

Research Experiences in Solid Earth Science for Students (RESESS): Engaging and Supporting Historically Underrepresented Students in the Geosciences

Over the past 9 years, UNAVCO supported 44 interns through Research Experiences in Solid Earth Science for Students (RESESS), an NSF-funded multi-year, geoscience research internship, community support, and professional development program. Upper-division students from underrepresented groups spend 11 weeks in Boulder, Colorado during the summer conducting an independent, authentic research project under the guidance of a research mentor and the support of a communications mentor. RESESS interns are also mentored and supported after the summer program, and throughout the academic year by RESESS program staff. The primary goal of the RESESS program is to increase the number of historically underrepresented students entering the geosciences. The alumni of RESESS are 55% Latino/Hispanic, 27% African American/Black, 11% Native American, and 7% Asian American. Of the 30 interns who have earned a BS or BA, 13 are enrolled in a Masters program, and 8 are currently enrolled in a doctorate program. Nine RESESS alumni are working in private industry, five of those in the geosciences.

RESESS and Enhanced REU Elements

RESESS includes traditional research experiences for undergraduates (REU) elements including conducting scientific research under the guidance of a science mentor, training to develop research and scientific communication skills, and social opportunities for building community. RESESS interns have at least one science mentor who guides the scientific research and career exploration as well as a communication mentor to guide development of written and oral communication skills. Working with diverse students requires programmatic elements not necessarily found in a traditional REU. To that end, RESESS also includes focused mentoring, social support systems, and additional financial support.

Students admitted to the RESESS program remain in the program until they graduate with their Bachelor's degree, provided they stay academically eligible. RESESS interns spend the first summer of participation working in Boulder, Colorado; returning interns have the option of working at another institution. These students spend the first and last week of the summer program in Boulder with the other interns developing leadership skills and sharing research results, respectively. After graduation, students are a part of the RESESS Alumni network. During their year(s) of participation, their RESESS experience is designed to support students beyond their summer research experience. Program elements contributing to student success include personalized mentoring, a Macbook and key software, academic scholarships, full financial support for scientific conferences, Graduate Record Examination preparation course and exam fees, membership to professional societies, and, in some cases, graduate school application fees.

UNAVCO, the NSF facility that manages the RESESS program, provides year-round support to the RESESS program staff. The Business Affairs staff provides all financial and employment related support including scholarships, recruitment, application processing, summer payroll, housing contracts, and budget support to the RESESS program Director. UNAVCO IT support all computing resources for interns and program staff and a broad spectrum of the UNAVCO staff assist with review of applications, coordination of networking activities during the year at conferences and meetings, and exposure to the instrumentation and data UNAVCO manages as a part of its role as a facility.

Professional mentoring and support of RESESS interns

Our experience shows that RESESS interns benefit from additional support structures and mentoring throughout the academic year. RESESS program staff provide year round support to students on how to navigate fellowship applications, graduate school applications, networking with professionals, facilitating meetings and making them aware of opportunities that could further their academic and professional careers. Additionally, RESESS staff provide information and support to parents and guardians of interns to inform them about the experience, answer questions, and address concerns they might have about their student participating in a research program in Boulder, Colorado.

Summary

Through a combination of professional development, financial support, mentoring support, and independent, authentic research experiences, the RESESS program has successfully supported 44 interns over the past 9 years. Our experiences support the importance of quality mentoring and authentic research experiences (Hensel, 2012; Johnson & Ridley, 2008). The program has demonstrated that multi-faceted, multi-year support of students from historically underrepresented groups facilitates the success of alumni in graduate school and professional geoscience occupations. Emphasis on professional development in addition to development of research skills enables students to excel in diverse professional environments, and provides the students with the confidence to pursue opportunities they may not have previously considered, leading to broadened participation and engagement of well-trained geoscientists.

References

- Hensel, N. (Ed.) (2012), *Characteristics of Excellence in Undergraduate Research*, 72 pp., Council on Undergraduate Research, Washington D.C.
- Johnson, W. B., and Ridley, C.R. (2008). *The Elements of Mentoring*, Revised Edition, Palgrave Macmillan; 176 pages.