

Energy and environmental sustainability research propelled by funding from Center of Excellence



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By [Sandhya Iyer](#), Staff Writer
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The Syracuse Center of Excellence recently selected a group of research projects related to innovations in energy and environmental sustainability to receive grant funding.

All the research projects are directed by faculty from Syracuse University and the State University of New York College of Environmental Science and Forestry. To be selected for the grants, faculty had to turn in a proposal explaining how their research related to improving environmental quality and clean energy systems and describe the procedures they would follow if they received the grant.

The projects must be completed by June 30, 2017. Most of the research projects will include opportunities for both undergraduate and graduate students on campus. Funding amounts ranged from \$10,000 to \$25,000, according to a request for proposals page on the CoE website.

Professors who were granted funding automatically joined the Faculty Fellows program at SU, a group started in the 2015-16 academic year that is composed of faculty members whose research interests align with the priorities of the Center of Excellence, said Ed Bogucz, the Center of Excellence's executive director.

A Faculty Fellow commitment lasts three years but can be renewed after, based on whether the faculty member wishes to continue.

Bogucz said the group has been "very pleased with the engagement of the faculty members."

One recipient of the CoE grant is Charles Driscoll, a professor of environmental systems who studied the effects of air pollutants on Syracuse's urban landscape. His research focuses on both measurement of mercury in the atmosphere and precipitation chemistry in the city.

The CoE was built on a brownfield, a former industrial site that has been contaminated, Driscoll said. When the CoE was improving the landscape, they removed the contaminated soil. Driscoll and his team measured the mercury in the air before and after the soil was removed. The removal resulted in a nearly 40 percent decrease of the concentration of mercury in the air.

Driscoll is also studying precipitation chemistry in downtown Syracuse. He previously researched the effects of acid rain in rural areas such as the Adirondacks Mountains, but said the chemistry greatly varies between the city and its surrounding regions.

"I'm interested in how air pollution impacts ecosystems," Driscoll said.

Both fields of research could have significant impacts on Syracuse residents. The rainwater that runs off the streets could potentially contaminate other bodies of surface water. Green infrastructure such as green roofs and urban gardens could absorb the polluted water.

Air pollution can have direct negative effects on an individual's health and the health of the ecosystem, Driscoll added.

"If you think about the way that we approach environmental monitoring, we measure data usually through one point in time," said Christa Kelleher, an assistant professor of earth sciences and civil engineering who also won an award from the CoE.

Kelleher will use drones to study patterns of stream temperature in Onondaga Creek. She will start looking at longitudinal water temperature patterns of the creek near the forests and will continue until reaching downtown Syracuse.

Stream temperature should change in a predictable way, Kelleher said. As it approaches urban areas, the water should get warmer. She wants to test the theory in the central New York region.

“We basically have a living laboratory around us,” Kelleher said.

Kelleher plans to test flight the project toward the end of November or the beginning of December. She also wants to look for patterns in snow melts and through the summer to see how the stream temperatures change in correlation to fluctuations in the season and climate, she said.

She also said she wants to test the tools and see how accurate her measurements are by eventually expanding the project to other places in upstate New York. Many of the other areas do not have any kind of measurements, and the drones will be helpful in collecting them, she added.

She also hopes to collaborate with other faculty on the research, she said.

“Finding resources at institutions is always kind of a challenge, and the fact that these resources exist (at SU) for faculty to use is really incredible,” Kelleher said.