Thank you for hosting the first of two meetings as it pertains to the Public act 12-155.

I have a few comments from today's meeting:

- MS4 re-write should include ALL municipalities. Currently only urban areas (population criteria) are mandated to comply regardless of impaired watersheds.
- Will CT-DEEP consider initiating a phosphorus reduction credit program modeled after the successful Nitrogen reduction program that will help "encourage" compliance? Without any $$ incentive we feel it is unlikely some municipalities will comply.
- When will the CT-DEEP complete the numeric criteria the watershed quality assessment?
- Very much agree with the "internal loading" component of phosphorus within lakes must be calculated as part of the model formula.
- In general pleased with programs and progress to date, however, much, much more needs to be done. Despite many of these programs we have eutrophic conditions.
- CT-DEEP and DPH must offer guidelines on cyanobacteria levels. FOTL did install a probe on our buoy this year as we have recorded some very high reading in late season blooms in past years. The public should be warned when concentrations get too high. Several New England states have recognized this as a health hazard and have set limits for public awareness. We need this done in CT.

Thank you for the opportunity to comment.

Greg Bollard, Executive board, Friends of the Lake, Lake Lillinonah

FOTL has documented a few cyanotoxin levels in surface scum algae a couple of years ago. We will increase our monitoring efforts by joining the GLEON research and thought CT-DEEP might express an interest in this study. We have also added a probe to our buoy, however this is attached and is 1 meter down in the "river" section so I think it may not be stationed in the best location for cyanotoxin detection?

I also think we need to increase our surface grabs and increase our dominant algae species recording. Let me know if you have any other suggestions for monitoring.

While this doesn't exactly pertain to PA12-155, I felt we should keep it included as many still do not seem to associate any health risk with excessive nutrient loading.

thanks
Greg

Gregory L Bollard
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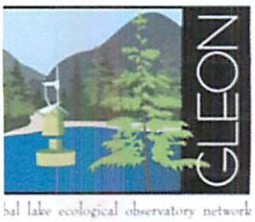
FYI
Friends of the Lake will incorporate and participate in this project for Lake Lillinonah.
Thanks
Greg



Invitation to Contribute to the Microbes- Cyanotoxins Project

Many eutrophic lakes experience frequent accumulations of both toxic and non-toxic cyanobacteria. While these organisms play a crucial role in many lake processes including nitrogen/carbon fixation, and nutrient cycling, their decaying biomass contributes to bottom water anoxia/hypoxia and produces noxious odors. In addition, some cyanobacteria produce hepatotoxins (e.g. microcystins, cylindrospermopsin) and neurotoxins (e.g. anatoxins and saxitoxins) that are harmful to aquatic biota, humans, and other animals (e.g. dogs and cattle). Decades of research on model cultures and in lake ecosystems suggests that warm water temperatures, a stable water column, low N:P ratios, and high pH among other variables favors cyanobacterial growth. In addition, toxin production has been linked to growth rate and nitrogen availability in cultures and in some lake studies. However, there are few examples of studies that compare toxin concentrations across lakes distributed globally.

We seek to identify drivers of cyanobacterial toxin production in lakes on a global scale. We invite GLEON members interested in cyanobacteria and cyanotoxin production in their lakes to submit samples to the Miller Laboratory at the University of Wisconsin – Milwaukee for cyanotoxin analysis. Data will be returned to contributors for their own use and collectively used by the "Microbes-Cyanotoxin Project" team (which you are welcome to join!) to test a range of specific hypotheses about the scales of variability in cyanotoxin production. Below we provide requirements for sampling, sample handling/shipping, and the types of contextual/metadata requested.

Members and/or Contributors:
Chris Barry (Agri-Food & Biosciences Institute, UK Northern Ireland)
Cayelan Cary (University of Wisconsin – Madison, Madison, WI, USA)
John Hernandez (University of Wisconsin – Milwaukee, Milwaukee, WI, USA)
Jen Klug (Fairfield University, Fairfield, CT, USA)
Todd Miller (University of Wisconsin – Milwaukee, Milwaukee, WI, USA)
Robyn Smith (Bard Center for Environmental Policy, Annandale-on-Hudson, NY, USA)
Chelsea Weirich (University of Wisconsin – Milwaukee, Milwaukee, WI, USA)
Others?

Overarching question: *What are the correlates of cyanobacterial toxin production in lakes?*

Toxins targeted will be:

- Microcystins (LR, YR, RR, LA)
- (Homo)Anatoxin-a
- (Homo)Anatoxin-a(s)
- Cylindrospermopsin
- Saxitoxin
- β-methylamino-L-alanine

Specific Hypotheses:

A. Temporal Analyses (samples should be collected weekly)
   a. Cyanotoxin concentration is related to cyanobacterial growth rate when nitrogen is not limiting – possibility to explore further through GLM-FABM modeling.
   b. Lake stability promotes toxin production.

B. Spatial (samples should be collected monthly)
   a. Land use surrounding lakes is related to magnitude of toxin concentration (agriculture vs. urban/suburban vs. forested).
   b. Lakes with zebra mussels have higher toxin concentrations.
   c. Magnitude of toxin concentration across lakes is related to "lake index" where lake index is defined as a cluster analysis of a subset of lake characteristics: mixing rate, TP, TN, GPP, DO, temperature, physical metrics (lake analyzer), etc.

Sampling Requirements.

A. Depth: In order to ensure uniformity across sites a simple surface (grab sample) is necessary from all sites. Depth- specific samples can be accepted and will be useful, but only if a surface sample is also included.

B. Sampling Bottle: Clean glass or plastic bottle washed/shaken three times with the water to be sampled.

C. Label: 2- digit lake code (TBD), date (6-digit serial, monthdayyear), and depth.

Contextual/meta-data.

A. Minimum required to test at least one hypothesis:
   a. Approximate GPS coordinates of sample location
   b. Water temperature depth profile at time of sampling

B. Additional data needed to test multiple hypotheses:
   a. Nutrient data (TP/TN) at the time/depth of sampling
   b. Weather data
   c. High resolution water temperature depth profile, DO, and wind speed
   d. Zebra mussel vs. no zebra mussels
   e. Other helpful data (phytoplankton composition, zooplankton counts)

Shipping. There are several options for sending samples for toxin analyses.
   a. Option A: Send a frozen sample (50-100 ml), overnight Fedex shipping in a styrofoam cooler, and provide tracking number. This might be mostly feasible for those located in the U.S.
   b. Option B: Send a frozen water sample (50-100 ml) shipped on dry ice, and provide a tracking number.
   c. Option C: Preserve a 50 ml water sample with 50 ml methanol or ethanol. Send at ambient temperature.
   d. Option D: Lyophilize a 50-100 ml sample and send at ambient temperature. This would provide the lowest shipping cost, but a lyophilizer (freeze drier is required. Alternatively, if there is interest in quantifying particulate and dissolved cyanotoxins then the water sample should be filtered and the filtrate and the filter lyophilized in separate vials and shipped dried at ambient temperature.

Timeline

	Work starts	Deadline
Collection/quantification cyanotoxins in archived water samples from contributors	ASAP	April 2013
Collect new samples from contributors.	Summer 2013	GLEON 15
Quantify cyanotoxins in samples from 2013	October 2013	April 2014
Analyze data*	GLEON 15	GLEON 16
Writing papers	GLEON 15	GLEON 16
Papers published	Jan. 2013	Jan. 2015

*Analysis of data or plans for analyzing data from archived samples could begin at GLEON 15. Analysis of new samples from summer 2013 will begin when data is available in early 2014.

Please contact Todd Miller if you would like to participate and/or become a contributor.

All samples should be shipped to:

Todd Miller
University of Wisconsin-Milwaukee
Lapham Hall 236
3209 N. Maryland Avenue
Milwaukee, WI, 53211 USA

Phone:443-255-0577
Email: millertr@uwm.edu