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OVERVIEW

Program Mission and Philosophy

The mission of the Environmental and Conservation Sciences (ECS) graduate program, North Dakota State University (NDSU) is to produce high quality graduates through an inclusive, respectful, caring and nurturing environment, and interdisciplinary research. The program serves as a platform for faculty from different disciplines to collaborate on research and education broadly on environmental and conservation issues. Research conducted in the program frequently involves environmental and conservation problems in the State of North Dakota which is aligned with NDSU as a land grant university. The program rests on an integrative curriculum and a multidisciplinary team approach. The program emphasizes the common ground shared by all sciences, and seeks to bridge methodological and philosophical boundaries that might hinder interdisciplinary communication and cooperation.

Participating Colleges and Departments

The ECS program was established in 2003-2004 and is participated by 4 colleges: Agriculture, Food Systems, and Natural Resources; Arts, Humanities, and Social Sciences; Engineering; and Science and Mathematics. Several departments under these colleges are involved in the program with Agribusiness and Applied Economics, Agricultural and Biosystems Engineering, Biological Sciences, Civil and Environmental Engineering, Geosciences, and Veterinary and Microbiological Sciences being major participants.

Degrees and Study Tracks

ECS M.S. and Ph.D. programs follow one of three tracks:

1. Environmental Science, focusing on abiotic environmental issues, such as water, air, and land pollution.
2. Conservation Biology, focusing on biotic issues, such as the preservation of biodiversity and ecosystem function.
3. Environmental Social Sciences, emphasizing relationships between humans and the natural environment, such as cultural and behavioral issues, policy, business and economics, and sustainable development.

Environmental Science

Areas of Environmental Science, such as climate change, groundwater, hazardous waste, and water chemistry, require broad training across discipline lines for successful application. To better predict anthropogenic environmental impacts, the engineering, earth material, chemical, and biological data must be considered in an integrated manner.

Conservation Biology

Conservation Biology offers a new philosophy of looking at complex problems. This discipline focuses on the loss of regional and global biodiversity, but also considers the
human element in its approach to resource issues. As an example, landscape ecology, sustainable development, and conflict resolution are themes promoted by the field of Conservation Biology.

*Environmental Social Sciences*

Environmental Social Sciences discipline looks at interactions between humans and the environment which tend to be complex and often require interdisciplinary efforts to understand and manage. Environmental policy, environmental economics, environmental history, environmental communication, environmental sociology, and human ecology are examples of the fields of study.

**POLICIES AND PROCEDURES**

**Admission and Funding/Assistantships**

To be admitted to the ECS program, the applicant must meet the Graduate School requirements ([https://bulletin.ndsu.edu/graduate/admission-information/](https://bulletin.ndsu.edu/graduate/admission-information/)). The English proficiency minimum requirements are a TOEFL iBT of 79 or an IELTS of 6.5. The application deadline for international applications is May 1 for fall semester and August 1 for spring semester. Domestic applicants should apply at least one month prior to the start of classes.

Basic application, admission, and financial support information and policies for the ECS program are as follows.

1. Only students with advisers and guaranteed funding will be admitted.
2. Applications are reviewed by an interdisciplinary faculty committee based on credentials such as grade point average, English proficiency scores (if applicable), recommendation letters, research experiences and statement of interests/purpose.
3. The best way to get funded is to contact ECS faculty whose research expertise matches students’ interests. A list of ECS faculty is available at: [https://www.ndsu.edu/ecs/index.php/people/faculty](https://www.ndsu.edu/ecs/index.php/people/faculty). NDSU faculty who are not on this list, may also serve as an adviser.

Applications will not be evaluated until there is a commitment from an ECS/NDSU faculty to serve as an adviser and financial support is secured.

**Major Advisor and Supervisory Committee**

Based on the admission policies above, the student will have a major/academic adviser upon entering the program. By the end of the second semester, the student and academic adviser will arrange for the appointment of a Graduate Supervisory Committee.

For Ph.D. study, the Graduate Supervisory Committee will consist of at least four members of the NDSU graduate faculty. The committee must include the student’s adviser, two additional ECS faculty members, and an appointee of the Graduate School.
One committee member must be from outside the student’s home department. The plan of study will be prepared by the student, in consultation with the major adviser, by the end of the third semester (not including summer) in residence.

For M.S. study, the Graduate Supervisory Committee will consist of at least three members of the NDSU graduate faculty and will include the student’s adviser, an ECS faculty member and a faculty from outside the student’s home department. The plan of study will be prepared by the student, in consultation with the major adviser, by the end of the first year in residence.

ECS graduate students will present their research proposal and plan of study to their graduate advisory committees for approval during the first year of their program for M.S. students and within the first two years for Ph.D. students. The proposal will be circulated to committee members at least two weeks prior to the committee meeting, and only after the student’s advisor has provided his/her approval. Students should ask each committee member if s/he prefers a hard copy or a pdf of the proposal.

Similarly, the dissertation/thesis will be shared with committee members at least two weeks prior to the thesis defense, and only after the student’s advisor has provided his/her approval. This requirement recognizes that faculty members need sufficient time to properly review the dissertation/thesis. Students should ask each committee member if s/he prefers a hard copy or a pdf of the dissertation/thesis. Committee meetings including defenses will be scheduled during the academic year (August 16 – May 15), as many faculty are on 9-month appointments.

**Program Structure and Administration**

The ECS program is administered by the ECS Director and Steering Committee. The Steering Committee is composed of at least four faculty members from four participating colleges. The Steering Committee membership is based on nomination and confirmation by the Director and existing Steering Committee members. The committee also includes a student member which is nominated annually by the ECS Graduate Student Association. The ECS Program Director presides over ECS Steering Committee meetings.

The ECS program is not a department and therefore does not have permanent faculty and facilities. The admitted student is a student in the ECS program but is housed in the home department of his/her major adviser. The office of the Director serves as the office of the program.

**Curriculum, and Degree and Thesis/Dissertation Requirements**

The information on curriculum, and degree and thesis/dissertation requirements is available on the program website ([https://www.ndsu.edu/ecs/index.php/future-students/courses](https://www.ndsu.edu/ecs/index.php/future-students/courses)). All Ph.D. students in the program are required to complete preliminary/comprehensive examination(s). The student, major adviser, and supervisory
committee mutually decide on the format and content for the examination(s). The program has no specific preliminary/comprehensive examination requirements.

Seminar Requirements

All ECS students are required to attend a weekly Green Bag Seminar series organized by the program and to give two seminar presentations. The first presentation is a short presentation (20 to 25 minutes) and is given at an initial stage of thesis/dissertation research, preferably in the second semester for M.S. students and the third semester for Ph.D. students. There is no course credit associated with this first presentation. The second presentation is a full presentation (40 to 45 minutes) and is given at the last stage of thesis/dissertation research, normally in the semester that the student plans to graduate. The student must register for 1 credit of ECS 790 Graduate Seminar for the semester that the full presentation is given. In addition to the Green Bag Seminar series, ECS students are required to attend seminars in their home departments.

Resources and Support

Website
The program website is available at http://www.ndsu.edu/ecs. It contains general and specific information about the program as well as announcements, events and news. The website also lists current students in the program. To be listed, the student should contact the Program Director and provide his/her information (similar to that posted on the website for other students).

Professional Development Events
The program usually sponsors one professional development workshop per year for the students and a career/job search panel. The topic of the workshop is proposed by the students and decided based on benefits and impact to the students at large. NDSU Graduate School also hosts several workshops and trainings annually for graduate students.

Research Integrity
ECS students are expected to be in compliance with NDSU Policy 348 on responsible conduct of research (https://www.ndsu.edu/fileadmin/policy/348.pdf). The ECS curriculum requires completion of UNIV 720 Scientific Integrity course for both M.S. and Ph.D. students. The students are strongly encouraged to take the course in the first or second semester of their study. In addition, several events and resources on campus related to responsible conduct of research, such trainings/workshops organized by Office of Research Creative Activities, and Blackboard System are available.

Travel Support
The program has limited funding to partially support the students to conferences and technical meetings. To request for the support, the students should write a request letter/e-mail to the Program Director and provide the following information.
- Conference name, location, and date
- Abstract acceptance letter/e-mail from the conference
- Estimated budget (Registration, transportation, and accommodation expenses)
- Potential sources of support and amount

Student Organization and Group
The ECS Graduate Student Association (ECSGSA) is a student organization associated with the program. ECSGSA hosts several social, fundraising, volunteer, and technical events. It is an active organization and represents ECS students in different events and activities. The annual membership fee for the organization is $10. More information on ECSGSA can be found on the program website and their Facebook page: https://www.facebook.com/ecsgsassoc.

ECS Ambassadors
ECS Ambassador Fellows have received stipend support via ECS recruiting grants awarded to their graduate advisors. The Ambassadors are responsible for assisting with ECS Recruiting activities. Their activities include but not limited to hosting campus visits by prospective students (providing campus and laboratory tours) and visiting local universities for recruiting events/fairs. The information on current ECS Ambassadors is on the program website.

Contact
For additional information and questions regarding the program, please contact:

Craig Stockwell
Program Director
Department of Biological Sciences
Office: Stevens 119
Phone: 701-231-8449
craig.stockwell@ndsu.edu

Robin Cummings Pas
Academic Support Specialist
College of Graduate and Interdisciplinary Studies
Office: Putnam 106
Phone: 701-231-8547
robin.groberg@ndsu.edu
PARTICIPATING FACULTY

The following list of faculty is based on their interests and interactions with the ECS program. It is not an exhaustive list of academic advisers/major advisers for prospective students:

F. Adnan Akyuz, Ph.D.
University of Missouri-Columbia, 1994
Research Interests: Applied Climatology and Microclimatology/Climate Based Agriculture

Laura Aldrich-Wolfe
Cornell University, 2006
Research Interests: Molecular Ecology, Conservation Biology, Plant-fungal interactions, Tropical Biology

Allan C. Ashworth, Ph.D.
University of Birmingham, 1969
Research Interests: Quaternary Paleoecology, Paleo climatology

Peter Bergholz, Ph.D.
Michigan State University, 2007
Research Interests: Food Safety and Environmental Microbiology, Landscape Genomics

Achintya Bezbaruah, Ph.D.
University of Nebraska-Lincoln, 2002
Research Interests: Nanomaterials for Pollution Control, Recalcitrant and micro pollutants, Contaminant fate and transport, Small community water and wastewater treatment, Environmental sensors, Environmental management

Julia Bowsher, Ph.D.
Duke University, 2007
Research Interests: Evolutionary and Developmental Biology

Malcolm G. Butler, Ph.D.
University of Michigan, 1980
Research Interests: Aquatic Invertebrate Biology, Limnology, Wetland Ecology

Igathinathane (Igathi) Cannayen
Indian Institute of Technology, Kharagpur, 1997

Patrick M. Carr, Ph.D.
Montana State University, 1989
Research Interests: Sustainable Agriculture, Cropping Systems
Frank X.M. Casey, Ph.D.
Iowa State University, 2000
Research Interests: Field and Laboratory Studies of Water Flow and Chemical Transport Processes

Larry Cihacek, Ph.D.
Iowa State University, 1979
Research Interests: Carbon Sequestration in Soils, Soil Physical Properties, Soil Management for Waste Disposal

Gary K. Clambey, Ph.D.
Iowa State University, 1975
Research Interests: Ecology and Biogeography, Environmental Analysis and Planning, Structure Function Relations in the Midwestern Ecosystems

Mark E. Clark, Ph.D.
University of Tennessee, 1996

Dennis Cooley, Ph.D.
University of Rochester, 1995 Research Interests: Ethics of Science

Davis Cope, Ph.D.
Vanderbilt University, 1980
Research Interests: Partial Differential Equations, Numerical Methods, Applied Mathematics

Aaron Daigh, Ph.D.
Iowa State University, 2013
Research Interests: Soil Physics, Transport in Soils, Soil Residue and Water Management, Crop Rotations, and Nutrient/Agrochemical/Industrial Byproduct Soil Amendment Impacts on Soil Physical Properties

Stephanie Day, Ph.D.
University of Minnesota, 2012
Research Interests: Fluvial Geomorphology, Slope Stability, Geospatial Sciences

Edward (Shawn) DeKeyser, Ph.D.
North Dakota State University, 2000
Research Interests: Wetland Ecology, Wetland Assessment and Monitoring, Invasive Species Ecology and Management, Native Prairie Restoration
Anne Denton, Ph.D.
University of Mainz, 1996
Research Interests: Data Mining, Bioinformatics, Scientific Informatics, Educational Technology, Model Building, Databases

Thomas M. DeSutter, Ph.D.
Kansas State University, 2004
Research Interest: Trace Gas Fluxes, Inorganic Soil Chemistry, Soil Environmental Conditions

Ned Dochtermann, Ph.D.
University of Nevada, Reno, 2009
Research Interests: Ecological and Evolutionary Causes and Consequences of Phenotypic Variation

Erin Gillam, Ph.D.
University of Tennessee, 2007

Gary A. Goreham, Ph.D.
South Dakota State University, 1985
Research Interests: Rural Sociology, Community, Family Research Methods, Sociology of Religion, Sociology of Agriculture

Kendra Greenlee, Ph.D.
Arizona State University-Tempe, 2004
Research interests: Environmental and Respiratory Physiology of Insects; Insect Immunology.

Timothy Greives, Ph.D.
Indiana University, 2009
Research Interests: Physiology and Behavior of Animals in Response to Environmental Signals

James W. Grier, Ph.D.
Cornell University, 1975

Jill Hamilton, Ph.D.
University of British Columbia, 2012
Research Interests: Plant Evolutionary Genomics
Jason Harmon, Ph.D.
University of Minnesota, 2003
Research Interests: Environmental Change; Ecosystem Services; Population and Community Ecology

Marion O. Harris, Ph.D.
Michigan State University, 1986
Research Interests: Insect-Pest Management, Host-Plant Relationships

Mark Harvey, Ph.D.
University of Wyoming, 1986
Research Interests: American West, Environmental History, Public History

Harlene Hatterman-Valenti, Ph.D.
Iowa State University, 1993
Research Interests: High-Value Crop Production

Robert R. Hearne, Ph.D.
University of Minnesota, 1995
Research Interests: Economic Analysis of Emerging Environmental and Resource Issues in the Northern Great Plains

Britt Heidinger, Ph.D.
Indiana University, 2007
Research Interests: Physiological Ecology, Senescence, Stress Physiology

Linda Helstern, Ph.D.
Southern Illinois University-Carbondale, 2001
Research Interests: Writing, Literature and the Environment, Multicultural Literature

David Hopkins, Ph.D.
North Dakota State University, 1997
Research Interests: Soil Formation and Chemistry

Tom Isern, Ph.D.
Oklahoma State University, 1977
Research Interests: History of Agriculture, History of Great Plains

Donna Jacob, Ph.D.
University College, 2004
Research Interests: Wetland Ecology, Biogeochemistry, Ecophysiology and Ecotoxicology

Sivaguru Jayaraman, Ph.D.
Tulane University, 2003
Research Interests: Photocatalysis, Photochemistry, Green Chemistry
Xinhua Jia, Ph.D.
University of Arizona, 2004
Research Interests: Evapotranspiration, Subsurface Drainage and Water quality

Dinesh Katti, Ph.D.
University of Arizona, 1991
Research Interests: Geotechnical Engineering, Constitutive Modeling of Geologic Materials, Expansive Soils, Multiscale Modeling, Steered Molecular Dynamics, Computational Mechanics, Nanocomposite, and Bio-nanocomposites. Computational Biophysics

Eakalak Khan, Ph.D.
University of California Los Angeles, 1997
Research Interests: Water Quality, Biological Process Development for Water and Wastewater Treatment, Storm water and Non-Point Source Pollution Control

Page Klug, Ph.D.
Kansas State University, 2009
Research Interests: Wildlife Damage Management – Birds and Agriculture

Benjamin Laabs
University of Wisconsin-Madison, 1999
Research Interests: Glacial Records and Pace of Climate Change,

Kenneth E. Lepper, Ph.D.
Oklahoma State University, 2001
Research Interests: Quaternary Geology and Age Dating

Adam R. Lewis, Ph.D.
Boston University, 2005
Research Interests: Long-term Climate Evolution, Antarctic Climate Evolution, and Glacial Geology

Wei Lin, Ph.D.
SUNY at Buffalo, 1992
Research Interests: Water and Wastewater Treatment, Hazardous Waste Management

Zhulu Lin, Ph.D.
University of Georgia, 2003
Research Interests: Surface and Subsurface Hydrology and Modeling, Soil and Water Resources Management, Environmental Systems Analysis, Risk Identifications and Assessment, Geostatistics and Spatial Statistics

George M. Linz, Ph.D.
North Dakota State University, 1982
Research Interests: Avian Ecology
Guodong Liu, Ph.D.
Hunan University, 2001
Research Interests: Synthesis of Novel Nanomaterials, Biosensors, Bioassays

John McEvoy, Ph.D.
University of Ulster Northern Ireland, 2002
Research Interests: Cryptosporidium Virulence Factors and Mechanisms of Pathogenesis

Mark Meister, Ph.D.
University of Nebraska, 1997
Research Interests: Rhetorical and Critical Theory, Environmental Communication

Jennifer Momsen, Ph.D.
Rutgers, 2007
Research Interests: Biology Education, Systems Thinking in Introductory Biology, Visualization, Assessing the Cognitive Level of STEM Courses

Bakr Mourad Aly Ahmed, Ph.D.
Virginia Tech., 2001
Research Interests: Sustainability Indicators and Implementation, Carrying Capacity Measurements, Coastal Development, Built Environment and Natural Resources Conservation

Jack Norland, Ph.D.
North Dakota State University, 2008

Peter Oduor, Ph.D.
University of Missouri - Rolla, 2004
Research Interests: Geographic Information Systems, Groundwater Flow Modeling, Groundwater Contamination

Marinus Otte, Ph.D.
Vrije Universiteit, 1991
Research Interests: Wetland ecology, Biogeochemistry, Ecophysiology and Ecotoxicology

G. Padmanabhan, Ph.D.
Purdue University, 1980
Research Interests: Hydrology, Water Resources, Hydraulic Engineering

Birgit Pruess, Ph.D.
Ruhr- Universitat Bochum, 1991
Research Interest: Microbial Physiology and Gene Regulation
Scott Pryor, Ph.D.
Cornell University, 2005
Research Interests: Biofuel Production from Cellulosic Feedstocks, Biobased Chemicals and Materials, Bioprocess Engineering, Process Optimization, Solid State and Liquid Fermentation Systems

Shafiqur Rahman, Ph.D.
University of Manitoba, 2004
Research Interests: Animal Waste Management, Biosolids Management, Air Quality, Water Quality, Composting

Wendy L. Reed, Ph.D.
Iowa State University, 2000
Research Interests: Physiological Ecology, Wetland and Bird Ecology, Environmental Endocrinology

David A. Rider, Ph.D.
Louisiana State University, 1988
Research Interests: Insect Systematics, Biodiversity

David C. Roberts, Ph.D.
Oklahoma State University, 2009
Research Interests: Evaluation and Design of Economically Efficient Tools and Policies for Pollution Control, Economic Valuation of Environmental and Ecological Attributes through Revealed and Stated Preference Methods, Valuation of Environmental Risk, and Low-impact and Precision Agriculture

Bernhardt Saini-Eidukat, Ph.D.
University of Minnesota, 1991
Research Interests: Environmental Geochemistry, Igneous Petrology, Economic Geology

Donald P. Schwert, Ph.D.
University of Waterloo, 1978
Research Interests: Quaternary Paleoecology, Analysis of Fossil Insects

Halis Simsek, Ph.D.
North Dakota State University, 2012
Research Interests: Bioenvironmental Engineering

Todd Sirotiak, Ph.D.
Iowa State University, 2008
Research Interests: Construction Process Improvement, Sustainability

Dean D. Steele, Ph.D.
University of Minnesota, 1991
Research Interests: Irrigation and Environmental Engineering
Craig A. Stockwell, Ph.D.
University of Nevada, 1995
Research Interests: Conservation Biology, Evolutionary Ecology of Native Fishes, Contemporary evolution

Jon Sweetman, Ph.D.
Queen's University, 2006
Research Interests: Aquatic Ecology and Environmental Change

Lydia Tackett, Ph.D.
University of Southern California, 2014
Research Interests: Early Mesozoic Marine Revolution, Manicouagan Bolide Impact Event, Norian-Rhaetian Boundary Events and the End-Triassic Mass Extinction

Steve E. Travers, Ph.D.
University of California, 1998
Research Interests: Plant Evolutionary Ecology

Cheryl Wachenheim, Ph.D.
Michigan State University, 1994
Research Interests: Eliciting Perceptions and Valuations from Consumers, Firms, Students and Other Stakeholders and Decision Makers

Alexander Wagner, Ph.D.
Oxford University, 1997
Research Interests: Lattice Boltzmann, Spinodal Decomposition, Viscoelasticity, Drop Deformation and Break-up in a Shear Flow, Wetting, Non-equilibrium Thermodynamics, Complex Systems

Dennis Wiesenborn, Ph.D.
Rice University, 1989
Research Interests: Refining, Fractionation and Conversion of Fats and Oils from Plants, Process Modeling for Biofuels and Renewable Products

Scott Wood, Ph.D.
Princeton University, 1985
Research Interests: Environmental Geochemistry, Radioactive Waste Disposal

George Youngs, Ph.D.
University of Iowa, 1981
Research Interests: Perceived Ethics of Genetically Modified Organisms, Sustainable Agriculture
Brian D. Wisenden, Ph.D.
University of Western Ontario, 1993
Research interests: Behavioral Ecology of Fishes, Chemical Ecology of Predator-Prey Interactions, Parental Care and Mating Systems