NEW Water Partnering on a Study of Cyanobacteria (Blue-Green Algae) in the Bay

Joint Study with Wisconsin Department of Natural Resources and

the University of Wisconsin-Milwaukee Zilber School of Public Health

Focuses on Toxins near Bay Beach

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NEW Water, the brand of the Green Bay Metropolitan Sewerage District, is currently collaborating with partners in a study entitled "Assessing Cyanobacterial Harmful Algal Blooms (CHABs) in Lower Green Bay". This joint study is monitoring cyanobacteria, commonly known as blue-green algae, and assessing the spatial abundance and the long-term presence of cyanobacterial toxins, including along the shoreline at Bay Beach.

Cyanobacteria have existed for millennia, and thrive in warmer temperatures, even in the absence of nutrients, such as phosphorus.

The three-year study, being conducted with the Wisconsin Department of Natural Resources and the University of Wisconsin-Milwaukee Zilber School of Public Health (UWM), is currently in the scientific data collection phase. Results will be shared upon study completion in 2019.

Photo credit: Steve Seilo / Photodynamix

Above: a plume of runoff from the Fox River empties into the bay, delivering pollutants and toxins. This occurs each spring, after snow melts

Harnessing the expertise of water scientists from all partners, the study has been collecting samples from the Bay of Green Bay (hereafter, "the bay"), since 2016. Cyanobacteria are known to produce toxins (cyanotoxins) which can be harmful to humans and animals from ingestion or skin contact.

Early results do confirm that these toxins are appearing in the bay.

Cyanotoxins pose the greatest risk to children and dogs, with reports of deaths and severe illnesses becoming more commonplace. See Wisconsin Department of Public Health, "Health Concerns Related to Blue-Green Algae" (https://www.dhs.wisconsin.gov/water/bg-algae/healthconcerns.htm). Children and dogs specifically tend to ingest waters when at a beach.

Photo credit: NEW Water's Aquatic Monitoring Program

Above: On September 13, 2017, water sampling off Bay Beach confirmed presence of cyanotoxins at concentrations more than 1,000 % above safe recreational limits; and 4,000 % above safe limits for drinking. Children and dogs tend to ingest water at beaches.

An example of a risk associated with cyanotoxins was observed on September 13, 2017, when a "scum" sample (a scraping of the thick cyanobacteria from the surface) was collected and tested by Dr. Todd Miller's lab UWM, and results showed a presence of 4,000 micrograms per liter of cyanotoxins, which is above the Environmental Protection Agency draft recreational guideline value of 4 micrograms per liter, and the World Health Organization drinking water guideline, which is 1.

Blooms and toxins come and go on a rapid basis, and are highly variable over space and time. Cyanobacteria are present throughout the bay, and the blooms and toxins tend to be more concentrated in shallow waters or closer to the shoreline. The shallow water encourages water stagnation, particularly in warmer summer temperatures, providing ideal conditions for cyanobacteria to fluorish.

The Fox River serves as a delivery mechanism for pollutants as it flows into the bay. In the accompanying aerial photo, a large brown plume from the Fox River delivers excess phosphorus, sediment, and pollutants. This phenomenon occurs annually, each spring after the snows melt. (View a video of runoff occurring here https://www.youtube.com/watch?v=pEilCFpEo4U.)

NEW Water is participating in the study through its Aquatic Monitoring Program, which has been sampling area waters since 1986. The program has collected over 12,000 water quality samples from the bay, the East River, Fox River, and is now beginning work in the surrounding watershed. These data are currently aiding NEW Water's efforts to achieve permit compliance through collaborative watershed quality improvement efforts (read more about the Aquatic Monitoring Program at http://newwater.us/programs-initiatives/aquatic-monitoring-program/).

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