

Harmful Algae Impacts the Coast of Florida



What is *Lyngbya*?

Lyngbya is a filamentous cyanobacteria (blue-green algae) that grows in tropical and sub-tropical waters.

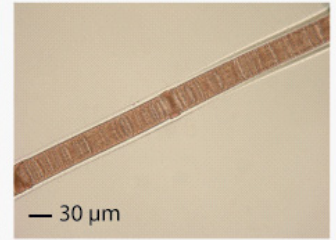
- *Lyngbya* are diverse in color, genetics, and chemical composition.
- There is a much greater diversity of *Lyngbya* species present in southern Florida than previously recognized.
- Waters rich in nitrogen (N), phosphorus (P), and bioavailable iron can lead to increased growth and productivity.
- *Lyngbya* produce “secondary metabolites” that can act as feeding deterrents to fish, crabs, and other animals. They also give *Lyngbya* a competitive advantage and can sometimes cause skin irritation and asthma-like symptoms.

A. *In situ*

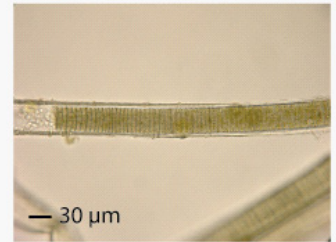
B. Microscopic



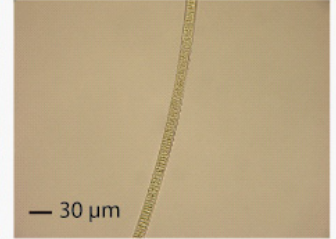
Lyngbya polychroa (A)



Lyngbya polychroa (B)

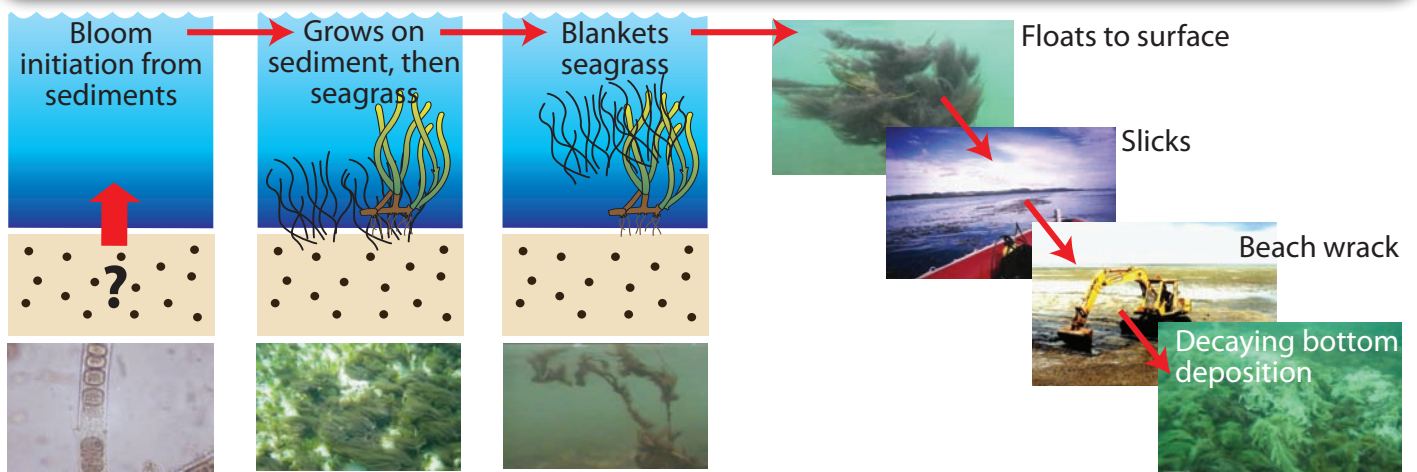


Lyngbya confervoides



What are Harmful Algal Blooms (HABs)?

HABs are algal species that can form large blooms, which can have adverse effects on either human or ecosystem health. HABs have increased in abundance and severity around the world in recent decades, especially cyanobacteria.



Bloom cycle and bloom fate: Nutrients from sediments and land inputs increase coastal algal growth, which can float and accumulate on beaches and foul recreational areas. “Secondary metabolites” or toxins can also potentially be released into the environment

What is happening in Florida?

Harmful algal blooms have become increasingly problematic in the nearshore waters of Florida, and it has been suggested that this may be the result of nutrient enrichment resulting from highly developed coastal habitats.

1. Sebastian Inlet
 2. Indian River Lagoon
 3. Jensen Beach
 4. Lake Worth Lagoon
 5. Hillsboro Inlet
 6. Port Everglades Inlet
 7. Dania Beach
 8. Hollywood Beach
 9. Biscayne Bay
 10. Long Key
 11. Big Pine Shoals
 12. Kemp's Channel
 13. American Shoals
 14. Dry Tortugas
 15. Sanibel Island
 16. Tampa Bay
- ★ Bioassay study site

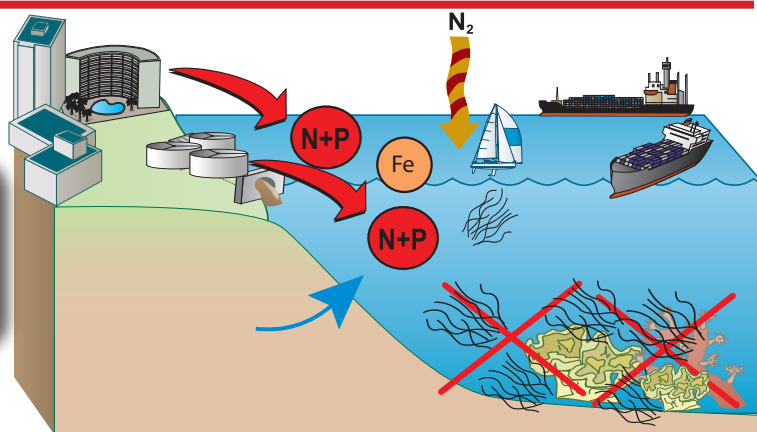


- Blooms of *Lyngbya* have been documented on the hard-bottom reefs of Broward County and on the seagrass beds of the Pine Island Sound area of Sanibel Island.
- *Lyngbya* blooms can overgrow seagrass or coral reefs and smother other benthic organisms.
- In Australia, *Lyngbya* bloom growth has been linked to external nutrient inputs of N, P, and biologically-available iron.

What factors cause this toxic algae to bloom?

Changes in temperature and increases or pulses in a nutrient source such as nitrogen (N) and/or phosphorus (P) cause algae to bloom.

- Increased human population in a watershed inherently causes increases in nutrients due to sewage, septic systems, agricultural fields, and fertilized lawns.
- An increase in paved surfaces, such as roads and other human development that doesn't allow for the filtering effect of vegetation, this can increase input of sediment and nutrients such as N and P to coastal waters.
- Nutrients enter the marine environment by way of drainage ditches, groundwater, streams, rivers, and runoff from storm events.



The coastal environments adjacent to Fort Lauderdale and Dania Beach, Florida, are also experiencing intense blooms of *Lyngbya polychroa*. This N-fixing cyanobacteria is responding to coastal inputs of iron (Fe), N, and P from sewage outfalls, wastewater, development, and groundwater. In addition to their toxicity, these blooms are causing adverse conditions for nearby coral reefs.



Coastal development continues to increase in Florida.



Lyngbya blooms often wash up on shore, as seen in Tampa Bay.

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