December, 2016
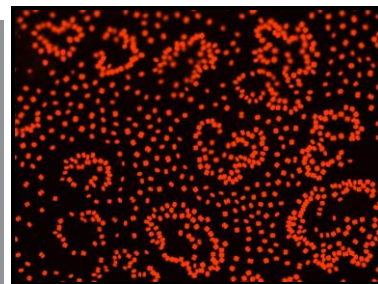
Freshwater HABs News

Microcystis aeruginosa
Fluorescent microscope image with green light excitation. Magnification 600x.
Source: Dr. Robert Zucker, EPA

EPA's National Lakes Assessment 2012 Report Released

On December 8, 2016, EPA announced the release of the National Lakes Assessment (NLA) 2012 Report. This report is the culmination of a significant partnership between EPA, states, tribes, and other partners. In addition to the report, assessment of conditions at regional scales, differences between natural lakes and reservoirs, and an opportunity to explore population-level results in an interactive dashboard are also available. A few key findings from the report include the following:

- The NLA indicates that nutrient pollution is common in U.S. lakes; 40% of lakes have excessive levels of total phosphorus and 35% have excessive levels of total nitrogen. Nutrient pollution is the most widespread stressor among those measured in the NLA and can contribute to algae blooms and affect public health and recreational opportunities in lakes.

- In comparison with the 2007 report, a measure of the density of cells that could produce cyanotoxins, shows a statistically significant increase (+8.3%) in the percentage of lakes in the most disturbed category. The NLA identified a significant increase in the detection of microcystin among lakes in 2012 (+9.5%). However, concentrations of this algal toxin remained low and rarely exceeded WHO recreational levels of concern (<1% of the population) in both assessments.

EPA and its partners are preparing to sample another 1,000 lakes in 2017, for the third NLA. If you have any questions, please contact Amina Pollard, lead for the NLA at pollard.amina@epa.gov

UPCOMING EVENTS

Webinars
EPA's Water Research Webinars

NWQMC and Sensor Workgroup
January 17, 2017

Inland HABs Discussion
February 14, 2017

Conferences
ASLO
February 26 to March 3, 2017
Hawaii

IAGLR
May 15-19, 2017
Detroit, Michigan

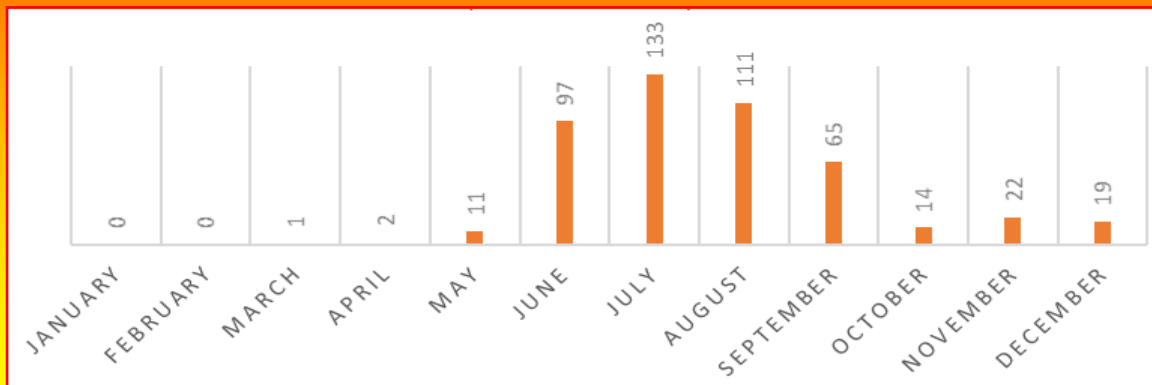Gordon Research Conference
Biotoxins
June 18-23, 2017
Easton, MA

On December 9th, EPA released a pre-publication version of the final **fourth Unregulated Contaminant Monitoring Rule (UCMR 4)** pursuant to the Safe Drinking Water Act. The final rule identifies 30 contaminants that will be monitored by public water systems between 2018 and 2020, and specifies the analytical methods that must be used to measure these contaminants. Of the 30 contaminants, ten are cyanotoxins: microcystins (-LA, -LF, -LR, -LY, -RR, -YR, and total MCs), nodularin, anatoxin-a, and cylindrospermopsin. EPA will consider the occurrence data from UCMR 4 and other sources, along with peer-reviewed health effects assessments, to support a regulatory determination on whether to initiate the process to develop a national primary drinking water regulation. EPA published the final rule in the *Federal Register* here.

On December 12th, EPA published the **Draft Human Health Recreational Ambient Water Quality Criteria and/or Swimming Advisories for Microcystins and Cylindrospermopsin** to protect the public from incidental ingestion of cyanotoxins during primary contact recreation. EPA is accepting comments on the draft criteria document for 60 days. For more information, please visit the Microbial (Pathogen)/Recreational Water Quality Criteria page.

HABs, BEACH CLOSURES and HEALTH ADVISORIES, DECEMBER 2016

⚠ **California** ⚠ **Massachusetts** ⚠ **Idaho** ⚠ **Kansas** ⚠ **Oregon** ⚠ **Washington**

SUMMARY OF HABs-RELATED ADVISORIES POSTED IN 2016*

Bar chart of advisory postings by month: January 0, February 0, March 1, April 2, May 11, June 97, July 133, August 111, September 65, October 14, November 22, December 19.

* Postings include blooms, cautions, warnings, public health advisories, and public health warnings, due to the presence of algae, toxins or both. This is NOT a comprehensive list, and many blooms may have not been reported. Thanks to Johnwilliam Carroll (Pathways Internship Program) USEPA, for helping compiling this list.

RECENTLY PUBLISHED ARTICLES

Reversal of a cyanobacterial bloom in response to early warnings
Michael L. Pace, Ryan D. Batt, Cal D. Buelo, Stephen R. Carpenter, Jonathan J. Cole, Jason T. Kurtzweil, and Grace M. Wilkinson. *PNAS*, December 27, 2016.

High-resolution mapping of global surface water and its long-term changes
Jean-François Pekel, Andrew Cottam, Noel Gorelick and Alan S. Belward. Letters. Nature. December 2016.

Spatially-explicit forecasting of cyanobacteria assemblages in freshwater lakes by multi-objective hybrid evolutionary algorithms
Hongqing Cao, Friedrich Recknagel, Michael Bartkow. Ecological Modelling, Vol. 342, 24 December 2016, Pages 97-112.

Growth, physiochemical and antioxidant responses of overwintering benthic cyanobacteria to hydrogen peroxide
Chao Chen, Zhen Yang, Fanxiang Kong, Min Zhang, Yang Yu, Xiaoli Shi. Environmental Pollution, Vol. 219, December 2016, Pages 649-655.

A review of monitoring technologies for real-time management of cyanobacteria: Recent advances and future direction
Arash Zamyadi, Florence Choo, Gayle Newcombe, Richard Stuetz, Rita K. Henderson. TrAC Trends in Analytical Chemistry, Vol. 85, Part A, December 2016, Pages 83-96.

Population persistence in flowing-water habitats: Conditions where flow-based management of harmful algal blooms works, and where it does not
James P. Grover, Daniel L. Roelke, Bryan W. Brooks. Ecological Engineering, Vol. 99, February 2017. 172-181.

Useful Resources
- √ **EPA Cyanotoxins in Drinking Water Page**
- √ **EPA Funding Opportunities Page**
- √ **EPA Water Research Page**
- √ **Great Lakes HABs Collaboratory Events**

Toxins Journal Special Collection on HABs

Topical Collection "Freshwater HABs and Health in a Changing World". To submit a manuscript, please go to www.mdpi.com and register to log in the journal.