# DEPARTMENT OF EARTH SCIENCES

The Department of Earth Sciences at Montana State University has a full-time faculty of 15 earth scientists, geologists and geographers. We have about 50 active graduate students in our Master of Science and Doctor of Philosophy in Earth Sciences programs. We stress independent thesis research with some supporting course work. Although we are a small department, our expertise spans most of the subfields of Earth Sciences.

## DEGREES OFFERED

M.S. IN EARTH SCIENCES
PH.D. IN EARTH SCIENCES
PH.D. IN ECOLOGY AND ENVIRONMENTAL SCIENCE

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We stress independent thesis research with some supporting course work. Although we are a small department, our expertise spans most of the subfields of Earth Sciences.

Our geography faculty includes specialties from settlement geography to bioclimatology, from international urban georgraphy to GIS to snow science. The interests of our geology faculty range from petrogenesis to paleobiology to applied hydrogeology, and from dinosaur taphonomy and stratigraphy to geomorphology. Our geobiology faculty have research interests in vertebrate paleontology, paleoecology, biogeography, paleoclimatology and geomicrobiology.

Our program strengths are in basin analysis and energy resources, dinosaur paleontology, geography of the northern Rocky Mountains, architecture and composition of the lithosphere, snow science and cryospheric processes, and climate change.


DEPARTMENT OF
EARTH SCIENCES
MONTANA STATE UNIVERSITY

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## ADMISSION

The department generally expects applicants to have a GPA of 3.0 or higher, GRE scores better than the 50th percentile and a strong academic background in Earth Sciences (geography, geology or geobiology). Foreign students must have a TOEFL score better than 550 for the paper test and 231 for the computer test. The department does not accept general applicants to our graduate program. An applicant should identify a major advisor from the list of faculty, contact that individual, and determine whether there is space available in that advisor's program.

For students who wish to study geography, the department requires the equivalent of a geography minor (eight semester geography courses including map skills and world regional, human and physical geography) as background. A geography undergraduate degree is preferred, and coursework and practical experience involving geographic skills such as cartography, field methods, aerial photograph interpretation, remote sensing, GIS and quantitative methods are considered a desirable part of an applicant's background.

For optimum course scheduling, applicants are accepted into the graduate program only at the start of fall semester. However, a student desiring to take courses to strengthen qualifications for the graduate program may be admitted as a non-degree student at the beginning of either the spring or summer term. Successful applicants must be accepted both by the department and by the Division of Graduate Education.

## PROGRAM REQUIREMENTS

Students are expected to develop a solid curricular foundation in geography, geology or geobiology. All graduate students in the Department of Earth Sciences are required to take Earth Science 500, Section 01, Thesis Design for one credit in the fall of their first year. Graduate programs include a core of geography, geology or geobiology courses, and are further tailored in consultation with the advisor and graduate committee to the specific talents and interests of the individual student. Coursework in disciplines outside the department is encouraged to support and enhance specific research areas in the Earth Sciences.

## FINANCIAL ASSISTANCE

Teaching and research assistantships are available each year. Graduate scholarships are awarded annually on a competitive basis in the second year of residence to assist with thesis research.

## FACULTY

DEPARTMENT HEAD
Stephan Custer

PROFESSORS

Jack Horner - Systematics of paleobiology, Jurassic and Cretaceous dinosaurs

David Lageson - Structural geology and tectonics, carbon sequestration

William Locke - Volcano-tectonism, fault scarp evolution, soil development, fluvial terrace systems, glacial geology, and climates

David Mogk - Evolution of Precambrian crust in SW Montana, petrogenesis of continental crust, geochemical evolution of the crust

Cathy Whitlock - Quaternary environmental change, vegetation, fire, and climate history of the western U.S. and southern South America

William Wyckoff - Cultural and historical geography of the United States,

ASSOCIATE PROFESSORS

Stephan Custer - Ground and surface water hydrology, stream morphology, water quality, snow dynamics (snow-melt runoff, wet and dry snow avalanche processes, snow distribution)

Todd Feeley - Volcanology, volcanic hazards, geochemistry of continental magmatism

Michael Gardner - Stratigraphy, sedimentology, subsurface geology, ancient ocean systems, petroleum geology

Jian-Yi Liu - Economic-urban geography of China

James Schmitt - Tectonics and sedimentation in foreland and extensional basins, alluvial fan sedimentology, vertebrate taphonomy

David Varricchio - Paleoecology of dinosaurs using taphonomic and anatomic evidence at sites world wide

ASSISTANT PROFESSORS

Mark Skidmore - Biogeochemistry, geomicrobiology of glaciated systems, and the geochemistry and biogeochemistry of carbon sequestration in the subsurface

RESEARCH PROFESSORS AND AFFLIATES

David Bowen - Stratigraphy of basin-bill deposits, carbon sequestration

Frankie Jackson - Dinosaur taphonomy, dinosaur eggs, geoscience education

Colin Shaw - Structural geology, metamorphic petrology, microstructural analysis

Karl Birkeland - Snow, avalanches