Lake Erie International Field Year 2005

‘Pre-Planning’

- Concept introduced in JGLR Editorial
- Lake Erie Millennium Workshops
- NOAA Workshop on HABs, Dead Zone and Fish Production, March 2004

Background

- GLERL wrote proposal to bring NOAA Vessel (or charter funds) to Great Lakes in 2005, 2006, 2007
  - Conduct an integrative, multidisciplinary research program on Lake Erie
  - Spearhead IFYGL II, emphasis on biology & chemistry
  - Understand bio-physical coupling to aid forecasting & allow for ecosystem management
- Proposal was funded (1st learned on Dec. 22)
  - $450K to charter 90 days of R/V Guardian
  - May receive some funds during 2006 & 2007

Coordination

- Lake Erie Committee
  - Jeff Tyson on planning team (LEC rep)
- Lake Erie LaMP
  - Stuart Ludsin on working group
- Lake Erie Millennium
  - Jan Ciborowski, Jeff Reutter, & Murray Charlton on planning team
- Regional Working Group of Presidents Executive Order
  - P. Horvatin on planning team

Key Goals

- Lake Erie research program will:
  - Be integrative
  - Be multidisciplinary (biological, chemical, & physical coupling)
  - Result in a product (e.g., maps, scientific understanding, and/or forecasting tools/ability to benefit management agencies)
  - Use scientific plans developed by 2004 Lake Erie Workshop and Lake Erie Millennium Workshops.

Major Support

- **NOAA**
  - **About $3M (ship support, buoy systems, personnel, cash)**
    - **>15 Principal Investigators**
  - **R/V Laurentian and R/V Cyclops to Lake Erie**
- **EPA**
  - **$450K Cost Match for Ship Time (R/V Lake Guardian)**
- National, NT, and Ohio Sea Grant
  - **$300K for university projects**
  - **Announcements this week**
- **Environment Canada (NWRI)**
  - **Met stations, Thermister Strings, Velocity Profilers, Transmissometers, CTDs**
  - **R/V LIMNOS Deployment**

Universities

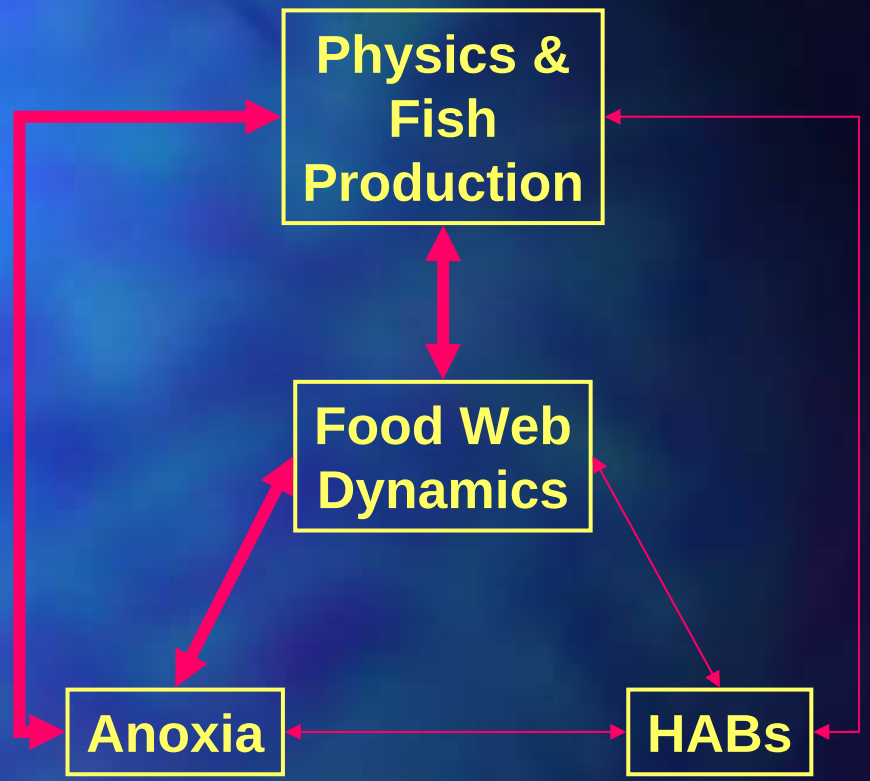
- University of Wisconsin-Milwaukee
- University of Michigan
- Michigan State
- Stony Brook, NY
- Kent State, OH
- SUNY –
- U. Akron
- York University
- Clarkson
- Bowling Green
- Stanford

Outside Support

- Ohio Sea Grant
  - **$30K to use their vessels (e.g., Explorer)**
- Lake Erie Committee agencies
  - Access to historical databases & some vessel support has been indicated from:
    - **Ohio Dept. of Natural Resources**
    - **Pennsylvania Boat & Fish Commission**
    - **Ontario Ministry of Natural Resources**
    - **New York State Dept. of Environmental Conservation**
    - **Michigan Dept. of Natural Resources**
- Lake Erie LAMP
- USGS
  - **Access to vessels (Musky II, Bowfin) in exchange for collaboration**
  - **Research assistance**

Primary Research Foci

- Anoxia
  - Forecasting
  - Food Web Impacts
- Fish Production
  - Food Webs
  - Physics
  - Anoxia
- Harmful Algal Blooms

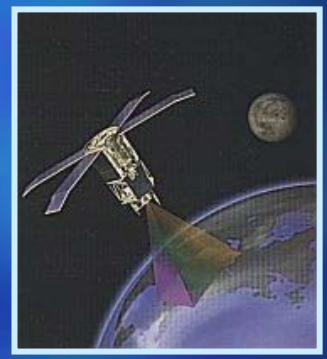


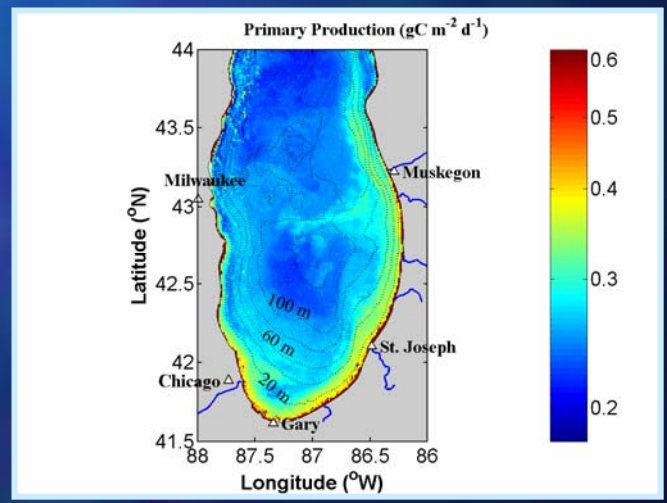
Detailed Research Foci

- Central basin hypoxia/anoxia
  - Models to understand magnitude, timing, & duration
    - Hindcast anoxia (past 50 yr), short-term forecasts
  - Explore ecological consequences of hypoxia
    - Emphasis on understanding & predicting how fish distributions, behavior, consumption, & production are influenced by hypoxia

Harmful Algal Blooms: Goals

1. Increase understanding of causes and consequences of cyanobacteria (e.g. ZM effect, toxin production etc.)
2. Develop models for cyanobacteria/toxins using hydrodynamics
3. Develop remote sensing – All platforms
4. Integrate into ecological forecasting models





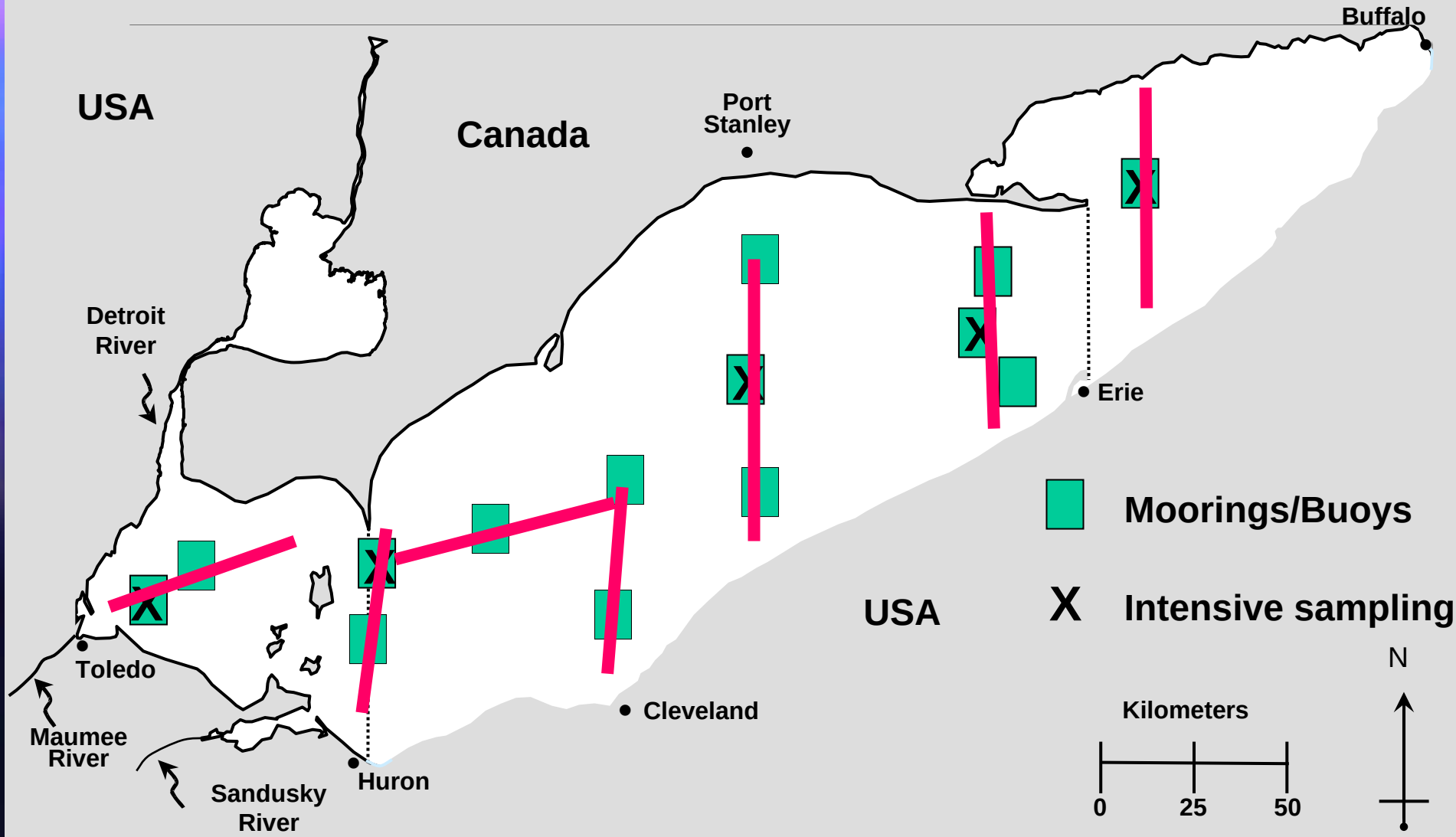
Detailed Research Foci

- Food web dynamics
  - Across all lake basins
  - Understand how exotics have modified native species composition & distributions
  - Understand exotic species persistence (e.g., high *Bythotrephes* in CB)
  - Develop & test extant food web models

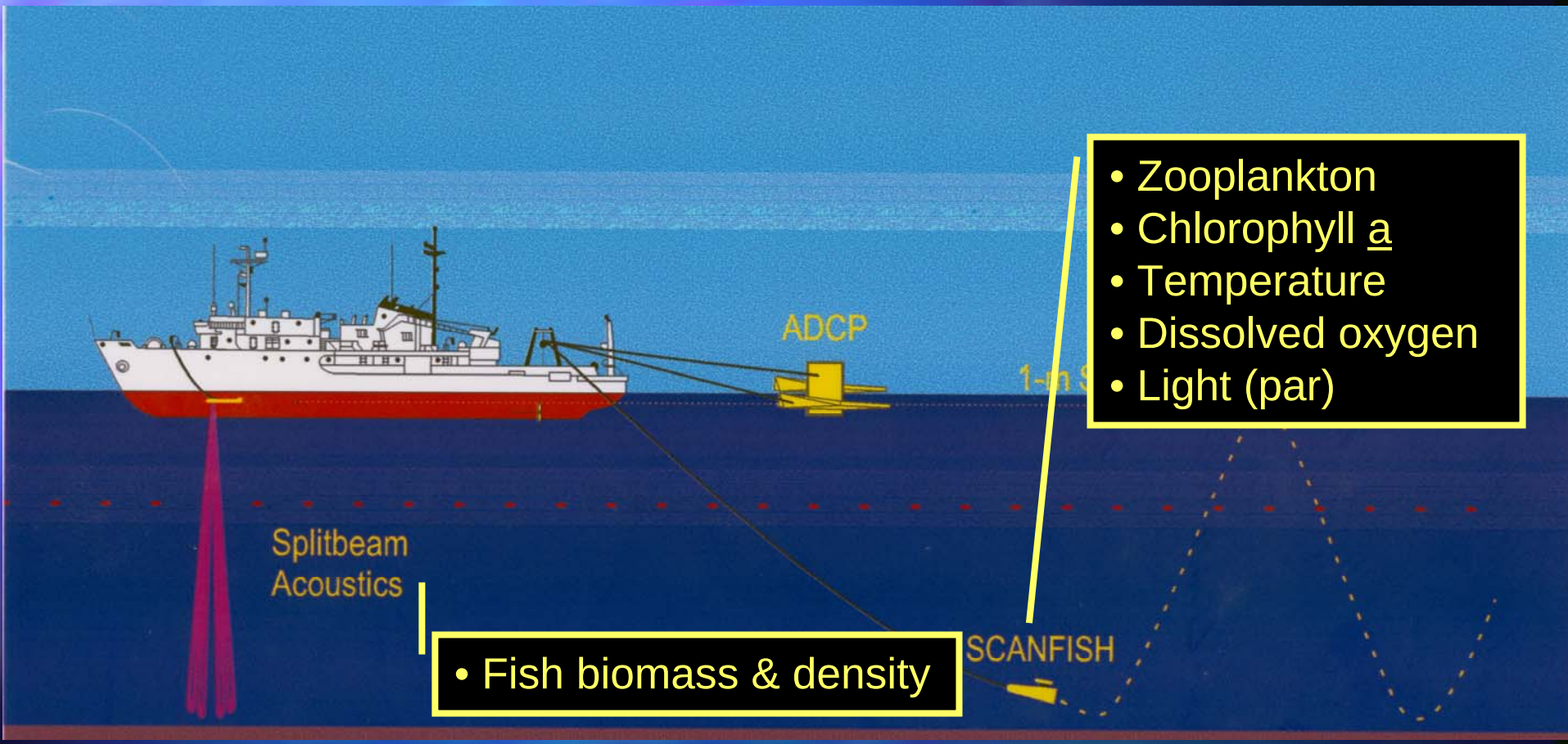
Fish Production

DRAFT Field Program (May- October)

- Continuous transect & focused sampling, moorings/buoys
- 14 - 18 d per month of Lake Guardian time (27 scientists)



Field Program



- Simultaneous trawling & gillnetting (Spp. Composition, fish for diet analyses)
- Collection of macroinvertebrates & ZP with nets/ponars (prey production)
- Diel sampling to quantify foraging & migration behavior
  - In response to prey, oxygen, exotics

End Products

- **Scientific understanding**
  - Derived from integration of field collections and modeling
    - e.g. Spatially-explicit bioenergetics modeling of walleye growth
    - Food web modeling
    - Network analysis
- **Valuable predictive tools**
  - 3-D hydrodynamic model to predict temp., sediments, DO & nutrients
  - Refinement of remote sensing algorithms and hydrodynamics to predict harmful algal blooms
- **Value to fisheries management**
  - 3-D hydrodynamics model to predict temperature, oxygen, & nutrient fields (identified as critical in 2004 Lake Erie Science workshop)
  - Assessment of how hypoxia might influence fisheries production
  - Better understanding of fish distributions, growth production

Timetable

February:	Continue to Develop Collaborations
March 15:	Identify Major University Partners & Funding
April 11-12:	All P.I. Meeting to Finalize Plans
April – May:	Detailed Cruise Preparations
May – October:	Field Season
November:	All P.I. Meeting & Initial Plan for 2006- 2007