



Harmful Algal Blooms & Muck

What's the Difference?



Harmful algal blooms and muck, otherwise known as *Cladophora*, can be mistaken for each other simply because people may associate an algal bloom with either type. However, both represent significantly different species. Unlike green algae such as *Cladophora*, blue-green algae is technically not an algae, but is a bacteria known as cyanobacteria that photosynthesizes like algae do. Blue-green harmful algal blooms (HABs) and green algae blooms can be found in similar locations. However, the two species differ in appearance and in factors that influence their growth and movement in the Great Lakes.

Harmful Algal Bloom: <i>Microcystis</i>	Muck: <i>Cladophora</i> or <i>Spirogyra</i>
<ul style="list-style-type: none">◆ Blooms tend to stay in water column	<ul style="list-style-type: none">◆ Can wash up on shore in mats
<ul style="list-style-type: none">◆ Can produce liver, skin, or nervous system toxins	<ul style="list-style-type: none">◆ Not known to produce toxins
<ul style="list-style-type: none">◆ Blooms not known to harbor <i>E. coli</i>	<ul style="list-style-type: none">◆ Mats (on beach and in water) have contained <i>E. coli</i>
<ul style="list-style-type: none">◆ Peak growth often occurs late summer	<ul style="list-style-type: none">◆ Peak growth often occurs early summer
<ul style="list-style-type: none">◆ When blooms die, sink to bottom, often responsible for depleted oxygen on bottom	<ul style="list-style-type: none">◆ When blooms die, float to surface, final location depends on wind and water bottom circulation
<ul style="list-style-type: none">◆ Colonial (circular cells)	<ul style="list-style-type: none">◆ Filamentous (end to end), branched
<ul style="list-style-type: none">◆ Grows in response to nutrients, light	<ul style="list-style-type: none">◆ Grows in response to nutrients, light
<ul style="list-style-type: none">◆ Planktonic (passively moves in water)	<ul style="list-style-type: none">◆ Benthic (bottom dwelling)
<ul style="list-style-type: none">◆ Microalgae (microscopic cells)	<ul style="list-style-type: none">◆ Macroalgae (grow up to 3 ft. long)
<ul style="list-style-type: none">◆ Zebra mussels promote by selectively filtering other algae, leaving toxic cyanos and rapidly recycling nutrients that stimulate growth.	<ul style="list-style-type: none">◆ Zebra mussels promote by providing substrate for growth and providing localized nutrient source.



Because harmful algal blooms (HABs) pose potential health risks from the toxin that can be produced, the NOAA Center of Excellence for Great Lakes and Human Health is researching factors that influence the growth of *Microcystis*, as well as developing tools to determine whether toxic strains of *Microcystis* are present in surface water blooms.

For more information on Harmful Algal Blooms, please visit our website at:
<http://www.glerl.noaa.gov/res/Centers/HABS/habs.html>

Microcystis blooms are suspended in surface water and can give water a green appearance. *Microcystis* blooms have been found in western Lake Erie, Saginaw Bay, western Lake Michigan, and inland tributaries of Lake Michigan. They do not typically wash up on shorelines or leave a slimy residue on shores or boats (but in some instances have), however, *Microcystis* is capable of producing the toxin microcystin, which poses potential health threats. The toxin may be present in the water even after the bloom subsides.

Cladophora blooms have been found in various areas of the Great Lakes, including western Lake Michigan and the Saginaw Bay area of Lake Huron in Michigan. *Cladophora* mats wash up on shorelines from the bottom of water bodies in the summer months and can be considered a nuisance to local communities. *Cladophora* blooms create a “muck” zone on beaches and have the potential to harbor bacteria, but do not produce algal toxins.



Algae blooms in western Lake Erie as shown from a MODIS satellite photo (top left) taken on August 13, 2009, and from an airplane (bottom left) taken on August 11, 2009 (photo from J. Lekki, NASA Glenn Research Center).



Shoreline muck in Saginaw Bay, Lake Huron in September 2006. Digging below the surface reveals vegetation underneath.

The NOAA Center of Excellence for Great Lakes and Human Health focuses on understanding the inter-relationships between the Great Lakes ecosystem, water quality and human health. The Center employs a multidisciplinary approach to understand and forecast coastal-related human health impacts for natural resource and public policy decision-making, and develops tools to reduce human health risks associated with three research priority areas: beach closures, harmful algal blooms, and drinking water quality. For more information on CEGLHH's research, please contact sonia.joseph@noaa.gov.

Michigan Sea Grant is dedicated to the sustainable use of the nation's Great Lakes and Michigan's coastal resources. It is a joint program of Michigan State University and the University of Michigan. Michigan Sea Grant accomplishes its mission through three primary program components: Research, Education, and Outreach. For more information on Michigan Sea Grant, please visit: www.miseagrant.umich.edu/

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