Macroalgae Blooms in Charlotte Harbor

WATER QUALITY IMPROVEMENT

Summary

Macroalgae are aquatic plants that use sunlight and nutrient in the water to survive. They are components of healthy Florida ecosystems and some amounts of macroalgae are natural in our estuaries. However, excessive blooms can have harmful effects on Florida's ecosystems and economy.

Blooms are occurring across the state and globally at an increasing frequency. Macroalgae are typically classified into three groups – red, green, and brown algae. They can detach from the bottom and float along the water and are often called "drift algae".

Contributing Factors

Nutrient pollution is the primary contributing factor to algae blooms and is a widespread problem in Florida. High nutrient levels (nitrogen and phosphorus) can stimulate excessive algae growth, causing more frequent and/or more severe algae blooms.

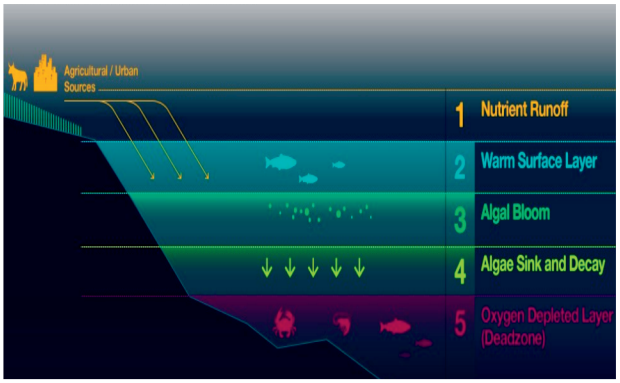
Sources of nutrient pollution include:

- Agricultural, industrial, mining, and urban stormwater runoff, fertilizer runoff from lawns and golf courses.
- Development and loss of wetlands leads to high flow volumes that carry nutrients into waters.
- Improperly constructed, placed, or maintained septics can leach nutrients and bacteria into groundwater and indirectly to surface waters. Ageing wastewater infrastructure can discharge high amounts of nutrient-rich water.

Impacts to the Ecosystem

Both plants and animals in a bay need oxygen to survive, and the seagrasses which provide food and cover for bay creatures need light for photosynthesis. Macroalgae blooms can:

- Decrease oxygen levels in the water so they are too low to support fish and shellfish.
- When algae decays it can smother and trap nutrients in the sediment causing sediment to become mucky.
- Large blooms may shade seagrass meadows, which also need light to grow.



Impacts to the Economy

Recreational and tourist-based industries depend on clean and clear water as well as healthy beaches and drive a significant portion of Florida's economy, they are especially vulnerable to impacts from blooms. The economic costs include losses in tourism and recreational revenue, decreased property values, fisheries and shellfisheries closures, as well as the cost of managing these impacts (cleaning beaches and monitoring).

COASTAL & HEARTLAND NATIONAL ESTUARY PARTNERSHIP

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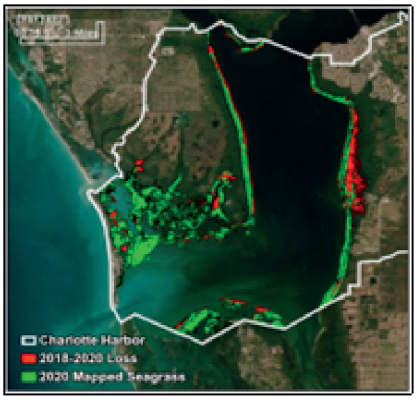
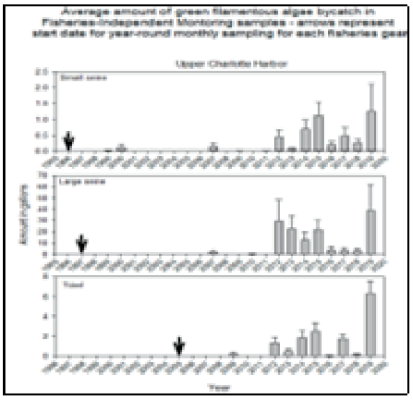
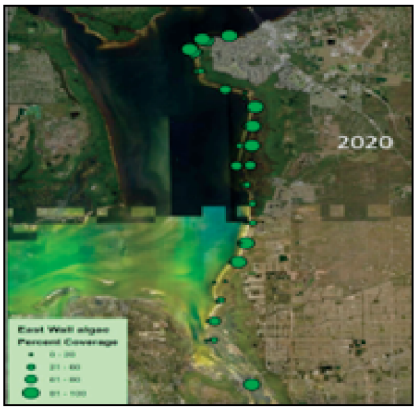
Blooms are occurring at an increasing frequency in Charlotte Harbor and surrounding estuaries. FL Fish & Wildlife Fisheries Independent Monitoring (FIM) scientists have collected data Charlotte Harbor since 1989. This historical data shows that large algae blooms were not seen in the Harbor until around 2012 (top right). Since then, multiple green algae blooms have occurred at 'hot spots' in the region. Following Hurricane Irma and an extended red tide bloom, another massive bloom of algae occurred in parts of Charlotte Harbor. The maps on the lower right illustrate the percent coverage of macroalgae found by scientists along the East Wall in January 2020 and again in January 2021.

Seagrass meadows along the Harbor's East Wall appear to have been severely damaged due in part to the bloom event (top left).

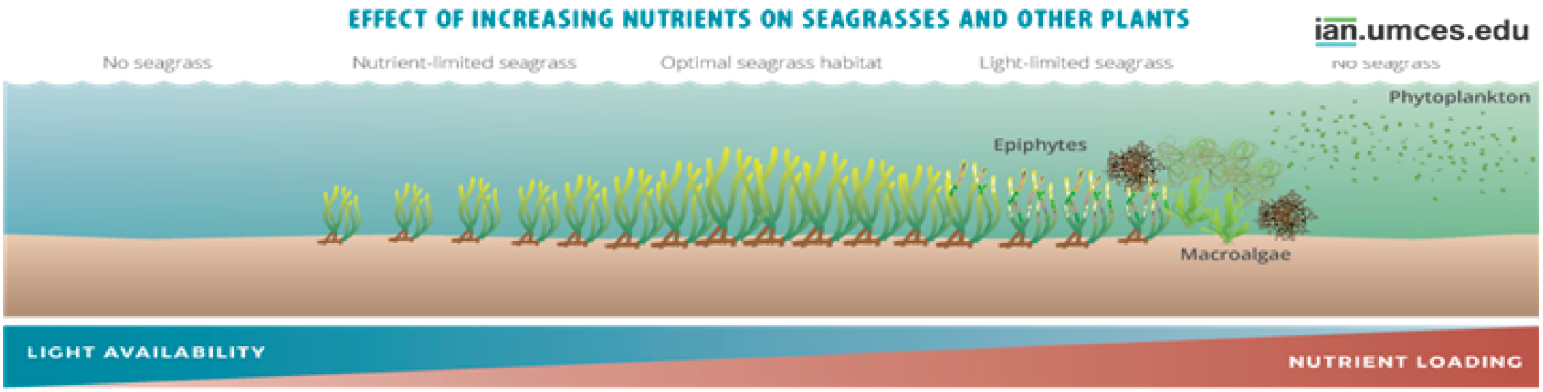






Research and Management Needs

- Macroalgae blooms are not specifically monitored in the Charlotte Harbor region, algae data is only gathered when scientist are capturing fisheries or seagrass data. Support is needed for additional monitoring and analysis of both seagrass and algae trends together. A new citizen science project 'Eyes on Seagrass' will help add to existing scientific efforts by documenting both seagrass and algae.
- Investigate to establish source/concentration for increased nutrients and manage our watersheds to mitigate.
- Support for legislation on nutrient reduction policies, as well as funding for upgrades to reduce nutrient impacts from wastewater systems and stormwater. Support for protection/restoration of wetlands that help cleanse water.



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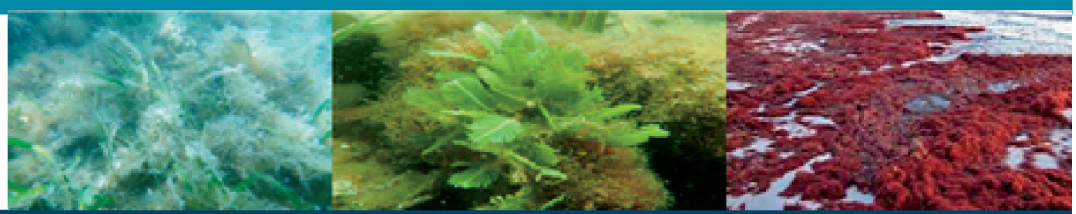

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