21st Century Innovation in Fisheries Science

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FISHERY DEGRADATION

- Habitat Destruction
- Water Quality Degradation
- Overharvest
- Invasive species
Un-successful attempts at cooperation

Failed Treaty
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
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
PILLARS OF THE GLWQA

Chemical

Biological

Physical
COOPERATIVE FISHERY SCIENCE IN THE BASIN

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

• A Success Story
• Improved Decisions (why)
• Research Questions (what)
• Science (new knowledge)
GREAT LAKES WIDE
HYBRID OBSERVATORY SYSTEM

Surface

Sub-surface

USGS
science for a changing world

Great Lakes Fishery Commission

Michigan Tech
Great Lakes Research Center
WHY THE GREAT LAKES?

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

The Winter of 2013-14

March 8, 2014
WHY THIS PARTNERSHIP?

A seamless international scientific network across 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

[Image with Vemco V9 and Vemco V9P (Depth) devices next to a coin]
ADVANCED GREAT LAKES
FISHERIES SCIENCE & MANAGEMENT

Faster, Better and Cheaper... through
Advanced Technology

USGS
science for a changing world

Protecting Our Fishery
Great Lakes Fishery Commission

MichiganTech
Great Lakes Research Center
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!
ACOUSTIC TELEMETRY AND THE GREAT LAKES RESTORATION INITIATIVE

Acoustic tag transmits unique acoustic signal

www.glatos.us

USGS  
science for a changing world

Michigan Tech
Great Lakes Research Center
GREAT LAKES ACOUSTIC TELEMETRY

• 15 total projects

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