Harmful Algal Blooms

Hamzah D Ansari

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Method

Discussion

Conclusion

Harmful Algal Blooms

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October 22, 2018

Outline

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- Increase in primary productivity and growth of microspopic algae and cyanobacteria
- Toxin-producing genera
- Decrease biodiversity
- Anoxic environment



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Irritant

- Lipolysacharides
- Toxins
 - Microcystin and nodularin
 - Cylindrospermopsin
 - Anatoxin¹
 - Saxitoxin²

¹Meyer et al., "Prerequisites of Isopeptide Bond Formation in Microcystin Biosynthesis".

²Fontanillo et al., "Synthesis of Highly Selective Submicromolar Microcystin-Based Inhibitors of Protein Phosphatase (PP)2A over PP1".

Law and Regulation

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- Safe Drinking Water Act³
- Maximum Contaminant Level⁴
 - Regulated and enforced
- Contaminant Candidate List
 - "More like guidelines"

³Davis et al., "Phylogenies of Microcystin-Producing Cyanobacteria in the Lower Laurentian Great Lakes Suggest Extensive Genetic Connectivity".

⁴Janda and Abbott, "16S rRNA Gene Sequencing for Bacterial

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Surveyed Lakes

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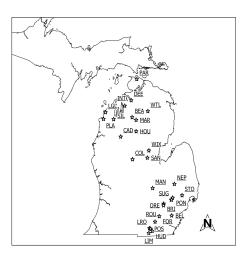
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Water Sampling

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Sampled each lake once a month

- Collected water
- Quickly transported back
- Analyzed ASAP

Nutrient Analysis

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LC-MS/MS

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Could we predict HABs?

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Acknowledgment

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Reference

- My lab partners Brian Spies and Andrew Herrpich
- Jason Sckrabulis, Ryan Mcwhinnie, Melissa Ostrowski
- Dr. David Szlag and Dr. Thomas Raffel
- Michigan Department Environmental Quality
- Oakland University and the Chemistry Department

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