



Marine Harmful Algal Blooms (May 2016)

What Are Harmful Algal Blooms (HABs)?

Marine harmful algal blooms (HABs) are mostly caused by single celled algae called phytoplankton. Phytoplankton are abundant in both marine and freshwater ecosystems and are an essential component of aquatic food webs. Harmful algae are a small subset of species that negatively affect human, animal, and ecosystem health and coastal resources through the production of potent chemical toxins.

Harmful algal blooms occur in fresh and marine waters all over the world and can be expansive, covering many square miles. The frequency and distribution of HABs and their impacts have increased considerably in recent years, both in the United States and globally. All U.S. coastal states are now adversely affected by HABs.

Four marine HABs found on the East Coast are:

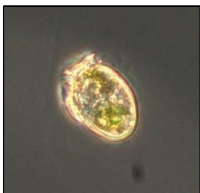


Photo Credit: NJDEP

Dinophysis sp.: an organism that can produce okadaic acid and dinophysistoxins which are linked to diarrhetic shellfish poisoning (DSP).

Pseudontizschia sp.: known to produce domoic acid which is the marine biotoxin related to amnesic shellfish poisoning (ASP).



Photo Credit: NJDEP



Photo Credit: David Patterson & Bob Andersen

Alexandrium sp.: a saxitoxin producing organism that causes paralytic shellfish poisoning.

Karenia brevis: produces potent neurotoxins that cause gastrointestinal and neurological problems in other organisms.



Photo Credit: Mote Marine Laboratory

What are the impacts of marine HABs?

Acute human health impacts: Effects of algal toxin exposure can range from neurological impairment, gastrointestinal distress, and/or respiratory irritation; some cases result in severe illness and even death. HAB-associated illness in humans is most often due to eating shellfish and/or fish contaminated by marine algal toxins.

Acute animal health impacts: Massive fish kills are perhaps the most commonly observed impact of marine HABs on wildlife, but marine algal toxins have also been associated with the deaths of whales, sea lions, dolphins, manatees, sea turtles, birds, and invertebrates.

Chronic health impacts: The effects of chronic or repeated, low-level HAB toxin exposure on health, reproductive failure, and behavior of humans and wildlife are only beginning to be understood. Impacts from this type of exposure could be significant on protected and endangered wildlife species.

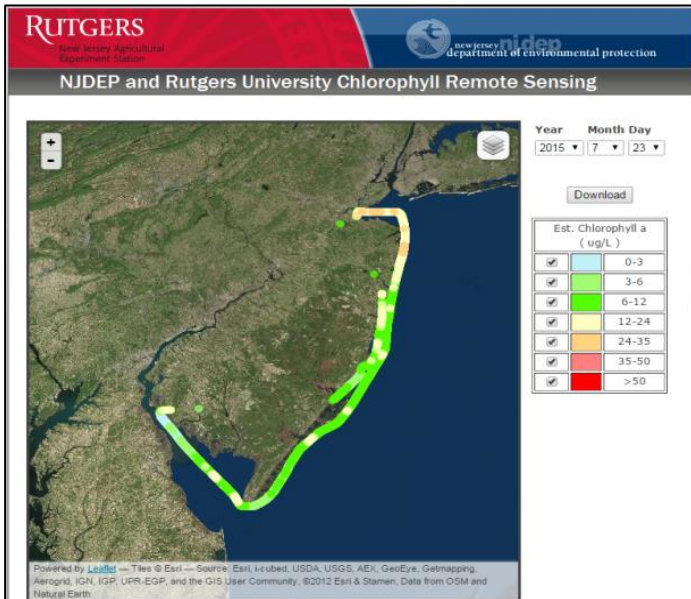
Environmental impacts: HABs can degrade ecosystem health by forming large and dense blooms. These blooms alter habitat quality through overgrowth, shading, oxygen depletion, and/or accumulation on beaches. Adverse effects are seen in degraded corals, seagrasses, and bottom dwelling organisms.

What is New Jersey Department of Environmental Protection (NJDEP) doing to monitor marine HABs?

Aircraft Remote Sensing

New Jersey Department of Environmental Protection's Bureau of Marine Water Monitoring has been working in cooperation with the New Jersey Forest Fire Service, Rutgers University, and the United States Environmental Protection Agency (Region 2) to conduct aircraft remote sensing for estimating chlorophyll levels in NJ coastal waters during the summer months.

These flights give NJDEP information on where to target more intensive water and/or shellfish tissue sampling to identify and enumerate harmful algal species.



Routine Sampling

The NJDEP has 48 routine marine phytoplankton sampling stations that give a representative overview of the estuarine waters of New Jersey (2015). These stations are sampled between 5 and 10 times a year. All samples are collected by the NJDEP for phytoplankton identification and chlorophyll *a* analysis. When analyzing the samples, the NJDEP focuses on identifying toxin producing species and dominant species. Cell counts are also conducted in order to help determine potential bloom conditions.



Biototoxin Analysis

In response to algal blooms that are dominated by potentially toxic species, the NJDEP collects shellfish (clams and/or oysters) and analyzes the tissue using Abraxis test kits (see photograph below). These test kits are designed to detect toxin levels near or above Food and Drug Administration guidance levels for biotoxins in shellfish tissue. The NJDEP may make closures to shellfish growing waters based on the results of biotoxin analysis. More information on the NJDEP’s Marine Biototoxin Contingency Plan can be found online at www.nj.gov/dep/bmw.



Marine Toxin Test Kit

Photo Credit: NJDEP

What can the public do to help?

More information on freshwater and marine water HABS can be found online at www.nj.gov/dep/wms/HABS.html.

The NJDEP has established a toll-free telephone hotline number you can use to report environmental incidents, abuses, and complaints in New Jersey or in surrounding areas impacting our state. If you see discolored marine water, please call the NJDEP’s Emergency Hotline at 1(877)WARNDP. Please note the location and approximate size of the potential algal bloom, the color of the impacted water, and the date and time of the observance.

Additional Contact:

NJDEP Bureau of Marine Water Monitoring
609-748-2000
bmwm@dep.nj.gov