Cyanobacteria Blooms in Lake Champlain

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Problem: Blooms are creating toxic conditions for humans and the environment.

What is cyanobacteria?

- A blue-green algae formed in freshwater.
- It can release toxins known as cyanotoxins. This release occurs when they break down and die.
- It is harmful to native plant and animal species, and dangerous to humans and pets.
- Blooms occur from mid to late summer.

What causes cyanobacteria blooms?

- Cyanobacteria are limited by nutrients such as nitrogen and phosphorous.
- When excess nutrients are added to freshwater bodies, cyanobacteria multiplies exponentially, creating a bloom.
- Phosphorus is the limiting nutrient in Lake Champlain. Human input of phosphorus is leading to an increase in blooms.

Effects of cyanobacteria

- Toxins are detrimental to human and animal health
  - Dogs that swim in cyanobacteria heavy water can die
  - Symptoms: loss of energy, vomiting, diarrhea, drooling
- Negative economic impacts:
  - Decrease in tourism
  - Decrease in fishing

A positive feedback loop

- The bacteria forms a thick layer on top of the water and prevents sunlight from entering.
- The layer on top blocks photosynthesis, which leads to plants dying.
- Decomposers use all the dissolved oxygen in the water while breaking the dead plants down.
- The lack of oxygen then kills the fish and creates a dead zone.

How do we fix this problem?

- Riparian buffers along shorelines soak up excess phosphorus before it pollutes the lake.
- Increasing the amount of permeable surfaces allows phosphorus to seep into the ground before entering water bodies.
- Using less fertilizer and better irrigation methods reduces phosphorus runoff.

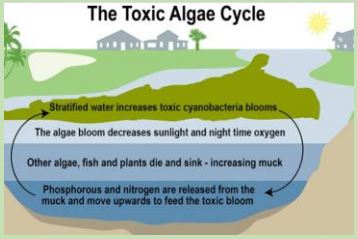
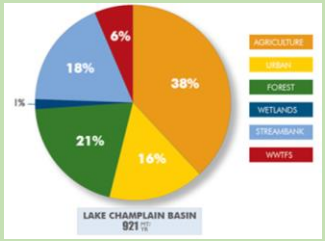


Image representation of the Toxic Algae Cycle



Types of land activities phosphorus in Lake Champlain comes from

Sources:
https://www.healthvermont.gov/tracking/cyanobacteria-tracker
https://atlas.lcbp.org/issues-in-the-basin/phosphorus/phosphorus-sources/
https://www.youtube.com/watch?v=mLbDbmmV6Qc
https://ahs-vt.maps.arcgis.com/apps/webappviewer/index.html?id=a46d42c05e864a198ab