GRADUATE PROGRAMS
EARTH SYSTEM
SCIENCE & POLICY
TO OUR
PROSPECTIVE STUDENTS

The University of North Dakota’s Department of Earth System Science & Policy is organized around researching and understanding earth systems and sustainability.

By bridging theory with practice, global and local perspectives, and scientific and social disciplines, the Department of Earth System Science and Policy seeks to understand how to meet the needs of society while researching how to sustain the life support systems of the planet.

The department strives toward excellence in three key areas of the academic experience in order to provide students with the strongest possible interdisciplinary background for career engagement:

**Excellence in Learning**
Student-structured curriculum, multidisciplinary teaching approach, experiential learning environments, field based education

**Excellence in Discovery**
Research driven by societal needs and values within an earth system science paradigm

**Excellence in Engagement**
Outreach, service, and practical experience putting knowledge related to Earth System Science and Policy to work
GRADUATE PROGRAMS

Doctor of Philosophy (Ph.D.)

An advanced research oriented program which involves conducting original research culminating in the defense of a dissertation and submission of peer reviewed publications. The goal of the Ph.D. program is to prepare students for a high level career in innovative research and/or academia, and generate new knowledge in the field of Earth System Science and Policy, and Sustainability.

Master of Science (MS)

A research oriented program which involves conducting a research project culminating in the defense of a thesis. The goal of the M.S. program is to prepare students with the necessary skills to conduct research in the field of Earth System Science and Policy. This degree is designed to help students develop a career in fields requiring research capabilities.

Master of Environmental Management (M.E.M.)

A Professional Science Master degree which emphasizes practical experience through an internship or an applied project. The M.E.M. offers an interdisciplinary-oriented education required by professionals working toward the management of earth systems and resources. The M.E.M. program helps students develop or strengthen capabilities for a career in environmental management, sustainable development, or environmental policy (online & on-campus delivery).

NOW OFFERED ONLINE!
OBJECTIVES

• Acquire and synthesized breadth of knowledge in Earth System Science and Policy and the ability to apply that knowledge to address societal-driven sustainability science research, with a broad sense of ethical and professional responsibilities.

• Acquire and master a strong knowledge of multi-scale processes, cutting-edge computer technology, geographical information systems (GIS), remote sensing, and quantitative analysis.

• Acquire and synthesize a strong knowledge of environmental policy, and environmental and resource economics related to human-environment interactions.

• Acquire and demonstrate written and oral communication skills that will facilitate the transfer of knowledge to support actionable decisions.

• Develop the ability to function within multi-disciplinary teams to accomplish common goals.

• Develop an awareness of and preparation for a lifetime of learning.
COURSE TOPICS

Earth System Science and Policy Core Course Subjects:
• Biosphere
• Energy in the Earth System
• Society and Environmental Policy
• Earth System Processes
• Environmental Economics
• Earth System Modeling
• Communicating Environmental Information

Financial Assistance
The department offers tuition waivers to most incoming graduate students. These waivers are awarded on the basis of academic merit. Graduate Research Assistantships (GRAs), offered depending on availability, allow students to work closely with faculty on research while providing a stipend.

Questions? Contact:
Dr. Jeff VanLooy, Graduate Director
jeffrey.vanlooy@UND.edu
ADMISSION REQUIREMENTS

Master of Environmental Management (MEM) and Master of Science (MS)

• Bachelor’s degree from an accredited college or university.

• Have satisfactorily completed a minimum of college-level algebra plus 3 credits of college statistics or calculus.

• M.E.M: Have completed a minimum of 6 semester credits in the natural sciences AND 6 semester credits in social sciences.
  MS: Have completed a minimum of 12 semester credit hours in natural or physical sciences.

• Minimum GPA of 3.00 on a 4.00 scale, on all upper division college-level course work.

Doctor of Philosophy (PhD):

• Master’s degree from an accredited college or university, in a discipline related to ESSP.

• Minimum average GPA of 3.50 on a 4.00 scale on all graduate-level course work.
DEPARTMENT CHAIR &
ASSOCIATE PROFESSOR
DR. SOIZIK LAGUETTE

Dr. Soizik Laguette holds a Ph.D. in Environmental Science. Within the context of the food/energy/water nexus, her research focuses on remote sensing of crop physiology and crop cultivation to improve cropping systems while addressing the need for sustainable food systems, and on developing and consolidating the bridge between researchers and the end-users community through a learning community approach. She is also interested in biomass energy and sustainable energy systems, and in the adoption and integration of a systems thinking and system dynamic approach.

RESEARCH INTERESTS: Remote sensing, sustainable cropping system, biomass energy, sustainable energy, systems thinking, learning community approach

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ASSISTANT PROFESSOR

DR. SEAN T. HAMMOND

Dr. Sean Hammond training as a molecular biologist strongly influences his macroecological approaches to forest and human ecology. Extraordinarily dynamic processes appear to have very basic underlying rules that govern the behavior of individual factors within the systems. Examples include the interaction of individual plants as they compete for light and space, where early human civilizations arose, and the structure of modern road networks. In his research he looks for simple relationships that result in bottom-up emergent behaviors, and the factors that impact the long-term stability of these systems.

RESEARCH INTERESTS: theoretical ecology, plant and forest modeling, plant structure and form, macroecology, plant molecular biology, history of science

PROFESSOR EMERITUS

DR. MICHAEL HILL

Emeritus Professor Dr. Michael J. Hill received his B. Agric. Sci. and M. Agric. Sci. from La Trobe University in Melbourne, and his Ph.D. in Agronomy from The University of Sydney, Australia. He spent 12 years in CSIRO Division of Animal Production and then 6 years in the Bureau of Rural Sciences in the Australian Government. In 2006, he became Professor of Earth System Science. He has a background in grassland agronomy, but has worked with spatial information and remote sensing of land systems for the past 30 years. He retired in June, 2016. He currently resides in Australia but continues his involvement with research at UND and as a visiting scientist at CSIRO Land and Water in Canberra, Australia.

RESEARCH INTERESTS: savannas and grasslands, ecosystem function, remote sensing, ecological modelling, land surface and vegetation dynamics
PROFESSOR
DR. REBECCA J. ROMSDAHL

Dr. Romsdahl is a translational ecologist with a PhD in Environmental Science and Public Policy. She teaches classes about environmental communication, policy, and sustainability. Her research examines the human dimensions of global environmental change, specifically topics involving climate change, biodiversity conservation, energy transitions, framing and public engagement, and local government policy process.

RESEARCH INTERESTS: Human dimensions of global environmental change, environmental policy development.

rebecca.romsdahl@UND.edu

GRADUATE DIRECTOR & ASSOCIATE PROFESSOR
DR. JEFF VANLOOY

Holding a Ph.D. in Geography, Dr. VanLooy conducts research on the changing conditions of mountain glaciers, specifically studying glacial melt rates and the contribution of melt water to stream flow. Dr. VanLooy has an interest in Earth surface processes and their relationship to climate change. His technological expertise is in geographic information science (GIS) and remote sensing.

RESEARCH INTERESTS: Physical geography, geomorphology, glaciology, climate change, remote sensing, GIS

jeffrey.vanlooy@UND.edu
ASSOCIATE PROFESSOR

DR. HAOCHI ZHENG

As an Environmental Economist, Dr. Zheng’s research interests are studying individual’s economic decision-making on natural resources use and management, and their consequences on the environment and society. Her research builds on the traditional micro-economic and valuation theories, but emphasizes more on applying economics tools (i.e. equilibrium model simulation, econometrics, benefit cost analysis, ecosystem services valuation) to quantitatively analyze environmental issues and support policymaking. With interdisciplinary approach, Dr. Zheng has developed a research theme that allows her to cross the traditional economics boundary and collaborate with scientists in various fields to study the integrated human-natural system with a focus on economic decision-making of natural resources, in particular land and water. Dr. Zheng has led multiple research projects funded by various federal and state agencies including USDA, NSF, NASA, and ND State. Her recent research topics include, but not limited to, land use and land management, water sustainability (quantity and quality), flood mitigation, and provision and valuation of ecosystem services, in particular, pollination services.

RESEARCH INTERESTS: Environmental and resource economics, energy economics, ecological economics, development economics, applied/micro econometrics
FOCUSING TO CREATE AN ACADEMIC AND INTELLECTUAL CLIMATE THAT APPRECIATES AND RESPECTS DIVERSITY, VALUES CREATIVITY, AND SUPPORTS THE ACADEMIC POTENTIAL OF EACH GRADUATE STUDENT.

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