Baylor Environmental Science

ENV News

Spring 2019
Volume 3, Issue 1

BREAKING NEW GROUND AND BUILDING UNDERSTANDING—THROUGH WHALE EARWAX

December 10, 2018 Posted in Academics, Research

History is embedded in, of all places, whale earwax.

Scientists have long examined the layers found in a whale's earwax to determine its age (not unlike the rings found on a tree), but it wasn't until two Baylor professors learned you could also learn more about their environment through earwax research that we realized just how many stories the 10-inch plugs could tell.

Dr. Sascha Usenko, associate professor of environmental science, and Dr. Stephen Trumble, associate professor of biology, broke new ground in 2013 when they pioneered a technique for analyzing whale earplugs and used it to uncover whales' exposure to pollutants and other man-made stressors.

Now, they've followed up that project with another first-of-its-kind study: an examination of whale stress responses over the last 150 years. The latest research, which paints a picture of marine mammal reactions to events like whaling and World War II, also reveals the ways whales respond to pollutants and changes in climate.

Trumble and Usenko examined fin, humpback and blue whale earwax samples acquired from 1870 through 2016 for the project, searching for cortisol, a stress-response hormone. After recording cortisol levels found in whales through the years, they compared that knowledge with historical data of human activity in oceans to see if there were any connections.

Not surprisingly, cortisol levels spiked during the years with highest whaling activity. But even as whaling was at an ebb in the 1940s, whale stress continued to show up at a high rate. The Baylor researchers say that time period corresponds with the large-scale oceanic traffic and human activity of World War II.

Even in recent years, with Northern Hemisphere whaling activity reportedly ceased, cortisol levels (and the incumbent stress they represent) continue to climb. Trumble and Usenko suggest that, as "sentinels of their environment," these species of whales are particularly sensitive to warming sea temperatures and other human-based stressors.

Just as it was with their first groundbreaking study, interest in the current research is high. They admit there's a certain curiosity that comes from the "gross factor" of their research, but it goes far beyond that. Long-form articles have already appeared in Smithsonian Magazine, National Geographic and The Atlantic, with scientists around the world interested in opportunities to learn more and collaborate with a duo who saw the possibilities of a humble piece of earwax.

Sic 'em, Drs. Trumble and Usenko!

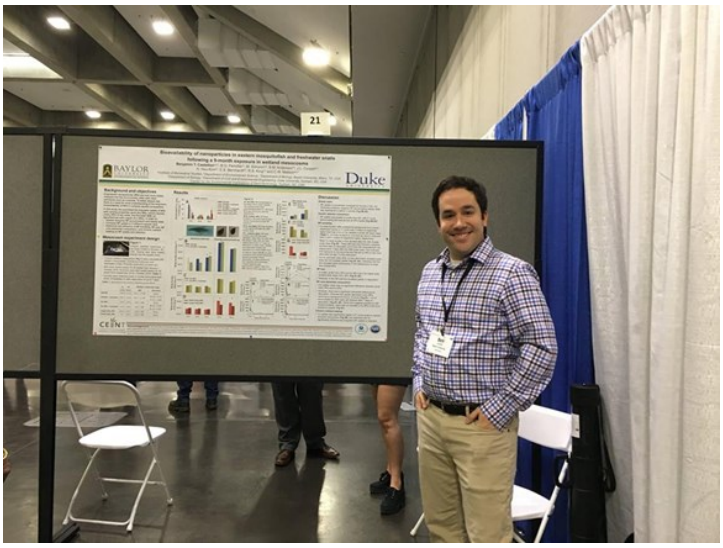
INSIDE THIS ISSUE

STUDENTS AND FACULTY ATTEND THE SETAC SACRAMENTO CONFERENCE

The Society of Environmental Toxicology and Chemistry in North America (SETAC) held its annual meeting in November 2018 in Sacramento, California. The meeting brought nearly 2,000 attendees from different geographic units (around the world), including professionals from academia, government and industry sectors.

Some of the attendees at the SETAC Sacramento Conference included (from left to right) Marco Franco, Raegyn Taylor, Bekah Burket, Grace Sutherland, Jordan Vanderpool, Cole Matson, Jing Liu, Brittany Perrotta , Elias Oziolor, Ben Castellon, Kendall Scarlett and Chad Mansfield.

Platform and poster presentations addressed the theme "Towards Sustainable Environmental Quality". Keynote presentations highlighted the progress in environmental science and policy in the last fifty years and effective science communication. Baylor graduate and undergraduate students, and faculty members from the Department of Environmental Science made 8 platform presentations and 9 poster presentations. Two major awards were given to Baylor attendees: Professor Bryan W. Brooks was honored as a Fellow of SETAC (see page 5), and Benjamin Castellon, a Ph.D. candidate in the Matson lab, was awarded 2nd place for best poster presentation by a Ph.D. student.



Congratulations to Ben Castellon for winning 2nd place PhD poster award at the SETAC North America meeting! Congratulations, Ben!

SETAC is well known for devoting many resources to support students, which have been important for many Baylor scholars. SETAC provides support through the North America Student Advisory Council (NASAC), and many graduate students from the Baylor Environmental Science Department have served or currently serve, as chairs of different NASAC sub-committees and regional chapters. Our alumni continue to serve in various other leadership roles. Therefore, during the Sacramento meeting, it was decided that Baylor will host the 2020 Young Environmental Scientists (YES) meeting, an international conference established for young scientists from around the world, with direct support from SETAC. SETAC Sacramento was a great success for Baylor Environmental Science, and our students and faculty eagerly await the opportunity to participate in the 2019 SETAC North America meeting, set to happen November 3-7 in Toronto, Ontario, Canada.

CONGRATULATIONS FALL 2018 GRADUATES

Undergraduate Students

Amarachukwu (Amara) Okpalo
BS - Environmental Health Studies

Connor Mason
BA—Environmental Studies

Scott Biebas
BA— Environmental Studies

Darien Bell
BS—Environmental Health Studies

James Ford
BA—Environmental Studies

Rafael Sandoval
BS—Environmental Science

Graduate Students

Sam Haddad
PhD in Environmental Science

Gavin Saari
PhD in Environmental Science

Jasmine Stovall
Masters in Environmental Science

ALUMNI UPDATES: WHERE ARE THEY NOW?

Nora Simpson (BA in ENV Studies with a minor in ASL and interpreting. Class of 2018): Nora was recently promoted to Environmental Compliance Specialist at UPS Global Headquarters in Atlanta, Georgia. Congrats, Nora!

Morgan Cody (BS ENV Science with a minor in Spanish. Class of 2018): Morgan is the newest Environmental Coordinator the City of Dallas. Way to go, Morgan!

Tyler Taba (Degree in Marketing with a minor in ENV Studies. Class of 2018): Tyler just started his Masters of Science in the Sustainability Management program at Columbia University in New York City.
Keep up the good work Tyler!

FACULTY SPOTLIGHT: DR. SASCHA USENKO

SASCHA USENKO, PH.D. is an Associate Professor in the Department of Environmental Science and holds adjunct appointments in Biology and Chemistry. Dr. Usenko is an analytical chemical who applies his analytical expertise to a wide range of environmental issues ranging from ocean health and atmospheric chemistry. During his tenure at Baylor, Usenko has developed strong research collaborations with faculty from chemistry, biology, geology and environmental science. Most importantly, Dr. Usenko has a very vibrant and exciting group of young scientist working in his group.

Dr. Usenko's research broadly focuses on studying the impact and intersection of environmental change and anthropogenic activities, with an emphasis on applied environmental chemical. "I have two specific lines of research, which I have been developing for the past decade. First is the study of stress, stressors, and health in marine wildlife, with a primary focus on baleen whales." This line of research founded in a novel technique developed at Baylor by Drs. Usenko and Trumble (Biology) that is capable of reconstructing the life history for individual baleen whales using their earplugs. Secondly, is the study of fate, transformation, and degradation of organic pollutions in an urban atmosphere. Specifically, focusing on the atmospheric oxidation of pesticides used to control mosquito populations (as disease vectors). Both lines of research are extremely large-scale in nature and offer significant opportunities to make a profound difference in our world.

With the help of his research group and collaborators (both on and off campus), Dr. Usenko has synergistically leveraged and expanded these research activities. Thereby increasing as externally funded research, top-pier publications, public outreach, positive media coverage, graduate successes, and a strong research infrastructure.

DR. BROOKS HONORED AS SETAC FELLOW

by Gabrielle White, student news writer

WACO, Texas (Nov. 15, 2018) – Dr. Bryan W. Brooks,

Distinguished Professor and Director of the Environmental Health Science Program was elected as a Fellow of the Society of Environmental Toxicology and Chemistry (SETAC) for his outstanding leadership and science. Brooks received the award at the SETAC meeting in Sacramento, California on Sunday, Nov. 4.

"I am humbled and honored by this recognition," Brooks said. "This reflects positively on the sustained scholarly contributions of our Baylor students and alumni, and collaborations with other scholars at Baylor and around the world. I accepted this award on behalf of current students and alumni from our research team."

SETAC is a non-profit, global professional society comprised of individuals and institutions engaged in the study, analysis and solution of environmental problems, the management and regulation of natural resources, environmental education and research and development.

The SETAC Fellows award was created to recognize SETAC members demonstrating both meaningful long-term scientific or science policy contributions and service and leadership within SETAC. Fellowship status within SETAC provides additional appreciation of members' contributions to ecotoxicology, environmental chemistry, risk assessment and life cycle assessment. To be chosen as a Fellow, one must be nominated by current Fellows then selected SETAC's Global Awards Committee.

Dr. Brooks has been a member of the SETAC North America Geographic Unit for 22 years. He was the past president of South Central SETAC, chairing an international SETAC conference in 2009 in New Orleans. He also has served as an associate editor of both the Society's international peer-reviewed journals; served on the North America Board of Directors and leads the Global Horizon Scanning Project, which structures important global environmental quality research questions in multiple scientific and engineering disciplines.

Dr. Brooks and his students are currently focusing on research in water quality and water reuse, comparative toxicology and pharmacology, bioaccumulation science, sustainable molecular design, developing approaches to define risks of contaminants of historical and emerging concern, environmental public health and the ecology and toxicology of harmful algae blooms.

"Baylor's support of our research with students and collaborators has provided an important foundation from which our scholarly contributions have progressed, expanded and been sustained," Brooks said. "I could not have achieved this recognition without the support of my undergraduate and graduate mentors, students, postdoctoral fellows and collaborators, and the steadfast support of my family."

FACULTY AND STUDENTS INFORM NEW PROSPECTIVE STUDENTS OF THE POSSIBILITIES IN ENVIRONMENTAL SCIENCE.

Tommy Watson BS (left), Professor Julie King (center), and Vivian Tran (right) met with potential students during the Invitation to Excellence event this Spring. Invitation to Excellence is a Baylor program in which gifted, incoming students come and learn more about the University. Departments from across Baylor talk to students about the advantages of the individual programs.

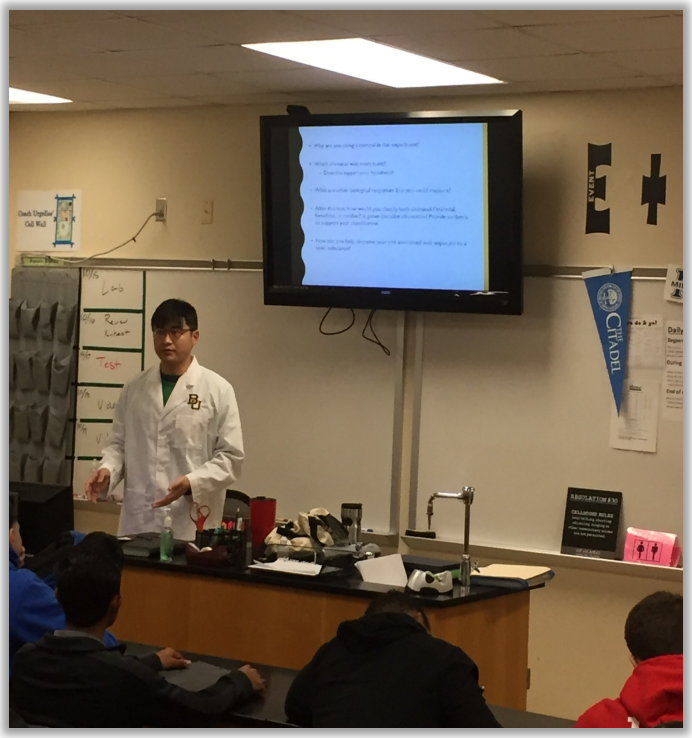
King, Watson, and Tran represented the Environmental Science department and discussed with attendees the world of Environmental Science at Baylor University. Prospective students become familiar with the programs by talking to faculty and current students directly, allowing them to ask detailed questions about what their time in the program might look like.

BAYLOR GRADUATE STUDENTS TEACH AQUATIC SCIENCE TO WACO HIGH SCHOOLERS

Baylor faculty and graduate students visited Midway High School twice this school year to assist Aquatic Science teachers. The class composed of juniors and seniors, discussed nutrient pollution and the effects of ubiquitous household chemicals on the environment, after we use them and they go down the drain. The students got to get a first hand education on the environment from some of the best in the nation.

Graduate student Ben Castellon said of the experience, "In ENV and CRASR here at Baylor, we strongly believe that every citizen, young and old, should know about science and be engaged on what modern science is all about, meet real scientists, talk about why scientists do the things that they do, etc. All of that s a way to pique the interest of future scientists and facilitate trust and support by all stakeholders. We as scientists also learn a lot by teaching to the next generation. By meeting and engaging with those in the community that our science helps, makes us all the more proud and motivated to keep working hard and serving the public."

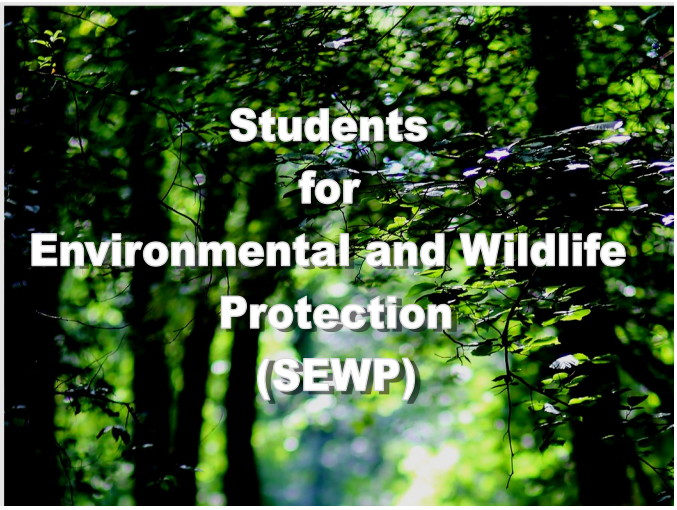
Thanks to Benjamin Castellon, Bridget Hill, Brittany Perrotta, Peter Bruns and Chi-yen Tseng for making these kids see the importance of environmental education! Together you are making a difference.



Chi Yen Tseng presenting to juniors and seniors at Midway High School.

THERE'S A NEW ENVIRONMENTAL CLUB ON CAMPUS!

Baylor University has recently welcomed one of its newest organizations to campus: The Students for Environmental and Wildlife Protection (SEWP). This organization was founded by Christine Snow, an Environmental Science minor with a desire to educate more students about environmental issues. With the help of Dr. Melinda Coogan and Mr. Doug Nesmith, Snow was able to make this dream a reality by creating a place where people can gather to explore modern environmental issues. Snow, who is now the President of the organization, says "We hope to encourage students of any major and background to join our organization, especially those who are passionate about the environment and wildlife, and hope to be a part in bettering it. We hope that through our organization, we can raise awareness for the issues that the environment is facing and remind students that individuals can make a very large impact. We also hope to inform students of small ways that they can help, while also providing large events on campus that give students an opportunity to help."



Dr. Coogan states that she is "most excited to see where students are interested in focusing their interests in protecting our natural resources, since membership interest came from many different majors on campus! This is definitely a student-driven organization, so we will begin with discussing what priorities Baylor students have both among the Baylor and greater Waco communities. At this point, we are discussing development of projects for Earth Week in April, so 'stay tuned!" We are excited to see where this organization will go!

Great job, Christine, Dr. Coogan, and Mr. Nesmith!

KURDISTAN EXPEDITION

"One more step Mr. Frodo and I will be further from the Shire than I have ever been before." Sam Wise, in J.R.R. Tolkien, Lord of the Rings

By Larry Lehr

Environmental Science Senior Lecturer Larry Lehr and Baylor University Emeritus Professor Bill Mitchell recently traveled to Kurdistan to evaluate infrastructure at refugee camps housing refugees from Syria, Iran, and Turkey and those internally displaced because of conflict in Iraq.

Dr. Lehr reported that it was a very positive experience that not only dispelled several public misconceptions about the region but also demonstrated the resilience and hope of people of faith, and the commonalities between people of different faiths.

Kurdistan is an autonomous governorate of Iraq and is home to 40 million Kurdish people; the largest number of persons in diaspora next to the Jewish faith. The Iraqi government has appointed a Kurdish governor who is the chief administrator for the region.

Lehr and Mitchell stayed with missionaries Billy and Dawn Ray in Soran, Kurdistan. The couple are Baylor graduates and though both attended Antioch Church in Waco at the same time, did not meet until they worked in Turkey. They have organized a school and orphanage for widows and children of the Kurdish Peshmerga, (the Kurdish military) and created two micro-refugee camps that provide housing, job skills, education and a clinic.

After four days in Soran, Larry and Bill traveled to Duhok, Kurdistan to meet with the Governor, His Excellency Farhad Ameen Atrushi. His Excellency had been Dr. Mitchell's translator on a trip to the area in 2005 and after receiving his PhD in political science and serving several terms in the Iraqi parliament, was appointed Governor of Kurdistan. Governor Atrushi and Bill have maintained their relationship over the years by telephone and personal visits both in the US and Iraq.

American University in Kurdistan,

There are 22 refugee camps in the Duhok area. His Excellency Mr. Farhad enabled Larry and Bill to visit Kurdish refugee camps of IDPs (Internally Displaced Persons, those that moved from other places within Iraq because of safety issues associated with the ongoing fighting with ISIS) with the goal of suggesting strategies for the development of energy infrastructure to improve standard of living and quality of life within the camps. More specifically, they are examining the feasibility of wind generators to supply electricity to the camps .

They also met with the President of the American University in Kurdistan, Dr. John Menzies, former US Ambassador to Bosnia, to discuss the possibility of collaboration with Baylor in specific academic disciplines. A report is being prepared for Baylor administrators to identify a mechanism for future collaboration and assess the possibility of a future visit.

Larry Lehr at Lalish; a 5,000 year old holy site of Yazidis.

The governor also provided the opportunity to visit with the Yazidis, one of the most persecuted cultures in the world today. They have faced genocide and the systematic dismantlement of their culture and religious belief. The religion is linked to Zoroastrianism and ancient Mesopotamian religions although they form a distinct and independent religious community and have their own culture. The religion is practiced by approximately 400,000 people. They are required to make a pilgrimage to Lalish, their holiest site, at least once in their lifetime. Larry and Bill were hosted by a Yazidi priest whose position has been handed down through familial lineage over thousands of years. They were able to visit the holy site; a cave, spring, and temple which has been the focal point of the Yazidi faith for over 5,000 years.

Larry reflected that: “the Muslim and Christian communities were integrated throughout the areas we traveled and there appeared to be no adverse relationships between the two communities. We were treated to a level of generous hospitality and extreme courtesy, not only by our hosts, religious leaders, people on the street, shopkeepers, hotel staff, and taxi drivers in the towns and villages we visited. What we witnessed first-hand was the commonality of tangent religious communities, Christianity and Muslim; both struggling to overcome some sort of adversity, capable of great compassion, people that love and care for their families, people that want to better themselves and their condition, and in the case of Kurdistan, a people who are willing and anxious to embrace democracy. It underscored how fortunate we are to be living in a democratic nation.

Regardless of the differences in religious tradition and culture, one must recognize and appreciate the dedication of a faith that is publicly called to prayer and formally prays five times a day. It was explained that frequent prayers remind the faithful of God and the many opportunities to seek His guidance and forgiveness. They also serve as a reminder of the connection that Muslims the world over share through their faith and shared rituals.

One wonders how we as a religiously affiliated university, a community, state, or nation, might be positively transformed if we showed the same outward devotion to our beliefs.

The quote from the Tolkien book at the top of this narrative refers not only to Larry’s adventure as the erstwhile though naïve traveler to a far off and troubled land, but also to the entire Kurdish experience. It depicts a society that has been introduced to a democratic model, including freedom of religion, economic development, education (particularly for women), and a somewhat more uncensored press. After thousands of years in a repressive system, the governorate is trying to ‘get its hands around’ democratic principles’. That doesn’t happen over-night.

"DATA, DATA, EVERYWHERE" IN BAYLOR A&S MAGAZINE

Excerpt from article written by Julie Engbretson , Baylor Magazine

Good genes

In the Department of Environmental Science in the College of Arts & Sciences, Dr. Cole Matson, an Associate Professor, is an environmental toxicologist specializing in the genetic effects of contaminants on wildlife. One of his current projects looks at wild Gulf killifish living in the Houston Ship Channel.

"With the Houston Ship Channel, we're talking about a highly polluted aquatic environment," Matson said. "We identified that we had populations of killifish living in the ship channel that were highly resistant to some of the industrial chemicals that are found there, so we wanted to understand how they have become resistant, from a mechanistic standpoint. How have they adapted? Genetically, how have these fish been altered to make them better able to survive that pollution?"

Matson said these questions required the sequencing of the entire genome (i.e., an organism's entire set of DNA) of 288 individual fish from seven different populations — which is just the sort of project where data science shines.

In fact, genome sequencing was among the earliest applications of data science. Launched in 1990, The Human Genome Project aimed to identify the sequence of chemical base pairs that comprise human DNA. But mapping the more than three billion nucleotides found in a single human reference genome (a representative example of a species' set of genes) presented some immediate challenges. Every genome is unique, so mapping them had to account for multiple variations of each gene, and working with the overwhelming volume of data produced required expertise in the field of computer science.

> *"What data science has really allowed us to do is approach projects without the need for any a priori hypotheses (i.e., hypotheses assumed as facts beforehand) about which genetic pathways are going to be important"*

After Matson's success in mapping the genomes of 288 fish, he and his colleagues can now approach the entirety of that data without having to make too many assumptions ahead of time.

"What data science has really allowed us to do is approach projects without the need for any a priori hypotheses (i.e., hypotheses assumed as facts beforehand) about which genetic pathways are going to be important," he said. "In the past, we could probe gene expression — using tools that have been around for 15 to 20 years — to look at a handful of genes that we knew we wanted to look at going in. We were limited to only probing pathways that we had already identified as likely important. Now, thanks to data science, we don't have to make those assumptions going in. We're looking at everything at once. We let the data, really the organism itself, tell us what's important. We can simply ask the data set, 'Where are the strongest signals of selection in our adapted populations?' and, 'What has changed the fastest in the resistant populations relative to the reference populations?'"

As valuable as data science is for projects such as Matson's, involving these uniquely adaptable killifish, he says making use of data is even more critical when researchers leave the lab and "go out into the real world."

"If I want to understand the toxicity of a single chemical or compound, I can design really targeted experiments because I have a decent idea about the types of toxicity I might expect to see," Matson said. "When I go out into the real world, I'm not dealing with one chemical compound — I'm dealing with hundreds if not thousands of potentially toxic chemicals that organisms are exposed to. So it's extremely difficult to predict what types of toxicity we could see."

OUTSTANDING GRADUATE STUDENTS NOMINATED FOR TEACHING AWARDS

Three environmental graduate students, Jasmine Stovall, Amjad Dabi, and Jaylen Sims have been nominated for an Outstanding Graduate Student Instructor Award! Students who are nominated by the Graduate School for the award, received top scores of above 4.0, taught three credit hours, have not yet graduated, and not previously won.

Congratulations to the ENV nominees, and keep illuminating our students!

RESEARCH AT ARGONNE NATIONAL LAB

By: Jing Liu

The Advanced Photon Source (APS) at the U.S. Department of Energy's Argonne National Laboratory (ANL) provides ultra-bright, high-energy storage ring-generated x-ray beams for research in almost all scientific disciplines. These x-rays allow scientists to pursue new knowledge about the structure and function of materials in the center of the Earth, in outer space, and all points in between. The knowledge gained from this research is impacting the evolution of combustion engines and microcircuits, aiding in the development of new pharmaceuticals, and pioneering nanotechnologies whose scale is measured in billionths of a meter, to name just a few examples. These studies promise to have far-reaching impact on our technology, economy, health, and our fundamental knowledge of the materials that make up our world.

Argonne National Laboratory in Lemont, Illinois

As a graduate student working in Dr. Cobb's lab, Jing Liu studies the effects of interactions of copper oxide nanoparticles and arsenic on rice plant growth. The goals of her research are to find out whether copper oxide nanoparticles can alleviate arsenic toxicity to rice plants, especially reducing arsenic accumulation in rice grains. To further understand the mechanisms of copper oxide nanoparticles and arsenic inside the rice plants, studies were performed on the speciation of copper and arsenic inside rice seedlings by analyzing the XANES (X-ray Absorption Near Edge Structure) spectra for copper and arsenic, which were collected with the APS at ANL in August 2018.

Environmental Studies student, Summer Miller was selected to intern at the Grant Teton National Park in Wyoming!

Great job, Summer!

NEW BEAR CUB

Congratulations to Dr. Gavin and Kady Saari on their new baby girl, Luna Estelle.

RECENT PUBLICATIONS

Bratton, Susan Power (2018). Eco-Dimensionality as a Religious Foundation for Sustainability. *Sustainability 10 , 1021.*

Schathauser, Bruno Henrique; Kristofco, Lauren A.; Ribas de Oliveira, Cintia Mara; **Brooks, Bryan W**. (2018), Global review and analysis of erythromycin in the environment: Occurrence, bioaccumulation and antibiotic resistance hazards. *Environmental Pollution, 238, 440-451.*

Steele, W. Baylor; Mole, Rachel A.; **Brooks, Bryan W.** (2018), Experimental Protocol for Examining Behavioral Response Profiles in Larval Fish: Application to the Neuro-stimulant Caffeine. *Jove-Journal of Visualized Experiments, 137.*

Taylor, Jason M.; Back, Jeffrey A.; **Brooks, Bryan W**.; et al. (2018). Spatial, temporal and experimental: Three study design cornerstones for establishing defensible numeric criteria in freshwater ecosystems. *Journal of Applied Ecology, 55(5), 2114-2123.*

Van den Brink, Paul J.; Boxall, Alistair B. A.; Maltby, Lorraine; **Brooks, Bryan W**; et al. (2018). Toward sustainable environmental quality: Priority research questions for Europe. *Environmental Toxicology and Chemistry, 37(9), 2281-2295.*

Burket, S. Rebekah; Sapozhnikova, Yelena; Zheng, J. S.; Chung, SS; **Brooks, Bryan W** (2018). At the Intersection of Urbanization, Water, and Food Security: Determination of Select Contaminants of Emerging Concern in Mussels and Oysters from Hong Kong. *Journal of Agriculture and Food Chemistry, 66(20), 5009-5017.*

Kristofco, Lauren A.; Haddad, Samuel P.; Chambliss, C. Kevin; **Brooks, Bryan W**; et al. (2018). Differential Uptake of and Sensitivity to Diphenhydramine in Embryonic and Larval Zebrafish. *Environmental Toxicology and Chemistry, 37(4), 1175-1181.*

Saaristo, Minna; Brodin, Tomas; Balshine, Sigal; **Brooks, Bryan W**; et al. (2018). Direct and indirect effects of chemical contaminants on the behaviour, ecology and evolution of wildlife. *Proceedings of the Royal Society B-Biological Sciences, 285(1885).*

Saari, Gavin N; Corrales, Jone; Haddad, Samuel P; **Brooks, Bryan W**; et al. (2018). Influence of diltiazem on fathead minnows across dissolved oxygen gradients. *Environmental Toxicology and Chemistry 37 (11), 2835-2850.*

Saari, Gavin N.; Wang, Zhen; **Brooks, Bryan W**. Revisiting inland hypoxia: diverse exceedances of dissolved oxygen thresholds for freshwater aquatic life. *Environmental Science and Pollution, 25(4), 3139-3150.*

Liu, Jing; Dhungana, Birendra; **Cobb, George P**. (2018). Copper oxide nanoparticles and arsenic interact to alter seedling growth of rice (*Oryza sativa japonica*). *Chemosphere, 206, 330-337* .

Liu, Jing; Dhungana, Birendra; **Cobb, George P.** (2018). Environmental Behavior, Potential Phytotoxicity, and Accumulation of Copper Oxide Nanoparticles and Arsenic in Rice Plants. *Environmental Toxicology and Chemistry, 37(1), 11-20.*

Sayes, Christie; Sharma, Virender (2018). Impact of advanced materials on the formation and toxicity of disinfection byproducts during drinking water chlorination. *Abstracts of Papers of the American Chemical Society 255.*

Watkins, Preston S.; Castellon, Benjamin T.; Tseng, Chiyen; **Matson, Cole W**; **Cobb, George P**. (2018). Validation of a Sulfuric Acid Digestion Method for Inductively Coupled Plasma Mass Spectrometry Quantification of TiO2 Nanoparticles. *Bulletin of Environmental Contamination and Toxicology, 100(6), 809-814.*

Colman, Benjamin P.; Baker, Leanne F.; King, Ryan S.; **Matson, Cole W;** et al. (2018). Dosing, Not the Dose: Comparing Chronic and Pulsed Silver Nanoparticle Exposures. *Environmental Science and Technology, 52(17), 10048-10056.*

Al-Naiema, Ibrahim M.; Yoon, Subin; Wang, Yu-Qin; **Sheesley, Rebecca J**; et al. (2018). Source apportionment of fine particulate matter organic carbon in Shenzhen, China by chemical mass balance and radiocarbon methods. *Environmental Pollution, 250, 34-43.*

GRANTS AWARDED TO OUTSTANDING PROFESSORS IN RESEARCH

External Grants

Dr. Bryan Brooks (2018) $164,211 The Interactions of Climate Change on Oceans & Human Health: Assessment of Risks Associated with Climate Change on Infectious disease, Harmful Algal Blooms & contaminants of Emerging Concern & Development of Predictive Models, Forecasts& Tools Designed to Protect Human & Environmental Health; University of South Carolina/NIH

Dr. Bryan Brooks (2018) $10,000; Comparative Aquatic Toxicology of Fish Models. Proctor & Gamble

Dr. Bryan Brooks (2018) $50,000; Understanding Needs, Challenges, Opportunities Vision and Emerging Roles in Environmental Health; National Health Association/CDC

Dr. Ramon Lavado & Dr. Bryan Brooks (2018) $199,976; Identifying Spatially-explicit Profiles of Endocrine Disruption Activity during Low Flows in East Canyon Creek, Utah; Carollo Engineers

Dr. Cole Matson (2018); Environmental Science; $86,321; A comprehensive photochemical vulnerability index for improved decision-making and marine biodiversity risk assessment in the Gulf of Mexico Large Marine Ecosystem; Arizona State University – Gulf of Mexico Research.

Dr. Cole Matson (2018); Environmental Science; $87,722 (additional funds); A comprehensive petrochemical vulnerability index for improved decision-making and marine biodiversity risk assessment in the Gulf of Mexico Large Marine Ecosystem; Arizona State University – Gulf of Mexico Research.

Dr. Christie Sayes (2018) $42,204 (additional funds); Comprehensive Nanocellulose Physicochemical Characterization of Nanocellulose Materials; Vireo Advisors – LLC

Dr. Christie Sayes (2018) $81,829; Proof-of-Concept Testing of Pesticide Encapsulated Nanoparticles; US Department of Agriculture.

Dr. Rebecca Sheesley (2018) $15,732 (additional funds); Analysis of San Antonio Field Study 2-17 Monitoring Data; University of Houston

Dr. Rebecca Sheesley & Dr. Sascha Usenko (2018) $98,087; Detecting Events and Seasonal Trends in Biomass Burning Plumes using Black and Brown Carbon: pilot study in El Paso, TX; AQRP

Internal Grants

Dr. Trey Brown (2018) $1,500; Childhood Lead (Pb) Exposure: An Examination of the Geospatial Distribution of Environmental Soil Pb in Two Urban Areas; University Research Committee – Baylor University

Dr. Ramon Lavado (2018) $24,637; A Novel Cell-Based Metabolomics Approach for Assessing the Potential Toxicity of Seafood. Young Investigator Development Program – Baylor University

Dr. Christie Sayes (2018) $6,750; Impact of Advanced Materials on the Formation and Toxicity of Disinfection Byproducts during Drinking Water Chlorination; Undergraduate Research Committee – Baylor University

Dr. Rebecca Sheesley (2018) $5,000; Establishing a Methylation Method to Quantify Organic Acids in Arctic Aerosol; Undergraduate Research & Scholarly Achievement (URSA); Baylor University

SPRING 2019 SEMINAR SCHEDULE

Date	Speaker	Affiliation	Topic
January 23	John Giesy	University of Saskatchewan	Environmental Forensics
January 30	Christie Sayes	Baylor University	Nanotoxicology
February 13	Bob Kane	Baylor University	Synthesis of bioactive small-molecules designed with specialized delivery strategies
February 20	Karen Vasquez	University of Texas at Austin	Genome instability, DNA damage, and mechanisms of repair
February 27	Jing Liu	Baylor University	Environmental behavior & accumulation of NPs and Ar in plants
March 27	Evan Braswell	USDA	Vector-Borne Diseases in the State of Texas
April 10	LTC Stephen E. Cassle	Chief of Food Protection Branch, Fort Sam Houston	Food Protection
April 11	Jillian Goldfarb	Cornell	TBA
April 17	Jeremy L. Conkle	Department of Physical and Environmental Sciences, Texas A&M University—Corpus Christi	SETAC
April 24	Amie Lund	University of North Texas	Cardiovascular Toxicology
May 1	Khara Grieger	RTI International	Risk Governance

Distinguished Professor and Director of the Environmental Health Science Program Dr. Bryan Brooks will receive the Recipharm International Environmental Award at a ceremony in Sweden for his achievements in the environmental field. Congratulations on your hard work Dr. Brooks!

HIGHLIGHTS FOR THE NEXT ISSUE:

- TEHA
- Faculty Spotlight
- SOT
- National Meeting Update
- BU SETAC Update
- Regional SETAC Meeting at Baylor
- Welcome Newest Faculty Member: Dr. Ryan McManamay

AS A REMINDER: The Environmental Science Department produces a newsletter each semester. If you are an Environmental Science student, working on a project, serving an internship, studying abroad, graduating or have some exciting news and want to share an article or picture, send an email to:

Heather Guenat at Heather_Guenat@Baylor.edu

For the latest in ENV news, seminar announcements, and more, join our Facebook group:

Baylor Environmental Science