

12-EH-01

Committee: Environmental/Occupational/Injury Steering Committee

Title: Proposal to support continuation of HAB illness surveillance with CDC coordination

I. Statement of Problem:

Harmful Algal Blooms (HABs) occur throughout the world with all major toxin-producing marine, estuarine and freshwater microalgae found in the US. During the past four years, CDC has funded a cooperative agreement with 12 states to develop and implement a nascent surveillance system, Harmful Algal Bloom Illness Surveillance System (HABISS) and to facilitate a cohesive public health response strategy throughout the US.

Due to funding limitations and competing public health challenges, the National Center for Environmental Health's Health Studies Branch at CDC will cease funding and supporting HABISS, as of October 2012. There is no commitment from CDC to continue its leadership role in furthering the national conversation identifying and defining health risks from HABs. The potential for algae and cyanobacteria to contaminate public water supplies and recreational water bodies is an issue of increasing national importance because of concerns associated with the effects of climate change and the quality of the nation's drinking water supply.

II. Statement of desired action(s) to be taken:

1. CDC will maintain subject matter expertise in the human health effects of harmful algal blooms.
2. CDC will support states using Environmental Public Health Tracking (EPHT) network resources to monitor HAB related environmental and human health data
3. CDC will support the sharing of these data through the EPHT network
4. CDC will support the development of surveillance indicators through the State Environmental Health Indicators Collaborative (SEHIC) and/ or EPHT.
5. CDC will facilitate communication and collaboration, as appropriate, with other federal agencies with an interest in HABs. These include, but are not limited to the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the Food and Drug Administration and the United States Geological Survey.

III. Public Health Impact:

Continued participation by the CSTE and CDC in facilitating a national HAB-related illness surveillance system and in promoting appropriate public health response to HAB-related exposures would be instrumental in a.) defining overall health threats, b.) improving case definition for the emerging spectrum symptoms related to cyanobacterial illnesses, and c.) affording greater protection to the public from HAB exposure from seafood, our nation's potable public water systems and recreational water bodies.

IV. References

1. Kinetic Study of Accumulation and Elimination of Microcystin-LR in Yellow Perch (*Perca Flavescens*) Tissue and Implications for Human Fish Consumption; Julianne Dyble et al. *Mar. Drugs* 2011, 9, 2553-2571; doi:10.3390/md9122553: Cyanobacterial harmful algal blooms (HABs) are increasingly prevalent in the Great Lakes as well as smaller inland lakes and reservoirs throughout the world, fueled by eutrophication and perhaps increasing global temperatures. The proliferation of HABs has

significant ecological consequences, including contributing to hypoxia and food web disruption. In addition, there are also significant concerns about the direct impacts of cyanotoxins on human and animal health.

2. Diverse taxa of cyanobacteria produce -N-methylamino-L-alanine, a neurotoxic amino acid; Paul Alan Cox et al Proceedings of the National Academy of Sciences; *April 4, 2005*, doi:10.1073/pnas.050152610: Cyanobacteria can generate molecules hazardous to human health, but production of the known cyanotoxins is taxonomically sporadic ... The ubiquity of cyanobacteria in terrestrial, as well as freshwater, brackish, and marine environments, suggests a potential for widespread human exposure.
3. Characterizing a cyanobacterial bloom in western Lake Erie using satellite imagery and meteorological data; Timothy T. Wynne et al; Toxic cyanobacterial blooms occur worldwide, on every continent except Antarctica. These blooms are associated with detrimental effects, including human respiratory irritation, taste and odor of potable exposure during recreation. Mortalities have been observed in domestic and wild animals. Additionally, cyanobacterial blooms can be aesthetically unappealing. This fact is amplified by a bloom's tendency to linger and become more concentrated along shorelines and in harbors where they are encountered more frequently by the public.
4. The Emerging Science of BMAA: Do Cyanobacteria contribute to Neurodegenerative Disease? Wendee Holtcamp; Environmental Health Perspectives 120 | number 3 | March 2012; Cyanobacteria either form symbiotic relationships with other organisms or live alone in fresh and marine waters, where they can erupt in sprawling and often toxic blooms associated with high nutrient inputs such as fertilizer runoff ... The incidence of cyanobacterial blooms has increased worldwide and may grow even more widespread with warming climates.
5. Water Sanitation Health - Water-related diseases: Cyanobacteria; World Health Organization. http://www.who.int/water_sanitation_health/diseases/cyanobacteria/en/ Cyanobacteria or blue-green algae occur worldwide especially in calm, nutrient-rich waters. Some species of cyanobacteria produce toxins that affect animals and humans. People may be exposed to cyanobacterial toxins by drinking or bathing in contaminated water. The most frequent and serious health effects are caused by drinking water containing the toxins (cyanobacteria) or by ingestion during recreational water contact. Disease due to cyanobacterial toxins varies according to the type of toxin and the type of water or water-related exposure (drinking, skin contact, etc.). Humans are affected with a range of symptoms including skin irritation, stomach cramps, vomiting, nausea, diarrhoea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth and liver damage. Swimmers in water containing cyanobacterial toxins may suffer allergic reactions, such as asthma, eye irritation, rashes, and blisters around the mouth and nose. Animals, birds, and fish can also be poisoned by high levels of toxin-producing cyanobacteria.



V. Coordination:

Agencies for Response:

- (1) Centers for Disease Control and Prevention
Thomas R Frieden, MD, MPH
Director
1600 Clifton Road, NE
Atlanta, Georgia 30333
(404) 639-7000
Txf2@cdc.gov

Agencies for Information:

- (1) U.S. Environmental Protection Agency
Lesley Vázquez-Coriano, Dr.PH, MEH
Office of Science and Technology, Office of Water
Health and Ecological Criteria Division
1200 Pennsylvania Ave., N.W. (MC 4304T)
Washington, DC 20460
202-566-1125
Vazquez-Coriano.Lesley@epamail.epa.gov
- (2) NOAA National Ocean Service
Richard P. Stumpf, Ph.D.
Oceanographer
01-713-3028 x173
richard.stumpf@noaa.gov
- (3) FDA Center for Food Safety & Applied Nutrition
Robert W. Dickey, Ph.D.
Director, Division of Seafood Science & Technology
Office of Food Safety, Gulf Coast Seafood Laboratory
1 Iberville Drive
Dauphin Island, AL 36528
Tel: 251-690-3368
Robert.dickey@fda.hhs.gov
- (4) U.S. Geological Survey
Keith Loftin
Organic Geochemistry Research Laboratory
Kansas Water Science Center
4821 Quail Crest Place
Lawrence, KS 66049
kloftin@usgs.gov
- (5) National Association of State Public Health Veterinarians
Joni Scheftel DVM, MPH
State Public Health Veterinarian
Minnesota Department of Health
625 Robert Street North
St. Paul, MN 55155

Submitting Authors:

- (1) Clifford S. Mitchell, MS, MD, MPH
Assistant Director for Environmental Health and Food Protection
Infectious Disease and Environmental Health Administration
Maryland Department of Health and Mental Hygiene
201 W. Preston Street, Room 327
Baltimore, MD 21201
(410) 767-7438 or 5045/Fax (410) 333-5995
CMitchell@dmmh.state.md.us

- (2) Carina Blackmore DVM, PhD, Dipl. ACVPM
State Public Health Veterinarian
State Environmental Epidemiologist
Chief, Bureau of Environmental Public Health Medicine
Florida Department of Health
4052 Bald Cypress Way, Bin A-08
Tallahassee, FL, 32399
(850) 245-4732
Carina_blackmore@doh.state.fl.us