

Harmful algae taking advantage of global warming

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You know that green scum creeping across the surface of your local public water reservoir? Or maybe it's choking out a favorite fishing spot or livestock watering hole. It's probably cyanobacteria – blue-green algae – and, according to a paper in the April 4 issue of the journal *Science*, it relishes the weather extremes that accompany global warming.

Hans Paerl, a University of North Carolina at Chapel Hill Institute of Marine Sciences Professor and co-author of the *Science* paper, calls the algae the “cockroach of lakes.” It's everywhere and it's hard to exterminate – but when the sun comes up it doesn't scurry to a corner, it's still there, and it's growing, as thick as 3 feet in some areas.

The algae has been linked to digestive, neurological and skin diseases and fatal liver disease in humans. It costs municipal water systems many millions of dollars to treat in the United States alone. And though it's more prevalent in developing countries, it grows on key bodies of water across the world, including Lake Victoria in Africa, the Baltic Sea, Lake Erie and bays of the Great Lakes, Florida's Lake Okeechobee and in the main reservoir for Raleigh, N.C.

“This is a worldwide problem,” said Paerl, Kenan Professor of marine and environmental sciences in UNC's College of Arts and Sciences.

“It's long been known that nutrient runoff contributes to cyanobacterial growth. Now scientists can factor in temperature and global warming,” said Paerl, who, with professor Jef Huisman from the University of Amsterdam, the Netherlands, explains the new realization in *Science* paper.

“As temperatures rise waters are more amenable to blooms,” Paerl said.

The algae also thrive in wet, soggy ground in areas experiencing periodic floods, like the U.S. Midwest. And in a drought, like the Southeastern United States is experiencing now, other algae and aquatic organisms die off, cyanobacteria thrive, waiting to explode

Warmer weather has also created longer growing seasons, and it's enabled cyanobacteria to grow in northern waters previously too cold for their survival. Species first found in southern Europe in the 1930s now form blooms in northern Germany, and a Florida species now grows in the Southeastern U.S. Others have appeared recently places as far north as Montana and throughout Canada.

Fish and other aquatic animals and plants stand little chance against cyanobacteria. The algae crowds the surface water, shading out plants – fish food – below. The fish generally avoid cyanobacteria, so they're left without food. And when the algae die they sink to the bottom where their decomposition can lead to extensive depletion of oxygen.

These cyanobacteria – blue-green algae – were the first plants on earth to produce oxygen.

“It’s ironic,” Paerl said. “Without cyanobacteria, we wouldn’t be here. Animal life needed the oxygen the algae produced.” Now, however, it threatens the health and livelihood of people who depend on infested waters for drinking water or income from fishing and recreational use.

These algae that were first on the scene, Paerl predicts, will be the last to go ... right after the cockroaches.

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For photos, visit: <http://uncnews.unc.edu/news/science-and-technology/algaimages.html>

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