



Lake Erie Millennium Network (LEMN)

<http://www.uwindsor.ca/erie2001>

Binational Network - formed November 1998

Convening Organizations:

F.T. Stone Lab - Ohio State University (Jeff Reutter)
NWRI - Environment Canada (Chris Marvin)
Large Lakes Research lab - US EPA (Russ Kreis)
GLIER - University of Windsor (Jan Ciborowski)

Sponsors: Federal, State, Provincial, Regional organizations

Collaborators: Groups active in research/information exchange

What Originally Prompted the Network?

Researchers: Limited research funding sources
(lake-wide questions need collaborative,
multidisciplinary expertise)

Agencies: LaMPs mandated to ask questions, but
poor link between mandates & research
knowledge base. (recent research
findings & tools)

Public: uninformed lobbying for changes in
management strategies to resolve 'crises'

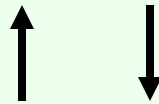
Goal: Develop an **open, inclusive, binational** framework to
a) address management needs
b) understand the ecosystem
c) communicate research findings/needs

Significant Events

- 1950s-70s** **Increasing Eutrophication**
(high TP & frequent anoxia)
- 1978** **Great Lakes Water Quality Act**
(regulation of TP loadings)
- 1987** **Dreissenids in Lake Erie**
- 1995** **Increasing water clarity – percid losses**
- 1997** **“too little phosphorus!- add sewage!” arguments**
- 1998** **Buffalo & Kent State dreissenid effects meetings**
- 1999** **LEMN trophic status workshop**
- 2001** **Rising TP - central basin hypoxia**
(“L. Erie’s dead zone!”)
EPA Chicago meeting – “Possible causes”
- 2002** **EPA GLNPO RFP → LETS project**
- 2004, 2009** **L. Erie Binational Collaborative Years (ECCS)**
- 2005-2009** **IFYLE, EcoFore, WLE & other modeling initiatives**
- 2010** **Great Lakes Restoration Initiative**
- 2007, 2011** **Massive *Microcystis* blooms**
- 2012** **Revised Great Lakes Water Quality Act**

Coordination

Advisory Committee
(representatives of Sponsoring Agencies)



Codirectors (2 in US; 2 in Canada) at
4 nodal institutions: (2 univ.; 2 gov't research labs)



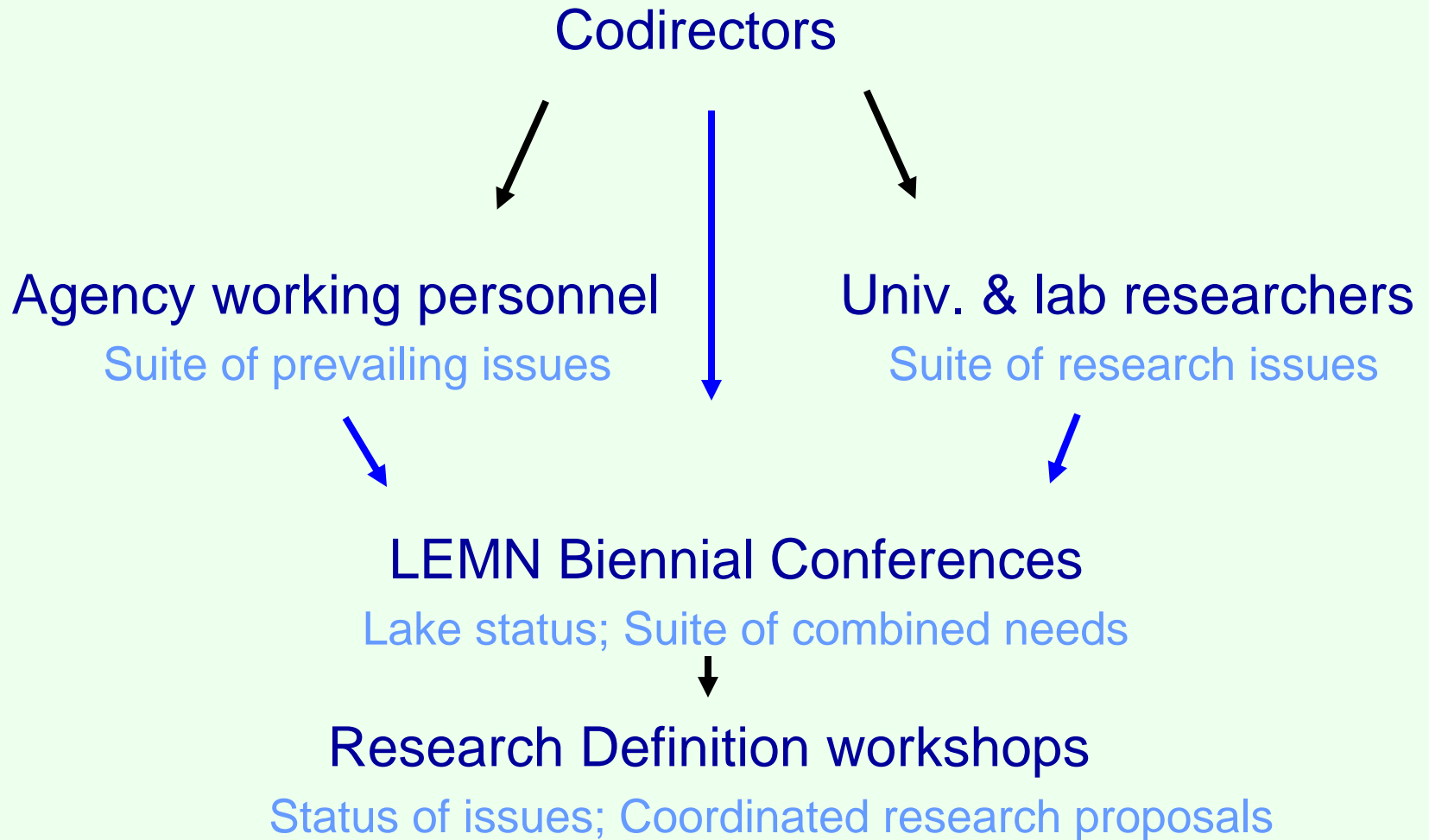
Agency working personnel
(issues/problems)

Univ. & lab researchers
(processes/unknowns)



Larger Lake Erie Community
(conferences; reports; proposals)

Coordination



Original Supporting Groups

Sponsors

(funds for meetings, publications, etc.)

Essex Region Conservation Authority
Great Lakes Fishery Commission
International Joint Commission
Lake Erie Lakewide Area Management Plan
through Environment Canada & US EPA
Michigan Sea Grant
Lake Erie Protection Fund
New York Sea Grant
Ontario Ministry of the Environment
Ontario Ministry of Natural Resources
Pennsylvania Dept. Environmental Protection
Pennsylvania Sea Grant
US Geological Survey - Gt. Lakes Sci. Ctr.

Campbell Scientific
DTE Energy, Inc.
Hoskin Scientific

Collaborators

(contribute to data needs, etc.)

Citizens Environment Alliance
Cornell University Biological Station
Ducks Unlimited
Essex County Stewardship Network
Great Lakes Commission
Great Lakes Environ. Res. Lab - NOAA
Great Lakes Research Consortium
Great Lakes Lab Fisheries & Aquatic
Sci. - Fisheries & Oceans Canada
Ontario Commercial Fishery Assoc.
Ontario Fed. of Hunters & Anglers
Ohio Dept. Natural Resources
Ohio Environ. Protection Agency
Ontario Ministry Agriculture & Food
Water Environment Federation

Strategy

1. document research & management needs of users and agencies

Prevailing Issues Workshop 1.0 – November 1998

- identify major questions and management issues

Outcome: list and classification of needs:

- 48 separate topics in 7 subject areas → workshop themes

Prevailing Issues Review Workshop – June 2006

- 10 topics reduced in priority (+ 'Y2K' problem solved)
- 17 additional topics; 2 new subject areas (communication)
- higher priority theme: watershed impacts on lake condition

Prevailing Issues Review Workshop – Summer 2013

LEMN Prevailing Issues Workshop - 27-28 June 2006

Tasks

1. Review priorities assigned by preliminary assessment.
2. Breakout group discussions (major concern/minor concern) to summarize
 - a) what would be an appropriate indicator of the status of the issue?
[acceptable amount/extent; unacceptable amount/extent]
 - b) what information do we need to adequately monitor the issue (needs/frequency)?
 - c) what information would we need to properly understand the issue?
 - d) what information would we need to solve the issue?
 - e) what new tools approaches do we need to address the issue?

Group

Contaminants

Eutrophication & Production

Habitat & Land use/land change

Invasive species

Ecosystem processes

All others (Communication; Human Health; Policy)

Strategy

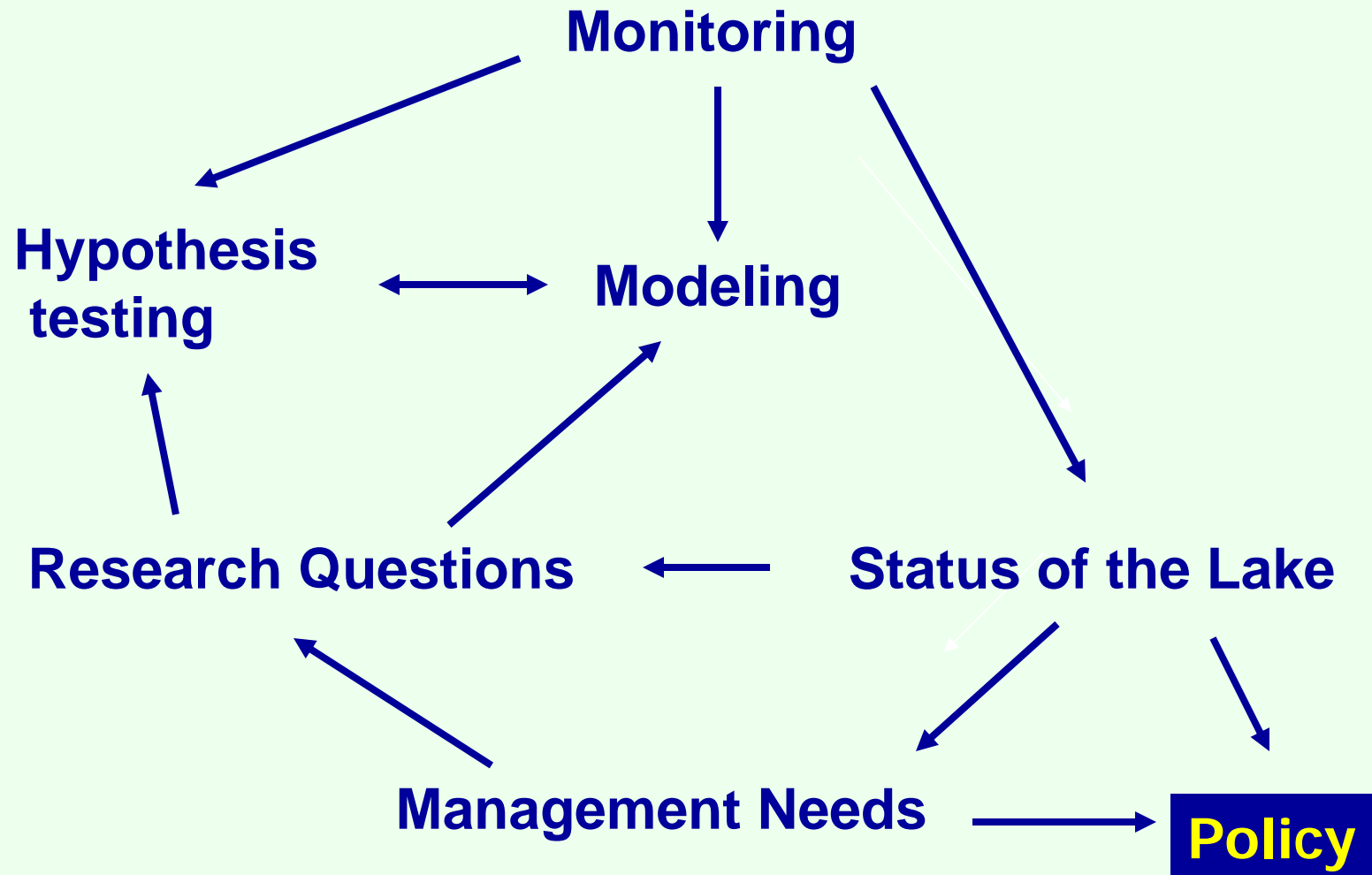
2. Binational Conferences (1999; 2001; 2003; 2006; 2008; 2010; 2013)

- 30-45 invited speakers + contributed posters; 175 attendees
- no concurrent sessions
- compile current knowledge of Lake Erie processes
- forecast trends for the next 3-5 years
- identify critical research gaps
- take stock:
 - what do we know?
 - what do we understand?
 - what do we need to know/understand?

Outcomes:

- “Research Needs” workshops --> summarize consensus on the 7 subject areas
- status reports & proposals
- collaborative research teams

3. forming collaborative groups (open to all)



Relationship among management, research, & monitoring needs within LEMP.

Workshops and Research Arising

1. Limits on Energy Transfer in the Lake Erie Ecosystem - Critical Tests of Hypotheses

EPA-funded Lake Erie Trophic Status project (2002):

- 28 PI's funded by US EPA (\$500K)
- all agency collaboration → \$2M in kind support
- *Journal of Great Lakes Research* special issue (June/06)

2. Contaminant Processes in Lake Erie (2000)

- **Part I. Loadings, Spatial Patterns, and Temporal Trends**
- **Part II. Mechanisms and Processes**
- **Part III. Ecosystem Implications** [review papers]

3. Habitat Structure, Function, and Change

*Anticipating effects of water level changes on habitat distribution & quality
in the Huron-Erie Corridor*

- funded by GLFC; 5 PI's & cooperators; models proposed (2004)

Binational Mapping Strategy for Lake Erie watershed

- funded by US EPA & Envir. Cda. (2005/06)
- 12 PI's & cooperators
- all agency collaboration

Workshops and Research Arising

4. Loading from landscapes & coastal margin effects: Developing a framework to evaluate consequences of land management strategies (2008)

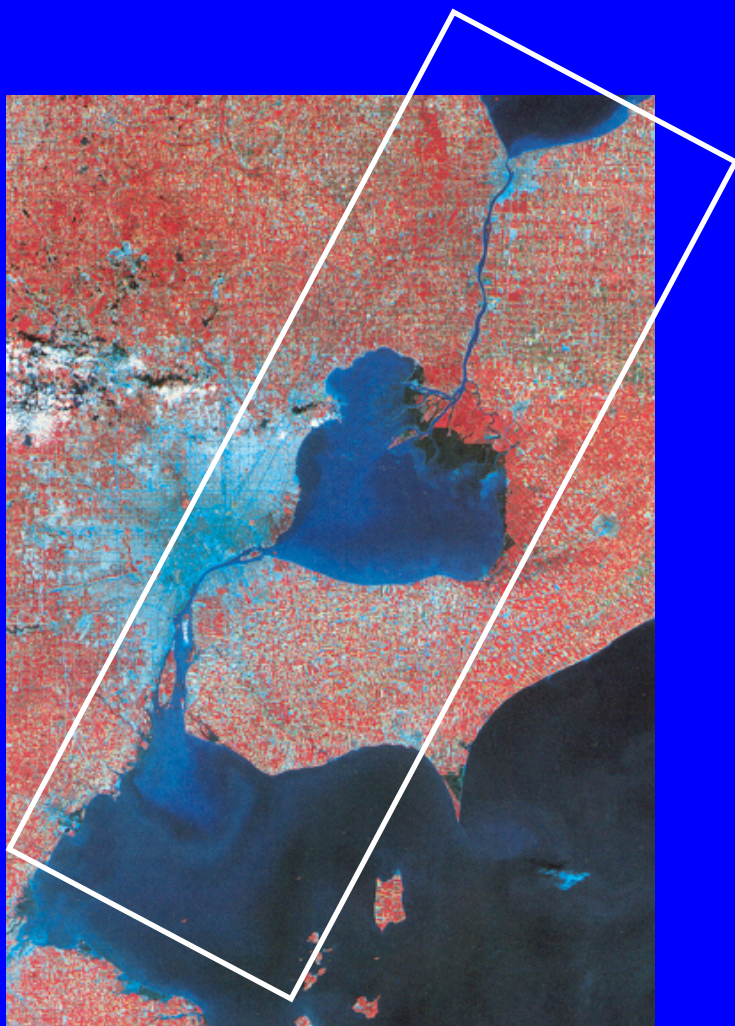
EPA-funded Lake Erie Nutrient Loading &
Harmful Algal Blooms Project (2008)
8 PI's funded by US EPA (\$280K)

Integrated with
Cooperative Science & Monitoring Program (2009)
Lake Erie Intensive Cooperative Year (2009/2010)

5. Great Lakes Restoration Initiative (2010-2012)

Lake Erie Millennium Collaboration (US)
Coordinating meetings & synthesis

HURON-ERIE CORRIDOR SYSTEM HABITAT ASSESSMENT – CHANGING WATER LEVELS & EFFECTS OF GLOBAL CLIMATE CHANGE



The “System”:

- St. Clair River
- St. Clair Delta
- Lake St. Clair
- Detroit River
- Western Basin, Lake Erie

Jeffrey Reutter
Scudder Mackey
Jan Ciborowski
Robert Haas
Phil Ryan
Murray Charlton
Russell Kreis

USFWS & GLFC



AN INTEGRATED HABITAT CLASSIFICATION AND MAP OF THE LAKE ERIE BASIN (Lake Erie Binational Map Project)

**Lucinda B. Johnson
Jan J.H. Ciborowski
Scudder D. Mackey
Ric Lawson
Nicholas E. Mandrak
Daniel T. Button**

Former LEMN Habitat-related Projects

- 1. Huron-Erie Corridor System Habitat Assessment – Changing water levels & effects of global climate change [Current & future aquatic habitat restoration opportunities]
Currently: Huron-Erie Corridor Initiative (USGS-led)**

- 2. An integrated habitat classification and map of the Lake Erie basin
Currently: Great Lakes Aquatic Habitat Framework (Inst. Fisheries Res-led)**

Plans for 2013

Release & implement new 5-year plan:

- 5-y plan approval by Advisory Committee
- workshops reflecting needs identified by updated Priority Needs list
- nearshore/land-water interaction emphasis on nutrient dynamics & habitat characteristics (new models)
- 2013 binational conference (Oct 29-31)
- planning for 2014 L. Erie Intensive collaborative year
- expand mapping & indicator initiatives to basin (SOLEC & IJC)

Summary

1. The LEMN is an open network of interested participants working to develop a binational research framework
2. Nearshore water quality & habitat reflect timing, amount & quality of materials transported from the watersheds
 - opportunity for closer ties with RAPs in AOCs & associated funding for research
3. Maintaining a balance of university & agency/institutional researchers ensures that research initiatives combine fundamental knowledge with agency needs.



Welcome to the new Lake Erie Millennium Network website...click [here](#) to find out about the network.



The Lake Erie Millennium Network is a series of events dealing with Lake Erie environmental issues. It is a cooperative approach, benefiting from the expertise and concerns of the public, regulatory agencies and the academic community.

Our goal is to define and understand Lake Erie's most pressing problems, propose solutions, and track the changes.

The Lake Erie Millennium Plan (LEMP), was initiated in 1998 by scientists at the University of Windsor, National Water Research Institute - Burlington, F.T. Stone Lab of Ohio State University, and US-EPA Large Lakes Lab at Grosse Ile, MI, to foster and coordinate research that will identify and solve basic ecological questions relevant to the Lake Erie Ecosystem through a binational, collaborative network.

Lake Erie News

[State plans to offer quieter experience at 2 Lake Erie islands - Akron Beacon Journal](#)

[Wildlife Officials, Residents Concerned About Major Lake Erie ... - WIVB](#)

[Lake Erie vs Waynesburg \(Sep 01, 2006\) - Waynesburg College Athletics](#)

[Lake Erie helicopter rescue for Michigan family members - WLNS](#)

[Boaters rescued during trip to cross Lake Erie - Toledo Blade](#)

GLRC News

[WETLANDS TO SLOW OR GROW GLOBAL WARMING?](#)

[TREES UNDER THE INFLUENCE OF OZONE AND CO₂](#)

[STEERING CARS OUT OF NATIONAL PARKS](#)

[CALI OUT FRONT ON GREENHOUSE GAS REGS](#)

[FISH-EATING BIRD DISRUPTING FOOD CHAIN](#)

GLIN News

[GLIN Daily News](#)

[Wisconsin mute swans are safe until January](#)

[Isle Royale: island wilderness](#)

[Could bills lead way to oil drilling in the Great Lakes?](#)

[Safety equipment slow to appear on waterfronts](#)