Volume 2

Spring 2012

ENV Notes

Department of Environmental Science, Baylor University

Special points of interest:

- Barrett Awarded Outstanding Graduate Student
- Dr. Cobb receives appointment with ACS CEI
- Baylor Environmental Science hosting SETAC conference at the Baylor Science Building
- Dr. Ted Valenti published a chapter of his dissertation and received media attention
- Dr. Williams receives attention on study of ingestion of house dust

Inside this issue:

Barrett Receives Outstanding Graduate Student Instructor Award for Fall 2011; Congratulations Tate!

Tate Barrett, a Master's student in Environmental Science, is working on his degree in regional and long range transport of black carbon, under the direction of Dr. Rebecca Sheesley, Assistant Professor in Environmental Science. Tate has been awarded an Outstanding Graduate Student Instructor Award for Fall 2011. This award is given to Baylor graduate students who serve as Teachers of Record and who are recognized for their outstanding teaching by students and faculty. "I was very surprised and honored when I heard about the award. All of the ENV TA's do a great job, and I want to thank Doug Nesmith for all of the hard work with the ENV labs," stated Barrett. He was the teacher of record for three Introduction to Environmental Analysis laboratory classes (ENV 1101). Barrett was selected by a committee of graduate faculty and graduate students as one of Baylor's outstanding teachers. This award is based on recommendations from our faculty, evaluations, students, and his teaching philosophy. Barrett and Doug Nesmith attended a dedicated luncheon on March 28. Barrett was recognized by the Graduate School and presented with his award.

Tate Barrett

Annual SETAC South-Central Regional Conference to be held at Baylor University

The 2012 South Central Regional Conference of the Society of Environmental Toxicology and Chemistry will be held May 31-June 2 at Baylor University. The conference will be hosted by the Department of Environmental Sciences, and held in the Baylor University Sciences Building. It will be co-chaired by our very own Dr. Matson and Dr. Usenko. We anticipate over 100 regional scientists from Texas, Oklahoma, and Louisiana to attend the conference. Student members attending the conference will have the opportunity to present their research findings, and to compete for travel support to attend the SETAC national conference in Long Beach, California. This conference provides an opportunity to introduce scientists across the region to Baylor University and Waco, Texas. You can visit www.baylor.edu/setac for more information.

Find us on Facebook

Join us on our Facebook group: Baylor Environmental Science, and keep up to date on current events happening in the department.

ENV student presentation recognized during Scholars Week

Congratulations to Ashleigh Myers; Dannie Dinh and Reyna Anderson. The poster titled "Impact of urban, natural and wilderness settings and three types of day hiking on perception of the natural environment" was independently judged and deemed to be a winner of the departmental award. The top students went on to the all campus display in the library for Baylor Undergrad Research in Science and Technology (BURST). Their poster was one of 3 from ENV to be displayed during Scholar's Week.

Jonescu, Brian; Stephanie Smith; Matthew Fisher; Alaina Hoey (S.P. Bratton, mentor), 2012, Day hiking in urban, natural, or wilderness settings: The type of hike versus the environment as determinants of hiker experience, Baylor University Scholars Week, March (poster).

Myers, Ashleigh; Dannie Dinh; Reyna Anderson (S.P. Bratton, mentor), 2012, Impact of urban, natural and wilderness settings and three types of day hiking on perception of the natural environment, Baylor University Scholars Week, March (poster).

URSA Steering committee and Bratton, S.P., 2012, Relative contributions of faculty, undergraduates, and graduate students to forming a community supportive of undergraduate research experience, Baylor University Scholars Week, March (poster).

Baylor exemplifies environmental academics

On March 12, 2012, Baylor University earned a spot in the Sustainable 16 just as the Baylor basketball teams began their March Madness, The Sustainable 16 is a group of colleges or universities that exemplify exellence in environmental academics. Enviance Inc. sponsored the first ever March Madness tournament in which schools highlighted their qualifications in such topics as curriculum, graduation rate, facilities and student retention. The "16" were selected to the tourney by expert judges. The Sustainable 16 were judged on their academics and sustainability strengths regarding the environment and the survey percentages. The Department of Environmental Studies was selected for the Sustainable 16 out of more than three dozen participating institutions. The Sustainable 16 was then narrowed to an Environmental Eight late March 2012 and ultimately a national champion. Baylor should be congratulated on their selection in the first 16.

ENV student taking shoes to Kenya in May

The Baylor Spiritual Life center is sending the Women's Leadership Team to Nairobi, Kenya in May 2012. This team will bring 125 pairs of new shoes to the St. Kizito Learning Center Orphanage. This team is made up of six students, and the team leader, Melanie Smith, International Student Relations Coordinator; and will be teaching leadership skills to women working in businesses, schools, and orphanages. Environmental Science minor and senior, Lauren Goff is the project coordinator. "I have seen pictures from last years visit of the St. Kizito orphanage, wanted to start a shoes project, and bring something that the children need and could use every day," said Lauren Goff.

The team will be documenting their donation of shoes for Buckner International and is working with Searsville Baptist Church on a expansion of the orphanage. "Each team member has brought their own project ideas to our group and made our team unique," Goff said.

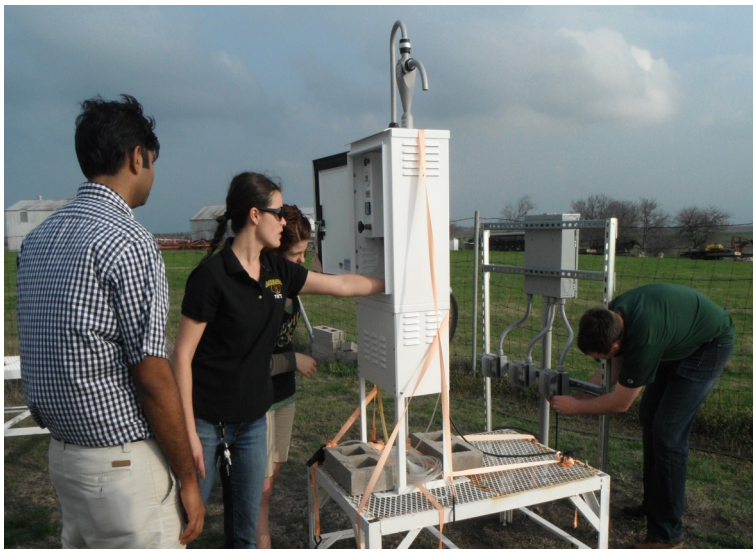
Dr. Cobb receives appointment as associate with ACS CEI

Dr. George Cobb accepted an appointment as an associate member of the Committee on Environmental Improvement (CEI). This is a joint committee reporting to the Council and the Board of Directors for the American Chemical Society (ACS). The mission of the Committee on Environmental Improvement is to promote the Society's and the publics' awareness and active concern for protecting and improving the quality of human health and environment. In order to achieve their goal, the committee is responsible for reporting to the ACS governing bodies on pertinent environmental issues in science, and public policy needing action by the Society.

New air and environmental monitoring station at USDA Research Farm in Central Texas

Above: Tate, Punith, Rebecca and Sascha at the precipitation sampler.

Baylor University and the USDA Agricultural Research Service have a history of collaboration at the Riesel Research Center and Farm. In early summer 2011, Dr. Sheesley and Dr. Usenko established an air monitoring site at the site. The site will be used to study air quality in Central Texas, including atmospheric particulate matter, organic contaminants, ozone, and sulfate concentrations in precipitation. Punith Dev Nallathamby and Tate Barrett, both Master's students in Dr. Sheesley's research group, have been collecting samples every 6th day since May 2011 for fine particulate mass, and black carbon concentrations. Tate has also conducted two sampling intensives in August 2011 and January 2012 to look in detail at the impact of local sources and regional urban emissions on air quality in Central Texas. Dr. Sheesley is also collaborating with the USDA to measure sulfate in rain at Riesel and to evaluate potential impacts of new local coal-fired power plants. The first project emerging from Riesel is a study of the concentration and optical properties of black carbon. Dr. Sheesley and Tate are collaborating with Dr. Anderson (Stockholm University), and the initial results will be presented at the European Geosciences Union General Assembly in April 2012.The air quality monitoring station will also be used to train undergraduate majors in field and laboratory techniques in air quality. By having a local station, students have the opportunity to learn about the local air quality conditions and chemistry.



Above: Punith, Rebecca, Victoria Nelson, Sascha setting up the PM 2.5 sampler.

Above: Punith Dev Nallathamby, Tate Barrett, Rebecca Sheesley, Sascha Usenko, Addie Clark with the PM2.5 sampler.

BREAKING NEWS: Student Scholarships/Internships, National Fellowships for students, SETAC regional and Europe coverage, department homecoming events, fundraising challenge, seminar updates, Dr. Usenko's Alaska research, our NSF sponsored conference in Argentina. This and more to come in Fall 2012 newsletter. Look for it in your e-mail inbox in October 2012.

Dr. Ted Valenti's doctoral research receives international media attention

Dr. Ted Valenti, a recent Ph.D. graduate student in Ecological, Earth and Environmental Sciences (mentored by Dr. Brooks) and former research and teaching assistant in ENV, published a chapter of his dissertation, which received international media attention. The story below appeared on ScienceDaily.com (http://www.sciencedaily.com/releases/2011/06/110628151641.htm). "*ScienceDaily (June 28, 2011)* — Some areas of the southern United States are suffering from the longest dry spell since 1887 and a new Baylor University study shows that could prove problematic for aquatic organisms.

The Baylor study found that drought conditions make some chemicals in the environment more toxic to fish and other aquatic life. Specifically, the study found that drought conditions exacerbate the magnitudes of the natural pH shifts in the water. "This is important," the researchers said, because some contaminants in the water, such as ammonia, are more toxic to aquatic life depending on the pH. Also, more than 75 percent of the essential drugs described by the World Health Organization and approximately one-third of modern pesticides have ionizable groups of compounds. These "weak base" compounds when dispersed in the environment can become more toxic to fish when surface pH levels are high. The findings appear online in the journal *Integrated Environmental Assessment and Management*. "The importance of this work is it shows that we may be underestimating or overestimating the adverse effects of some chemicals on fish," said study co-author Dr. Bryan Brooks, associate professor of environmental science and biomedical studies and director of environmental health science at Baylor. "How drought conditions, especially those influenced by climatic changes, impact fluctuations of the water's pH level is just now emerging as an area of concern in regards to making certain chemicals more toxic and more likely to accumulate in fish." The Baylor researchers took samples at different times over the course of two years at 23 streams across the southern U.S. and measured how ecosystem production and respiration, dissolved oxygen content, the amount of phosphorus and nitrogen, and pH changed over the course of a day. Valenti and co-workers found that in the year that was one of the driest on record, the fluctuations of the water's pH was extreme and coincided with increased toxicity to aquatic life. "Future water scarcity associated with global climate change and altered precipitation patterns may profoundly impact in-stream flows in semiarid regions, which have direct implications for water resource management," said study co-author Dr. Ted Valenti, a former Baylor doctoral student. "Predicting the cumulative effects of climatic variability on the risk of contaminants may require a significant shift in the environmental assessment and management approaches for freshwater systems." Co-authors of the study include Dr. Ryan King, associate professor of biology at Baylor, Jeff Back and Jason Taylor, both doctoral students at Baylor.

Congratulations on retirement Glenda Plemons

Glenda Plemons worked for Baylor University for over 24 years, and worked in the Environmental Science Department for 10 years. She recently retired from the Baylor Environmental Science Department to spend and enjoy more time with her family. The Environmental Science Department threw a going away party for Plemons to recognize her hard work and dedication to the Environmental Science Department. All Environmental Science Faculty, Staff, and graduate students attended the party to give Plemons a gift from the department, and enjoy refreshments together on her last day of work. "Retirement is great, and thank you for your part in my retirement party. It was a wonderful way to end my last day of work," "But the best keepsakes to have are the many memories of the great people at ENV," said Plemons.

"the many memories of the great people at ENV"

Dr. E. Spencer Williams study on ingestion of house dust receives significant attention

Dr. E. Spencer Williams

A Baylor-led study evaluating exposures to organic chemicals through incidental ingestion of house dust has received significant attention in the press. Dr. E. Spencer Williams, a research scientist associated with the Center for Reservoir and Aquatic Systems Research, recently published an article in *Environmental Pollution,* which examined the exposures of children to polycyclic aromatic hydrocarbons (PAHs) in house dust. Specifically, Dr. Williams used data from the US Geological Survey (USGS) on concentrations of PAHs in house dust from apartments that were adjacent to parking lots treated with coal tar-based sealing products. Previous studies from the USGS have demonstrated that the use of these products is associated with significantly higher concentrations of PAHs in nearby soils and settled house dust. Outlets to cover the study included the Miami Herald, Chicago Tribune, Boston Herald, and MSNBC.com. "Our studies of coal tar-based pavement sealants are continuing," Dr. Williams said. "Next, we're hoping to connect the dots between these exposures and what they may mean for human health through publishing a risk assessment." Williams previously presented the results of risk assessment at a meeting at the University of Connecticut last fall, as well as the SETAC annual meeting in Boston.

Dr. Bratton and Tom Conry receive regional coverage

Dr. Susan Bratton and Tom Conry; who is teaching as an adjunct for the Environmental Science Department, both wrote chapters for a planning summary for the Brazos and Bosque River corridor released by the Parks Department of the City of Waco. The document received regional newspaper and television coverage, including a feature article in the *Waco Tribune Herald*. Dr. Bratton provided an ecological perspective for reporters. The vision for the river corridor integrates business and recreational development, with protection of historic and ecological features, and improvement of water quality. The report is available in PDF form to interested members of the Baylor community, and to the general public on the City of Waco website.

Melissa Casserly at the terminus of the Appalachian Trails, in Georgia.

Marcus Keck on Sharp Top, Peaks of Otter, VA.

Source: Bratton, S.P., 2012, Section 2: the Ecology [of the Brazos and Bosque River corridor], pp. 21-30 and selected photographs in City of Waco, Parks and Recreation Department, National Park Service, Trails and Conservation Assistance Program, US Army Corps of Engineers, *For All Our Lifetimes: A Vision for the Brazos and Bosque Rivers – Waco, TX,* Waco,: City of Waco Parks and Recreation, 62

News from the Usenko Lab

By: Dr. Usenko

Above: Lissette Aguilar, Dr Usenko, Eleanor Robinson, Bikram Subedi, and Addie Clark.

Over this past year my laboratory has really begun to build momentum. My three graduate students Lissette Aguilar, Bikram Subedi, and Eleanor Robinson have made excellent progress this past year. I am also happy to announce that Addie Clark has also joined my laboratory, and will be measuring contaminants in atmospheric samples from Fort Worth, TX starting in Spring 2012. We are still busy with proposals, and set up our new research laboratory; however, this year my laboratory published three manuscripts and just submitted two more. We are also currently working on four additional manuscripts.

I am very proud of all three manuscripts published this past year; however, I am exceptionally proud of Bikram Subedi's first publication as lead author. Bikram's first manuscript was published in the *Journal of Chromatography A* titled "Simultaneous Analysis of Select Personal Care Products, Carbamazepine, and Diazepam in Fish Tissue Using Pressurized Liquid Extraction Combined with the Silica Gel Cleanup". This year I was also able to publish with my wife, Crystal Usenko for the first time. This is remarkably rare, and we relished the opportunity. With our co-authors, Dr. Erica Bruce, Eleanor Robinson, and Dr. Bryan Brooks, we examined rates of uptake for different flame retardants and their major metabolites using Zebrafish. This manuscript was Eleanor Robinson's first manuscript. I am very pleased to publish with my wife, and I am happy to announce that we are working on a second publication together.

This year graduate students and post-doctoral scientist Dr. Olga Furman presented their research at regional, national, and international scientific conferences including: Italy, Mexico, Denver, and Boston. I believe that these conferences are important for students, our laboratory, and Baylor University and offer a unique learning/growing opportunity. Bikram Subedi and Lissette Aguilar won 2nd and 3rd place, respectively, in the Best Oral Presentation competition at the regional SETAC conference. Three of my four graduate students presented at this year's national Society of Environmental Toxicology and Chemistry conference held in Boston, MA. In Boston, Bikram Subedi won 2nd place in the Best Oral Presentation and Eleanor Robinson was ranked 2nd in the Minority Student Travel Award. Eleanor Robinson also won a very coveted American Chemical Society-Division of Environmental Chemistry Student Research Award this year. Bikram Subedi, Eleanor Robinson, and Lissette Aguilar also all won Minority Student Travel Awards to help support travel to Boston. My laboratory received ~$2,600.00 in non-institutional travel support to Boston, MA from the regional SETAC Presentation Awards, and the Minority Student Travel Awards.

This year a group of scientists from Rice University, University of Houston, University of New Hampshire, University of Michigan, and NCAR (National Center for Atmospheric Research) was funded by TCEQ to run a temporary, ground-based air sampling supersite. This large-scale, multi-university field campaign was established to investigate and characterize the level of atmospheric oxidants, volatile organic carbon, nitrogen oxides, and organic particulate matter to study the high ozone near the Dallas/Fort Worth area. Dr. Rebecca Sheesley and I were invited to participate in this major Texas air quality field campaign. My laboratory sampled for semi-volatile organic compounds in both the gas and particulate phase, using a high-volume air sampler. Our goal is that Addie Clark with internal funding from Baylor's University Research Committee will be able to analyze our samples by June of next year.

Finally, I am ecstatic to announce that Dr. Trumble, from the Department of Biology and I received funding from the Marine Mammal Commission to analyze whale earwax plugs for contaminants and stress hormones. Prelimary data using in the funded proposal received great attention at two national conference this year. Currently, Eleanor Robinson is working on a publication that examines contaminant profiles in an earwax plug from a 72 foot Blue Whale.

Recent Publications

November 2011-April 2012 Publications (* denotes Baylor student coauthor)

Jacobsen NW*, **Brooks BW**, Halling-Sørensen B. 2012. Suggesting a testing strategy for possible endocrine effects of drug metabolites. *Regulatory Toxicology and Pharmacology* 62: 441-448.

Valenti TV*, Gould GG, Berninger JP*, Connors KA*, Keele NB, Prosser KN*, **Brooks BW**. 2012. Human therapeutic plasma levels of the selective serotonin reuptake inhibitor (SSRI) sertraline decrease serotonin reuptake transporter binding and shelter seeking behavior in adult male fathead minnows. *Environmental Science and Technology* 46: 2427-2435.

Grover JP, Roelke DL, **Brooks BW**. 2012. Modeling of plankton community dynamics characterized by algal toxicity and allelopathy: A focus on historical *Prymnesium parvum* blooms in a Texas reservoir. *Ecological Modeling* 227: 147– 161.

Forbes MG, Doyle RD, Scott JT*, Stanley JK*, Huang H*, Fulton BA*, **Brooks BW**. 2012. Carbon sink to source: Longitudinal gradients of planktonic P:R ratios in subtropical reservoirs. *Biogeochemistry* 107: 81-93.

Bikram Subedi* and **Sascha Usenko**, 2012. Enhanced pressurized liquid extraction technique capable of analyzing polychlorodibenzo-p-dioxins, polychlorodibenzofurans, and polychlorobiphenyls in fish tissue. *Journal of Chromatography A*. 1238: 30-37

Subedi, B.*, Mottaleb, M.A., Chambliss, C.K., **Usenko, S**. 2011. Simultaneous Analysis of Select Personal Care Products, Carbamazepine, and Diazepam in Fish Tissue Using Pressurized Liquid Extraction Combined with Silica Gel Cleanup. *Journal of Chromatography A.* 1218 (37): 6278-6284

Genualdi, S. A.; Hageman, K. J.; Ackerman, L. K.; **Usenko, S.**; Simonich, S. L. M. 2011. Sources and Fate of Chiral Organochlorine Pesticides in Western Us National Park Ecosystems *Environmental Toxicology and Chemistry*, *30*: 1533-1538.

Usenko, C. Y.*; Robinson, E. M.*; **Usenko, S.; Brooks, B. W.**; **Bruce, E. D**. 2011. PBDE Developmental Effects on Embryonic Zebrafish. *Environmental Toxicology and Chemistry*, *30*: 1865-1872.

Usenko, C.Y.*; Hopkins, D.C.*; Trumble, S.J.; **Bruce, E.D**. 2012. Hydroxylated PBDEs induce developmental arrest in zebrafish. *Toxicology and Applied Pharmacology, available online 21 April 2012, http://dx.doi.org/10.1016/j.taap.2012.04.017.*

Zhang J, **Cobb GP**. 2012. Effect of Titanium Dioxide Nanomaterials and Ultraviolet Light Coexposure on African Clawed Frogs (Xenopus Laevis). *Environmental Toxicology and Chemistry.* 31(1): 176-183.

Scollon EJ, Carr JA, Rintoul DR, McMurry ST, **Cobb GP**. 2012. Metabolism and distribution of p,p'-DDT during flight of the white-crowned sparrow, Zonotrichia leucophrys. *Environmental Toxicology and Chemistry.* 31(2): 336-346.

McMurry ST, Jones LE, Smith PN, **Cobb GP**, Anderson TA, Lovern MB, Cox SB, Pan XP. 2012. Accumulation and effects of octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) exposure in the green anole (Anolis carolinensis). *Ecotoxicology.* 21(2): 304-14.

Wang J, Cai Q, Fang Y, Anderson TA, **Cobb GP.** 2011. Determination of Fullerenes (C60) in Artificial Sediments by Liquid Chromatography. *Talanta*. 87 :35-9.

Book and Book Chapters:
***Brooks BW**, Huggett DB (Eds). 2012. Human Pharmaceuticals in the Environment: Current and Future Perspectives. Springer, New York. ISBN 978-1-4614-3419-1.*

Book Chapters:
Brain RA, **Brooks BW**. 2012. Considerations and Criteria for the Incorporation of Mechanistic Sub-Lethal Endpoints into Environmental Risk Assessment for Biologically Active Compounds. In: Brooks BW, Huggett DB (Eds). *Human Pharmaceuticals in the Environment: Current and Future Perspectives*. Springer, New York.

Brooks BW, Berninger JP, Ramirez AJ, Huggett DB. 2012. Perspectives on Human Pharmaceuticals in the Environment. In: Brooks BW, Huggett DB (Eds). *Human Pharmaceuticals in the Environment: Current and Future Perspectives.* Springer, New York.

Williams, ES, Brooks BW. 2012. Human Health Risk Assessment of Pharmaceuticals in the Environment: Existing Practice, Uncertainty, and Future Directions. In: **Brooks BW**, Huggett DB (Eds). *Human Pharmaceuticals in the Environment: Current and Future Perspectives.* Springer, New York.