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VIRGINIA TECH

Virginia Tech Council on Vibrant Virginia Approves Five Projects Focused on Addressing Challenges Across the Commonwealth

Vibrant Virginia began in 2018, working to foster collaboration between the university and external partners, building connections between and within urban and rural communities, and striving to create a Virginia full of economic and social vitality.

The Virginia Tech Council on Vibrant Virginia invited Virginia Tech faculty in June 2021 to submit proposals for the Vibrant Virginia Impact Fund.

In October 2021, the Council approved five projects that address a range of community and economic development concerns facing Virginia, with focuses that include health and community well-being and talent development and education.

The funding of these projects will advance one of the goals within Virginia Tech's Advancing Beyond Boundaries strategic plan, which is to increase the number of Vibrant Virginia projects by 2022, enhancing Virginia Tech's regional impact.

Analyzing and Improving Vaccine Uptake among Latinx Populations in Southwest Virginia, led by Julie Gerdes from the Department of English, will address disparities in vaccination rates in the Latinx communities of Virginia. As of September 3, 2021, Latinx people accounted for 15.1% of Virginia's COVID-19 cases, despite making up 9.8% of the state's population. This project will partner with Casa Latina, a non-profit organization that serves the Spanish-speaking community in the Roanoke Valley, to conduct participatory action research on communication about COVID-19 and vaccination in local Latinx communities. By working alongside community members and framing vaccination as part of participants' everyday experience, the project hopes to address fears and misinformation with a combination of small-group listening sessions, stakeholder workshops, and a larger health promotion event.

Comprehensive Community Capacity Building Experiential Learning Model, led by Cornelia Deagle from the Department of Population Health Sciences, will test an experiential learning model for public health students through consistent ongoing community-university partnership. The project will determine if the model can effectively combine the three goals of academic public health programs – educating students, improving the health of communities, and supporting expert faculty. The proposed model will be implemented through the course "Methods of Community Engagement." During this course, students will read, learn, and discuss key public health issues in the classroom and apply them to the communities in which they are placed. Working in communities will allow the students real-life and real-time exposure to the challenges and opportunities that impact the health of residents. Through written reflections, students will discuss their opinions, perspectives, and experiences during the course. The opportunity to integrate readings, discussions, fieldwork, and life experience will allow students to explore public health in an open and safe environment and build professional competencies while building capacity of communities to improve their health and well-being. The project will be in partnership with Kim Butterfield and Laura Reasor from Virginia Cooperative Extension, who are located in Roanoke and Pulaski respectively.

Recovering Critical Elements from Coal and Converting Coal to Advanced, Critically Needed Battery Materials, will be led by Feng Lin from the Department of Chemistry, with co-PIs Wencai Zhang of Mining Engineering and Chixia Tian of Academy of Integrated Science. The project will develop alternative uses of coal in two ways: by recovering critical elements from the mineral matter of coal, such as rare earths, cobalt, and manganese, and by using coal to create lithium and sodium ion batteries. Coal production reached 706.3 million short tons in the United States in 2019. Most of the produced coal is used for electricity generation, which inevitably increases the carbon footprint and contributes to climate change. On the other hand, the coal industry significantly contributes to the economy of the United States, particularly states with large coal reserves, including Virginia. This project will address this dilemma by using coal to establish a secure supply of critical elements and fully utilizing it for energy storage without creating carbon waste.

Supporting School-Industry Partnerships and Career Exploration in the New River Valley, led by Jacob Grohs from the Department of Engineering Education with graduate research assistant Danny Mathieson, will analyze the current status of the school-industry partnerships in the region, explore innovative strategies to prioritize workforce development throughout COVID-19, and strengthen regional infrastructure to prioritize education and career outcomes for rural youth. In the initial outreach phase, the team will survey regional stakeholders such as teachers, STEM coordinators, internship coordinators, nonprofit leaders, and industry professionals to understand the effects of COVID-19 on STEM school-industry partnerships during the 2020-2021 and 2021-2022 school years. School-industry partnerships help students and teachers learn about STEM content and careers, and even students who do not actively pursue STEM careers will have learned transferable skills. The project will be in partnership with the New River Valley Regional Commission and seeks to expand that work to strengthen connections with the United Way of Southwest Virginia and Virginia regional school superintendents.

Improving the Resilience of Stormwater Treatment in Fredericksburg, led by David Sample from the Department of Biological Systems Engineering, will increase the resilience of stormwater infrastructure in Fredericksburg, Virginia while improving downstream water quality. The project team will collect data on runoff from urban areas in the Fredericksburg vicinity; publish datasets, scientific articles, and factsheets; develop and calibrate process models; and create videos and material for outreach. Both undergraduate and graduate students will assist with the project. Managing runoff from urban development is a daunting challenge for many Virginia communities. Development increases impervious surfaces, including buildings and roofs, roads, sidewalks, driveways, and parking areas, leading to increased runoff and transport of pollutants downstream. These impacts can be addressed using many small infiltrative stormwater treatments upland or a few large storage-based practices downstream. Fredericksburg provides an ideal location to explore tradeoffs between upland and downstream controls. This project potentially provides a reproducible example of sound stormwater planning.