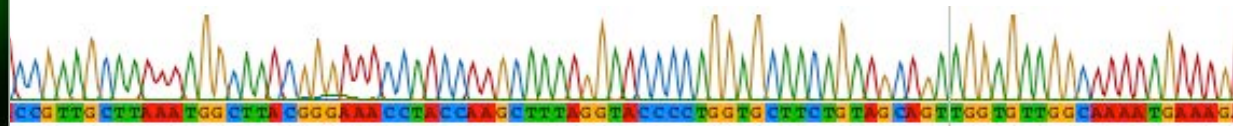


# CyanoHABs in Oregon

**Theo W. Dreher**

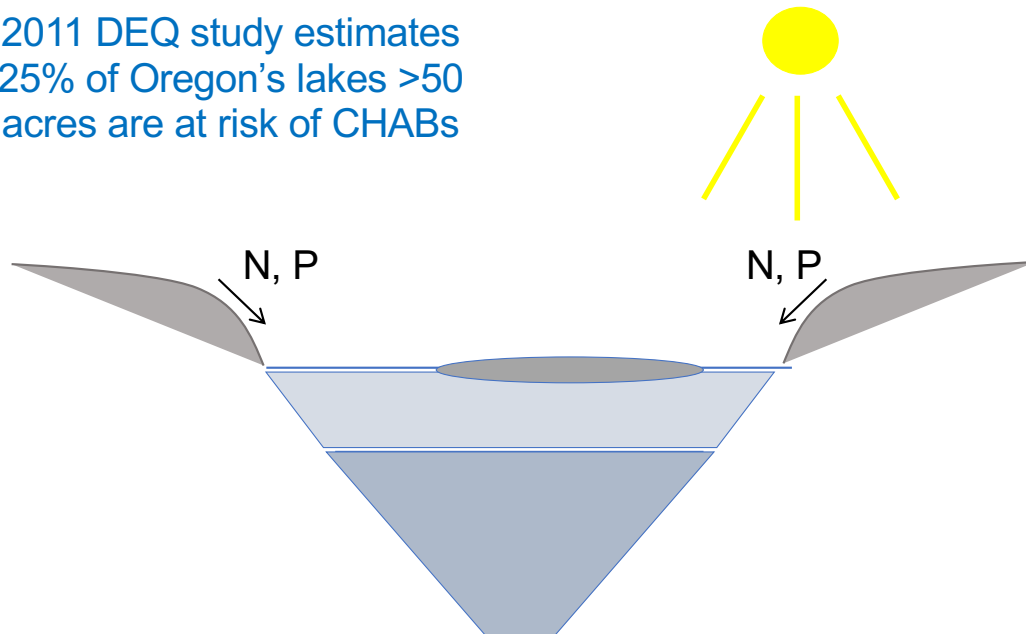
**Professor Emeritus  
Department of Microbiology  
Oregon State University, Corvallis, OR**

**President  
Oregon Lakes Association**

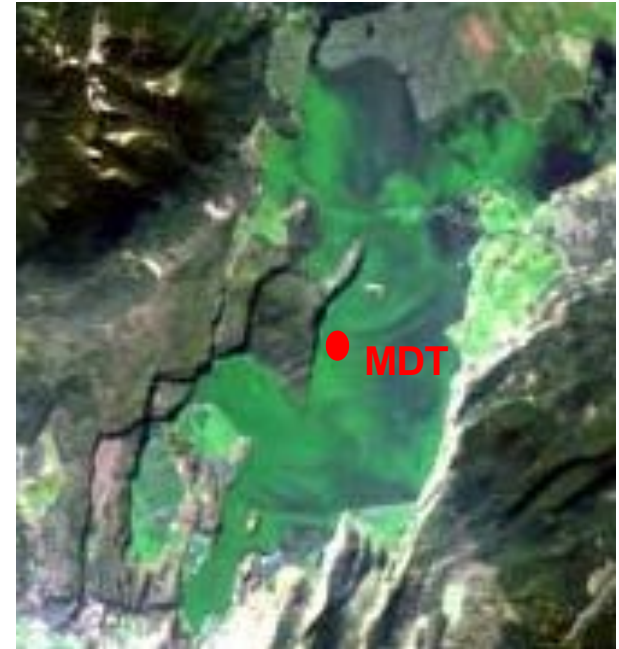


## CyanoHABs are characteristic of lakes

2011 DEQ study estimates  
25% of Oregon's lakes >50  
acres are at risk of CHABs



Replete nutrients  
Higher water temperatures  
Stratified water, high retention times  
Low zooplankton grazing pressure

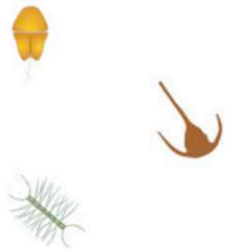


Upper Klamath Lake, 1 July, 2013  
HICO International Space Station image;  
Nick Tufillaro  
*Aphanizomenon* bloom

**..... but can be transferred 100's of km down rivers**

# Changes to water quality: climate change & post-wildfire

Fewer CyanoHABs



Temperature



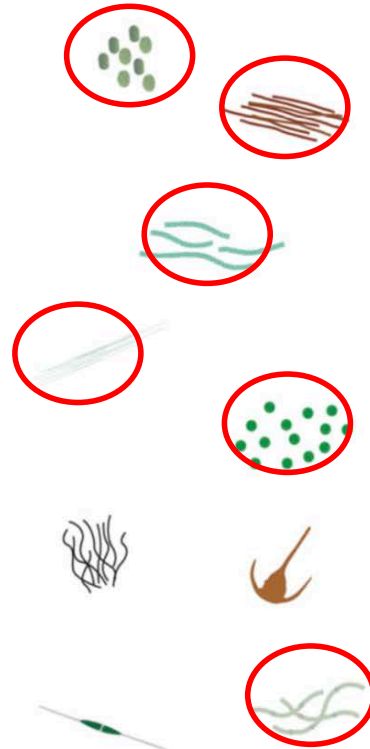
Stratification



Faster relative growth;  
longer growth season

Buoyancy advantage;  
CO<sub>2</sub> concentration,  
N, P scavenging

More CyanoHABs

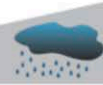


From: O'Neil et al., 2012, Harmful Algae, 14:313-334

More diatoms and  
dinoflagellates



Rainfall



Turbidity

Storms



Nutrients



Intermittency/decreased  
summer: solute concentration,  
salinity, stagnancy

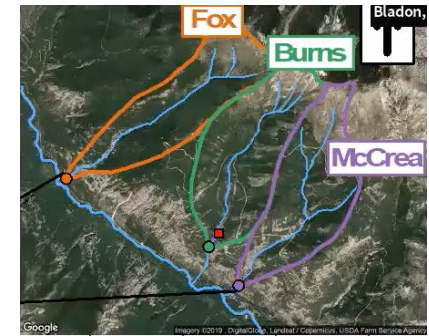
Erosivity: nutrient inflow,  
turbidity

Erosivity: nutrient inflow,  
turbidity

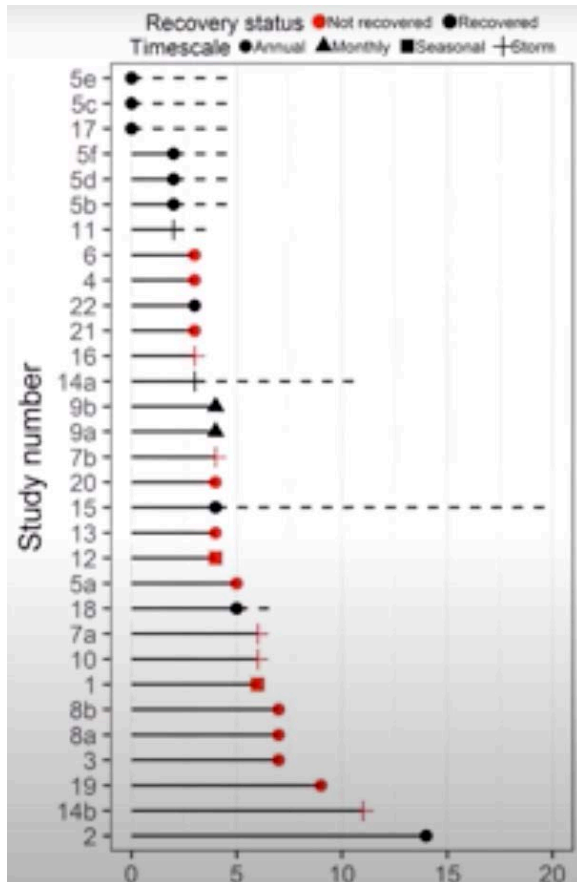
## Effects of wildfire on streams

- Increased runoff & erosion
- Increased C, N & P nutrients
- Increased sediment transfer
- Increased stream temperatures
- Increased light
- Altered in-stream invertebrate populations
- Influenced by status of burned lands
  - Fused topsoil, downed logs, replanting

**More Cyano  
HABs?**



Kevin Bladon, Coll of Forestry, OSU



**Years post-fire**

Wagenbrenner, Bladon et al., J. Hydrology, in review



## Some toxic CyanoHABs in Oregon: *Dolichospermum*

