Dr. George Bullerjahn, Professor in the Department of Biological Sciences at the Bowling Green State University is nearing completion of an Ohio Water Resources Center funded project via a joint USGS 104(b) and OWDA subaward. His project entitled "**Source Tracking of *Microcystis* Blooms in Lake Erie and its Tributaries"** is focused on identification of the geographic sources of toxic, bloom-forming cyanobacteria in Lake Erie. The results can affect the lake management, as bloom events that occur in Lake Erie may rely on intervention strategies implemented upstream.

The funded work is targeting cyanobacteria sampling at Sandusky Bay, the Maumee River and Lake St. Clair, comparing the bloom-forming genera at each site using high-throughput DNA sequencing of diagnostic target genes. The results from the first year of sampling indicated that all toxic *Microcystis* strains found in Lake St. Clair clustered with toxic strains found in samples previously collected from Lakes Erie and Ontario, demonstrating extensive genetic connectivity between the three systems and establishing Lake St. Clair as an important immediate and historical source of toxic *Microcystis* to lakes Erie and Ontario (Figure 1). Furthermore while Lake Erie *Microcystis* genotypes are found in abundance upstream in Lake St. Clair, nearshore sites in Lake Erie (Sandusky Bay and Maumee River) are dominated by microcystin-producing *Planktothrix*.

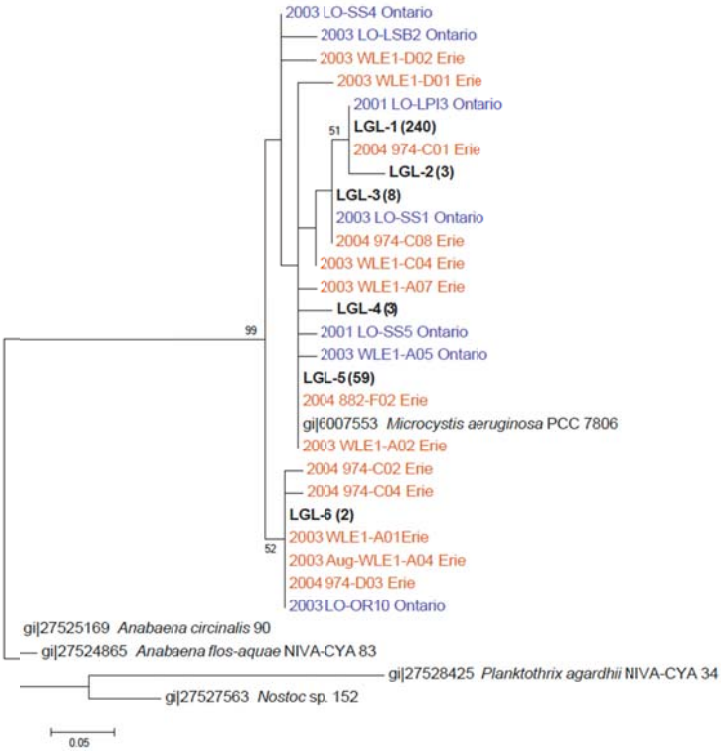

Figure 1 Sandusky Bay Marina sampling October 2014 and Phylogenetic tree of microcystin synthetase toxin *(mcyA)* gene sequences from Lake St. Clair, compared with environmental sequences from Lakes Erie and Ontario. The Lake St. Clair sequences (LGL) exist as six genotypes that are detected as abundant bloom formers downstream in Lakes Erie (orange) and Ontario (blue).

Researcher: Dr. George Bullerjahn's work is currently focused on enumeration and the physiological performance of phototrophs and ecologically important chemolithotrophs in aquatic systems. His group has identified genes and gene products inducible under nutrient (N, P) limitation and stationary phase conditions, and this work has aided in the development of whole-cell biosensors detecting the bioavailability of nutrients in environmental samples. Additionally, he examines the composition and dynamics of cyanobacterial and nitrifying communities in freshwater environments, focusing primarily on the N and P cycles in the Laurentian Great Lakes.