The Cyanobacteria Monitoring Collaborative
An Approach to Educating, Monitoring, and Managing Harmful Cyanobacteria Blooms

INLAND HABS DISCUSSION GROUP WEBINAR
FEBRUARY 14, 2017
Today's Talk

- Program Background
- Overview of Methods and tools
- Data
Why the Need?

- A request from states & constituents
- No clear picture at any spatial scale
- A moving target
- Lack of local knowledge
- Public Lack of knowledge on health risk
- Lack of overall data
  - Risk/vulnerability
  - Toxin associated genera
  - Management applications
heaviest 1% of all daily events from 1901 to 2012 for each region

http://nca2014.globalchange.gov/highlights/report-findings/extreme-weather
What Must it Encompass?

- Low cost
- Easy implementation
- Established baseline (standardized methods/consistency)
- New **useful** information & connectivity to existing programs
  - Educational/Informative
  - Utility for resource management applications (PWS/beach programs)
- Address ambient waters (preemptive) and bloom conditions
- Commensurate QA
BloomWatch!
CyanoScope
CyanoMonitoring
Training and Expertise
Waterbody management
Quality Assurance
Educational/Informative
COST $$
Data/Information
We work with citizen scientists, trained water professionals, and the general public to find and study cyanobacteria in waterbodies.
BloomWatch!

To determine the spatial and temporal patterns of bloom occurrence anywhere

- Bare bones
- Smartphone App
- Embedded QA
- Educational & Informative
- Crowdsourced information
- Data Visualization – public domain
BLOOMWATCH APP

CROWDSOURCING TO FIND AND REPORT POTENTIAL CYANOBACTERIA BLOOMS
Lake Conditions & Bloom Size Screen

bloomWatch!

Date: [input field]  TODAY

SELECT DATE

Town: [input field]

SELECT

State: [input field]

SELECT

Does lake/pond have public access for boating, fishing, or bathing?

Make selection

SELECT

Weather conditions:

Surface conditions:

Bloom size or extent:

General Comments:

Submit Data
bloomWatch!

Up to three photographs may be taken per site.

Photo 1: Attempt to capture the areal extent of the bloom, (lake/pond wide, along the shoreline, etc.). If additional description is necessary, enter it in the box below.

Describe Photo 1

Latitude:  
Longitude:  

Photo 2: Attempt to capture a photo from standing position to the water a distance of 10-30 feet. If additional description is necessary, enter it in the box below.

Describe Photo 2

Latitude:  
Longitude:  

Photo 3: Attempt to get a close up photo of bloom (picture of bloom material from three feet away or in a clear glass container at arm’s length). If additional description is necessary, enter it in the box below.

Describe Photo 3

Latitude:  
Longitude:  

Interested in taking a look under the microscope? Send us a picture to help us identify cyanobacteria species around the region through our sister program, cyanotrace. (Paste to browser - http://cyanos.org/cyanoscope)
Pressing **Submit Data** will send data directly to CitSci.org, and will also open an email to send data to your state and regional cyanobacteria experts.
bloomWatch

47 members  11 observations  11 locations  139 measurements

Manager: Jasper Hobbs
Description: Help track cyanobacteria blooms using your smartphone!

Are you seeing a normally-clear lake that has suddenly turned the color of pea soup or a blue-green paint spill? It may be a bloom of cyanobacteria, which has the potential to produce toxins that affect humans, pets, and our ecosystems.

State and local officials can't be watching every lake at all times. With you and your smartphone helping us out, we want to improve our ability to understand where, how, and when these blooms are appearing and are causing issues.

Submit data for bloomWatch using our app, which connects directly to this CitSci.org webpage! Download the app from our project website: http://cyanos.org/bloomwatch#Project-Overview.
CyanoScope

Established to determine the occurrence and distribution of cyanobacteria genus/species (mapping of potentially toxin producing waterbodies)
**GOAL:** Tracking of cyanobacteria concentrations within waterbodies in combination with efforts to forecast bloom occurrences, determine risk, and assess waterbody/human health vulnerability to toxic cyanobacteria.

- Consistent methods/QA
- Consistent tools (Cyano Kit)
- Temporal component
- Centralized Data Control
- Data Visualization tools
Baseline Sampling Design

**On-Shore and/or On-Lake**

- BOH/Beach Programs, Lake associations, state WQ folks
- 1 meter IT sample & net tow
- 3 meter IT sample & net tow
- Cyanamonitoring Kit
- JUN-SEP minimum
- Sample every other week
- 1 fixed site per waterbody minimum

Designed to complement currently existing programs
Handheld 2-Channel Fluorometer

- Chlorophyll
  - .25 - 2,500 ppb
- Phycocyanin
  - 10 - 100,000 ppb
- Other 2-chnl handheds available
- $1,500 - $2,500
- Stnds approx. $200 each
- Rhodamine solid state standards (2 year shelf)
Meter Madness!
PC/Chla Ratio precedes Secchi Disk depth and is most sensitive metric.
http://cfb.unh.edu/CyanoKey/indexCyanoQuickGuide.html

http://listserv.uri.edu/cgi-bin/wa?SUBED1=CYANO_COLLAB

Snook.Hilary@epa.gov
617-918-8670
Additional Slides
Cyanoscope Kit
cyanoScope uses modern technologies and social media platforms to learn more about the occurrences and timing of cyanobacteria in our waters

**Goals:**

• *Public Outreach*: Increase awareness about cyanobacteria

• *Crowdsourcing Identification*: Use social media to identify the cyanobacteria in lakes, ponds, and other surface water bodies

• *Scientific*: Map the spatial distribution and seasonal occurrence of potentially toxin producing cyanobacteria
A smartphone app-based project to determine the spatial and temporal patterns of bloom occurrences

http://cyanos.org/bloomwatch

**Users:** General public, trained citizen scientists, water quality professionals

**Goal:** Engage public (increase awareness about cyanobacteria), collect basic surveillance bloom data

**Data Collected:** Macro-level photo(s), geolocation, contact information, qualitative questions, notes

**Considerations:** Distribution, simplicity, responding to submissions (state capacity to respond), photo storage