

Providing Pathways Into Science

An Interview with Eric Barron, The Pennsylvania State University by Gina Maranto

Courses provide pathways into science for students who might otherwise have shied away from it



Says Eric Barron, professor of geosciences at Pennsylvania State University, "We were hard at work on a class on Earth as a system before 1991, and we were looking for opportunities to do more." And do more they did.

Take a look at the graphs and charts Barron prepared last year surveying a decade of Earth system science at Penn State, and you'll see striking upward trends in numbers of graduate students—especially women—numbers of women and under-represented faculty, and total research dollars.

Barron, now Dean of the College of Earth and Mineral Sciences at Penn State, recalls the early days of interdepartmental efforts to expand the study of ESS. Brought in to head the Earth Systems Science Center, his mission was to seek support for the study of global change. As a geologist and oceanographer who had studied ancient climate as a post-doc at the National Center of Atmospheric Research, Barron had his eye not only on undergraduate science majors, but on students across the university who, he believed, should gain great understanding of the planet.

In 1991, a grant in the first round of ESSE funding helped Barron reach out to the general student population. He developed an approach for a basic Earth system science course that asked students to master fundamental concepts, rather than memorize a bunch of facts. For instance, he explains, "You might ask students to derive an energy balance, and then use it over and over again on different problems." To Barron's surprise, science majors took the course for fun and spread the word, drawing in students who might otherwise have been daunted by the math.

Today, ESS courses pull in a large chunk of students fulfilling General Education requirements, with EARTH 002, Gaia—The Earth System, and EARTH 100, Environment Earth, providing interdisciplinary overviews of global processes and human impacts. Barron has found it especially gratifying that these courses provide pathways into science for students who might otherwise have shied away from it. Indeed, the successes of expanding the curriculum to factor in the human dimensions of global change have, says Barron, sparked interest among some at Penn State to try to get further funding for pre-college programs that would allow high schoolers to discover ESS.

Among Barron's favorite courses is his EARTH 103, Earth Futures, a lab-intensive exploration of what the planet might look like in 100 years. The syllabus includes sections on future greenhouse gas emissions, crop and forest distributions, and water supplies, as well as on potential health, tourism, and demographic impacts of climate change. Students carry out a range of activities, from developing a survey to assess other students' awareness of climate change, to carrying out a study of two river basins and then staging a debate between lab sections about their results.



Earth 103 Syllabus and Lab Assignments: http://www.emsei.psu.edu/earth_futures/