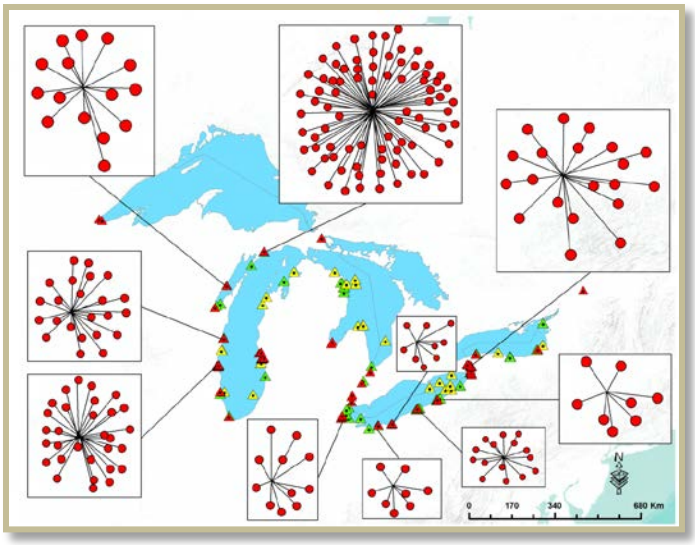
NOAA GLRI Webinar - Project Fact Sheet

Project Title	Great Lakes Mussel Watch
Project Lead	**PI:** Ed Johnson **Co-PIs, if applicable:** Kimani Kimbrough
Funding amount ($) and years funded	**2010:** $200K**; 2011:** $414K**; 2012:** $394K**; 2013:** $484K**; 2014:** $460K**; 2015:** $448K**; 2016:** $400K**; 2017:** $450K**; 2018:** $650K**; 2019:** $484K**; 2020: $**
External partners, collaborators and/or sub-awardees	**Federal**: USGS, EPA/ORD, FWS, USACE, NOAA/OAR/GLERL **Laboratories**: AXYS, NIST, TDI Brooks
GLRI Focus Area	Focus Area 1: Toxic Substances and Areas of Concern
GLRI Action Plan Primary Measure	**Objective:** 1.3. Increase knowledge about (1) "Chemicals of Mutual Concern" identified pursuant to the Great Lakes Water Quality Agreement's Annex 3; and (2) other priority chemicals that have negatively impacted, or have the potential to negatively impact, the ecological or public health of the Great Lakes.
	Measure(s) of Progress: 1.3.1. Discrete chemical monitoring and assessment activities conducted.
Brief project description	Mussel Watch Program (MWP) began monitoring nationally in 1986, the Great Lakes in 1992 and amassed one of the most comprehensive chemical contaminant databases for biota, sediment, and passive water samplers including legacy, emerging and Chemicals of Mutual Concern. We utilize invasive mussels (dreissenids) and fish (gobies) to inform on contaminant levels across the basin (exception Superior). Our uniqueness is the ability to provide contaminant information at varying spatial and temporal scales and with a national context. Unlike fish and birds, mussels are sessile and precisely reflect environmental conditions from their collection site. They readily tolerate caging and relocation, which allows us to assess outfalls or other suspected hotspots. MWP data can inform on remediation and restoration effectiveness, and contaminant transport from rivers and land-based sources of pollution to lake nearshore and offshore zones. For example, our comprehensive spatial/temporal data of PAH fingerprints in mussels from rivers to open lake zones are useful l to assess oil spill and potentially climate change impacts. More recently, our database has grown exponentially with mussel metabolome data from sites across the basin to inform on adverse biological effects and basic mussel biology/ecology.



Mussel Watch has expanded to over 200 sites basin-wide:

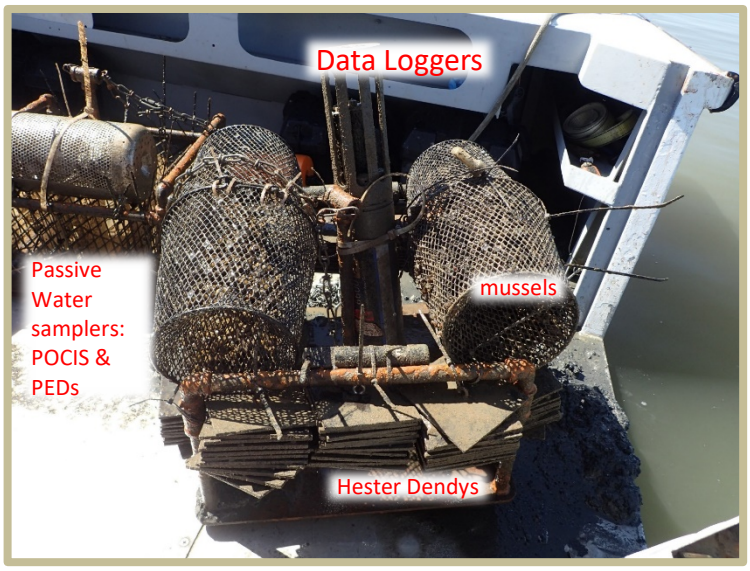
Red circles = river-harbors

Green squares = nearshore lake

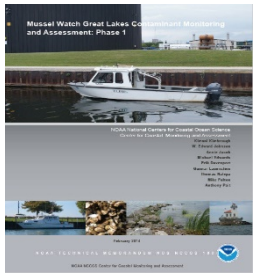
Yellow triangles = offshore open lake

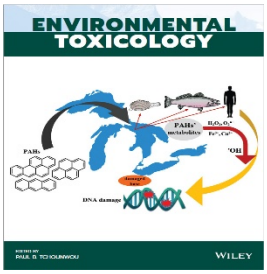
Mussel Watch is part of the Invasive Mussels Collaborative.

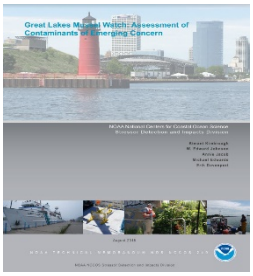
Dreissenid mussels tolerate caging quite well and can be relocated to high interest areas like outfalls. The use of moorings allows co-location of other metrics such as passive samplers (POCIS/PEDs) and Hester Dendys (substrate for colonization by benthic infauna).



Selected publications:







Publications in preparation:

- Basin wide assessment of PAHs;
- Maumee River contaminant assessment;
- Mussel metabolomics: basin wide site comparisons;
- Mussel metabolomics: temporal comparisons;
- Milwaukee Estuary assessments;
- Cellular biomarkers in contaminants exposed mussels;
- Microplastics in dreissenid mussels.