The Earth Systems Program at Stanford
Earth Systems Program at Stanford
School of Earth, Energy & Environmental Sciences

A Systems Approach

The complex Earth resource and environmental challenges facing humanity today transcend any one discipline or approach. The scientific expertise of our environmental leaders must be both broad and deep, enabling them to evaluate potential solutions from a systems perspective.

Around the world, many such leaders are alumni of the Stanford Earth Systems Program. Earth Systems students learn about and independently investigate complex environmental problems caused by the interaction of human activities and natural changes in the Earth system. They gain skills in those areas of science, economics, and policy needed to tackle the globe’s most pressing social-environmental problems, and they become scientists, professionals, and citizens who approach and solve problems in a systematic, interdisciplinary way.

The Undergraduate Program

Earth Systems majors take courses in the fundamentals of biology, calculus, chemistry, geology, and physics, as well as economics, policy, statistics, and systems thinking. After completing breadth training, they concentrate on advanced work in one of six areas: human environmental systems; biology and ecology (biosphere); energy, science, and technology; sustainable food and agriculture; land systems; or oceans and climate.

These tracks support focus and rigor but include flexibility for specialization. Just a few examples of the many specialized foci students have chosen include environment and human health, energy economics, sustainable development, social entrepreneurship, and marine policy. All Earth Systems students put theory into practice by completing a required 270-hour internship, gaining hands-on experience working on a supervised field, laboratory, government, or private-sector project.

Students also reflect on their learning and hone skills for communicating their expertise to diverse audiences in a required two-quarter senior capstone and reflection course. Applying their interdisciplinary environmental problem-solving skills to a capstone project of personal interest, they produce a substantial piece of work that represents the culmination of their training and experience.

STANFORD LAUNCHED the Earth Systems Program in 1992 amid growing scientific interest in integrating studies of Earth’s surface and subsurface processes. A quarter century later, Earth Systems is the most popular major within the School of Earth, Energy & Environmental Sciences and one of Stanford’s largest interdisciplinary programs.
Many Earth Systems students choose to stay in the program an extra year, earning a coterminal master’s degree alongside their bachelor’s. Some “coterms,” as they are called, also serve as teaching assistants—positions that provide tuition support and important opportunities to collaborate with faculty to help realize the program’s teaching mission.

Having long offered a coterminal master of science (MS) degree for students wishing to go deeper on the science in their chosen track, Earth Systems launched a master of arts (MA) degree in environmental communication in 2015. Initiated in response to high student demand, the MA program serves Earth Systems students seeking additional skills for leveraging their scientific training to influence policy and inspire and educate others.

In addition to an overview of the theory, techniques, and challenges of communicating environmental concepts to non-specialist audiences, the MA provides hands-on experience with writing, multimedia production, and pedagogy.

Like their MS counterparts, MA graduates typically pursue careers in academia and non-governmental organizations, where their scientific contributions are enhanced by a communication orientation. Some find themselves drawn to careers in environmental education, developing curriculum and programming for public museums and aquariums, for example. Others gravitate to environmental journalism and documentary work in news or advocacy organizations.

**DENLEY DELANEY, ’17, MA ’18,**

began making documentary films as an ocean-loving youth growing up in The Bahamas. She took up scuba diving at age 11 and wanted to share the marine life and habitats she was seeing with her parents, who fished and boated with the family but didn’t dive. Finding that words could not do justice to the beauty and complexity of the marine environment, she acquired a video camera … and a passion for environmental communication.

As an Earth Systems major in the oceans and climate track, Delaney learned more about the physical, biological, and chemical underpinnings of the ocean system that is so vital to the economic and environmental security of The Bahamas. After a summer internship at National Geographic, she returned to Stanford to complete her coterminal MA in the Earth Systems environmental communications program. Speaking as one who once yearned to know what lay beneath the ocean surface, Delaney says, “I hope to use science communication and documentary film to increase awareness of the importance of the environment and to inspire curiosity about the natural world in which we live.”

**CLAIRE MILES**

**Environmental Geoscience**
Since its inception in 1992, the Earth Systems Program has grown substantially in both scope and impact. Additional resources are needed to accommodate this growth and to position the program for the future. In honor of the program’s 25th anniversary, Stanford is pleased to announce a dollar-for-dollar match on new endowment gifts of $100,000 or more for its highest priorities:

**Program Support Funds**
An important source of unrestricted support, these funds offer maximum flexibility for meeting the program’s most critical needs.

**Student Support Funds**
Because coterminal master’s students are not eligible for undergraduate financial aid, need-based fellowships are a vital mechanism for supporting promising students and promoting diversity in the Earth sciences. These student-focused funds can also be used to support teaching assistants, internships, and research opportunities.

**Lecturer/Visiting Scholar Funds**
These funds promote outstanding teaching by underwriting the salaries of full-time teaching staff as well as short- and long-term visitors who can bring complementary expertise, including practical experience designing innovative approaches to environmental problem solving.

**Environmental Communication Coterminal Master’s Program Funds**
The MA program in environmental communication is an initiative of the Earth Systems Program to train a new generation of environmental scientists and professionals with the mindset and skills needed to break down communication barriers surrounding issues of science, policy, and environment. These funds provide for the greatest needs of the program, including curriculum development, teaching, student support, and research.

**THE EARTH SYSTEMS PROGRAM 25TH ANNIVERSARY MATCH**
New endowment funds established with the help of this generous matching grant will be invested by the university to provide a steady stream of funding for the Earth Systems Program in perpetuity.

_The matching program is available through December 2019 and up to a total of $2 million. Pledges are payable over five years._