An aerial photograph of a large, dark blue lake, likely Lake Ontario, surrounded by a mix of green and brown terrain. The text is overlaid on the image.

**Data management  
(bi-national repository and web presence)**

**Tim Johnson  
OMNR Lake Ontario Fisheries Station**

# Acknowledgements

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- Giselle Maira, NOAA-GLERL
- Norine Dobiesz, OMNR / U of T / U Waterloo
- Tom Bridgeman, U Toledo / Lake Erie Centre
- Pranas Prankevicius, U.S. EPA

# Challenge

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- multi-agency, collaboration collecting a large volume of information representing a variety of different formats

# Solution

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- password protected website
- information archive (project description, media, correspondence, data, protocols, etc.) designed as searchable lists that serve as pointers to common format files (text, spreadsheet, image, etc.)

# Objective

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- consolidate all project data into a single repository for fast and easy access by all project members

# Considerations

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- security
- reliability
- standardisation
- simplicity
- fast access

# Considerations

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- security
  - access (public space, various levels of password protection for data and protocols)
  - data corruption
- reliability
- standardisation
- simplicity
- fast access

# Considerations

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- security
- reliability
  - continual access
  - long-term
- standardisation
- simplicity
- fast access

# Considerations

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- security
- reliability
- standardisation
  - naming & units (metadata / data dictionary)
  - format / structure
  - archive of protocols
- simplicity
- fast access

# Considerations

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- security
- reliability
- standardisation
- simplicity
  - store information in tables / lists
  - download to local workstation for analysis
  - low cost (development & maintenance)
- fast access

# Considerations

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- security
- reliability
- standardisation
- simplicity
- fast access
  - want information now (no complex routines / queries)
  - ready access (internet is universal)

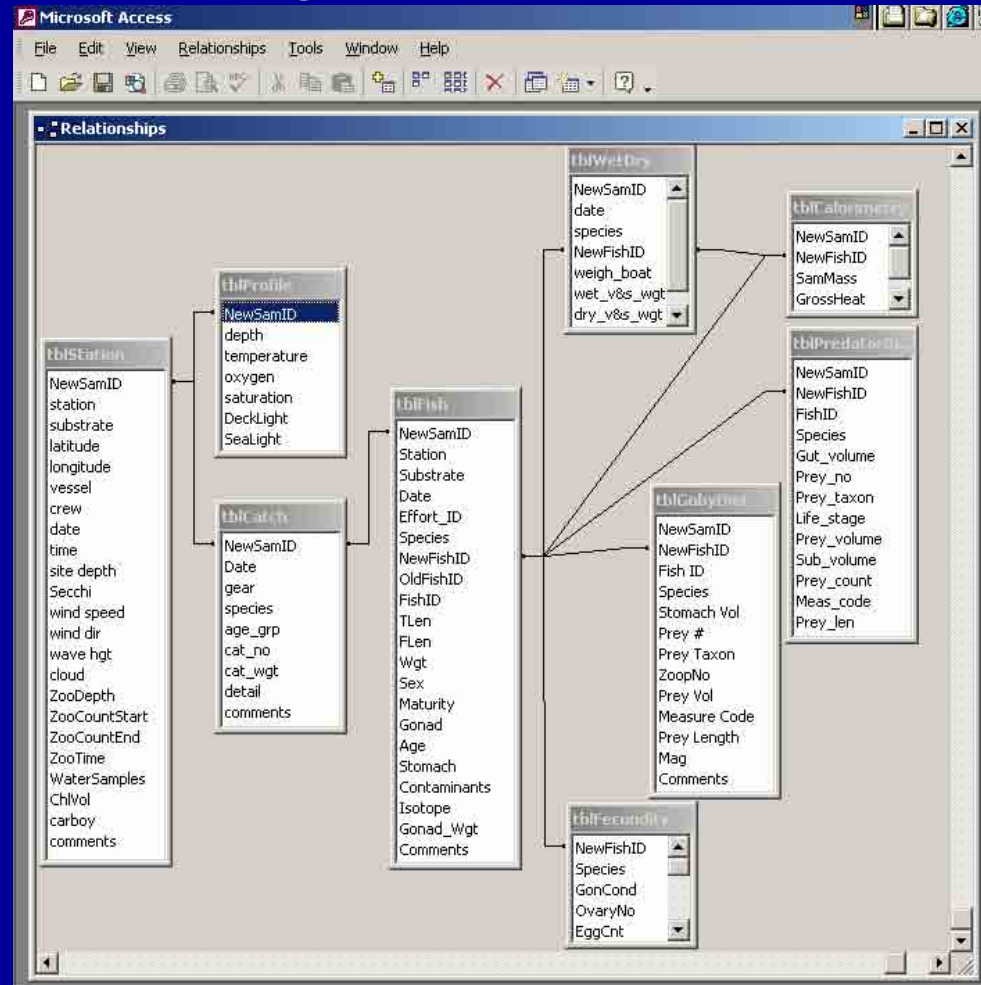
# Website Design

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- what types of data (formats) and associated fields
  - sample data sheets / data sets
- who will use the site? how will the site be used
- data standards
  - naming, format, structure, etc.
- longevity & maintenance
- cost

# Relational Databases

- use key variables to link many tables of otherwise dissimilar information (i.e. ship log, zooplankton data, fish gut contents)
- queries create a subset of the data containing only the relevant fields
- drawbacks:  
computationally complex (slow and more memory) and compatibility issues



# Contents

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- project overview
- subproject details (proposals)
- data archive
- historic data
- past reports & key publications
- protocols & data dictionary
- primary correspondence
- contacts for team members

# Database Manager

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- part time (0.1 PY)
- does all posting of data (security)
  - new data and changes submitted electronically
- each data table has an “owner” who authorises posting and edits for that area
- maintenance log (documents updates and changes)

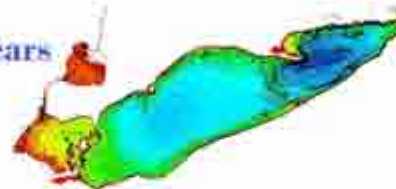
# Cost

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<b>Item</b>	<b>Cost</b>
Development of web interface	\$3-5K
Database manager (upload data and basic maintenance)	\$3-5K (0.1 PY)
Lease server space	\$1K

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## International Field Years on Lake Erie IFYLE



NOAA Great Lakes Environmental Research Laboratory (GLERL) in collaboration with researchers from the U.S. and Canada have initiated one of the largest, most comprehensive Lake Erie research field programs ever conducted. The project, the International Field Years on Lake Erie (IFYLE), began in May 2005, with a focus on hypoxia and harmful algal blooms.

The Lake Erie ecosystem faces wide and varied threats to its health and integrity, including harmful algal blooms (HABs) in the west basin, recurring low oxygen episodes ("dead zones") in the central basin, and invasive species. Each of these threats has the potential to disrupt normal food web and ecosystem processes, and in turn, jeopardize the ability of Lake Erie to provide valued ecosystem services (e.g., recreational and commercial fish production, safe drinking water, and clean, bacteria-free beaches).

The three primary objectives of the IFYLE program are to:

- Quantify the spatial extent of hypoxia across the lake, and gather information that can help forecast its timing, duration, and extent;
- Assess the ecological consequences of hypoxia to the Lake Erie food web, including phytoplankton, bacteria, microzooplankton, mesozooplankton, and fish;
- Identify factors that control the timing, extent, and duration of HAB (including toxin) formation in Lake Erie, as well as enhance our ability to use remote sensing as a tool to rapidly map HAB distributions in the lake.

### What's New

**NEW** Pressor Sensor  
Data added:  
**Moored Instrument  
Data Page**  
2006-09-15

**Products Page**  
updated 2006-09-27

### Lake Erie Current Conditions

**Web Cam**  
+ Toledo Light #2  
(wind speed, max wind speed, wind direction, air temperature, web cam)

**Lake Erie Satellite Imagery**  
+ GLERL Coastwatch Node

**2-km Lake Erie (and other lakes) Great Lakes Coastal**

## International Field Years on Lake Erie (IFYLE)

◀ Back

### List of IFYLE Projects

#### Project Titles and Investigators

Spatial and Temporal Distribution of Cyanobacterial Toxins in Lake Erie:

G. Boyer [glboyer@esf.edu](mailto:glboyer@esf.edu)

Historical Distribution of Microcystis and Its Toxins in Lake Sediments:

G. Boyer [glboyer@esf.edu](mailto:glboyer@esf.edu)

Microbial food-web structure and function in Lake Erie: Influence of benthic-pelagic coupling on hypoxia in the central basin

H. Carrick [hjc11@psu.edu](mailto:hjc11@psu.edu)

Estimations and Implications of Plankton Mortality in Lake Erie:

C. Gobler [christopher.gobler@liu.edu](mailto:christopher.gobler@liu.edu) S. Wilhelm [wilhelm@utk.edu](mailto:wilhelm@utk.edu)

Time Series Measurements in Lake Erie:

N. Hawley [nathan.hawley@noaa.gov](mailto:nathan.hawley@noaa.gov)

Role of Natural Microbial Taxa and Assemblages in P- and C-dynamics in Lake Erie:

R. Heath [rheath@kent.edu](mailto:rheath@kent.edu) T. Meilander [ttrzebuc@kent.edu](mailto:ttrzebuc@kent.edu)

The Influence of Seasonal Hypoxic Events in the Central Basin of Lake Erie on the Short-Term Growth of Organisms from Multiple Trophic Levels:

T. Hook [thook@umich.edu](mailto:thook@umich.edu) J. Diana [jimd@umich.edu](mailto:jimd@umich.edu)

Examination of Nutrient Loading and Internal Nutrient Dynamics Association with Central Basin Lake Erie Hypoxia:

T. Johengen [johengen@umich.edu](mailto:johengen@umich.edu)

Lake Erie Core Inventory: Pb, 210 dating, Org. C, & TN analysis

### Strategic Research Planning Team

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*Project Chief*

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Management Research  
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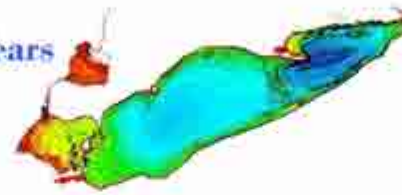
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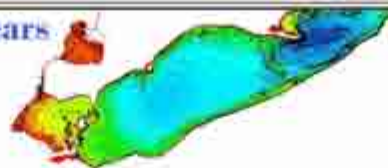
## International Field Years on Lake Erie IFYLE



### Field Sampling Protocols (login required)

- bacterial productivity
- chlorophylls
- phosphate uptake
- nutrients
- sediment traps
- zooplankton pumping

## International Field Years on Lake Erie IFYLE



### Lake Erie Physical Data Sets

These data sets are comprised of existing long-term and IFYLE-specific physical environmental variables for Lake Erie. Included are hourly surface meteorological data from U.S. and Canadian weather stations, Coast Guard stations, buoys, and coastal marine stations around Lake Erie. Meteorological parameters are summarized on daily, monthly, and annual time scales. In addition, long-term ice concentration, hydrology, storm climatology, remote sensing, and U.S. Army Corps of Engineers wave climatology data are included. Data from IFYLE moored instrument arrays include surface meteorology from buoys, thermistor profiles, and current meter time series. Metadata is included for each specific data file.

IFYLE cruise data (e.g., nutrient samples, ctd profiles, towed instruments) are not reported here; rather they are found in the [IFYLE Cruise Database](#).

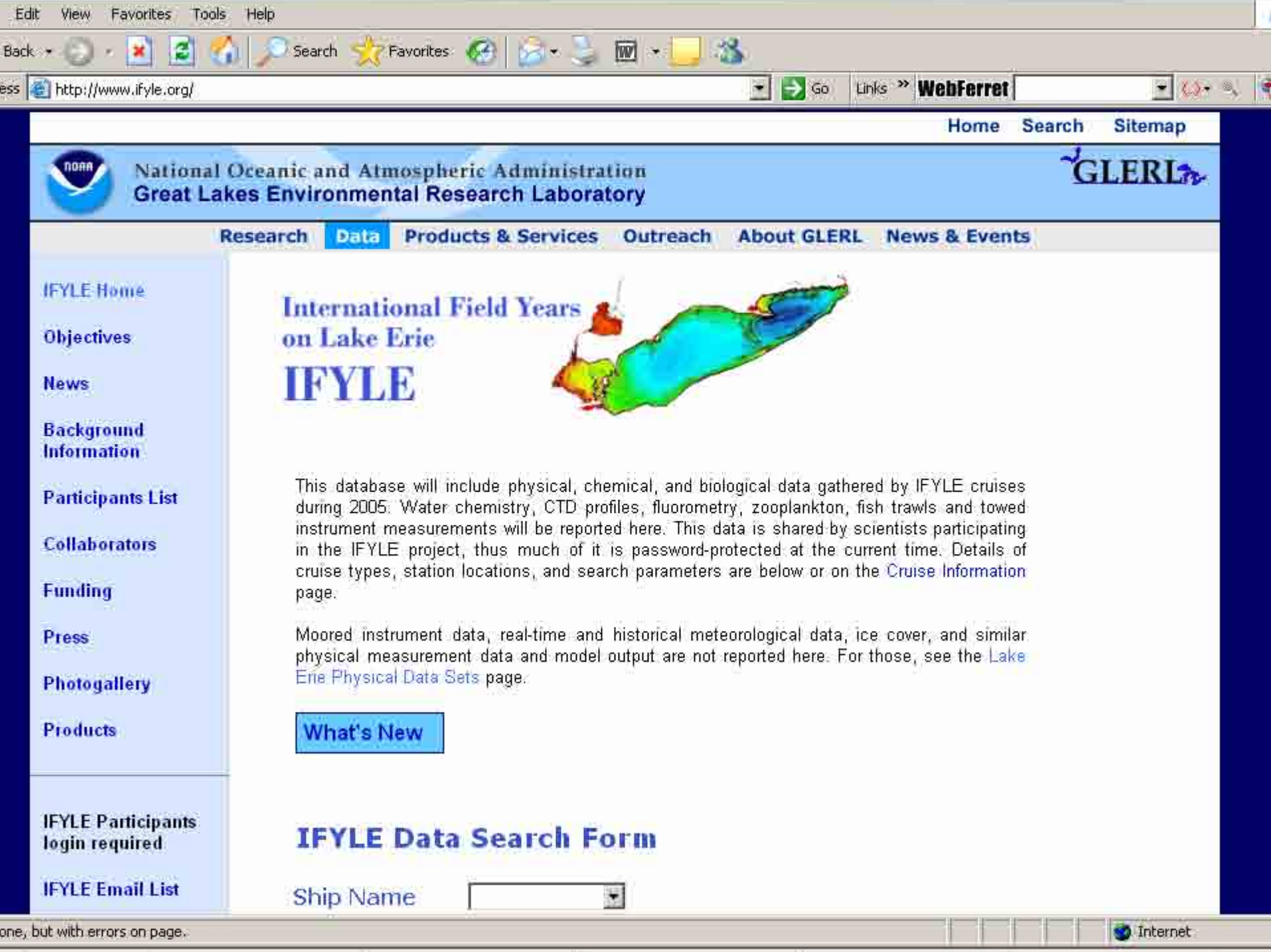
#### Data Sets:

- [Met Station Data](#) (fixed coastal meteorological stations)
- [Moored Instrument Data](#) (moored buoys, thermistors, transmissometers, current meters, YSI data, pressure sensors)
- [Model Output](#) (model output of wind & waves, basin runoff)
- [Spatial Data](#) (ice cover)
- [Ancillary Data](#) (drifter tracks, air temp & precip, water levels, WTP water temps)

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For more information contact:

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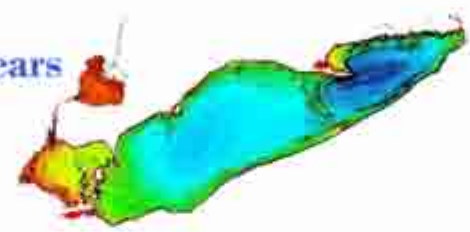
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## International Field Years on Lake Erie

# IFYLE



This database will include physical, chemical, and biological data gathered by IFYLE cruises during 2005. Water chemistry, CTD profiles, fluorometry, zooplankton, fish trawls and towed instrument measurements will be reported here. This data is shared by scientists participating in the IFYLE project, thus much of it is password-protected at the current time. Details of cruise types, station locations, and search parameters are below or on the [Cruise Information](#) page.

Moored instrument data, real-time and historical meteorological data, ice cover, and similar physical measurement data and model output are not reported here. For those, see the [Lake Erie Physical Data Sets](#) page.

[What's New](#)

## IFYLE Data Search Form

Ship Name

- IFYLE Participants  
login required
- IFYLE Email List
- Project List  
Description
- Lake Erie  
Physical Data Sets
- IFYLE Cruise Data
- Field Sampling  
Protocols
- Cruise Information

## IFYLE Data Search Form

Ship Name	<input type="text"/>	
Cruise Type	<input type="text"/>	<a href="#">Description of Cruise Types</a>
Month	<input type="text"/>	
Day of Year	<input type="text"/>	<a href="#">Calendar</a>
Station	<input type="text"/>	<a href="#">Station Information</a>   <a href="#">Map of Stations</a>
		<a href="#">Station List</a>
Data Type	<input type="text"/>	<a href="#">List of Available Data Types</a>
Activity	<input type="text"/>	<a href="#">List of Activity Codes</a>
Oplog Number	<input type="text"/>	<a href="#">Metadata</a>   <a href="#">Cruise Ops Master Files</a>

[Database Content](#)

[Data Policy](#)

### Contact Information

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