

# Ph.D. in Ecology & Environmental Sciences

This cross-college doctoral degree represents a broad collaboration among departments and faculty from across MSU. It provides the opportunity for motivated students to integrate our world-class faculty research programs in diverse aspects of ecology and environmental sciences, often within the unparalleled natural laboratory that is the Greater Yellowstone Ecosystem. Particular program strengths include terrestrial and aquatic ecology, environmental biogeochemistry, evolutionary biology, hydrology and watershed analysis, quantitative ecology, agroecology, environmental risk assessment, invasive plant ecology and management, conservation biology, land rehabilitation/restoration ecology, environmental microbiology, remote sensing and spatial sciences, chemical ecology and land-atmosphere interactions.

Graduates will be well-trained professionals who will compete strongly in research, teaching, and related fields nationally and internationally.

Ecology and Environmental Sciences doctoral students will be affiliated with a home department that corresponds to that of their major faculty advisor. Other specific graduate program criteria, procedures, and processes vary among departments; students will follow those of their home department, which are also consistent with policies set forth by The Graduate School (<http://www.montana.edu/gradschool/>).

## Core Curriculum

Because of the substantial diversity in disciplinary and multidisciplinary foci within the Ecology and Environmental Sciences doctoral program, EES Ph.D. students are required to take a cohort-building course, LRES 593, which is focused on the principles and foundations of Ecology and Environmental Sciences. The course is required for each new EES Ph.D. student during the first year they are in residence on the MSU campus, but also open to other interested Ph.D. students in appropriate disciplines. The Program of Study for each EES student will also require any other requirements of the home department (i.e. LRES requires LRES 594- Seminar, for proposal presentation during the students' first year). Additional department-specific requirements will include required exams (qualifying, comprehensive and thesis/dissertation defense), expectation of subject matter for exams, and thesis/dissertation format requirements. A minimum of 30 credits of resident coursework must be taken from MSU.

Additionally, multiple courses relevant to EES could also be taken to meet The Graduate School requirements: <http://ou.montana.edu/environmental-science/>

## Ecology & Environmental Sciences Oversight Committee

The EES Oversight Committee is comprised of faculty representatives from each of the Departments that train graduate students in the EES program. Doctoral credit goes to the Department of the major professor on the Program of Study.

### Current Committee Membership:

#### EES Oversight Committee Members

##### Department

Institute on Ecosystems Chair, Director of IoE	Dr. Andy Hansen,
Land Resources & Environmental Sciences	Dr. Robert Peterson

Ecology	Dr. Diane Debinski
Earth Sciences	Dr. Dave McWethy
Animal and Range Science	Dr. Lance McNew
Plant Science & Plant Pathology	Dr. Ryan Thum
Microbiology and Immunology	Dr. Deborah Keil

## Program Participants

The program is open to students and faculty mentors in several MSU departments who undertake relevant doctoral study. For more information about the Ph.D. Program in Ecology & Environmental Sciences, faculty and their areas of research, and the application requirements and procedures, visit the department by clicking on the links below.

### College of Agriculture:

- Animal & Range Sciences (<http://animalrange.montana.edu/>)
- Land Resources & Environmental Sciences (<http://landresources.montana.edu/>)
- Microbiology & Immunology (<http://www.montana.edu/mbi/>)
- Plant Sciences & Plant Pathology (<http://plantsciences.montana.edu/>)

### College of Letters & Science:

- Ecology (<http://www.montana.edu/ecology/>)
- Earth Sciences (<http://www.montana.edu/earthsciences/>)

Stipend and operations funding are generally from research grants awarded to faculty members, but graduate teaching assistantships and other forms of support are also available on a limited basis.

## Program Learning Outcomes

- Demonstrate oral and written communication and presentation skills.
- Demonstrate problem solving skills, including critical thinking, quantitative reasoning, analytical synthesis, and decision making; information gathering skills including finding appropriate information sources (e.g., soil maps, vegetation surveys, research articles, etc.).
- Demonstrating the ability to read and summarize research papers;
- Demonstrate data management and quantitative skills such as working with spreadsheets, calculating basic statistics, organizing data layers, and applying data to equations. ;

LRES 593	Grand Challenges in Ecology and Environmental Sciences	1
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