

Harmful algae in Oklahoma

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ABSTRACT: Oklahoma has increasingly witnessed severe and damaging harmful algal blooms (HABS) in its lakes and reservoirs in recent years. The toxigenic golden alga *Prymnesium parvum* first bloomed in Lake Texoma in winter 2003-2004, causing a massive fish kill lake wide. Subsequent blooms in six of the last eight winters have been limited to a few western coves. Golden algae also have bloomed in the Altus City reservoir, a small lake near Marietta, and multiple private lakes and ponds in the Red River watershed, and golden algae are present in the Canadian River watershed. In response to the sudden appearance of golden algae in Oklahoma, and with the serious threat to the state's fisheries, the Oklahoma Department of Wildlife Conservation initiated and supported an extensive research and monitoring program by the University of Oklahoma's Plankton Ecology and Limnology (PEL) Laboratory in effort to better understand, but also to mitigate potential negative impacts of this destructive invading species.

Since 2005, the ODWC and the PEL lab have invested heavily in the development of modern environmental monitoring and research capabilities for intensive study of golden algae and other HABS. We have documented golden algal abundances and environmental conditions where it occurs, quantified its toxicity to fish and zooplankton, discovered and characterized previously-unknown toxins, documented unforeseen human health consequences, constructed an empirical model to predict its presence across the landscape, and developed an accurate and efficient early-warning detection capability for golden algae.

Other HAB species also threaten Oklahoma's lakes. Multiple species of cyanobacteria (bluegreen algae) bloom in lakes across the state, causing anoxia, fish kills, beach closures, and human health concerns. The PEL lab is now developing capabilities similar to those for golden algae, but for early-warning detection of both cyanobacteria and their toxins. Given recent revelations of multiple severe human health issues relating to exposure to cyanobacterial toxins, it is imperative that we quickly develop expertise in these worrisome threats to the state's water resources.

Here we will provide a brief overview into our long-term golden algae research and monitoring program, as well as our new bluegreen algae monitoring and research program. Our results to date highlight the importance of an extensive monitoring program, but also the benefit of early-warning detection. We believe that our unique capacity with respect to HABS provides the PEL lab an opportunity to move forward rapidly and effectively in developing real-time monitoring and problem-solving research capabilities for HABS across the state of Oklahoma.

Further reading:

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