

# Biological Systems Engineering *Newsletter*

FALL 2016

## In this issue

Note from the  
Department Head..... 2

Department News..... 2

BSE Student News..... 4

BSE Faculty & Staff News..... 11

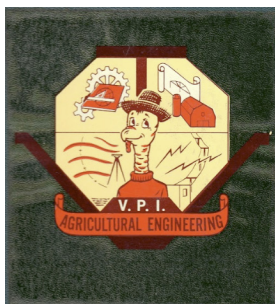
BSE Alumni News..... 14

## Big Milestones Ahead for BSE! Help Us Celebrate

Next Spring we will celebrate 80 years of Seitz Hall (cornerstone 1937), the on campus home of Biological Systems Engineering - and in 2020 we'll be celebrating 100 years as a degree granting department at Virginia Tech.

We're getting excited for these big milestones and want all our alumni and friends to help us begin the celebration now! Go to <http://vtbsehistory.weebly.com/photo-vote.html> and vote for your favorite historical photos from our 100 years. The top pictures will be used in a new Seitz lobby collage.

And if you have favorite pictures of your own, special reminiscences, or information about any of the historical photos we've posted, please contact BSE Professor Cully Hession at [chession@vt.edu](mailto:chession@vt.edu).



Departmental Logo Circa 1960s



## BSE Undergrads Invent the Future this Summer

Summer 2016 provided many opportunities for our undergraduates to complement their classroom experiences with hands-on experience through internships and undergraduate research programs. BSE students literally traveled around the globe this summer to invent the future, and the diversity of their experiences reflects the every-growing breadth and demand for engineers in our discipline.

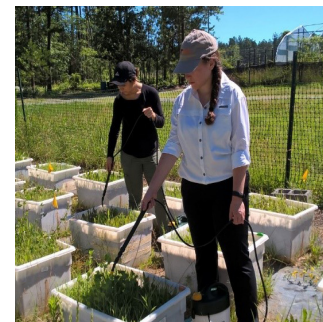
Some of our students spent their summers getting dirty in the field examining the ecology of linked human and natural systems. Junior **Taylor Duncan** spent her summer at the Middleburg Agricultural Research and Extension (MARE) Center in Middleburg, VA, where she quantified the impacts of rotational vs continuous grazing on pasture nutritional value, species diversity, and weed percentage. Meanwhile, junior **Alison Waldman** participated in the Environmental Implications of Nanotechnology Research Experience for Undergraduates (REU) program at Duke University in Durham, NC. Working on small mesocosms, she examined the fate and transport of copper nanoparticles found in fungicides through both terrestrial and wetland ecosystems. Senior **Jason Wilkinson** also traveled to North Carolina, interning with the Estuarine Ecology and Human Health Lab within UNC Coastal Studies Institute. Jason got his "sea legs" patrolling the Outer Banks coastline collecting population data for juvenile fish to determine the impacts of an emergency ferry channel.

Other students this year sought laboratory experiences in biomedical engineering throughout the United States. BSE seniors **Kevin Dennis** and **Bob Accolla** spent their summer as fellows in the University of Louisville's Micro/Nano Manufacturing REU, working on biomedical projects related to the 3D printing of orthopedics and skin scaffolds (for more on Kevin's GE Award related to his work, see p. 7). Sophomore

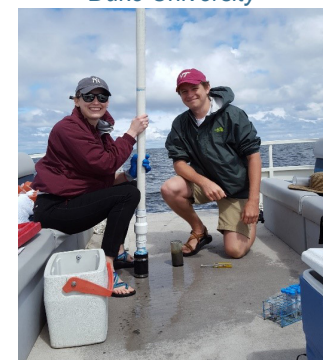
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Taylor Duncan and four-legged research assistant at the MARE Center



Alison Waldman treating wetland mesocosms at Duke University



Jason Wilkinson collecting fish samples off the coast of NC



**Mary Leigh Wolfe**  
*Professor and Department Head*

## Valued Contributors to BSE (6/1/16 - 10/31/16)

Thank you to all of our alumni, friends, and organizations who generously support the department through gifts and donations! Your contributions help the department enhance the educational experience of our students. You have given us the means to award scholarships to many students. We also use your contributions to help recruit outstanding graduate students and support student travel to conferences and to participate in special projects both domestically and internationally. Your contributions also support departmental activities that enhance the educational and work experience of BSE students, staff, and faculty. Please contact the department ([mclark5@vt.edu](mailto:mclark5@vt.edu) or [mlwolfe@vt.edu](mailto:mlwolfe@vt.edu)) if your name has been omitted from this list.

Theo Dillaha  
Charles Dyson  
Jeffrey Higgins  
Robert Pitman  
Donald Wells  
Eugene Yagow

Dear BSE Alumni and Friends,

As always at this time of year, I find myself looking back at the past year and looking forward to the new year and beyond. For the BSE department, looking back at 2016 finds a number of highlights, many of which you can read about in this newsletter (and in the spring 2016 newsletter).

A great opportunity for the BSE department to honor the past and look forward to the future is our upcoming 100<sup>th</sup> anniversary in 2020. We are starting to plan the Centennial Celebration, including celebrating the past and looking forward to the next 100 years. In addition to a major event in 2020, the Celebration will include activities leading up to 2020. We look forward to participation by alumni and friends. If you would like to help in planning the 100<sup>th</sup> anniversary celebration or have ideas, photos, or memories you would like to share, please let me know ([mlwolfe@vt.edu](mailto:mlwolfe@vt.edu); 540-230-6092). Additional details will be forthcoming.

As we start 2017, we wish the best to three faculty members as they embark on new adventures.

- **Conrad Heatwole** is retiring after 30 years in the department. I have had the privilege of knowing Conrad since we were both undergraduate students in the department. I have enjoyed working with him for the past 24 years; some great experiences with Conrad that I will always remember include working as collaborators on research projects, serving together on advisory committees for graduate students, and traveling to Brazil. Many alumni remember the great opportunities that Conrad provided to study or conduct research in South America or Africa. Congratulations to Conrad and best wishes to him for a long, healthy, and happy retirement!
- Beginning January 3, **Kumar Mallikarjunan**, professor, will be Head of the Food Science and Nutrition Department at the University of Minnesota. While this is a great opportunity for Kumar, I will miss him greatly as a colleague. He has been commended by his graduate students as an outstanding advisor. He provided great service to the department, college, and university, while conducting an outstanding research program. Congratulations to Kumar and best wishes for every success!
- **Warren Ruder**, assistant professor, is joining the Bioengineering Department at the University of Pittsburgh in January 2017. We are sorry to see Warren leave Virginia Tech and wish him the best.

During 2017, we look forward to hiring a new faculty member focused in watershed engineering, graduating a strong class of seniors, recruiting a strong class of graduate students to enter in fall 2017, and continuing to grow our undergraduate program. We also look forward to new accomplishments of our faculty, staff, alumni, and students and continued positive impacts of our research, extension, and teaching programs.

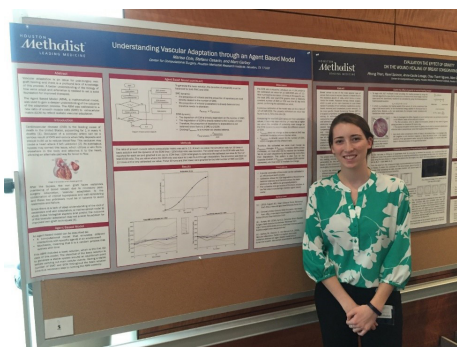
Best wishes for a great 2017!

*Mary Leigh Wolfe*



*Continued from front page*

**Nick Bohmann** also spent his summer thinking about and researching the design of engineered tissues at the Therapeutic Biomaterials Laboratory at the University of Rochester in Rochester, NY. Senior **Marisa Cole** spent her summer as an intern



*Marisa Cole presents her summer research at the Houston Methodist Hospital*

at The Houston Methodist Research Institute in TX, researching how vascular cells in a vein graft adapt post-surgery. In addition to her lab work, this interdisciplinary experience allowed Marisa to observe multiple surgeries and gain significant MATLAB programming skills. BSE junior **Taylor Lohneis** kept busy in Frederick, MD investigating drug delivery, protein purification, and cancer treatment as an intern at the National Laboratory for Cancer Research. Farther north, senior **Ryan Marano** spent his summer in North Haven, CT as an intern with Medtronic, within the Minimally Invasive Therapies Group. On the job he primarily investigated the performance of laparoscopic surgical staplers.

As in previous years, many of our undergraduates sought on the ground design experience in water quantity and quality management. Junior **Shelbie Dashiell** interned with the North Reverse Osmosis Water Production Plant in Kill Devil Hills, NC. Through this experi-

ence, Shelbie became familiar with five different water plant designs in the area, and gained substantial experience in water quality testing. Fellow junior **Jenna O'Brien** interned with General Electric (GE) Water and Process Technologies in Trevose, PA, specifically researching efficient and practical methods to measure residual levels of flocculants in treated wastewater. Senior **Connor Brogan** spent his summer interning with ARCADIS in Richmond, Virginia, assisting with the design and inspection of urban stormwater sites. Connor reflected on the insight this experience gave him, saying, "It was a really awesome experience; by working with highly practiced PEs and talking to a few clients directly, I realized how extensive engineering projects are. From start to finish, planning to quality control, each portion of the design process has to be well documented and reported to the state and client!" Meanwhile, senior **Dina Huynh** learned that water qual-

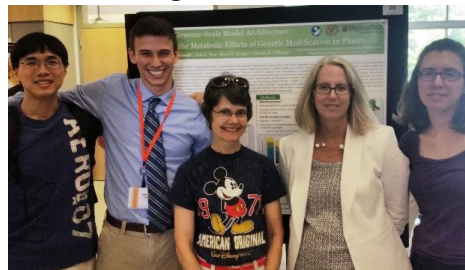


*Dina Huynh (left) and colleague enjoy some sight-seeing after work in Vietnam*

ity and treatment is an issue that certainly extends across national borders through an internship with PETECH Engineering Corporation in Vietnam. During her time in Vietnam, Dina assisted in design specifications for wastewater treatment via moving-bed biofilm reactors. She also put her language skills to the test by translating and developing technical manuals for these

treatment systems.

And, BSE was strongly represented in on-campus summer research programs right here on the Blacksburg campus. Senior **Malee Garcia** researched how elevated nitrogen and carbon supplies affect denitrification and storm water nitrogen removal in bioretention systems in a Crop and Soil Environmental Sciences laboratory through the university Multicultural Academic Opportunities Program (MAOP). Junior **Michael Johnson** participated in the Virginia Tech Fralin Sum-



*Michael Johnson (2nd from left) celebrates a project well done with SURF mentors and colleagues*

mer Undergraduate Research Fellowship (SURF) working in a plant biochemistry lab on an interdisciplinary project connected to BSE Associate Professor **Ryan Senger**. Michael highly recommends the program to future students, as he managed to gain a wealth of experiences, from genome-scale metabolic modelling to bench-top experience working with plant extractions to scientific communication.



*Bob Accolla and Kevin Dennis keep things sterile in the lab at the University of Louisville*



## ASABE Student Branch News

Fall semester is over and was a great start for the members of ASABE. To welcome students back from summer break, we hosted a water balloon fight in the Ag Quad and held a resume workshop with Amy McPherson from Career and Professional Development to prepare for the Engineering Expo. In September, we hosted a tailgate before the VT vs. Boston College football game, participated in a stream clean-up with the local American Water Resources Association (AWRA) chapter, and heard from representatives from SAHA Global and the GREEN Program about study abroad opportunities for undergraduates. In October, we held our annual pumpkin carving event, hiked up McAfee's Knob, and hosted a panel of past graduates from the BSE department about their work experience and what to expect after graduation. We also had several students present on their unique summer internship opportunities and how these opportunities helped them gain valuable experience in real-world applications. These presentations are great opportunities for the younger members of ASABE to see what they can do with a BSE degree and how they can get involved. Lastly, we hosted our annual Pig Roast for BSE students and faculty, which was a huge success despite the inevitable rain that seems to happen every year!

Most of the rest of our year will involve preparation for the ASABE Southeastern Regional Rally at the University of Arkansas from March 17th to 19th. We are looking forward to attending with about 12 students this year and are busy fundraising in order to be able to cover the cost of the registration fees, national dues, hotel rooms, and a large passenger van. We are also trying to mentally prepare for the 14-hour drive to the school! Over Halloween weekend, we organized our annual "Raking Dead" fundraiser, where we raised about \$1,500 raking leaves around town dressed as zombies. Our goal is to raise \$3,000 before the beginning of March. If any alum, families or corporations would like to sponsor our trip or have other fundraising ideas, please contact me at [taylorL2@vt.edu](mailto:taylorL2@vt.edu).

**Taylor Lohneis**, ASABE President 2016 - 2017

## Alpha Epsilon (BSE Honor Society)

The Virginia Tech Eta Chapter of Alpha Epsilon (AE) "the honor society of food, biological, and agricultural engineering", would like to acknowledge our previous president Imen Taniche for the amazing work she has done with AE during her doctoral research.

For the academic year of 2016-2017, our current officers are Pedro Ivo Guimarães (President), Frank Gillam (Vice-President), Sampath Karunarathne (Treasurer) and Tyler Keys (Secretary). The new and the 2015-2016 officers had a power transfer meeting early in the semester and discussed several aspects of AE and went over previous projects and accomplishments of this organization to make sure that we would maintain the quality and reach of our future events and social work.

This year, AE plans are to strengthen our relationship with GSO, have more social events such as Pizza Party, Ice Cream Social and others. We will also try to increase the amount of social work we do for the Blacksburg community, not only with food and clothing drives, but with events focused in scientific education of children and adults.



## BSE Students Travel Abroad

BSE student **Abbe Preddy** spent three weeks in Malawi, Africa participating in a Virginia Tech study abroad program on water sanitation and hygiene issues in developing countries. She then spent another three weeks interning at Find Your Feet, an NGO that addresses and works to decrease food security issues. The study abroad course included multiple lectures from Virginia Tech and University of Mzuzu professors and brought local and visiting students together to engage in various research projects. Abbe worked with other students from the University of Mzuzu, University of Denver and Virginia Tech to assess the E. coli contamination of fish caught from the only freshwater source in the country, Lake Malawi. Through their research, the students had the opportunity to join the fishermen out on the lake at 3 a.m. as they brought in their morning catch, and also allowed them to interact with the middlemen and see firsthand the entire process the fish go through from being caught to being sold in the market. Abbe identifies her contact with the people there to be the most rewarding part of her experience: "The culture in Malawi is by far the friendliest and most welcoming one that I have ever encountered, reinforcing Malawi's reputation as 'the Warm Heart of Africa'."



*Abbe Preddy  
with new friends  
at a water pump  
in Rumphi,  
Malawi*

## Spring 2016 Dean's List

Congratulations to the BSE undergraduate students who made the Dean's List in the spring 2016 semester. Undergraduate students must attempt at least 12 credit hours graded on the A-F option and earn a 3.4 grade point average (on a 4.0 scale) during the spring or fall semester to be awarded Virginia Tech Dean's List status.

### ***BSE Sophomores (in spring 2016)***

Emily Berg  
Serena Emanuel  
Emmett George  
Austin Gouldin  
Alexandra Groen  
Michael Johnson  
Joshua Kennedy  
Andrea Kuliasha  
Rachel Molloy  
Melissa Oberly  
Elaina Passero  
Teresa Reiber  
Lauren Wills

Jacob Patish  
Sara Peterson  
Dalia Rakha  
Lea Sarment  
Cara Sarver  
Suraye Solis  
Morgan Steel  
Alexandra Thomasson  
Jackson Toth  
Samantha Ziemba

### ***BSE Juniors (in spring 2016)***

Robert Accolla  
Christine Ash  
John Brabender  
Dallas Bridges  
Connor Brogan  
Carolyn Carrithers  
Sarah Chaikind  
Marisa Cole  
Benjamin Croom  
Micah Dezort  
Ruochen Dong  
Vasilios Dounis  
Nicole Fazekas  
Garrett Feagans  
Allison Guzman  
Justin Haber  
Brian Harris  
Reece Hoerle  
Dina Huynh  
Danielle Jones  
Matthew Kapinos  
Sydni Koch  
Stephanie Lundgren  
Sean Mackey  
Ryan Marano  
Elizabeth Merin  
Gina Muan

### ***BSE Seniors (in spring 2016)***

Taylor Adams  
Heather Bomberger  
Brigid Byrd  
Lauren Cashman  
Shelbie Dashiell  
Stephanie Dotterer  
Taylor Duncan  
Kendall Dunham  
Joseph Eck  
Jerad Engebret  
Zayd Farah  
Christopher Gilson  
Michael Grinter  
Sasha Howes  
Brianna Jahn  
Colette Julson  
Tad Kolterman  
Alexander Kwiatkowski  
Nikkole Lenardson  
Demetrius Lunsford  
Lee Markely  
Carolyn Mottley  
Patrick Murray  
Thomas Murray  
Joel Neifert  
Mark Piatkowski  
Dane Pizzo  
Eva Rabil  
Gavin Vess  
Daniel Wilkin  
Urban Withers

- continued on page 7

## NEW GRADUATE STUDENTS - FALL 2016

### MS Students

**Sasha Howes** (Ogejo) - BS Biological Systems Engineering, Virginia Tech, 2016

**Kyle Jacobs** (Krometis/Hession) - BS Biological Systems Engineering, Virginia Tech, 2016

**Madeline Ryan** (Scott) - BS Crop and Soil Environmental Sciences, Virginia Tech, 2016

### PhD Students

**Michael Behrens** (Ruder) - BS Electrical Engineering, Walla Walla University, 2016

**Ming-Cheng Chen** (Ruder) - MS Chemistry, National Taiwan University, 2012, BS Biochemistry, National Taiwan University, 2009

**Cristina Marcillo** (Krometis) - BS Environmental Engineering, Saint Francis University, 2016

**Mohammed Nayeb Yazdi** (Sample/Scott) - MS Civil and Environmental Engineering, Sharif University Tech, 2012, BS Civil Engineering, University of Mazandaran, 2010

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## Graduate Student Organization (GSO)

Fall 2016 was marked by a variety of Graduate Student Organization (GSO) events, the vast majority of which were social in nature and focused on furthering connections within the BSE graduate student community.

Weekend hikes, led by **Tyler Keys** (Vice President), **Vinit Sehgal** (Secretary), and me, provided us with some of our favorite experiences of graduate school thus far; amidst the backdrop of towering mountain ridges and russet brown foliage, we sussed out the colorful personalities of our BSE graduate students and inevitably forged bonds with one another. Hikes began with an early summer journey to the resplendent Cascades, a trip that was so successful that we revisited it in late September en route to the often overlooked Barney's Wall. Other trips included hikes to Dragon's Tooth, Angel's Rest, Devil's Marbleyard, and McAfee Knob, which was followed by a plentiful feast at the nearby Homeplace Restaurant. Indeed, the hiking trips quickly became an integral part of the routine, and we set aside time each week to break the grind and indulge in much-needed rejuvenation.

**Laura Hanzly** (Vice President) has spearheaded the continuation of the departmental happy hour tradition, and **Kathryn Douglass** (Treasurer) has graciously hosted several events, including a bonfire and movie night, at her beautiful home in the pastoral Newport countryside. In the near future, we would like to revive GSO coffee hour, put into action by last year's officers, and, in the spring, we anticipate overnight hiking and camping trips, including an excursion to Old Rag in Madison, VA.

### Brady Coleman

GSO President 2016-2017

### BSE Doctoral Student Selected as GSA President

The Graduate Student Assembly (GSA) holds three missions paramount: improving graduate life, fostering career development, and building scholarly community. As the 2016-2017 President of the GSA, I have been honored to carry these missions through multiple advocacy initiatives both internal and external to Virginia Tech. As this year's President, I was invited to the President's Suite at the Virginia Tech vs. ECU football game (unexpectedly allowing a picture with the Hokie bird!). During this event, I was also able to speak with VT Deans, University and Community committee representatives, and Board of Visitors members about graduate student concerns, issues and wants ranging from healthcare and child care to career opportunities and resources. I was also invited to introduce President Sands at his inaugural State of the University Address in October. This opportunity provided viewers the chance to put a face to graduate student life here at Virginia Tech.

As the GSA moves forward this year, I am strongly advocating for a community of thriving graduate students by reaching out to faculty, staff, and administration around the university. By increasing awareness of graduate student voices, I strongly believe I can fulfill all GSA's missions.

Go Hokies!

**Chelsea Corkins**, GSA President





## BSE Senior Wins Award from GE

“Unimpossible Missions” is a global competition sponsored by General Electric (GE) which challenged university students to come up with innovative ideas and new GE technology to solve seemingly impossible expressions or idioms. BSE senior **Kevin Dennis**’ submission focused on the idiom, “Hanging by a Thread”. Over the summer, he participated in an REU at the University of Louisville which involved working with polymer complexes used in 3D printing. GE is currently implementing novel polymer matrix composites (PMCs) in many of their products. Using one of their organic PMCs, Kevin proposed an experiment that displayed the impressive size to strength ratio of the material. Kevin’s proposal was awarded second place in the national competition. As an award winner, he will be participating in a 10-week paid internship at the GE Global Research Center in Niskayuna, NY during summer 2017. Gordie Follin, Executive Manager - Advanced Turboprop Program, GE Aviation & Executive Champion for VT came to Blacksburg in August to present the award to Kevin.



*Gordie Follin GE, presenting BSE Senior, Kevin Dennis his award (above) & talking about the experience (below)*



*Academic Advisor, Priscilla Baker, Kevin and Department Head, Mary Leigh Wolfe*



## BSE Students Abroad (continued from page 5)

Two other BSE students gained experience outside the classroom this summer by participating in the Birthright Israel program. **Lucy Epshteyn** spent ten days traveling around Israel with a group from Penn State Hillel, a college Jewish organization and she says “It was definitely one of the best experiences I’ve ever had, no matter how sleep deprived I was.” Bus rides past the Gaza Strip and a trip to a military base with a view of Jordan and Syria provided Lucy with a sense of just how prevalent conflict is in other parts of the world. Part of the group’s time in Israel was spent with six Israeli soldiers who traveled with them to the Western Wall and Mount Herzl in Jerusalem. Also in Jerusalem the group had the opportunity to sing and dance to traditional music with the locals. Lucy found the entire experience to be amazing and will definitely return to Israel in the future.



**Casey Schrading** traveled to Israel with two other Virginia Tech students to learn the history of Israel and explore outdoor adventures like camel riding, hiking, and rafting down the Jordan River. Casey claims “I absolutely loved my experience in Israel and we got to travel with 7 Israeli soldiers during most of our time there which was incredible because we could talk to them about their experiences and beliefs.” Casey extended his overseas stay by visiting a friend (also a Virginia Tech student) in Palestine. He feels “incredibly lucky to have experienced both sides of a very heated middle-eastern conflict.”

*Casey Schrading ready for a camel ride in the Negev Desert in Israel*

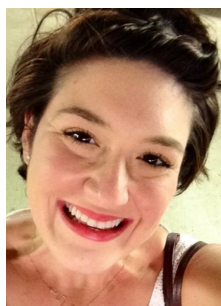


*Lucy Epshteyn in front of the floating orange tree in the old city of Jaffa, Israel*

## Degrees Earned

Congratulations to seven BSE graduate students who completed their degrees in spring/summer 2016

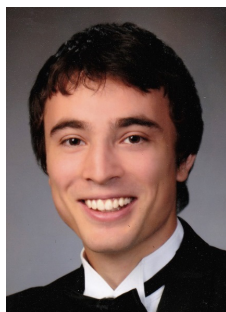
### MS Degrees



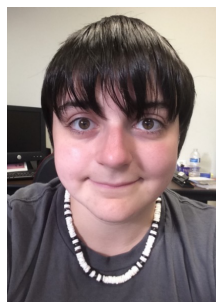
**Hannah Billian** (Advisor: Krometis), *Fecal Matters: Fate and transport of traditional fecal indicator bacteria and source-tracking targets in septic drainfields*. Hannah is a staff engineer with HydroLogics in Greeley, Colorado.



**Breanne Ensor** (Advisor: Scott), *Spatial and temporal trends in greenhouse gas fluxes from a temperate floodplain along a stream-riparian-upland gradient*. Breanne is working at KCI Technologies in Sparks, MD as a Water Resources Engineer, with most of her work focused on stormwater management in the Chesapeake Bay watershed.



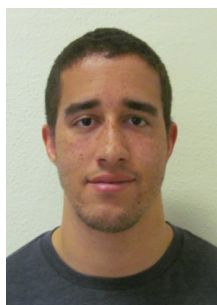
**Jacob Cantor** (Advisor: Krometis), *A Multi-disciplinary approach to tracking the downstream impacts of inadequate sanitation in Central Appalachia*. Jake is working as an assistant engineer in Boston, MA for Hazen and Sawyer on water, wastewater, and stormwater projects.



**Rachael Johnson** (Advisor: Sample), *Applicability of stormwater best management practices in the Virginia coast*. Rachael is working at WSP|Parsons Brinkerhoff as an engineer.



**Dylan Cooper** (Advisor: Scott), *Nutrient release potential during floodplain reconnection: Comparison of conventional and ecological stream restoration approaches*. Dylan is now an engineer for Angle Environmental in Warrenton, VA.



**Russell Umstead** (Advisor: Easton), *Development of fungal bioreactors for water related treatment and disinfection applications*. Russell is now a research scientist at Afton Scientific in Charlottesville, VA.

### PHD Degree



**Winfred Mbungu** (Advisor: Heatwole), *Impacts of land use and land cover changes, and climate variability on hydrology and soil erosion in the Upper Ruvu Watershed, Tanzania*. Winfred has returned home and is now a faculty member at the Sokoine University of Agriculture in Morogoro, Tanzania.

Thinking about grad school...

Or know of someone who is?

BSE is accepting  
applications

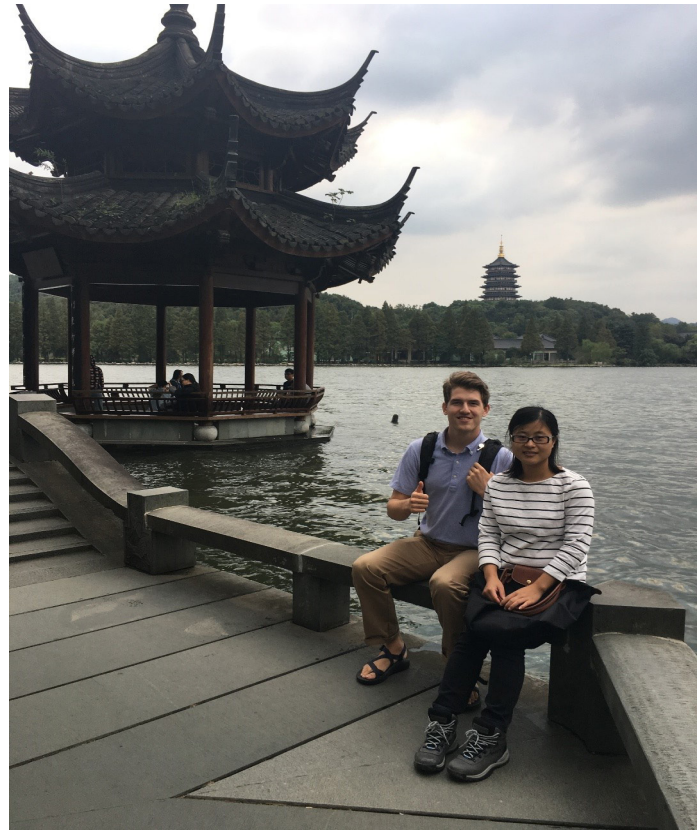
**Application due date for  
Spring 2018:  
September 15, 2017**

For more information, please  
visit [www.bse.vt.edu/apply](http://www.bse.vt.edu/apply)



## Exciting New International Program for BSE Students

Last summer, BSE began an exciting new international program for our students, as alumnus **Dr. Youtong Fu** (PhD '94) mentored six VT-BSE students in 10-week internships in Hangzhou, China at the Huadong Corporation. The program was a remarkable success; so much so in fact, that one of its participants, recent graduate **Chris Gilson** (BS '16) decided to stay! Chris is currently working as a Junior Hydrologist for the Huadong Corporation, as well as studying the Chinese language. In addition to working on local issues in China, Chris is currently building a HEC-RAS model of the Chari River that will be used in watershed decision-making in the Lake Chad region of Africa in partnership with a company partner based in Canada. Of his new international career, Chris says, "It's funny that I came all the way to China to work in Africa alongside Canada! Crazy world we live in. I guess that's the nature of going about combating large challenges." Chris also reports that Virginia Tech alumni are vibrant and welcoming all over the world – he even ran into fellow BSE alumna **Dr. Hehuan Liao** (PhD '15) at a local Hokie get together in Hangzhou!



## BSE Grad Student Representative on National ASABE Committee

BSE PhD student **Qualla Jo Ketchum** was elected Graduate Student Representative to the 2016-2017 ASABE Young Professionals Community's Executive Committee at the 2016 Annual ASABE International Meeting (AIM) in Orlando, FL.



*Qualla Jo Ketchum*

Although graduate students have always been members of the Young Professionals Community, the graduate student commu-

ty came together in 2014 to clearly define their space within the greater ASABE and YPC communities. The ultimate goal is not only to build community and sponsor AIM events specifically for graduate students, but also to enhance graduate student visibility within the membership. Qualla has been a member of ASABE since her freshman year at Oklahoma State. She has attended every AIM meeting in some capacity since 2012 and joined the planning committee after attending the first Graduate Student Involvement events in 2015. In 2016, YPC voted to make the Chair of the Graduate Student Involvement (GSI) Planning Committee an official YPC Executive Committee position. Qualla is honored to serve as the first elected representative and excited to plan the events for the 2017 International Meeting. She hopes to see you all in Spokane!



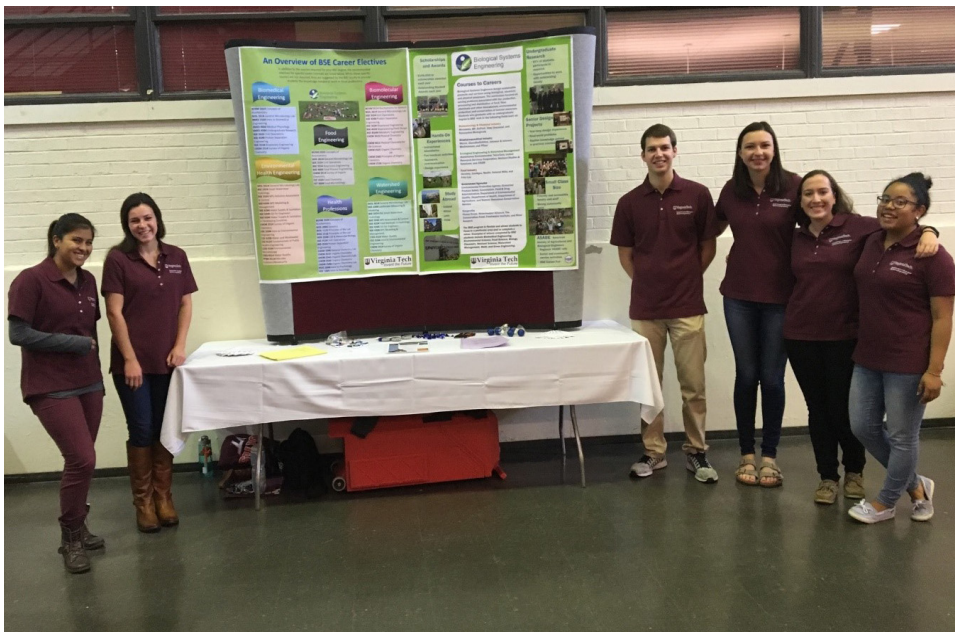
## BSE Undergraduate Wins Soil Judging Competition

This October BSE junior **Samuel Withers** won second place at the annual Southeast Regional Soil Judging Competition. Samuel traveled along with the entire Virginia Tech interdisciplinary soil judging team to Auburn University, where they practiced describing and interpreting characteristic soils of the area, including those of both the Piedmont and Coastal Plain physiographic regions. In addition to Samuel's individual prize, Virginia Tech placed first in team competition, competing against teams from eight other regional universities. Congrats, Samuel!



*Virginia Tech Soil Judging Team with accolades; Samuel Withers is pictured second from the right.*

## BSE Ambassadors

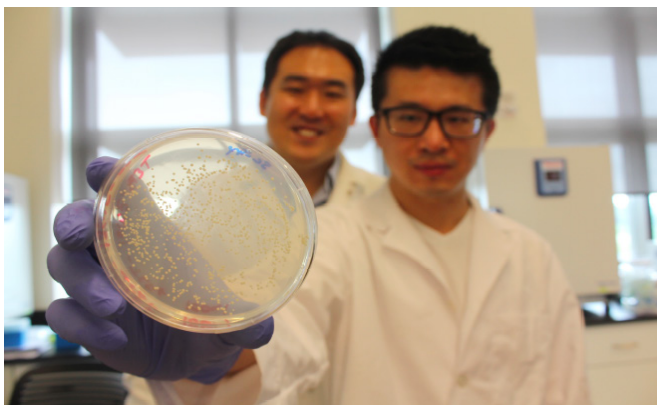


*Ambassadors Pictured - From Left to Right: Bianca Pinto, Elaina Passero, Sean Mackey, Jenna O'Brien, Alison Waldman and Suri Solis*

The 2016-2017 BSE Ambassadors have been busy this fall representing the department at various recruiting events. We have had four College of Engineering (COE) Open House events targeting prospective high school students and the COE Information Session for the General Engineering students here at Virginia Tech as they try to choose which departments they want to apply to when they officially declare their engineering majors. We represented BSE at the Student Engineers Council's Mixer and have given multiple individual tours to high school students and their families. Additionally, the Ambassadors are in the process of visiting classrooms and student clubs at local high schools in Roanoke and all over the New River Valley.



## Feng Receives ICTAS Junior Faculty Award for Research on Precision Medicine



*Assistant Professor Xueyang Feng (left) and Post-doctoral Associate Jiayuan Sheng*

Assistant Professor **Xueyang Feng** received a Junior Faculty Award from the Virginia Tech Institute for Critical Technology and Applied Science (ICTAS) to support his team's research on precision medicine. In collaboration with colleagues in the Department of Chemical Engineering at Virginia Tech, Feng's group will create a micro-scale device to allow the synthesis of vaccines, antibodies, and other therapeutic proteins at point-of-care. This medical device will allow immediate and accessible health care at or near the patient's bedside. This technology could eventually overcome the current limitations of maintaining therapeutic proteins, i.e., a limited shelf life in continuous cold storage, and would create new opportunities for distributing medicines and treating patients residing in remote locations. To develop

this technology, Feng's group will use a cell-free synthetic biology approach to manufacture therapeutic proteins within hours and miniaturize the entire bioprocess into a microfluidic chip the size of a US quarter coin.

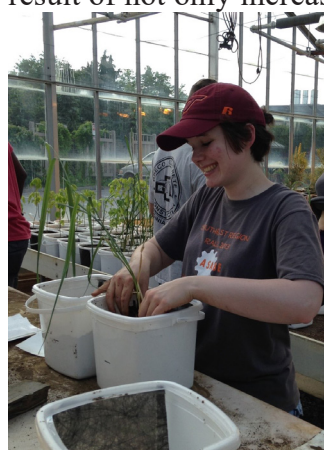
## RESEARCH SPOTLIGHT: DR. TESS THOMPSON'S ECOLOGICAL ENGINEERING GROUP

"I have a very distinct memory of being a small child, sitting on the side of a concrete-lined ditch, playing with mud. Who knew my research career would start at such a young age? In all seriousness, my research program is inspired by personal observation and curiosity. Prior to starting my PhD program, I worked for state government, private consulting, and Cooperative Extension; these experiences illuminated gaps in our understanding of aquatic ecosystems and shaped my research program. The overarching goal of my program is to protect and restore stream and wetland systems, and two of my current research foci are estimating erosion of fine-grained streambanks and quantifying the role of vegetation in wetland water budgets.



*Professor Tess Thompson removing soil sensors*

Because cohesive soils are comprised primarily of very small particles, stream banks consisting of silt and clay are held together by electrochemical forces on the mineral surfaces. Our research has shown that when stream water temperatures increase, such as during a summer thunderstorm in an urban area, the erosion rate also increases. These early results suggest that the extensive stream degradation we observe in urban areas may be the result of not only increasing storm flows from the impervious areas, but also the increased stream temperatures that result from rainwater running off the asphalt heat exchangers we call parking lots. We are continuing to document this phenomenon and to determine the underlying mechanisms responsible for this soil behavior. Long-term, these research results could lead to changes in how we manage and treat urban stormwater and mitigate climate change impacts.



*BSE MS student, Lizzie Hickman, planting switchgrass into a silt loam soil from the floodplain along the New River*

My research group has investigated techniques for predicting flow resistance through emergent wetland vegetation and evapotranspiration rates from common wetland vegetation communities. In collaboration with faculty at VT, Old Dominion University, and the University of Kentucky we are incorporating these results into an improved wetland design model, Wetbud. This free computer model is currently being beta tested across the country and we are monitoring two existing wetlands to collect field data for further model development. Ultimately, improving predictions of water movement in wetland systems will significantly increase the success of restoration designs."



## SHORTTRIDGE JOINS BSE

**Julie Shortridge** joined BSE as an assistant professor and extension specialist in August, 2016. Her research aims to make water resource systems more sustainable, efficient, and resilient through the use of systems engineering methodologies, such as risk and decision analysis, statistical modeling, and simulation. She received her Ph.D from the Department of Geography and Environmental Engineering at Johns Hopkins University. Prior to attending graduate school, she worked as a practicing engineer on the remediation of contaminated soil and groundwater, and as a consultant for the United Nations Environment Programme on disaster preparedness.

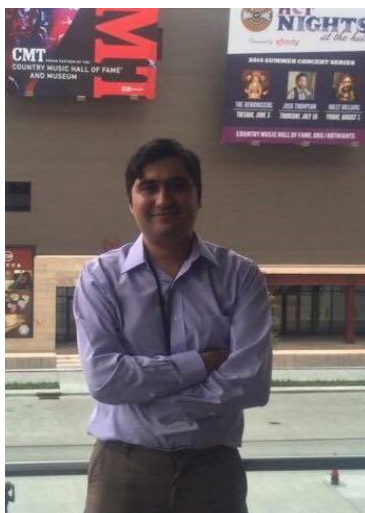
Dr. Shortridge's early research largely focused on the use of sophisticated statistical methods to evaluate and model the relationship between climatic conditions, physical and institutional infrastructure, and public health. More recently, she has been working on climate change impacts and adaptation for long-lived water resources infrastructure, with a particular focus on quantifying and managing the uncertainty surrounding hydrologic changes in the future.

At Virginia Tech, Dr. Shortridge will focus on using these tools to better understand and model the interactions between built water infrastructure and the human and hydrologic systems in which it resides. In particular, she is interested in understanding how human decision-making responds to changes in water availability and quality at both the consumer and institutional level, and how water infrastructure interacts with non-engineered watershed features. As an extension specialist, she aims to provide water users and managers in Virginia with the tools, technology, and guidance they need for efficient and sustainable use of the state's water resources.

In her spare time, Julie enjoys spending time with her husband Ehren, baby son Everett, and dog Ritter. Since moving to Blacksburg they have been spending a lot of time hiking around the Jefferson National forest and starting a garden in their backyard.

## Welcome New BSE Research Faculty

**Ebrahim Ahmadisharaf** is currently a postdoctoral associate in the BSE Department working with **Brian Benham**. He earned his doctoral degree from the Civil and Environmental Engineering Department at Tennessee Technological University and B.S. and M.S. degrees from the Civil Engineering Department at Sharif University of Technology, Iran. He has done extensive research in the area of water resources, which resulted in several peer-reviewed publications. He is also a member of the ASCE/EWRI TMDL Analysis and Modeling Task Committee.



## IN MEMORIAM

Dexter Davis, a long time field technician in the department, passed away June 29, 2016 at home in Floyd, VA. Dexter was responsible for the success of innumerable research projects, and is sorely missed.



## DUMITRU BRANISTEANU NAMED CALS “STAFF EMPLOYEE OF THE MONTH”

**Dumitru Branisteanu**, a Field Research Technician, was named the College of Agriculture and Life Sciences “Staff Employee of the Month” for September 2016. BSE Assistant Professor **Leigh-Anne Krometis**, who nominated Dumitru for this award, praised his work ethic and attitude saying, “I am excited to nominate Dumitru Branisteanu for the CALS “Staff of the Month” award. Dumitru’s hard work, laughs, and engineering “magic” have contributed to the success of many research efforts in our department...Even though his responsibilities on the project primarily pertain to the field work, he makes sure to drop by the lab and check on the students analyzing samples from the site and check out their results, reminding them how “cool” and important their research is to the world. This “can do” team-oriented attitude keeps morale high and everyone motivated and optimistic.” As the September Employee of the Month, Dumitru received a plaque, gifts from the college, has his photo displayed in the case in Hutcheson Hall, will be featured in an article in Insights and will be eligible to be considered for the 2016-17 Employee of the Year award.



*Dumitru receiving his award with Leigh-Anne and Dean Grant*



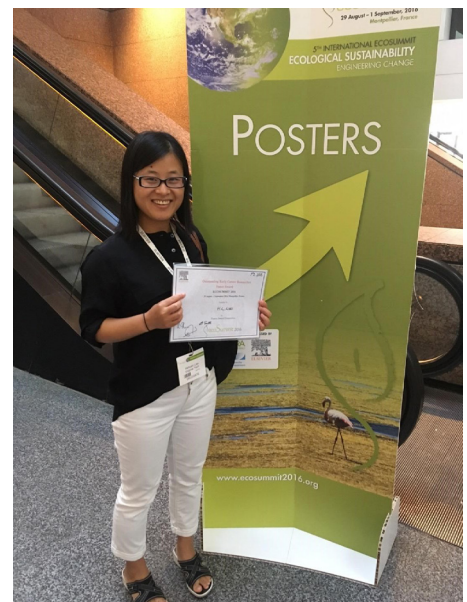
*Leigh-Anne & Dumitru suit up to collect wastewater for a septic experiment*



*BSE MS student Lauren Wind & Dumitru show off the veggies grown at the Urban Horticulture Center*

## Hehuan Liao Won the Early Career Scientist Award

BSE postdoctoral researcher **Dr. Hehuan Liao** (PhD '15) won the Early Career Scientist award for her poster presentation, “The interplay between water quality and habitat on the health of benthic macroinvertebrate communities in mixed-landuse streams”, at the Elsevier EcoSummit meeting in Montpellier, France this September. Hehuan’s work, under BSE Assistant Professor **Leigh-Anne Krometis** and Virginia Tech Mining Engineering Assistant Professor Emily Sarver, focuses on examining the relative effects of watershed landuse and in-stream habitat on aquatic ecology in West Virginia. Having recently completed her postdoctoral tenure at Virginia Tech, Hehuan is now a visiting scholar at the School of Civil and Environmental Engineering of South University of Science and Technology in Shenzhen, China.



## Welcome new Administrative Assistant to the Department Head

Melody Clark has joined BSE! Melody moved from Dundee, New York to Blacksburg, VA in June and has become a part of our department. Melody brings 20 plus years of academic experience with her. Prior to moving,



Melody was the Administrative Assistant to the Superintendent at Dundee Central School. She lives in Blacksburg with her husband, Alfred, of 26 years and her two children, Amanda (21) and Andrew (18). She loves this area as it reminds her of her hometown in Upstate New York. The Clarks moved to the area to be closer to family and are enjoying getting to know the area better.

## Dr. Mallikarjunan to head Food Science and Nutrition at University of Minnesota

**Dr. Kumar Mallikarjunan** will be leaving Virginia Tech and will become the department head for the Food Science and Nutrition Department at the University of Minnesota. Kumar joined Virginia Tech in January of 1999 and has focused his research in the food process engineering area. He is responsible for funded research projects totaling over \$7 million and through his research programs, he has guided over 20 Masters students, 9 Doctoral students and 13 senior capstone design teams. He has been teaching his signature food process engineering course since he joined Virginia Tech and also involved in developing several new courses in the department. Apart from food engineering research, Kumar enjoyed being faculty in the department and appreciated his colleagues' support. He cherishes the trips he took to Brazil and Taiwan with fellow Hokie faculty. He has gained so much from the department which turned him into who he is now and will carry these experiences with him to Minnesota.

## BSE ALUMNI NEWS

### 1990s

**Gina LoBosco Tonn** (BS '97) recently completed a PhD in Geography and Environmental Engineering at Johns Hopkins University, where she participated in the IGERT Water, Climate and Health fellowship program. She is now employed as a Postdoctoral Research Fellow at the Wharton Risk Management and Decision Processes Center of the University of Pennsylvania. Her research involves resilient infrastructure systems and natural hazard risk management. She resides in Wilmington, Delaware with her husband and three children.



### 2015

The morning of graduation, **Michael Scimeca** accepted a job at CRB, a perfect fit for a student graduating from the BSE program. CRB is a consulting engineering company that provides facility scale up designs for pharmaceutical and biotech companies around the world. Mike worked on various projects throughout the world including manufacturing plant designs in England, Colorado and Maryland, collaborating with architects, mechanical engineers, electrical engineers and I&C engineers in order to develop a cohesive facility design. This fall, Mike started a PhD position at NYU in the Department of Chemical and Biological Engineering where they have a strong emphasis in clean energy and nanotechnology and are building nano devices to convert heat directly into electricity or convert solar energy into hydrogen fuel.

**Lindsay Carr** has been working as a Data Scientist for the US Geological Survey Office of Water Information in Madison, WI since July 2015. Her main role is to program reproducible data analyses and visualizations to communicate water issues to the public. In addition, she manages and leads the scientific computing training program, and travels across the country to teach other scientists basic programming skills. Though it is not traditional engineering, Lindsay has enjoyed this work especially since it started thanks to an internship through BSE with the Virginia Department of Environmental Quality (thanks Dr. Scott & Rob Burgholzer). In her spare time, she has taken up community theater and has been in 3 productions!

**Charlie Rocco** is in his second year in the Bioengineering PhD program



at the University of Washington. He is loving Seattle - from the hiking, sailing, and snowboarding that's close by to the concerts and nightlife in the city. Some of the projects he is working on in the lab include development of a scalable single-cell RNA sequencing method and using machine learning to predict optimal drug targets for some genetic disorders.

**Aidan Suiter** has been working as a Water Resources Designer for Thomas & Hutton Engineering Co. in Savannah, Georgia for just over a year now. He has enjoyed learning a variety of new modeling techniques and tackling the challenges presented in designing stormwater management systems for a low-lying, coastal city. When not working, Aidan tries to take full advantage of living in such a beautiful city. His weekends are usually spent exploring historic downtown, kayaking the coastal waterways, or making beach trips with friends; although, he always saves a weekend or two every fall for football trips back to Blacksburg!

## 2016

**Sara Gokturk** married Randall Ferrance (CpE '15) on July 9th in Fairfax, Virginia. After the wedding, the Ferrances honeymooned in Antigua. Randall is a computer engineer working for the Department of Defense and Sara is a water resources engineer working for ARCADIS. The newlyweds are excited to have bought a house in Alexandria, Virginia where they live with their cat Buttons.



*Sara Gokturk and her husband Randall*

**Patrick Gallagher** is currently working at the Food and Drug Administration as a Biomedical Engineer, in Silver Spring, MD. His job in the Office of Device Evaluation is to review medical devices before they are made available to the public. In order to determine that a new device meets federal regulations, he reviews testing data, researches similar devices, and works with colleagues to make a recommendation on whether or not the device is safe and effective. One of the best parts of his job is getting the chance to work with so many different scientists, engineers, biologists, and MD's. Occasionally, companies visit the FDA and present their new devices in an expo-style fashion, allowing them to see and operate their devices in simulation. Patrick had the very memorable experience of extracting a brain tumor using a computer-vision guided system, as well as using an endoscope to perform radiofrequency tissue ablation inside a mock lung. In his down time, Patrick enjoys hiking in the beautiful fall colored forests of Maryland, and exploring the museums and cultural treasures of Washington D.C.

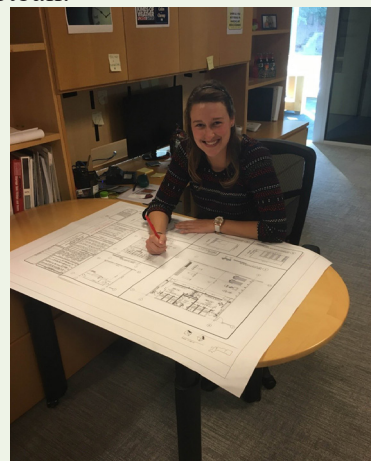


*Patrick enjoying his work.*

**Demetrius Lunsford** is almost four months into his year-long rotational program at Gatorade and gets to see all the departments, such as Safety, Quality Assurance, Production, Maintenance, Waste Water, Distribution, and a variety of other business functions. He gives trainings and presentations on how to check products for defects and makes sure they're

providing the proper product to customers. In his Production rotation, he is working on projects that will save money, time, and make the lives of several colleagues easier with some new designs by changing the way Gatorade stores heavier parts. Seeing how a professional team operates and relies on each other has definitely helped him grow and learn as a professional and a person.

Since graduating in May, **Kindell Schmitt** moved to Atlanta, GA and is working as a process engineer for The Dennis Group. The Dennis Group is a planning, engineering and construction management firm that focuses in the food and beverage industry. In her free time, she enjoys playing tennis, hiking and watching Virginia Tech football.



*Kindell reviews designs in her new office.*

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And always feel free to send your alumni updates to Leigh-Anne Krometis at [krometis@vt.edu](mailto:krometis@vt.edu).

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*BSE Fall 2016 Welcome Picnic and Expo*

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