

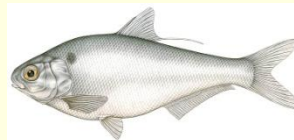
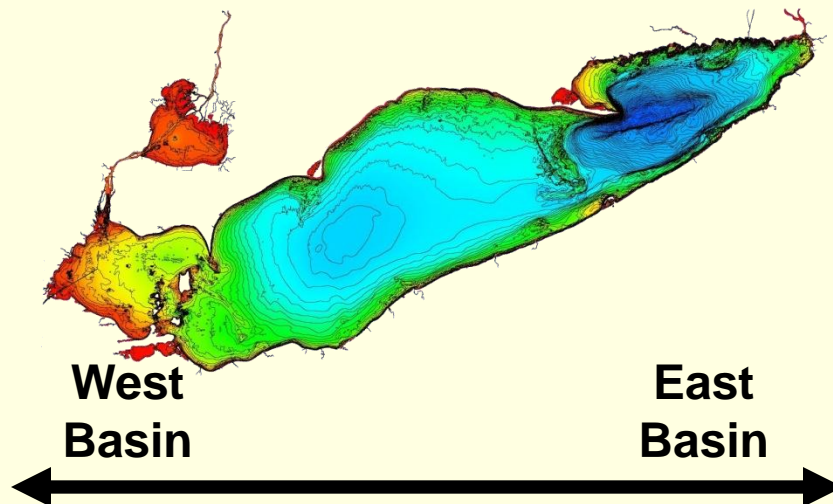
Status of the Lake Erie Fish Community 2010

Jeff Tyson, Ohio Division of Wildlife

Status of the Lake Erie Fish Community 2010

Physical Environment/Fish Community

- West to east gradient in depth, temperature, and productivity
- West to east gradient in fish community
 - Warm and cool water species dominant in west basin
 - Cool and cold water species dominant in east basin
 - West to east gradient in diversity



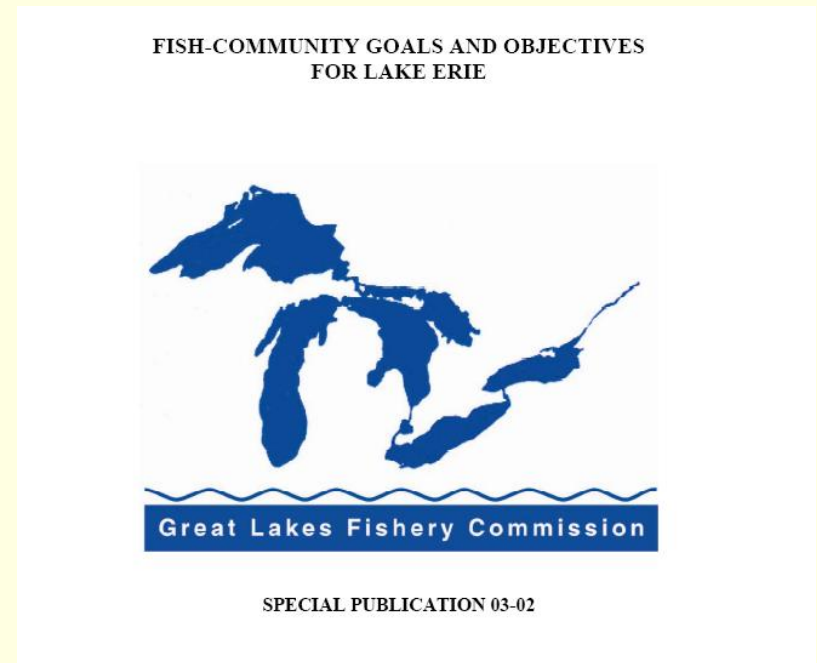


Status of the Lake Erie Fish Community, 2010

Fish Community Goals

- West/Central Basin
 - “secure a balanced, predominately cool-water fish community with walleye as a key predator...”

- East Basin
 - “secure a predominantly cold-water fish community with lake trout and burbot as key predators”



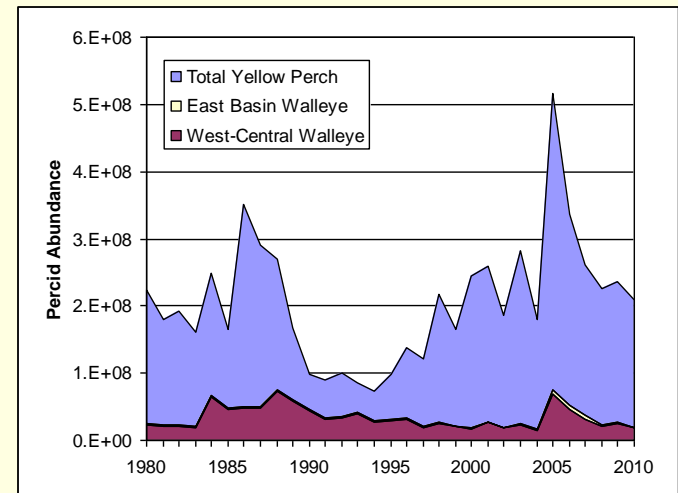


Status of the Lake Erie Fish Community 2010

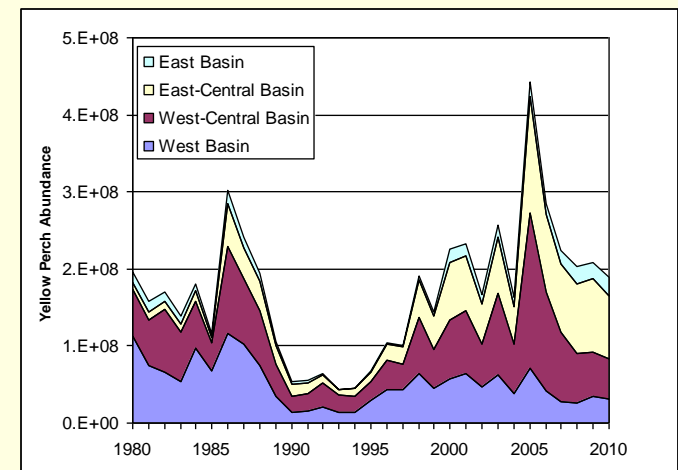
Predator Trends (West)



- Percid abundance similar to 80's
- Noticeable 2003 hatch for all percids
- Abundance dominated by yellow perch
- Eastern basin walleye population remains relatively small
- Shift in yellow perch productivity



Yellow Perch



Great Lakes Fishery Commission

Lake Erie Committee

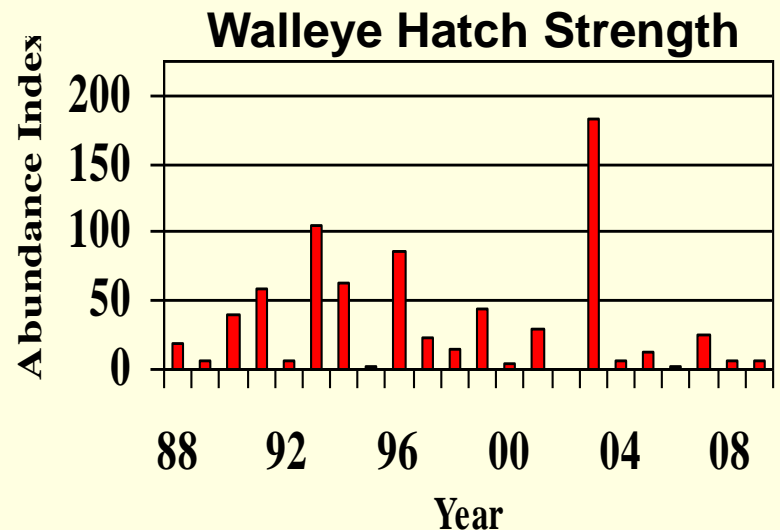
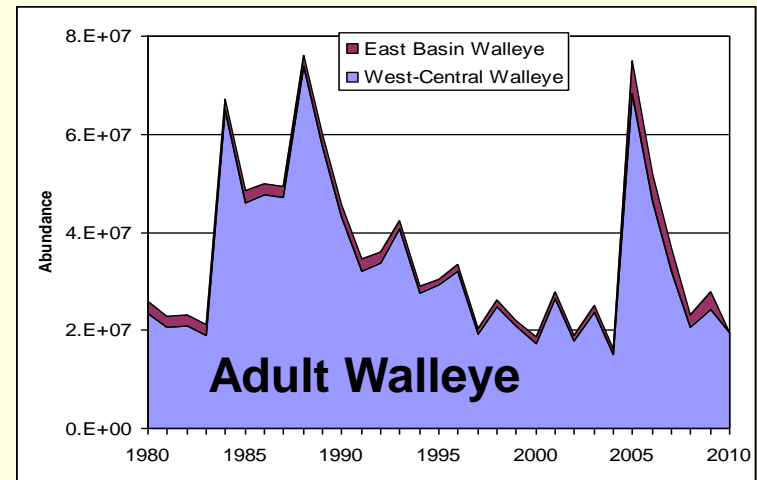


Status of the Lake Erie Fish Community 2010

Predator Trends (West)



- Walleye abundance has declined
- Highly variable recruitment
- Large 2003 year-class
- Moderate to poor hatches since
- Changes in distribution
- Growth stable



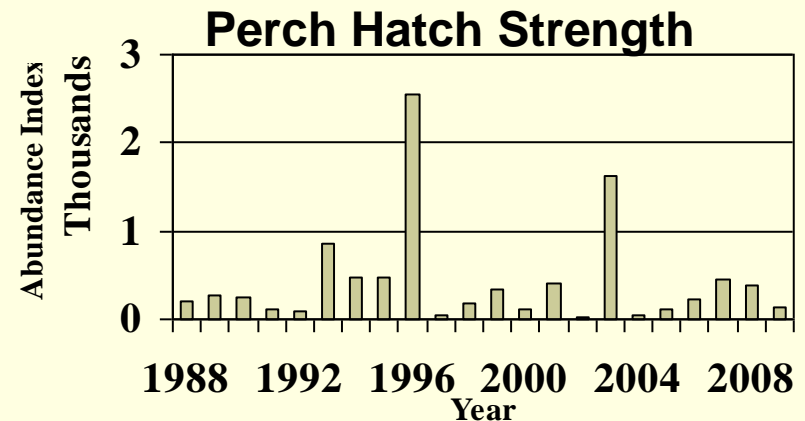
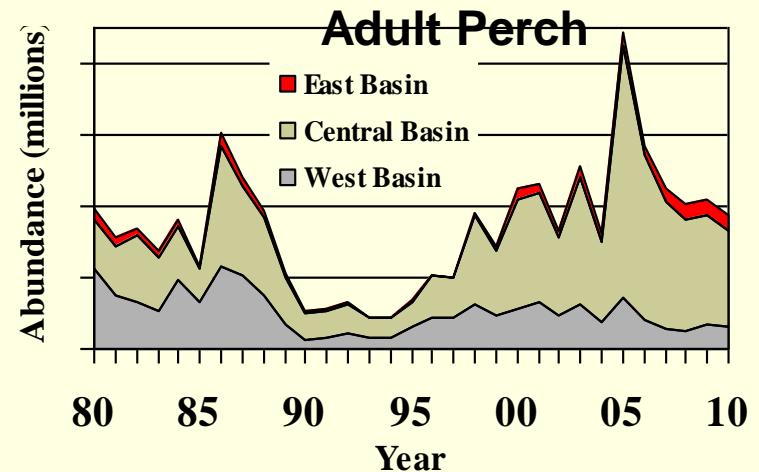


Status of the Lake Erie Fish Community 2010

Predator Trends (West)



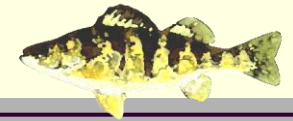
- Yellow perch abundance has decreased, but remains relatively high
- Year-class strength highly variable, but more stable than walleye
- Large 1996 and 2003 year-classes
- Increased growth (due to increased benthos)



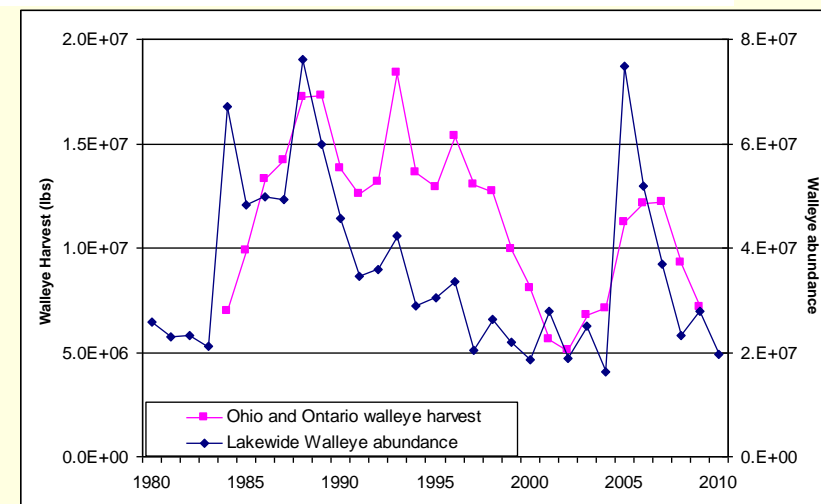
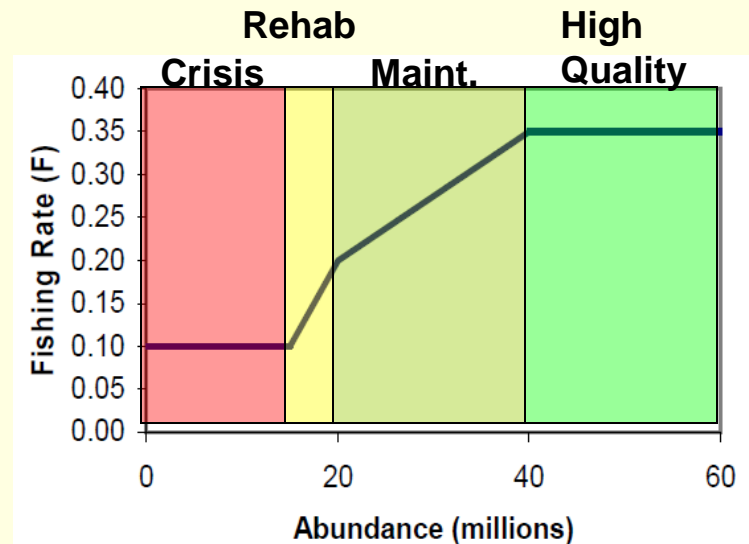


Status of the Lake Erie Fish Community 2010

Management (*Percids*)



- Walleye and yellow perch Management Plans
- Harvest strategy
- Rehabilitation mode (when populations in “crisis or rehab modes”)



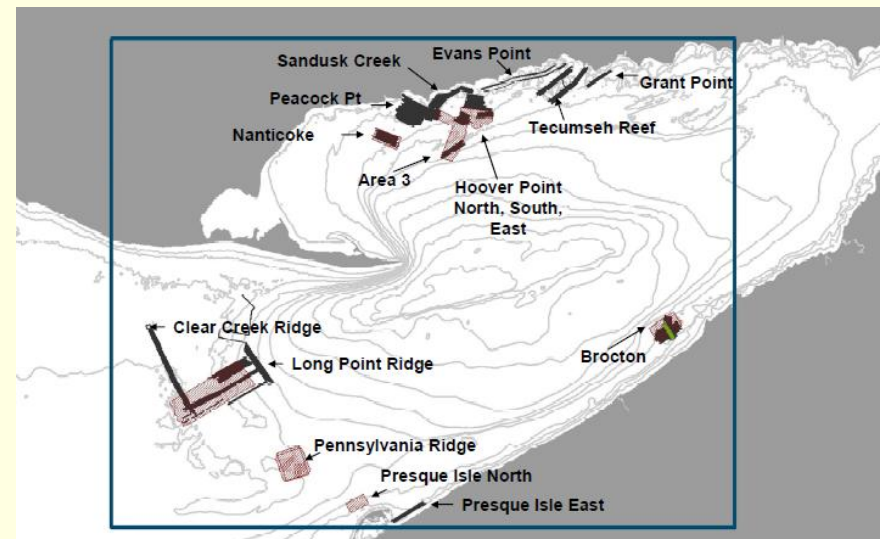
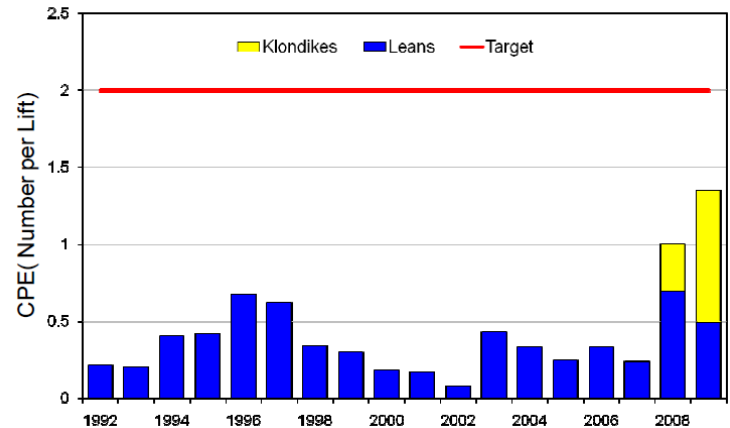


Status of the Lake Erie Fish Community 2010

Predator Trends (East)



- Adult lake trout abundance up since 1985
- No natural reproduction
- High growth rates
- Exploring additional strains
- Explore habitat/stocking locations

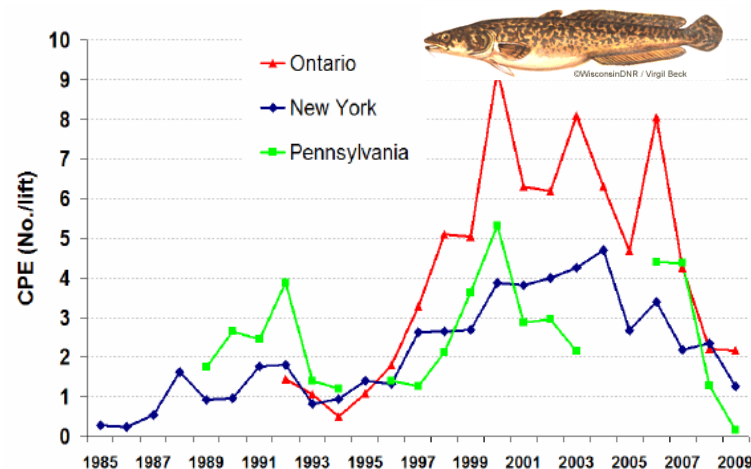


Status of the Lake Erie Fish Community 2010

Predator Trends (East)

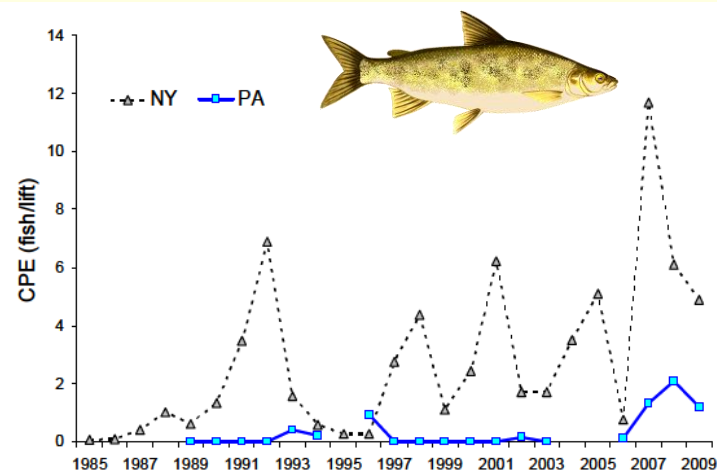
■ Burbot

- Decreasing basinwide – coincides with round goby expansion
- More abundant on north side of basin



■ Whitefish

- Relatively high abundance (2003 hatch)
- Declining condition (primarily males)

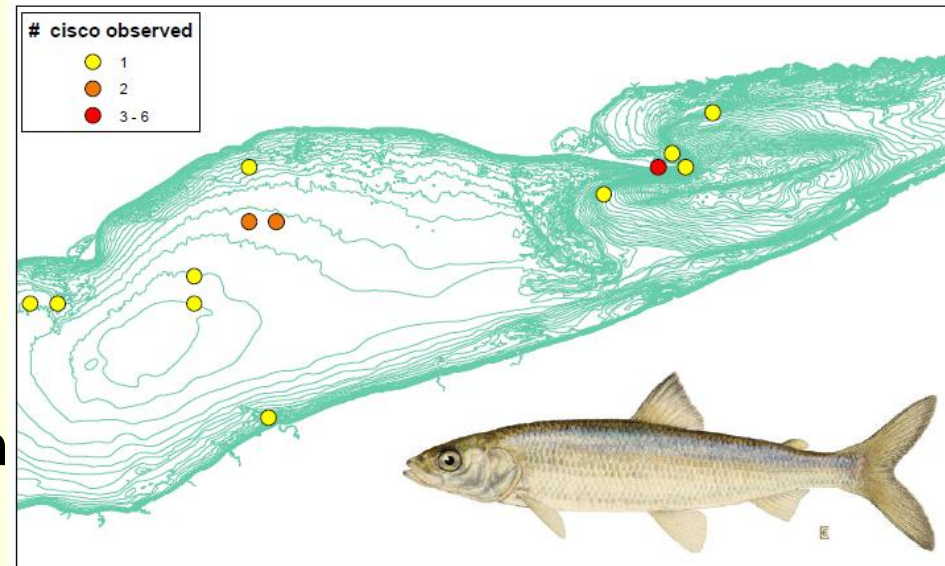


Status of the Lake Erie Fish Community 2010

Predator Trends (East)

■ Lake Herring

- Present in low abundance
- Exploring rehabilitation options



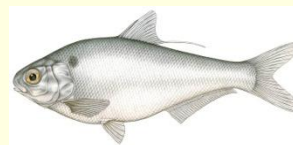
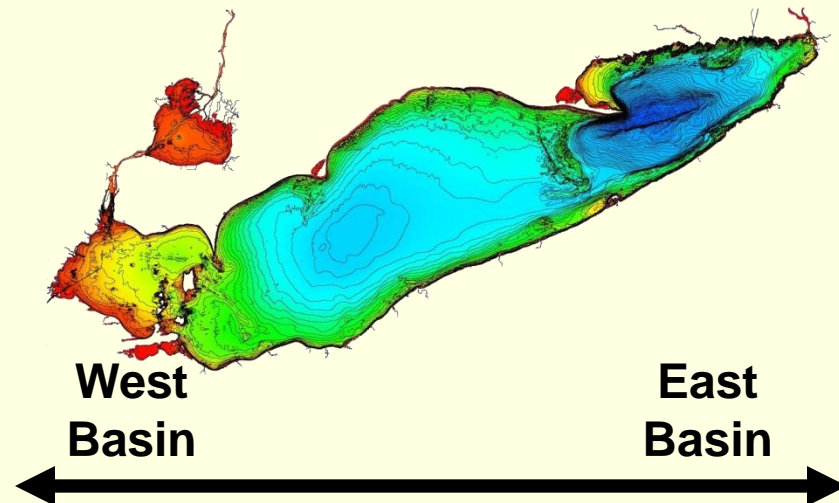
- Lake Herring Management Plan in development



Status of the Lake Erie Fish Community 2010

Prey Trends

- Gradient in prey fish community west to east
 - Higher diversity west
 - Lower diversity east
- Clupeids, shiners dominate in west
- Rainbow smelt dominate in east
- Gobies incorporated into diets



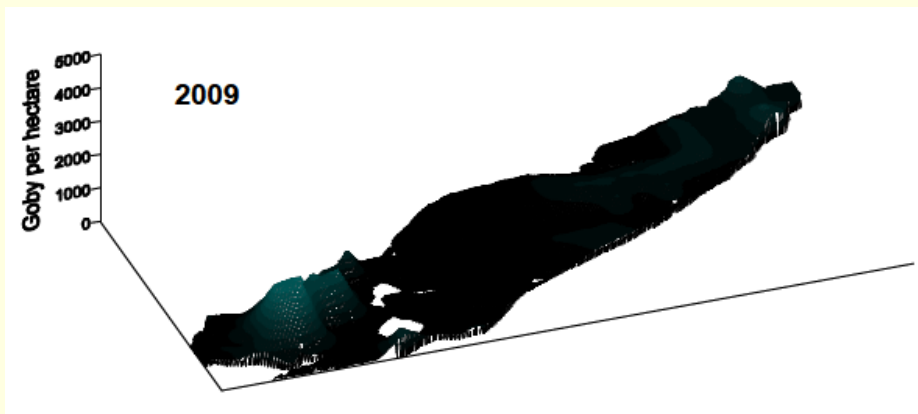
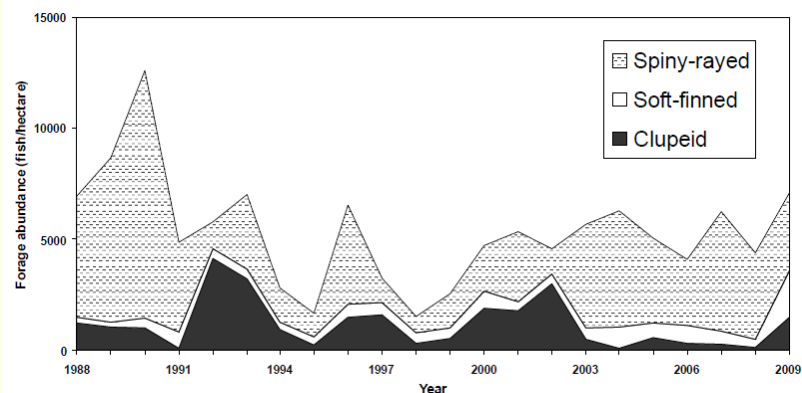


Status of the Lake Erie Fish Community 2010

Prey Trends

- West
 - Fewer clupeids
 - Increasing shiner abundance
- East
 - Unstable smelt
 - Goby expansion
 - Higher diversity than in past

West Basin Forage



Great Lakes Fishery Commission

Lake Erie Committee

Status of the Lake Erie Fish Community 2010

Research Needs

- Hydrodynamic models
 - Linking tributaries to open lake
 - Linkages between fish life stages
 - Changes in land use
 - Climate change

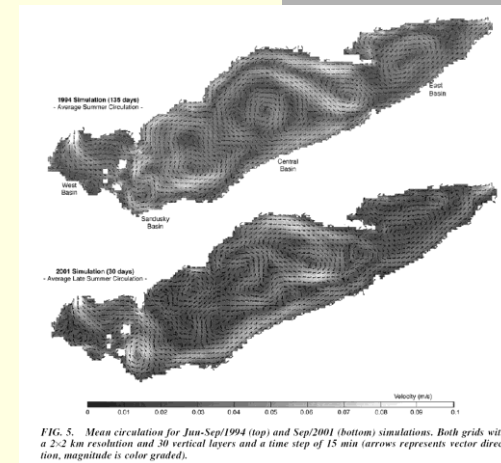
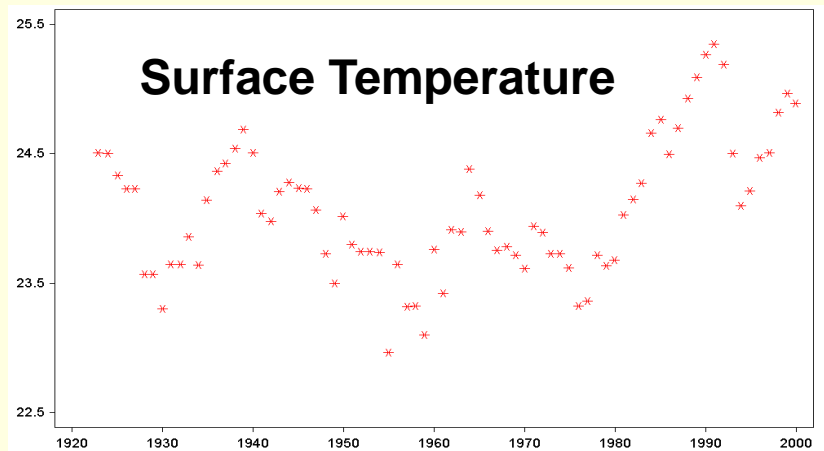
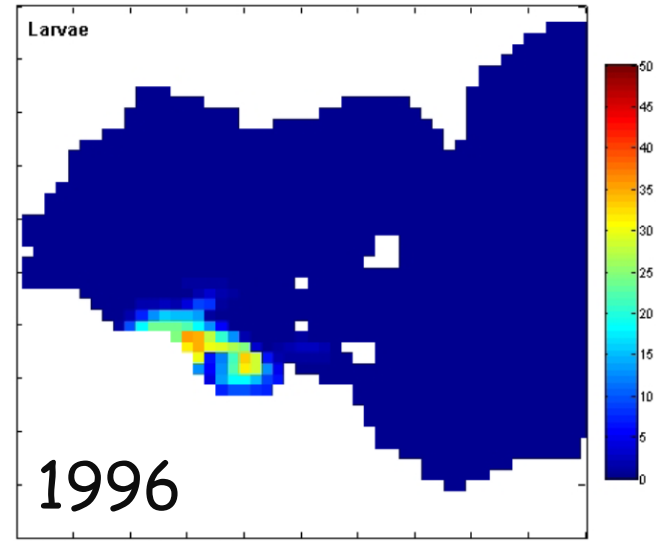
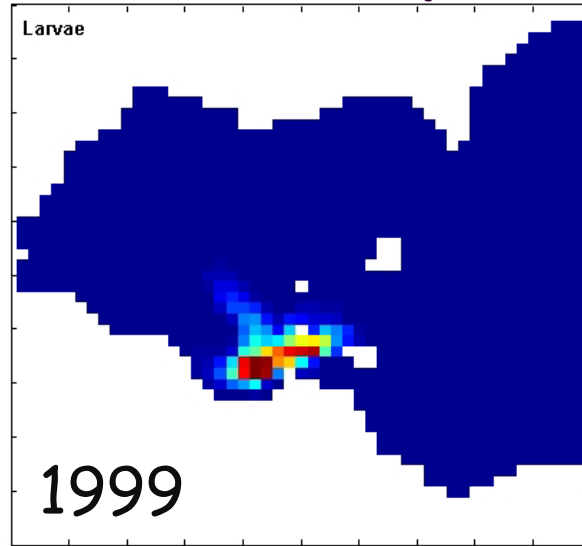


FIG. 5. Mean circulation for Jun-Sep/1994 (top) and Sep/2001 (bottom) simulations. Both grids with a 2x2 km resolution and 30 vertical layers and a time step of 15 min (arrows represents vector direction, magnitude is color graded).

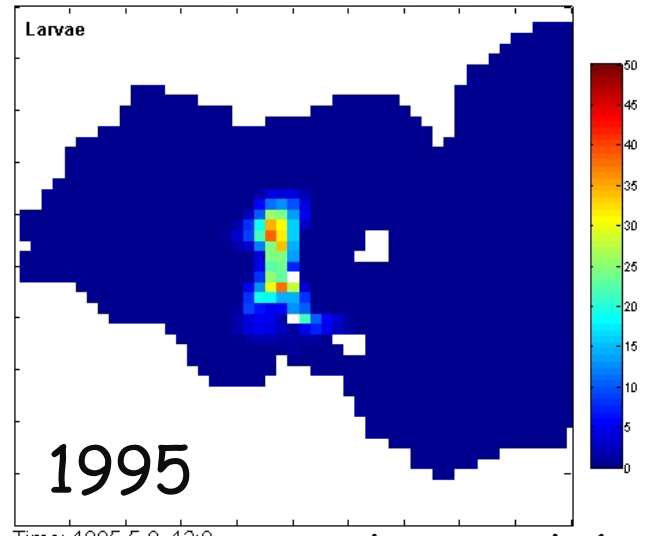
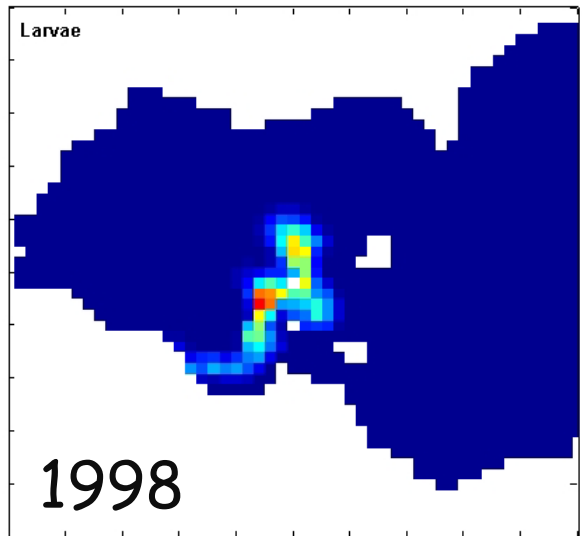


A Biophysical Model of Lake Erie Walleye Recruitment

Strong
(nearshore)



Weak
(offshore)





Status of the Lake Erie Fish Community 2010

Research Needs

- Hydrodynamic models
- Water Quality/Trophic Interactions
 - Increasing SRP, blue-green algae, exotics
 - Changing trophic pathways (round goby)
 - Changes in fish distribution
 - Exotics

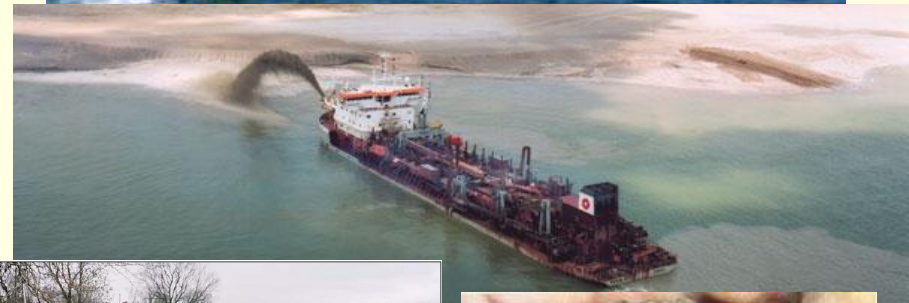




Status of the Lake Erie Fish Community 2010

Research Needs

- Hydrodynamic models
- Water Quality/Trophic Interactions
- Habitat Alterations
 - How to minimize negative impacts
 - Potential enhancements





Acknowledgements

- Lake Erie Committee
 - Walleye, Yellow Perch, Forage, and Coldwater Task Groups

- Great Lakes Fishery Commission

- Staff of ODNR, MDNR, OMNR, PFBC, and NYS DEC

