Project TIERRA: Targeted Investigations of Earth Resources Related to Agriculture

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Northeastern Illinois University (NEIU) received a $248,000 grant through the USDA National Institute of Food and Agriculture to employ second-year NEIU students (16 per summer) to complete summer field research, learn soil science concepts, and explore degree and career options related to agriculture. Faculty and USDA Natural Resources Conservation Service (NRCS) interactions supported targeted Hispanic participants to connect urban soil issues to security of global food supply and to apply this knowledge to choices for their future. NEIU is a federally designated Hispanic-serving four-year public commuter university located in Chicago.

The TIERRA (Targeted Investigation of Earth Resources Related to Agriculture) project recruited students from the Earth Science Department and provided them with a 10-week summer research experience focused on soil science. The students were also introduced to career opportunities in agriculture-related fields through visits to regional governmental field offices and meetings with scientists applying geoscience concepts to agricultural issues. At NEIU, approximately 50% of first-year students are Hispanic compared with 28% of all undergraduates. Targeting first-year students for the TIERRA project provided a larger pool of underrepresented groups for this exposure to geosciences and careers related to agriculture. The two-year TIERRA project was first implemented during the summer of 2011 and involved 13 students; the following summer, 16 students participated. The NEIU faculty and sponsors were Laura L. Sanders, Ph.D., Professor of Earth Science; Kenneth M. Voglesonger, Ph.D., Assistant Professor of Earth Science; and Jean M. Hemzacek, M.S., Instructor of Earth Science.

Groups of two or three students selected a research question, devised a research plan, and conducted research on soils at the North Park Village Nature Center, an urban nature center located near NEIU where NRCS soil scientists had previously completed an Order 1 soil survey. Early project efforts included training sessions with an NRCS soil scientist to help students learn about soil science while later sessions involved mentoring and supervision of team research. Field trips to USDA offices and visits from USDA scientists and agricultural engineers provided opportunities for students to learn about agricultural science and careers in USDA-related fields. NRCS soil scientists visited the NEIU campus and the TIERRA research sites and conducted trips to a site with soil pits where the students had hands-on experiences in describing and evaluating soils. Field trips were taken to an NRCS field office (Sycamore, IL), a dairy farm, the NRCS–Illinois state office, the University of Illinois, Purdue University, and the USDA Agricultural Research Service.

Students indicated that project trainings increased their science knowledge, particularly soil science concepts. Some said their work with the NRCS soil scientists contributed to their soil or earth science knowledge or skills. While students’ self-reported knowledge of scientific skills (for example, plotting data on a graph, analyzing graphs, and writing a research abstract) exhibited a low range prior to participation in the project, by the end of the 10 weeks, their average rating of...
knowledge of four of the skills was very high. In post-project self-reflections, students described how various facets of the project increased their self-confidence or self-efficacy in conducting research projects or performing particular research tasks. A majority of the students described acquiring greater awareness of and/or interest in a career in agricultural, earth, or soil science. Several students described how key project activities gave them a chance to see and/or experience what “real scientific research is like.”

The project engaged first-year students in the kind of research experience that usually does not take place until senior year. It also provided many of them with an understanding of agriculture and connection to the food supply. As the project faculty noted, and several students mentioned, most had never been on a farm. Many had not even been out of the city. The TIERRA project offered students a tangible understanding of the relationship among agriculture, farming, and their own food supply. At the conclusion of the first year, seven students gave oral and poster presentations at the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference in San Jose, CA. NEIU also received an award from USDA as a Hispanic Serving Institution (HSI) of Higher Education.

This article was edited and submitted by Mark Bramstedt, Illinois NRCS soil scientist, from a compilation of excerpts from articles written by Laura Sanders, Jean Hemzacek, and Ken Voglesonger of Northeastern Illinois University. Photos are courtesy of Sanders, Hemzacek, and Voglesonger.