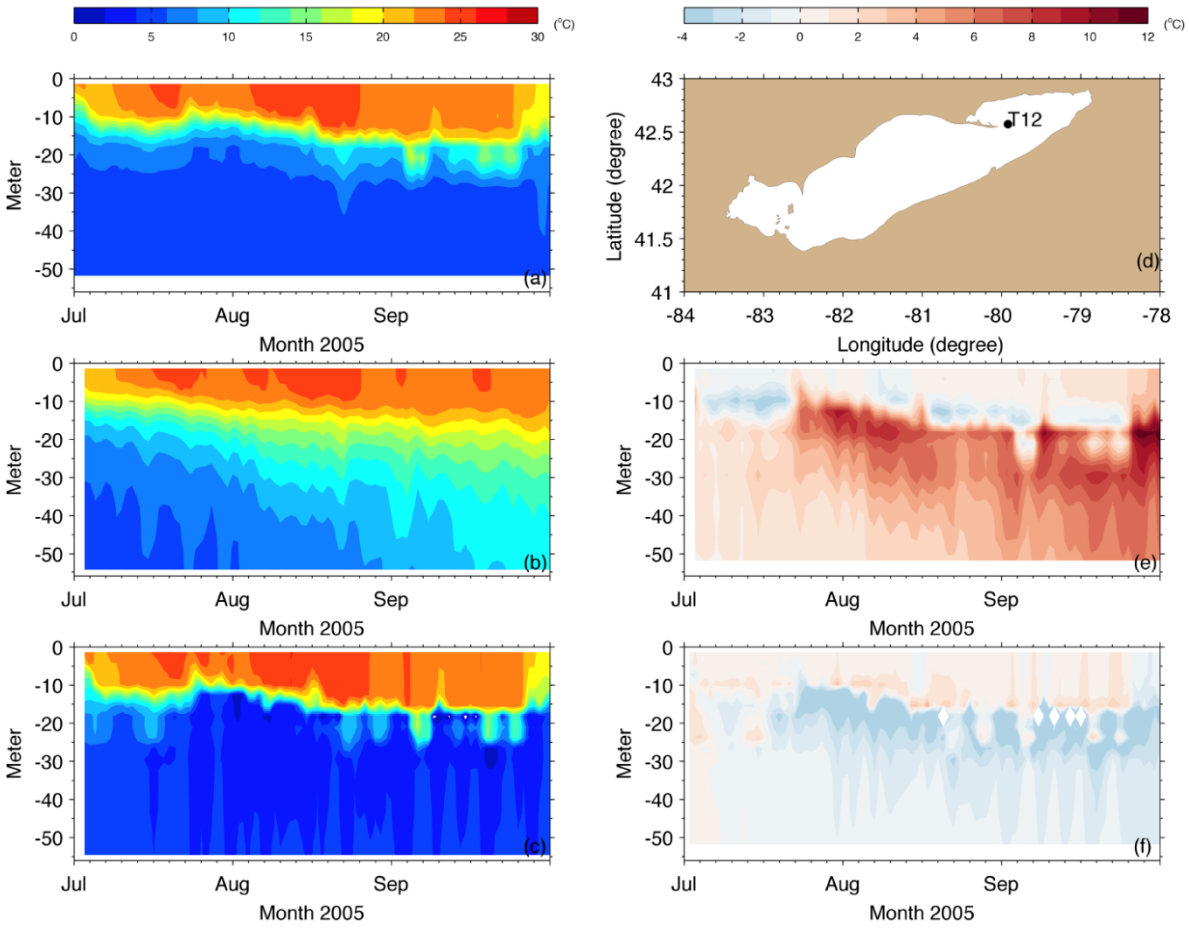
NOAA GLRI Webinar - Project Fact Sheet

Project Title	Long-term data assimilative, temperature and currents database for Lake Erie and Lake Michigan
Project Lead	PI: Philip Chu, NOAA/GLERL Co-PI: Eric Anderson, NOAA/GLERL
Funding amount ($) and years funded	FY18: $250K FY19: $250K
External partners, collaborators or sub-awardees	Pengfei Xue, Xinyu Ye, Chenfu Huang, Michigan Technological University (MTU)
GLRI Focus Area	FA 5: Foundations for Future Restoration Actions
GLRI Action Plan Primary Measure	Objective: 5.2 - Conduct comprehensive science programs and projects
	Measure(s) of Progress: 5.2.1 - Annual Great Lakes monitoring conducted and used to prioritize GLRI funding decisions
Brief project description	Project objective is to create a long-term temperature and currents database of Lake Erie and Lake Michigan by assimilating data collected from SOAR network, moorings and gliders into Great Lakes forecast model. The combined data-model approach offers the most accurate three-dimensional temperature and currents reanalysis and simulations to support GLRI management and restoration efforts in the Great Lakes region. Once completed, this long-term, data-assimilative reanalysis will allow decision makers and coastal managers to evaluate various planning and restoration scenarios due to climate change. Existing data management tools used as part of the GLRI adaptive management process provide access to limited monitoring locations, with very few instruments measuring the physical conditions of the lakes (*e.g.* temperature, currents, waves, wind, etc.), thus making it difficult to develop and validate decision support tools. This project will enhance these data sets by assimilating field data collected from the SOAR project, Coastal Hypoxia Research Project (CHRP), and other measurements blending with high-resolution, three-dimensional hydrodynamic model to generate long-term temperature reanalysis of Lake Erie and Lake Michigan. This unique dataset will enable decision makers, coastal managers and ecosystem/ecological modelers to plan and evaluate restoration efforts for the Great Lakes at a much longer time horizon, providing the necessary baseline physical information from which to inform historical assessments and scenario projections.

	Project Milestones Q1: Evaluate field data inventory, Process data sets for model implementation Q2: Prepare model forcing files and data, Conduct baseline reanalysis without data assimilation Q3: Conduct data-assimilated hindcast reanalysis, Prepare statistical analysis of model output Q4: Create metadata and publish reanalysis data on public database **Project Deliverables** The project deliverable will be a long-term, comprehensive data assimilative database of the lake temperature and current velocities that follows NOAA's Environmental Data Management Directive in a standard format, and share with EPA, USGS, other federal agencies and stakeholders. Results will be published in Journal articles and presented at conferences.



Improved vertical thermal structure by assimilative mooring data into forecast model.

(a) mooring data, (b) control run, (c) data-assimilative run, (d) mooring location
(e) model bias from control run, and (f) model bias from data assimilative run