

The Department of Earth System Science at the University of California, Irvine



Overview

We study how the atmosphere, land and oceans interact as a system and how the Earth will change over a human lifetime.

We focus on key areas of climate science including biogeochemistry of oceans and atmospheres, climate dynamics, atmospheric science, cryosphere, the global water cycle and human systems.

Climate change and global warming are some of the most outstanding challenges of this coming century. Joining the Department of Earth System Science at the University of California, Irvine is one way to make a difference.

Academics

Undergraduate

- We offer two interdisciplinary undergraduate degrees: (B.S.) Bachelor of Science in Earth System Science and (B.A.) Bachelor of Arts in Environmental Science.
- Coursework covers the science of the Earth as a system, the causes of current environmental problems and pathways toward global sustainability.
- Students are encouraged to conduct research and field work and participate in the UCI Education Abroad Program.
- Graduates go on to graduate school or begin careers as research scientists, policy advisors, data analysts, environmental consultants or technical writers.

Graduate

- The UC Irvine Ph.D. in Earth System Science program is ranked among the top doctoral programs in the country by the National Research Council.
- Coursework includes a multidisciplinary curriculum covering physical, chemical and biological aspects of Earth system science.
- Our graduate students travel around the world to conduct research in mountains, forests, oceans, caves, glaciers, laboratories and climate simulation centers.
- Graduates go on to become post-doctoral scholars, faculty and leading Earth science researchers.

B.S. Requirements

- One of the courses from Earth System Science: 1, 3 or 5.
- All of the following courses:
 - Earth System Science: 51, 53, 55, 114, 116, 191, 192
 - Mathematics: 2A-B and 2D or 3A
 - Chemistry: 1A-B-C and 1LC-LD, or H2A-B-C and H2LA-LB-LC
 - Physics: 3A-B-C and 3LB-LC or 7C-7LC-7E
- Seven electives from the following (at least four must be Earth System Science courses)
 - Any four-unit upper-division Earth System Science courses (100-199) except 114, 116, 190C and 198 or H198 (199 or one quarter of H199A-B-C may count only once toward the elective requirement)
 - Chemistry 51A, 51B and 51LB, 51C/51LC, H52A and H52LA, H52B and H52LB, H52C, 130A, 130B, 130C, 131A, 131B, 131C
 - Physics 51A, 51B, 115A, 120, 134A, 137, 144, 145
 - Mathematics 2D or 3A (may be counted only once) 3D, 105A, 112A, 115, 131A, 131B, 131C
 - Mechanical and Aerospace Engineering (MAE) 91, 130A, 164, 180, 185
 - Civil and Environmental Engineering (CEE) 156, 162, 171, 172, 176, 178
 - Biological Sciences 93, 94, 98, D105, E106, E167, E178, E179, E179L, E186, E189, M133
 - Criminology, Law and Society C148
 - Planning, Policy and Design 133, 136, 138, 139
 - Public Health 161
 - Computer Science 31, Engineering EECS10, Engineering MAE10, Physics 53, or an approved programming course

B.A. Requirements

- One course selected from Earth System Science courses: 1, 3, 5, 7, 11, 13, 15, 17, 21, or 23. All of the following Earth System Science courses: 60A-B-C, 114, 180, 182, and 192
- All of the following courses: Chemistry 1A-B-C and 1LC-LD or H2A-B-C and H2LA-LB-LC, Biological Sciences 93 and 94.
- Three courses from the following: Mathematics 2A-B, 4, 7; Social Science 9A-B-C, 10A-B-C; Economics 15A-B; Earth System Science 19, 116, 134.
- Four courses from the following: Sociology 1, 2, or 3; Economics 13, 20A-B; Planning, Policy, and Design 4, 134, 139, 140, or 151; Biological Sciences E189; Earth System Science 110, 178; Logic and Philosophy of Science 60.
- Two electives each from the following three categories:
 - Any upper-division, 4-unit course in Earth System Science (199/H199 may count only once; the combination of 190A and 190B may be used as one elective requirement); courses may not be used as electives if counted toward degree requirements.
 - Chemistry 51A, 51B and 51LB, 51C and 51LC, H52A and H52LA, H52B and H52LB, H52C; Biological Sciences 20, 55, 65, 97, 98, 99, E106, E138; E140; E150; E151; E160; E161L; E166; E167; E172; E174; E175; E176; E178; E179; E179L; E181; E182; E184; E186; E189 Physics 3A, 3B, 3C, 7C, 14, 20A, 20B, 20C, 20D.
 - Economics 100A-B-C, 141A-B-C, 142A-B-C, 144A-B-C, 144T, 145E, 145L; Sociology 31, 43, 44, 110, 141, 147A, 171. Planning, Policy, and Design 135.

Career Pathways

- Air/Water Quality Management
- Atmospheric Scientists (including Meteorologists)
- City and State Environmental and Natural Resource Regulators
- College and University Professors (graduate school required)
- Conservation Scientists and Foresters
- Consultants (w/ government/private sector experience)
- Environmental Law
- Environmental Policy and Planning
- Environmental Science and Protection Technicians
- Environmental Scientists and Specialists
- Forest and Conservation Technicians
- Geographers
- Geoscientists
- Hydrologists (graduate school required)
- Oceanographers
- Pollution Cleanup Specialist
- Public School Earth System Science Teachers
- Soil Scientist
- Waste Management

Research

We are engaged in a variety of research projects in locations around the globe, including Greenland, China, Antarctica, Brazil, Cape Verde, Germany, Iceland, Hawaii, Colorado, Wyoming, and California.

Our research facilities include state-of-the-art laboratories, technological tools and advanced instrumentation.




The faculty, research staff, and students include chemists, biologists, ecologists, physicists, hydrologists, geologists, meteorologists, engineers, applied mathematicians and oceanographers.

People

The wide-ranging expertise of our internationally recognized faculty allow students to learn valuable scientific skills in the classroom, laboratory and field experiences.

Our faculty includes AGU Fellows, AAAS Fellows and TOC Fellows, as well as recipients of the Bower Award and Prize for Achievement in Science, Members of the National Academy of Sciences and the Norwegian Academy of Science and Letters and lead and contributing authors to IPCC Ar4, which was awarded the Nobel Peace Prize in 2007, and IPCC Ar5.

Faculty Research Areas

|  Atmospheric Chemistry |  Biogeochemical Cycles |  Physical Climate |
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| Claudia Czimczik | Claudia Czimczik | James Famiglietti |
| Ellen Druffel | Steven J. Davis | Kathleen Johnson |
| Alex Guenther | Ellen Druffel | Gudrun Magnúsdóttir |
| Saewung Kim | Michael Goulden | Mathieu Morlighem |
| Michael Prather | Kate Mackey | Francois Primeau |
| Eric Saltzman | Adam Martiny | Mike Pritchard |
| Charles Zender | Keith Moore | Eric Rignot |
| | Francois Primeau | Isabella Velicogna |
| | James Randerson | Jin-Yi Yu |
| | Eric Saltzman | Charles Zender |
| | John Southon | |
| | Susan Trumbore | |
| Affiliated & Emeritus Faculty | Affiliated & Emeritus Faculty | Affiliated & Emeritus Faculty |
| Ralph Cicerone | Steven Allison | Kristen Davis |
| Jasper Vrugt | William Reeburgh | Soroosh Sorooshian |
| | | Jasper Vrugt |
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