

Blue-green algal blooms on Lake Simcoe

Town of Georgina Council

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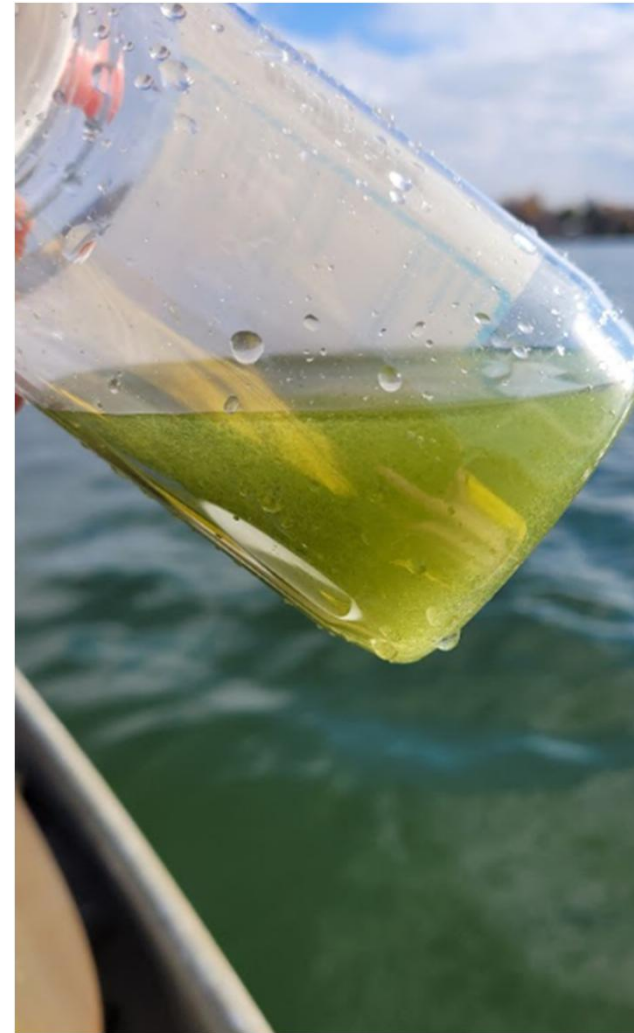


Lake Simcoe Region
conservation authority



Blue-green algae (Cyanobacteria)

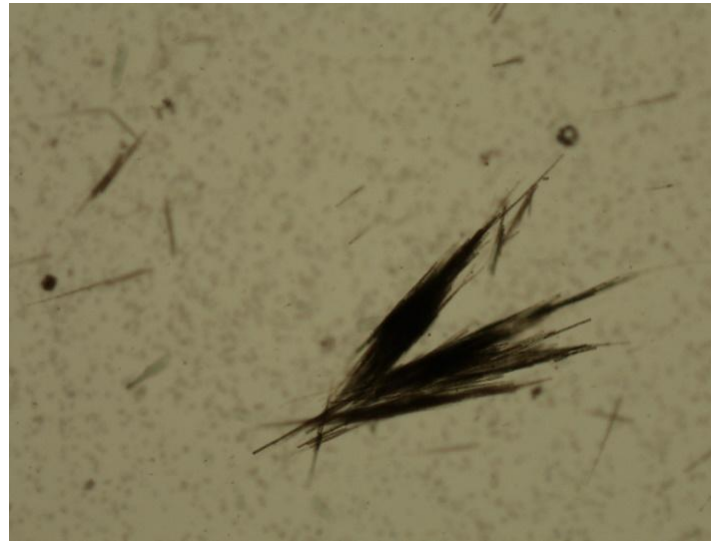
- First photosynthetic organisms: 3.5 billion years!
- Can survive tough environmental conditions – make their own nutrients
- Part of natural phytoplankton / algae cycle: increase in late summer / early fall
- Can form blooms: rapid population increase w/ surface scums
- Blooms are becoming more common in Ontario, often in low nutrient lakes
- Probable causes:
 - Ø Wet spring (nutrient inputs?)
 - Ø Hot summer
 - Ø Strong wind to mix water column
- But there are also “cold blooms” and now blooms in low nutrient lakes



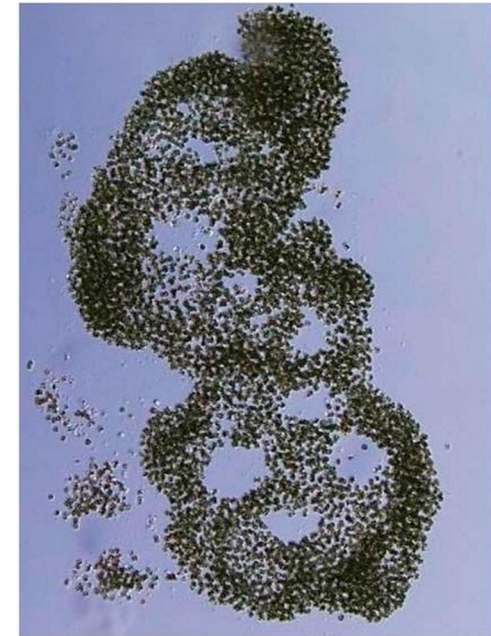
Cyanobacteria: "Annie, Fannie, & Mike"



Anabaena
(*Dolichospermum*)
"string of pearls"



Aphanizomenon
"sheaves of wheat"



Microcystis
mass of cells
(often central holes)

Blue-green blooms are tricky!

- Not always “blue-green” - brightest colour when bloom is ending
- Water often just looks turbid / cloudy and greenish-brown
- Best seen in morning / evening, vanish at noon
 - Control buoyancy (up to 11 metres)
- Not all blue-greens form blooms, not all blooms have toxins
- Toxins: liver, nerves, skin irritation
 - Children and pets especially vulnerable
 - Also present in aerosols

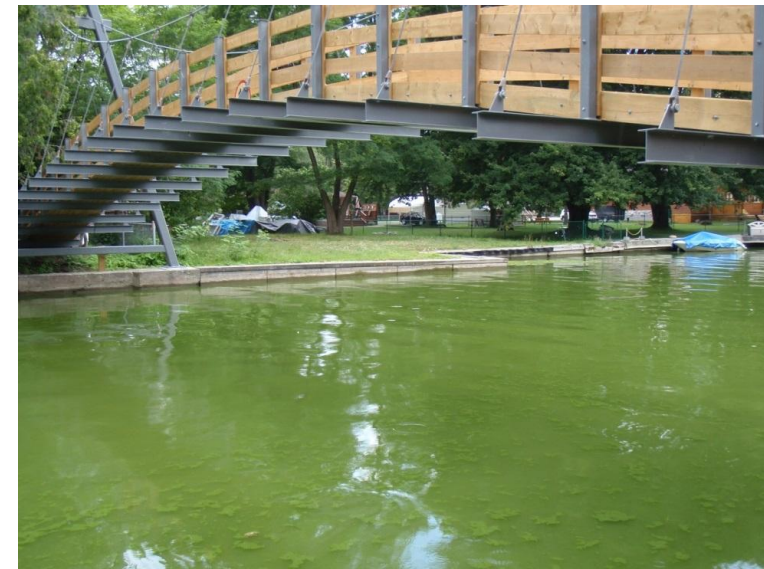


Photos: Wisconsin Department of Natural Resources

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Blue-greens and Lake Simcoe

- Some reports of “blooms” from 1970s
- Since 2008: Localized small surface scums at some shorelines
 - Blooms at inland lakes: Musselman (2007, 2013, 2023) and Wagner (2019); also Lake Wilcox
 - Bloom at Lagoon City (2013) - probably linked to aquatic herbicide application
- Conservation Authority Harmful Algal Bloom monitoring and surveillance (2016): Monitor for precursor conditions, alert Ministry of the Environment, Conservation and Parks (Ministry)/ partners
- Blooms are a threat to recreation, reputation, and drinking water supply

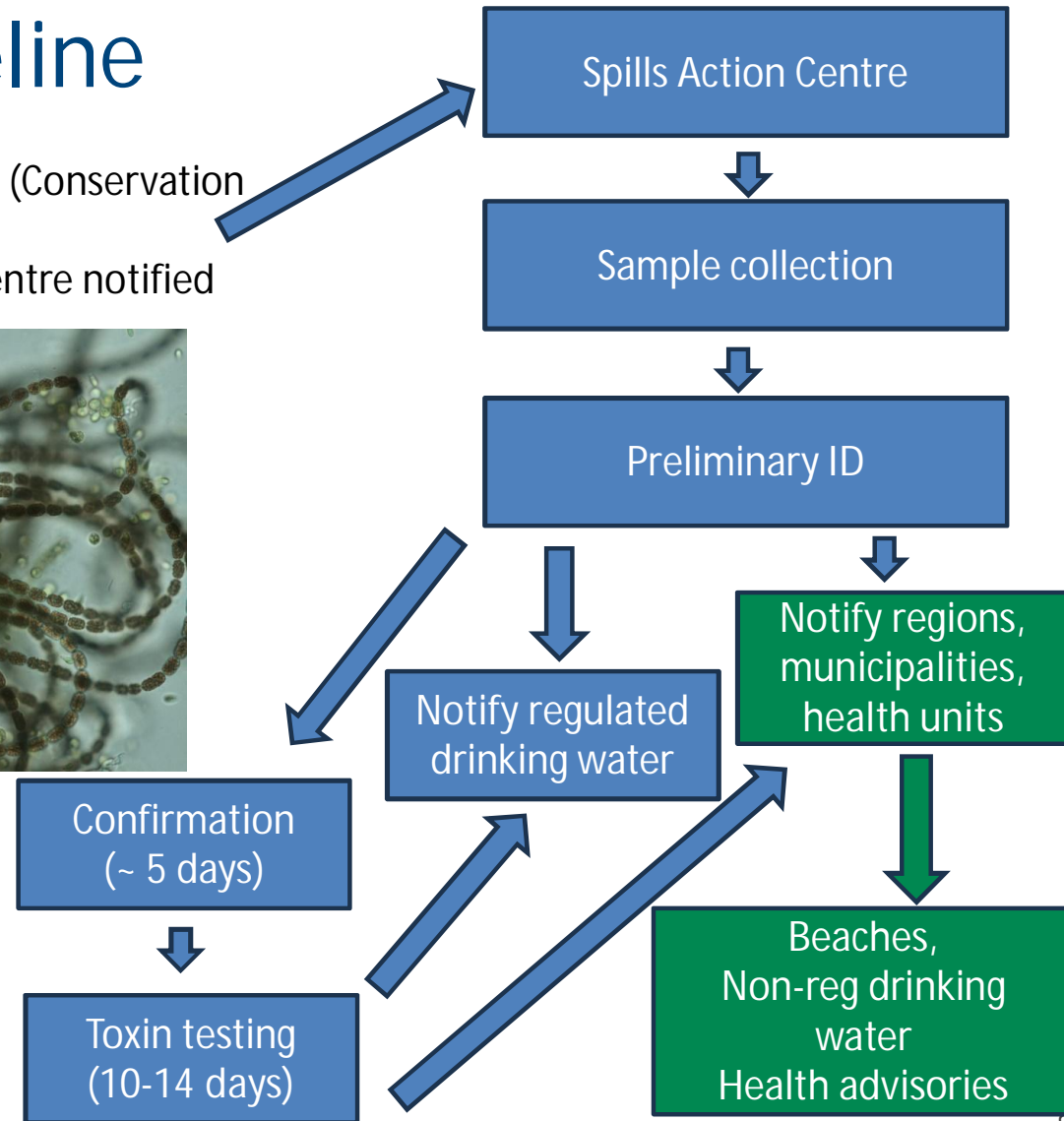


2024 Blue-green bloom timeline

Tuesday
2 July

- Identified as blue-green (Conservation Authority)
- Ministry Spills Action Centre notified

Hawkestone wharf



2024 Blue-green bloom timeline

Wednesday
3 July



Conservation Authority Rapid Toxin test:

- Microcystins negative
- Anatoxin present



- Re-visit Hawkestone, coastal surveillance
- Interviewed locals
- Bloom stretched from Oro 5th Line to Hawkestone
- Conservation Authority notifies local partners

2024 Blue-green bloom timeline

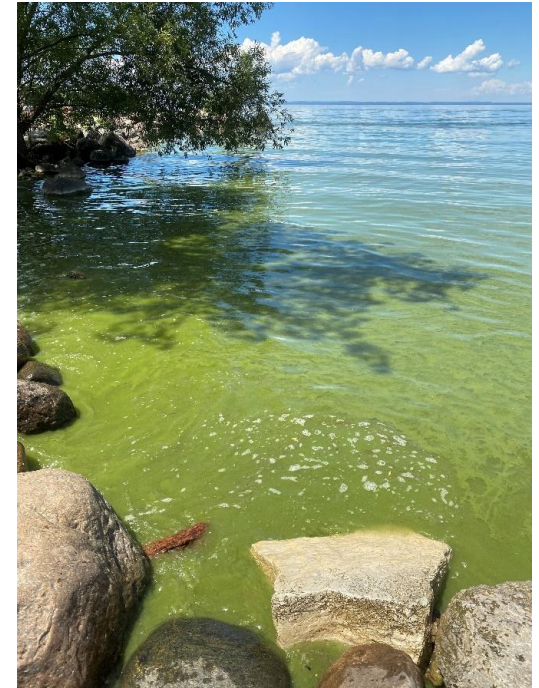
Friday
5 July



- Surface scums offshore in main basin
- Additional lab identification



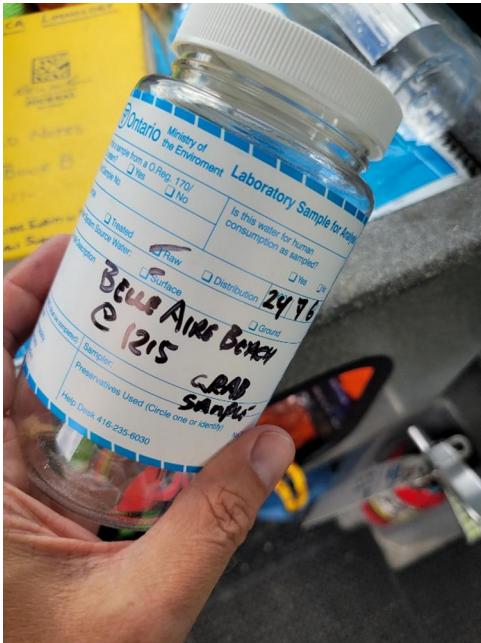
- Algal layer observed to 4 metre depth



- De la Salle Park / Roches Point
- Updated Ministry Spills Action Centre
- Updated partners

2024 Blue-green bloom timeline

Saturday
6 July



- Belle Ewart / Innisfil beaches
- Samples collected for the Ministry



- Sampling, monitoring
- Outreach to lake users and partners

2024 Blue-green bloom timeline

Sunday
7 July



Monday
8 July



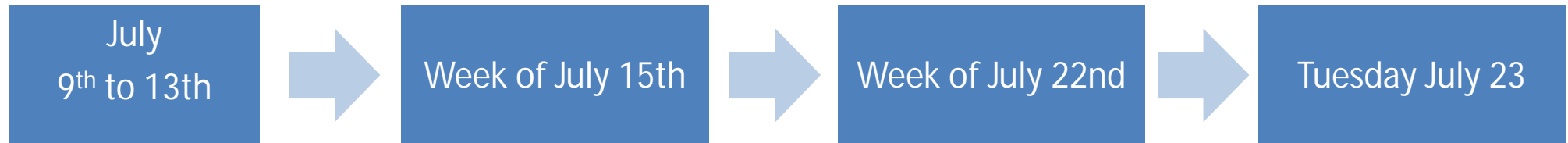
- Beach postings



- Roches Point



2024 Blue-green bloom timeline

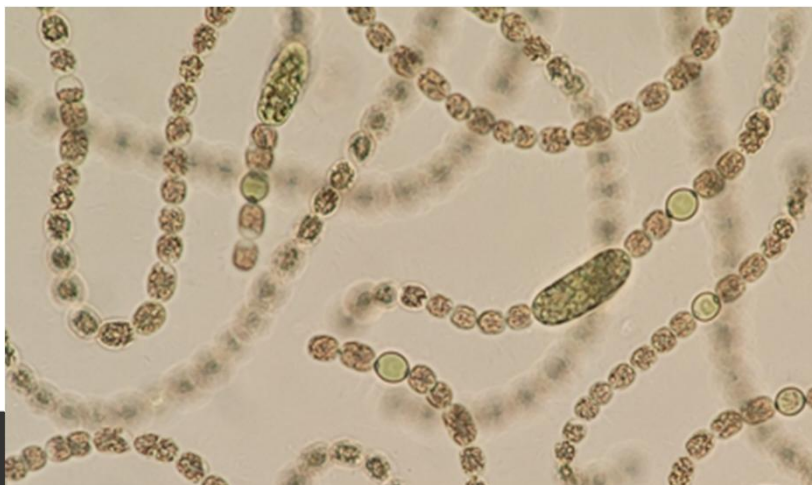


- Ongoing lake-wide surveillance, monitoring, and outreach

- Monday / Friday on lake
- Algae community changing
- Water clarity improving
- Did bloom settle to bottom?

- Ongoing lake-wide surveillance
- Lake-wide plant survey
- Health units re-open beaches

- Bloom reported at Holmes Point
- Conservation Authority on scene 1 hour later
- Samples collected
- Shoreline: non-toxic algae
- Offshore out to Thorah Is: *Anabaena* and *Microcystis*



2024 Blue-green bloom timeline

- On-going (often daily) updates to the Ministry and York Region
- Lake-wide monitoring for bloom conditions
- Current:
 - Water transparency is near normal
 - Seasonal algae dominant
 - Relatively high blue-green pigments near bottom
- But:
 - Lake whiting event underway (false reports)
 - Warmest / least windy months are ahead of us



2024 Water soldier

- Reported to the Ministry of Natural Resources along southern Cook's Bay
- Conservation Authority finds large population at golf course

