

Metabolism and Biogeochemical Cycling in Benthic Ecosystems of the Great Lakes

Long-term Fellow: Shelby LaBuhn (University of Wisconsin-Milwaukee)

Mentor(s): J. Val Klump (University of Wisconsin-Milwaukee), Ashley (Baldrige) Elgin (NOAA GLERL), Tom Johengen (UM CILER)

NOAA Sponsoring Office: Great Lakes Environmental Research Laboratory

Budget Amount: \$25,000

CILER Theme: Ecological Risk Assessment

NOAA Strategic Goal(s):

Goal 1 - Healthy Oceans

Goal 3 - Climate Adaptation and Mitigation

Overview and Objectives:

Our objective was to provide a set of novel measurements of benthic metabolism in critical Great Lakes environments to help understand the role of the benthic system on oxygen balance, nutrient cycling and carbon remineralization within the hypolimnion.

This project advances understanding of a complex ecosystem process (benthic metabolism) and allows for comparison between different Great Lakes environments. Creating comparisons for this process at the current time will serve as an indicator for climate change impacts on coastal and open water environments. This project also facilitated mentoring and training of a PhD student (Ms. Shelby LaBuhn), who hopes to work in the Great Lakes basin.

Accomplishments:

Ms. LaBuhn participated in a research cruise of nearshore Lake Michigan with Dr. Ashley (Baldrige) Elgin. Due to site difficulty on the eastern shore the experiments were not performed, but nearshore Lake Michigan experiments will be performed the week of July 11th 2016 on the western side of Lake Michigan.

A 2-week visit to GLERL from July 25-August 5 2016 is being planned to facilitate more research and in-lab experiments between Ms. Shelby LaBuhn and Drs. Ashley Elgin and Tom Johengen. The goals are to perform benthic metabolism experiments in both the western and central basins of Lake Erie.

Publications:

LaBuhn, S., Weckerly, K., Anderson, P. and Klump, J.V. *In prep.* Benthic respiration and hypoxia in Green Bay, Lake Michigan

Presentations:

Klump, J.V., K. Fermanich, H.Bravo, S. Hamidi, S. LaBuhn. 2015. Hypoxia in Green Bay, Lake Michigan. CERF annual conference. Portland OR. Special session on the Harmful Algal

Bloom and Hypoxia Research and Control Act: accomplishments and remaining challenges” (invited).

Klump, J.V., Bravo, H.R., LaBuhn, S.L., Hamidi, S.A., Fermanich, K., Baumgart, P. and Verhamme, E.M. 2016. What will it take to restore Green Bay? International Association for Great Lakes Research annual conference. Guelph, Ontario.

LaBuhn, S.L., Wilcox, E.M., Valenta, T., Qualls, T., Klump, J.V. and Kennedy, J. 2016. Estimating summertime primary production via in-situ monitoring in Green Bay, Lake Michigan. International Association for Great Lakes Research annual conference. Guelph, Ontario.

Outreach Activities:

S. LaBuhn will be participating in a 6-day cruise aboard the *Dennis Sullivan* in coordination with Wisconsin and Minnesota Sea Grants. The focus of the cruise is to help educate Wisconsin and Minnesota teachers about Great Lakes issues and research. LaBuhn will be providing research demos and giving a presentation about the research supported by CILER, as well as other topics.

