [David Dreier](mailto:David.Dreier@setac.org) or [Jen Lynch](mailto:Jen.Lynch@setac.org) with any questions about the event or to register as a volunteer.

**Women in SETAC Luncheon**

11:15 a.m.–1:00 p.m. Tuesday | Room: Conway | Pre-registration is required
The Honorable Pat Schroeder, the groundbreaking congresswoman from Colorado who championed many legislative initiatives during her 24-year career in the United States House of Representatives, will be the keynote speaker. Schroeder will draw upon her personal and professional experiences to address the challenging topic of work–life balance.

Career Navigation Event
9:00–11:00 a.m. Wednesday | Room: Exhibit Hall | Pre-registration is recommended

Landing your dream job can be tricky. Join us at the Career Navigation Event to hear expert advice about how to get there! Representatives from industry, academia and government will be available to provide insight and feedback. Come with your questions and resumes, and leave equipped to make a smooth transition from student to professional life.

Noontime Seminar
11:15 a.m.–1:00 p.m. Wednesday | Room: Conway | Pre-registration is required

Speaker: Kate Sellers, President Elect of the Product Stewardship Society and Technical Director at ERM
Hindsight may be 20:20; how good is our foresight?

Our decisions as scientists can profoundly affect the world in which we live, but no scientist has complete information or perfectly accurate tools to support her recommendations. We must often balance competing objectives and act when we can only imperfectly understand the potential consequences. In this discussion, we’ll explore how we make wise decisions as environmental scientists in an ever-changing world. Kate Sellers, a Technical Director in the product sustainability practice at ERM, will catalyze the discussion with a case study from her recent book “Product Stewardship: Life Cycle Analysis and the Environment” (CRC Press, 2015). Attendees will use the lessons we can learn from that look back in time to explore some of the issues that challenge us today. We hope to engage the attendees in a lively, thought-provoking discussion!

All Student Assembly
1:00–2:00 p.m. Wednesday | Room: Conway

Discover the latest on what’s happening in the world of SETAC’s North America Student Advisory Council (NASAC) and Students of SETAC. All students are welcome to join.

Student Mixer
9:00 p.m.—Until Wednesday | Club 39 | Tickets are $25

Come join us for the 3rd Annual North America Student Mixer! There will be drinks, music and dancing at Club 39 at the Rosen Plaza Hotel. Tickets include 2 drinks. Drinking age 21+.
REFLECTING ON THE 5TH YOUNG ENVIRONMENTAL SCIENTISTS MEETING

By Alex MacLeod

This spring we were pleased to host over 90 young professionals from 13 countries to the University of Florida in Gainesville for the 5th SETAC Young Environmental Scientists (YES) meeting. The YES meeting is a unique concept built on the four previous meetings – 2009 in Landau, Germany, 2011 in Aachen, Germany, 2013 in Kraków, Poland, and 2014 in Valjevo, Serbia. This was the first time that the for-students, by-students SETAC meeting was held in North America. It featured poster and platform presentations, career talks, and laboratory and soft skills development courses. Furthermore, students had the opportunity to network with their peers and get meaningful and relevant feedback from them on their research, study design, and presentation skills. In addition to the opportunity for students to engage in a non-intimidating, all-student meeting environment, a key part of this meeting is that no registration fees were charged and travel grants were given to all students who were selected to present their work. Currently, the European Student Advisory Council (SAC) is planning the 6th YES meeting for Stockholm, Sweden in 2017. Meanwhile, the SETAC North American Student Advisory Council (NASAC) is preparing plans for the 7th YES Meeting in Madison, Wisconsin in 2018.

Following the success of the past four YES meetings, we had quite a challenge ahead of us to maintain the collaborative spirit of this "for-students, by-students" event, while at the same time bringing new ideas and perspectives. We started the meeting with a presentation and workshop by Marianne Shockley, strong proponent for science outreach and service, to discuss building effective outreach or service-learning projects, culminating with a build-your-own science outreach and public engagement program group exercise.

The meeting was officially opened by the NASAC Chair, the YES 2016 Local Organizing Committee and Scientific Committee Chairs, SETAC North America Executive Director and Incoming President, and a special visit from SETAC Global Executive Director. Our participants enjoyed the Florida spring sun (and some drinks as well) during an opening reception, followed by a workshop about SETAC and how being involved in the society is beneficial for both your science as well as your career. This was concluded with a heartfelt remembrance of Lou Gillette in lieu
of his recent passing, acknowledging and celebrating his achievements and impact on the field of endocrine disruption and his students.

We had a fantastic scientific program ranging from nanoparticles to public health and epidemiology, with all student participants giving either a platform or a poster presentation. We were very glad to have three wonderful career speakers, Mace Barron (US-EPA), Beth Carraway (Clemson University), and Isabel Johnson (NextEra) who not only provided their experiences in their work but spent time chatting with students in a more informal setting.

This YES meeting was the second to have short courses that focused on both laboratory and professional development skills — all for free for every participant. We had several hands-on short courses set in the state-of-the-art ICBR laboratories on NextGen DNA sequencing, monoclonal antibody, gene expression and genotyping, flow cytometry, proteomics and mass spectrometry, electron microscopy, and bioinformatics. We also had several professional development courses on “Risk Assessment and Regulation” by Leah Stuchal, “Making Good Scientific Presentations Great” by Andy Kane, “How to Get a Job in Academia” by Chris Martyniuk, “Introduction to Life Cycle Assessment” by Christoph Koffler, “Scientific Publishing” by Bryan Brooks and Charlie Menzie.
**MEMBERSHIP APPLICATION/RENEWAL**

SETAC: the **Society of Environmental Toxicology and Chemistry** is an independent, nonprofit professional society that provides a forum for individuals and institutions engaged in the study of environmental issues, management and conservation of natural resources, environmental education, and environmental research and development.

CPRC: the **Chesapeake and Potomac Regional Chapter** of SETAC is a non-profit organization started in the year 1983. CPRC’s mission is to promote the exchange of information among environmental scientists in the Mid-Atlantic States.

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Note: you do not have to be a SETAC member to be a member of CPRC.

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There are three ways to join/renew:

1) **Preferred Method** SETAC North America (SNA) ([tinyurl.com/cprcmember](http://tinyurl.com/cprcmember)). SNA will send us your contact info so we can add you to our chapter mailing list. You do not have to be an SNA member to use this option.

2) PayPal CPRC ([tinyurl.com/DuesCPRCpp](http://tinyurl.com/DuesCPRCpp)) credit cards accepted, no PayPal account needed. Enter appropriate fee amount ($5 student, $15 professional). Please note that it is easier for us to track your membership when you join via the SNA site (option 1 above).

3) Snail Mail: Check and money orders accepted. Please include your name, affiliation and address with your payment.

   SETAC-CPRC  
   P.O. Box 153  
   Severn, MD 21144  
   Attn: Matthew Behum, Treasurer

Membership renewals occur every December. If you have any difficulty with your membership application or payment, please contact Matthew Behum ([treasurer.setac.cprc@gmail.com](mailto:treasurer.setac.cprc@gmail.com)).
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**SPONSORSHIP OPPORTUNITIES**

On behalf of the membership of the Chesapeake Potomac Regional Chapter (CPRC) of the Society of Environmental Toxicology and Chemistry (SETAC), the CPRC Board of Directors is asking for your support as a Corporate/Organizational Sponsor for 2017 or beyond. The benefits of sponsorship are substantial, and include (but are not limited to): fostering interaction among members (both professionally and socially), hosting scientific meetings and social events, writing and distributing a biannual newsletter, maintaining and updating our website, and funding student awards that encourage and promote research and professional development of our student members. Your support would play a key role in maintaining these activities, and help us achieve our goal of expanding the size of CPRC and the range of benefits that we can offer. We offer two formal levels corporate sponsorship with the benefits summarized below. We also welcome and recognize sponsorships focused on specific areas (for example, a student travel award) and smaller level contributions. ([https://cprcsetac.wordpress.com/sponsorship/sponsorship-program/](https://cprcsetac.wordpress.com/sponsorship/sponsorship-program/))

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To become a sponsor, please remit payment (payable to CPRC-SETAC) with your company and contact information to:

SETAC-CPRC  
P.O. Box 153  
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Attn: Matthew Behum, Treasurer

Matthew Behum, Treasurer ([treasurer.cprc.setac@gmail.com](mailto:treasurer.cprc.setac@gmail.com)) can answer any additional questions.