Expanded networks, faculty mentorship bolster female undergrads' pursuit of geoscience

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A recent PROGRESS networking event at a Colorado State University solar field. Credit: Ilana Pollack/Colorado State University

To retain more undergraduate women in geoscience majors, a supportive network that includes faculty mentorship seems to be a key driver, according to a new study led by Colorado State University.

The study, published earlier this month in the journal *PLOS ONE*, is the first official result from an ongoing effort led by Emily Fischer, assistant professor of atmospheric science.

Fischer and colleagues from seven universities across the Front Range, Wyoming and the Carolinas are in the fourth year of a five-year, $1.7 million National Science Foundation grant for a program called PROGRESS (PROmoting Geoscience Research, Education and Success). They are investigating how best to attract and retain women in traditionally male-dominated science fields, particularly earth and environmental sciences.

"Our program seems to be helping students better identify as scientists, and giving them a stronger intention to remain in the earth and environmental sciences," said Fischer, who led the rollout of PROGRESS in 2015 at CSU.

About 150 women across the seven participating universities, including about 30 at CSU, are involved in PROGRESS. The program includes an introductory weekend workshop and pairing students with female mentors, typically graduate students or postdocs. For the study, the PROGRESS women's outcomes were compared with a separate group not participating in PROGRESS.

Results show that a program like PROGRESS can expand a student's network of support by connecting them with people, particularly other women, they view as role models. The students are then more inclined to further expand those networks on their own, notably with faculty in earth and environmental sciences.

"As part of our mentoring and professional development activities, we are not always directly connecting our PROGRESS students with faculty, but there is something about their interaction with faculty members that is an important predictor in their intention to stay in the earth and environmental sciences," Fischer said. "That surprised us; we didn't expect this to be so important."

The aim of PROGRESS is to reduce the attrition of women who begin college as science majors but don't stay there, said paper first author Paul Hernandez, assistant professor in the Department of Learning Sciences and Human Development at West Virginia University. "We focus on women in STEM majors within their first or second year of college and work to support those women through to graduation."

The program was born out of the need to increase diversity among professionals in the geosciences, Hernandez said. This is based on the premise that higher diversity yields more scientific innovation. PROGRESS is largely modeled after a peer mentoring program for professionals involved in the Earth Science Women's Network.

PROGRESS leaders are continuing to track their participants and learn more about how the program influencing their academic and career paths.

"It's promising to have a tangible, doable thing that appears to make a big difference in women's retention in the sciences," Fischer said.

More information: Paul R. Hernandez et al, Promoting professional identity, motivation, and persistence: Benefits of an informal mentoring program for female undergraduate students, *PLOS ONE* (2017). DOI: 10.1371/journal.pone.0187531

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