Student Spotlight

MEGAN DALEY

Ph.D. student **Civil and Environmental Engineering**

THIS PAST SUMMER. I SPENT 10 weeks working as a science reporter for the Los Angeles Times. I was selected for this position through the American Association for the Advancement of Science (AAAS) Mass Media Science & Engineering Fellowship, a program that provides STEM graduate students an opportunity to work in newsrooms nationwide and learn how to research time, and to present it in a format that and write stories about scientific issues. One of my goals as an EMPOWER trainee is to improve my ability to communicate complex scientific findings to the public, so was thrilled to be selected for this prestigious fellowship.

My experience built on the two science communication courses I completed at SU, giving me an opportunity to feel the pulse of a realworld newsroom. I researched topics. interviewed scientists, and worked closely with an editor in a fast-paced environment. I experienced some of the difficulties reporters face when preparing stories, like how to distill scientific studies down to the vital parts for public consumption. Most importantly, I got real-time feedback and tangible responses to my writing from my editor, the involved scientists, and the public. I discovered that the general population is eager to read about science and that scientists are enthusiastic to share their findings,



hard work, and insights with them. I also learned how important it is to select the "right" topic at the "right" is digestible and comprehensible.

Of the 14 stories I wrote, my favorite was on the Perseid meteor shower. My article had over 150,000 unique readers during its first day on the LA *Times* Science page—a response nearly 10 times the normal reaction. My editors requested a follow-up article after I watched the meteor shower in Joshua Tree National Park. The meteor shower was more brilliant than anything I could have imagined, and I was thrilled to share both the science and my personal experience of enjoying the meteor shower with a receptive national audience. The convergence of scientific facts with the wonder and beauty of nature was the perfect way to end my summer as a science journalist, and I am eager to continue developing my skills as a science communicator as an EMPOWER trainee.

Megan's story about the meteor shower can be found in the science section of the LA Times online (latimes.com).

LAURA M. DeMOTT Ph.D. student Earth Sciences

VERY FEW PEOPLE GET A CHANCE to experience a truly wonderful summer job. For the past two summers. I have been an instructor for GeoFORCE Texas, a geoscience education and outreach program for high school students run by the Jackson School of Geosciences at the University of Texas at Austin. GeoFORCE is a four-year, field-based program that targets high-achieving students from underrepresented regions of Texas, primarily the rural southwest and inner-city Houston. The program begins before the students enter ninth grade, and for the next four summers, students go on field trips across the country learning college-level geoscience in intensive, one-week courses until they are seniors. I became involved in the program in 2008 as a corporate sponsor, and in 2015 became an instructor for the field courses. One of my focus areas as an EMPOWER trainee is geoscience education, and working for GeoFORCE aligns perfectly with my professional development as an educator.

This summer, I taught two field courses for GeoFORCE. In the first week, I took a group of 47 rising 12th-graders to Utah and Wyoming, visiting world-class geologic sites like the Great Salt Lake, the Wasatch Mountains, Dinosaur National



Monument, Grand Teton National Park, and Yellowstone National Park. We learned about plate tectonics, basin evolution, mountain building, the geologic history of the western United States, and, of course, supervolcanoes! For my second week, I had 40 rising 11th graders in Oregon, where we learned about plate tectonics, subduction zones, volcanoes and volcanic rocks, and the geologic history of Oregon while visiting sites such as Mt. St. Helens, Mt. Hood, Crater Lake, and the Oregon coast. Being able to see the geology of these sites up close makes it easier for the students to learn complex concepts. For example, visiting a string of active volcanoes in the Cascades brings home plate tectonics in a way that diagrams and maps cannot. Students learn new vocabulary, take nightly quizzes (and a test at the end!), make new friends, and have fun learning about the Earth in a way they never would in school. Working with GeoFORCE has helped me develop a true passion for education, and I can't wait to get back next year!







NRT Program Takes Off EMPOWER welcomes its first trainees

FALL 2016



From the Director

WE ARE THRILLED TO

welcome our first cohort of M.S. and Ph.D. students for Syracuse University's EMPOWER National Science Foundation Research Traineeship (NRT) Program. The 18 students are from a range of disciplines, including Earth Sciences, Chemistry, Civil and Environmental Engineering, and Mechanical and Aerospace Engineering, but share a common interest in research at the waterenergy nexus.



Recently, I joined Deanna McCay, the EMPOWER Program Manager, for oneon-one conversations with each of our students to learn more about their individual interests and career goals. I learned that while some are interested in ultimately pursuing an academic career, most are looking closely at other careers. Our students are interested in working in outreach, for not-for-profits, in national labs, for government agencies, as consultants, urban planners, and with the U.S. Geological Survey. For examples of these diverse and fascinating career interests, check out the work of Laura DeMott and Megan Daley in our Student Spotlight.

The experience of our students is not unique. National trends show M.S. and Ph.D. graduates are increasingly pursuing diverse career pathways, and this is particularly true in disciplines involving water and energy. EMPOWER is one of several NRT programs across the nation that are transforming graduate programs in science, technology, and engineering to be more responsive to the changing needs of today's Ph.D. student, who is increasingly interested in careers outside of the traditional academy. EMPOWER offers professional and technical training to prepare students for careers in energy, environmental consulting, government, nonprofits, and academia.

Our success will be measured by the success of our students, as they transition from their graduate programs to the "real world." Our goal through EMPOWER is to arm them with the tools they need to be successful there.

-LAURA LAUTZ. Director. EMPOWER

ON THE COVER: Trainee Emily Baker at the AAAS Science Communication Workshop at Syracuse University in April 2016.

Evaluators Find High Faculty Engagement

EMPOWER HAS PARTNERED WITH

Hezel Associates, LLC, to provide an independent evaluation of the program. Researchers from Hezel interviewed participating faculty this past semester and found high degrees of faculty support and engagement with the program.

One faculty member observed "I think this program will be a very good case study and example of how researchers with somewhat disparate interests can join together and build something greater than the parts."

Another stated "[The interdisciplinary approach] really gives [students] a broader sense of how they engage with the world, beyond what can sometimes be a narrow focus on their research."

Faculty also noted that the students have spoken positively about the program: "...all the feedback I've gotten from students has been very positive and I've really been enjoying being a part of this, and see only good things coming from [EMPOWER],"

Several of Hezel's recommendations will strengthen the program. In the upcoming year, EMPOWER will reshape recruiting and admissions strategies, enhance internal and external communication efforts, initiate more interdisciplinary collaborations, and increase participation by the broader University community.

Evaluation of the program is ongoing. This semester, researchers will survey the trainees to assess EMPOWER's impacts on their graduate school career.



NEARLY ALL U.S. REGIONS STAND TO gain economic benefits from power plant carbon standards that set moderately stringent emission targets and allow a high level of compliance flexibility, according to a new study co-authored by EMPOWER NRT Co-PI Charles Driscoll.

The study, published in the open access journal PLOS ONE, reports large national net benefits of approximately \$33 billion per year for the power plant carbon standard, based on estimated costs of \$17 billion per year and projected benefits of \$29 billion for a



Renovation of Collaborative Space in 333 Heroy

THIS SUMMER, OVER 2,500 CUBIC feet of office and meeting space was created to support the EMPOWER program. The 333 Heroy Suite. formerly the Geology Library, was completely gutted and renovated to



333 Heroy Geology Lab during construction (A) and almost finished (B). Photos courtesy of Michael Cheatham

Vice Chancellor and Provost. The renovation was one component of a large commitment of resources by the University to support EMPOWER, including four University Fellowships for EMPOWER Trainees each year of the five-year award, support for travel expenses for visiting EMPOWER seminar speakers, tuition waivers for EMPOWER trainees, and teaching relief for participating faculty. The EMPOWER program is grateful for continued University support.

Faculty Spotlight

HARLES DRISCOLL

University Professor of Civil and Environmental Engineering n the College of Engineering and Computer Science

subset of health co-benefits, and \$21 billion for climate benefits. While other studies have analyzed total national costs and benefits of power plant carbon standards, this is the first study of its kind to break down the costs and benefits by sub-region for the entire United States.

Driscoll, along with co-authors from the Harvard T.H. Chan School of Public Health. Resources for the Future. and the Harvard Forest, found that the benefits would be widespread and, before accounting for costs, most counties would receive more than \$1 million in health co-benefits annually from the carbon standard in the study. Counties in the Northeast and Southwest United States are projected to gain the largest health co-benefits. The Mid-Atlantic, Ohio River Valley, and South-Central regions of the United States are projected to gain the largest health co-benefits per capita.

"Our results suggest that net economic benefits from power plant carbon standards tend to be greatest in highly populated areas near or downwind from coal-fired power plants that experience a shift to cleaner sources with the standards," savs Driscoll,

Visit journals.plos.org/plosone/ to access the study, including maps of benefits and costs.

For the full story, please see news.syr.edu.

0&A

with the EMPOWER Program Manager, Deanna McCay

What sparked your interest in working on the EMPOWER NRT team?

I have a Ph.D. in geography from the University of Georgia and my interests are in physical geography, biogeography, and land use history. I have had a pretty unconventional career trajectory because early on in my academic career I realized that holding a faculty position was not for me. While I loved being in higher education, I far preferred the idea of being behind the scenes, supporting and facilitating research. When I was working on my Ph.D., there was little discussion about non-academic career paths, and it seemed that all good graduate students should go on to tenure-track positions. Not that there is anything wrong with that career path, but there are many non-tenure-stream professions—like the ones we explore with this NRT—that are important components of the STEM landscape. I strongly believe in the mission of this program because, in some ways, I have lived it!

How has your experience as a Ph.D. scientist shaped your role as the program manager for EMPOWER?

A My dissertation research made me one of the few "experts" in the ecology of sand pine forests. But, more broadly, going to graduate school gave me many transferrable skills that I use daily in my work. Right now, I am building a database management system that is going to allow me to track student progress through graduate school. Because I spent so much time analyzing data in my graduate work, I have found developing this new system to be a blast.

I am working closely with our external evaluator to develop and administer an assessment of the EMPOWER program. The data that we are collecting are more qualitative than quantitative, but my background in science has given me a good understanding of study design and has helped me contribute to the development of the study protocol. Also, having a Ph.D. has prepared me to critically review current literature something that I am doing in my current position.

As a Ph.D. scientist yourself, what advice would you give our EMPOWER trainees?

A Two things:

- Be flexible and creative when considering your own career trajectory
- Never underestimate the importance of networking, particularly with your fellow graduate students. In five years, your cohort will become your colleagues

What do you do for fun?

Horseback riding, reading, and spending time with my family.

As program manager, Deanna oversees program communication, budget administration, and academic program administration. She can be reached at dhmccav@svr.edu.