Toxins - Lyngbya

Lyngbya Toxin Production

- Multiple types impacting skin
- Six known neurotoxins produced directly by lyngbya:
- ***Connection between environmental growth factors and toxin production is unclear***

Toxins - Lyngbya

Lyngbya Toxin Production

- Multiple types impacting skin
- Six known neurotoxins produced directly by lyngbya:
- Connection between environmental growth factors and toxin production is unclear

- ***Ongoing Research:***
  - **Environmental conditions can cause toxins to degrade and create other toxin forms**
    - **These products are about 4 times more toxic**

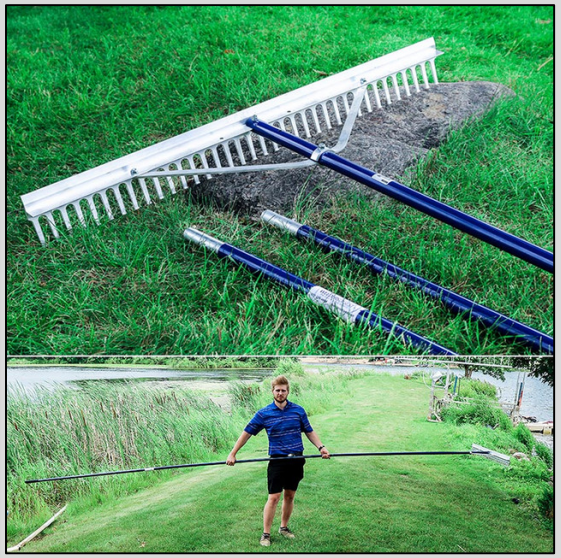
Toxins - Lyngbya

Lyngbya Toxin Production

Concerns

- Products of *L. wollei* toxins degradation
  - Drying out benthic mats
  - Increased toxicity upon reintroduction into water column and potentially inhalation

- Don't Rake the Lake!
  - Only temporary relief
  - Increased toxin exposure



Toxins - Lyngbya

Lyngbya Toxin Production

Concerns

- Chronic exposure through drinking water and long-term public health
- Changing environmental factors related to climate change could impact lyngbya toxin production
  - Water temperatures and pH
- Compounding effects of multiple lyngbya toxins release simultaneously.

Toxins - Lyngbya

Lyngbya Toxin Production

Concerns

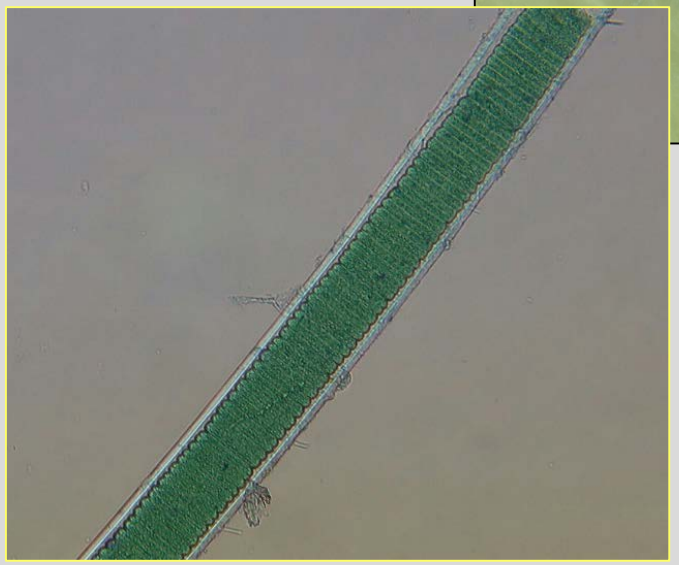
- ***What does that mean for Lake Gaston??***
- ***Is Lake Gaston lyngbya producing toxins??***

Toxins - Lyngbya

Lyngbya Toxin Production

NCSU / ODU Pilot Study

- Old Dominion University's (ODU) Phytoplankton Analysis Laboratory
- Pilot study so scope was small

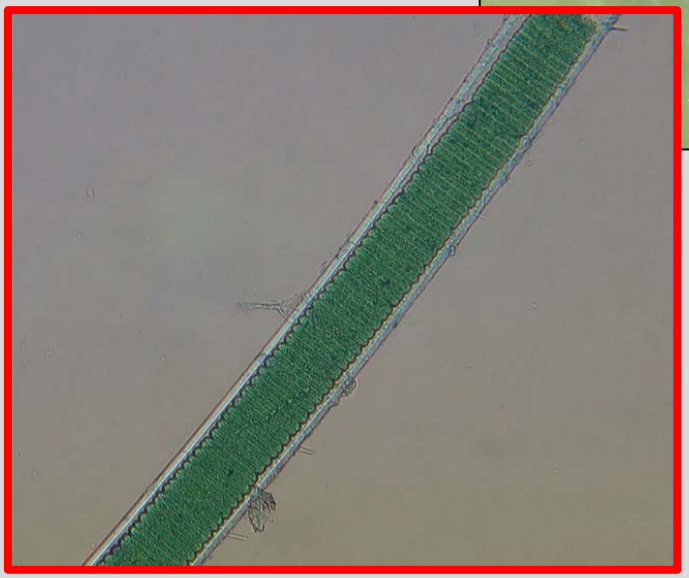


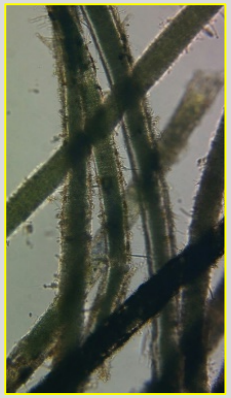
Toxins - Lyngbya

Lyngbya Toxin Production

NCSU / ODU Pilot Study

- April 2021
  - Collection of mat material
  - Run for toxins
    - Saxitoxin-a
    - Cylindrospermopsin
  - Positive detections for both
    - Mat material is ground up
    - Intercellular toxins



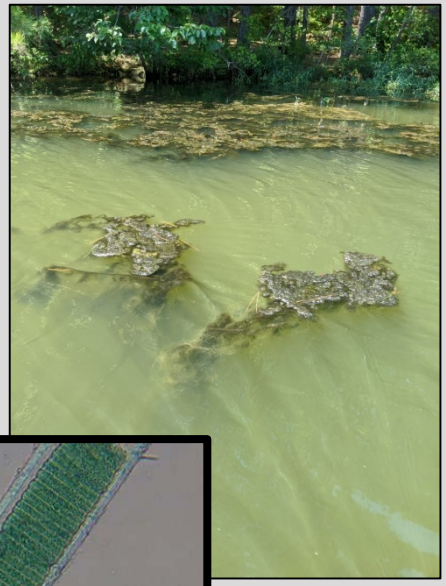


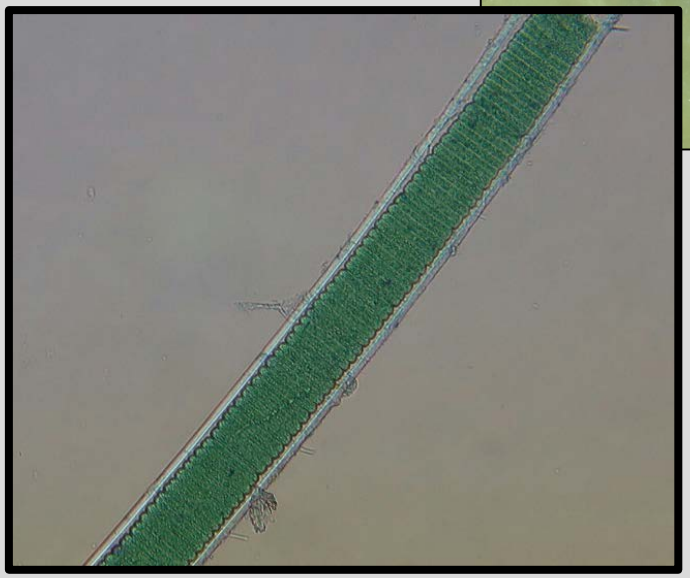
Toxins - Lyngbya

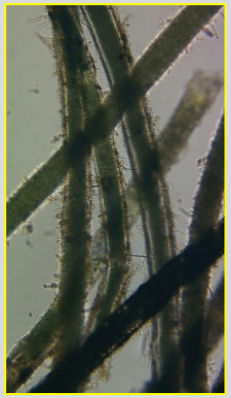
Lyngbya Toxin Production

NCSU / ODU Pilot Study

- April 2021
  - Collection of mat material
  - Run for toxins
    - Saxitoxin-a
    - Cylindrospermopsin
  - Positive detections for both
    - Intercellular toxins
    - Ambient toxins??







Toxins - Lyngbya

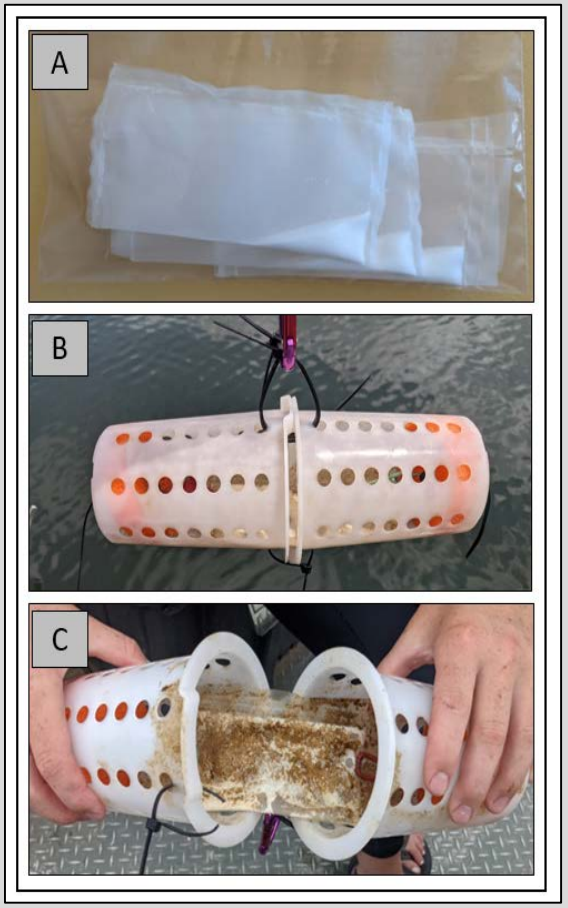
Lyngbya Toxin Production

NCSU / ODU Pilot Study

- **June 2021**
  - **Deployment of SPATTS**
    - **Solid Phase Adsorption Toxin Tracking**

  SPATTS

  - **Developed as a cost-effective way to monitor toxic algal blooms in New Zealand**
  - **Deploys a synthetic resin with the ability to adsorb toxins directly from the water column**



Toxins - Lyngbya

Lyngbya Toxin Production

NCSU / ODU Pilot Study

- June 2021
  - Deployment of SPATTS
    - Solid Phase Adsorption Toxin Tracking

  SPATTS

  - Can tell you presence, but NOT concentration!

  - This study didn't test for individual *L. wollei* toxins
    - Just tested for Saxitoxin-a