

# MASTER OF SCIENCE IN GEOSCIENCES

Program Advisor: John Caskey

The Master of Science in Geosciences provides an advanced degree that prepares students to work in private industry or government agencies, teach in community colleges or high schools, or continue postgraduate studies leading to a doctoral degree at another university. The graduate program also gives professional geoscientists an opportunity to update and upgrade their job skills.

The School of the Environment' faculty has expertise in geology, meteorology, oceanography, and paleoclimate –fields critical to understanding many environmental problems, such as air and water contamination, active faulting, coastal erosion, and global warming. There are no formal concentrations within the M.S. program, but most students choose to emphasize research that is aligned with the faculty area of expertise. We encourage students to work on interdisciplinary projects, particularly in the San Francisco Bay Area. We also encourage students to develop linkages with other departments in the university, and with agencies and firms in the local region.

All students take courses in their respective areas of emphasis plus a common core of three courses: EARTH 700, a multidisciplinary seminar that exposes students to current geoscientific research and literature, and EARTH 701 and EARTH 702, which prepare students for thesis research, quantitative analyses and scientific writing. Thesis projects are expected to have a rigorous base in a geoscience discipline. Depending on the particular field and focus of study, these projects can involve laboratory research, fieldwork, theory development, numerical simulations or model development.

Recent graduate research projects have focused on topics such as active faults in Death Valley, effects of climate change on regional aquifers, geomorphic controls on Bay Area streams, deformation associated with the San Andreas fault system, Pliocene–Pleistocene climate change, large-scale tectonic processes in the Himalayan Mountains, carbon cycling in the ocean, wave erosion at Ocean Beach, and characteristics of severe storms in California. We encourage students to work on interdisciplinary projects and develop interactions and collaborations with other departments in the University, other institutions and agencies, and private industry.

We strongly recommend that students plan a course of study before beginning the M.S. program, in consultation with a faculty advisor and the graduate coordinator.

## Admission to the Program

The School of the Environment is committed to recruiting and supporting a diverse group of graduate students with the potential to develop into excellent scientists. We offer limited financial support in the following ways:

### The John A. and Anna Monteverdi Fellowship

The Monteverdi Fellowship provides one year of significant support to graduate students in the School of the Environment who are specializing in atmospheric science, oceanography, or climate science and who demonstrate outstanding academic merit and financial need. The fellowship award of \$10,000 can be used to pay for tuition, fees, books,

and any other expenses that you may incur. A condition of the fellowship is that you register for 6 or more units each semester.

### The Professor Emerita Karen Grove and Jay Ach Fellowship Teaching fellowship

The Grove/Ach Fellowship provides two years of significant support to graduate students who demonstrate exceptional promise of achievement in the M.S. program in Geosciences. The fellowship award of \$10,000 per academic year (renewal for second academic year contingent on good research progress) can be used to pay for tuition, fees, books, and any other expenses that you may incur. A condition of the fellowship is that you register for 6 or more units each semester.

### The Department Teaching Fellowship

The Teaching Fellowship is designed to support students with a strong interest in strengthening their teaching and communication skills in addition to their scientific research. The fellowship provides the opportunity to teach up to two sections for two years (contingent on strong student and faculty evaluations of their teaching). Students with this fellowship will be required to attend SCI 750 Science Teaching for Scientists I.

### Other Sources of Support

Depending on available funding, the School of the Environment or individual faculty may be able to support additional students as Graduate Teaching Assistants, student assistant, or research assistants.

### Application Process

A critical step to being accepted to the MS Program in the School of the Environment is identifying a research mentor. We therefore strongly encourage students to email faculty they are interested in working with.

To be considered for admission to the master's program as a classified graduate student, applicants must:

- Satisfy the University admission requirements.
- Have a bachelor's degree in one of the geosciences (geology, meteorology, or oceanography) or a related discipline.
- Have a 3.0 GPA in their earned undergraduate degree or last 60 semester (90 quarter) units completed.
- Provide letters of recommendation from at least two people familiar with the applicant's previous academic work and/or professional accomplishments.
- Submit a statement of purpose. The statement should address the following questions
  - What are your main research interests and why?
  - Which faculty member(s) are you interested in working with directly?
  - Describe your financial need
  - Describe your interest in teaching and/or your interest as working as a Graduate Teaching Assistant.

Applicants lacking the appropriate background may be admitted as conditionally classified graduate students. These students must complete additional coursework that will not be counted toward the degree requirements. Conditionally admitted students may take courses but cannot file an Advancement to Candidacy (ATC) form until all deficiencies have been satisfied.

All application material should be submitted at <https://www2.calstate.edu/apply> (<https://www2.calstate.edu/apply/>)

## Written English Proficiency Requirement

Each graduate student is required to demonstrate an acceptable level of written English proficiency on two levels:

### Level One

Written English proficiency will be assessed on the basis of the Statement of Purpose. Students who demonstrate a need for additional writing support will be required to take a graduate-level writing class.

### Level Two

Satisfied by completion of a written thesis (ERTH 898).

## Program Learning Outcomes

Upon completion of the Master of Science in Geosciences:

- Students can access information about previous research that is relevant to their own study, and they can organize that information and incorporate it into their writing (thesis proposal and thesis manuscript).
- Students can formulate a research question and develop a detailed plan to address their research question.
- Students can work independently to collect appropriate data and evaluate its quality.
- Students can use quantitative methods to analyze research data.
- Students can write clear, well-organized explanations of their research goals, methods, results, and implications.
- Students can obtain entrance into a doctoral program or find employment in their field of interest.

## Advancement to Candidacy

To be advanced to candidacy, each student must:

- Satisfy level one of the written English proficiency requirement.
- Satisfy all course deficiencies stipulated upon entrance into the master's program.
- Choose a faculty advisor and complete a research proposal that has been approved by the student's thesis committee.
- File an Advancement to Candidacy (ATC) form.

## Geosciences (M.S.) – Minimum 30 units

### Required Courses (17 units)

Code	Title	Units
ERTH 700	Graduate Seminar in Geosciences	2
ERTH 701	Research Methods in Geosciences	3
ERTH 702	Quantitative Methods in Geosciences	3
ERTH 897	Research Project	6
ERTH 898	Master's Thesis	3

### Elective Courses (13 units)

Upper division or graduate elective courses on advisement.

All students must present an oral thesis defense to the Earth & Climate Sciences faculty and students.

Elective units are chosen from courses offered by the Department or other University departments, and must be selected by students in consultation with their faculty advisors. At least 6 units must be courses

numbered 700 or higher, and 6 units must be courses offered in the Earth & Climate Sciences Department.

To help prepare for their careers, graduate students are strongly encouraged to serve as a Graduate Teaching Assistant (GTA) for at least one semester. GTAs typically teach lab sections attached to lectures in introductory, general education courses in geology (ERTH 112, ERTH 210, ERTH 230), meteorology (ERTH 162), and oceanography (ERTH 172). To support their professional development in teaching, GTAs are strongly encouraged to enroll in a professional development course such as SCI 750 (2 units) before or during their service as a GTA, to learn about research-based best practices in teaching and learning. (These courses count toward the 13-unit graduate elective unit requirement.)

Students can receive their graduate degree when they complete all course requirements and their thesis committee approves the written thesis and oral thesis defense.