

EMPOWER

WINTER 2019-20

EMPOWER: Excellence in Training and Research Across Disciplines



From the Director

2019 has been an eventful year for EMPOWER. Importantly, we have had eight trainees complete their graduate programs (E. Baker PhD EAR, C. Burgess MS EAR, L. DeMott PhD EAR, G. Millard PhD CIE, R. Sessanna MS EAR, A. Stathis PhD CHE, L. Worthen MS CIE, C. Zheng PhD MAE). Congratulations to our graduates and best wishes for their future endeavors.

Our trainees have been busy in 2019, including participating in the EMPOWER Water Seminar, professional development activities, research, internships and presentations of their research at professional meetings and publication in journals. We completed a successful domestic field class in August involving 13 students. The first week was held at the Hubbard Brook Experimental Forest, NH. Trainees conducted an experiment involved addition of nitrate to a stream, and learned stream discharge, lake water quality profiling and resistivity measurements. Students conducted field measurements and data analysis, and presented their results at the end of the week. Additional activities included tours of climate change experiments and instrumentation at Hubbard Brook as well as a tour of the meteorological observatory at nearby Mt. Washington. A highlight of the week were group dinners prepared by teams of trainees.

The second week of the field class occurred in Central New York. This session was led by Laura Lautz and Chris Junium and included a stream nitrate experiment in Meadowbrook and profiling in Green Lake. These measurements were compared with the observations made at Hubbard Brook.

I want to express our appreciation to EMPOWER's founding director, Laura Lautz. Laura successfully developed and submitted the proposal for EMPOWER in the first cohort of NRTs funded by the NSF. She has been the heart and soul of EMPOWER, working tirelessly with students and faculty to build a truly model program among all the NRTs across the US. Although Laura has left Syracuse University to accept a Program Director position at the NSF, she's had a tremendous impact on all the trainees who have participated and seamlessly guided this program since its inception. Thank you, Laura.

Charley Driscoll
Director, EMPOWER



Charley Driscoll, Julio Beltran and Shaidu Shaban discuss a stream sampling location during the EMPOWER Domestic Field Class in Hubbard Brook, NH, August 2019.

ON THE COVER: Trainees check water depth and velocity during the EMPOWER Domestic Field Course 2019 at Hubbard Brook Experimental Forest in New Hampshire this summer.

Q&A with external advisor Gillian Dunlop

Tell us a little bit about your current position. How did you get this job?

I'm a Risk Assessor at Stantec Consulting Ltd. in the Environmental Services division. My job includes evaluating human health and ecological risks at contaminated sites. The job requires scientific knowledge as the foundation, but also incorporates project management, client relations and an understanding of relevant environmental regulations. The work includes projects in mining, oil and gas, manufacturing, power and real estate development. I am based in Mississauga, Ontario, Canada, but have worked on projects from the Yukon to Brazil, British Columbia to New Brunswick. One of the aspects of consulting that I enjoy is the range of projects that I work on, and the opportunity to work as a team and learn from colleagues.

I started my career as a Risk Assessor after completing my Ph.D. and I transitioned to Stantec through the network of contacts I made working in the industry.

What might readers not know about your background? Anything unexpected?

My educational background is environmental science and chemistry. I've been working in environmental consulting since I graduated with my Ph.D. from the University of Toronto. It's a fairly straight and narrow career path. My interest in the environment started with a science project when I was in grade four.



What sparked your interest in participating in the EMPOWER NRT team?

At the time I was finishing graduate school, I wasn't aware of the different type of jobs available for someone with my academic background. Now having a good understanding of the industry, and the types of skills that are valued, I'm

hoping to pass on that knowledge to the next generation of environmental scientists.

What do you hope to see as outcomes for the EMPOWER program?

Graduates who have gathered the skills they need, both technical and otherwise (e.g., communication, project management), to succeed in the workforce.

As a PhD scientist yourself, what advice would you give our EMPOWER trainees?

There are many different career paths available to a Ph.D. scientist; get to know the different types of jobs, speak to individuals about their day-to-day tasks, and try to find the best fit.

What do you do for fun?

I like to spend time outside with my three-year-old daughter, taking nature walks in the fall and making snow angels in the winter. I enjoy experiencing our natural environment through a child's eyes.

EMPOWER Shines at NSF NRT National Meeting



Nearly 300 graduate students, faculty and professionals (program managers and evaluators) from more than 90 NRT's and 60 institutions attended the 2019 National Science Foundation Research Traineeship Annual Meeting hosted by the IDEAS NRT program at Northwestern University from September 25 through 27.

EMPOWER was represented by Co-PIs Professor Christa Kelleher and Associate Provost Chris Johnson, and Program Manager Annie Pennella. Two EMPOWER trainees also attended, Julianne Davis and Ruta Basijokaite. Tashera Bolds Gale from Higher Ed Insight, our programs external evaluator, joined us at the meeting as well.

The goals of the meeting were to share both innovative and best practices, and to have candid discussions about how to improve NRTs across the country. The 3-day meeting consisted of poster sessions, panel discussions, and lightning talks. A fun kick-off event featured the newest program grantees and opportunities for networking.

The poster sessions were devoted to the NRT programs themselves. Instead of showing latest data sets, programs were given the chance to display their teaching strategies, achievements and learning moments while also providing a chance to review the same from other research programs.

Lightening panels and talks focused on different pedagogic topics of interest such as training in leadership skills and science communication, workforce entry preparation, attracting and retaining underrepresented trainees and program promotion. Not all content was pre-arranged. Event participants had the opportunity on the second day to discuss and select topics for self-organized final workshops, the findings of which were presented to all conference attendees.

Many researchers and students were able to connect and learn from one another during the NRT conference, providing new insight and new ideas to take home to their own programs.

Faculty Spotlight

CHRISTA KELLEHER

EMPOWER faculty member Professor Christa Kelleher first joined the Syracuse University faculty in January of 2016 as a member of the departments of Earth Sciences and Civil and Environmental Engineering. Christa is an enthusiastic educator, researcher, and mentor who investigates relationships between watershed form and function in both natural and urban settings. Many of her former and ongoing research projects have included sites within Syracuse and across New York State.



Christa maintains a vibrant group of MS and PhD students from across the departments of Civil Engineering in the College of Engineering and Computer Science and Earth Sciences in the College of Arts and Sciences. She takes pride in training students to approach interdisciplinary scientific questions in collaboration with city planners, chemists, ecologists, and sociologists. In the past three years, she has trained and graduated six MS students across Civil Engineering and Earth

Science. Her three most recent MS graduates, Riley Sessanna, Crystal Burgess, and Lucie Worthen, were all EMPOWER trainees who are currently working in consulting firms. Christa co-taught the Water seminar this fall semester.

For her efforts in undergraduate and graduate classrooms, Christa was awarded the 2019 Meredith Excellence in Teaching Award, the most prestigious award given for teaching at Syracuse. Her nominators wrote of her, "It is unsurprising that Professor Kelleher's inclusive teaching philosophy, warm, outgoing and welcoming personality and superb work ethic have resulted in an accomplished teaching portfolio that receives some of

the best evaluations in the Department of Earth Sciences, not just in a single class but across the board."

Kelleher earned a B.S. in Civil Engineering from Lafayette College and a MS and PhD in Civil Engineering from the Pennsylvania State University. Her research is currently funded by the National Science Foundation and the United States Department of Agriculture.

Trainees Expand Skills, Explore Career Paths with Internships

The "Career Pathways Experience" program element requires that EMPOWER trainees complete an internship of their own design. This element is often viewed with some apprehension by trainees when they first join EMPOWER. As students progress through the program, however, confidence builds and they begin to "think big" about how to fulfill this key training component. The results of their ideas and efforts continue to impress!



Lachlan Wright completed an intensive three month internship at Chevron, Inc. Houston, TX



Micah Wiesner visiting a USGS long-term climate change research site outside Moab, Utah. Wiesner interned at a USGS research facility analyzing desert soil carbon fixation through laboratory titrations.



Geoffrey Millard loading samples into the custom built Fourier Transform Ion Cyclotron Mass Spectrometer (FTICR-MS) during his Career Pathways experience at the Pacific Northwest National Laboratory in Richland WA.

Trainee Spotlights

LAURA MARKLEY

EMPOWER has inspired me to take my career and graduate training in directions I would never have anticipated and given me the opportunity to foster friendships and a sense of community during my graduate training. EMPOWER has a focus on collaborating outside of our disciplines, communicating our science to scientists in other fields and non-scientists, and exploring careers outside of academia.

A seed grant from EMPOWER helped me to start my own project in a new discipline, studying endocrine disruptors from plastics, and collaborate

with scientists from the Henderson lab in the Syracuse Biomaterials Institute. This ongoing project and collaboration has exposed me to methods used in toxicological research that will prove invaluable in my field. The process of writing this grant and learning about the

grant proposal process in our weekly water seminars prepared me for submitting a larger grant proposal to the New York State Water Resources Institute funded by the USGS, which was successfully funded. This project will quantify microplastic abundance in Central New York freshwater ecosystems.

In addition to my research, EMPOWER has motivated me to seek out other professional opportunities to grow my skills as a science communicator on social media



(@wastefreephd) and otherwise. Last year, I was part of the Sustainable Materials Management Stewards program with the Syracuse University Center for Sustainable Community Solutions (SU-CSCS) as part of EMPOWER's career pathway experience. This opportunity allowed me to hold workshops at local and rural libraries, clean-up events in Westcott and downtown Syracuse, and an info booth at Athleta to discuss waste reduction and plastic pollution. These experiences helped me better apply my research out of the confines of academia and into a realm that is applicable to the health

and betterment of our community and society at large. The process of organizing this outreach events was so beneficial, that I have continued to stay active and hold community events, including waste reduction and social media for scientists' workshops.

Thanks to the CIE department and EMPOWER, I was most recently able to host a University lecture and book signing from a prominent researcher in my field, Leo Trasande, MD.

EMPOWER has shown me that there is life outside of our research and there are opportunities outside of academia. I feel less limited in my future career and more hopeful that activities or hobbies I explore outside of my research will be just as advantageous as those within it.

LACHLAN "LOCKIE" WRIGHT

I was drawn to the EMPOWER program initially because of the programs focus on the diversity of career paths outside of academia as well as its focus on the Energy-Water nexus. Three years and many fantastic EMPOWER seminars later, I've learned a lot about both academia as well as industry and have had an opportunity to build lasting networks in both circles.

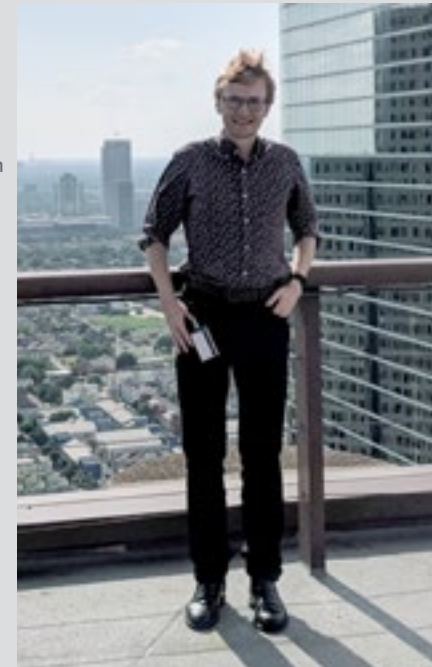
This past summer for my Career Pathway Experience, I spent 14 weeks working in Houston, TX as an Earth Scientist on the Integrated Exploration Strategic Research Team at Chevron Corporation. During this internship I was able to learn

about the critical long wavelength role that scientific research plays in-and-across a major integrated energy company. Within Chevron, I spearheaded a frontier exploration research project in an emerging play, with the ultimate goal of producing a conceptual model of rift evolution that was informed by, and consistent with a variety of geophysical data types (it's not often a project like this is given to the intern). I was seconded from my research team to a exploration business

unit working in the area, and this enabled me to work across, and collaborate with a whole host of teams in both the research, and exploration spaces to craft a final suite of deliverables that was uniquely tailored to the needs of the energy explorer actively working in the area, while being informed by all of the available research data. It was a fantastic experience leveraging the suite of basin analysis & research skills I have developed as an Earth Scientist over the last 7 years in a non-academic setting. Moreover, as an international student, none of this would have been possible without the support, encouragement, and flexibility of the

EMPOWER program. I am excited to be returning to Chevron this coming summer to work with the same team on another long-wavelength research project.

Looking forward, I have recently passed my qualifying exam this semester and I am currently working on the project that will form chapter 2 of my PhD. None of this fantastic journey would have been possible without the continued guidance and support of the EMPOWER program.



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LEADERSHIP TEAM

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Chris Johnson, Environmental Chemistry
Teng Zeng, Environmental Engineering

Earth Sciences

Christopher Junium, Organic Geochemistry
Christa Kelleher, Hydrology
Christopher Scholz, Sedimentary Basin Analysis
Donald Siegel, Hydrogeology

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Peter Wilcoxon, Energy Economics

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CONTACT

Visit empower.syr.edu for our calendar of events, full news stories, and the latest program information.

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