



Oregon needs a comprehensive state-wide CyanoHABs program for monitoring, response, and research

Because of risk to health and the environment

Why now? We've had 3 high impact HAB events in Oregon recently

(A HAB is a harmful algal bloom, when microscopic organisms produce toxins that make people, animals, and plants, sick)

- 32 steers died from cyanobacterial toxin exposure after drinking from Junipers Reservoir, Lakeview, OR, June, 2017
- City of Salem do-not-drink advisory to at-risk sub-population due to cyanotoxins in drinking water, summer 2018
- Bloom advisory affecting 5+ miles along Willamette River through downtown Portland, originating in Ross Island Lagoon, August 2018 and previous summers



We need to be better prepared to respond to or anticipate these HAB events

An independent consultant concluded that the City of Salem was poorly prepared in spite of a known toxin presence in the watershed. The widespread alarm and confusion among Salem residents indicated poor rollout of drinking water warnings. A CyanoHABs program with dedicated funding would have provided the resources and backup to prevent these mistakes.

Response to the Junipers Reservoir cattle deaths involved frustration on the part of extension agents, veterinarians, and ranchers, in obtaining advice. Again, having a program in place would have resulted in quicker responses in determining whether a wider threat existed.

Worse HAB events could occur here, as in Lake Erie & Lake Okeechobee



Miles of Algae Covering Lake Erie

By JUGAL K. PATEL and YULIYA PARSHINA-KOTTAS OCT. 3, 2017

A potentially harmful algae bloom covered more than 700 square miles in the western basin of Lake Erie last week, turning the lake bright green and alarming residents and local officials.

City of Toledo at bottom left: about 400,000 were without water in August 2014 because of cyanoc



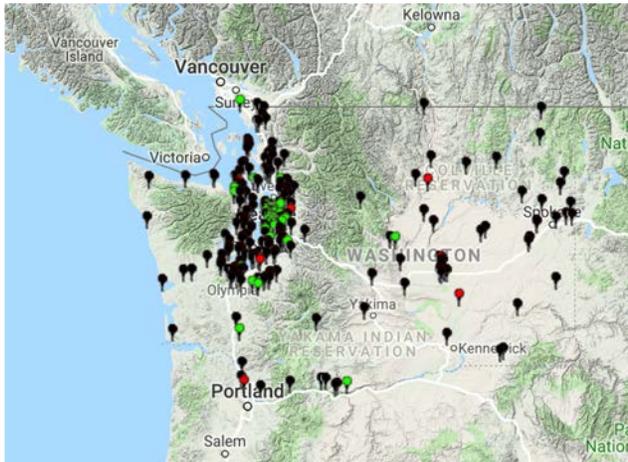
Florida's politicians use slimy algae to muddy each other

The green sludge is becoming powerful ammunition in Florida's election year.

Tampa Bay Times, 12 July, 2018

It already is here, in Upper Klamath Lake

Oregon's current freshwater HABs program is stretched thin. OHA and DEQ do not have dedicated personnel to work on freshwater HABs. **There is no organized toxin monitoring of lakes and waterbodies in Oregon.**



In Washington, toxin analyses are accessible from scores of lakes in a publicly accessible website. Red means high toxin levels. Many lakes are tested in a collaborative program between Depts. of Ecology and Health

<https://www.nwtoxicalgae.org/Data.aspx>, 20 Sept, 2018

US-EPA has excellent resources to help states set up programs. <https://www.epa.gov/nutrient-policy-data/cyanobacterial-harmful-algal-blooms-water>

WA, OH and CA have strong HABs programs and are willing to help put similar systems in place for Oregon.

At the Sept. 2018 Oregon Lakes Association conference, we proposed an outline for a state-wide HABs monitoring and research program

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| Funding | "Policy Option Package" (POP) proposal; Boat license fees; Other? |
| Sampling A. Who B. Where C. How often D. What methods | <ul style="list-style-type: none"> A. Agency employees + trained volunteers B. High risk lakes always, but ALSO others; guided by satellite remote sensing C. Start when bloom is visible (earlier with Q-PCR?) D. Grab samples (surface, benthic, intake) |
| Testing A. What lab B. Who C. Who pays D. What methods are used E. Results turnaround time | <ul style="list-style-type: none"> A. DEQ/contract lab B. DEQ/contract lab employee C. Paid by funding program D. ELISA; Q-PCR for toxin & ID genes; LC MSMS; cell counts/biomass/volume E. 48 hours (72 hr for weekends) |
| Research Needs | <ul style="list-style-type: none"> A. Interlaboratory validation for methods used B. Public awareness programs C. Training programs for cyanoHAB management and mitigation D. Genetic identity (PCR genes/genomes), causes, patterns/trend interpretation, prediction E. Remote Sensing Applications for Monitoring and Mitigation |
| Requirements/Rules | OHA, DEQ, reviewed initially in 3 years-longer if needed. |
| Communication of Findings To whom, how fast | As soon as lab results done, publicly accessible website with location and date; use experience of WA state, CA, OH & Klamath KBMP monitoring |