



**GRADUATE PROGRAMS**  
**EARTH SYSTEM**  
**SCIENCE & POLICY**



# DISCOVER THE INTERCONNECTEDNESS OF OUR WORLD

Welcome to the Department of Earth System Science and Policy in the John D. Odegard School of Aerospace Sciences at the University of North Dakota.

Our planet is made up of a complex set of systems which include both human and environmental components, which are constantly interacting and influencing each other through various feedbacks. Over the last century as humans have increased our technological abilities and grown in population, our environmental systems which provide life support and critical resources, has become strained. In order to find solutions to balance human and environmental relationships leading to a more sustainable future, it is necessary to study the interconnected systems of our planet.

The Department of Earth System Science and Policy offers graduate students an opportunity to learn from a wide variety of faculty who have come from a range of environmentally related academic fields and perspectives. No faculty members have the same degree field, which range from energy to environmental policy, and microbiology to environmental economics, but we all have the same broad goal of working toward a more sustainable world through researching our intertwined fields.

We invite you to apply to one of our graduate programs to begin your journey of discovery and research, and to become a leader in making our planet a more sustainable place to live for future generations!

**Jeff VanLooy, Ph.D.**

Graduate Director, Earth System Science and Policy

# ESSP GRADUATE PROGRAMS

Address today's environmental and sustainability challenges to define and shape tomorrow's positive and sustainable changes.

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

### On-Campus and Online

The M.E.M. offers an interdisciplinary-oriented education required by professionals working toward the management of earth systems and resources.

This master's of environmental management program is geared toward those with a strong background in environmental and sustainability science, and environmental policy by providing advanced quantitative and analytical knowledge, integrated geospatial technology skills, and a breath of professional component that includes business, economics and communication.

### Admission Requirements:

- 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
- Have completed a minimum of 6 semester credits in the natural sciences AND 6 semester credits in social sciences
- Minimum GPA of 3.00 on a 4.00 scale, on all upper division college-level course work

## Master of Science (M.S.)

### On-Campus and Online

Study the planet's different systems — hydrosphere, lithosphere, atmosphere, biosphere and anthroposphere — as an integrated Earth system. In this master's program, you'll gain valuable foundational and technical knowledge to help solve problem areas related to Earth sustainability and global change. Your graduate work will include researching integrative human and environmental processes for shaping environmental policy and integrating environmental and resource economics.

### Admission Requirements:

- 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
- 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 (Ph.D.)

### On-Campus and Online

UND's Earth System Science & Policy Ph.D. program is multidisciplinary and practical in nature. You'll have opportunities to become a high-level researcher with the ability to generate new theories and knowledge. In addition, you will gain research expertise to be able to critically evaluate and identify gaps in existing knowledge.

Learn to generate rigorous scientific inquiry that bridges the gaps identified in scientific knowledge. UND's Earth System Science & Policy Ph.D. combines theory with practice, global and local perspectives, and scientific and social disciplines.

### Admission Requirements:

- 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
- College-level Algebra, and College Statistics or Calculus
- 12 credits in Natural or Physical Sciences
- 6 credits in Social Sciences

# WHAT WE OFFER

The department of Earth System Science & Policy at UND offers an original approach that bridges theory with practice, global and local perspectives, and scientific and social disciplines.

Students are equipped with skills and knowledge in natural science, environmental policy, and economics to solve real-world issues through a holistic approach. Learn from a student-structured curriculum, a multi-disciplinary teaching approach, and experiential learning environments.



## Research in ESSP

### Gain hands-on experience in conducting research.

Faculty led research topics in ESSP are broad and varied, from analyzing biofuel applications to evaluating the economic impact of natural resources, and from analyzing the quantity and quality of water resources to understanding how to communicate science in an effort to create successful environmental policies.

Students accepted into the ESSP graduate programs have the opportunity to work alongside the faculty to gain hands-on experiential learning within these (and more!) research topics through either a Graduate Research Assistantship, or within their own thesis or dissertation research.

Students are encouraged to work closely with their advisors on these topics, which often has led to students presenting at national conferences (some of which have won awards), and peer-reviewed publications where students are the first author.

## WHAT WE OFFER

### ESSP Core Course Subjects

- Biosphere
- Energy in the Earth System
- Society and Environmental Policy
- Earth System Processes
- Environmental Economics
- Earth System Modeling
- Communicating Environmental Information

### 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.

# BY THE NUMBERS

## Earth System Science & Policy

**6**  
faculty members

**90+%**  
job placement rate

**6 months**  
average job placement time

**\$93K**  
median salary range for an environmental scientist and specialist

# EARTH SYSTEM SCIENCE & POLICY GRADUATE FACULTY



Department Chair | Associate Professor

## DR. SOIZIK LAGUETTE

Ph.D., 1997, Environmental Science, French Institute of Forestry, Agricultural and Environmental Engineering

### 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

Ph.D., 2011, Botany, Cornell University

### RESEARCH INTERESTS:

Theoretical ecology, plant and forest modeling, plant structure and form, macroecology, plant molecular biology, history of science.

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Professor Emeritus

**DR. MICHAEL HILL**

Ph.D., 1985, Agronomy, the University of Sydney, Australia

**RESEARCH INTERESTS:**

Savannas and grasslands, ecosystem function, remote sensing, ecological modelling, land surface and vegetation dynamics.

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Graduate Director | Associate Professor

**DR. JEFF VANLOOY**

Ph.D., 2007, Geography, University of Utah

**RESEARCH INTERESTS:**

Physical geography, geomorphology, glaciology, climate change, remote sensing, GIS.

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Professor

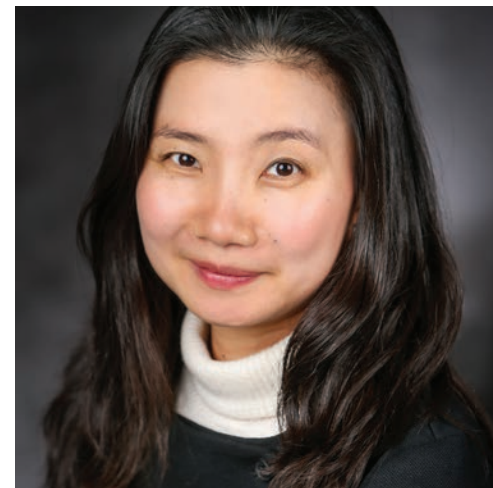
**DR. REBECCA J. ROMSDAHL**

Ph.D., 2005, Environmental Science and Public Policy, George Mason University

**RESEARCH INTERESTS:**

Human dimensions of global environmental change, environmental policy development.

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Associate Professor

**DR. HAOCHI ZHENG**

Ph.D., 2010, Agricultural and Applied Economics, University of Minnesota

**RESEARCH INTERESTS:**

Environmental and resource economics, energy economics, ecological economics, development economics, applied/micro econometrics.

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Learn more about  
the ESSP graduate  
programs

[aero.UND.edu/essp](http://aero.UND.edu/essp)



## Schedule Your Visit

See UND Aerospace up close and ask all the questions you want! An in-person visit is a great way to see what awaits you at UND.



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