

# World Health Organization

- **Cyanobacterial Toxins**
- Cyanobacteria or blue-green algae occur worldwide especially in calm, nutrient-rich waters.
- Some species of cyanobacteria produce toxins that affect animals and humans. People may be exposed to cyanobacterial toxins by drinking or bathing in contaminated water.

# Washington Post

The toxin that shut off Toledo's water? The feds don't make you test for it.

August 11, 2014

- There are no national standards for algal cyanotoxin in drinking water. U.S. utilities don't need to test for it. How widespread the toxin is in drinking water is a mystery. Monitoring is voluntary. ...The U.S. Environmental Protection Agency for years has discussed drafting rules to cover cyanotoxins but hasn't acted.
- And with these algal blooms predicted to worsen in Lake Erie and other lakes and reservoirs — thanks to a mix of **global warming, invasive species and pollution** — the issue is expected to pop up more often. Some believe Toledo could be a tipping point.

Toledo Ohio water intake surrounded by algae, Aug 3, 2014  
2.5 miles from shore of Lake Erie





**Blooms Like It Hot**  
Hans W. Paerl, *et al.*  
*Science* **320**, 57 (2008);  
DOI: 10.1126/science.1155398

CLIMATE

## **Blooms Like It Hot**

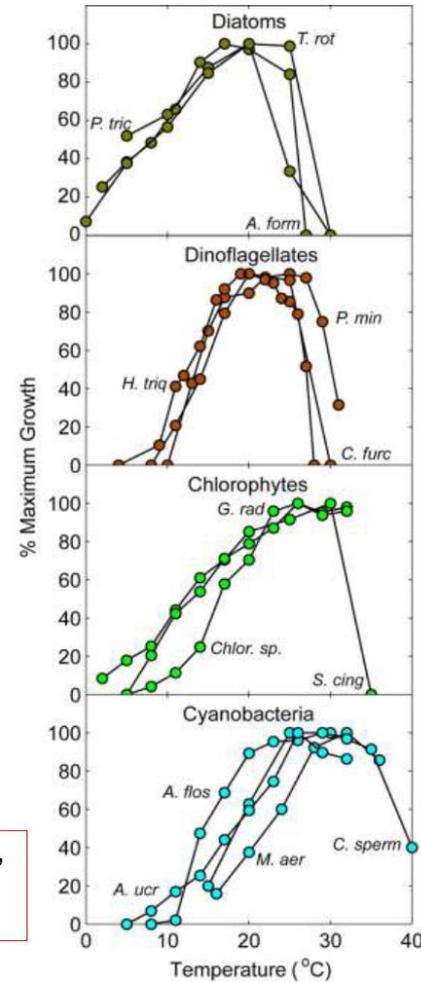
Hans W. Paerl<sup>1</sup> and Jef Huisman<sup>2</sup>

A link exists between global warming and the worldwide proliferation of harmful cyanobacterial blooms.

# The link to CyanoHABs..... Temperature affects growth rates



References: Kraweik 1982, Grzebyk & Berland 1996; Kudo et al., 2000, Litaker et al., 2002, Briand et al., 2004, Butterwick et al., 2005, Yamamoto & Nakahara 2005, Reynolds 2006



# Iowa Beach Closings - Cyanobacteria

Year	Number of Microcystin Advisories
2014	22
2013	24
2012	14
2011	7
2010	2

- The Iowa DNR only collects samples and run the advisory until Labor Day.
- Rain late in the season saved 2014 from having higher numbers.
- Locations are roughly the same each year, although L. Darling got a late start due to construction and Brushy Creek didn't have water due to restoration.

**Effects of rainfall patterns on toxic cyanobacterial blooms in a changing climate: between simplistic scenarios and complex dynamics.**

[Reichwaldt ES](#)<sup>1</sup>, [Ghadouani A](#).

- This review ...identifies mechanisms that influence ... toxic cyanobacterial blooms. ...
- Such changes in the rainfall patterns will lead to favourable conditions for cyanobacterial growth due to a **greater nutrient input into waterbodies during heavy rainfall events**, combined with potentially longer periods of **high evaporation and stratification**.

# Analysis of Monthly Waste Water ByPass information from Iowa DNR – April 2009 to October 2013

- Heavy rains and saturated conditions overwhelmed collection system and treatment plant
- Summary data being sought