

# PROGRESS

PROmoting Geoscience Research, Education, and Success

PROGRESS (<https://progress.colostate.edu/>) is an evidence-based mentoring program that encourages undergraduate women interested in the earth and environmental sciences to pursue education and career opportunities. The program was co-developed by earth scientists and educational psychologists with support from the National Science Foundation (NSF). Since its initial development in 2015, the program has served undergraduate women attending more than 20 different universities across 5 different geographic regions. The essential PROGRESS program components include: 1) a women-only regional kick-off workshop that includes structured activities designed to introduce students to the earth and environmental sciences, expand their professional networks, and increase their sense of belonging, 2) introduction to a local mentor (of any gender identity), 3) invitation to relevant on-campus events, 4) continued access to other PROGRESS mentees and opportunities via GroupMe, and 5) periodic professional development webinars. PROGRESS was developed specifically for the earth and environmental sciences, but it can readily be adapted to support retention and inclusion goals in other STEM disciplines. This program made the 2020 shortlist for the Nature Research Inspiring & Innovating Science Awards.

PROGRESS has been extensively evaluated through longitudinal research focused on participants and a matched control group. From our research, we have found clear and significant benefits for women who participate in PROGRESS:

- Undergraduate women in earth and environmental science related majors that participate in PROGRESS have higher rates of persistence. The persistence of undergraduate women in these geoscience-related majors approximately doubles for every same-gender role model they identify (Hernandez et al., 2018).
- PROGRESS helps undergraduate women grow their developmental mentoring support and inspirational role modeling networks. Compared to undergraduate women in a matched control group, women in PROGRESS develop larger networks of STEM mentors, are more likely to have a faculty mentor, and report more STEM women role models (Hernandez et al., 2017; Hernandez et al., 2018).
- The mentoring support that students develop through PROGRESS strengthens their science identity and intention to pursue STEM educational pathways and careers (Hernandez et al., 2017; Hernandez et al., 2023).
- To increase science identity, resilience, and intention to persist in scientific careers, PROGRESS must consistently include programming to inspire students, tools to overcome obstacles, and an introduction to a local mentor (Hernandez et al., 2020).
- PROGRESS helps students understand that STEM fields can support communal goals, a key component of women's interest in future careers (Henderson et al., 2022).

If your institution is interested in implementing PROGRESS, please reach out to Dr. Emily V. Fischer ([Emily.V.Fischer@colostate.edu](mailto:Emily.V.Fischer@colostate.edu)). General questions can also be directed to [progressgeoscience@gmail.com](mailto:progressgeoscience@gmail.com).



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More information about PROGRESS can be found in the follow publications:

Burt, M. A., R. T. Barnes, S. Schanz, S. Clinton, and E. V. Fischer (2023), Mentorship builds inclusivity and belonging in the geosciences, *Eos*, 104, <https://doi.org/10.1029/2023EO230020>.

Du, W. P. R. Hernandez, A. S. Adams, R. T. Barnes, M. Burt, S. M. Clinton, I. Pollack, E. V. Fischer (2023), Promoting Sense of Belonging and Interest in the Geosciences among Undergraduate Women through Mentoring, *Mentoring and Tutoring*, 41:4, 446-465, <https://doi:10.1080/13611267.2023.2225395>.

Fischer E.V., B. Bloodhart, R. T. Barnes, A. S. Adams, S. M. Clinton, I. B. Pollack, E. M. Godfrey, M. Burt, and P. R. Hernandez, (2018), Welcoming women into the geosciences, *Eos*, 99, <https://doi.org/10.1029/2018EO095017>.

Henderson, H. L., B. Bloodhart, A. S. Adams, R. T. Barnes, M. Burt, S. Clinton, E. Godfrey, I. Pollack, E. V. Fischer and P. R. Hernandez (2022), Seeking Congruity for Agentic Women A Longitudinal Examination of College Women's Persistence in STEM, *Social Psychology of Education.*, 25, 649–674, <https://doi.org/10.1007/s11218-021-09679-y>.

Hernandez, P. H., A. Adams, R. Barnes, B. Bloodhart, M. Burt, S. Clinton, W. Du, E. Godfrey, H. Henderson, I. B. Pollack, and E. V. Fischer (2020), Inspiration, inoculation, and introductions are all critical to successful mentorship for undergraduate women in geoscience careers, *Communications Earth and Environment*, 1,7, <https://doi.org/10.1038/s43247-020-0005-y>.

Hernandez, P.R., B. Bloodhart, R. T. Barnes, A. S. Adams, S. M. Clinton, I. Pollack, E. Godfrey, M. Burt and E. V. Fischer (2018), Role Modeling is a Viable Retention Strategy for Undergraduate Women in the Geosciences, *Geosphere*, 14, 4, <http://doi.org/10.1130/GES01659.1>.

Hernandez, P.R., B. Bloodhart, R. T. Barnes, A. S. Adams, S. M. Clinton, I. Pollack, E. Godfrey, M. Burt and E. V. Fischer (2017), Promoting professional identity, motivation, and persistence: Benefits of an informal mentoring program for female undergraduate students, *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0187531>.

Hernandez, P. R., M. S. Patterson, J. M. Nyanamba, A. S. Adams, R. T. Barnes, B. Bloodhart, M. Burt, S. M. Clinton, I. Pollack and E. V. Fischer (2023), Webs of Science: Developmental Networks Influence Women's Integration into STEM Fields, *Frontiers in Ecology and the Environment*, 21(9), 404-410, <https://doi:10.1002/fee.2666>.

Students from the following institutions have participated in PROGRESS between 2015 and 2023:

*Colorado State University, University of Colorado-Boulder, University of Wyoming, Colorado College, Metropolitan State University of Denver, University of Northern Colorado, University of North Carolina Charlotte, University of South Carolina, North Carolina Agricultural and Technical State University, North Carolina State University, University of North Carolina Chapel Hill, Emory University, Georgia Tech, Spelman College, Georgia State University, Georgia Gwinnett College, University of Georgia, Texas A&M University, Baylor University, University of Houston, University of Texas El Paso, and El Paso Community College.*



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