Potential Barrett Scholars 2026 Projects

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The handshake job posting is at the following URL or QR code:

https://uvm.joinhandshake.com/stu/jobs/10625223

You can read more about the program at the following URL or QR code:

https://www.uvm.edu/cems/richard-barrett-scholars-program

This program is **ONLY** open to engineering students at UVM who are NOT graduating in Calendar year 2026 (Soph, Junior, Seniors)

Application Deadline March 2nd – Submit Application via Handshake

1. **<u>Project title:</u> Glass Beyond the Bottle: Life Cycle Assessment of Innovative Uses for Recycled Glass**

Project Description: Each year, materials recovery facilities (MRFs) generate significant quantities of glass that cannot be remanufactured into new containers, creating a large stream of recovered material known as processed glass aggregate (PGA). Although PGA can be used in various applications, its most suitable end uses and their environmental impacts remain poorly understood. This project aims to advance a more circular and sustainable materials system by evaluating alternative, high-value pathways for recovered glass using environmental life cycle assessment (LCA), a state-of-the-art method for quantifying environmental impacts across multiple categories. In partnership with the Casella Center for Circular Economy and Sustainability, the project will assess environmental tradeoffs of new PGA applications, explore design alternatives, and identify pathways that best reduce emissions, conserve resources, and extend material utility. Two Vermont MRFs that manage most of the state's recovered glass will provide real-world data for case-study modeling. This work supports broader circular-economy efforts and builds on an ongoing comprehensive LCA of PGA in roadway applications, offering a hands-on opportunity to apply environmental modeling techniques to real materials-management challenges and contribute to research that can inform more sustainable infrastructure and resource-recovery strategies.

Barrett scholar's role: Develop and compare LCA scenarios for alternative PGA applications using an environmental modeling tool (e.g., OpenLCA, SimaPro, Brightway), which can be chosen based on the student's interest (i.e., industry-standard LCA approaches or next-gen programming-based tools in Python). Data analysis extending existing life cycle inventory datasets. Collaborate with the Casella Center.

Other details: This project builds upon an ongoing LCA by the Casella Center on PGA for roadway applications. There is a PhD Student in Dr. Hinkelman's lab and a Research Specialist with the Casella Center available for data and mentoring support. Students motivated to learn computational tools are encouraged to apply.

Proposing faculty: Kathryn Hinkelman (Civil and Environmental Engineering): kathryn.hinkelman@uvm.edu; Eric Roy (Rubenstein School of Environment & Natural Resources)

2. Project title: Evaluating the Effectiveness of Electric Vehicle Incentive Programs

Project description: There is an ongoing need to evaluate electric vehicle (EV) incentive programs to understand whether and how to implement them to achieve efficient greenhouse gas (GHG) emissions reductions as the vehicle market and regulatory landscape shift. Encouraging greater uptake of battery electric vehicles and plug-in hybrid vehicles has been an important strategy for decarbonizing the transportation sector. Prior evaluations of the effectiveness of electric vehicle incentive programs has primarily relied on surveys and aggregate vehicle data and simplified assumptions about how households acquire and use vehicles. This project will build on recent research conducted by the UVM Transportation Research Center (TRC) that uses a unique spatially-detailed vehicle dataset to evaluate the performance of Vermont's electric vehicle incentive programs using actual household-level transportation GHG emissions before and after an incentive is acquired. This Barrett project will build on the TRC's prior work by evaluating whether simplified estimation methods can provide a comparable level of accuracy when evaluating incentive programs. If estimates differ materially it will also explore the drivers of differences and the direction of their effects on GHG emissions estimates. Insights from this research will be an invaluable resource for decision makers as they evaluate the performance of incentive programs in regions that lack the UVM TRC's detailed vehicle data.

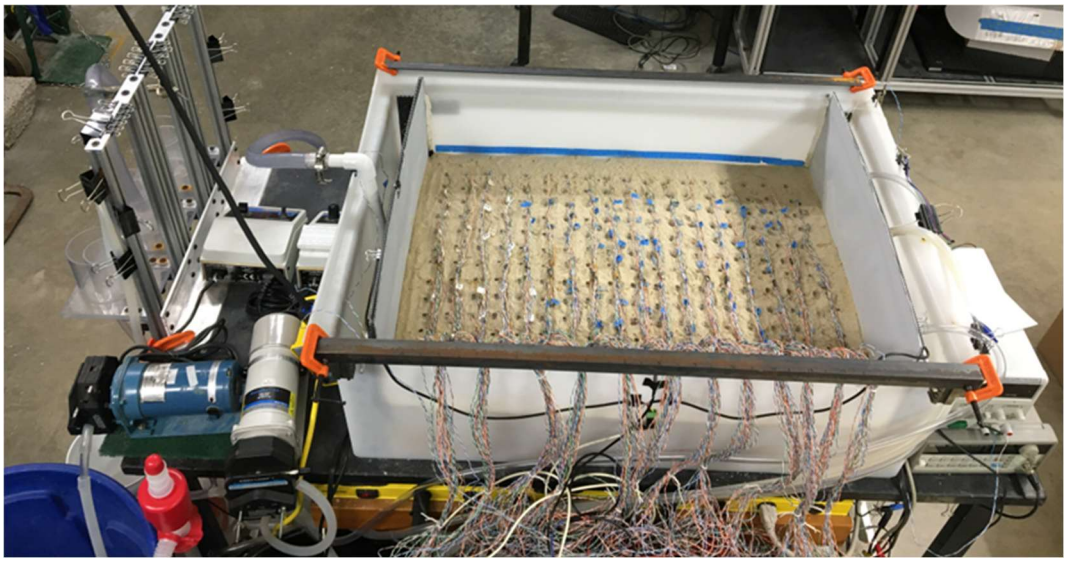
Barrett scholar's Role: The Barrett scholar will lead the analysis of incentive performance using simplified data sources, including national and regional aggregate data and through deriving state-level aggregate values using the TRC's detailed vehicle data. Some knowledge of programming and/or statistics is a plus, but the scholar can also learn these skills during the Barrett program.

Other details: This project is being conducted through the TRC. The Barrett scholar will work alongside other researchers currently evaluating electric vehicle use and charging patterns in Vermont. They will also work alongside a larger group of graduate and undergraduate students conducting research on sustainable and equitable transportation systems.

Proposing Faculty: Dana Rowangould: Dana.Rowangould@uvm.edu

3. Project Title: Fabrication and Functional Evaluation of Microelectronic Groundwater Contamination Sensors

Project Description: The project objective is to establish the viability and accuracy of micro-electronic sensors tasked with measuring and communicating groundwater contamination levels via wireless communication under field-like conditions. The required instruments and associated electronics will be fabricated in the laboratory, and their accuracy and robustness will be tested using a system like that illustrated below. Water will flow through sand from one end to the other of this system. The dissolved constituents will be added to the upstream water reservoir at one end of the model, flow from one end to the other, and be collected for disposal. Their modification along their flow path will be measured with the test equipment. A range of contaminant concentrations will be employed, and various flow patterns will be established by modifying the grain-size distribution to mimic conditions found in the field. The robustness and accuracy of the sensor system using various physically realistic soil-particle distributions and flow patterns will be assessed. The results will be analyzed and evaluated.



Barrett-Scholar Role: The Barrett Scholar will be responsible for the design and fabrication of an apparatus similar to the one shown here. This person will work with the authors of this proposal to modify and extend as necessary the pictured equipment. Experiments will be formulated and executed using the resulting equipment. Analysis of the resulting data will be done to inform conclusions regarding the effectiveness, accuracy, and viability of the fabricated sensors under a range of conditions mimicking field conditions.

Proposing Faculty: George Pinder: pinder@uvm.edu and Raju Badireddy: raju.badireddy@uvm.edu

4. Project title: Quantifying Erosional Flood Hazard Thresholds and Drivers to inform Flood Risk Communication and CBA Analysis

Project description: Flood inundation extent as provided by the National Water Model's current Flood Inundation Mapping (FIM) service provides warning forecasters, emergency managers, and the public with novel insight into the probable extent of flooding; however, it neglects important information necessary to communicate the risk to life and property from variable flood conditions. In addition to inundation, the speed and power of flood waters, their depth, and the duration of forecasted flooding conditions are all critical factors that determine outcome severity. Damage to transportation networks can be particularly dangerous and require significant cost to repair and rebuild. To minimize these impacts, best management practices can be implemented on state and local roadways including but not limited to stone lined ditches, road crowning, and right-sizing culverts. Some of these practices are also beneficial for the protection of downstream water quality. This project seeks to assess road network damage datasets from two major storms that occurred in July of 2023 and 2024 in Vermont to inform flood risk communication and the conduct of cost benefit analysis to inform ongoing management of road networks.

Barrett scholar's role: The Barrett scholar will support data cleaning, QA/QC, and analysis to support erosional thresholds for flood risk communication and the conduct of cost-benefit analysis. Independent data collection with Vermont town officials is also possible. Ability to clearly communicate with potential project partners and town officials, as well as the ability to work both independently and with a team, is required. Familiarity with model building, coding, statistics, and/or cost-benefit analysis preferred.

Other details: Barrett scholar will join a research team that includes several faculty across multiple departments and colleges at UVM, along with two postdocs and a graduate student.

Proposing faculty: Elizabeth Doran: elizabeth.doran@uvm.edu

5. Project title: Understanding Ecohydrology and Water Quality using Novel Sensor Networks

Project description: Functioning alluvial floodplains perform many ecosystem services, including sediment and nutrient storage, groundwater recharge, and the creation and maintenance of aquatic and riparian habitats, including forms that support plant and animal occurrence and adaptation. River corridors, including riparian and floodplain habitat areas, are considered important connective areas for the regional mobility of larger species between upland forest habitats as well as critical environments for species with smaller near-aquatic habitat ranges. Restoring and protecting ecosystem connectivity across the landscape at multiple scales increases the resilience of the natural communities and the ecosystem services they provide in the face of a rapidly changing climate. This project leverages a novel high-density network of large mammal occupancy observation sites within the Lewis Creek Watershed of the Lake Champlain Basin to test novel, printed water quality sensors to inform land use management for both water quality, flood, and ecosystem objectives as well as to better understand the acceptability of novel sensor networks in environmental applications.

Barrett scholar's role: The Barrett scholar will support field campaign activities to install and conduct regular monitoring of printed water quality sensors at established field site networks within the Lewis Creek Watershed. This will include communication with landowners, time spent outdoors with potential exposure to hazards and weather conditions, and data management and analysis to support overall project objectives.

Other details: The Barrett scholar will join a diverse team of engineering faculty and graduate students working to develop novel sensors and better understand their acceptability.

Proposing faculty: Elizabeth Doran, PhD

Email: elizabeth.doran@uvm.edu

6. Project title: Assess Climate Vulnerability at Quarai Spanish Mission Complex

Project description: This project will conclude previous work to develop a climate vulnerability assessment of the 17th Century Quarai Spanish Mission Church in New Mexico, a stone masonry structure constructed c. 1626. Quarai is part of the Salinas Missions National Monument and includes architecture associated with the mission period, cultural landscape features, and archaeological deposits associated with the mission and the ancient Indigenous communities living on the site. It retains connections to living descendant communities. The site is located in a region where climate change impacts are expected to include prolonged and more severe droughts, increased wildfire risk, more frequent extreme precipitation events, and reductions in current groundwater levels. This project will create essential baseline data to assess and monitor the mission church, identify vulnerabilities associated with climate change, and make recommendations to develop mitigation/adaptation strategies to be implemented by the Park. The Salinas project is part of a pilot conducted by the Vanishing Treasures Program of the National Park Service, intended to develop options for climate change preparedness that will apply to other southwest parks.

Barrett scholar's role: Participate in a site visit to archaeological sites in the park by the project team, acquire climate data for the region, conduct statistical analyses of changes in rainfall extremes over time, and assist in deploying sensors to acquire site-specific data.

Other details: This project will be conducted in partnership with the Department of Anthropology at the University of New Mexico (UNM), which is in the third year of a 3-year project in the Monument. In addition to the Barrett Scholar, the project will involve students (undergraduate and graduate) from UNM.

Proposing faculty: Arne Bomblies abomblie@uvm.edu and Doug Porter: douglas.porter@uvm.edu

7. Project title: Climate Vulnerability and the Preservation of Archaeological Sites and Landscapes in Canyon de Chelly National Monument, Part II

Project description: Canyon de Chelly National Monument, an area co-managed by The Navajo Nation and the National Park Service encompass one of North America's longest continuously inhabited landscapes. Currently, ancient structures and archaeologically rich deposits are threatened by increasingly intense rainfall, which is causing extreme flash floods. Flash floods are encroaching on a protected structure (Antelope House), threatening to undermine its outermost walls. The project involves hydraulic modeling to mitigate the threat by reducing the erosive power. Moreover, heavy rains have accelerated erosion in dry gullies ("arroyos") that are exposing and washing away archaeologically rich middens near other sites, including a large settlement at Mummy Cave. The project entails monitoring and modeling of extreme rainfall and erosion processes at the site, with the use of a ground-based lidar scanner in the field to measure erosion rates, and the development of a hydraulic model (partially completed) for use in testing mitigation scenarios such as optimal placement of small dams or minimally intrusive engineered log jams, both of which reduce erosive power. The project offers in-depth exposure to active archaeological work at the Mummy Cave site, as well as hands-on fieldwork and computational modeling.

Barrett scholar's role: Participate in site visits to archaeological sites in the park by the project team, acquire climate data for the Chuska Mountains and canyon region, retrieve data from the sensors deployed in 2025, make repeat scans using the UVM-owned ground-based lidar instrument to quantify erosion rates, and fine-tune the previously-developed hydraulic model to optimize the location of erosion-mitigation structures.

Other details: This project will be conducted in partnership with the Department of Anthropology at the University of New Mexico, which is in the fifth year of an 8-year project in the Monument. In addition to the Barrett Scholar, the project will involve Anthropology students (undergraduate and graduate) from UNM, an engineering student from UC Berkeley, and an intern with Indigenous artists.

Proposing faculty: Arne Bomblies abomblie@uvm.edu and Doug Porter: douglas.porter@uvm.edu

8. Project title: Space Weather Monitoring and Prediction for Planetary Health

Project Description: Modern society is increasingly reliant on electrical and communications infrastructure that is vulnerable to disruptions caused by adverse space weather. Additionally, earth-based weather and radiation depend on space weather. This study would have the student study space weather, link into available databases, and possibly build earth-based sensors that detect the effects of space weather.

Barrett scholar's role: Data analysis, computer modeling, possible sensor fabrication and networking.

Other details: Students from virtually every field in CEMS could participate.

Proposing faculty: Dryver Huston: dhuston@uvm.edu

9. Project title: Computer Chip Packaging for Reduced Environmental Impact

Project Description: Microelectronics, i.e. computer chips, continue to play an important role in modern society. The advancement and demand for AI systems is driving an extraordinary growth in computer hardware and the associated environmental impact, including heat generation, energy consumption and the use of deleterious materials. This project would be to examine computer chip packaging architectures for reduced energy and environmental impact. A focus may be on 3-D heterogeneous packaging as it increases performance, increases heating issues, and offers potential opportunities for environmental mitigation. The project would involve numerical modeling, experiments and possibly interaction with the semiconductor industry.

Barrett scholar's role: Data analysis, computer modeling, possible experiments.

Proposing faculty: Dryver Huston: dhuston@uvm.edu

10. Project title: Self-Healing Concrete with Advanced Admixtures

Project Description: The use of concrete is one of the biggest generators of carbon released into the atmosphere, 8% of annual worldwide output. A multi-year research effort at UVM has investigated concrete mixes with low-carbon footprints that have durability and cost comparable to conventional Portland Cement concrete. This research would examine the use of advanced admixtures to promote self-healing, control shrinkage, stress, microstructure and durability of cement. Active yarn fibers, ground glass pozzolans, and Portland Limestone Cements are among the possibilities..

Barrett scholar's role: This project involves experiments, possibly numerical modeling, and interactions with the concrete industry

Proposing faculty: Dryver Huston: dhuston@uvm.edu

11. Project title: Evaluating Basin-scale Effectiveness of River Restoration Projects to Achieve more Flood Resilient Communities

Project Description: Under a changing climate, intense precipitation events are becoming more common, such as the July 2023 and 2024 storms that flooded Vermont communities. Restoration of rivers and floodplains offers one important pathway to build flood resilience for communities, providing opportunities to store floodwaters and attenuate flood waves, thereby decreasing flood levels and damage to downstream buildings, roads, and other critical infrastructure. However, many questions remain, such as: *How much upstream floodplain reconnection is needed to lower flood levels and reduce damaging impacts in a downstream community? At the river basin scale, where are the optimal locations to implement restoration? How do multiple restoration projects perform in aggregate to influence flood-wave propagation through the river network?*

This Barrett internship project will provide technical support to ongoing research in Vermont that is exploring strategic and effective basin-scale planning for improved community flood resilience. At the same time, the chosen Barrett scholar will have the

opportunity to develop a research question(s) and sub-scope of their choosing, focused on hydraulic modeling or geospatial analysis at site or regional scales.

Barrett scholar's role: Identifying and prioritizing a list of flood mitigation projects for the Winooski River basin, relying on an existing web-based decision support system and leveraging ongoing project scoping efforts already underway in many of the target communities. Supporting hydraulic models being developed for the basin (by others) by modifying digital elevation maps in GIS to simulate watershed restoration projects including floodplain lowering, berm removals, dam removals, and property buyouts. Analyzing geospatial data sets to develop statistical models linking watershed and river network characteristics to flood attenuation potential. Some experience with GIS and programming languages is required, and the Barrett intern will build their proficiency in data science skills during this role, including learning statistical analyses and data visualization techniques.

Other details: The chosen Barrett intern will engage with an interdisciplinary team of graduate students, post-docs, research staff and faculty with specialties in river science, engineering, and machine learning. This role will also involve networking with Vermont-based engineering firms and outreach to community planners, watershed groups, and members of Long-Term Recovery Groups that formed after the 2023-2024 Vermont flood events.

Proposing faculty: Kristen Underwood: Kristen.Underwood@uvm.edu

12. Project title: Assessing Post-wildfire Soil Recovery

Project description: This project is researching how forested hillslopes recover after destructive wildfires by leveraging advanced modeling informed by a low-cost and long-term sensing platform for in situ soil measurements.

Barrett scholar's role: The Barrett scholar will work directly with a PhD student to conduct tests to ascertain a soil's pre-/post-burn stability and ability to hold moisture. In addition, the scholar will gain experience with a wireless moisture sensing approach that leverages an embedded, passive transponder. The student will thus gain experience that crosses disciplinary boundaries.

Other details: This is an ongoing project being supported by the National Institute of Food and Agriculture and is a collaboration with Oregon State University and the University of South Florida. The work has already involved CEMS REUs from electrical, environmental and mechanical engineering, so we feel confident that we can set appropriate expectations for and provide quality mentoring to the Barrett scholar. The Barrett scholar will work directly with a PhD student who is completing their third year on the project.

Proposing faculty: Jeff Frolik: jfrolik@uvm.edu, and Mandar Dewoolkar: mdewoolk@uvm.edu

EXTERNAL INTERSHIP OPPORTUNITIES

US Army Cold Regions Research and Engineering Lab, Hanover, NH (Internship)

13. Project title: Cold-hardening and Sensitivity Analysis of Distributed Fiber-optic Sensing

Project description: Distributed fiber-optic sensing (DFOS) systems are used frequently in cold-weather conditions; however, the sensitivity of these systems to cold temperatures is poorly understood, and depends on the specifics of the cable and sensing system employed. This project would entail testing of various DFOS configurations in the CRREL cold rooms at temperatures down to -40 C. The project would involve the design of a test bed that incorporates different substrates (e.g., soil boxes, variable grain size containers, etc), data collection, and analysis to demonstrate the sensitivity of DFOS systems as a function of temperature. The project would develop any design recommendations yielded by the analysis.

Barrett scholar's role: The Barrett scholar(s) will design the experiment within the cold chambers, conduct the testing, analyze the resulting data to determine system sensitivity to energy impulses, and recommend design changes to ensure high system fidelity in cold and extreme environments. If time allows, the Barrett scholar may assist with the system deployment near the summit of Mt. Washington to initiate a year-long collection.

Other details: The Barrett scholar will work alongside Army researchers and in state-of-the-art cold-testing facilities. Opportunities to continue research beyond the support of the Barrett Foundation may arise. Scholar must be available to travel to Hanover, NH.

Proposing faculty: Dr. Adrian Doran and Dr. Meghan Quinn, US Army Cold Regions Research and Engineering Lab, Hanover, NH

Email: adrian.k.doran@usace.army.mil

14. Project title: Design, Develop, and Fabricate a Vibro-acoustic Source

Project description: Distributed Acoustic Sensing (DAS) systems measure vibration strain along a fiber optic cable. Assessing and comparing performance between arrays requires a calibrated source. Current techniques include using a standardized drop hammer. However, this is an impulse source and doesn't capture a complete picture of array performance. This project is a design, develop, and fabricate a source that can perform calibrated seismic and acoustic frequency sweeps / chirps powerful enough to stimulate the array. The source must be shippable, portable, and standalone.

Barrett scholar's role: The scholar will work alongside Army researchers to develop a standardized source. The scholar will be responsible for system design, fabrication, and testing.

Other details: Scholar must be available to travel to Hanover, NH.

Proposing faculty: Dr. Meghan Quinn: meghan.c.quinn@usace.army.mil and Dr. Adrian Doran, US Army Cold Regions Research and Engineering Lab, Hanover, NH

PurposeEnergy, Middlebury, St. Alban's, or Burlington, VT. (Internship)

15. Project Title: Supporting Anaerobic Biotechnology and Renewable Energy Generation and Optimizing Renewable Biosolids from Food Waste Anaerobic Digester

Project Objective: Outline quantitative, process variables that optimize renewable biosolids production (e.g., FeCl3 dosing, TSS concentration).

Project Description: Biosolids are generated during anaerobic digestion. Maintaining proper solids concentration in the reactor is essential for optimal digester microbiome health, biogas production, methane yield, and overall process stability. Dewatering equipment extracts and concentrates solids from digestate into biosolids, which are then used as soil amendments or fertilizer. Chemical flocculation and coagulation are required prior to mechanical dewatering, and proper chemical balance directly affects floc quality and dewatering efficiency. Overuse of chemicals reduces equipment efficiency and increases economic costs and environmental impacts, while underuse results in low biosolids concentration that adds costs and operability challenges. Optimizing the balance between chemical dosing and mechanical dewatering improves biosolids quality, reduces chemical consumption, and enhances reactor performance.

Barrett scholar's role: The student will support daily operations to learn basic operations in anaerobic biotechnology and renewable energy generation. With a trained technician, the student will also develop testing plans, observe the dewatering process while adjusting equipment parameters, as well as sample, conduct fundamental water quality tests, and analyze data. By balancing polymer dosage, ferric chloride, and equipment settings, the student will analyze parameter changes to optimize biosolids yield using jar testing, solids analyzers, and real-time machine data.

Other Details: Study will be conducted at the PurposeEnergy facility in Middlebury, St. Alban's, or Burlington, VT. The student will be supervised and collaborate with PurposeEnergy's Engineering and Operations teams.

Project Contact: Director of Human Resources, Katelyn Auclair: katelyn@purposeenergy.com

16. Project Title: Ultrafiltration Optimization of Food Waste Anaerobic Digester Effluent

Project Objective: Support anaerobic biotechnology and renewable energy generation and outline quantitative, process variables that optimize UF operations (e.g., throughput, influent and effluent TSS/pressure).

Project Description: Ultrafiltration is used at PurposeEnergy to remove water from anaerobically digested biosolids. Producing consistently high-quality discharge water is essential for maintaining reactor levels, stable feed rates, and steady biogas production, which supports continuous renewable power generation by the CHP system. As a tertiary treatment step, ultrafiltration separates treated water—referred to as permeate—through membrane modules. Permeate production is controlled by balancing pressure and flow rates. Optimizing permeate output across

each membrane ensures consistent system performance, reduces energy consumption, and extends membrane life.

Barrett scholar's role: The student will support daily operations to learn basic operations in anaerobic biotechnology and renewable energy generation. The student will also study real-time pressures and flows to develop a model of current system production. By adjusting system parameters, the student will track changes and report which variations produce positive or negative impacts on system performance.

Other Details: Study will be conducted at a PurposeEnergy facility in Middlebury, St. Alban's, or Burlington, VT. The student will be supervised and collaborate with PurposeEnergy's Engineering and Operations teams.

Project Contact: Director of Human Resources, Katelyn Auclair: katelyn@purposeenergy.com

17. Project Title: Utilization of Struvite for Nitrogen (N) and Phosphorus (P) Recovery

Project Objective: Support anaerobic biotechnology and renewable energy generation and outline quantitative, process variables that maximize P removal in anaerobic biosolids (e.g., mixing, chemical concentrations).

Project Description: Struvite (Magnesium Ammonium Phosphate) is a mineral that often deposits in pipes, pumps, and equipment in wastewater treatment systems. Traditionally considered a nuisance, recent innovations have demonstrated its potential for efficient removal of ammonia (NH_3) and phosphate (PO_4) from wastewater.

When magnesium compounds such as MgO, $MgCl_2$, or $Mg(OH)_2$ are added to wastewater containing sufficient NH_3 and PO_4, struvite can be precipitated in a controlled manner, effectively removing these nutrients. The precipitation process depends on factors such as reaction time, magnesium dosage, pH, temperature, and mixing conditions. Precise control of these parameters is essential for successful struvite production. Previous jar testing by PurposeEnergy yielded mixed results under varying conditions, indicating the need for further optimization.

The Barrett scholar will support daily operations in order to learn basic operations for anaerobic biotechnology and renewable energy generation.

Task 1: Assess soluble PO_4-P removal in the sludge stream by adding magnesium compounds. This will allow struvite to precipitate in the sludge and be removed during dewatering/thickening, reducing anaerobic reactor effluent phosphorus (a key eutrophication-inducing constituent when discharged to receiving water bodies).

Task 2: NASA has developed a patented method (Patent No. 10,676,374) for recovering NH_3 using struvite. In this process, pure struvite solids are heated to release NH_3, converting struvite into magnesium phosphate ($Mg_3(PO_4)_2$). The released NH_3 vapor is captured and condensed to produce an aqueous ammonia solution—a valuable organic fertilizer. The resulting $Mg_3(PO_4)_2$ solids can be reused as an absorbent to treat additional wastewater, enabling a regenerative cycle for NH_3 capture and recovery.

Barrett scholar's role: For Task 1: work with senior engineers to develop test plans and build lab-scale mixed reactors to produce struvite in sludge. For Task 2: first produce struvite with Tribrid Bioreactor™ effluent by adding Mg, then produce clean struvite. Then the captured struvite will be placed in a custom steel filtration apparatus and heated to release NH_3. Magnesium phosphate will be recovered and reused in loop cycles. NH_3 vapor will be captured and produce aqueous ammonia solution.

Other Details: Study will be conducted at a PurposeEnergy facility in Middlebury, St. Alban's, or Burlington, VT. The student will be supervised and collaborate with PurposeEnergy's Engineering and Operations teams.

Project Contact: Director of Human Resources, Katelyn Auclair: katelyn@purposeenergy.com

Edesia, North Kingstown, RI (Internship)

18. Project title: Commissioning and Start-Up of Humanitarian Aid Facility Expansion for Operational Readiness

Project Description: Edesia is a Rhode Island–based nonprofit social enterprise that manufactures ready-to-use therapeutic and supplementary foods used in the treatment and prevention of malnutrition worldwide. Working in partnership with international humanitarian organizations, governments, and NGOs, Edesia produces nutrient-dense, shelf-stable products that support emergency response and long-term nutrition programs in vulnerable communities. This project supports the commissioning and start-up of an expanded humanitarian aid facility designed to increase production capacity, reduce costs, and improve logistical efficiency. The expansion includes additional storage, new production lines, and enhanced rail access to strengthen supply chain performance and support the delivery of affordable nutritional products.

Barrett Scholar's Role: The Barrett scholar will be responsible for assisting the engineering team with the commissioning of the new process system. This will include hands-on equipment start-up and commissioning. Additionally, once the project enters the qualification and validation phases, the scholar will be responsible for data analysis to support the final approval of the new process.

Qualifications:

- Pursuit of a bachelor's degree in engineering.
- Minimum G.P.A. of 3.0 out of 4.0
- Proficient computer skills, including spreadsheet application(s)
- Experience in 2D and 3D modeling software (i.e., CAD software such as Autodesk AutoCAD & Inventor, SolidWorks, SketchUp, etc.)
- Basic knowledge of engineering and manufacturing concepts
- Effective organizational and time management skills
- Ability to work on multiple cross-functional teams in and out of the manufacturing plant
- Proficient in technical writing, good documentation skills
- Troubleshooting and problem-solving ability

Housing option if needed:

- Location: URI Townhouses (approximately 20 minutes from the factory)
- Accommodation: 3-bedroom townhouse (shared), with a private bedroom
- Dates: May 23 – August 22

Cost & Responsibilities

- Edesia will connect the intern with the landlord, but is not responsible for coordinating housing logistics.
- The intern is responsible for:
    - Coordinating and signing the rental agreement
    - Paying the security deposit (equal to one month's rent)
    - Paying for all utilities except water (gas, electric, internet)

Additional Notes

- No transportation is provided.
- This project, in addition to the normal $7,500 stipend, will have a $2,600 housing allowance.

Project Contact: Senior Process/Project Engineer, Ken McConnell: KMcConnell@edesianutrition.org

ABOUT THE ORGANIZATION: Edesia is a non-profit social enterprise on a mission to end global malnutrition. We manufacture and distribute life-saving, ready-to-use therapeutic foods—such as Plumpy'Nut and Nutributter—to treat and prevent malnutrition among children and mothers in the world's most vulnerable and hard-to-reach communities. Through strong partnerships with leading humanitarian organizations, NGOs, and Ministries of Health, we ensure our products reach those who need them most—even in the midst of the most complex and challenging humanitarian emergencies.
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