Research and Education Programs at the University of Toledo Lake Erie Center

Dr. Carol Stepien, Lake Erie Center Director and Distinguished Professor of Ecology, Department of Environmental Sciences

Research Laboratories

Applied Spatial Ecology Laboratory: Dr. Jonathan Bossenbroek

• Projects focus on modeling of zebra mussels, emerald ash borer, yellow perch in Lake Erie, darters in the Ohio River basin and phyto-remediation of contaminated soil.

Aquatic Ecology Laboratory: Dr. Christine Mayer

• Research includes fish and invertebrate ecology, organism-habitat modification (ecosystem engineering), and introduced species effects and impacts.

Western Lake Erie Limnology Laboratory: Dr. Thomas Bridgeman

• Research focuses on environmental problems in western Lake Erie including Harmful Algal Blooms and episodes of low oxygen (hypoxia) near the lake bottom.

Environmental Remediation and Restoration Lab: Dr. Daryl Dwyer

• Research objectives encompass modeling and understanding the interactions of soil, water, and plants and restoring degraded sites to native habitat with sustainable design.

• Recently awarded over $1 million in US EPA Great Lakes Restoration Initiative funding to construct a passive treatment wetland at Maumee Bay State Park.

Great Lakes Genetics/Genomics Laboratory: Dr. Carol Stepien

• GLGL research focuses on evaluating the systematic and evolutionary relationships, population genetics, and biogeographic structure of fishes; understanding the vector pathways, population dynamics, and genetic time course of nonindigenous species invasions; and Interpreting gene flow patterns of river and lake fishes as influenced by habitat changes.

About the Lake Erie Center:

The *University of Toledo's Lake Erie Center* is an interdisciplinary research and education center dedicated to solving environmental problems at the land-water interface and bay-lake exchanges in the Great Lakes - the world's largest freshwater ecosystem. The Lake Erie Center is an integral environmental resource at The University of Toledo and is located in the northwestern corner of Ohio's Maumee Bay State Park. Research at the LEC explores the linkages among land use, aquatic resources, water quality, sustainable living and human health – using the Maumee River/Bay watershed and western Lake Erie Basin land-lake continuum as a model of the Laurentian Great Lakes ecosystems. The LEC assembles within a single facility programs and expertise in aquatic conservation, bioremediation and restoration, coastal zone processes, environmental chemistry and hydrology, ecology and ecosystem management, fishery genetics, geography and land use planning, limnology, remote sensing, and environmental and health monitoring.

NSF GK-12 Program, Graduate Fellows in High School STEM Education: An Environmental Science Learning Community at the Land-Lake Ecosystem Interface – PIs: Drs. Stepien, Gruden, Becker, Bridgeman and Czajkowski

Our Gk-12 program partners interdisciplinary teams of advanced graduate students, teachers, and their high school students each year and builds upon an existing UT-founded Student Watershed Watch program to build a year-round Environmental Science Learning Community. Our fellows bring hands-on research experience and mentoring to over 450 high school students each year of which 28% are minorities and 23% are low-income. We focus on the role of urban and agricultural influences on watersheds in the history, social development, and future vitality of the Great Lakes region.

Education and Outreach

NSF Undergraduate Research & Mentoring in Environmental Biology – PIs: Drs. Sigler and Stepien

Goals of the URM program are to train and mentor underrepresented undergraduate student scientists for graduate study in environmental biology, while augmenting community understanding of anthropogenic land-water interface stressors in the biodiversity, habitat, and water quality crises.

Public Lecture Series

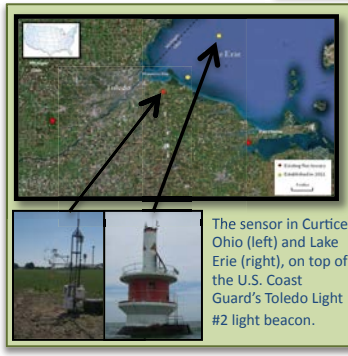
We host a monthly public talk series that focuses on relevant environmental and ecological issues within the Great Lakes region. We also have a spring-fall Naturalist Speaker Series, which features nature talks and outdoor excursions.

Art and Photo Contests

We run annual art and photo contests, both themed "The Nature of Maumee Bay." Hundreds of local artists and photographers participate each year.

Tours, Field Trips and Science Camp

We offer weekly facility tours and host school groups at other times for educational activities. We also conduct a summer science camp for local elementary students.



The sensor in Curtice, Ohio (left) and Lake Erie (right), on top of the U.S. Coast Guard's Toledo Light #2 light beacon.

Lake Erie Center's Environmental Sensor Network

The Environmental Sensor Network (ESN) includes six eddy covariance (EC) flux tower monitoring stations that measure carbon/water cycling in the Great Lakes, providing fundamental data for understanding ecosystem and climate changes and fluxes across the Western basin of Lake Erie. The ESN includes two stations on permanent structures in Lake Erie, a vessel-mounted station on the LEC's research boat, a station in an agricultural field, a station in a coastal wetland and a large tower station in a mixed oak forest known as "Oak Openings". ESN is a contributing member of the Global Lake Ecological Observatory Network (GLEON) and the Ameriflux Network. Biometric and chamber based measurements of ancillary ecosystem characteristics are conducted at both the site and watershed scales. The ESN is funded by the FSML program of the National Science Foundation, National Oceanic and Atmospheric Administration and the United States Department of Agriculture Forest Service. **PIs: Drs. Chen, Becker, Czajkowski, Bridgeman and Stepien.**

Location and Contact Information

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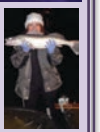

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