

Harmful Algal Blooms

Hamzah D. Ansari

Oakland University

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Outline

Harmful Algal
Blooms

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Introduction

References

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References

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

^aTest

Toxicity

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- Irritant
 - Lipolysacharides¹
- Toxins
 - Microcystin and nodularin ¹
 - Cylindrospermopsin²
 - Anatoxin³
 - Saxitoxin ¹

¹Moore, Richard and Ohtani, Ikuko, "Cyanobacterial Toxins".

²Dittmann, Fewer, and Neilan, "Cyanobacterial toxins".

³Codd et al., "Cyanobacterial toxins, exposure routes and human health"

Exposure Route

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- Direct contact
- Aerosols
- Ingestion
 - Seafood/Fish
 - Drinking water
 - Algal supplements

Law and Regulation

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- Safe Drinking Water Act
- Maximum Contaminant Level
 - Regulated and enforced
- Contaminant Candidate List
 - “More like guidelines”

Objectives

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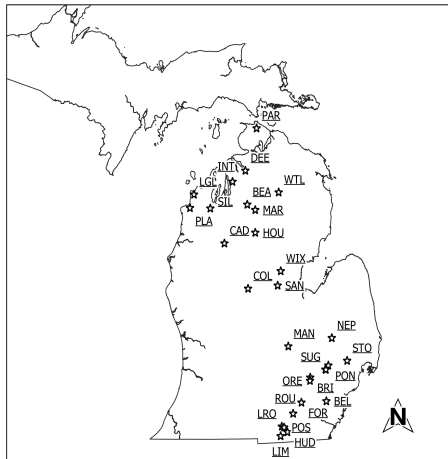
Surveyed Lakes

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Methods

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Water Sampling

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- Sampled each lake once a month
- Collected water
- Quickly transported back
- Analyzed ASAP

Analysis

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Coloremetric

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■ jflsd

- Freeze/Thaw
- Filter

SPATT

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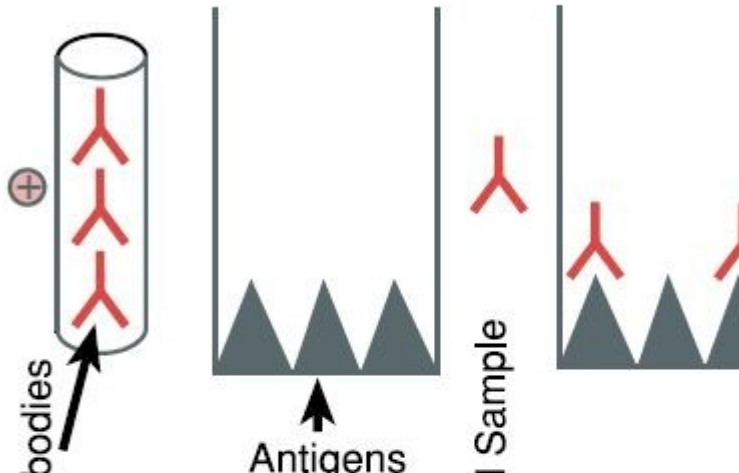
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- Solid phase adsorbent toxin tracking
- Similar to the stationary phase

ELISA

- Enzyme-linked immunosorbent assay



Geospatial Analysis

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Results

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Could we predict HABs?

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Acknowledgment

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References

- 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

References I

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- Dittmann, Elke, David Fewer, and Brett Neilan. "Cyanobacterial toxins: Biosynthetic routes and evolutionary roots". In: *FEMS microbiology reviews* 37 (Sept. 2012). DOI: 10.1111/1574-6976.12000.
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