MONTANA STATE UNIVERSITY
Land Resources and Environmental Sciences

CONTACT INFORMATION
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UNDERGRADUATE DEGREE PROGRAMS
Students in LRES degree programs receive a broad education. The foundation of our majors includes courses in biology, chemistry, earth science, ecology, mathematics, physics, and science, economics, statistics, and written and oral communication. From there, students have more to tailor their studies to their interests. A senior-level capstone course allows students to apply their classroom knowledge by developing solutions for real-world environmental problems.

B.S. in Environmental Sciences
Students may elect an option below or design their own course of study within the Environmental Sciences curriculum.
- Environmental Biology Option
- Geospatial and Environmental Analysis Option
- Land Rehabilitation Option
- Soil and Water Sciences Option

B.S. in Sustainable Food and Bioenergy Systems
- Agroecology Option

LRES Undergraduate Minors
- Soil Science
- Entomology (shared with other College of Agriculture departments)
- Water Resources (shared with other MSU Colleges)

GRADUATE DEGREE PROGRAMS
Students pursuing a master's degree or a doctoral degree in the LRES department are provided with a range of opportunities for specialization and the opportunity for cross-departmental study. Graduate student research programs are related to the diverse interests of LRES faculty. Graduate programs provide flexibility in coursework programs so students can address their individual career goals.
- M.S. in Land Resources and Environmental Sciences
- M.S. in Land Resources and Environmental Sciences (online)
- M.S. in Land Rehabilitation (Cross-departmental)
- M.S. in Entomology (Cross-departmental)
- Ph.D. in Ecology and Environmental Sciences (Cross-college)
RESEARCH OPPORTUNITIES

**Environmental Biology**
- Studies in understanding vegetation and plant ecology across natural and disturbed environments. Focus areas include:
  - Microbial ecology of extremophile environments in nearby Yellowstone National Park.
  - Remediation science, where environmental biophysicists and chemists conduct microbially-enabled research to understand the ecology of contaminant degrading bacteria.
  - Ecology of areas impacted by mining, mining, and other biosecurity impacts and plant growth impacts on trucks, control, and restoration.
  - Microbial ecology of Antarctic ecosystems focusing on the biogeochemical and biophysical processes driving life in Earth's coldest, driest, and highest environments.
  - Impact of technology abundance (precision agriculture, nutrients, herbicides, GMOs) on agroecosystems.
  - Long-term ecological research in the Greater Yellowstone and Montana’s Golden Triangle to Mongolia and Antarctica.

**Environment and Montana’s Golden Triangle to Mongolia and Antarctica.**

**Invasive Plants**
- Study the lifecycle, ecology, and management of invasive plant species in a wide range of systems (agriculture, range, rangeland, wetlands, and urban landscapes).
- Quantify the environmental and biotic drivers of plant invasion from local to global scales.
- Evaluate climate, land use, and other general mechanisms of plant invasion and management.
- Develop remediation and restoration strategies for disturbed and invasive plant-dominated areas.
- Create integrated and agriculturally framed management approaches for invasive plants in all systems.

**Insect-Plant Interactions**
- Using arthropods, microorganisms, and other natural enemies to manage insect and weed pests in wildlands and croplands.
- Developing integrated pest management and economic entomology for arthropods of small grains, forage, and specialty crops.

**Soils and Water Science**
- Integrated multi-disciplinary research on soil and environmental physics, chemistry, hydrology, watershed analysis and modeling, limnology, microbiology, hydrology, ecology, land remediation, and landscape science and explore
- Biogeochemical cycling of toxic elements associated with gold and other impacted areas.
- Interactions between plants and soils, including water relationships, plant physiology and ecology, and environmental risk assessment.
- Interactions of climate, landscapes, plants, soils, and humans.
- Temperature sensitivity and plant growth impacts on trucks, control, and restoration.
- Management approaches to improve surface and ground water quality, such as vegetative filter strips, riparian and wetland buffers, and saline-fallow replacement with grain legumes or cover crops.
- Local牵 chain impacts on hydrology, vegetation, and biogeochemical watershed hydrologic modeling.

**Ecotourism**
- Specialize in several areas of entomological science and its interface with agriculture and natural resource sciences.
- Research areas include:
  - Insect-plant interactions, including chemical ecology and plant and insect physiology, and insect behavior and ecology as they relate to pest management strategies.
  - Using orthoptera, insects, and other natural enemies to manage pest and weed pests in wildlands and crops.
  - Integrated pest management and economic entomology for arthropods of small grains, forage, and specialty crops.

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OUR FOCUS: DISCOVERY AND COMMUNICATION

Land Resources and Environmental Sciences (LRES) offers a multi-disciplinary approach to understanding and managing land resources. Our coursework and research involves soils, microbiology, insects, plants, climate, and water, the subject matter of our majors allow students to focus on their specific areas of interest.

Students have the opportunity to join LRES faculty members in cutting-edge, internationally recognized investigations, many of which take place in the world-renowned and diverse natural laboratories within the Greater Yellowstone Ecosystem. We address issues affecting cropland, rangeland, forests, restored land, extreme environments, and protected road and rail.

Through our classes, research, and service-learning opportunities, we challenge our students to shape the knowledge they gain about local and global environments with agricultural producers, land owners and managers, the general public in community, and the citizens of Montana. Our students graduate with a broad, scientifically-sound education and are well-prepared for careers in the environmental sciences.