

21st Century Innovation in Fisheries Science

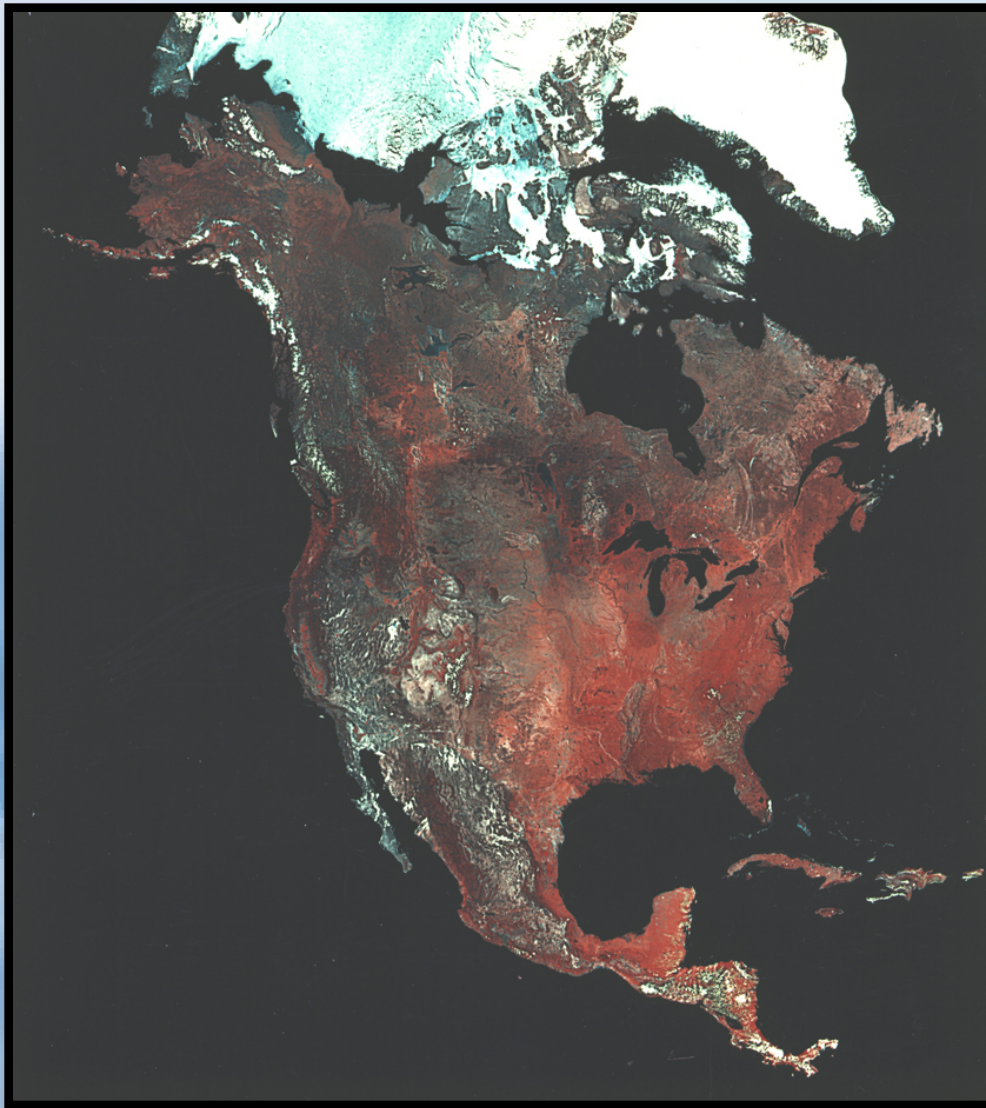
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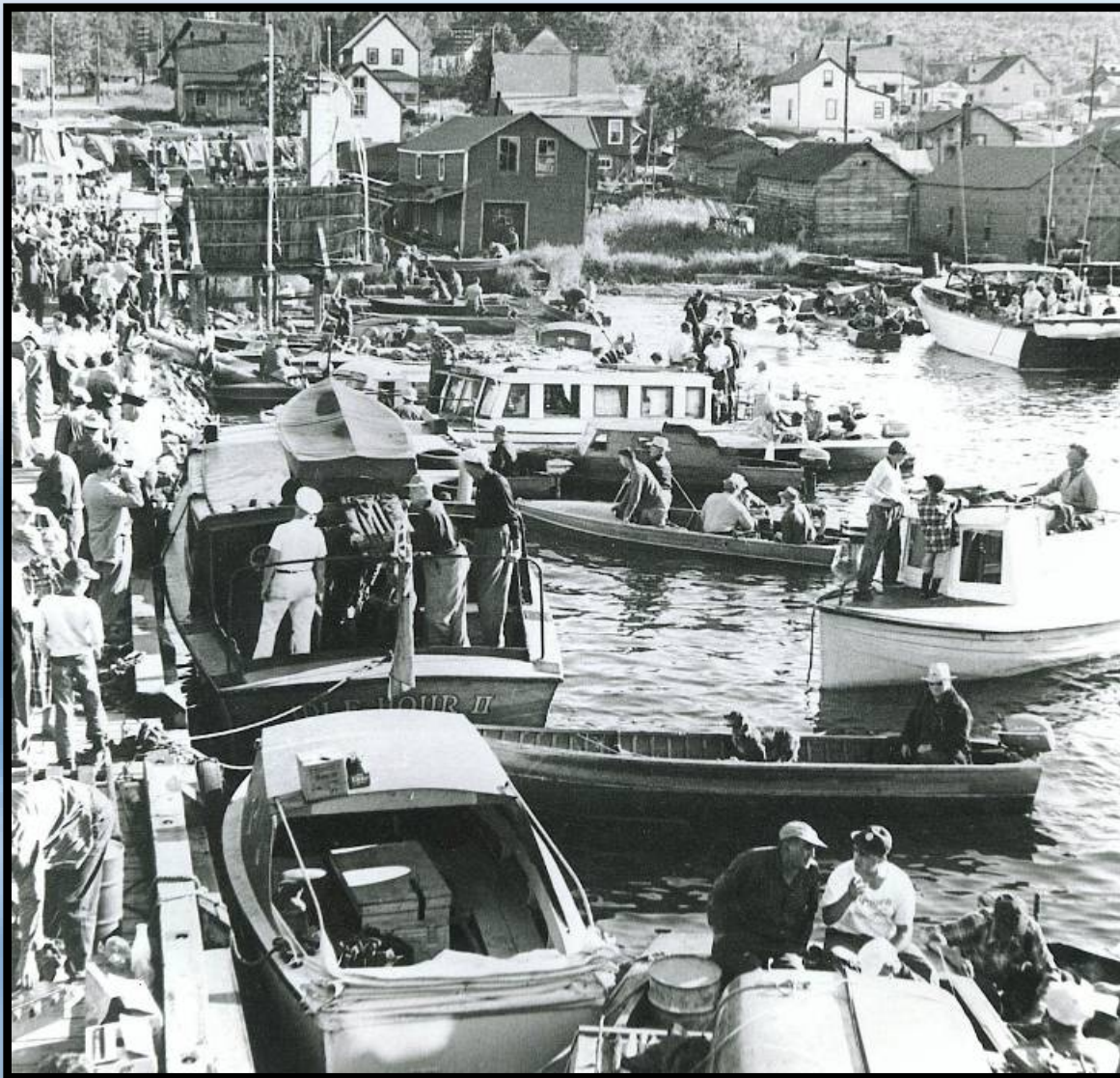
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FISHERY DEGRADATION

- Habitat Destruction
- Water Quality Degradation
- Overharvest
- Invasive species





**Un-successful
attempts at
cooperation**



**Failed
Treaty**



1880s

1890s

1900s

1910s

1920s

1930s

1940s

1950s



Signatories to A Joint Strategic Plan for Management of Great Lakes Fisheries



GREAT LAKES FISHERY MANAGEMENT

- Sustain fish stocks
- Protect diversity
- Balance predator/prey
- Manage → best information
- Balance constituent needs



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AN INTERNATIONAL RESOURCE



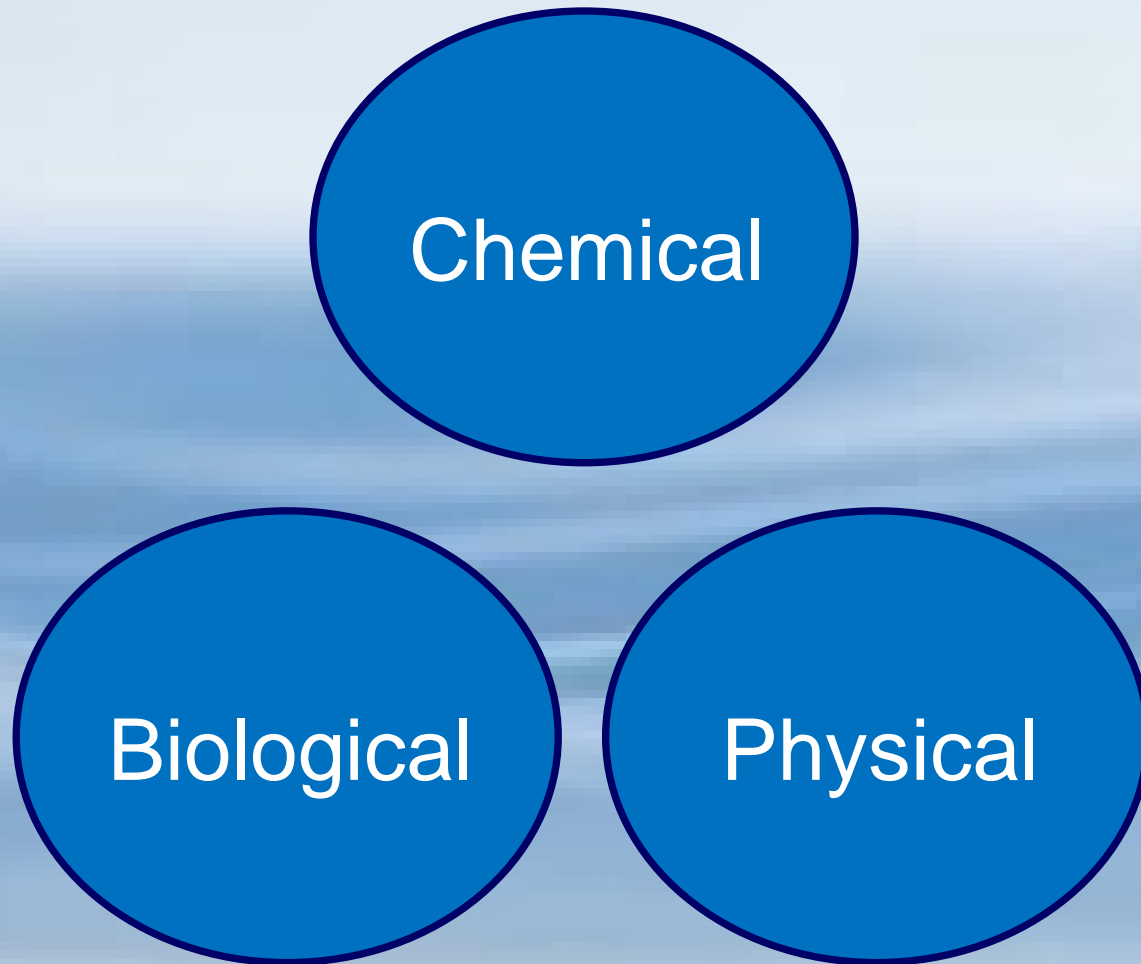
Massive economic engine:

- \$35 billion/year in fishing, tourism and industry
- 75,000 jobs
- Backbone of local communities
- Requires science to inform lake conservation and water management decisions
- A fisheries resource for eight states and two provinces



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PILLARS OF THE GLWQA



COOPERATIVE FISHERY SCIENCE IN THE BASIN

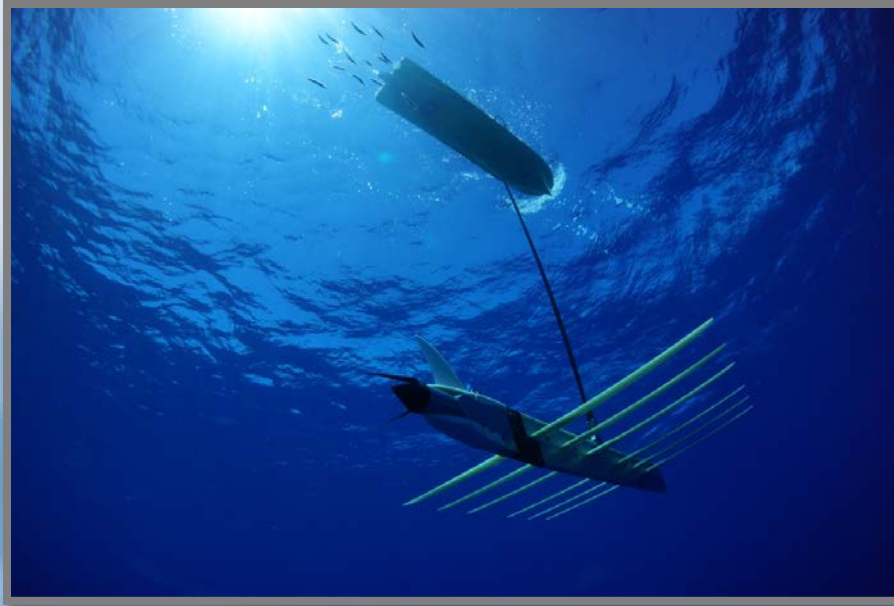
- Great Lakes Fishery Commission
- U.S. Geological Survey
- States, provinces, tribes
- Federal agencies
- Universities



Department of Fisheries and Wildlife



NEED FOR TECHNOLOGY

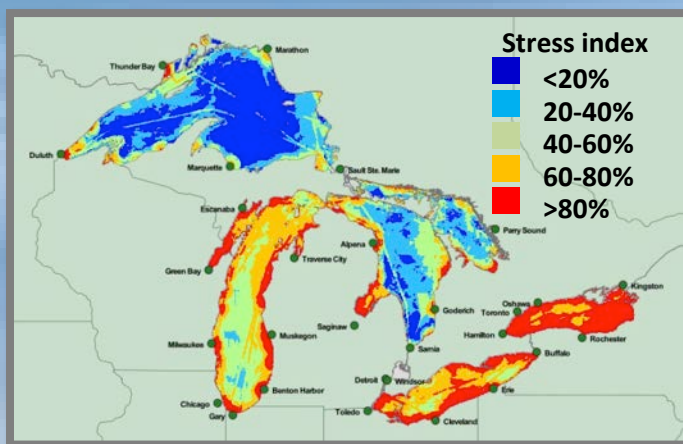


- Keeping up with cutting-edge technology
 - Satellite pop-off tags
 - **Wave gliders**
 - **Next-generation DNA sequencing**



USGS GREAT LAKES SCIENCE CENTER

- Deepwater science cornerstone of fisheries management
- Increasing stress
- Emerging technologies



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USGS GREAT LAKES SCIENCE CENTER

- New advanced technology program for USGS Fisheries
- Technology transfer from marine realm
- USGS Technology Initiative in Ecosystems Science (TIES): Unravelling the Mysteries of the Deep



Autonomous Ocean Sampling Networks

Observing

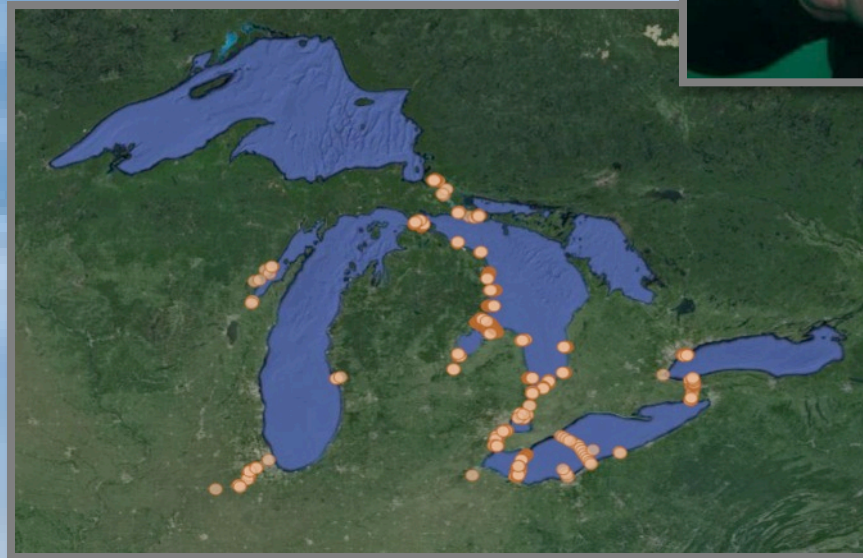
Predicting

Understanding the Ocean

Monterey Bay 2003 Field Experiment

ACOUSTIC TELEMETRY

- A Success Story
- Improved Decisions (why)
- Research Questions (what)
- Science (new knowledge)

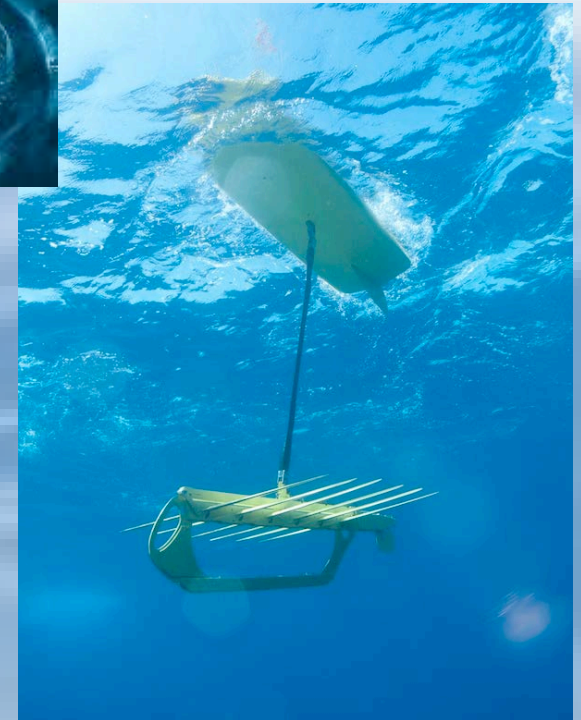


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GREAT LAKES WIDE HYBRID OBSERVATORY SYSTEM



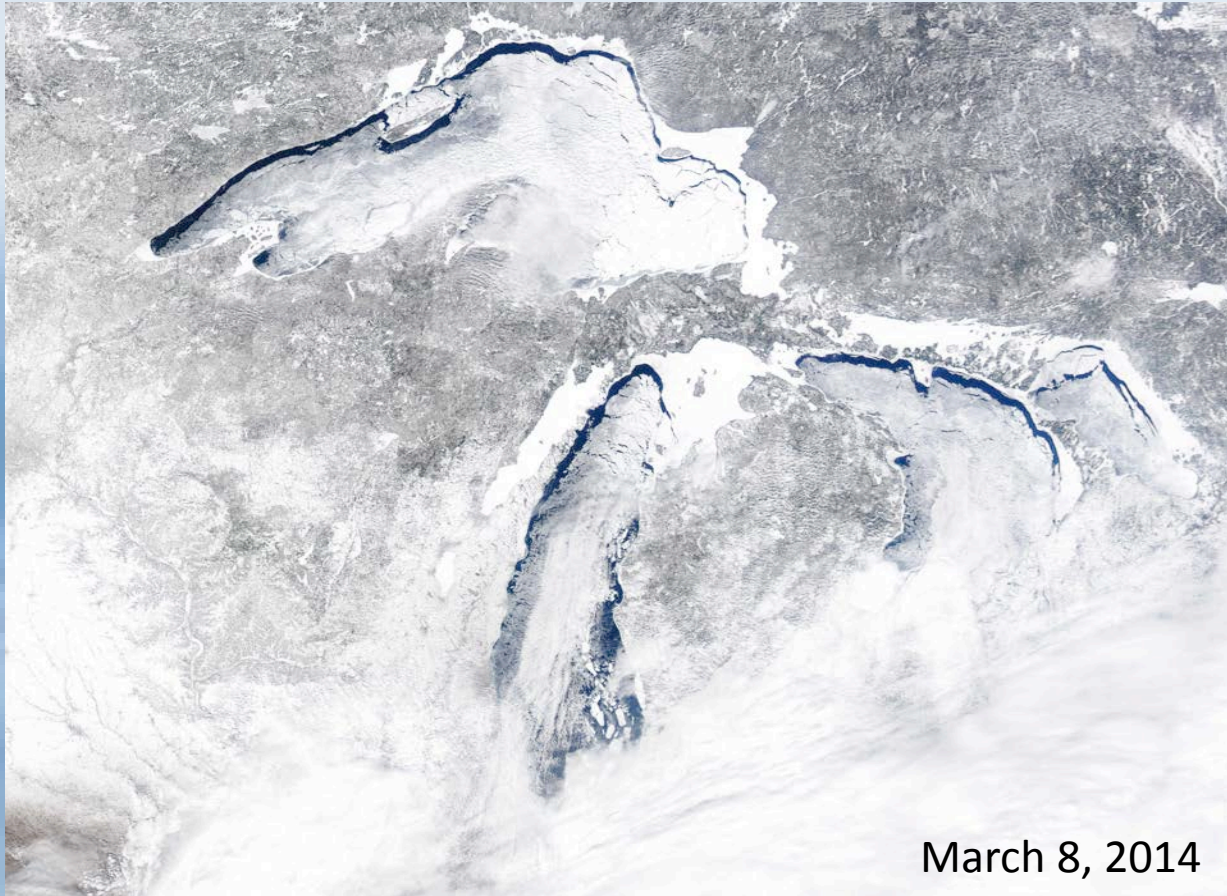
Surface



Sub-surface



WHY THE GREAT LAKES ?



The Winter of 2013-14

In the Great Lakes,
we are currently
“Scientifically Blind”
though all winters...



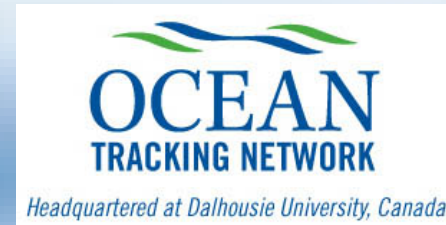
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WHY THIS PARTNERSHIP ?

A seamless international scientific network
across the the entire Great Lakes

Understand and tackle today's and
tomorrow's Great Lakes challenges.

All weather, all season observations



GREAT LAKES LESSONS FROM OTN

- POST – Pacific Ocean Shelf Tracking project
- Ocean Tracking Network (OTN)
- Adopted OTN approach – much smaller scale, instead of global – Laurentian Great Lakes of Canada and the U.S.!
- Thus the Genesis of GLATOS



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ADVANCED GREAT LAKES FISHERIES SCIENCE & MANAGEMENT

Faster, Better and Cheaper...
through
Advanced Technology



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WHY NOW ?

Leverage Canadian Investment ...

- CFI encouraged Michigan Tech to engage Canadian Universities and U.S. Federal Agencies
 - Five Canadian Great Lakes Universities - \$18 M pending
 - Canadian observatories will seamlessly mirror US effort/design
- The Great Lakes are critical in fisheries, drinking water, transportation, recreation and commerce.



WHAT IS NEEDED?

- Full support for GLRI, including Great Lakes Acoustic Telemetry
- Full funding (\$27 million) for GLFC
- Full funding for USGS-GLSC: \$15 million
- Incorporation of GLRI into base budgets
- Match the Canadian investment in an Advanced Hybrid Observatory System for the Great Lakes (\$18M).

THANK YOU!

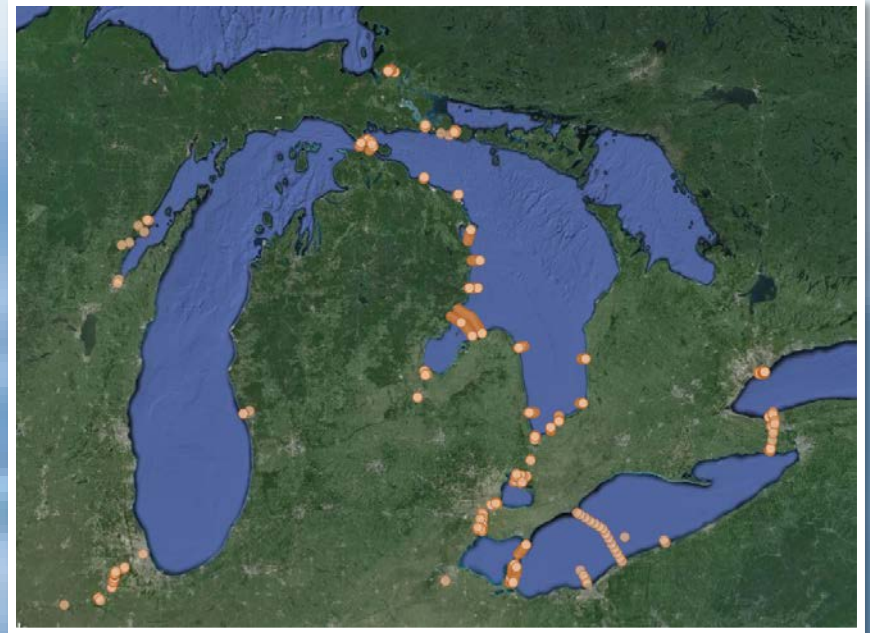


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ACOUSTIC TELEMETRY AND THE GREAT LAKES RESTORATION INITIATIVE



www.glatos.us



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GREAT LAKES ACOUSTIC TELEMETRY

- 15 total projects
- GLFC – GLRI projects
 - 3 Sea Lamprey
 - 2 Lake Trout
 - 2 Walleye
 - 1 Lake Sturgeon (GLFT)



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