
ERIE
DOCTORAL STUDIES IN
ECOSYSTEM RESTORATION
THROUGH INTERDISCIPLINARY EXCHANGE

AMERICAN STUDIES / BIOLOGY / CHEMISTRY

ECOLOGY / ENVIRONMENTAL ENGINEERING / GEOGRAPHY

GEOLOGY / PHILOSOPHY

The University at Buffalo offers an integrated doctoral traineeship program in Ecosystem Restoration through Interdisciplinary Exchange (ERIE) that advances ecosystem restoration through theoretical research and applied studies focused on the ecological recovery of the Lower Great Lakes region.

The program provides training that integrates the study of the natural sciences that govern ecosystem function, the engineering disciplines that enable interventions in impaired systems, and the cultural and political disciplines that define how societies manage resources.

ERIE Trainees take a series of novel interdisciplinary core classes (Perspectives on Ecosystem Restoration, Practices in Ecosystem Restoration, Ecosystem Restoration Practicum) in ecosystem restoration and complete the doctoral requirements from one of the eight participating programs.

Besides attending the ERIE core courses, trainees participate in a series of summer short-courses on the topics of ecosystem restoration and the use of case studies in science teaching. Trainees also engage in an off-campus internship with regional governmental agencies, Native American Tribes, non-governmental organizations, and environmental consultants.

Dissertation research focuses on fundamental questions related to restoration science, engineering, and policy, with many ERIE projects referenced to actual regional projects and the accompanying cultural and political issues. All trainees are trained to interact with the public through various aspects of science education, including formalized project case studies and collaborations with K-16 educators.

ERIE trainees follow an inherently interdisciplinary curriculum that provides a broad knowledge base while maintaining the solid credentials of an established doctoral degree program.

ERIE's collaborates with a long list of professional partners, including the US Army Corps of Engineers and US Department of Agriculture, NY Departments of Environmental Conservation and Transportation, the Buffalo-Niagara Riverkeeper, several Canadian governmental agencies, and environmental programs from the Tuscarora, Seneca, and St. Regis Mohawk nations.

ECOSYSTEM RESTORATION

encompasses a broad range of activities to assist the recovery of aquatic and terrestrial ecosystems that have been degraded by natural or human influences. Restoration projects may seek to reestablish natural conditions prior to human influence or provide focused improvements to ecosystem forms or functions.

ERIE's integration of theoretical and applied research is enriched by the variety and complexity of ongoing restoration projects in the Lower Great Lakes region. Example projects range from the restoration of specific ecological habits to the adaptive management of streams, lakes, wetlands, and urban brownfields. ERIE research encompasses a range of temporal and spatial scales, from the redesign of local stream corridors to the integrated management of the entire Great Lakes basin.

In addition to ecological and engineering considerations, ERIE scholars also address the social and institutional context for restoration. Effective ecosystem management often involves numerous layers of U.S., Canadian, and Tribal governments, as well as active participation by nongovernmental organizations and citizen groups. Among these groups, the philosophies that guide restoration practices can vary considerably. Successful ecosystem restoration, therefore, requires a pragmatic and adaptive approach to science, engineering, and policy that respects traditional ecological knowledge and cultural practices of Tribal and other place-based communities.

ERIE'S PROFESSIONAL PARTNERS ARE ENGAGED IN A VARIETY OF DIVERSE AND INNOVATIVE RESTORATION PROJECTS.

ECOSYSTEM ASSESSMENT

Assessment metrics and paradigms are essential for designing and evaluating the success of restoration projects. Effective monitoring programs provide the essential data needed to support ongoing adaptive management.

ERIE research seeks to critique and expand the range of assessment tools and concepts needed for the evaluation of restoration measures. Research on ecosystem assessment encompasses physical, biological, and geochemical processes, as well as systems that exhibit variability in space and time. Of particular concern is the adaptation of existing metrics and indicators to address the issues surrounding urban rivers, mixed-use watersheds, and the Great Lakes.

ECOSYSTEM MODELING

Modeling is an essential tool for understanding ecosystem processes and evaluating restoration strategies. The development of interdisciplinary modeling approaches that integrate multiple ecosystem variables is recognized as a critical research need.

Examples of ecosystem modeling projects include the development of new approaches to simulating groundwater/surface water interactions, the expansion of water quality models to include ecological and microbiological components, the use of distributed sensing technology for gathering data to calibrate and test models, and the integration of models across environmental media and spatial scales to support "whole system" analysis of the Great Lakes basin.

ECOSYSTEM MANAGEMENT

Ecosystem management includes both policy questions, such as the interactions of governments and stakeholders in setting restoration goals, as well as science/engineering studies to support the development and evaluation of specific techniques for restoring ecosystems.

A central research focus examines the potentially conflicting forms of value that intersect in environmental restoration projects. Conflicting values may originate from contrasting world views (Native American or European), political boundaries (U.S., Canadian, or Tribal) or from different assumptions used to justify policy formulation (environmental ethics, economics, or pragmatism).

PROGRAMS

- CIVIL ENGINEERING (ENVIRONMENTAL)
- AMERICAN STUDIES (POLICY STUDIES, NATIVE AMERICANS)
- BIOLOGY
- CHEMISTRY
- ECOLOGY, EVOLUTION, AND BEHAVIOR
- GEOGRAPHY
- GEOLOGY
- PHILOSOPHY

APPLICATION INFORMATION

Applications submitted by February 1, 2009 will receive full consideration for funding for the following Fall semester. Applicants must be US citizens or permanent residents. For more information, please visit our web site www.erie.buffalo.edu or e-mail igert-erie@buffalo.edu.

TRAINEESHIP BENEFITS

ERIE IGERT PhD traineeships include $30,000 stipends, tuition waivers, university fees, health benefits, and travel and research funds. Applicants apply to a participating department and submit a supplemental application to ERIE.

UNIVERSITY AT BUFFALO
The State University of New York

A flagship institution in the State University of New York system, UB is the largest and most comprehensive in the 64-campus SUNY system. The University at Buffalo has an enrollment of about 28,000 students and a distinguished faculty of approximately 2,000.

The University at Buffalo offers 184 master's degree and 84 doctoral degree programs. Yearly research expenditures of over $300 million and membership in the Association of American Universities put the University at Buffalo in the first rank among the nation's research-intensive public universities.

ERIE's local academic partners include faculty members from Buffalo State College (BSC) and Niagara University. BSC offers an extensive suite of undergraduate and graduate programs and houses the Great Lakes Center, which conducts applied research using its own fleet of research ships and an on-shore lab.

In addition to the standard two-year support package, additional NSF funding is available for extended research visits to Canadian partners institutions, including the University of Waterloo, University of Windsor, and McMaster University.

University at Buffalo
The State University of New York