

BSE NEWS

Virginia Tech Department of Biological Systems Engineering

FROM SEITZ HALL

Greetings to all from BSE at Virginia Tech!

In the coming days, we'll be celebrating the graduation of 44 BSE seniors in fully in-person ceremonies, hosted by both the University and the Colleges, for the first time since 2019! I've been privileged to spend some time with many of our seniors, and I can tell you that they are a truly special group of young persons - motivated, globally aware, and exceptionally innovative. And faithful to the traditions of previous Virginia Tech graduates, they embrace and demonstrate the spirit of Ut Prosim. I'm a big fan of this year's graduates and, after reading more about them in this newsletter, you will be too.

Earlier this semester, we hosted approximately 120 participants in the 2022 ASABE Southeastern Region Student Rally, representing 11 different universities (including California, Nevada, and South Dakota). After kicking off with student chapter updates (which is always both informative and entertaining), the three-day event was filled with professional development and networking events which included a design competition and a scavenger hunt. Dean Alan Grant (College of Agriculture and Life Sciences) and Dean Julie Ross (College of Engineering) were on hand to welcome the participants, who included Keith Tinsey (President-Elect of ASABE), Jasper Cunningham (Membership Director of ASABE), and retired alumnus Travis "Rusty" Unterzuber ('72). This was the first in-person rally since spring of 2019, and the energy level among the participants was very high. Thanks to support from a wide cross section of undergraduate students, graduate students, staff, and faculty, the event was highly successful. We were proud to host the 2022 Rally and look forward to maintaining relationships with the attendees.

January 10th marked the beginning of Dr. Mary Leigh Wolfe's retirement from Virginia Tech. Dr. Wolfe is a two-time alumna of Virginia Tech who, after a detour to the University of Minnesota to earn her PhD and another to Texas A&M University as a junior faculty member, returned to Virginia Tech as an Associate Professor in BSE. With teaching and research responsibilities in Watershed Science and Engineering, she developed a nationally-recognized research program in watershed management and nonpoint source pollution control while also demonstrating herself to be a gifted educator. Dr. Wolfe served as Interim Department Head from 2009 - 2011 before her selection as Department Head, in which capacity she served until 2018. She has been a driving force behind outstanding departmental successes such as our 1990s reorganization and our move into HABB1, and she hired more than 25% of our current staff and faculty. Her remarkable professional accomplishments include the presidencies of ASABE and ABET, selection as Fellow Member of ASABE, ABET and the American Institute for Medical and Biological Engineering, and recipient of ASABE's Massey-Ferguson Educational Gold Medal. To put it simply, Dr. Wolfe has served the Department, Virginia Tech, and our profession in ways that are too numerous to count. It is impossible to overstate the impacts of her exemplary career. Dr. Wolfe was honored with Emerita status on April 4th, and we will be hosting a celebration of her career at the University Club of Virginia Tech in Lane Stadium on May 17th. Dr. Wolfe intends to remain active in BSE through our recently-established Alumni Engagement Committee.

In other transitions, our Financial Analyst, Ling Li, departed BSE after nearly 10 years to accept the position of Business Director for the Center of Power Electronics Systems at Virginia Tech. We were fortunate to recruit Matthew Bright, who holds a BS from Penn State University and an MBA from Liberty University, as BSE's new Financial Analyst beginning in early February. Dr. Abhilash Chandel accepted the position of Assistant Professor at the Tidewater Agricultural Research and Extension Center (AREC) in Suffolk. Dr. Chandel's tenure home is in BSE, and we are very excited about the opportunities to collaborate with him in his specialty area of Precision Agriculture. We are hopeful that we are in the final stages of our search for an Assistant Professor in the Translational Biotechnology field of specialty, and we are in the early stages of searching for a tenure-track faculty member in the area of Cyberbiosecurity to be stationed in Northern Virginia with a tenure home in BSE. Along with our formal affiliations with Dr. Haibo Huang (Food Science and Technology) and, more recently, Dr. Reza Ovissipour (Seafood AREC in Hampton, Virginia), these developments position BSE to significantly expand our scope of efforts and our impacts.

Finally, please consider following us at our social media links in this newsletter. Many interesting and exciting things occur between newsletters, and I feel confident that it will make you feel good to stay current on the activities and achievements of BSE's outstanding students, staff, and faculty.

Times are exciting for BSE, and the mood is optimistic. I can honestly say that I look forward to updating you during coming newsletters. In the meantime, each of us in BSE wishes you and yours a fun, safe summer, and we hope you will reach out to us the next time you're in the Blacksburg area.

GO HOKIES!

Sincerely,
Dwayne R. Edwards, Ph.D., P.E.
Professor and Head
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STAY CONNECTED

To follow the latest achievements of our students, faculty, and staff and view recent departmental news, visit our website.

WWW.BSE.VT.EDU

Follow us on social media for daily content, which includes announcements, event information, student features, departmental plans, and more!

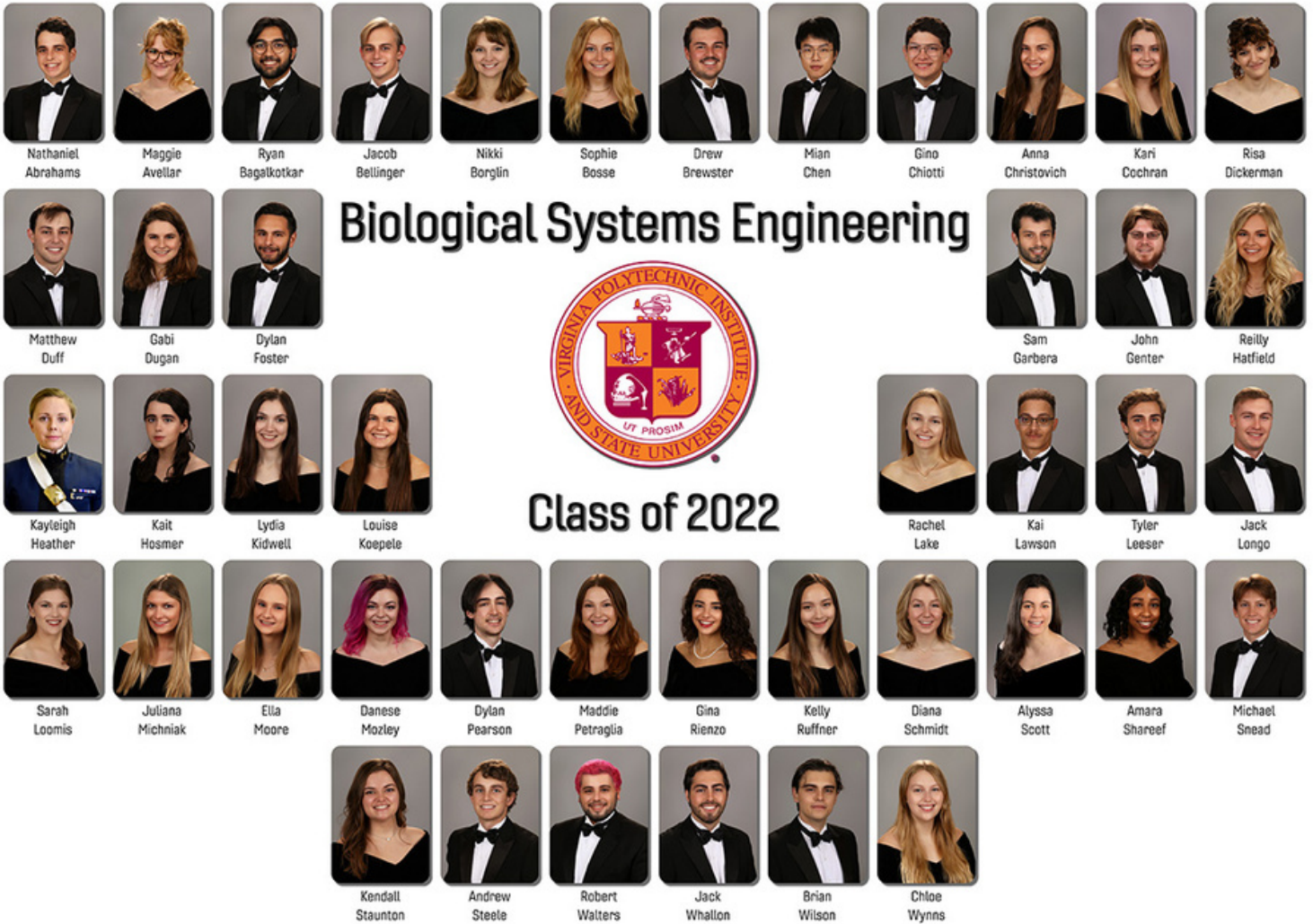
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Biological Systems Engineering at Virginia Tech

STUDENT NEWS



LOUISE KOEPELE

Louise Koepele from Long Island, New York focused on our Watershed Science & Engineering and Environmental Health Engineering tracks and minored in Green Engineering. After graduation, Koepele will join the wastewater team at Weston & Sampson as a Project Engineer in Charleston, South Carolina.



MIAN CHEN

Mian Chen from China focused on our Biotechnology track in our department. After graduation, Chen will be attending Northwestern University to pursue a Master's in Biomedical Engineering.



KENDALL STAUNTON

Kendall Staunton from Covington, Virginia focused on our Biotechnology pathway and minored in Biomedical Engineering. After graduation, Staunton will be working as a CQV Engineering Consultant at Sequence, Inc. in the Cary-Raleigh, North Carolina area.

Senior Spotlights



SARAH LOOMIS

Sarah Loomis from Waynesboro, Virginia focused on our Environmental Health and Watershed Science tracks and double-minored in Environmental Science and Watershed Management. Loomis was also the President of the Society of Women Engineers. After graduation, she'll join CDM Smith in Fairfax, Virginia as a Water Resources Engineer.



KELLY RUFFNER

Kelly Ruffner from Fairfax, Virginia focused on our Environmental Health Engineering and Watershed Science & Engineering tracks and double-minored in Green Engineering and Ecological Cities. After graduation, Ruffner will join GKY in Chantilly, Virginia as a Water Resources Engineer.



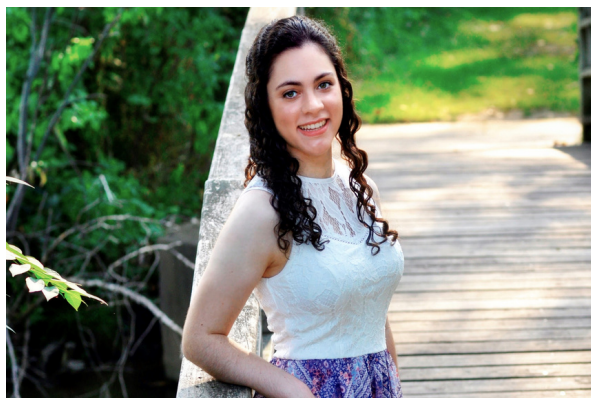
RACHEL LAKE

Rachel Lake from Ona, West Virginia focused on our Environmental Health Engineering and Watershed Science & Engineering tracks and minored in Green Engineering. After graduation, Lake will join Celanese Corporation in Narrows, Virginia as an Environmental Engineer.



REILLY HATFIELD

Reilly Hatfield from Roanoke, Virginia focused on our Health Professions track and minored in Biomedical Engineering. After graduation, Hatfield will attend the Physician Assistant Program at Radford University Carilion's College of Graduate Studies and Research.



ALYSSA SCOTT

Alyssa Scott from Plymouth, Michigan pursued the Pre-Med and Biotechnology tracks in our department and minored in Chemistry. After graduation, Scott will join Epic Systems as a Technical Solutions Engineer.



CHLOE WYNNNS

Chloe Wynnns from Virginia Beach, Virginia focused on our Watershed Science & Engineering and Environmental Health Engineering pathways and minored in Green Engineering and Ecological Cities. After graduation, Wynnns will be working as a Civil Analyst at Kimley-Horn in Charlotte, North Carolina in their hydrology department.

Senior Spotlights



JULIANA MICHNIAK

Juliana Michniak from King of Prussia, Pennsylvania focused on our Biotechnology pathway and minored in Biomedical Engineering. After graduation, Michniak will be working in research and development at Locus Biosciences in Raleigh, North Carolina.



MADDIE PETRAGLIA

Maddie Petraglia from Oakton, Virginia focused on our Biotechnology pathway in our department and minored in Biomedical Engineering. After graduation, Petraglia will work as a CQV Consultant at Sequence, Inc.



SAM GARBERA

Sam Garbera from Richmond, Virginia focused on our Food Engineering and Biotechnology pathways. After graduation, he'll be joining New Age Meats in Berkeley, California as a metabolomics intern researching flavor and texture of cultivated meat.



DIANA SCHMIDT

Diana Schmidt from Damascus, Virginia focused on our Watershed Science & Engineering and Environmental Health Engineering pathways. She was a Global Change Center Scholar and on the VT Climbing Team. Schmidt is in our Accelerated Master's program and will be staying in Blacksburg to pursue her Master's in BSE advised by assistant professor, Jonathan Czuba.



JACOB BELLINGER

Jacob Bellinger from Richmond, Virginia focused on our Watershed Science & Engineering pathway in our department and minored in Green Engineering. After graduation, Bellinger will work for Wetland Studies and Solutions Inc., as a Design Engineer in June.



ANNA CHRISTOVICH

Anna Christovich from Powhatan, Virginia focused on our Pre-Med track in our department and minored in Biomedical Engineering and Chemistry. After graduation, Christovich will take a gap year before attending medical school and work as a medical scribe.

Senior Spotlights



AMARA SHAREEF

Amara Shareef from Pittsburgh, Pennsylvania pursued a variety of electives: watershed hydrology, nonpoint source pollution (NPS) and control, geographic information system (GIS), and landscape modeling and measuring. Shareef also minored in Green Engineering. After graduation, Shareef will move back home to Pittsburgh and work remotely.



GINA RIENZO

Gina Rienzo from Shark River Hills, New Jersey focused on our Biotechnology pathway in our department and minored in Biomedical Engineering. Post graduation, Rienzo will be working as a CQV Engineering Consultant for Sequence Inc. in their Boston location.



LYDIA KIDWELL

Lydia Kidwell from Ashburn, Virginia focused on our Environmental Health pathway and minored in Green Engineering. After graduation, Kidwell will move to Richmond, Virginia and join Timmons Group as a Project Engineer on the Economic Development Team.



TYLER LEESER

Tyler Leeser from Milton, Pennsylvania focused on our Watershed Science & Engineering track in our department and minored in Green Engineering. After graduation, Leeser will be taking a gap year before starting a Master's in Renewable and Sustainable Energy at University of Colorado Boulder.



NIKKI BORGLIN

Nikki Borglin from Fort Mills, South Carolina focused on our Watershed Science & Engineering pathway and minored in Watershed Management. After graduation, Borglin will move to Boston to start as an entry-level Water Resource Engineer for Woodard and Curran.



Check out our Facebook photo albums to view all of our commencement-related photos. We have photos from our Commencement Reception, Senior Design Poster Session, and Spring Banquet by our Communications Specialist, Cameron Warren, photos that our undergraduate advisor, Priscilla Baker, snapped on the field on commencement day, and photos captured by various Virginia Tech affiliated photographers for graduation.

[Commencement Reception](#)
[Commencement](#)
[Senior Design Poster Session + Banquet](#)

BSE Outstanding Students

ANNA CHRISTOVICH HONORED AS BIOLOGICAL SYSTEMS ENGINEERING'S OUTSTANDING SENIOR

Anna Christovich is an exceptional person in our community, who excels both in and outside of the classroom. She'll be graduating with Honors, Summa Cum Laude, with a minor in Biomedical Engineering and Chemistry. Additionally, Christovich has maintained a 4.0 GPA throughout her time here at Virginia Tech, and is graduating first in her class for our department, for our college, and for our university. While this achievement alone is remarkable, it doesn't portray the depth of her involvement across the Virginia Tech community and beyond. In 2019, Christovich pursued a co-op with Dupont and, over the course of two semesters, she was on a team developing new Tyvek packaging, where she was involved in research and data analysis. As an undergraduate researcher, she's participated in projects ranging from anti-malarial drug development to the microbiome.

She's currently the president of the International Medical Relief of Children, a club that supports aspiring health professionals. Throughout her time at Virginia Tech, Christovich has actively engaged in helping others through peer mentoring, serving people undergoing food scarcity, and initiating a bible study in April 2020, when many people needed a sense of community. This semester, she served as an undergraduate teaching assistant in our junior level Bioprocessing Course, serving as a trusted resource for our juniors. In summary, Christovich's involvement in our community and beyond illustrate that she embodies Ut Prosim.

After graduation, Christovich will serve as a medical scribe where she'll help provide supportive, compassionate patient care as she applies for Medical School.

MIRIAM BADRE HONORED AS BIOLOGICAL SYSTEMS ENGINEERING'S OUTSTANDING JUNIOR

Miriam Badre joined our program during her sophomore year in the Fall 2019 semester. Over the course of this last year, Badre traveled to Wisconsin to co-op at Essity, where she worked with operators, environmental engineers, and other operations leaders to support sustainability initiatives. In the summer of 2020, Badre joined associate professor, Durelle Scott, and his undergraduate research group and worked with this team to support water supply permitting across Virginia. Badre has also been active in the leadership of Students for Sustainable Practices, from treasurer to president. She's given back to our program as a volunteer mentor and to our local community through a food pantry. Badre will intern with the Natural Resources Conservation Service (NRCS) this summer.



LISA SMALL HONORED AS BIOLOGICAL SYSTEMS ENGINEERING'S OUTSTANDING SOPHOMORE

Lisa Small has excelled in her coursework, as is evident by the fact that she's been on the Dean's List since her start at Virginia Tech and, though sophomore year typically has a heavy engineering course load, Small stands out for her engagement beyond the classroom. During her first year, she was on the national championship soil judging team at Virginia Tech and was the only freshman to participate. She's a clarinet player in the Marching Virginians and serves as the treasurer for Tau Beta Sigma, a national band service sorority, which is active in serving people in need within our local community. Small is also passionate about environmental stewardship and has worked in a nature-based camp. This summer, Small is developing a course on environmental anthropology in the context of Biological Systems Engineering where she'll demonstrate how BSE is actively involved in climate change solutions.



BSE Outstanding Students

MINA SHAHED BEHROUZ SMITH HONORED AS BIOLOGICAL SYSTEMS ENGINEERING'S OUTSTANDING PH.D. STUDENT

Mina Shahed Behrouz is a fourth-year BSE Ph.D. student working with David Sample, BSE professor and extension specialist, conducting research related to identifying parameters most likely to affect runoff quantity and quality for identifying restoration activities needed in the Chesapeake Bay watershed. She has obtained several competitive grants from the Virginia Water Resources Research Center (VWRRC) as well as the Virginia Lakes and Watershed Association (VLWA). She has two refereed manuscripts published from her MS research and two of her dissertation manuscripts have been submitted and are currently in review.

Shahed Behrouz is academically strong and has been involved in numerous service and professional activities. She is passionate about increasing diversity in engineering as well as improving the perception of Iranian researchers in the United States. Shahed Behrouz will defend her dissertation on May 11, 2022.



NICHOLAS CHRISTENSEN HONORED AS BIOLOGICAL SYSTEMS ENGINEERING'S OUTSTANDING MASTER'S STUDENT

Nicholas Christensen is a BSE M.S. student who successfully defended his thesis on May 6, 2022 under the guidance of BSE assistant professor, Jonathan Czuba. His research is related to utilizing field measurements and high-resolution hydrodynamic modeling to compare different restoration techniques that were implanted along Stroubles Creek at the Virginia Tech StREAM Lab. He is utilizing high-resolution spatial data from our drone with a lidar system and long-term data from our StREAM Lab monitoring program to implement a 2D hydrodynamic model and utilizing field data to validate the model results in terms of hydraulic function and floodplain connectivity.

Christensen is academically strong and has been an excellent teaching assistant. He's already published two manuscripts that are NOT even part of his M.S. Thesis! Christensen will continue his studies as a Ph.D. student at Colorado State University during the fall of 2022.



Graduating + Returning BSE Ambassadors

Congratulations to all of our graduating BSE Ambassadors! We sincerely thank you for your service in department. We appreciate all of your efforts at recruiting events, information sessions, and high school visits to spread the word about our department and all of the opportunities that await those who are interested in BSE. We hope you know that your passion and dedication never went unnoticed.



Jacob Bellinger



Gino Chiotti



Rachel Lake



Chloe Wynns

Thank you to the individuals below for continuing your service to the department by returning next year. We can't wait to see what you'll do as your undergraduate careers progress and we're excited to have you represent the department at several recruiting events coming up over the course of the next year.



Theo Auchincloss



Olivia Basco



Nicole Chapman



Alex Lowe

Nicole Chapman was selected as the winner of the 2022 Robert E. Stewart Engineering-Humanities Award, one of ASABE's major awards to be presented at the American Society of Agricultural and Biological Engineers Annual International Meeting in Houston, Texas, on Wednesday, July 20, 2022. Way to go!

2022 Senior Design Team Projects



BIOPROCESS PLANT DESIGN FOR PROTEIN EXTRACTION FROM MICROALGAE TEAM

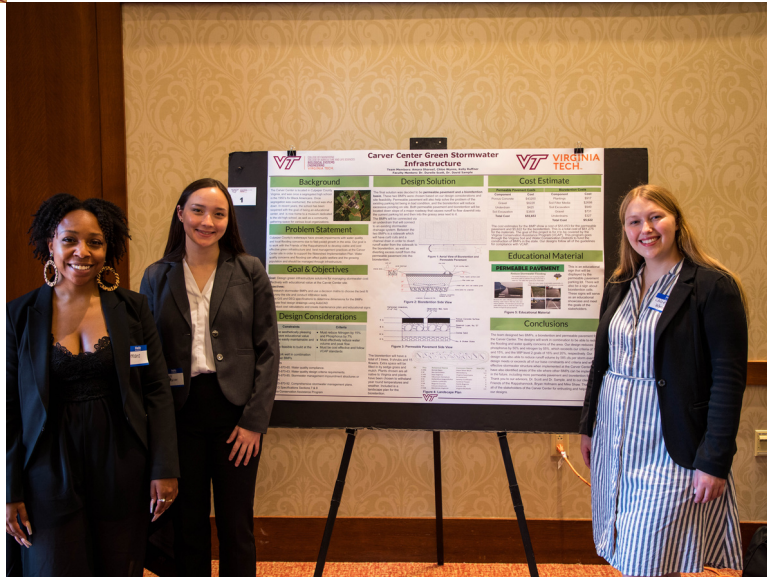
DYLAN FOSTER, RYAN BAGALKOTKAR, RISA DICKERMAN, MATTHEW DUFF, JULIANA MICHNIAK, DANESE MOZLEY, MADISON PETRAGLIA, & JACK WHALLON

Conventional oil extraction from microalgae typically results in low value yield waste streams and industrial applications require a specific protein value within its algal waste stream for extraction to remain profitable. This senior design team will develop a downstream bioprocess, with scale up capabilities, for DSM, a global company in health, nutrition, and bioscience, to extract high value proteins from a micro-algal waste stream to increase process profitability by May 2022.

CULPEPER COUNTY BEST MANAGEMENT PRACTICES AND STORMWATER INFRASTRUCTURE TEAM

KELLY RUFFNER, CHLOE WYNNS, & AMARA SHAREEF

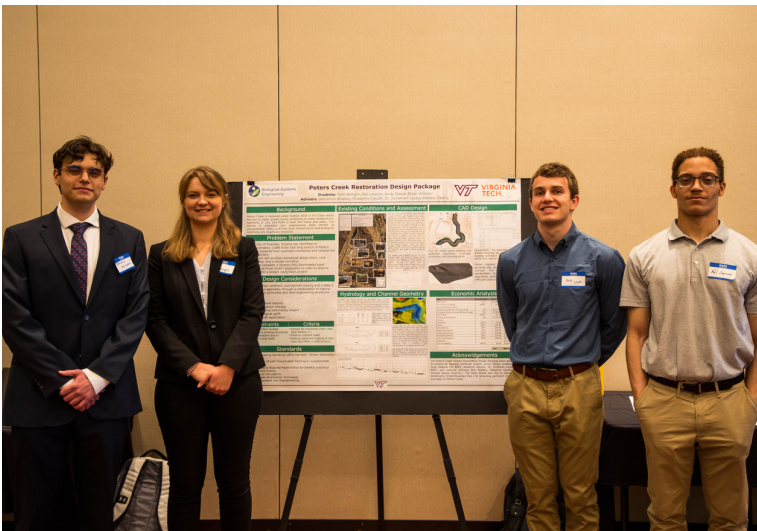
Culpeper County's waterways have stream impairments with water quality and local flooding concerns, due to fast-paced growth in the area. Flooding can affect public welfare and the growing population and should be managed through infrastructure. Team Green is working with the Friends of the Rappahannock to develop viable and cost-effective green infrastructure and best management practices at the Carver Center site to support the Watershed Implementation Plan.



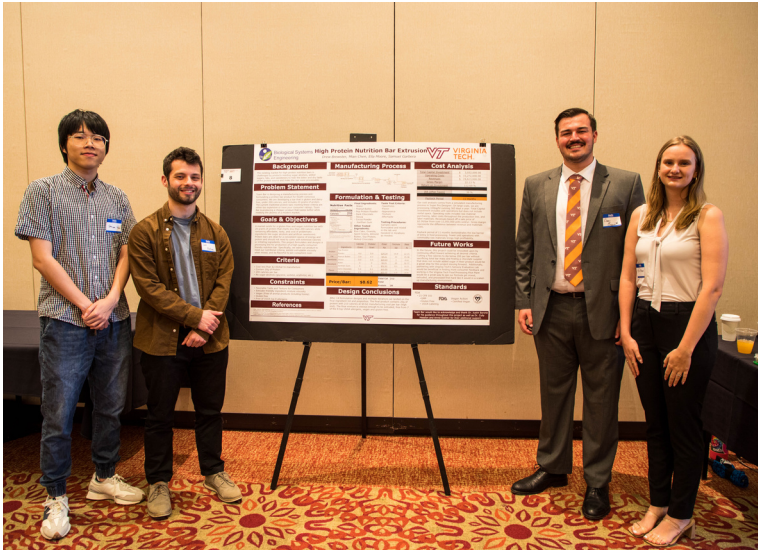
PETERS CREEK STREAM RESTORATION TEAM

NIKKI BORGLIN, KAI LAWSON, ANDY STEELE, & BRIAN WILSON

The City of Roanoke has identified a 1,500 linear foot stretch of Peters Creek impaired from upstream residential and commercial development. Proper stream conditions are crucial in providing flood control, protecting ecological health, and improving water quality. Using evaluation techniques, such as the Rosgen stream classification system and nutrient reduction calculations, this team will develop conceptual design plans, cost estimates, and a design narrative for the restoration of Peters Creek through the completion of a Virginia DEQ Stormwater Local Assistance Fund (SLAF) application.



2022 Senior Design Team Projects



HIGH PROTEIN NUTRITION BAR EXTRUSION TEAM

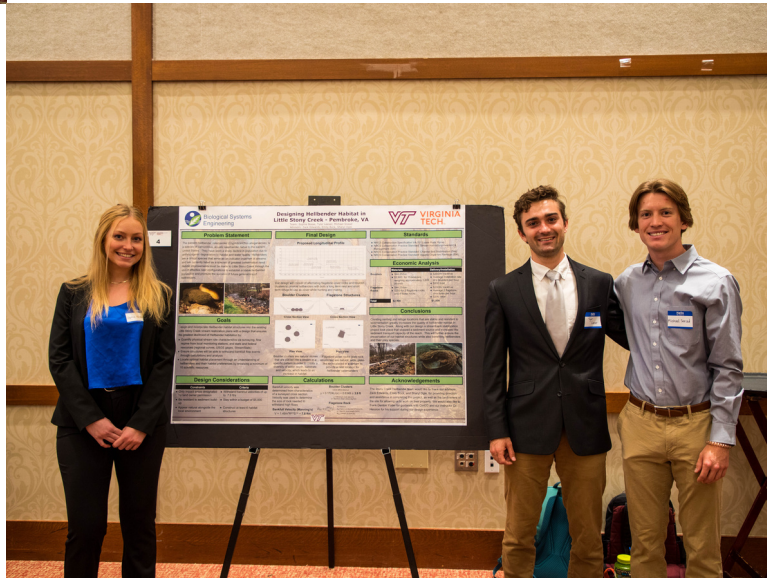
DREW BREWSTER, MIAN CHEN, SAM GARBERA, & ELLA MOORE

Team Bar is formulating a protein bar and designing a manufacturing process for creating a product for health-conscious consumers. The bar will be gluten and dairy-free, under 200 calories, and include 20 grams of protein, while maintaining a low price point and meeting the taste preferences of consumers.

HELLBENDER PROJECT LITTLE STONY CREEK TEAM

SOPHIE BOSSE, TYLER LEESER, & MICHAEL SNEAD

Currently, there is a decline in hellbender populations in Little Stony Creek in Pembroke, Virginia. This decline could lead to negative environmental health impacts on other aquatic species in the region. To protect the current population and promote the success of future hellbenders, this team will design and incorporate habitat structures into existing Little Stony Creek stream restoration plans.



MINIMAL FOOTPRINT URBAN HYDROPONIC GARDENING TEAM

JOHN GENTER, LYDIA KIDWELL, & LOUISE KOEPELE

Some Roanoke City residents lack access to healthy foods, particularly fresh produce and Carilion Clinic is seeking a way to meet the needs of these residents. Team Hydro will work to create a hydroponic garden to increase the resiliency of the local food system development and encourage healthy behaviors.



2022 Senior Design Team Projects



RASPBERRY PI LED FLUORESCENCE MICROSCOPE TEAM

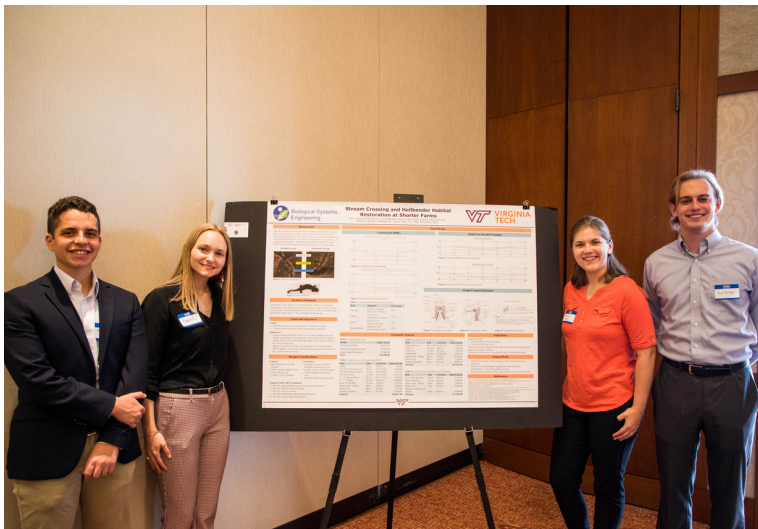
ALYSSA SCOTT, KARI COCHRAN, KAIT HOSMER, & GINO CHIOTTI

Tuberculosis caused by *Mycobacterium tuberculosis* has been in and around human populations for over 70,000 years, and it is estimated to currently be infecting over 2 billion people. Raspberry Pi Assisted Tuberculosis Detecting LED Microscopes are needed to improve the accuracy of tests performed in low- and middle-income countries, but these microscopes require a lot of training and are high in cost. To meet WHO's Sustainable Development Goals, this senior design team will design new aspects and improvements to the current LED microscope to make it suitable for consistent tuberculosis detection and easier to operate with than current LED microscopes on the market.

MOPP SYSTEM FOR HEART TRANSPLANTATION TEAM

MAGGIE AVELLAR, ANNA CHRISTOVICH, GABI DUGAN, REILLY HATFIELD, JACK LONGO, DYLAN PEARSON, GINA RIENZO, & KENDALL STAUNTON

Heart disease is one of the leading causes of death in America and the most common treatment option is transplantation. A significant limitation in current organ preservation techniques is their lack of ability to retain organ viability and the subsequent organ damage they can cause. To combat this limitation, Team Hokie Heart is designing a Machine Organ Perfusion Preservation (MOPP) System for heart transplantations that properly and efficiently sustains the heart during layover time between procurement, transportation, and delivery.



HELLBENDER PROJECT-TOMS CREEK TEAM

RACHEL LAKE, NATHANIEL ABRAHAM, SARAH LOOMIS, DIANA SCHMIDT, & JACOB BELLINGER

The Eastern hellbender, an aquatic giant salamander, is an important indicator of stream ecosystem health in the eastern United States and this species has recently been identified in the Tom's Creek watershed in Montgomery County, Virginia. A section of Tom's Creek on the Shorter Farm property is experiencing bank erosion, over-widened channels, and riparian buffer loss, all of which decrease hellbender habitat quality. This team will redesign two stream crossings on the affected area to limit bank erosion and downstream sedimentation, which will subsequently improve the Eastern hellbender habitat.

2022 Senior Design Poster Winners

This year's Senior Design Posters were judged by our BSE External Advisory Board and ranked in five categories: creativity, clarity, and organizations; background information and project goals; design approach, testing, and results; information conveyed about design process and results; and preparation and articulation. The winners below represent the three teams with the highest rankings among these categories.



FIRST PLACE

Hellbender Project-Toms Creek Team

Rachel Lake, Nathaniel Abrahams, Sarah Loomis, Diana Schmidt, & Jacob Bellinger

Advisors: Benjamin Bradley (Conservation Management Institute), Sharyl Ogle (USDA Natural Resources Conservation Service), and Emily Bock (USDA Natural Resources Conservation Service)



SECOND PLACE

Culpeper County Best Management Practices and Stormwater Infrastructure Team

Kelly Ruffner, Chloe Wynns, & Amara Shareef

Advisors: David Sample (BSE) and Durelle Scott (BSE)



THIRD PLACE

MOPP System for Heart Transplantation Team

Maggie Avellar, Anna Christovich, Gabi Dugan, Reilly Hatfield, Jack Longo, Dylan Pearson, Gina Rienzo, & Kendall Staunton

Advisors: John Robertson (BME), Ryan Senger (BSE), and Fredrick Gage (Sentient Perfusion LLC President)

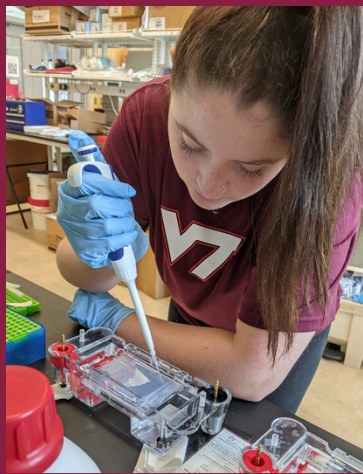
Undergraduate Research Week

April 18-22, 2022 marked the nationwide celebration of Undergraduate Research Week. To celebrate, we highlighted a few of our undergraduate researchers across all of our social media platforms. The research performed by these students represents the wide array of projects going on in our department.



TYLER SMITH

Tyler Smith oversees the calibration and regular maintenance of the water quality sensors and groundwater well field at the Virginia Tech StREAM Lab at Stroubles Creek. Smith's recent research project focuses on the evaluation of toxic metals in Pulaski's Peak Creek. This data is being used to find the specific adsorption coefficient for certain metals in Peak Creek and how the adsorption coefficient relates to the load of metals in the stream during storm events.



KARI COCHRAN

Kari Cochran, senior, is researching how an enzyme in immune cells called Cathepsin S breaks down immunogenic proteins in vaccines in Dr. Chenming "Mike" Zhang's lab. By understanding this process better, vaccine engineers can get information to our immune system in more precise ways.



NATALIE LARSSON

Natalie Larsson, a student working in Dr. Julie Shortridge's lab investigating the impact of sea level rise on tidal irrigation sources used for agriculture in Virginia. Larsson is analyzing salinity samples collected from the Rappahannock River and identifying the conditions that lead to high salinity concentrations that could be harmful to crops. The results from her project will aid farmers in understanding when salinity levels are likely to be high so they can avoid damaging crops with saline water. Larsson was also one of four nationwide recipients of a \$2,500 ASABE-CNH Industrial Undergraduate Scholarship.

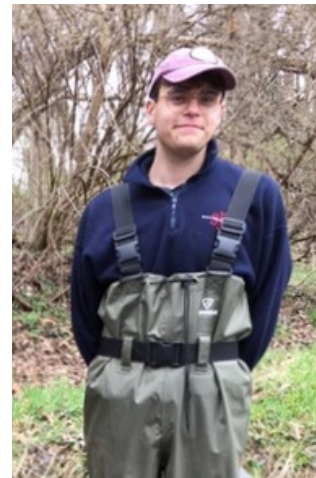


GAVRIEL CAMBRIDGE

Gavriel Cambridge, sophomore, is working with BSE professor, Cully Hession, and biological sciences assistant professor, Erin Hotchkiss to research the impacts of beaver dams on the hydrology and biogeochemistry of agricultural streams in order to inform stream restoration practices that incorporate beaver populations rather than remove them. He is studying how changes to hydrology, such as increased stream-floodplain connectivity and water residence times, affect biogeochemical factors such as nutrient cycling and dissolved greenhouse gas concentrations. He also developed an underwater camera trapping system which is used alongside a series of trail cameras to observe wildlife activity around a beaver dam located at the Virginia Tech StREAM Lab. Cambridge's research proposal "Hydrologic and biochemical impacts of beaver activity on stream restoration," was recently selected for funding by the Virginia Water Resources Research Center's Student Competitive Grant Program.



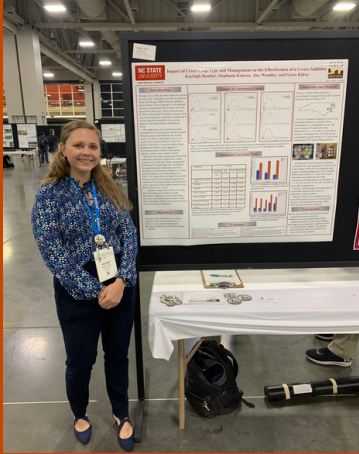
MICHAEL SNEED



BRIAN WILSON

Michael Sneed and Brian Wilson studied how organic matter, plant roots, and soil microorganisms improved soil stability and protected streambank soil from erosion by water by using an indoor stream channel and conducting various lab experiments.

Undergraduate Student Experiences



KAYLEIGH HEATHER

Last summer, Kayleigh Heather, senior, studied the effects of cover crop type, management, and termination timeline on urease inhibitors in NC State University's Agroecology Scholars Program In Research and Education (ASPIRE), where she was mentored by NCSU Crop and Soil Sciences assistant professor, Stephanie Kulesza. Heather's findings were presented at the Annual Tri-Societies Conference in Salt Lake City, Utah and the paper that she worked on was published in the Soil Science Society of America Journal.



RONNIE DIFULVIO

Ronnie Difulvio, junior, co-oped last semester at Clorox and was a part of the Global Safety and Environmental Team, where she served as a corporate resource for the manufacturing site safety leads, while managing a variety of projects. She worked to develop a standardized training program for the manufacturing, research, and office settings across the Product Supply Organization. Difulvio also planned and executed a global safety and environmental conference for the United States, Canadian, and Latin American Manufacturing sites.



MIRIAM BADRE

Last semester, Miriam Badre, junior, co-oped at Essity USA Paper Mill in Menasha, Wisconsin. Badre took daily wastewater process samples that she then tested for nutrients to determine the health of the process and see if any inputs needed to be adjusted. Additionally, she tested samples of water discharged back into the lake and tested it to make sure Essity USA maintained compliance with their wastewater discharge permit. Badre also had the chance to work with the environmental engineering team on different improvement projects in the treatment plants and create new standards for the operators.



KAYLEIGH HEATHER

Last semester, Kayleigh Heather, senior, served as a congressional intern for Representative Rob Wittman (VA-01) and her duties included maintaining constituent relations, compiling daily media hits, updating contact lists, and assisting on different projects when needed. Due to COVID-19, all guests needed to be escorted around the House Office Buildings and, as a result, she got to meet different generals, CEOs, university presidents, and the infamous Carole Baskins.



JAIDEN SHAH

Jaiden Shah, junior, was the team leader of the BSE Volleyball Team in the College of Engineering's first-ever Volleyball Tournament. Team BSE walked out of the tournament as the inaugural College of Engineering Volleyball Tournament Champions, after having won four matches against Mechanical Engineering, Computer Engineering, Material Sciences & Engineering, and Aerospace Engineering.

"I've been playing volleyball for the past 3-ish years since freshman year and one of my favorite things that I love about the tournament is being able to play with all of my friends and make a whole bunch of new friends in all of these different engineering disciplines and majors," Shah said.

Study Abroad Experiences



OLIVIA BASCO

BSE Ambassador, junior and BSE/French double-major, Olivia Basco, received the Jocelyne Couture-Nowak Memorial Scholarship, which will support her study abroad experience in Paris, France this coming summer.

KYLE & ALEX LOWE

Kyle Lowe, junior, and Alex Lowe, junior, studied abroad at the University College Dublin this semester. Their travels were supported by the Julia K. Pryde Memorial Scholarship.



STEVEN KENAH

Steven Kenah, junior, studied abroad this semester with the Virginia Tech Honors College in Riva-San Vitale, Switzerland, where he conducted research on the treatments of Parkinson's disease. Over the course of his semester, Kenah has visited Luzern, Lake Lugano, Lake Como, Zermatt, and Budapest!

KAYLEIGH HEATHER

During the 2021 Winter Semester, Kayleigh Heather, senior, had the opportunity to go on a trip to Senegal with the Virginia Tech College of Agriculture and Life Sciences to study Youth and Development in Agriculture.



Graduate Student Accomplishments



Beth Prior (advisor: Cully Hession) was one of fourteen students nationwide selected to participate in the National Science Foundation (NSF) International Research Experience for Students (IRES) Program for Graduate Training in Advanced Techniques for Water Management, which will be held May 27-June 11 in the Netherlands. Prior is also the recipient of a highly competitive and prestigious \$20,000 Scholar Award from the Philanthropic Education Organization (PEO) Sisterhood. She was featured in the Roanoke Times for this achievement.



Daniel Smith (advisor: Tess Thompson) will also be attending the NSF IRES Program in the Netherlands this summer and, with departmental scholarship funds, will present his research at the European Geophysical Union conference in Vienna, Austria. This semester, Smith participated in the 2022 Center for Communicating Science Nutshell Games with his presentation entitled "Plant Hugs or Plant Snot: Which Would Soil Prefer?" and won third place for his presentation on "Inert fibers and soil microorganisms promote stream bank soil resistance to fluvial erosion" at the Interdisciplinary Graduate Research and Earth Day at the 7th Annual Interfaces of Global Change Research Symposium.



Roja Kevah Garna (advisor: Zachary Easton) received funding through departmental scholarship funds to support her research in developing low-cost sensors to measure and enhance water quantity and quality management for crop production in Iran.



Laljeet Sangha (advisor: Julie Shortridge) participated in the 2022 Center for Communicating Science Nutshell Games, where he (along with Daniel Smith) had only 90 seconds to wow the audience and a panel of judges using everyday language and a single prop to tell the story of their work and their passion for it. Sangha's presentation was titled "Water Security from Field to State through Science and Water Policy."

VT BSE Graduate Program Ranked as 13th Best Biological/Agricultural Engineering Program in the Country



Virginia Tech offers some of the top graduate programs in the country, according to a 2023 ranking by U.S. News & World Report.

In the latest ranking of the best U.S. graduate programs, the College of Engineering is No. 30 among 200 schools nationwide, up one spot from No. 31 last year. Some of the college's specialty engineering programs landed in the top 20. They are industrial, civil, and environmental, each ranking No. 7. Others include biological/agricultural at No. 13, aerospace at No. 14, nuclear at No. 17, mechanical at No. 19, and electrical at No. 19. Computer engineering is No. 20.

"We're pleased that the College of Engineering graduate program as a whole has advanced in rank, as have several programs individually," said Holly Matusovich, associate dean for graduate and professional studies. "Our focus on aligning education and research for impact, as well as an increased focus on the graduate student experience, is yielding outcomes. We're hopeful that continued emphasis on student opportunities, support, and long-term success will lead to sustained progress for our programs overall."

The U.S. News Best Graduate Schools ranking is based on two types of data – expert opinion about program excellence and statistical indicators that measure the quality of a school's faculty, research, and students.

Join us in congratulating these students for graduating and receiving their Master's degree or Ph.D. this year!



MUNEER AHAMMAD

Muneer Ahammad successfully defended his thesis "Advanced Suspended Sediment Sampling and Simulation of Sediment Pulses to Better Predict Fluvial Geomorphic Change in River Networks" and received his Ph.D. His advisor was Jonathan Czuba.



CONNER BROCKE

Conner Brocke successfully defended his thesis "In-vitro Glioblastoma Treatment Focusing on Convection Enhanced Delivery" and received his M.S. His advisor was Ryan Senger.



NICHOLAS CHRISTENSEN

Nicholas Christensen successfully defended his thesis "Comparison of hydraulic function and channel-floodplain connectivity between actively and passively restored reaches of Stroubles Creek 11 years after restoration" and received his M.S. His advisor was Jonathan Czuba.



CAMERON CORNWELL

Cameron Cornwell successfully defended his thesis "Associations between drinking water source watershed and adverse birth outcomes in central Appalachia" and received his M.S. His advisor was Leigh-Anne Krometis.



KELLY GRAFF

Kelly Graff successfully defended her thesis "The Effect of a Trace Element Supplement on the Biomethane Potential of Food Waste Anaerobic Digestion" and received her M.S. Her advisor was Jactone Arogo Ogejo.



KYLE KNUPP

Kyle Knupp received his M.S. this spring and his advisor was David Sample.



MINA SHAHED BEHROUZ

Mina Shahed Behrouz successfully defended her thesis "Improving Predictions of Stormwater Quantity and Quality through the Application of Modeling and Data Analysis Techniques from National to Catchment Scales" and received her Ph.D. Her advisor was David Sample.

The BSE Graduate Student Organization is proud to introduce the 2022-2023 Executive Board!



KATIE WARDINSKI

Katie Wardinski will continue to serve as President of GSO this next academic year. Wardinski is originally from West Allis, Wisconsin and is a Ph.D. student advised by associate professor, Durelle Scott. Her research interests include water quality and biogeochemistry. She's currently researching dissolved organic matter cycling in geographically isolated wetlands.



BETH PRIOR

Beth Prior will continue to serve as the GSO Vice President for Watershed Science & Engineering. Prior is from Auburn, Alabama and she's a Ph.D. student advised by BSE professor Cully Hession and co-advised by Forest Resources and Environmental Conservation professor, Valerie Thomas. Her research is focused on coupling remote sensing with hydrodynamic modeling to better understand and model floodplain vegetation dynamics.



PAT CHAISUPA

Pat Chaisupa will continue to serve as the GSO Vice President of Bioprocessing. She is originally from Thailand and is a Ph.D. student advised by assistant professor, Clay Wright. Her research interests are in synthetic biology and bioengineering. Her research focuses on engineering a protein biosensor derived from plants for metabolic engineering, agricultural, and medical applications.



SAMI TOWSIF KAHN

Sami Towsif Khan was elected as the new BSE GSO Treasurer. Towsif Khan is a Ph.D. student. He received his B.Sc. in Civil Engineering from the Bangladesh University of Engineering & Technology. He's advised by BSE professor, Cully Hession and his research focuses are in stormwater hydrology, green infrastructure and nature-based solutions, and hydrological modeling.



KATHLEEN HOHWEILER

Kathleen Hohweiler was elected as GSO Secretary. Hohweiler is a Master's student. She received her B.S. degree in Geology from Towson University in Maryland. Hohweiler is advised by BSE associate professor and Turner Faculty Fellow, Leigh-Anne Krometis. Her research focuses are in environmental/public health, drinking water safety, and community engagement.



SARAH PRICE

Sarah Price was elected as GSO Volunteer Liaison. Price is from the town of Warrenton in Northern Virginia. She is a Direct Ph.D. student, although she also completed her undergraduate degree at Virginia Tech. Her research focus is within the efficacy and improvement of wastewater treatment infrastructure, particularly in the removal of bacterial contaminants. She is currently studying the influence of rural septic systems on private groundwater supplies.

The VT ASABE Student Branch is proud to introduce their Executive Board for the 2022-2023 school year and celebrates three members for their outstanding service.



HENRY PRESMAN

Henry Presman was elected as the new ASABE President. Presman is from Rockville, Maryland and is following the Environmental Health and Watershed Management pathways. He cherishes opportunities to do community service and help others and hopes to use his BSE degree to do just that.



LINDSY STAMENKOVICH

Lindsay Stamenkovich will serve as the ASABE Vice President this next academic year. Stamenkovich is a rising senior focusing on our biotechnology track in our department.



JULIA POST

Julia Post was elected as the new ASABE Treasurer. Post is a rising senior from Leesburg, Virginia and is pursuing our Environmental Health track in BSE. She is very passionate about the environment as well as volunteerism. After graduation, she hopes to work in the water resources industry and aspires for a career in stormwater management and design.



RACHEL PORTER

Rachel Porter was elected as the new ASABE Secretary. Porter is a rising senior from Alexandria, Virginia, and is on the biotechnology track within BSE. After graduation, she hopes to do graduate work within the field of entomology, applying biotechnology to environmental health.

The ASABE Outstanding Students were all chosen for their commitment to ASABE meetings and opportunities over the past year including various networking, volunteer, and social events.



REILLY OARE

ASABE OUTSTANDING SOPHOMORE



HENRY PRESMAN

ASABE OUTSTANDING JUNIOR



GINO CHIOTTI

ASABE OUTSTANDING SENIOR

Virginia Tech ASABE Southeastern Region Student Rally



For more photos, check out our VT ASABE SE Rally 2022 Facebook Album.

The first weekend in April, students from eight universities traveled to Virginia Tech's campus to participate in the 2022 ASABE Southeast Regional Student Rally. The Department of Biological Systems Engineering hosted the event drawing more than 100 attendees. Participating schools included: Virginia Tech, Clemson University, North Carolina State University, North Carolina A&T State University, University of Tennessee, Knoxville, University of Florida, Florida A&M University, and University of Georgia. We also had students from South Dakota State University and University of California-Davis attend!

The three-day event kicked off on Friday, April 1, with a packed agenda built for networking and learning. A favorite of the Southeast Rally is to designate the "most spirited" branch. Prior to their arrival, all ASABE student branches prepared a presentation of the activities, outreach, and programming they have conducted over the past year and shared them with their peers. Congratulations to the University of Florida who took home the title this year! The Rally planning was led by Virginia Tech Faculty Advisor Jonathan Czuba, PE, and Department Head Dwayne Edwards, PE, along with the 2022 Southeast Region officers: President, Kendall Staunton (VT); Vice President, Grace Rembold (OSU); Secretary, Brooke Carter (NC A&T); Treasurer, Mattie Wood (OSU); Parliamentarian, Melvin Jordan (FL A&M).

The rally focused on helping students to develop their careers and build expertise. Three keynote speakers (Travis "Rusty" Unterzuber ('72), Marty Matlock, and ASABE President-Elect Keith Tinsey) underscored this theme. Unterzuber, a Virginia Tech alum, spoke of his career pathway and focused on encouraging and empowering students. Matlock, senior advisor at the USDA, discussed the challenges and opportunities facing the agri-food system, and charged agricultural and biological engineering students to help create the solutions to these issues. Finally, Tinsey shared his ASABE experience and impressed upon the attendees the importance of engaging with a professional society. Panel sessions were also conducted with recent and experienced alumni. They offered perspective on how to gain experience, assimilate in the workforce, pursue further education, and obtain professional licensure. Julie Carrier, department head at the University of Tennessee, Knoxville, spoke about the ASABE Annual International Meeting and also about an ASABE Initiative Fund that connects students through a networking approach at subsequent rallies. A representative from the California/Nevada Student Rally and two representatives from the Midwest Regional Student Rally attended to network and collaborate.

Networking was a cornerstone feature of the rally, and a design competition, scavenger hunt, and a capstone banquet provided opportunities. The water quality lab at the Human and Agricultural Biosciences building offered the perfect setting for students to create a filter to remove phosphates, nitrates, and sediment from a water sample. Students were given biochar, sand, clay, and woodchips to create their filtering system. A beautiful sun-filled day set the tone for tours of the biological systems engineering department, and the accompanying scavenger hunt encouraged participants to look for "cowgoyles" built in to the Hokie stone façade and take a stroll to the campus duck pond.

During the 2022 business meeting, the University of Florida was selected to host the rally in 2023. The officers were also selected during the business meeting: President, Nathan Bush (UF); Vice President, Savannah Roth (UTK); Secretary, Kevin Poole (FAMU); Treasurer, Kennedy Belknap (UF); Parliamentarian, Alexander Wynn (NC A&T).

All undergraduate ASABE student members are automatically members of the ASABE International Student Branch (ISB). The ASABE ISB represents more than 1,400 individuals and 120 academic institutions globally. To learn more about the ISB, contact Jasper Cunningham.

ALUMNI NEWS

A tradition worth its weight in gold

The Hokie Gold Legacy Program allows Virginia Tech alumni to donate class rings to be melted to create gold for use in future class rings - a tradition that connects the past, the present and the future.



Travis "Rusty" Unterzuber recently donated three rings to be melted and used for the making of future class rings, while a fourth – his 1972 class ring – will be placed in a time capsule being constructed near Burruss Hall to commemorate the university's 150th anniversary. Photo by Christina Franusich, Virginia Tech.

Talking about his father, his father's 1942 Virginia Tech class ring, his mother's miniature ring, and the opportunity to add to his family's legacy with Virginia Tech brought forth all sorts of emotions for Travis "Rusty" Unterzuber.

Six months ago, he and his sisters weren't sure what to do with the rings of their now deceased parents. Then by chance, Unterzuber remembered the Hokie Gold Legacy Program, which allows alumni or families of alumni to donate class rings to be melted to create "Hokie" gold that is included in future class rings. A family discussion ensued, and they agreed they wanted to be a part of the program.

"I knew the program was there, and I knew we had rings," Unterzuber said. "Never got the two together until about six months ago."

In late November, Unterzuber made the 15-hour drive from his hometown of Davenport, Iowa, to Richmond to visit with family relatives during the Thanksgiving holiday. Then he worked in a visit to Blacksburg to be a part of the ring melting ceremony held at the VTFIRE Kroehling Advanced Materials Foundry on Virginia Tech's campus.

The ceremony, held Nov. 29, has taken place annually since 2012 and even took place last year, though with just the 2022 class president in attendance because of a COVID-related restriction in the number of people allowed in the facility. This unique tradition of bridging the past and the future started when two class members from the 1964 M Company of the Virginia Tech Corps of Cadets – Jesse Fowler and Jim Flynn – came up with the idea.

Laura Wedin, associate director for student and young alumni engagement, coordinates the program, collecting rings from alumni who want their rings melted and removing the stones from them. She also keeps track of donation forms and biographies of ring owners and sends email verification upon receipt of rings that have been shipped.

In addition, Wedin coordinates the gold melting ceremony, which includes Bugle yearbooks that represent the years of the rings being melted. Donor rings get placed on the open page of an alumnus or an alumna, and current ring design committee members then transfer each of these rings to a graphite crucible, saying the name of the alumnus or alumna or spouse who originally wore the ring and the class year before dropping the rings into the cylinder-shaped object.

Unterzuber brought three rings to be melted - his father's class ring, his mother's miniature ring, and wife Doris' engagement ring. Unterzuber and his wife were married in 1972, the same year in which he graduated. His father's class ring had been given to his younger sister, Kaete, by their mother after his father's passing, and Kaete Unterzuber agreed to donate the ring for melting. His mother's miniature ring had been left to his wife after his mother's passing, and Doris Unterzuber agreed to donate that ring for the proceedings.

Read the full story in our Newsroom on our website.



RICH ALLEVI

Virginia Tech is partnering with SunTribe to boost their Climate Action Commitment implementation efforts toward 100% renewable electricity by 2030! BSE alumnus, Rich Allevi (M.S. '12), is one of SunTribe's co-founders. You can read more about Virginia Tech's sustainability efforts and how SunTribe is helping the the university meet its goals by heading to our BSE Newsroom.

[FULL ARTICLE AVAILABLE HERE](#)

ROBYN MCGUCKIN

On World Water Day, BSE Alumna, Robyn McGuckin (B.S. '95), wrote an article sharing three ways to make water and sanitation access visible. McGuckin is the Director of Partnerships for P4G Partnerships.

[READ THE ARTICLE HERE](#)



CATHY UNDERWOOD

Cathy Underwood (B.S., M.S. '94-'98) was promoted to President of Branch Builds, Inc., one of the largest and most respected construction management and general contracting firms in Virginia and North Carolina. Fun fact about Underwood: To this day, her master's degree publication "Permanent bracing design for MPC wood roof truss webs and chords" in the Forest Products Journal is referenced and used for calculating required bracing forces in the wood truss industry.

BSE Alumni: Are you interested in speaking to our newest cohort of BSE Hokies? We're collecting short videos of alumni putting their BSE knowledge to work! If you're interested in sharing what you have been up to post graduation, contact Leigh-Anne Krometis at krometis@vt.edu.

EXTENSION NEWS



Julie Shortridge is an assistant professor and extension specialist in our department and her extension program encompasses two broad themes of Climate Change Impacts and Resilience and Water Use and Irrigation. Within both of these themes, she aims to translate novel approaches to managing climatic and water related insights into practical recommendations for agricultural producers, water managers, and municipal agencies.

Her program on Climate Change Impacts and Resilience supports a diverse group of clientele in understanding and addressing risks from climate change and extreme weather. She has written peer-reviewed extension bulletins on climate and weather aimed at both agricultural producers and planning personnel, and given extension talks reaching a combined audience of approximately 1,150 growers, planners, and members of the general public. Her work on the scientific advisory committee for the Science Museum of Virginia has provided guidance on informal educational programming on climate change that reaches an estimated audience of 360,000 people per year. Her contributions to the Town of Blacksburg's Climate Vulnerability Assessment will be used to incorporate climate resilience into the town's process for allocating and prioritizing the \$25.7M spent annually on infrastructure, capital improvement, and public works projects. By providing growers, planners, and the general public with knowledge and tools to address climate risks, this extension programming will ultimately help Virginia become more resilient in the face of growing climatic threats.

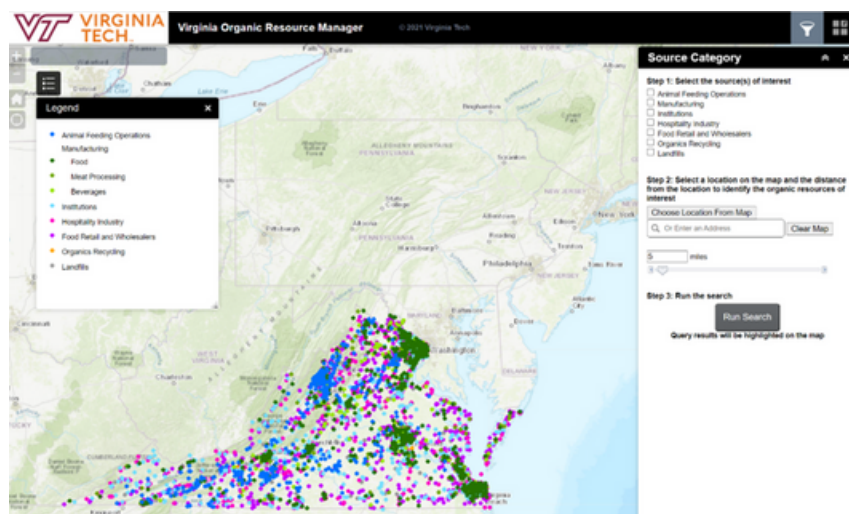
Shortridge's Water Use and Irrigation program develops and delivers educational resources that inform producer decision making about whether or not to introduce irrigation into their operation, and, if they do, to improve their irrigation management skills. In many humid regions like Virginia, large-scale agricultural irrigation has historically been limited, but has been growing in the past decade. While irrigation has the potential to increase agriculture's profitability and resilience, it can also result in sunk financial costs, strains on water resources in dry years, and excess nutrient loss. To this end, she has written six peer-reviewed extension bulletins on irrigation and created an interactive tool to help producers estimate the financial costs and benefits of irrigation. Depending on the irrigation system and farm conditions, these can range from a loss of \$10,000 to gains of \$16,000 per 100 acres. This tool can thus help producers avoid making costly investments in irrigation when it won't benefit them.

She has conducted 14 extension presentations on the topic and organized a two-day workshop on irrigation with experts from across the Eastern U.S., collectively reaching an audience of over 520 producers and extension/conservation educators. Follow-up surveys conducted after the workshop indicated that a majority of respondents had either already taken or intended to take actions related to workshop material, including doing a financial assessment of whether or not to install irrigation, obtaining a water withdrawal permit, or implementing improved irrigation scheduling. This work will ultimately help growers manage irrigation in a way that maximizes economic benefits while minimizing its impact on our water supplies.



Jactone Arogo Ogejo's extension and research programs are integrated and focus on advancing and improving the management and use of bioresidues from the food systems supply chain. His programs aim to increase the knowledge of recovering value and minimizing the adverse impacts that bioresidues present to our society. Specifically, Ogejo develops and disseminates educational programs to advance and transition managing bioresidues in the food systems supply chain from the current linear model to a circular economy model. His work involves improving the handling, safety, use, and environmental stewardship of bioresidues.

By using a systems approach, Ogejo and his team simultaneously consider problem formulation and analysis of critical factors (internal and external) to devise solutions to recover value-added products and, more importantly, to advance knowledge and increase the acceptance and adoption of technology. The materials they develop are delivered and disseminated through field demonstrations, webpages, factsheets, and workshops. Below is an example of an ongoing effort of one of Ogejo's extension program activities.



Managing bioresidues starts with the knowledge of quantities available or generated. Thus, to meet this need for the Commonwealth of Virginia, Ogejo's extension program is building an online resource called the Virginia Organic Resource Manager (VORM). Briefly, VORM is an interactive web-based platform envisioned to enhance the increased use or repurposing of organic residuals generated from agricultural production, food processing, and food consumption. VORM provides information about the location and approximate quantities of organic residuals available in the Commonwealth of Virginia. Thus, allowing connections between organic residue generators (sources) and entrepreneurs interested in upcycling these organic residuals to other value-added products.

Additionally, VORM will present educational materials that describe potential uses of organic residuals for stakeholders who may be interested in recovering value from these residues. When successfully implemented, VORM will contribute to the diversion of organic residuals from landfills, thereby reducing greenhouse gas emissions and mitigating climate change.

CHECK OUT THE VORM ONLINE RESOURCE:
[HTTPS://SECURE.GIS.VT.EDU/VORM/](https://secure.gis.vt.edu/vorm/)

FACULTY + STAFF NEWS



MARY LEIGH WOLFE RETIRES AFTER SERVING ALMOST 30 YEARS AT VIRGINIA TECH

Mary Leigh Wolfe, professor of biological systems engineering, retired in January 2021, after serving for almost 30 years in the Department of Biological Systems Engineering, the College of Agriculture and Life Sciences, and the College of Engineering. Wolfe was the first woman in the department to be promoted to professor and to serve as the department head.

Wolfe received both her bachelor's ('79) and master's ('82) in Agricultural Engineering at Virginia Tech and she would later re-join the campus community as an associate professor in 1992. Wolfe had the unique experience of returning to Virginia Tech just as the department was embracing its new name of biological systems engineering.

"The expansion of agricultural engineering to include additional aspects of biologically-related engineering initiated a massive change in the profession," Wolfe said. "Additionally, there was a push towards a more multi-disciplinary and collaborative approach to solve real-world problems."

This new sense of collaboration within the discipline is what attracted Wolfe back to the region, after she earned her Ph.D. from the University of Minnesota and served on the faculty at Texas A&M University for over six years. Around the same time that Wolfe was offered a faculty position at Virginia Tech, a group of Virginia Tech biological systems engineering faculty and researchers were awarded the U.S. Environmental Protection Agency (EPA) Administrator's Pollution Prevention Award for their contributions toward the Chesapeake Bay Nonpoint Source Pollution Program. This occasion marked the first time in which the EPA gave this award to an academic institution, and this only made Wolfe more excited.

A GLOBAL CHALLENGE: ADDRESSING WATER AND HEALTH ISSUES FROM RURAL APPALACHIA TO CHINA

Inadequate access to safe drinking water remains a significant global challenge for low-income, rural communities around the world. Because of a history of underinvestment combined with technical challenges posed by the Appalachian topography, many people in Appalachia have adapted to a life with a number of inequities, one being a lack of safe and reliable drinking water. Many live without public water systems and must go to great lengths to find safe drinking water.

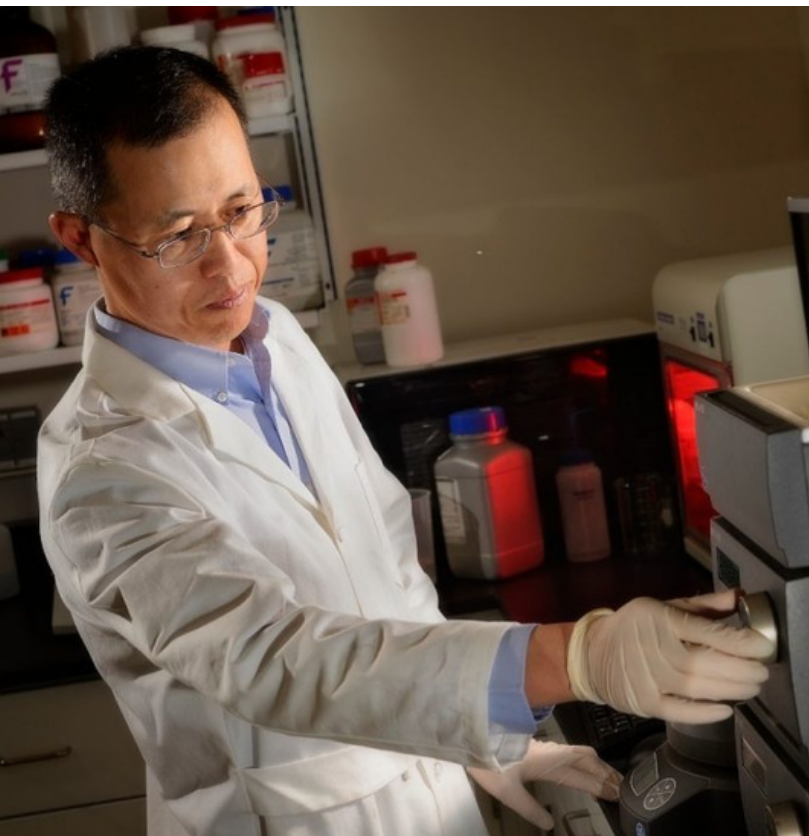
America prides itself on having one of the safest and most reliable drinking water systems in the world, but in reality, a staggering 1.7 million Americans don't have reliable access to safe drinking water, says a 2019 report from Dig Deep.

This figure comes as no surprise to water and public health specialists like Alasdair Cohen, an assistant professor of environmental epidemiology in the Department of Population Health Sciences at the Virginia-Maryland College of Veterinary Medicine and an affiliated faculty member of the Fralin Life Sciences Institute, and Leigh Anne Krometis, an associate professor in the Department of Biological Systems Engineering in the College of Engineering and the College of Agriculture and Life Sciences, and underlines the need to cease labeling water difficulties as a developing nation problem.

"I feel that there's a certain amount of humility that Americans should have, since we haven't fixed our problems here," added Krometis, who is also an affiliated faculty member in the Global Change Center. "I believe we can learn from developing countries. I think that the extreme challenges they encounter means that they have solutions that we don't have. We're always exporting solutions, but we need to solve our own."



Both articles are available to read on our website in our Newsroom.



VIRGINIA TECH RESEARCHERS DEVELOPING A NEW VACCINE FOR A SWINE CORONAVIRUS

To address climbing economic losses from swine that contract the porcine epidemic diarrhea virus, Virginia Tech researchers in the College of Agriculture and Life Sciences and Virginia-Maryland College of Veterinary Medicine are developing a vaccine to combat the disease that has a near 100 percent mortality rate in newborn piglets.

The disease emerged in the United States in 2013 and has since caused around \$600 million in annual losses to swine producers. When combined with increased food prices for consumers and decreased exports of hogs, the associated loss amounts to more than \$900 million annually in the U.S.

While there are two commercially available vaccines for the virus commonly known as PEDv, neither are effective in preventing the disease. Mike Zhang, the principal investigator of the project and a professor in the Department of Biological Systems Engineering and Turner Faculty Fellow, saw the urgency for an effective vaccine against this virus.

With a four-year, \$630,000 grant from the USDA National Institute of Food and Agriculture, Zhang and co-principal investigator X.J. Meng, a University Distinguished Professor of molecular virology in the Virginia-Maryland College of Veterinary Medicine, are researching a nanoparticle-based vaccine to curb this highly contagious coronavirus among swine.

Because of PEDv being in the coronavirus family, the researchers hope to gain knowledge and insight in order to swiftly produce vaccines against human coronaviruses and their variants.

VENKAT SRIDHAR RECEIVES FULBRIGHT U.S. SCHOLAR AWARD TO STUDY WATER AVAILABILITY AND DEMAND RESEARCH IN INDIA

Venkat Sridhar, a biological systems engineering professor in the College of Agriculture and Life Sciences and the College of Engineering at Virginia Tech, has received a Fulbright U.S. Scholar Program award to study in India, where he will conduct hydrological assessments on the Ganges and Cauvery river basins to quantify water availability and demand for agriculture.

The Ganges is revered as a holy river in India, and the Cauvery River basin serves as a significant rice-producing region for southern India. The Cauvery River is one of the few rivers that is shared by two states, Tamil Nadu and Karnataka. Because of climate change and climate variability, these regions experience high variability in precipitation, leading to uncertain river flows and difficulties supplying enough water for agriculture. Activities like this have the potential to cause unrest in the region, affecting more than 300 million people.

"This research will help us in responding to changing water use and availability scenarios and improve our ability to respond to changing conditions of water use and availability," Sridhar said.

Sridhar's research has broader implications for society by improving the understanding of consumption and providing measures to implement adaptive water management policies, which is typically a source of contention for various water-stressed river basins nationally and internationally.



Both articles are available to read on our website in our Newsroom.



MATTHEW BRIGHT

We're excited to welcome Matthew Bright, our new Financial Analyst, to BSE. Bright earned his BS degree from Penn State and his MBA from Liberty University, and he has leveraged his training successfully in a variety of positions outside Virginia Tech.



ABHILASH CHANDEL

Join us in welcoming Abhilash Chandel to the Department of Biological Systems Engineering! Chandel is joining us as an Assistant Professor at the Tidewater AREC, with research and extension responsibilities in the area of Precision Agriculture.



REZA OVISSIPOUR

We're happy to announce the appointment of Reza Ovissipour as an Affiliate Assistant Professor in the BSE department. Ovissipour is currently an Assistant Professor stationed at the VT Virginia Seafood Agricultural Research and Extension Center in Hampton, Virginia.



ROBERT "BOB" LANE

Robert "Bob" Lane, Extension Specialist and Seafood Engineer, is retiring. Lane has held this position for the last 31 years, earning a M.S. degree in Agriculture and Life Sciences with a focus on food safety in 2011. Join us in extending our best wishes on his well-deserved retirement from Virginia Tech.



LEIGH-ANNE KROMETIS

The Universities Council on Water Resources (UCOWR) has selected associate professor and Turner Faculty Fellow, Leigh-Anne Krometis, to receive the 2022 UCOWR Mid-Career Award for Applied Research. Krometis will be recognized for this award at the 2022 UCOWR/NIWR Annual Water Resources Conference in Greenville, SC, June 14-16. Assistant professor, Jonathan Czuba, was selected as an Honorable Mention for the UCOWR 2022 Early Career Award in Applied Research.



JONATHAN CZUBA



CLAY WRIGHT

Clay Wright, BSE assistant professor, and Sherif Sherif of the Alson H. Smith, Jr. AREC were recently awarded a grant of nearly \$300K from the USDA National Institute of Food and Agriculture (NIFA) to identify the chemical signals responsible for frost tolerance of apple blossoms.



SHERIF SHERIF

DONOR GRATITUDE



Giving Day this year took place on February 23-24 from noon-noon, until Virginia Tech received so many donors that the Giving Day dashboard couldn't handle it anymore! Thus, Giving Day activities continued until the end of day on February 24 and we had 35 donors support the Department of Biological Systems Engineering. We also met our department challenge, which unlocked an additional \$10,000 gift from Rusty and Doris Unterzuber for the Ut Prosim Fellowship.

We wanted to take the time to say thank you to all of our donors. Your support is critical to our department's growth. We encourage you to come back to campus to see the positive impact of your gifts. Your contributions provide scholarships for students, enhance their learning experiences, improve our facilities, and help us retain and attract eminent professors to the department. Gifts and donations can make a difference between a good and an excellent department. Giving is a critical component of keeping the Virginia Tech Department of Biological Systems Engineering competitive with other top programs in the world.

It doesn't take a lot to make a significant impact on the experiences of our students:

- A \$25 gift enables 12 students to collect water samples at our one-of-a-kind StREAM Lab.
- A \$100 gift buys lab materials for a student learning state-of-the-art techniques for processing biological materials in our Unit Operations course.
- A \$1,000 gift funds a team of seniors to work with faculty and practicing professionals on innovative solutions to contemporary engineering challenges as part of their capstone design course.



MAKE A GIFT TO BSE TODAY

You can securely make a gift by filling in our secure online pledge form! When you fill on the form, choose "College of Agriculture and Life Sciences", then click "select a fund", then scroll and click on "Biological Systems Engineering Department Annual Fund." Alternately, click "select an area" and begin typing "Biological Systems Engineering" in "Search for an area to support" and our department fund will be found via search.