Unsafe waters in Indianapolis

Posted on Aug. 5, 2009 by Laura McPhee

A fast and toxic algae growth spurt on Central Indiana waterways in recent weeks is responsible for hundreds of dead fish in White River in Indianapolis, as well as warnings to those using the Geist or Morse reservoirs for summer recreation.

In mid-July, a large number of resident complaints about floating clumps of algae on White River in Hamilton County and south into Marion County prompted the Indiana Department of Environmental Management to test toxicity levels. At the time, IDEM spokesperson Amber Finkelstein reported nothing unusual or dangerous about the increased algae, saying it was harmless and rare, caused by "temperature, rain and run-off from yards."

Two weeks later, however, those algae blooms are being blamed on increased levels of toxins in the river and the dead fish.

On July 24, after receiving numerous and continuing complaints about a fish kill around Rocky Ripple, IDEM and the Department of Natural Resources sent investigators to determine the problem. Five days later, a simple press release announced that the fish kill was the "result of an excessive algae bloom."

But it's not quite that simple.

While there are dozens of types of algae that occur naturally in waterways, and the majority of them are not toxic, there are an increasing number of blue-green algae that science is finding to be more pervasive and toxic than thought.

Blue-green algae have many names; technically it's cyanobacteria ("cyan" for the blue; "bacteria" because it actually is bacteria that produces toxins). The bacteria grow in warm, moist and fertilizer-rich environments. Heavy infestations of this type of algae, known as blooms, are stimulated by excessive levels of phosphorus and nitrates in the water, according to IDEM. Run-off from lawn and field fertilizers is cited as the most common cause for increases, particularly in the summer.

The type of blue-green algae of most concern has only been found in Indiana since 2001, and wasn't known to exist anywhere in the United States prior to the 1990s. Since 2007's unprecedented occurrence of algae problems at Geist, the IUPUI Center for Earth and Environmental Science has been monitoring Indiana waterways and tracking the levels of toxins created and released by the algae.

"When the algae are in very high concentrations, like they are right now in the White River, they make oxygen during the day, but rob oxygen from the water at night," according to Lenore Tedesco, director of CEE. "Without enough oxygen, fish will basically suffocate."

While the presence of this type of algae is natural, the excessive and fast growth as seen in recent weeks, and the resulting dead fish, are not produced by natural causes.

"Right now we are seeing algal blooms in may of our freshwater systems," Tedesco said. "This suggests excessive nutrients in the water."

By nutrients, Tedesco means nitrogen and phosphorus -- elements most associated with the run-off and dumping of fertilizers containing phosphorus and animal waste, as well as nitrogen found in the raw sewage of human waste.

In addition to testing White River, Tedesco and her team of researchers are also responsible for testing the waters at Geist and Morse Reservoirs for these types of algae, as part of a multiyear project that documents the extent of the toxic algae problem in Indiana.

While there are no national standards for what constitutes dangerous or unacceptable levels of the toxins associated with this type of algae, the World Health Organization has designated risk categories associated with the parts per billion of toxin to water. Low risk is categorized as 2-4 ppb.

As of last Friday, Geist had 6 ppb of microcystin in the water -- the type of toxin known to cause a variety of adverse health effects, including liver toxicity and neurotoxicity, as well as promoting tumor growth. Exposure to the algae, even in low levels, can cause rashes, skin and eye irritation, allergic reactions and gastrointestinal upset. At high levels, exposure can result in serious illness or death.

Over the past few years, public health officials throughout the Midwest have reported excessive growth of toxin-producing blue-green algae in Illinois, Indiana, Iowa, Michigan, Nebraska and Kansas, according to IDEM.

Health alerts in each state, as well as reports of livestock and pets dying after drinking or coming into contact with the contaminated water, and human illness have been reported. Here in Indiana, more than 25 lakes, reservoirs and streams have been found to contain microcystin, the toxin most worrisome from the blue-green algae.

Eagle Creek, Geist and Morse reservoirs are under the most scrutiny, as they provide drinking water and summer recreation opportunities. While water treatment facilities claim to be able to safely manage the removal of the toxins before it is consumed through their delivery methods to residents' homes, swimming and other sports provide an increased risk that cannot be managed at this point.

On July 29, IDEM released a warning about high levels of blue-green algae at Morse and Geist.

IDEM and DNR confirm the latest White River fish kill is a result of algae - Photo by Ted Somerville

Swim at your own risk

If you plan on getting wet at Indiana lakes, rivers, beaches or reservoirs over the next few weeks, here are the "common sense precautions" IDEM recommends you take:

During recreation in the water

Avoid coming in contact with visible algae while swimming, jet skiing or tubing.
Avoid swallowing large amounts of contaminated water.
Recreate in groups.
Don't let your pet drink or swim in contaminated water.
If your pet does swim in the river, be sure to properly bathe your pet afterwards.
Always supervise children playing in or around water, as they are more likely to swallow water.

After recreating in the water

Bathe or shower with warm, soapy water after being in water that may be contaminated.
Don't drink, cook or shower with contaminated water.
Anyone who may be experiencing symptoms related to exposure to blue-green algae, including stomach cramps, diarrhea, vomiting, headache, fever, muscle weakness or difficulty breathing, should contact their health care provider.

For more information on blue-green algae toxins, environmental impacts, health guidelines and other information, go to www.algae.in.gov

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"Direct contact with blue-green algae can cause skin irritation," IDEM warns. "Drinking untreated water, intentional or accidental, may result in gastrointestinal illness and more sever illness may occur with the presence of microcystin toxin."

According to IDEM, anyone who comes in contact with the water in these sources should take a bath or shower with warm soapy water immediately afterward -- particularly before preparing or consuming food. Do not use untreated water from ponds, lakes, streams or reservoirs to drink, cook or shower.

"It is important for individuals to avoid coming into direct contact with the algae and to try to avoid swallowing water if at all possible," said James Hall, state epidemiologist.

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