



Earth & Atmospheric Sciences



Degree Programs and Research Areas

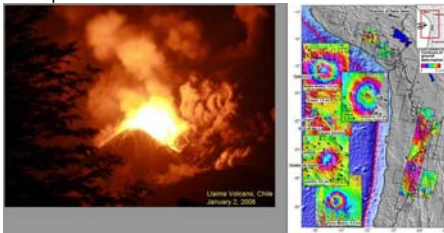
The following degrees can be earned through EAS from the College of Engineering:

- B.S. in Science of Earth Systems
- M.S., MEng, and Ph.D. in Geological Sciences

EAS also offers undergraduate degrees in the Science of Earth Systems (SES) through the College of Ag & Life Sciences (CALS) and the College of Arts & Sciences as well as graduate and undergraduate degrees in Atmospheric Science through CALS.

EAS Research includes:

- Deep Structure & Evolution of Mountain Belts (esp. Andes, Himalaya/Tibet, Canadian Cordillera)
- Geodetic, Geophysical & Geological Investigations of Earthquake & Volcanic Processes
- Mantle Plumes & Global Dynamics
- Geology of the Deep Crust
- Paleoclimatology and Paleoecology
- Upper Atmospheric Physics
- Weather & Climate Forecasting, Regional /Global
- Atmospheric Biogeochemistry & Aerosol Transport
- Marine Ecosystems
- Deep Circulation of the Global Ocean



EAS faculty members Matt Pritchard and Rowena Lohman use the latest space technologies such as GPS and INSAR to assess earthquake and volcano hazards. This map shows INSAR estimates of surface deformation associated with volcano inflation in the central Andes between 1992 and 2006.

Trends

Broadening of research into areas related to clean energy and global environmental processes. New technologies such as INSAR and GPS are being applied to studies of volcanic hazards and deep magmatic systems as well as energy extraction/sequestration monitoring.

Achievements

Department/Faculty Achievements:

- Four new faculty hires, including two females (Lohman, Mahowald) and one underrepresented minority (Andronicos)
- 4 new Chaired Professorships (Allmon, Brown, Jordan, and Kay)
- 4 Engineering Excellence in Teaching Awards earned (Andronicos, Hysell, Pritchard, Moore)
- Prof. Suzanne M. Kay was selected as Outstanding Educator by the Eastern Section of the American Association of Petroleum Geologists and as a Fellow of the Society of Economic Geologists
- Prof. Chuck Greene was elected as Fellow of The Oceanography Society
- Prof. Susan Riha was appointed as Director of the New York State Water Resources Institute (WRI)
- Prof. Chris Andronicos earned the 2008 Zellman Warhaft Commitment to Diversity Award
- Prof. Rick Allmendinger became Associate Dean of Diversity, Faculty Development and Mentoring in the College of Engineering

EAS successfully organized or hosted:

- The Third International Joint Workshop between Tsinghua University and Cornell University on the theme of Sustainable Development: Water Resources, Energy and the Environment (2008)
- INSTOC Workshops on Tectonics of the Continental Lithospheric Mantle (2005), Subduction, Orogeny, and the Surface of the Earth (2006), The Unknown Andes (2007) and Magma (2008)

EAS scientists continue to lead major research initiatives around the world, including in the Andes (PUNA, INSAR), Tibet (INDEPTH), Taiwan (TAIGER), and the Caribbean (Montserrat SEA CALIPSO).

EAS Prof. Sue Kay and University of Missouri's Prof. Eric Sandvol deploy seismic equipment as part of a major study in the central Andes. EAS scientists lead major geological and geophysical studies in major mountain belts around the world.



Priority Goals

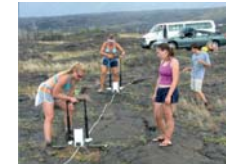


EAS Prof. Dan Wilks uses statistical methods to refine our ability to predict the impact of severe weather such as hurricanes, which some expect to increase in severity as sea temperatures rise. Understanding the impacts of global climate change is a strategic priority.

EAS will work to:

- Expand global leadership in key areas such as global/regional tectonics & meteorological education
- Significantly increase research funding, especially in new areas related to natural hazards, strategic resources, and global change
- Expand faculty and research staff to sustain new initiatives
- Become the **premier** resource for earth literacy in the Cornell curriculum
- Become a top-ranked undergraduate program in the Science of Earth Systems in the United States
- Become known for the best undergraduate field opportunities in sustainability (e.g. Semester in Hawaii Program)

Earth and Atmospheric Sciences provides unique opportunities to gain intensive field experience which provides critical connections between theory and the real world. The EAS Semester in Hawaii Program emphasizes sustainability and natural systems in a unique cultural context. Here students in the Hawaii program carry out ground penetrating radar surveys of lava flows near Kilauea.



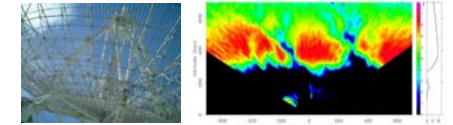
At the same time, EAS is broadening the material covered in the traditional classroom to provide the comprehensive coverage required by the Earth Systems approach.



Challenges

EAS faces challenges to:

- Maintain international leadership while broadening areas of research/teaching
- Implement a broader curriculum while maintaining the quality of specialization with limited faculty resources
- Stay competitive with peer institutions for limited research funds from traditional sources (e.g. NSF)



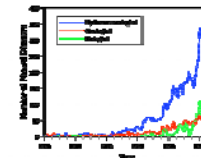
Prof. David Hysell uses ground based radar arrays to map the upper atmosphere. The image at left maps plasma instabilities in the subtropical ionosphere.

We plan to meet these challenges by:

- Prioritizing areas for research concentration
- Expanding faculty and research staff
- Expanding collaboration with other departments at Cornell to increase the pool of intellectual resources

Opportunities

- Expanded demand for new sources of energy and clean water
- Expanded market demand for students who need to be well trained for future careers in energy and strategic resources
- Increased economic, political and personal vulnerability to natural hazards (e.g. earthquakes, volcanoes, sea level rise, climate shifts)
- Increased interest by fellow engineering departments in energy/sustainability issues to which we can contribute basic scientific context



Natural Hazards: A Growth "Industry"