

## NEW AWARD RECOGNIZES BAYLOR ARTS & SCIENCES FACULTY WHO EXCEL AS STUDENT MENTORS

Randy Fielder

**D**r. Susan P. Bratton, professor of environmental science, is the inaugural recipient of a new award presented to faculty members in the College of Arts & Sciences who excel at helping undergraduate students expand their knowledge through learning outside the classroom.

The new Elizabeth Vardaman Award for Excellence in Mentoring Undergraduates will be presented annually to Arts & Sciences faculty who guide students through research projects and other engaged learning activities that supplement traditional classroom instruction.

Bratton is the lone faculty member to receive the award during the current academic year. Starting with the 2019-2020 academic year, the College will award seven “Betsy’s” each year to Arts & Sciences faculty members — three to faculty in STEM (Science, Technology, Engineering and Mathematics) fields, three to faculty in the humanities and social sciences, and a seventh award open to faculty from all fields.

Both tenured and non-tenure track faculty are eligible for the awards of \$1,500 each. Nominations will be solicited from Baylor faculty, department chairs and students, and a faculty committee within the College of Arts & Sciences will choose each year’s winners. Faculty are eligible to receive the award multiple times during their career.

Bratton was chosen to receive the first Vardaman Award because of her long record of mentoring students.

“Dr. Bratton started URSA (Baylor’s Undergraduate Research and Scholarly Achievement initiative) in 2007 and served until last year as its director. Not only that, she has personally directed many undergraduate research projects over the years.

Bratton said that she is honored to receive the first Elizabeth Vardaman Award.

“This award is a sign of advancement in Baylor’s already very competitive undergraduate education programs,” Bratton said. “It concerns educator-student relationships that treat students as individuals, and addresses their educational needs directly.”

Bratton believes that the mentoring of undergraduates by faculty members can play an important role in students’ development and future success.

“Mentoring forwards imagination and planning, and it encourages students to take more control of their futures,” she said. “It’s not just about increasing their skills — a good mentor helps a student to develop self-confidence, form cooperative relationships with colleagues and explore paths to employment. A good mentor makes a major contribution to a student’s academic and professional future.”



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# HYBRIDIZATION LEADS TO POLLUTION TOLERANCE IN FISH FROM HEAVILY POLLUTED HOUSTON SHIP CHANNEL

*Baylor Media May 2, 2019*

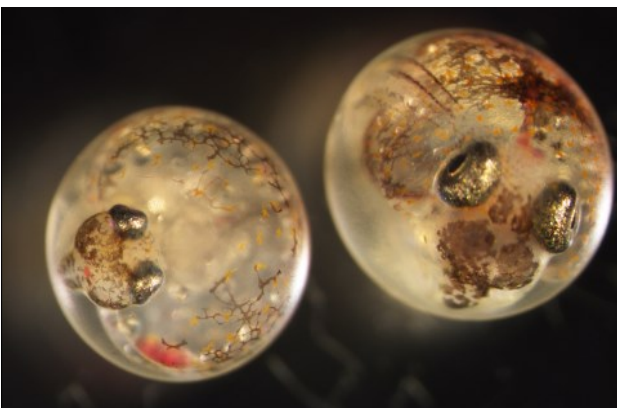


Dr. Cole Matson with Gulf killifish from Galveston Bay, Texas, in tank (Photo by Matthew Minard/Baylor Photography)

**R**ecent hybridization of the Gulf killifish — a large minnow common in the heavily polluted Houston Ship Channel — has enabled the species to adapt rapidly to extreme pollution, a Baylor University study has found.

“Our work demonstrates that hybridization can act as a mechanism of evolutionary rescue — likely not only in response to chemical pollution, but possibly also in response to the rapid environmental changes associated with global climate change,” said senior author Cole Matson, Ph.D., associate professor of environmental science and a member of the Center for Reservoir and Aquatic Systems Research (CRASR) at Baylor University.

The study — “Adaptive introgression enables evolutionary rescue from extreme environmental pollution” — is published in *Science*, a peer-reviewed journal of the American Association for the Advancement of Science.



Five-day-old Gulf killifish embryos from two different populations in Galveston Bay, following exposure to environmental pollutant. The heart in the one on the left, from a reference site, has failed to properly develop, which has dramatically reduced its growth and ultimately will prove fatal. Meanwhile, the one on the right — from the pollution-tolerant population in the Houston Ship Channel — is developing normally in spite of chemical exposure. (Photo by Cole Matson/Haley Davis)

The Gulf killifish, a common inhabitant of coastal estuaries along the northern Gulf of Mexico and the Florida Atlantic coast, is important both ecologically and economically. It is a preferred prey item of many coastal sport fish, including speckled trout, red drum and flounder.

The Houston Ship Channel is heavily polluted from more than 60 years of industrial activity, according to the study. This pollution has led to fish consumption advisories being issued by the Texas Department of State Health Services, with Gulf killifish representing an important link for environmental pollution to pass from contaminated sediments and macroinvertebrates into popular game fish, which are then consumed by humans.

The substantial industrial pollution in the Houston Ship Channel has long posed a significant challenge to local fish populations, fueling the need for adaptation.



Causes for those changes could range from chemical or oil spills to altered salinity to shifting temperatures. In the past, species generally have been able to evolve over centuries, millennia, or even longer, to survive such changes. But now they may need to evolve in decades instead to survive.

“This accelerated pace relies more heavily on existing genetic variation or connectivity to other populations, as beneficial genetic mutation is quite rare,” Matson said.

In events of extreme change, “natural populations rely on genetic variation to allow them to rapidly adapt,” said author Elias Oziolor, Ph.D., (Biomedical Studies) ’17, a senior scientist at Pfizer who conducted much of the study as part of his dissertation research at Baylor University. “The huge population sizes of Gulf killifish allow them to retain a large amount of genetic variation.”

However, “under radical pollution pressure, the ultimate solution was not their own genetic variation, but variation they were lucky enough to capture from their sister species, the Atlantic killifish, through hybridization.”

For the study, Gulf killifish were sampled from 12 sites in the Houston Ship Channel and Galveston Bay with varying pollution levels. These fish were then cultured in Baylor aquaculture facilities, including the collection of embryos to test for pollution tolerance. This was done by exposing embryos from each of the populations to model pollutants that act through toxicity pathways similar to many chemicals in the Houston Ship Channel.

The two genomic regions under the strongest selection traced back to Atlantic killifish, rather than Gulf killifish — a result of recent hybridization believed to have occurred as a result of human activity, possibly in ballast water from a large ship.

“Although Gulf killifish have adapted to prevent the cardiac deformities expected within the polluted Houston Ship Channel, the impact on other resident fish species is unclear and an area of future research,” Matson said. “We are also very interested in how Gulf killifish from other polluted regions have responded to pollution.

“We are not suggesting that hybridization will commonly provide a solution to environmental challenges,” he said. “In fact, the limited duration of this hybridization event, and the very strong selective advantage of killifish with these specific gene variants, provided a rare set of circumstances allowing for adaptive introgression without any evidence of the harmful genetic baggage one might expect as a result of hybridization.”

More research will be required to understand the relative importance of the various mechanisms of evolutionary rescue in the face of rapid environmental change, Matson said.

“Hybridization is not likely to be a commonly utilized mechanism of evolutionary rescue,” he said.

“But this study clearly shows that it is possible.”



Baylor University environmental scientist Cole Matson casts a net in Galveston Bay, Texas, during a Gulf killifish collection trip. (Photo by Leanne Baker)

# ENVIRONMENTAL LAW TRAVELS TO CANADA

By Lauren Patterson



Pictured (front row, l to r) Tommy Watson, Haley Davis, Lauren Patterson, (back row l to r) Professor Julie King, Evan Armstrong, Tyler Rutherford, Taylor Le Moal, Mariah Rose, Sophia Wu

A once in a lifetime opportunity was given to twelve students in Ms. King's Environmental Law class to travel to Vancouver and Victoria, Canada in the Spring of 2019. Vancouver was cold, pristine and still yet beautiful. She had tall buildings with green vines growing on the sides and on top of the roofs. Vancouver provided a majestic view of the water and the mountains. She was a breath-taking view with much history. The city of Victoria was also filled with beautiful views of the coast, water and bald eagles soaring in the sky that one could see from the ferry.

One of their first stops was to the West Coast Environmental Law office. The West Coast Environmental Law firm focuses on informing and shaping environmental decision-making and protecting the environment through the law. They additionally work on linking together the Indigenous people and Canadian law.



Haley Davis at the Capilano Suspension Bridge in North Vancouver, BC

Students also visited the Capilano River Hatchery, where they got to witness Salmon runs dumping nutrients back into the river. Due to the construction of a dam on the Capilano River, and it's effects on the salmon population, the Capilano River Hatchery was opened in 1971. The Capilano River Hatchery works to help increase the population of coho, steelhead and chinook salmon. The hatchery is working to help create a self-sustainable system. Due to the dam, the Capilano River Hatchery built a fish ladder. Depending on the season, visitors can see mature salmon returning home to spawn. The salmon climb the fish ladder by jumping from one pool to the next.

During their tour, the class was able to see the breeding males and females of the coho salmon and were able to see the growth stages of the salmon from the eggs to adult. There are different housing areas for different age groups of the salmon. As a class, they learned how workers fertilize the salmon eggs.



British Columbia Parliament building in Victoria, BC

One of the classes favorite stops on the trip was the British Columbia Parliament building. Its beauty was not contained to outside but opened up within the hallways and rooms indoors as well. The British Columbia Parliament building preserves historical knowledge about Canada and provides great insight to Canada's past. The British Columbia Parliament buildings are home to the Legislative Assembly of British Columbia. The class had the pleasure of viewing the legislative chamber inside the Parliament building. The Parliament has intricate designs on the walls, drawing everyone's eyes upward to the magnificent stained-glass windows and small silver flowers that outlined the top of the beams.



Orca whale spy hopping during the whale watching expedition.

Another class favorite along the trip was a whale watching expedition. Students and faculty alike loved seeing the orcas play freely in the waters. Baylor students had the opportunity to see the orcas breach, put their flukes up in the air and even slap their flukes on the water as the whales happily played in the cold waters. Bald Eagles were visible on the boat, flying by and sitting on the coast line. Being able to see these animals out in the wild was "breathtaking and inspiring."

The trip to Vancouver and Victoria, Canada was an amazing experience that twelve students in Dr. King's Environmental Law class were all able to share. From this experience students gained knowledge, friendships and memories that will last a lifetime.



# BAYLOR PROUD

## CONGRATULATIONS SPRING 2019 GRADUATES

### Undergraduate Students

#### B.A. Environmental Studies

Jessica Bateman,  
Clark Coneby  
James Harrell  
Saskia Henery  
Benjamin Kraus  
Zoe Laskoskie  
Kayla Marquez  
Madison Ohler  
Hope Schroeder  
Tonya Torabi

#### B.Sc. Environmental Science

Erika Barron  
Brian Burbidge  
Natalie Hernandez  
Charles Schaub  
Emma Villarreal  
Thomas Watson

#### B.Sc. Environmental Health Science

Hali Hoglund  
Dora Lopez  
Irkan Notta  
Quinn Otte  
Shanthi Tanga  
Laila Mccutcheon  
Vivian Tran  
Jahsarah Williamson

### Graduate Students

Grace Sutherland: M.S. Environmental Science

Jing Liu: PhD. Environmental Science

Baylor Steele: PhD. Biomedical Studies

Casan Scott: PhD. Environmental Science

## ALUMNI UPDATES: WHERE ARE THEY NOW?

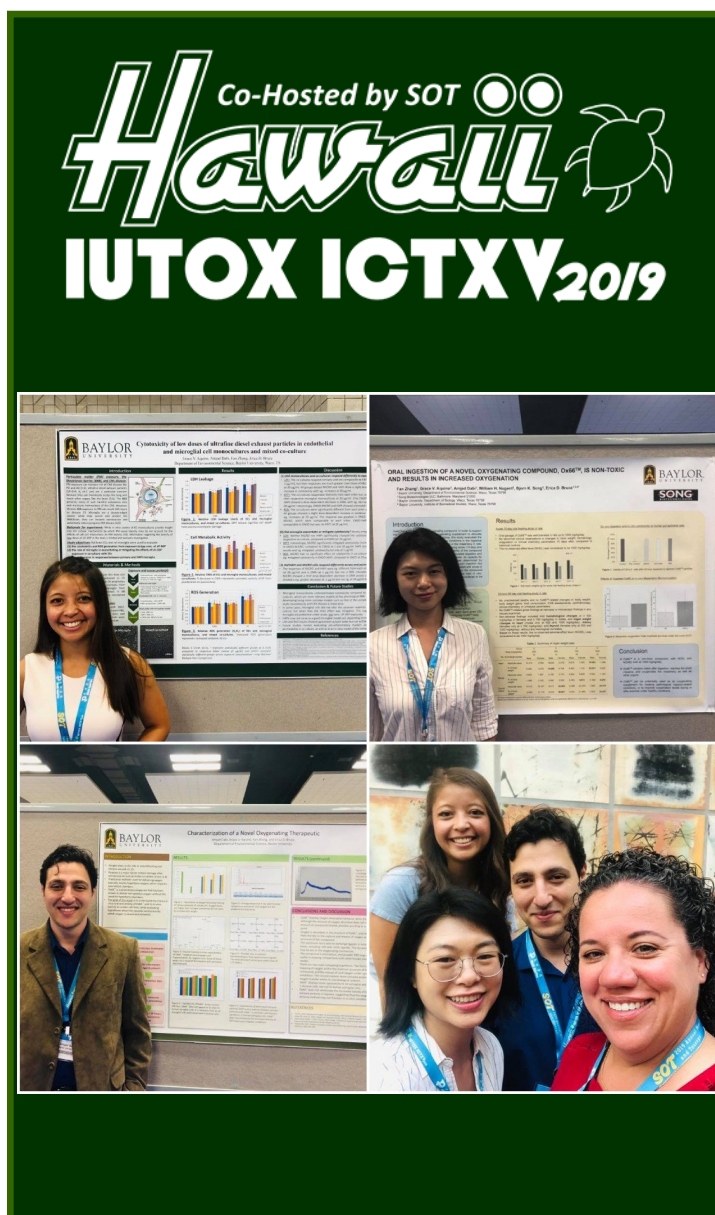
Susan Stradley (B.A. ENV Studies, Class of 2016): Susan has recently graduated from The University of Texas Law School and will be starting a federal clerkship for a judge in Tyler, TX. Way to go Susan!

Sam Ballard (B.A. ENV Studies, Class of 2014): Sam has recently graduated Texas Tech Law School and has started a job as an Environmental Law Associate with the firm, Lloyd Gosselink, in Austin, TX. Keep up the great work Sam!

Justin McClain (B.S. ENV Science, Class of 2016): Justin has recently been accepted into the Air Force pilot training program. He begins Officer Training School this July. Great job Justin!

## PHD STUDENT WINS 1ST PLACE INTERNATIONAL AWARD

The Bruce Lab attended the International Union of Toxicology 15th International Congress of Toxicology (ICTXV) in Honolulu, Hawaii in July 2019. All of Dr. Bruce's Ph.D students and her post-doctoral associate, Dr. Fan Zhang, presented at the meeting. One of Dr. Bruce's Ph.D. students, Grace Aquino, received the International Congress of Toxicology IUTOX Trainee Award for Best Poster Presentation for her poster entitled, "Cytotoxicity of Low Doses of Ultrafine Diesel Exhaust Particles in Endothelial and Microglial Cell Monocultures and Mixed Co-Cultures". Grace was presented with a \$500 award and a certificate plaque to commemorate her award. Grace's work focuses on the cellular components of the blood brain barrier and how particles move across the barrier affecting integrity of the barrier and ultimately influencing or inducing neurological disease states.



## WELCOME NEW FACULTY MEMBERS: DR. BENJAMIN J. RYAN AND DR. RYAN MCMANAMAY

Dr. Ryan joined the Environmental Science faculty in August 2019. His work and research relates to environmental health science, communicable and noncommunicable diseases, humanitarian assistance and disaster risk reduction. Dr. Ryan has led workshops, training, lectures, research and operational activities in these fields across the Indo-Pacific, Europe and North America.

His field experience includes responses to natural disasters and disease outbreaks, mass casualty incidents, failures of critical business functions, leading health sector preparations for the G20 Finance Ministers meetings held in Australia, managing projects in Indigenous communities and facilitating delivery of health services to asylum seekers. He has worked at local, state and federal levels of government in Australia and for the Department of Defense in the United States. Dr. Ryan has published numerous peer-reviewed articles, guidelines, contributed to books and conducted media interviews relating to environmental health science and disaster risk reduction.



Also in August, Dr. Ryan McManamay joined the faculty within the Department of Environmental Sciences. Previously, he was a research scientist at Oak Ridge National Laboratory for 6 years. Ryan is a spatial ecologist that studies large-scale impacts of humans on natural landscapes, particularly the impacts of dams on rivers. His research also evaluates natural and human-induced patterns in biodiversity, spans a number of scales, and includes both field and modeling analysis at ecosystem, community, and population levels. One of his specific interests is how to design sustainable future cities, specifically with respect to changes to land cover, shifts in regional to global water budgets, and changes in biodiversity.

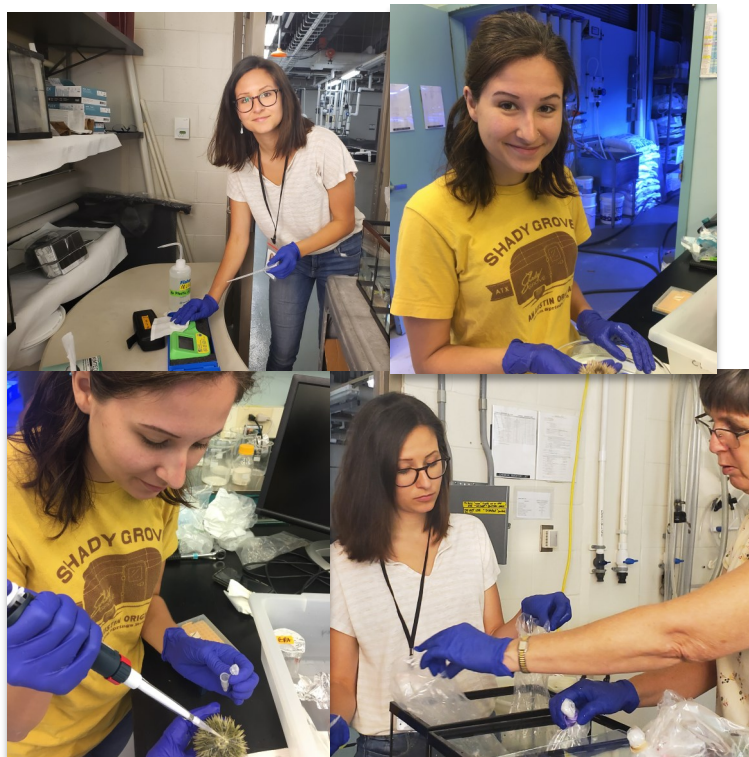
He is a member of the American Geophysical Union and the American Fisheries Society and serves as an Associate Editor of Transactions of the American Fisheries.

He has authored over 50 peer-reviewed journal articles and book chapters. He received his Ph.D. in Fisheries and Wildlife and his M.S. in Biological Sciences, both from Virginia Tech. He earned his B.S. in Biological Sciences from Clemson.

## STUDENT INTERSHIP LEADS TO AN UNFORGETTABLE EXPERIENCE

This Summer one of our students, Haley Davis, interned at "the National Oceanic and Atmospheric Administration (NOAA) at the Hollings Marine Laboratory with Dr. Cheryl Woodley in Charleston, South Carolina to better understand the way human activities impact our environment.

More specifically, she studied the ways in which certain agricultural pesticides – after being washed into our waterways - affect important coral reef ecosystems. This was all a part of the NOAA Hollings Scholarship/ Internship program which Haley applied to as a Sophomore at Baylor; the program has provided an incredible opportunity for her to work with a government agency in an effort to better protect our coastal communities which are an invaluable resource for humanity. "My internship experience this summer gave me new lab skills, a better sense of direction for my future, important connections, and many unforgettable adventures!", Haley said.





## BAYLOR ENVIRONMENTAL HEALTH SCIENCE PROFESSOR WINS INTERNATIONAL ENVIRONMENTAL AWARD

WACO, Texas (March 20, 2019) Baylor University Media and Public Relations

**B**ryan W. Brooks, Ph.D., Distinguished Professor of Environmental Science and Biomedical Studies in Baylor's College of Arts & Sciences, received international recognition for his contributions and scholarly research on environmental sustainability.

Recipharm, a contract development and manufacturing organization in the pharmaceutical industry, named Brooks as its 2018 International Environmental Award recipient.

"I am humbled and honored to receive this award from Recipharm, which I warmly accept on behalf of our current and former students," Brooks said. "I am grateful for support from Baylor University, my longtime collaborators Dr. Kevin Chambliss and Dr. Duane Huggett, and other close colleagues with whom we are engaging research on six continents."

The International Environmental Award recognizes the best environmental practice or innovation within the pharmacy and healthcare industries or academia.

"We are delighted to present the 2018 award to Bryan Brooks. His work, which explores the potential effects and risks of contaminants, including pharmaceuticals, on the environment is widely recognized in our industry and beyond," said Lars Backsell, chairman of the board of Recipharm. "This research will help to build a greater understanding of the impact of certain contaminants on the environment and could potentially provide invaluable guidance on how to reduce any negative effects."

Brooks' transdisciplinary research includes understanding and managing human activities and environmental stressors across levels of biological organization, particularly in rapidly urbanizing regions.

"More and more people are living in urban areas, which has contamination implications for water and food, and as a result, generates some complex health risks," Brooks said. "However, it also presents a number of opportunities to reduce waste and exposures, to increase resource recovery and to design less hazardous chemicals for the protection of public health and the environment."

His current research with students focuses on water quality and water reuse, comparative toxicology and pharmacology, sustainable molecular design, environmental public health and the ecology and toxicology of harmful algal blooms.

Brooks routinely works internationally on water quality, environmental contaminants and sustainability issues and is a frequent presenter at international meetings. In 2012, Brooks and Huggett published the book "Human Pharmaceuticals in the Environment: Current and Future Perspectives."



Bryan W. Brooks, Ph.D., Distinguished Professor of Environmental Science and Biomedical Studies in Baylor's College of Arts & Sciences.

Additionally, Brooks coordinates the strategic Global Horizon Scanning Project, which aims to identify priority research questions that will help achieve sustainable environmental quality around the world.

"Our research examines interfaces among environment and health with a goal of understanding and managing challenges that affect us all, so we're delighted to be acknowledged for our team's contributions," Brooks said.

Brooks' research efforts are supported by the National Institutes of Health, the National Science Foundation, Centers for Disease Control and Prevention, the U.S. Department of Agriculture and the U.S. Environmental Protection Agency, as well as local government and businesses.

Brooks received the Recipharm International Environment Award at a prize ceremony in Stockholm this past summer.



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# RECENT PUBLICATIONS



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

**Brooks, BW**, and Conkle, JL. (2019) Perspectives on Aquaculture, Urbanization and Water Quality. *Comparative Biochemistry and Physiology Part C: Toxicology and Pharmacology* 217 1-4.

**Brooks, BW**, and Conkle, JL. (2019) Perspectives on Aquaculture, Urbanization and Water Quality. *Comparative Biochemistry and Physiology Part C: Toxicology and Pharmacology* 217 1-4.

Wang, Z., Dinh, D., Scott, WC., Williams, ES., Ciarlo, M., DeLeo, P., and **Brooks, BW**. (2019) Critical review and probabilistic health hazard assessment of cleaning product ingredients in all-purpose cleaners, dish care products and laundry care products. *Environ. Int.* 25, 399-417.

McRae, NK., Gaw, S., **Brooks, BW**, Glover, CN. (2019) Oxidative stress in the galaxiid fish, *Galaxias maculatus*, exposed to binary waterborne mixtures of the pro-oxidant cadmium and the antioxidant diclofenac. *Environ Pollut* 247 638-646.

Wang, Z., **Brooks, BW**, Zeng, EY and You, J., (2019) Comparative mammalian hazards on neonicotinoid insecticides among exposure durations. *Environ. Int.* 25, 9-24.

Chung, S. and **Brooks, BW**, (2019) Identifying household pharmaceutical waste characteristics and population behaviors in one of the most densely populated global cities. *Resources, Conservation and Recycling* 140, 267-277.

Ondarza, PM., Haddad, SP., Avigliano, E., Miglioranza, KSB., **Brooks, BW**. (2019) Pharmaceuticals, illicit drugs and their metabolites in fish from Argentina: Implications for protected areas influenced by urbanization. *Sci Total Environ.* 649 1029-1037.

Scott, CW., Breed, CS., Haddad, SP., Burket, SR., Saari, GN., Pearce, PJ., Chambliss, CK., **Brooks, BW**. (2019) Spatial and temporal influence of onsite wastewater treatment systems, centralized effluent discharge, and tides on aquatic hazards of nutrients, indicator bacteria, and pharmaceuticals in a coastal bayou. *Sci Total Environ.* 650(1) 354-364.

Saari GN, Corrales J, Haddad SP, Chambliss CK, **Brooks BW**. (2018) Influence of diltiazem on fathead minnows across dissolved oxygen gradients. *Environmental Toxicology and Chemistry* 37: 2835-2850.

Kelly KR, **Brooks BW**. (2018) Global aquatic hazard assessment of ciprofloxacin: Exceedances of antibiotic resistance development and ecotoxicological thresholds. *Progress in Molecular Biology and Translational Science* 159: 59-77

Lyons K, Burket SR, **Brooks BW**. (2018) Sex may influence environmental diphenhydramine accumulation in Round Stingrays. *Marine Pollution Bulletin* 135: 648-653.

Saaristo M, Brodin T, Balshine S, Bertram MG, **Brooks BW**, 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: 20181297

Zhang, F, Aquino, G.V., Dabi, A., **Bruce, E.D.** (2018) Assessing the translocation of silver nanoparticles using an in vitro co-culture model of human airway barrier. *Toxicol In Vitro.* 56, 1-9.

Zhang, F, Aquino, G.V., Dabi, A., Nugent W.H., Song B.K., **Bruce E.D.** (2018) Oral ingestion of a novel oxygenating compound, ox66, is non-toxic and has the potential to increase oxygenation. *Food Chem Toxicol.* 125, 217-224.

Liu, J., Wolfe, K., Potter, PM., **Cobb, GP**. (2019) Distribution and Speciation of Copper and Arsenic in Rice Plants (*Oryza sativa japonica* 'Koshihikari') Treated with Copper Oxide Nanoparticles and Arsenic during a Life Cycle. *Environ. Sci. Technol.* 53:9 4988-4996

Liu, J., Simms, M., Song, S., King, R., **Cobb, G. P.** (2018). Physiological Effects of Copper Oxide Nanoparticles and Arsenic on the Growth and Life Cycle of Rice (*Oryza sativa japonica*). *Environmental Science and Technology*, 52(23), 13728-13737.



## RECENT PUBLICATIONS



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.

Ishmaeel, A., **Lavado, R.**, Smith, R. S., Eidson, J. L., Sawicki, I., Kirk, J. S., Bohannon, W. T., Koutakis, P. (2018). Effects of limb revascularization procedures on oxidative stress. *Journal of Surgical Research*. 232, 503-509.

Franco, M. E., Sutherland, G. E., **Lavado, R.** (2018). Xenobiotic metabolism in the fish hepatic cell lines Hepa-E1 and RTH-149, and the gill cell lines RTgill-W1 and G1B: Biomarkers of CYP450 activity and oxidative stress. *Comparative Biochemistry and Physiology. Part C: Toxicology & Pharmacology*, 206-207, 32-40.

Oziolor, E., Reid, NM., Yair, S., Lee., KM., Guberman VerPloeg, S., Bruns, P.C., Shaw, JR., Whitehead, A., and **Matson, CW.** (2019). Adaptive introgression enables evolutionary rescue from extreme environmental pollution. *Science* 364(6439) 455-457.

Oziolor, E., **Matson, C.** (2018). Adaptation in polluted waters: Lessons from killifish. *Chapter in: Development and Environment*. 355-375. Heidelberg: Springer.

Sharma, V., **Sayes, C.**, Guo, B., Pillai, S., Parsons, J. G., Wang, C., Yan, B., Ma, S. (2019). Interactions between silver nanoparticles and other metal nanoparticles under environmentally relevant conditions: A review. *Science of the Total Environment*, 653, 1042-51.

**Sayes, C.**, Hickey, A. J. (2019). Perspectives for Characterizing Drug Component of Theranostic Products Containing Nanomaterials. In: Rai P., Morris S. (eds) *Nanotheranostics for Cancer Applications. Bioanalysis (Advanced Materials, Methods, and Devices)*, vol 5. Springer, Cham

Stewart, M., Mulenon (George), M. M., Steele, L., **Sayes, C.** (2018). Differences Among Unique Nanoparticle Protein Corona Constructs: A Case Study Using Data Analytics and Multi-Variant Visualization to Describe Physicochemical Characteristics. *Applied Sciences*, 8(12) 2669.

**Sayes, C.**, Singal, M. (2018). Optimizing a Test Bed System to Assess Human Respiratory Safety after Exposure to Chemical and Particle Aerosolization. *Applied In Vitro Toxicology*, 4(2), 193-201.

Winiger, P., Barrett, T. E., **Sheesley, R. J.**, Huang, L., Sharma, S., Barrie, L. A., et. al. (2019). Source apportionment of circum-Arctic atmospheric black carbon from isotopes and modelling. *Science Advances*, 5(2), [eaau8052].

Wex, H., Huang, L., Zhang, W., Hung, H., Traversi, R., Becagli, S., **Sheesley, R.**, Moffett, C. E., Barrett, T. E., et. al. (2019). Annual variability of ice nucleating particle concentrations at different Arctic locations. *Atmospheric Chemistry and Physics Discussions*, 1-31.

Yoon, S., Fairley, D., Barrett, TE., **Sheesley, R.** (2018) Biomass and fossil fuel combustion contributions to elemental carbon across the San Francisco Bay Area. *Atmospheric Environment*, 195, 229-242.

Trumble, S., Norman, S. A., Crain, D. D., Mansouri, F., Winfield, Z. C., Sabin, R., Potter, C. W., Gabriele, C. M., **Usenko, S.** (2018). Baleen whale cortisol levels reveal a physiological response to 20th century whaling. *Nature Communications*, 9(1) 4587.

# 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



## FALL 2019 SEMINAR SCHEDULE

Date	Speaker	Affiliation	Topic
September 4	Beth Polidoro	Arizona State University	Environmental behavior and risk assessment of microplastics & other contaminants in American Samoa
September 11	Ben Ryan	Baylor University	Environment, health and disaster risk reduction
September 18	Ivan Castro-Arellano	Texas State University	Host Related ecological factors affecting Hantavirus prevalence from global to local scales
September 25	Matteo Minghetti	Oklahoma State University	Studies at the interface between the environment and organism
October 2	Nancy Denslow	University of Florida	Biological Responses to Produced Water
October 9	Ashleigh K. Acevedo	Pillsbury Lawyers	Navigating the Environmental Law and Science Interface
October 16	Jordan Crago	Texas Tech University	Predictive molecular level toxicity signatures based on non-targeted analysis and QSAR modeling: a case study of the Lubbock Canyon Lake System

### HIGHLIGHTS FOR THE NEXT ISSUE:

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

**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](mailto:Heather_Guenat@Baylor.edu)



For the latest in ENV news, seminar announcements,  
and more, join our Facebook group:  
[Baylor Environmental Science](#)