Exploring Drivers of Cold oligotrophic lake algal blooms and forecasting them

Brainstorm team
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Can we forecast WHERE blooms are likely to happen?

What are the environmental drivers that encourage blooms?

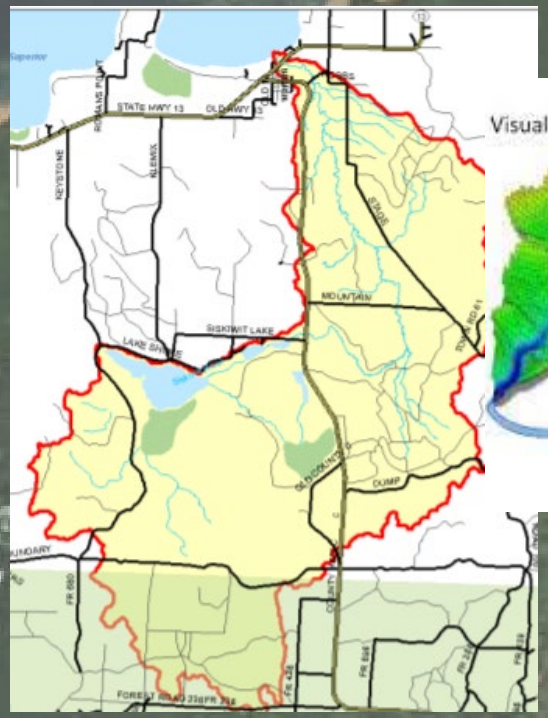
Toxin production?

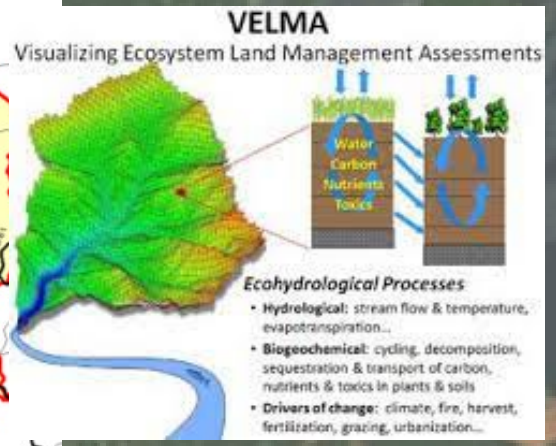
What does climate change mean for bloom management/mitigation?

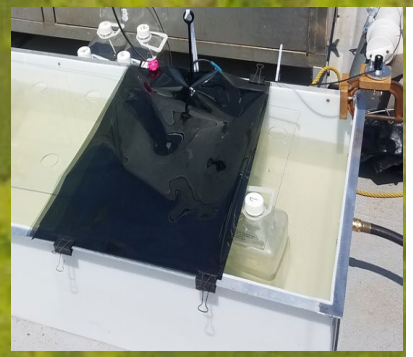
What watershed approaches can be taken to reduce bloom risk?

How might our sense of place change in the face of HABs? What does it mean for community subsistence?

USEPA Great Lakes Toxicology and Ecology Division lead research





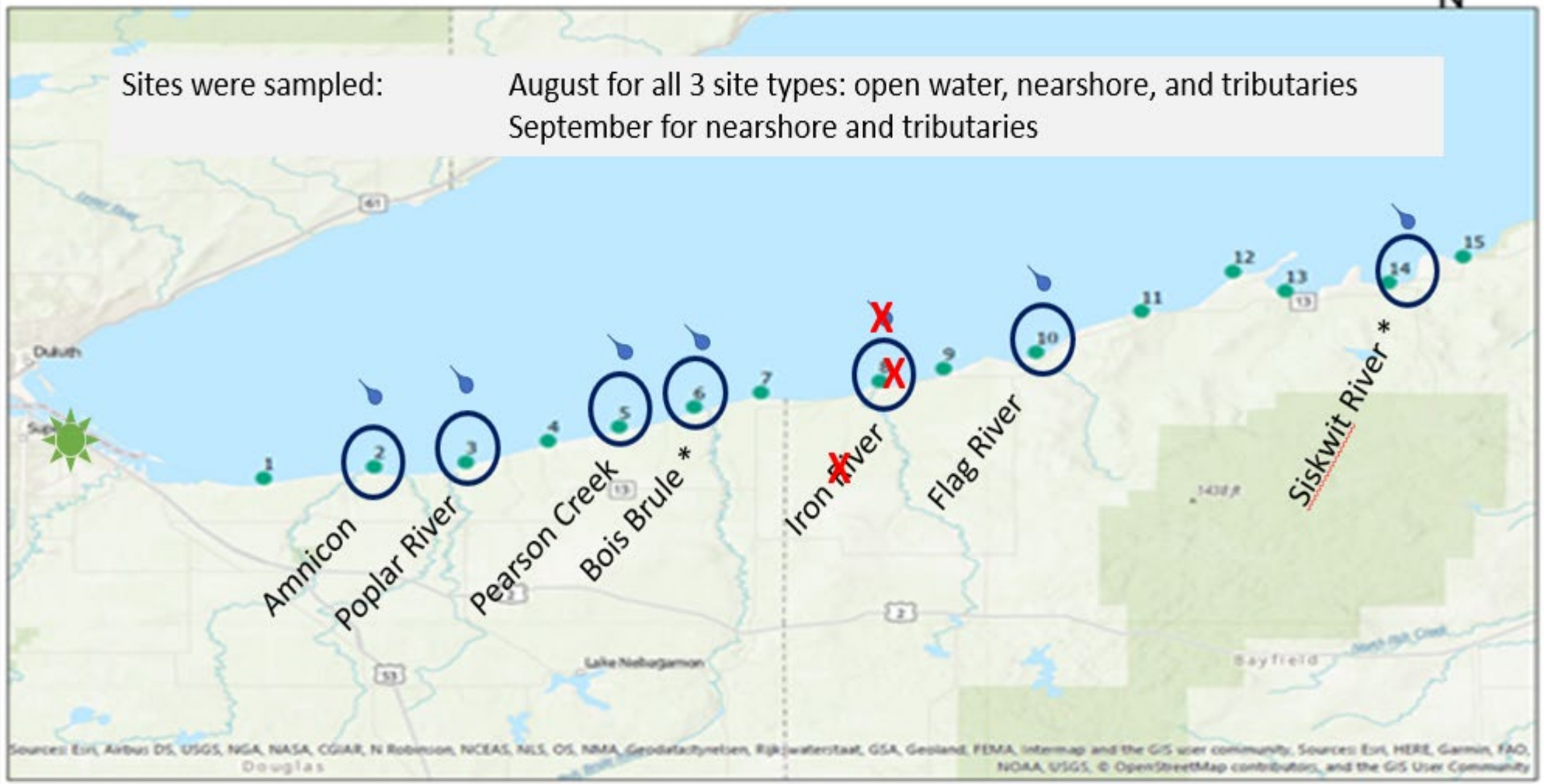


2021 WDNR CSMI Sampling

Thank you to WiDNR for sampling the nearshore for us

Sites were sampled:

August for all 3 site types: open water, nearshore, and tributaries
September for nearshore and tributaries



Sites are along 5m contour, will be sampled every two weeks from Mid-June till Mid-September WiDNR

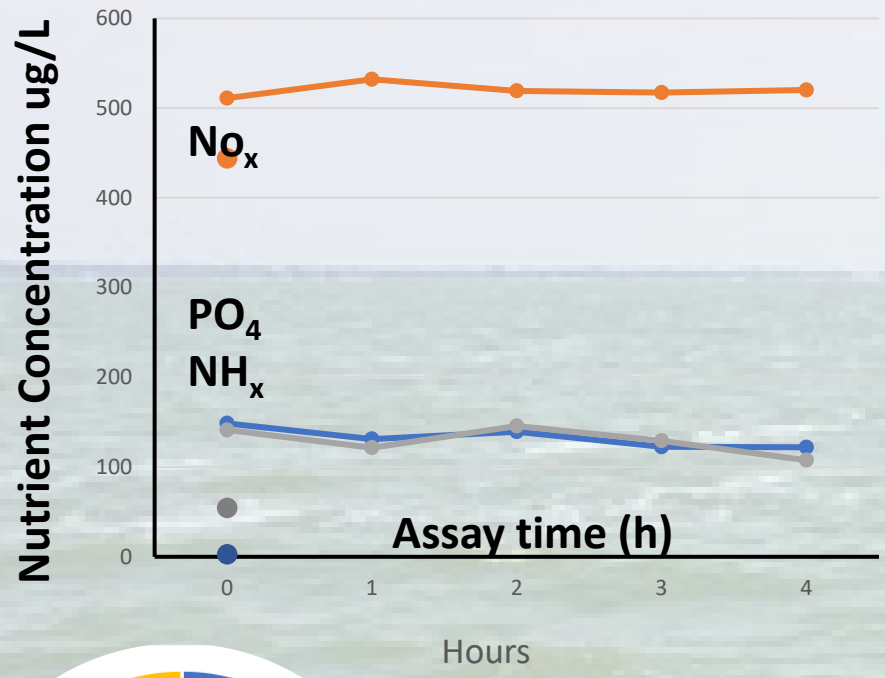
USEPA community dynamics study

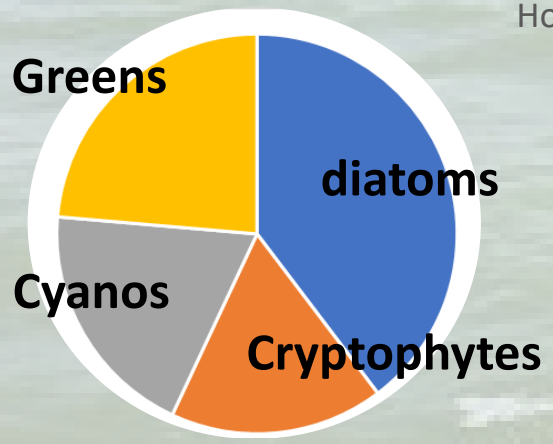
Open water sites (LEII)

USEPA NUA nearshore sites

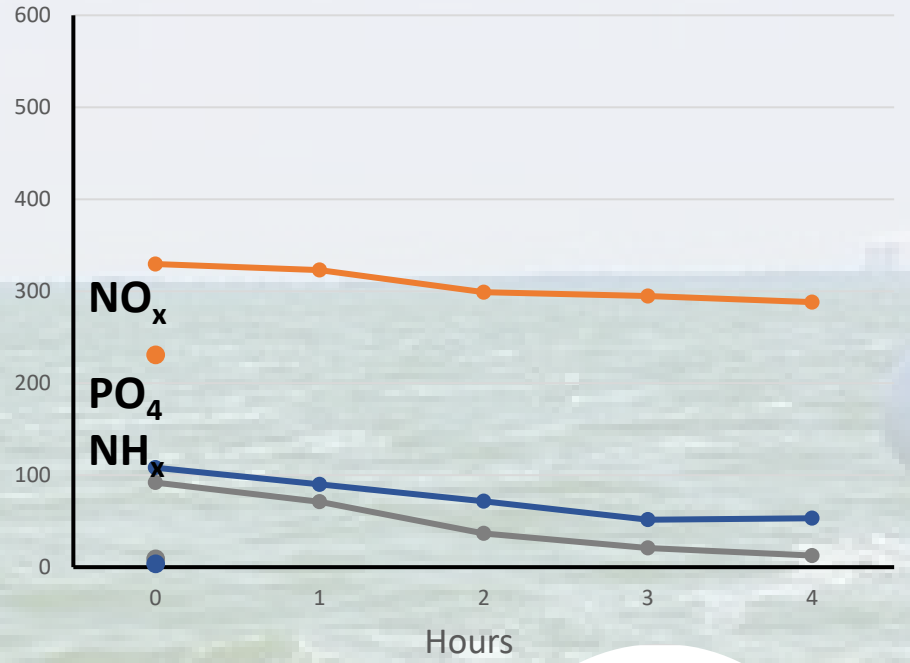
Nutrient uptake dynamics in Lake Erie (CSMI 2019)

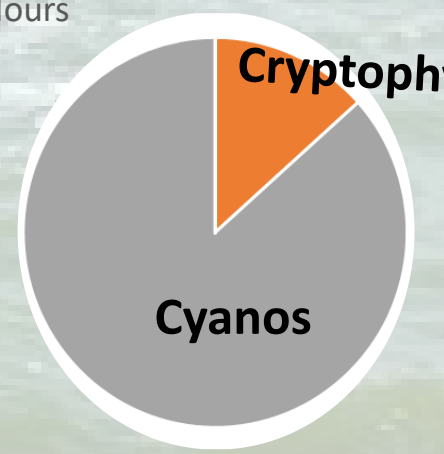
Low Chl a (2.6 ug/L)





High Chl a (40 ug/L)





Nutrient uptake assays show minimal nutrient uptake in low Chlorophyll a sites, while high Chlorophyll a sites show Ammonium and Phosphate as the preferred nutrients, possibly co-limiting.

N:P uptake ratios to infer optimal conditions for HABS Lake Superior tributaries to open lake

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- Understanding of nutrient stoichiometry necessary to support HABs, HABs ecology.
- Conduct nutrient uptake assays in the Great Lakes: Erie, Michigan, & Superior in areas where HABs are probable.
- Methodology for understanding nutrient dynamics in large lakes.
- Understanding of the underlying nutrient requirements for HAB to better target nutrient reduction practices.