



# LAKE ERIE CENTER

Research  Education  Communication

[www.lakeerie.utoledo.edu](http://www.lakeerie.utoledo.edu)



LAKE ERIE CENTER



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# Purpose

- **Lake Erie Center is an interdisciplinary research and education center dedicated to improving environmental health at the land-water interface and bay-lake exchanges in the Great Lakes – the world's largest freshwater ecosystem.**

- **Environmental & Human Health Research**

- **Education**

- **Communication & Outreach**





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# Mission: *Environmental Research*

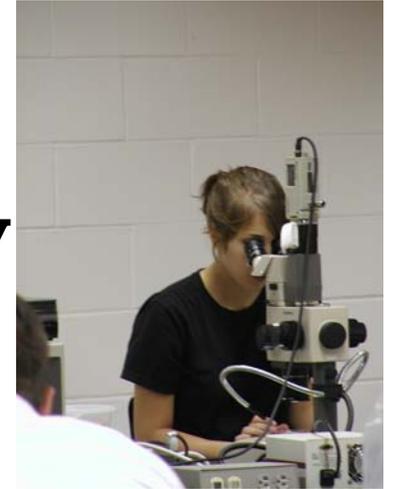
- **Long term environmental health research on Maumee Bay/western Lake Erie ecosystem**
- **Research of linkages among environmental conditions and habitat, natural resources, economics, & human health**





## **Mission: *Collaboration, Education, Communication & Outreach***

- **Facility for research & collaborations by faculty, other universities, agencies, & visiting scientists**
- **Facilitate research & education experiences for graduate & undergraduate students**
- **Engage secondary school students & the public with outreach environmental education programs**





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# Lake Erie Center Staff



**Jeffrey Savino**  
**Facility Manager**  
**& Education-Outreach**  
**Coordinator**



**Pat Uzmann**  
**LEC Secretary**



**James Coss**  
**Information**  
**Communication**  
**& Data Management**



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# LEC Facility

- **30,000 ft<sup>2</sup>**
- **Research Labs**
- **Teaching Labs**
- **Classrooms**
- **Offices**
- **Meeting rooms**
- **Aquaria**
- **Boats & Equipment**





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# Education

**NSF Summer Research Experience  
for Undergraduates –year 7**

**NSF GLOBE (K-12) Program**

**Summer Graduate & Undergraduate  
Course Program (year 2)**

**High School and Middle School  
Research**

**Shadowing, Internships, Student  
Projects**





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## Summer Classes LEC 2007

- **GIS Applications in the Lake Erie Region**
- **Lake Erie Fish Ecology**
- **Phytoremediation: An investigative field approach to developing a new technology**
- **Field Geology of the Lake Erie Region**
- *Day-long classes with hands-on field & lab experience*
- *2 semester credits each, 1 week, advanced undergraduate & graduate levels*





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## **Coming Talks LEC 2007**

● ***Modeling and forecasting PCBs and atrazine in Lake Michigan***

● **Dr. Russell G. Kreis, Jr, Station Director and Branch Chief U.S. Environmental Protection Agency.  
Tuesday February 13, 7:00 PM**

● ***Contaminated Freshwater Sediments: Considering In Situ Alternatives***

● **Dr. Cyndee L. Gruden, Assistant Professor  
Department of Civil Engineering, University of Toledo.  
Wed. March 14, 2007 at 7:00 PM.**



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# Communication & Outreach

**Public Environmental Science  
Monthly Lecture Series**

**Tours, Schools, Scout Troops**

**Waterwatch**

**TMACOG Water Quality Program**

**Host Environmental Meetings &  
Groups:**

*Duck & Otter Creeks Partners  
Maumee Bay Bacterial Task Force  
Maumee Bay Waterkeepers*





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# Collaborative Environmental Research

**Aquatic conservation**

**Bioremediation and restoration**

**Coastal zone processes**

**Environmental chemistry and hydrology**

**Ecology and ecosystem management**

**Fishery genetics**

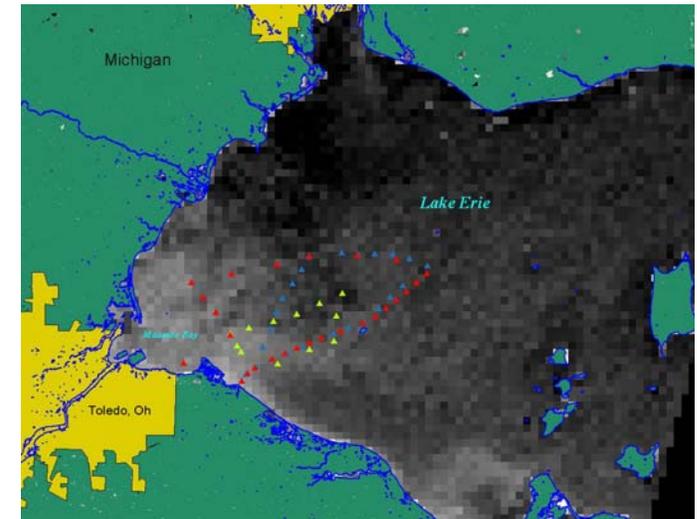
**Geography and land use planning**

**Bioeconomics**

**Limnology**

**Remote sensing and environmental  
monitoring**

**Public Health**





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# Research: *Current External Funding*

**National Science Foundation**

**Great Lakes Fishery Commission**

**Lake Erie Protection Fund**

**NOAA-Great Lakes Environmental**

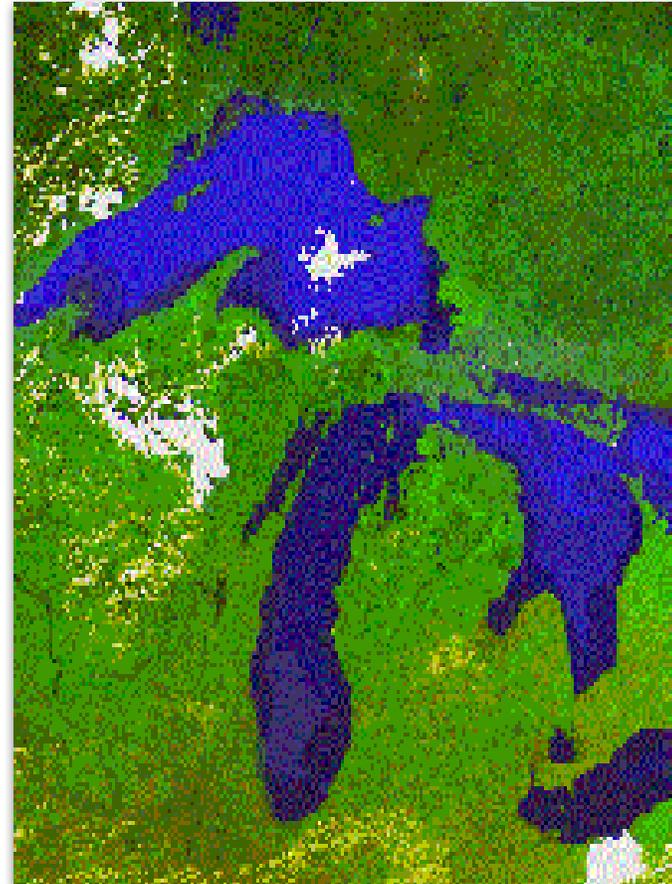
**Research Laboratory**

**NOAA Sea Grant & Ohio Sea Grant**

**US Department of Agriculture**

**US Environmental Protection Agency**

**US Fish & Wildlife Service**





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# Modeling Land-Use and Water Quality Relation

- **Data inputs from lake & watershed monitoring**
- **Spatial and temporal models link land use & human activities to water quality**

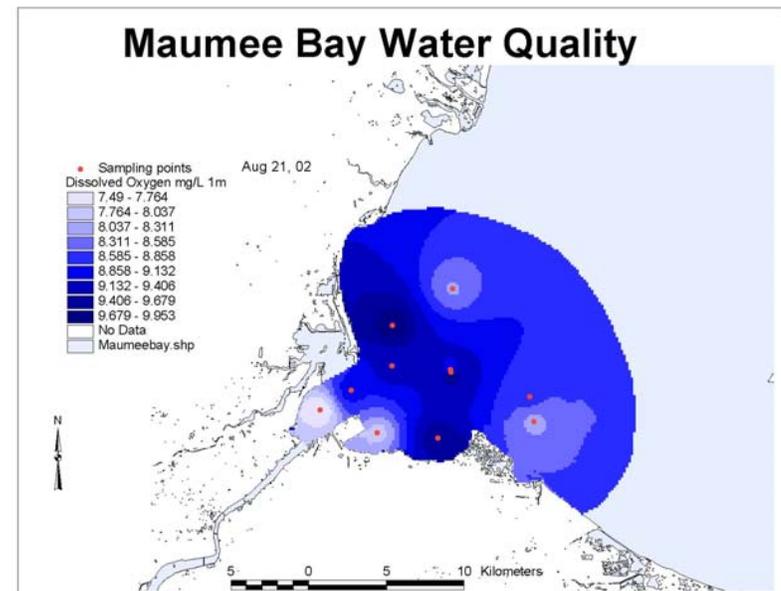


## Investigators:

**Kevin Czajkowski**  
**Thomas Bridgeman**  
**Daryl Dwyer**  
**Hans Gottgens**  
**Daryl Moorhead**  
**David Krantz**  
**Alison Spongberg**  
**Patrick Lawrence**  
**Cyndee Gruden**

## Agency Partners:

**USDA USEPA**  
**USFWS**  
**USGS**  
**NOAA**





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# Characterization of Lake Erie Water Quality

- Remote sensing & direct sampling of water & sediments
- Compare current lake & bay conditions to baseline data from the 1970s & 80s



## Faculty:

Thomas Bridgeman  
Daryl Moorhead  
Christine Mayer  
Kevin Czajkowski

*NOAA*  
*USDA*  
*USEPA*  
*USFWS*  
*USGS*  
*Ohio DNR*  
*Michigan DNR*  
*Ontario MNR*  
*Lake Erie Protection Fund*



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# Ecological Bioremediation

- **Develop bioremediation techniques for contaminated sites such as landfills & brownfields that affect the Lake via its tributaries**
- **Identify sources of *E. coli* contamination of Maumee Bay beaches**
- **Construct wetlands for cleaning bacterial contamination**



## Investigators:

Daryl Dwyer  
Johan Gottgens  
Von Sigler  
Alison Spongberg  
Cyndee Gruden

## Partners:

USDA  
USGS  
US Army Corp of  
Engineers  
TMACOG  
Cities of Toledo &  
Oregon



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# Fishery Stock Assessment

- **Develop genetic & modeling tools for analyzing fishery stock/population structure**
- **Conserve genetic diversity in spawning & nursery areas**



## Investigators:

Carol Stepien  
Christine Mayer  
Jon Bossenbroek  
Roger Knight (ODNR)  
Ed Roseman (USGS)  
Stu Ludsin (NOAA)

## Agencies:

*USFWS*      *NOAA Seagrant*  
*USGS*        *USEPA*  
*Ohio DNR*    *Mich. DNR*  
*Pa. F&BC*    *NYDEC*  
*Ohio EPA*  
*Great Lakes Fishery Comm.*  
*Lake Erie Protection Fund*



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# Lake Erie Wetlands Restoration

- **Test potential of using restored Lake Erie wetlands for water quality benefits**
- **Field experiments analyze natural ability of coastal wetlands to trap & transform runoff**

## **Faculty:**

**Johan Gottgens  
Daryl Dwyer  
Von Sigler**

## **Agency**

## **Collaborators:**

***USDA, USEPA,  
NOAA, USGS,  
USFWS, Ohio EPA***





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# Nonindigenous Species Invasion Ecology

- **Evaluate ecological interactions, economic impacts, vector pathways, sources, and the time courses of invasions by nonindigenous species in the Great Lakes**

- **Methods: Molecular genetics, ecology, economics, computer modeling**



## **Faculty:**

**Carol Stepien**

**Jon Bossenbroek**

**Christine Mayer**

## **Agencies:**

**USFWS**

**NOAA**

**USGS**

**USDA**

**USEPA**

**Ohio DNR**

**Ohio EPA**

**Lake Erie Protection Fund**