Harmful Algal Blooms (HABs)

What is a harmful algal bloom?

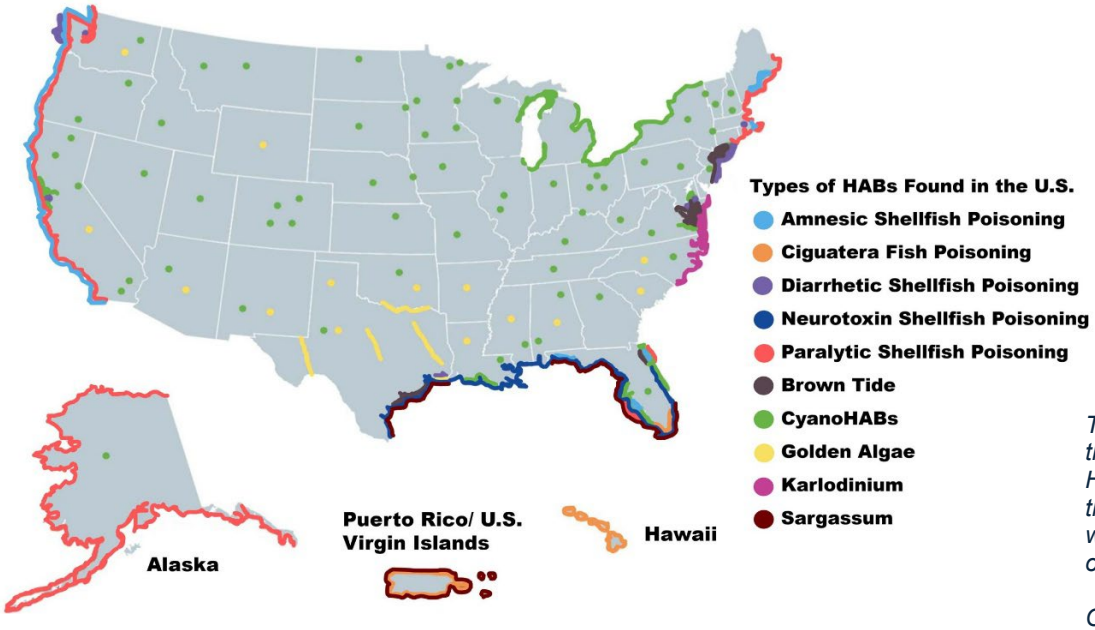
A Harmful Algal Bloom occurs in Lake Erie. Credit: NOAA

Harmful algal blooms, or HABs, occur when colonies of algae — simple plants that live in the sea and freshwater — grow out of control and produce toxic or harmful effects on people, fish, mammals, and birds. Illnesses caused by HABs, though rare, can be debilitating or fatal.

Ranging from microscopic, single-celled organisms to large seaweeds, algae are simple plants that form the base of food webs. Under the right conditions, algae may grow out of control — and a few of these "blooms" produce toxins that can kill fish, mammals and birds, and may cause human illness or even death in extreme cases. Other algae are nontoxic, but eat up all of the oxygen in the water as they decay, clog the gills of fish and invertebrates, or smother corals and submerged aquatic vegetation. Still others discolor water, form huge, smelly piles on beaches or contaminate drinking water. Collectively, these events are called harmful algal blooms, or HABs.

Every U.S. coastal and Great Lakes state experiences HABs.

These blooms are a national concern because they affect not only the health of people and marine ecosystems, but also the "health" of our economy — especially coastal communities dependent on the income of jobs generated through fishing and tourism. These blooms occur in fresh and salt water alike, wreaking havoc on drinking water, fisheries, and outdoor recreation as the unsafe water poses a health risk to people and pets. With climate change and increasing nutrient pollution potentially causing HABs to occur more often and in locations not previously affected.



This map shows the types of HABs found in the U.S. and where they occur.

Credit: NOAA.

What can be done?

There is a general consensus that prevention is the preferred management strategy for HABs, but this management strategy can be difficult to implement, and there are presently few active efforts aimed at directly preventing blooms. A growing field of research is focused on methods and technologies to control or suppress blooms. These approaches include strategies that kill HAB organisms or limit growth, and/or physically remove cells and toxins from the water column.

Bloom control or suppression activities can be controversial, however, due to concerns regarding unintended ecosystem impacts of these controls. Most mitigation studies fall under four broadly defined categories, summarized below. In practice, perhaps the best known involves physical or mechanical control (e.g., flocculation), but in addition to mechanical control, there are several other strategies that theoretically could be used to control or suppress HABs and their toxins. [WHOI Control and Treatment]

On the federal level, management of harmful algal blooms requires close coordination between municipal, state, and federal bodies, including the National Oceanic and Atmospheric Administration (NOAA), the US Environmental Protection Agency, the Food and Drug Administration, the US Geological Survey, and the Centers for Disease Control to monitor and address health risks.

The Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2017 (HABHRCA) requires NOAA and other federal agencies to advance the scientific understanding of and ability to detect, predict, control, mitigate, and respond to HAB events in the U.S. HABHRCA established a national HAB program that coordinates interagency activities on forecasting, prevention and control.

Legislation in the 119th Congress

- Harmful Algal Bloom and Hypoxia Research and Control Amendments (HABHRCA) Act (H.R.644) led by Rep. Bonamici (D-OR-01)
- NERRS Reauth: Resilient Coasts and Estuaries Act (H.R.2786) led by Rep. Levin (D-CA-49)
- NEP Reauth: ESTUARIES Act (H.R.3962) led by Rep. Figures (D-AL-02)
- IOOS Reauth (H.R.2294) led by Rep. Ezell (R-MS-04)
- Weather Act Reauthorization Act (H.R.3816) led by Rep. Frank Lucas (R-OK-03)
- American Water Stewardship Act (H.R. 6422) led by Rep. Pete Stauber (R-MN-08)

FY2027 Appropriations

- Support the NERR ($39M Operations, $10M Procurement, Acquisition, and Construction; House CJS Approps)
    - Dear Colleague Letter Lead: Reps. Van Drew and Larsen
- Support the NEP ($50M, including $1M per NEP; House Interior Approps)
    - Dear Colleague Letter Leads: Reps. Haridopolos, Bonamici, Mast, and Larsen
- Support IOOS Regional Observations ($56M; House CJS Approps)
    - Dear Colleague Letter Leads: Reps. Ezell, Pingree, Carbajal, and Weber
- Support EPA Geographic Programs (At least $690M; House Interior Approps)

Resources to Learn More

National Centers for Coastal Ocean Science
US Environmental Protection Agency
US Geological Survey
Centers for Disease Control
Woods Hole Oceanographic Institute