

New research to unravel how nutrients drive toxic 'brown tides' on East Coast

September 17 2009

NOAA has awarded Massachusetts-based Woods Hole Oceanographic Institution \$120,000 as part of an anticipated three-year, nearly \$500,000 project, to determine how nitrogen and phosphorus promote brown tides on the East Coast. Funds were awarded through the interagency Ecology and Oceanography of Harmful Algal Blooms (ECOHAB) program.

The project will focus on brown tides, a type of algae along the East Coast that causes tremendous damage to coastal habitats and scallop and hard clam fisheries from Rhode Island to Virginia. Researchers plan to use genome technology to examine how these nutrient pollutants may cause a brown tide event and influence its duration.

"In the late 1980s, brown tide caused the collapse of the multi-million dollar scallop industry on eastern Long Island and mass die-offs of seagrass in its bays," said Christopher Gobler, Ph.D, a brown tide expert from the State University of New York at Stony Brook who is involved in the project. "Blooms have continued since then with damage extending to New York's largest fishery which harvests the northern quahog, or hard clam. Unfortunately, these blooms were so damaging, the fisheries and resources have never recovered."

Brown tides are unusual since they grow when a certain type of inorganic nitrogen is in low supply. As such, it is suspected that an excess of other nutrient types, mainly organic phosphorus and nitrogen, in aquatic ecosystems contributes to the development of brown tides. Determining

which nutrient conditions trigger these blooms will help predict and prevent brown tides. Knowing the genome sequence of the brown tide organism also allows researchers to observe changes in the cell's genes as conditions change.

"The ability to monitor individual genes from brown tide cells that are 'turned on or off' in response to nutrients is a breakthrough that can show us precisely which nutrient conditions foster the growth of brown tide cells in nature," said principal investigator Sonya Dyhrman, Ph.D., of the Woods Hole Oceanographic Institution. "It is difficult to track how nutrient type and supply influence harmful [algal blooms](#) because most of the approaches examine all species in the environment, rather than one specific harmful species."

"This project is timely as the state of New York is currently developing a nutrient management strategy for our estuaries," said Karen Chytalo, Section Chief of Marine Habitat Protection of the New York State Department of Environmental Conservation. "The type of detailed information this project will provide is exactly what we need to develop estuarine nutrient criteria so that, ultimately, we can prevent these damaging events and improve the overall health of our estuaries."

Source: NOAA ([news](#) : [web](#))

Citation: New research to unravel how nutrients drive toxic 'brown tides' on East Coast (2009, September 17) retrieved 20 April 2024 from <https://phys.org/news/2009-09-unravel-nutrients-toxic-brown-tides.html>

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