6. Student Spotlight: Emily Voytek, Colorado School of Mines

Emily Voytek is a doctoral candidate in the Hydrologic Science and Engineering (HSE) program at the Colorado School of Mines. Her research primarily focuses on mapping groundwater flow patterns using electrical methods, or, more specifically, using self-potential (SP) measurements to analyze groundwater flow in arctic and alpine regions. After starting her Ph.D., she received the National Defense Science and Engineering Graduate (NDSEG) Fellowship, a highly competitive Department of Defense program that accepts only 10% of its applicants each year. With this 3-year fellowship, she has been given the scientific freedom to build and pursue her own research ideas without the restriction of fitting into existing projects.

Prior to her program in Colorado, Emily worked as a hydrologist at the USGS Office of Groundwater, Branch of Geophysics, in Connecticut. In this position Emily obtained valuable field and processing experience that enhanced her geophysical background and solidified her desire to continue in the field. For example, her projects often involved constructing or modifying existing field instruments. Not only was this a less expensive equipment alternative, but it also provided an opportunity to learn how the instruments operate, what causes failure, and how to appropriately resolve such challenges in the field while waist deep in a river. One notable product of her time at the USGS is the computer program 1DTempPro, which analyzes vertical one-dimensional temperature profiles of groundwater–surface water exchange.

At the 2015 AGU Fall Meeting Emily presented results from a project in Alaska as a poster titled "Identifying Hydrologic Flow Paths on Arctic Hillslopes Using Electrical Resistivity and Self Potential." The poster received a 2015 Outstanding Student Paper Award from the focus group. In this work she differentiated between frozen permafrost and thawed materials using electrical resistivity in conjunction with self-potential measurements to identify flow patterns around water tracks, drainage features on arctic hillslopes. The results were also recently published in a special cryosphere section of *Geophysics*. The effectiveness of her presentation can be attributed to her great enthusiasm for her work as well as her dedication to creating a poster that allowed her figures to explain her concepts rather than paragraphs of text. She also found that concise bulleting facilitated the main points of the project while still leaving room to spark engaging conversation with the reader.

As a testament to the impact and promising success of her research, Emily received the 2015 Horton Research Grant, a competitive research grant awarded each year to three Ph.D. students in the AGU Hydrology section. With this funding she will continue investigating shallow groundwater flow using passive electrical techniques, including a project in Rocky Mountain National Park, and analyzing seasonal changes in groundwater flow patterns.

If you are interested in learning more about Emily's work or receiving additional advice on effective poster presentations, please contact Emily Voytek.