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ECOS

Risk Communication of Harmful Algal Blooms

North Carolina Department of Environmental Quality

Background and Environmental Agency Program/Capacity

The North Carolina Department of Environmental Quality (DEQ) is an independent agency tasked with environmental protection in the state. DEQ has various water quality monitoring programs within the Division of Water Resources including the Basinwide Lake Assessment program, which conducts lake and reservoir assessments (including algal assemblage evaluations) on a five-year cycle. DEQ also has an Ambient Monitoring Program that conducts monthly water quality monitoring on streams, rivers, and estuaries. Staff in both programs perform algal bloom and fish kill investigations during scheduled monitoring and in response to concerned citizen reports. DEQ's HABs research program primarily focuses on identifying and communicating risks of the blooms of toxigenic cyanobacteria identified during these investigations.

DEQ's algal program began in the 1980s when the department was called the Agency of Natural Resources. In partnership with the North Carolina Department of Health and Human Services (DHHS), DEQ first developed analytical capabilities in response to red tide and pfiesteria, and eventually cyanobacteria. DEQ is the lead agency in data-gathering and algal-assessing efforts, providing results and data to the DHHS. DHHS conducts health report evaluations, similar to health advisories, to determine if the bloom conditions pose an actual human, pet, or livestock threat.

As awareness of HABs in North Carolina has risen in recent years, DEQ researched other state agencies' efforts and realized that no state agency had the same processes for responding to a HAB. After some internal coordination, DEQ established roles and responsibilities for the various state agencies involved in algal bloom response. DEQ serves as data gatherers, working with state agencies and local municipalities to identify blooms. DEQ field staff collect samples analyzed by biologists in the Water Sciences Section of the Division of Water Resources and then tested for microcystin in the agency's chemistry laboratory when known toxin-producing algae are present. DEQ acquired a cyanotoxin monitoring system in August 2017. Prior to that, algal bloom samples were provided to the DHHS for testing. This process took three to four days to get results, creating a total response time of seven days for a particular bloom. DEQ's new capabilities allow the agency to perform the toxin testing internally, saving time and providing a more thorough investigation. Algal bloom samples are still provided to DHHS for confirmation as the agencies continue to coordinate toxin testing efforts. Ultimately, all data from the tests are provided to DHHS to determine if there is an exposure risk and, if appropriate, to issue a health advisory.

Rollout and Dissemination of Advisory and Relevant Resources

When HABs are confirmed, DEQ, in coordination with DHHS, issues a press release and notifies stakeholders in the area. The press release is generic: DEQ cuts and pastes the names of the lakes or situations occurring, and changes the species or levels of toxins. DHHS assumes responsibility for notifying the local health department.

DEQ has a response system in which a citizen or municipality can call its DEQ regional offices to ask questions or report blooms. DEQ also has an algal bloom map on its website to display bloom locations and corresponding test results, and an online app to report blooms and fish kills.

Gaps and Challenges

DEQ has faced the following challenges when disseminating information on the risks of HABs:

- The DEQ and DHHS relationship has not been tested for HABs to the extent it has been for more public-facing crises like GenX, a replacement for perfluorooctanoic acid that spilled from the Chemours plant into the Cape Fear River in 2017. The roles and responsibilities among DEQ and DHHS staff are established but not written into policy or as official agreements. While DEQ worries that a potential HABs crisis might reveal loopholes in its processes, the relationship is working well so far.
- Education is important, not just with the public but with agency staff as well. There are a hundred autonomous county health departments in North Carolina with varying degrees of knowledge, interest, and experience dealing with HABs. The DHHS is challenged in bringing local health departments up to speed to understand the issues.
- Science is ahead of the policy for HABs. North Carolina has no water quality standards for cyanotoxins, so agencies rely on a combination of the **World Health Organization's** and **U.S. EPA's** guidelines for recreational and drinking water when issuing health advisories.

DEQ recommends that other states:

- Identify roles for each agency involved and its staff.
- Determine the fastest, most reliable testing method while limiting sample handling.
- Set up reporting tools to inform the public of HABs contamination and DEQ activities.
- Hold public meetings and create fact sheets to maximize community relationships after HABs are confirmed.
- Educate field staff in multiple agencies (e.g. wildlife conservation, marine fisheries, shellfish sanitation, state parks service, etc.) who may observe or have contact with citizens observing algal blooms.

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