



Incident Response

Hazardous Materials

The Water Quality Team responds to hazardous materials incidents in the District that include, but are not limited to, oil spills, residual waste spills, fly ash spills, and the monitoring of wells at legacy land fill sites. Some, but not all, of the special chemical analyses include total petroleum hydrocarbons, oil, diesel and gasoline range petroleum hydrocarbons, volatile and semi-volatile organic compounds, sulfates, chlorides and bromides, radioisotopes, herbicides, pesticides, and cyanide. Samples are collected to identify the cause of the spill and to make operational decisions in order to mitigate for it.



Fish Kills

Fish kills occur for a variety of reasons, and while they are not uncommon in reservoirs and the outflows of dams, the water quality team makes many operational suggestions for daily operations in order to reduce their mortality. In the event of a fish kill the state resource agency for that area is notified and the water quality team investigates the water quality conditions to ascertain the cause of the kill. Some previous causes of fish kills include anoxic conditions late in the summer when the lake is stratified and fish get caught in zones with little to no oxygen and suffocate, or in the spring when lake turnover occurs. They can also die from fast and intense pressure variations when going through the dam gates. In many other cases there may be some other reason for the fish kill, such as pollution or a species specific disease.



Harmful Algae Blooms

Algal blooms are rapid increases in the phytoplankton population, typically triggered by eutrophication, a condition of nutrient over-enrichment of water systems characterized by excessive concentrations of nitrogen and phosphorus compounds. Algal blooms are a problem for water environments because they often result in conditions of low oxygen concentration due to algal respiration at night and bacterial decomposition of dead algae. These decreased dissolved oxygen levels, and in some cases anoxic conditions, can create large fish kills. Algal blooms usually are considered nuisance events that inconvenience or constrain recreation and water supply treatment. In extreme cases, harmful algae blooms, or HABs, are algae blooms composed of blue-green algae (BGA) or cyanobacteria that are known to naturally produce biotoxins. HABs can occur when these algae grow quickly in water, creating biochemical conditions that may harm the health of the environment, plants, animals, or the public. In some cases these HABs can produce toxic chemicals (called cyanotoxins) that are harmful to the nervous system (neurotoxins), the liver (hepatotoxins), and the skin (dermatotoxins) of humans and other animals.



Although some HABs occur during the cold seasons, they most frequently occur in lakes and reservoirs during the summer and fall when water temperatures are high, retention times are the longest, skies are clear, and the flow of incoming water is low. Two of the most influential factors of HAB growth are the concentration and bioavailability of nutrients such as nitrogen and phosphorus. Nitrogen and phosphorus are both required by BGA to live and can be scarce in the environment, thereby limiting growth. When the limiting nutrient becomes available in the ecosystem, algae populations increase dramatically resulting in a bloom. Most nitrogen and phosphorus pollution (also known as nutrient overloading) comes from agricultural runoff (fertilizer and animal waste), mineral extraction and industrial discharges, lawn fertilizer, municipal wastewater, and untreated or poorly treated human sewage.

Monitoring for HABs

Authority for monitoring HABs generally rests with the individual states or tribes where the reservoir projects are located. However, in those states where a HAB strategy is not developed or, due to geographic boundaries, does not address the entire lake body; LRD has directed each District in the Division to develop their own HAB response plan, using the World Health Organization (WHO) guidelines, to reduce human health risk associated with exposure to algal toxins. The WHO guidelines identify safe levels for exposure to BGA, which are based on cell counts. For the reservoirs located in states that have HAB Response strategies in place; safe exposure levels may be determined using cell counts or different methods, such as toxin analysis, remote sensing, or modeling, or a combination of these methods. In the Pittsburgh District, only Ohio has a HAB response strategy. Ohio's strategy, which is based on toxin analyses, applies to Berlin Lake, Mosquito Creek Lake, and M.J. Kirwan Reservoir. The District HAB Plan applies to all other reservoirs until such time that PA, NY, WV, MD, and/or the Seneca Nation implement HAB strategies.

Blue-Green Algae or Cyanobacteria Threshold Values

The Pittsburgh District has adopted blue-green algae or cyanobacteria (BGA) threshold values from the World Health Organization's "Guidelines for Safe Recreational Water Environments" (see Chapter 8 under the link "WHO Guidelines"). These values reflect the levels at which the Pittsburgh District will classify a BGA bloom as a HAB.. These values are measured as the number of cells of BGA per milliliter of water (cells/mL). HAB ADVISORY's and CAUTION's are lifted once cell counts decline below the threshold values.

Cyanobacterial cell count	Health Risk	Classification
Exceed 20,000 cells/mL	Low probability of adverse health effects. <i>Short-term adverse health outcomes, e.g., skin irritations, gastrointestinal illness.</i>	HAB ADVISORY
Exceed 100,000 cells/mL	Moderate probability of adverse health effects. <i>Potential for long-term illness with some cyanobacterial species.</i> <i>Short-term adverse health outcomes, e.g., skin irritations, gastrointestinal illness.</i>	HAB CAUTION

{This table is adapted from the World Health Organization's "Guidelines for Safe Recreational Water Environments" Chapter 8.}

Public Relevance

In accordance with the District HAB Plan, when BGA cell counts exceed 20,000 cells per milliliter, but are below 100,000 cells per milliliter in District reservoirs, HAB advisory alert information will be posted in at public access areas in the vicinity of the bloom. A

HAB ADVISORY indicates that a HAB is present and that there is a relatively low probability of experiencing adverse health effects with exposure. The public should exercise caution when recreating in the reservoir and consider the possibility of adverse health effects.

When BGA cell counts exceed 100,000 cells per milliliter in District reservoirs, HAB caution advisory information to be posted in public access areas in the vicinity of the bloom. A HAB CAUTION advisory indicates that a HAB is occurring and that there is a moderate probability of experiencing adverse health effects with exposure. The public must exercise caution when recreating in the reservoir and consider adverse health effects.

Precautionary measures include:

- Avoiding contact with visible algae and not swallowing water while swimming.
- Taking a bath or shower with warm, soapy water after coming in contact with water in ponds and lakes, especially before preparing or consuming food.
- Not allowing pets or livestock to swim in or drink untreated water from these sources. Livestock, pets and wild animals can be poisoned by the toxins produced by some algal blooms. Small animals can ingest a toxic dose quickly.
- Dogs are particularly susceptible to blue-green algae poisoning because the scum can attach to their coats and be swallowed during self-cleaning.
- Remove fish skin and organs before cooking, do not consume or allow pets/animals to consume the organs or skin.

Visitors to a lake experiencing a HAB must consider risks before participating in water-related activities. Visitors who swim, boat or enter the water are at higher risk to experience adverse health effects if they come in contact with water from the lake. BGA species are known to produce skin toxins, which may cause rash, nausea, diarrhea, vomiting, upper respiratory symptoms, and other flu-like symptoms. Exposure to BGA during recreational activities such as swimming, wading, and water-skiing or boating, have resulted in rashes, skin, eye irritation, and other uncomfortable effects such as nausea, stomach aches, and tingling in fingers and toes. Effects to the skin can develop fairly quickly. Some but not all BGA blooms produce nerve and liver toxins, which are extremely dangerous. Wash all clothing and equipment including life jackets after contact with algal blooms and scum. Use fresh water to wash life jackets and use soap as an additional precaution. Algal cells can accumulate under swimwear so it is especially important to rinse clothing and skin with fresh water and soap.



If a lake provides water to local water/utility companies, the utility companies are notified of the HAB so that they can take precautionary measures in treating the drinking water. For specific inquiries about your drinking water quality, contact your utility office.

Monitoring Schedule and Sample Analysis

The District HAB Plan recommends that BGA cell counts be monitored weekly and that signs be posted in high use recreational areas around the lake, if and when cyanobacteria threshold values are exceeded, to warn the public of the possible health risks associated with exposure to algal toxins. In accordance with the Plan, samples are collected by the Water Quality Team, project staff, or stakeholders, which are then sent to a contract laboratory for algae species identification and enumeration. Weekly sampling continues until cell counts remain below action levels for at least two weeks. For specific details on HAB monitoring and algae sample analyses, please contact the Pittsburgh District Water Quality Team at 412-395-7300.

More Information and Reporting HABs

For more information about HABs in the Pittsburgh District, please contact the Water Quality Team with the Pittsburgh District. The [Ohio algae info](#) link has updated information about HABs in Ohio lakes.

If you see signs of a potential HAB and want to report it, please contact the Pittsburgh District Water Quality Team by email at LRP-WaterQuality@usace.army.mil or call (412) 395-7300.

To report a HAB in the state of Ohio, go to the [Ohio algae info](#) link and fill out the Bloom Report Form.

U.S. EPA CyanoHABs

<http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/cyanoHabs.cfm>

World Health Organization Guidelines

<http://www.epa.state.oh.us/dsw/HAB.aspx>

Ohio algae information

<http://www.epa.state.oh.us/dsw/HAB.aspx>

Photo Captions and Credits (From Top to Bottom)

Oil Spill on Chappel Fork Creek (2008), tributary to Allegheny Reservoir – Rose Reilly, Biologist

Dead Carp in Allegheny Reservoir (2013) – Carl Nim, Biologist

Algae Bloom Allegheny Reservoir (2012) – Rose Reilly, Biologist

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