

Environmental Dynamics (ENDY)

Peter Ungar
Program Director
336 Old Main
479-575-6603
Email: endy@uark.edu

Environmental Dynamics Website

Degree Conferred:

M.S. in Environmental Dynamics (ENDY)
Ph.D. in Environmental Dynamics (ENDY)

Program Description: The Environmental Dynamics faculty prepare program graduates to enter the workforce as leaders in the global effort to understand and manage climate change and human responses to it. Environmental Dynamics students can learn from nearly 100 affiliated faculty members and make use of state-of-the-art research facilities and laboratories on our campus. Our approach is interdisciplinary and allows students to work across departments and colleges to gain the tools needed to address today's most pressing environmental issues. The Environmental Dynamics program's focus is unique and two-tiered, providing students with a deep-time perspective, which gives human-environmental interactions context, and sustainability, which gives them relevance. This approach benefits all Environmental Dynamics students and prepares them to meet the challenges of employment that master's and doctoral degree-holding professionals face in today's world.

Primary Areas of Faculty Research: Interdisciplinary research activities among faculty participating in the ENDY program are very broad, though particular areas of strength are found in dendrochronology and paleoclimatology; watershed and water resource sciences; geosciences (geomorphology, geodynamics, geodesy, geoinformatics and geospatial applications); anthropology; soil sciences; sustainability issues; ecology, ecological change, environmental pollution and land use change; and impacts of natural hazards. In addition, many research activities involve strong components of social sciences, economics and sustainable development. Interested individuals are encouraged to contact the ENDY program or participating faculty to obtain additional information related to specific research projects and possible participation.

Requirements for M.S. in Environmental Dynamics

Admission: The candidate for admission to graduate study in Environmental Dynamics must satisfy the requirements of the Graduate School and have the approval of the Administrative Board. The student must have a B.A. or B.S. in a related field and submit the following information:

1. Three recommendations from individuals familiar with the applicant's academic or work history who can give candid assessments of the applicant's ability to perform at the graduate level.
2. A Statement of Purpose outlining the applicant's plans for the ENDY degree program that includes relevance of previous academic or work experience, current research interests or employment that bear on graduate level research, special skills, fieldwork. experience, familiarity with interdisciplinary work (if any), and future career goals.

3. An example of the applicant's writing such as a publication reprint, report, major term paper, undergraduate honors thesis, or similar document that demonstrates the applicant's organizational skills, research ability, familiarity with a body of literature, ability to report clearly on an academic topic, and/or general writing skills.
4. English language requirements of the Graduate School.
5. GRE scores are not required but are strongly encouraged.
6. Other relevant information that would assist the Admissions Committee in selecting applicants to the program.

The program of study is designed primarily for the student who seeks the Ph.D. degree. However, those interested in a terminal master's degree will be considered for admission on a case-by-case basis. All Ph.D. candidates entering with a B.A./B.S. must complete requirements for the M.S. degree.

Requirements for the Master of Science Degree: Students who seek only the Master of Science Degree must complete 24 hours of coursework which include the following four required courses:

ENDY 6013	Environmental Dynamics	3
ENDY 5053	Quaternary Environments	3
ENDY 5113	Global Change	3
ENDY 6033	Society and Environment	3

In addition, student must complete 6 hours of ENDY 600V (Thesis hours) and submit a research thesis or take a total of 36 hours for a non-thesis M.S.

Ph.D. in Environmental Dynamics

Requirements for Admission: Applicants should hold a bachelor's or master's degree in a discipline with an environmental focus, such as anthropology; geography; geology; biological sciences; crop, soil and environmental sciences; environmental engineering; environmental economics, policy, or sociology. Further, these students will be required to have at least a 3.0 GPA and strong scores on all components of the Graduate Record Examination (GRE). Admission into the program will be by committee evaluation. In addition to fulfilling the requirements for admission to the Graduate School, applicants must also supply the following materials:

1. Three recommendations from individuals familiar with the applicant's academic or work history who can give candid assessments of the applicant's ability to perform at the Ph.D. level.
2. A Statement of Purpose outlining the applicant's plans for the Environmental Dynamics degree program that includes relevance of previous academic or work experience, current research interests or employment that bear on doctoral research, special skills, fieldwork experience, familiarity with interdisciplinary work (if any), and future career goals.
3. An example of the applicant's writing such as a publication reprint, report, major term paper, undergraduate honors thesis, chapter from M.A./M.S. thesis, or similar document that demonstrates the applicant's organizational skills, research ability, familiarity with a body of literature, ability to report clearly on an academic topic, and/or general writing skills.
4. English language requirements of the Graduate School.
5. GRE scores (optional but strongly encouraged).
6. Other relevant information that would assist the Admissions Committee in selecting applicants to the program.

Requirements for the Degree: During the first semester of study, all students will be assigned an advisory committee to determine the student's particular program plan. Students are required to integrate both environmental and human components into their Ph.D. coursework and dissertation research. The advisory committee will determine the courses required and assist the student in balancing courses among disciplines.

Students become candidates for the doctorate only upon passing written and oral comprehensive exams. The examination must be passed at least nine months before graduation. If necessary comprehensive exams may be taken a second time at the discretion of the Comprehensive Exam Committee.

Each candidate must complete a doctoral dissertation on a topic determined through collaboration with a major professor and dissertation committee. This dissertation must be a scholarly and significant original contribution to knowledge within the field of Environmental Dynamics.

A final oral examination is required and must be taken at least two weeks before graduation. The examination will be concerned primarily with the candidate's dissertation but may include other aspects of the graduate work.

Individually tailored programs of study will be designed with the expectation that the student will complete requirements for the master's degree in Environmental Dynamics during the course of study (or enter the Ph.D. Program with an M.A. or M.S. degree in a related field in hand), and a minimum of 24 hours of course work beyond the master's level, to include four required courses if they haven't already been taken as part of their M.S. study:

ENDY/GEOS 5113	Global Change	3
ENDY 6013	Environmental Dynamics	3
ENDY/ANTH/GEOS 5053	Quaternary Environments	3
ENDY/ANTH 6033	Society and Environment	3

In addition, students are required to take three semesters of ENDY 6991 Environmental Dynamics Colloquium if they haven't already been taken as part of their M.S. study, and 18 hours of dissertation research are required.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (http://catalog.uark.edu/graduatecatalog/degree_requirements/#phdandeddgreestext).

Environmental Resiliency Sustainability Graduate Microcertificate

The Environmental Resiliency Sustainability Graduate Microcertificate will be the first step in understanding sustainability and resilient systems. The foundation will include the ability to analyze the data and to understand sustainability on a global scale.

Students enter the program with a minimum of a B.S. or B.A. from an accredited university. Students must have a 3 point GPA, or better, and for non-native speakers must have language test scores acceptable for admission by the University of Arkansas graduate school standards.

Course Requirements

SUST 5103	Foundations of Sustainable and Resilient Systems	3
SUST 5203	Decision Making, Analysis and Synthesis in Sustainability	3
SUST 5303	Sustainable Global Food, Energy and Water Systems	3
Total Hours		9

A

Aly, Mohamed H., Ph.D. (Texas A&M), M.S., B.S. (Zagazig University), Associate Professor, Department of Geosciences, 2013, 2020.

Arnold, Mark E., Ph.D., B.S. (Northern Illinois University), A.S. (Rock Valley College), Associate Professor, Department of Mathematical Sciences, 1993, 1999.

B

Beaupre, Steven J., Ph.D. (University of Pennsylvania), M.S., B.S. (University of Wisconsin), Professor, Department of Biological Sciences, 1995, 2006.

Befus, Kevin, Ph.D. (University of Texas at Austin), M.S. (University of Colorado Boulder), B.S. (Wheaton College), Assistant Professor, Department of Geosciences, 2020.

Boss, Steve K., Ph.D. (University of North Carolina at Chapel Hill), M.S. (Utah State University), B.S. (Bemidji State University), University Professor, Department of Geosciences, 1996, 2022.

Brady, Robert M., Ph.D. (University of Michigan-Ann Arbor), M.A. (Western Kentucky University), B.S. (Murray State University), Associate Professor, Department of Communication, 1979.

Brye, Kristofor R., Ph.D., M.S. (University of Wisconsin-Madison), B.S. (University of Wisconsin-Stevens Point), University Professor, Department of Crop, Soil and Environmental Sciences, 2001, 2020.

C

Cheng, Linyin, Ph.D. (University of California, Irvine), M.S. (Clarkson University), B.S. (Sichuan University), Assistant Professor, Department of Geosciences, 2018.

Chevrier, Vincent Francois, Ph.D. (CEREGE, Aix-en-Provence, France), M.E.S. (University Paris VII), B.S. (Academy of Versailles, France), Research Associate Professor, Department of Chemistry and Biochemistry, 2005.

Cothren, Jackson David, Ph.D., M.S. (The Ohio State University), B.S. (United States Air Force Academy), Professor, Department of Geosciences, Leica Geosystems Chair in Geospatial Imaging, 2004, 2020.

Covington, Matthew D., Ph.D. (University of California-Santa Cruz), B.A. (University of Arkansas), Associate Professor, Department of Geosciences, 2012, 2018.

D

Davidson, Fiona M., Ph.D., M.A. (University of Nebraska-Lincoln), B.A. (Newcastle Upon Tyne Polytechnic), Associate Professor, Department of Geosciences, 1992, 1998.

Delezene, Lucas, Ph.D., M.A. (Arizona State University), B.S. (Emory University), Associate Professor, Department of Anthropology, 2011, 2020.

Dickson, Ryan W., Ph.D., B.S. (University of Florida), Assistant Professor, Department of Horticulture, 2018.

Dumond, Gregory, Ph.D. (University of Massachusetts), M.S. (Texas Tech University), B.S. (University of Texas El Paso), Associate Professor, Department of Geosciences, 2010, 2018.

F

Fairey, Julian, Ph.D., M.S.C.E. (University of Texas at Austin), B.S.C.E. (University of Alberta, Canada), Associate Professor, Department of Civil Engineering, 2008, 2014.

Feng, Song, Ph.D., M.S. (Chinese Academy of Sciences), B.S. (Yunnan University), Associate Professor, Department of Geosciences, 2013, 2018.

Fernandes, Katia de Avila, Ph.D. (Georgia Institute of Technology), M.S. (Instituto Nacional de Pesquisas Espaciais, Brazil), B.S. (Universidade Federal de Pelotas, Brazil), Assistant Professor, Department of Geosciences, 2019.

Fitzpatrick, Kevin M., Ph.D. (State University of New York at Albany), M.A. (University of South Carolina at Columbia), B.A. (Susquehanna University), University Professor, Department of Sociology and Criminology, Bernice Jones Chair in Community, 2005, 2014.

Forbes, Kristian M., Ph.D. (University of Jyväskylä), M.P.H. (Latrobe University), B.Sc. (Latrobe University), Assistant Professor, Department of Biological Sciences, 2018.

Fredrick, David Charles, Ph.D. (University of Southern California), M.A., B.A. (University of Kansas), Associate Professor, Department of World Languages, Literatures and Cultures, 1991, 1997.

G

Gosman, Sara, J.D., M.P.A. (Harvard University), A.B. (Princeton University), Assistant Professor, School of Law, 2014.

H

Haggard, Brian Edward, Ph.D. (Oklahoma State University), M.S. (University of Arkansas), B.S. (Missouri University of Science and Technology), Professor, Department of Biological and Agricultural Engineering, 2006, 2011.

Hale, Micah, Ph.D., M.S.C.E., B.S.C.E. (University of Oklahoma), Professor, Department of Civil Engineering, 21st Century Leadership Chair in Civil Engineering, 2002, 2013.

Henry, Christopher Garrett, Ph.D. (University of Nebraska-Lincoln), M.S., B.S. (Kansas State University), Associate Professor, Department of Biological and Agricultural Engineering, 2011, 2018.

Huang, Quiqiong, Ph.D. (University of California-Davis), B.S. (Remin University of China), Professor, Department of Agricultural Economics and Agribusiness, 2013, 2018.

Huang, Xiao, Ph.D. (University of South Carolina), M.S. Georgia Institute of Technology (2016), B.S. (Wuhan University), Assistant Professor, Department of Geosciences, 2020.

K

Kovacs, Kent F., Ph.D. (University of California-Davis), B.A. (Vassar College), Associate Professor, Department of Agricultural Economics and Agribusiness, 2012, 2018.

L

Liner, Christopher L., Ph.D. (Colorado School of Mines), M.S. (University of Tulsa), B.S. (University of Arkansas), Professor, Department of Geosciences, 2012.

M

Magoulick, Daniel D., Ph.D. (University of Pittsburgh), M.S. (Eastern Michigan University), B.S. (Michigan State University), Research Professor, Department of Biological Sciences, 2000, 2010.

Marshall, Jill A., Ph.D. (University of Oregon), M.S. (San Francisco State University), B.S. (California State University, Hayward), Assistant Professor, Department of Geosciences, 2017.

Matlock, Marty D., Ph.D., M.S., B.S. (Oklahoma State University), Professor, Department of Biological and Agricultural Engineering, 2001, 2009.

McCown, Ken, M.Arch. (University of Illinois at Urbana Champaign), Professor, Department of Landscape Architecture, 2019.

Messadi, Tahar, Ed.D., M.Arch. (University of Michigan-Ann Arbor), B.Arch. (Universite de Constantine, Algeria), Associate Professor, Department of Architecture, 2003, 2009.

Miller, David M., Ph.D. (University of Georgia), M.S., B.S. (Purdue University), Professor, Department of Crop, Soil and Environmental Sciences, 1988, 2001.

Miller, Jefferson Davis, Ph.D., M.A. (Oklahoma State University), B.A. (Northeastern State University), Professor, Department of Agricultural Education, Communications and Technology, 2001, 2012.

N

Naithani, Kusum, Ph.D. (University of Wyoming), M.Sc. (G.B. Pant University of Agriculture and Technology-India), B.Sc. (University of Lucknow-India), Associate Professor, Department of Biological Sciences, 2014, 2021.

Nalley, Lawton Lanier, Ph.D. (Kansas State University), M.S. (Mississippi State University), B.S. (The Ohio State University), Professor, Department of Agricultural Economics and Agribusiness, 2008, 2018.

P

Paradise, Thomas R., Ph.D. (Arizona State University), M.Sc. (Georgia State University), F.G.A. (Goldsmith Hall Gem-A, London), G.G. (Gemological Institute of America), B.S. (University of Nevada), University Professor, Department of Geosciences, 2000, 2016.

Plavcan, Joseph M., Ph.D., B.A. (Duke University), Professor, Department of Anthropology, 2001, 2010.

Popp, Jennie Sheerin, Ph.D., M.S. (Colorado State University), B.S. (University of Scranton), Professor, Department of Agricultural Economics and Agribusiness, 1998, 2010.

Popp, Michael P., Ph.D. (Colorado State University), M.B.A. (University of Colorado-Boulder), B.Comm. (University of Manitoba), Professor, Department of Agricultural Economics and Agribusiness, 1998, 2006.

Potra, Adriana, Ph.D. (Florida International University), M.S., B.S. (University of Babes-Bolyai, Romania), Associate Professor, Department of Geosciences, 2012, 2019.

R

Rom, Curt R., Ph.D., M.S. (The Ohio State University), B.S. (University of Arkansas), University Professor, Department of Horticulture, 1989, 2014.

Runkle, Benjamin R.K., Ph.D., M.S. (University of California-Berkeley), B.S. (Princeton University), Assistant Professor, Department of Biological and Agricultural Engineering, 2014.

S

Savin, Mary Cathleen, Ph.D., M.S. (University of Rhode Island), B.S. (University of Notre Dame), Professor, Department of Crop, Soil and Environmental Sciences, 2002, 2011.

Shaw, John B., Ph.D. (University of Texas at Austin), B.A. (Oberlin College), Associate Professor, Department of Geosciences, 2014, 2019.

Shew, Woodrow L., Ph.D. (University of Maryland-College Park), B.A. (College of Wooster), Associate Professor, Department of Physics, 2012, 2017.

Smith, Carl Alan, Ph.D., M.A. (University of Sheffield), B.Sc. (University of Lancaster), Associate Professor, Department of Landscape Architecture, 2008, 2013.

Song, Geoboo, Ph.D. (University of Oklahoma), B.A. (Korea University), B.A. (Hanyang University), Associate Professor, Department of Political Science, 2012, 2019.

Stahle, David William, Ph.D. (Arizona State University), M.A. (University of Arkansas), B.A. (University of Arizona), Distinguished Professor, Department of Geosciences, 1982, 2005.

Stephenson, Steven Lee, Ph.D., M.S. (Virginia Polytechnic Institute and State University), B.S. (Lynchburg College), Research Professor, Department of Biological Sciences, 2003.

Stoner, Wesley, Ph.D., M.A. (University of Kentucky), B.A. (Pennsylvania State University), Associate Professor, Department of Anthropology, 2014, 2020.

Suarez, Celina A., Ph.D. (University of Kansas), M.S. (Temple University), B.S. (Trinity University), Associate Professor, Department of Geosciences, 2012, 2018.

T

Terhune, Claire E., Ph.D., M.A. (Arizona State University), B.A., B.S. (College of Charleston), Associate Professor, Department of Anthropology, 2013, 2020.

Tian, Ryan, Ph.D. (University of Connecticut), B.S. (Fudan University, Shanghai), Associate Professor, Department of Chemistry and Biochemistry, 2004, 2010.

Tullis, Jason A., Ph.D., M.S. (University of South Carolina), B.S. (Brigham Young University), Professor, Department of Geosciences, 2004, 2018.

U

Ungar, Peter S., Ph.D., M.A. (State University of New York at Stony Brook), B.A. (State University of New York, Binghamton), Distinguished Professor, Department of Anthropology, 1995, 2009.

V

Villaseñor, Amelia, Ph.D. (George Washington University), B.A. (Arizona State University), Assistant Professor, Department of Anthropology, 2019.

Vining, Benjamin R., Ph.D., M.A. (Boston University), B.A. Colgate University, Associate Professor, Department of Anthropology, 2016, 2022.

W

Whayne, Jeannie, Ph.D., M.A., B.A. (University of California-San Diego), University Professor, Department of History, 1990, 2015.

Wickramasinghe, Ranil, Ph.D. (University of Minnesota-Twin Cities), M.S., B.S. (University of Melbourne, Australia), Distinguished Professor, Ralph E. Martin Department of Chemical Engineering, Ross E. Martin Chair in Emerging Technologies, 2011, 2021.

Wood, Lisa S., Ph.D., M.S., B.S. (University of Arkansas), Clinical Associate Professor, Department of Crop, Soil and Environmental Sciences, 2012, 2019.

Z

Zhang, Wen, Ph.D. (Purdue University), M.S. (University of Kansas), B.S. (Tongji University, China), Associate Professor, Department of Civil Engineering, 2011, 2018.

Courses

ENDY 5053. Quaternary Environments. 3 Hours.

An interdisciplinary study of the Quaternary Period including dating methods, deposits soils, climates, tectonics and human adaptations. (Typically offered: Fall) This course is cross-listed with ANTH 5053, GEOS 5053.

ENDY 5113. Global Change. 3 Hours.

Examines the interacting natural and anthropogenic factors involved in global change, concentrating on climate variability and change. Prerequisite: Graduate standing or instructor's approval. (Typically offered: Spring) This course is cross-listed with GEOS 5113.

ENDY 5653. GIS Analysis and Modeling. 3 Hours.

Unlike conventional GIS courses that focus on studying "where", this course will teach students to address beyond "where" using various GIS analysis and modeling techniques to explore "why" and "how". The course will provide theoretical and methodological reviews of the principles of cartographic modeling and multi-criteria decision-making. Students will receive degree credit for only one of ENDY 5653, GEOS 5653, or ANTH 5653. (Typically offered: Spring)

This course is cross-listed with GEOS 5653.

ENDY 5853. Environmental Isotope Geochemistry. 3 Hours.

Introduction to principles of isotope fractionation and distribution in geological environments isotopic analytical methods, and extraction of isotope samples; application of isotopes in characterization of geologic processes and interaction with hydrologic, surficial, and biologic attenuation, paleothermometry soil and biochemical processes. (Typically offered: Spring)

This course is cross-listed with GEOS 5853.

ENDY 600V. ENDY Thesis Research. 1-6 Hour.

Master's Thesis. May be repeated for degree credit. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ENDY 6013. Environmental Dynamics. 3 Hours.

Required course for ENDY doctoral candidates. Overview of Earth Systems: Lithosphere; Hydrosphere, Atmosphere, Biosphere, Cryosphere, and human interaction across Earth systems. Emphasis on understanding of processes within Earth systems and interactions across Earth Systems as they pertain to global self-regulation, secular variation, climate stability, development and sustainability of human societies. Prerequisite: Graduate standing. (Typically offered: Fall)

ENDY 602V. Current Topics Seminar. 1-2 Hour.

Various aspects of the environment will be explored through topic specific seminars. Subject matter will change each semester addressing current environmental issues and research. Seminars will be one or two hours credit. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ENDY 6033. Society and Environment. 3 Hours.

This course examines the complex interrelationships between human societies and the natural environment. Drawing on diverse and interdisciplinary perspectives in archaeology, ethnography, history, geography, and palaeo-environmental studies, readings and discussion will explore the co-production of social and environmental systems over time. (Typically offered: Spring) This course is cross-listed with ANTH 6033.

ENDY 689V. Special Problems in Environmental Dynamics. 1-6 Hour.

Independent study of a topic related to environmental dynamics under the guidance of an ENDY faculty member. (Typically offered: Fall, Spring and Summer) May be repeated for up to 12 hours of degree credit.

ENDY 6991. Environmental Dynamics Colloquium. 1 Hour.

Weekly meetings for discussion of current research in environmental dynamics. Graduate students must register for colloquium each semester during their first three semesters. Colloquium credit does not count towards minimum hours required for the doctorate. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 20 hours of degree credit.

ENDY 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.