Welcome! The webinar will begin at 10A.M. Eastern

Harmful Algal Blooms in Florida: An overview of new informational resources and how you can use them

Sea Grant Florida

UF IFAS UNIVERSITY of FLORIDA

Center for Public Issues Education

Overview of today's webinar

- Register for webinars in advance
- Webinars are recorded
- https://piecenter.com/
- Chat box for Q&A
- Post webinar evaluation

Speakers

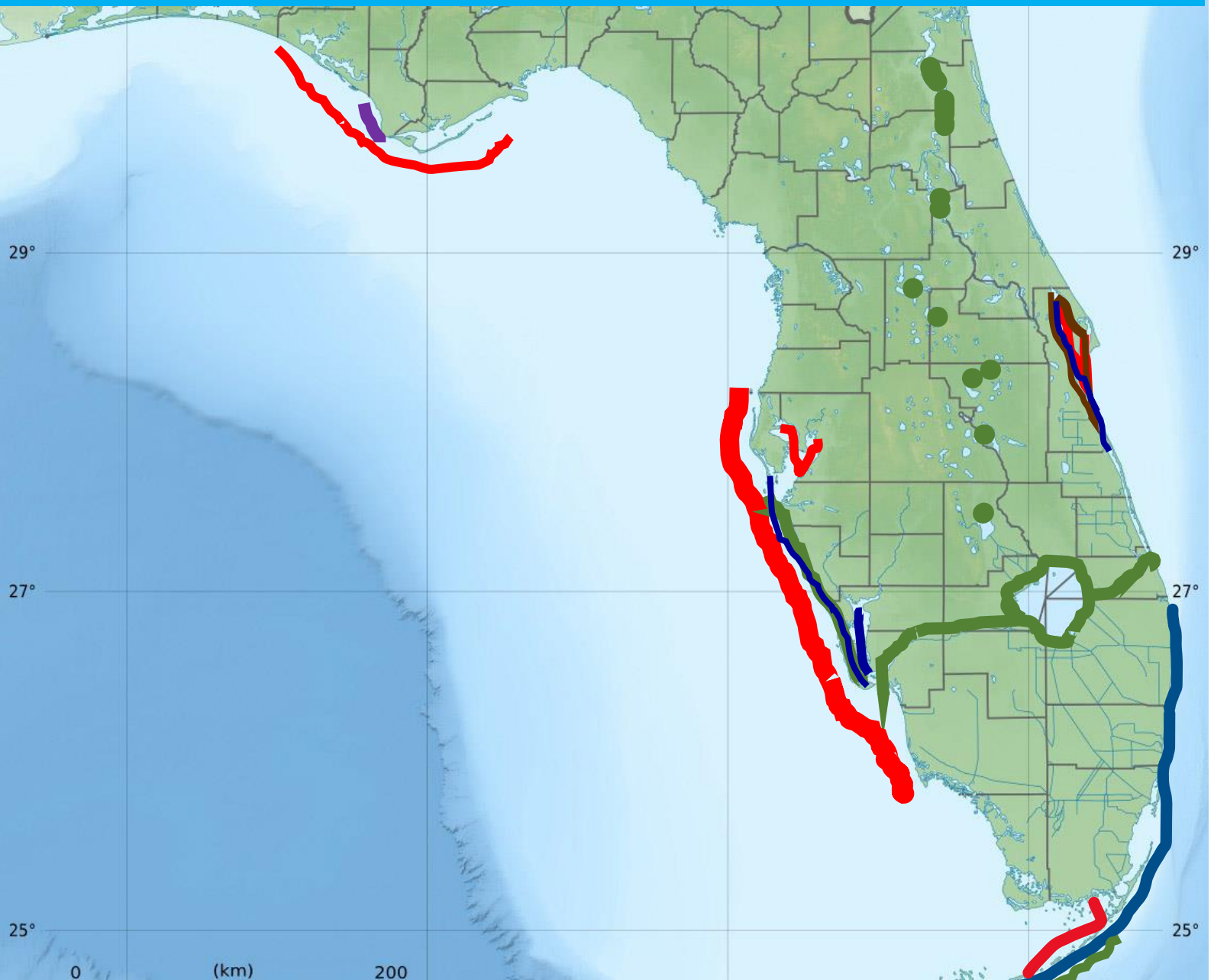
Dr. Ricky Telg

Director, UF/IFAS
PIE Center

Betty Staugler

UF/IFAS Extension
Charlotte County

AN OVERVIEW OF HABs IN FLORIDA



Diatoms

Pseudo-Nitzschia

Dinoflagellates

Pyrodinium bahamense
Karenia brevis
Ciguatera

Cyanobacteria

Microcystis aeruginosa
Lyngbya and *Lyngbya*-like
Synechococcus

Nano- & picoplankton

Aureoumbra lagunensis
others

Macroalgae

Sargassum
others

Algal Blooms Need:

SUNLIGHT

NUTRIENTS

(EXTERNAL & INTERNAL)

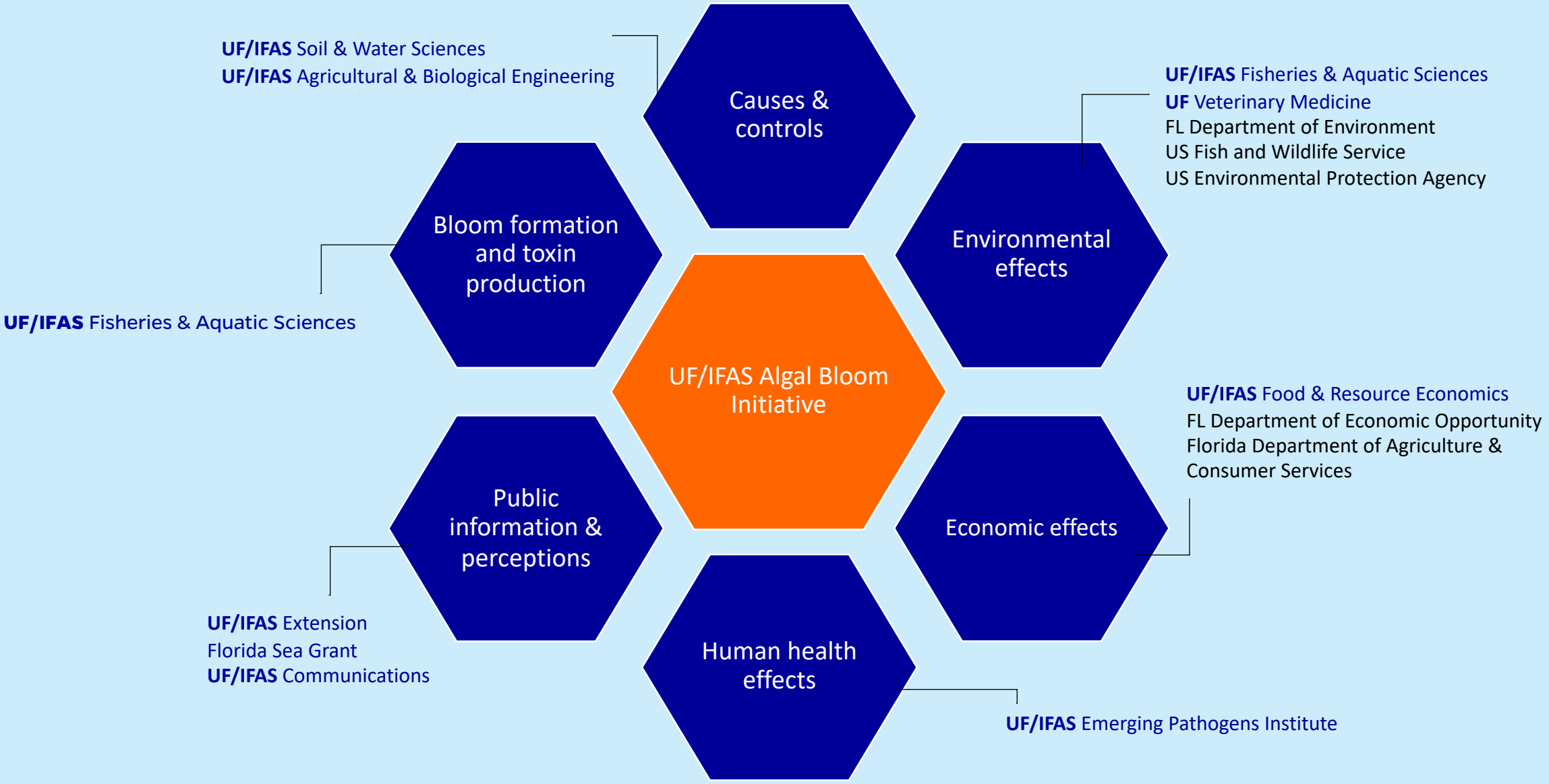
TIME

(SLOW MOVING WATER)

Floridians Need:

CONSISTENT, TIMELY & ACCURATE COMMUNICATION

UF/IFAS HAB Taskforce



Understanding the Dynamics & Impacts of Harmful Algal Blooms in Different Systems

- Inventory aquatic algae and toxin analysis throughout the state
- Identify drivers for blooms and opportunities for control
- Evaluate efficacy of algaecides on Florida strains under different aquatic environments
- Examine best methods for bioremediation and nutrient removal
- Assess perceived risk and management solutions for Florida residents
- Evaluate the economic impacts of 2017-2019 *Karenia brevis* bloom in SW Florida
- Develop portable device that detects, measures, and monitors aerosolized brevetoxin

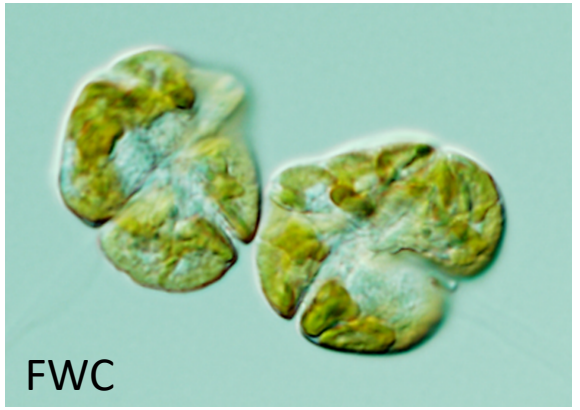
UF/IFAS Research & Extension: Nutrient Management

- Development/revision of fertilizer recommendations for turfgrasses
- Irrigation recommendations Smart irrigation controllers for less wasted irrigation
- Florida Friendly Landscaping program – residential
- GI-BMP program - fertilizer applicators
- Urban stormwater nutrient management
- Low impact development and green infrastructure
- Riparian and coastal shoreline improvements
- Restoration of submerged aquatic vegetation
- Treatment wetland technologies
- Soil amendments for improved turfgrass
- Ag BMP recommendations and education program
- Crop fertility recommendations
- Interaction of micronutrients and amendments and N requirements
- Alternative crops for nutrient management
- Demonstration of banding fertilizer vs. broadcast
- Alternative bed geometry
- …. And so much more

Florida Sea Grant HAB Work Action Group

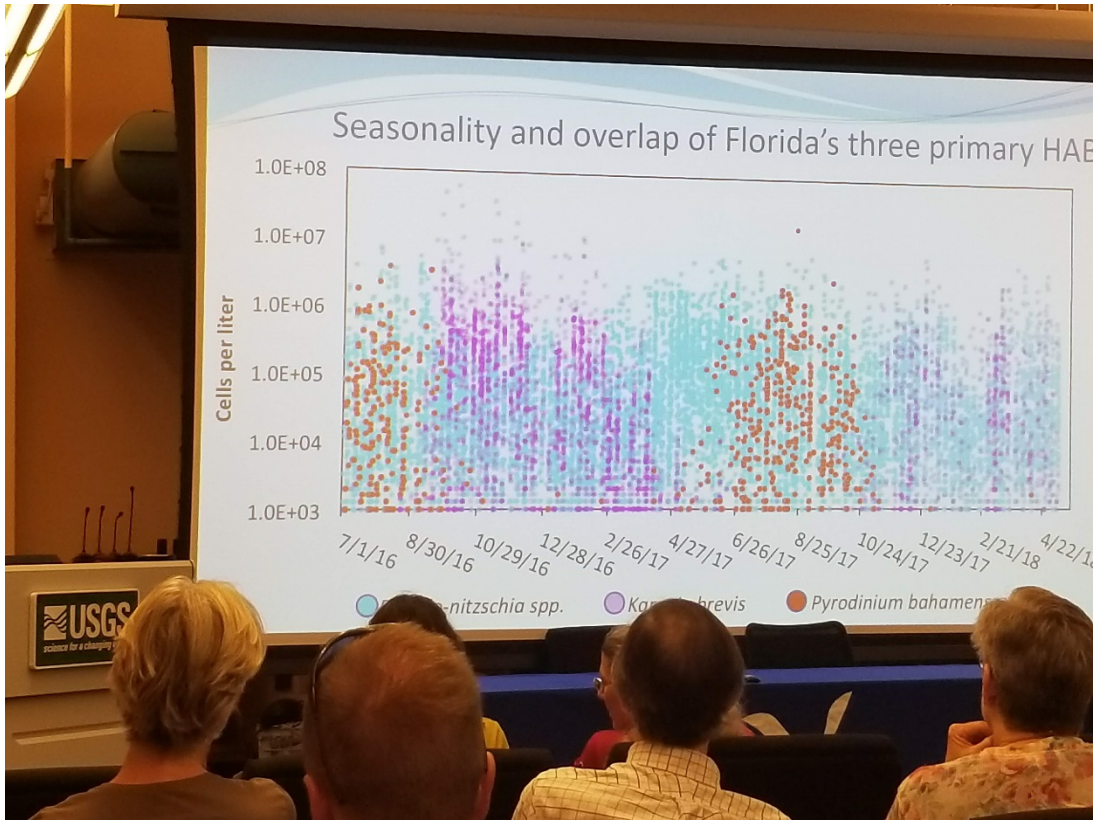
Develop & disseminate regional and statewide HAB extension programs

- Development of algae bloom educational products
  - *Microcystis aeruginosa*
  - *Sargassum*
  - *Karenia brevis*
- *Sargassum* composting study
- Citizen-science HAB monitoring programs
- Facilitate regional and statewide symposia and workshops


FWC

UF/IFAS Extension Communication

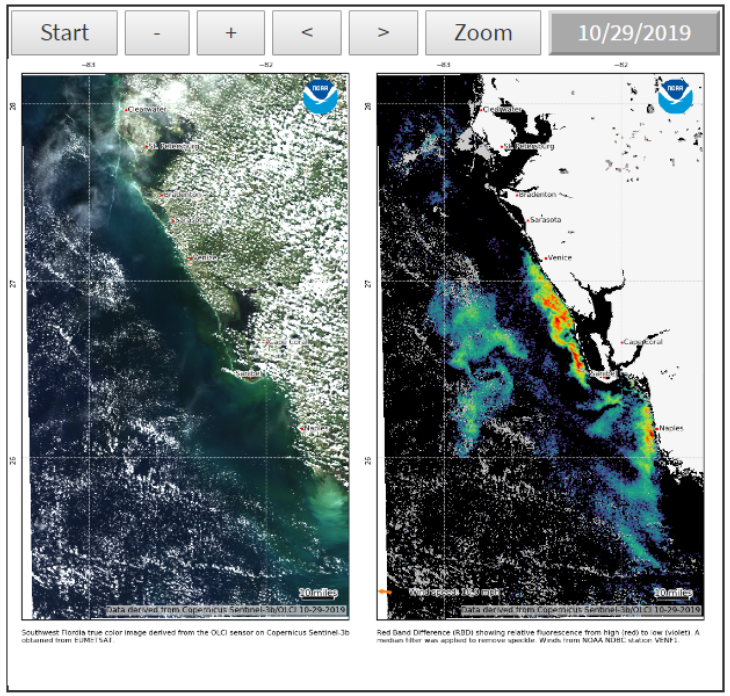
- State of the Science for Harmful Algal Blooms in Florida: *Karenia brevis* and *Microcystis* sp.
  - Technical document
  - Lay summaries
- Florida Macroalgae Workshop (Jan 2021)
- Development of a red tide communications plan for Florida
- HABscope usability survey

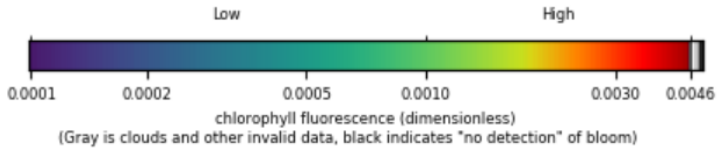


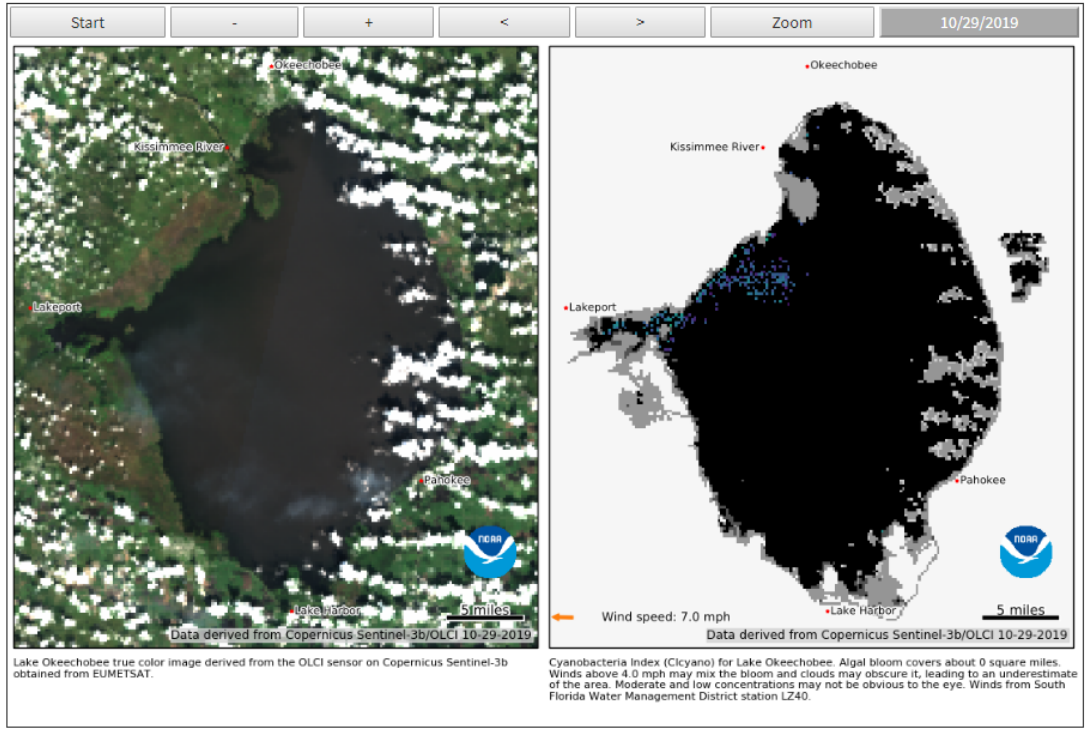
HAB Liaison

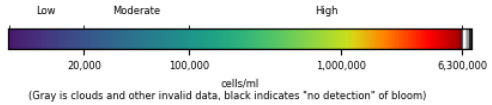
- NOAA NCCOS HAB Forecasting Branch
- Enhance HAB forecasting by aligning needs of end users with forecasting tool development
- Develop compelling stories and communications products about NCCOS HAB products

HAB Monitoring System







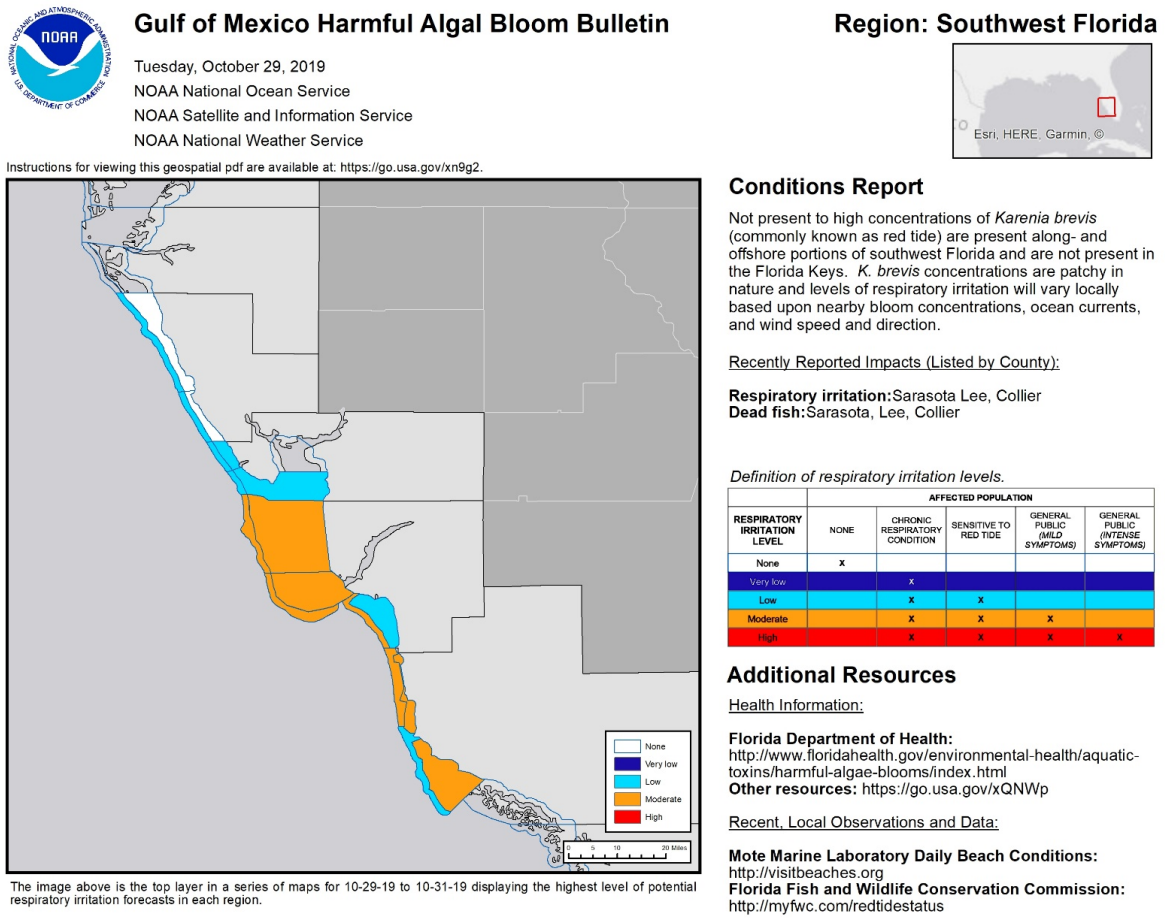


https://coastalscience.noaa.gov/research/stressor-impacts-mitigation/hab-monitoring-system/

HAB Bulletin

- Identify harmful blooms, location, size and trajectory
- Early warnings provide health officials and resource managers timely information to better focus testing for beach and shellfish closures
- Operational reports e-mailed HAB Bulletin bi-weekly during an active bloom and weekly during non-bloom periods

https://www.tidesandcurrents.noaa.gov/hab/gomx.html



Gulf of Mexico Harmful Algal Bloom Bulletin

Tuesday, October 29, 2019
NOAA National Ocean Service
NOAA Satellite and Information Service
NOAA National Weather Service

Instructions for viewing this geospatial pdf are available at: https://go.usa.gov/xn9g2.

Region: Southwest Florida

The image above is the top layer in a series of maps for 10-29-19 to 10-31-19 displaying the highest level of potential respiratory irritation forecasts in each region.

Conditions Report

Not present to high concentrations of *Karenia brevis* (commonly known as red tide) are present along- and offshore portions of southwest Florida and are not present in the Florida Keys. *K. brevis* concentrations are patchy in nature and levels of respiratory irritation will vary locally based upon nearby bloom concentrations, ocean currents, and wind speed and direction.

Recently Reported Impacts (Listed by County):

Respiratory irritation: Sarasota Lee, Collier
Dead fish: Sarasota, Lee, Collier

Definition of respiratory irritation levels.

RESPIRATORY IRRITATION LEVEL	AFFECTED POPULATION				
	NONE	CHRONIC RESPIRATORY CONDITION	SENSITIVE TO RED TIDE	GENERAL PUBLIC (MILD SYMPTOMS)	GENERAL PUBLIC (INTENSE SYMPTOMS)
None	x				
Very low		x			
Low		x	x		
Moderate		x	x	x	
High		x	x	x	x

Additional Resources

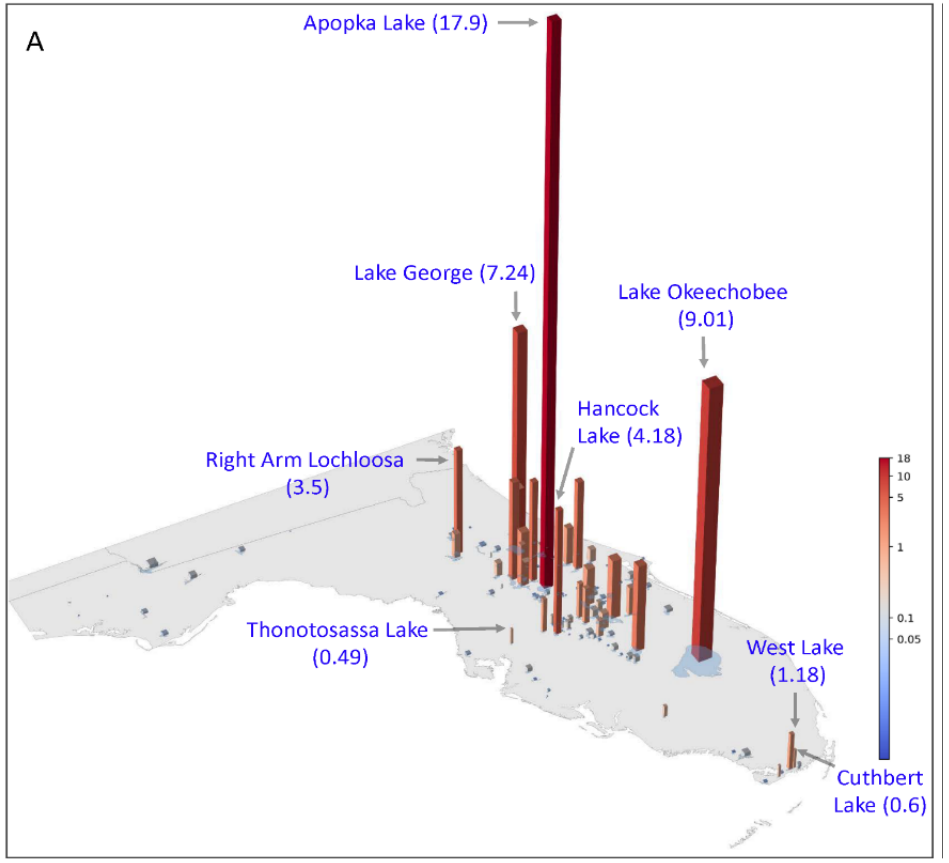
Health Information:

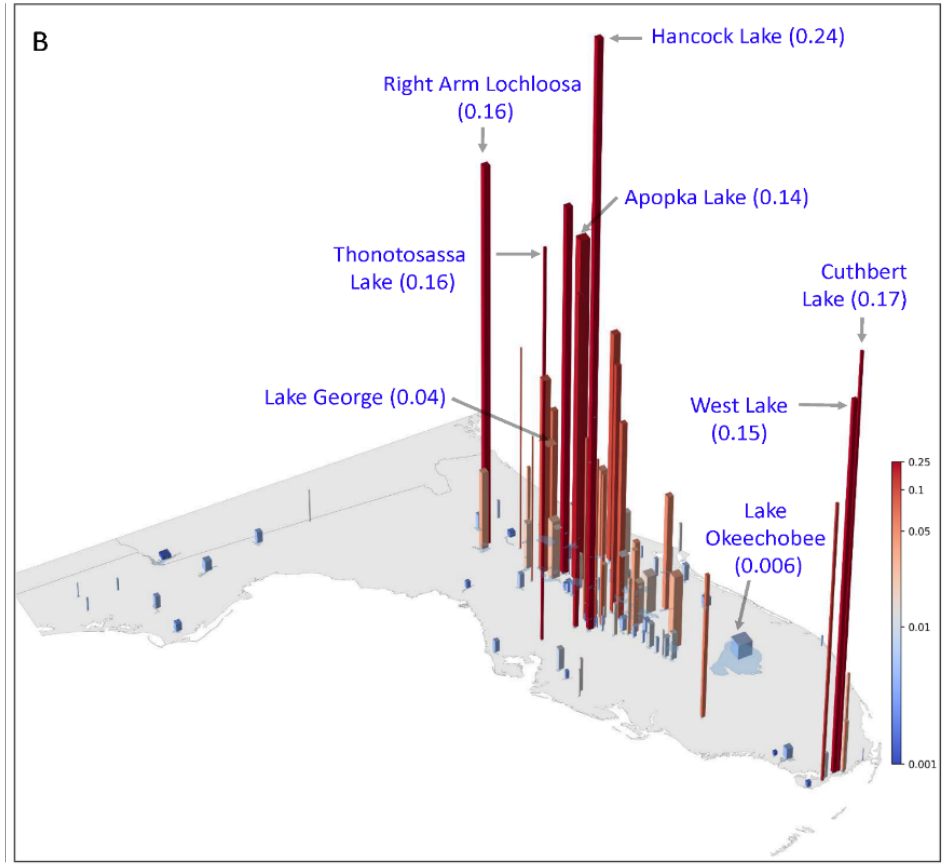
Florida Department of Health:
http://www.floridahealth.gov/environmental-health/aquatic-toxins/harmful-algae-blooms/index.html
Other resources: https://go.usa.gov/xQNWp

Recent, Local Observations and Data:

Mote Marine Laboratory Daily Beach Conditions:
http://visitbeaches.org
Florida Fish and Wildlife Conservation Commission:
http://myfwc.com/redtidestatus

Different Lakes: Bloom Magnitude From Satellite





Nature Scientific Reports, Mishra, Stumpf et al. 2019

Lighthouse Beach

Sample Taken: 2019/10/28 02:40 PM EST
Model Run: 2019/10/30 08:10 AM EST

Forecast

Time	Risk	Wind Speed	Wind Dir
2019/10/30 11:00 AM EDT	Moderate	7.0 knots	ESE
2019/10/30 02:00 PM EDT	Low	5.0 knots	SW
2019/10/30 05:00 PM EDT	Low	4.0 knots	W
2019/10/30 08:00 PM EDT	Moderate	2.0 knots	ESE
2019/10/30 11:00 PM EDT	Low	3.0 knots	E
2019/10/31 02:00 AM EDT	Low	5.0 knots	E
2019/10/31 05:00 AM EDT	Low	5.0 knots	E
2019/10/31 08:00 AM EDT	Low	5.0 knots	E
2019/10/31 11:00 AM EDT	Moderate	5.0 knots	SE
2019/10/31 02:00 PM EDT	Low	4.0 knots	S

Legend
No Data
Very Low
Low
Moderate
High
More Info

Develop compelling stories and communications products about NCCOS HAB Products

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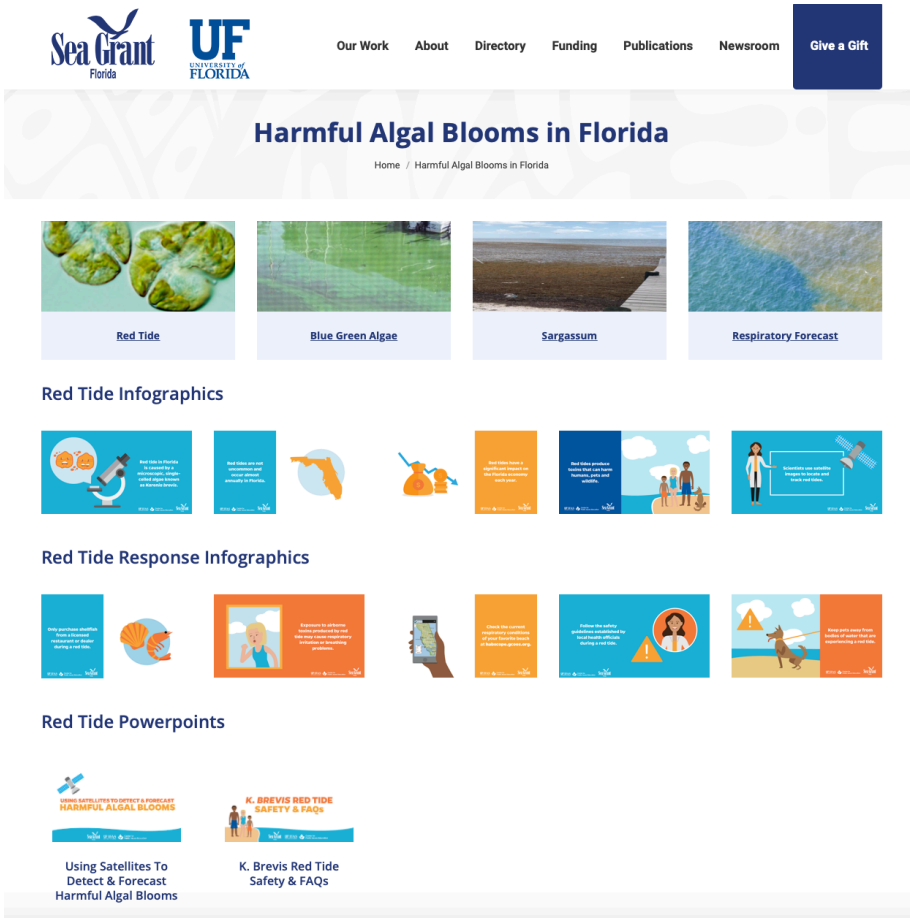
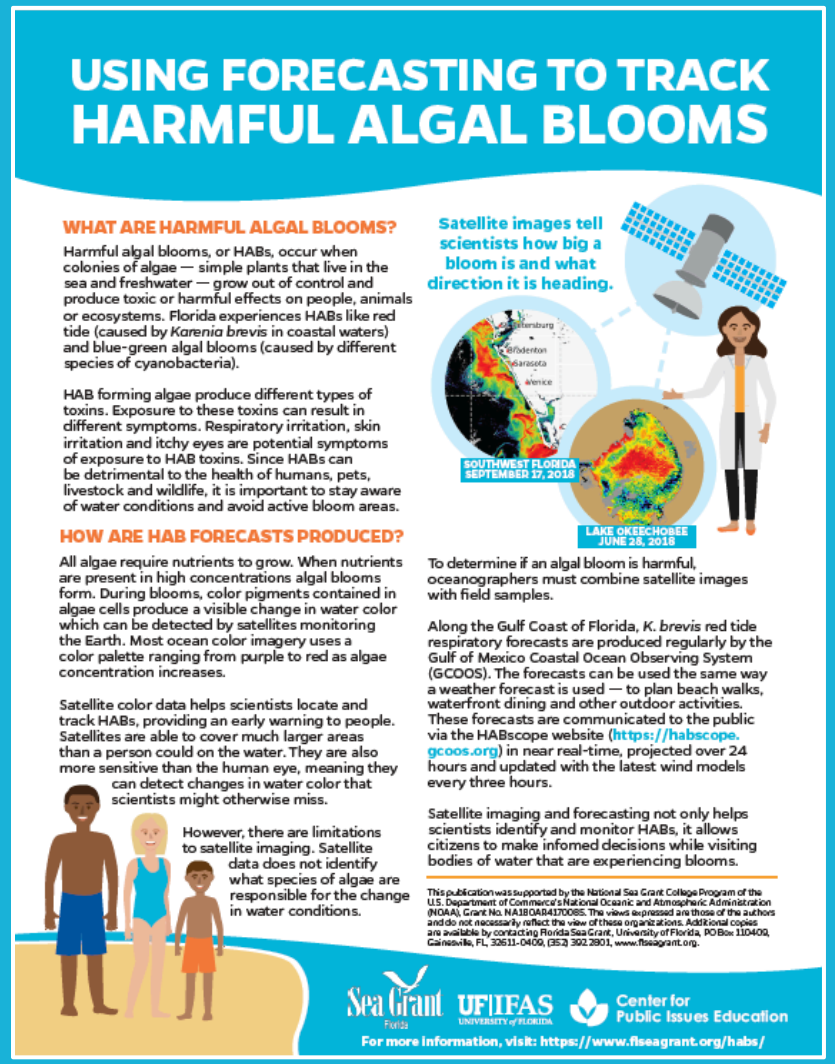
HAB Resources

- The PIE Center created various resources related to HABs in collaboration with Florida Sea Grant.
- All materials are free to download and can be found at https://www.flseagrant.org/habs/



Issue Guide



USING FORECASTING TO TRACK HARMFUL ALGAL BLOOMS

WHAT ARE HARMFUL ALGAL BLOOMS?

Harmful algal blooms, or HABs, occur when colonies of algae — simple plants that live in the sea and freshwater — grow out of control and produce toxic or harmful effects on people, animals or ecosystems. Florida experiences HABs like red tide (caused by *Karenia brevis* in coastal waters) and blue-green algal blooms (caused by different species of cyanobacteria).

HAB forming algae produce different types of toxins. Exposure to these toxins can result in different symptoms. Respiratory irritation, skin irritation and itchy eyes are potential symptoms of exposure to HAB toxins. Since HABs can be detrimental to the health of humans, pets, livestock and wildlife, it is important to stay aware of water conditions and avoid active bloom areas.

HOW ARE HAB FORECASTS PRODUCED?

All algae require nutrients to grow. When nutrients are present in high concentrations algal blooms form. During blooms, color pigments contained in algae cells produce a visible change in water color which can be detected by satellites monitoring the Earth. Most ocean color imagery uses a color palette ranging from purple to red as algae concentration increases.

Satellite color data helps scientists locate and track HABs, providing an early warning to people. Satellites are able to cover much larger areas than a person could on the water. They are also more sensitive than the human eye, meaning they can detect changes in water color that scientists might otherwise miss.

However, there are limitations to satellite imaging. Satellite data does not identify what species of algae are responsible for the change in water conditions.

Satellite images tell scientists how big a bloom is and what direction it is heading.

SOUTHWEST FLORIDA SEPTEMBER 17, 2018

LAKE OKEECHOBEE JUNE 28, 2018

To determine if an algal bloom is harmful, oceanographers must combine satellite images with field samples.

Along the Gulf Coast of Florida, *K. brevis* red tide respiratory forecasts are produced regularly by the Gulf of Mexico Coastal Ocean Observing System (GCOOS). The forecasts can be used the same way a weather forecast is used — to plan beach walks, waterfront dining and other outdoor activities. These forecasts are communicated to the public via the HABscope website (https://habscope.gcoos.org) in near real-time, projected over 24 hours and updated with the latest wind models every three hours.

Satellite imaging and forecasting not only helps scientists identify and monitor HABs, it allows citizens to make informed decisions while visiting bodies of water that are experiencing blooms.

This publication was supported by the National Sea Grant College Program of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), Grant No. NA18OAR4170085. The views expressed are those of the authors and do not necessarily reflect the view of these organizations. Additional copies are available by contacting Florida Sea Grant, University of Florida, PO Box 110409, Gainesville, FL, 32611-0409, (352) 392.2801, www.flseagrant.org.

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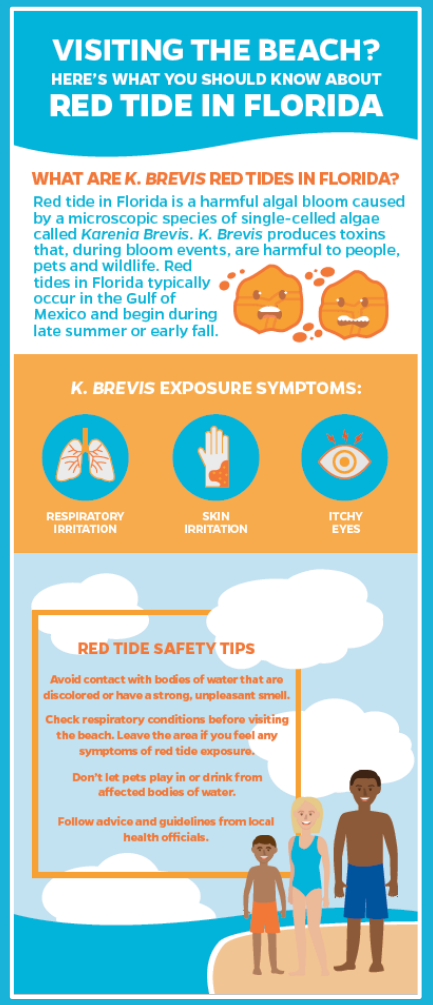
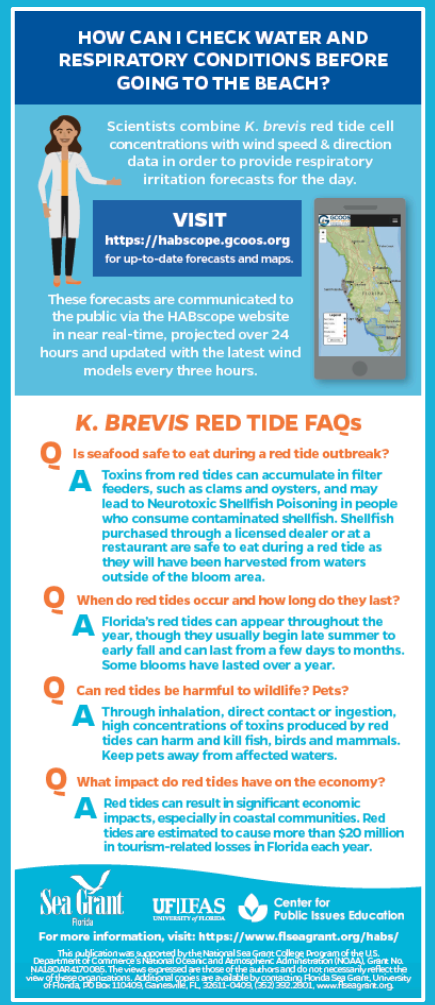
For more information, visit: https://www.flseagrant.org/habs/

- One-page issue guide targeted towards Extension programming.
- Explains the science behind HAB respiratory forecasts:
  - How scientists use satellite imaging to locate and track HABs.
  - How to read a satellite image.
- Provides resources for accessing current HAB forecasts.

Rack card

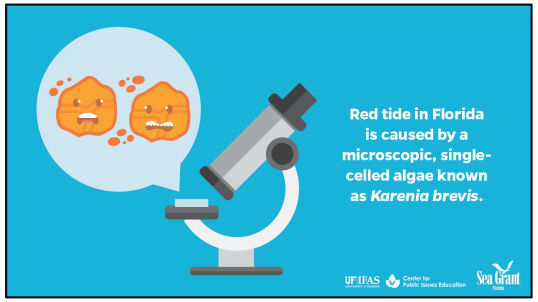


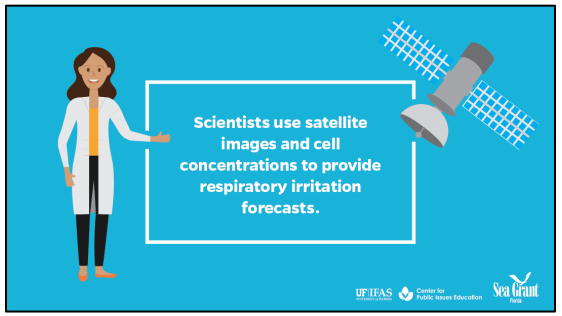


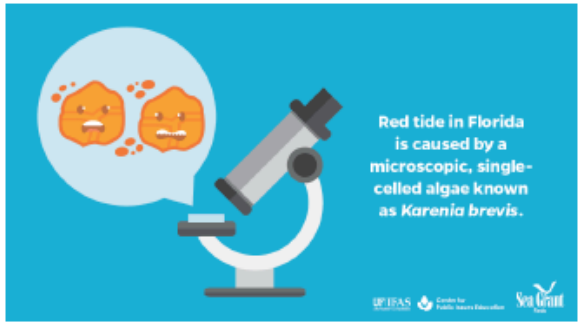
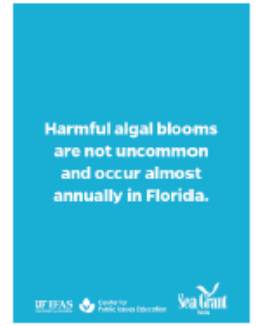
- Intended for tourists or coastal businesses.
- Explains general red tide information:
  - Identifies symptoms of red tide exposure.
  - Suggests safety tips.
  - Provides resources for accessing HAB forecasts.
  - Answers red tide FAQs.

Social Media – General Information

- This social media kit includes 5 graphics that give general information about red tide.
- Recommended captions and schedule of posting is provided.

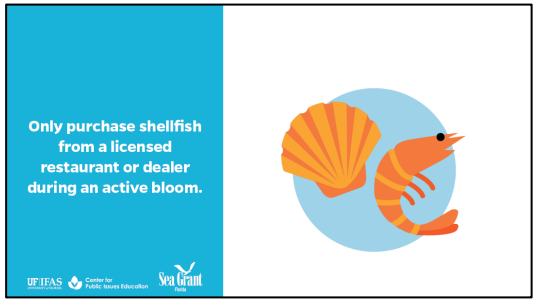


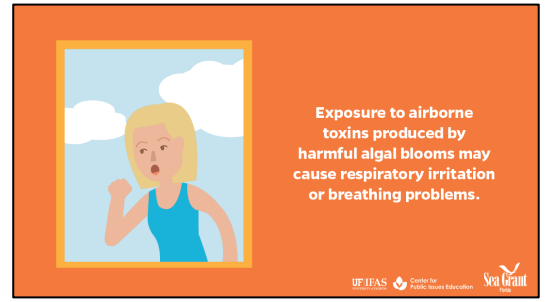


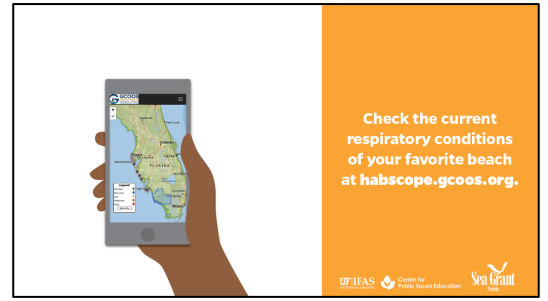
Post	Graphic
Red Tide Messages	
Harmful algal blooms (HABs) occur around the world and are caused by many different algal species. Red tide, a type of HAB in Florida, is caused by a microscopic, single-celled algae known as *Karenia brevis*, which naturally occurs in the Gulf of Mexico. Not all algal blooms or species are harmful. Only when they can cause damage to humans, ecosystems or the economy are they considered to be harmful algal blooms. Learn more at https://www.flseagrant.org/habs/.	
Red tides are not uncommon and occur almost annually in the Gulf of Mexico, particularly in the Tampa Bay to Charlotte Harbor region. Florida's Red tides can appear throughout the year, though they usually begin late summer to early fall and can last from a few days to months. Learn more at https://www.flseagrant.org/habs/.	 
Red tides can result in significant economic impacts. HABs are estimated to cause more than $20 million in tourism-related losses in Florida each year. Additionally, according to the Florida Department of Health, medical expenses and lost workdays associated with harmful algal blooms cost the United States an estimated $22 million annually. Learn more at https://www.flseagrant.org/habs/.	 

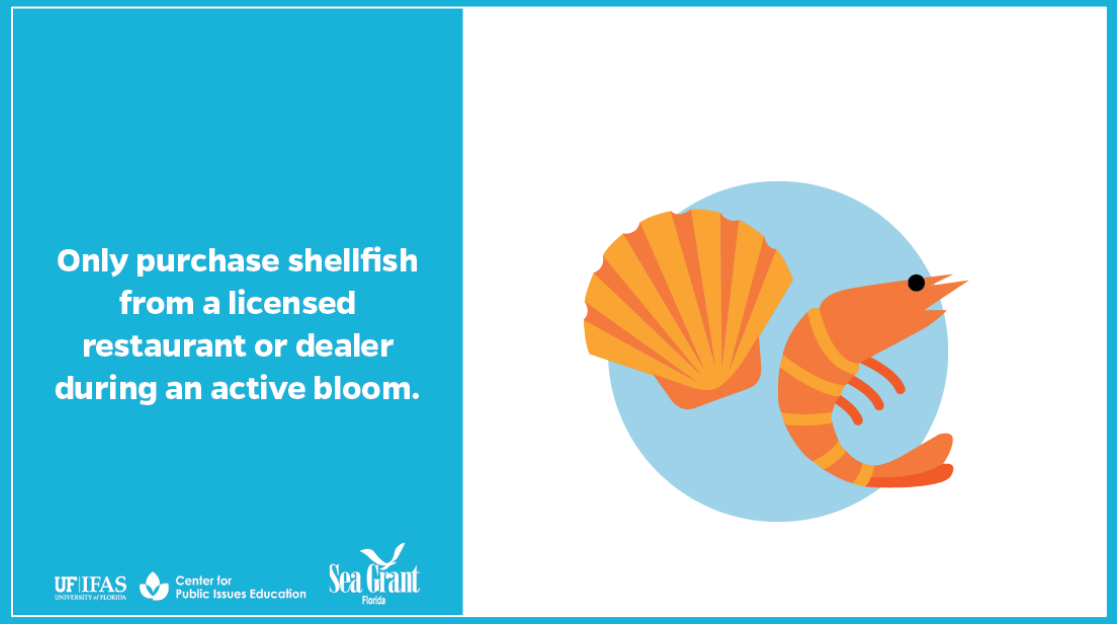
Social Media – Emergency Response

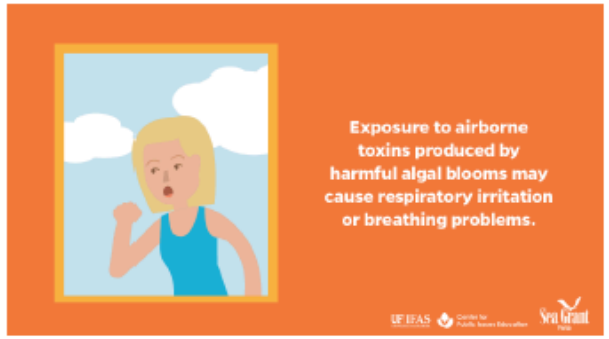
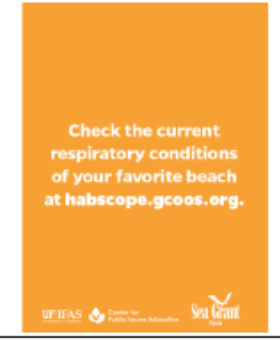
- This social media kit includes 5 graphics that provide information and guidance to use during a red tide event.
- Recommended captions and schedule of posting is provided.



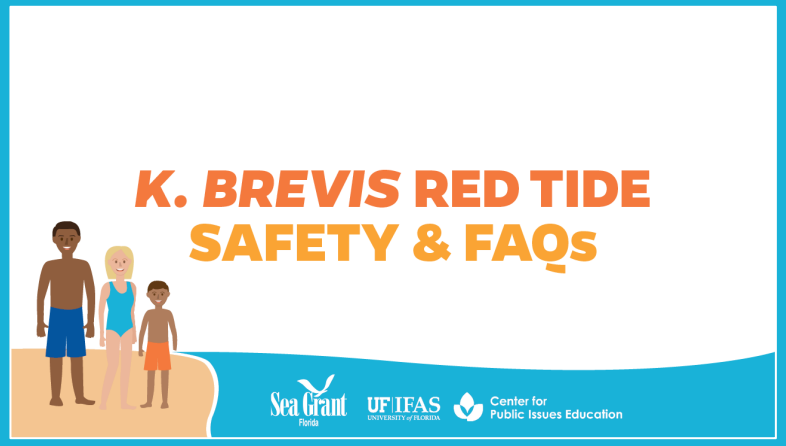


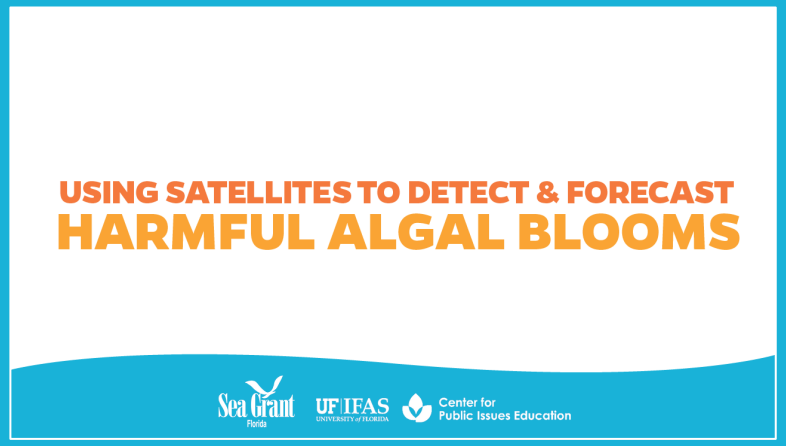




Post	Graphic
Red Tide Response	
Toxins from red tide can accumulate in filter feeders, such as clams and oysters, and may lead to Neurotoxic Shellfish Poisoning in people who consume contaminated shellfish. Shellfish purchased through a licensed dealer or at a restaurant are safe to eat during a harmful algal bloom as they will have been harvested from waters outside of the bloom area. Learn more about harmful algal blooms at https://www.flseagrant.org/habs/.	
During an active red tide, healthy individuals may experience some irritation from exposure to aerosolized or airborne toxins, but these symptoms typically subside once they leave the impacted area. Individuals with respiratory conditions can experience more severe and prolonged breathing problems. Learn more about harmful algal blooms at https://www.flseagrant.org/habs/.	
Before going to the beach, check respiratory conditions at https://habscope.gcoos.org. If the area is experiencing unfavorable respiratory conditions due to a harmful algal bloom, avoid the area or go to a different beach with more favorable conditions. Learn more about harmful algal blooms at https://www.flseagrant.org/habs/.	 

PowerPoint Presentations





- Two pre-made PowerPoint presentations were created to be used in Extension programming:
  - Red tide safety: includes general information and answers FAQs. Adapted from rack card information.
  - Forecasting: explains process of using satellites to create HAB respiratory forecasts. Adapted from issue guide.

Red Tide Safety PPT Slide Examples

K. Brevis exposure symptoms

- Exposure to *K. Brevis* red tides through airborne particles or contact with affected bodies of water can cause the following symptoms:

Respiratory irritation

Itchy/ irritated eyes

Skin rashes

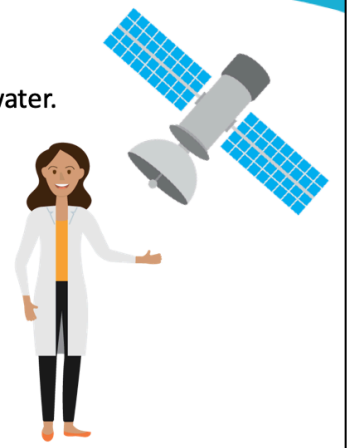
What is *K. Brevis* red tide?

- Red tide in Florida is caused by a microscopic species of algae called *Karenia Brevis*.
- When present in high concentrations, *K. Brevis* produces toxins that are harmful to people, pets and wildlife.
- In Florida, red tides typically occur in the Gulf of Mexico and begin during late summer or early fall.

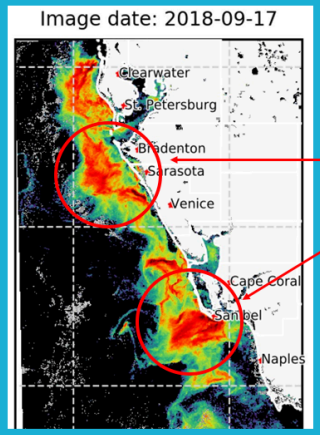
Forecasting PPT Slide Examples

How do scientists track HABs?

- Benefits of satellite imaging:
  - Satellites cover larger areas than a person could on the water.
  - Satellite images are more sensitive than the human eye.
- Satellite images tell scientists how large a bloom is and what direction it is heading.



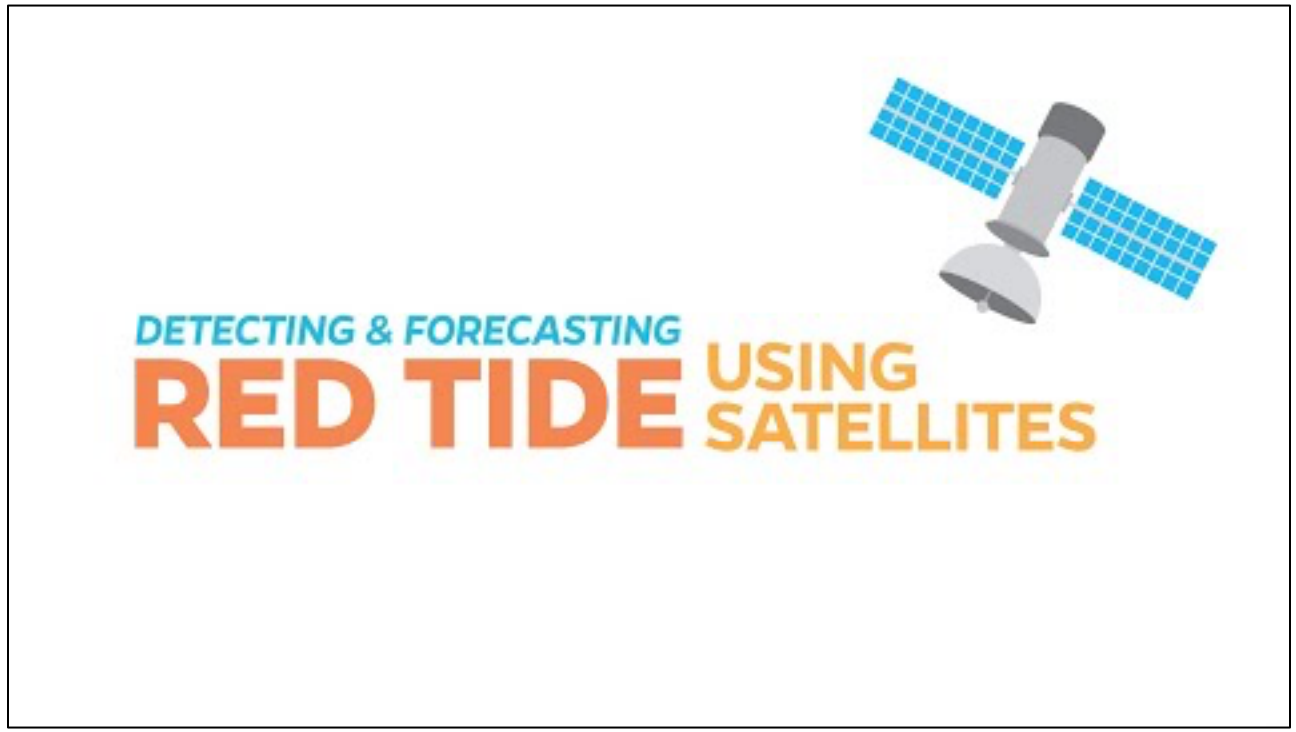
Satellite images of HABs in Florida



High concentrations of *K. brevis* during a red tide event pictured off Florida's west coast in 2018.

Kinetic Typography Video

- Short video with animated text and graphics.
- Explains the forecasting process.
- Can be used as part of PowerPoint presentations or by itself.



Toolkit

- A toolkit was created to compile all materials into a guide.
- Explains the purpose of each material and provides detailed instructions for use.

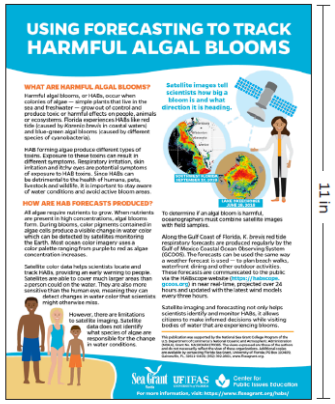
ABOUT

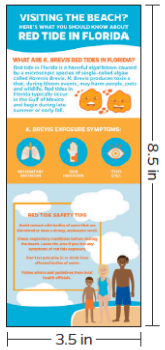
Harmful algal blooms (HABs) pose risks to the health and economy of coastal communities in Florida. Learn about resources to aid in your communication about HABs in this toolkit.

The UF/IFAS Center for Public Issues Education in Agriculture and Natural Resources curated the following materials in partnership with Florida Sea Grant. The purpose of these materials is to educate various audiences about harmful algal blooms (HABs) and their effects on humans, animals and the ecosystem. This toolkit includes social media content, educational print pieces, Powerpoint presentations, an informational video and instructions for how to access and use the materials.

This publication was supported by the National Sea Grant College Program of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), Grant No. NA18OAR4170085. The views expressed are those of the authors and do not necessarily reflect the view of these organizations. Additional copies are available by contacting Florida Sea Grant, University of Florida, PO Box 110409, Gainesville, FL, 32611-0409, (352) 392.2801, www.flseagrant.org.

PRINT MATERIALS





The Red Tide Toolkit includes one double-sided informational rack card and one full page issue guide. These print materials are intended to provide audiences with important information about red tide by using a combination of text and colorful graphics.

The rack card explains what a red tide is, details symptoms of exposure, provides health and safety tips and answers frequently asked questions. This piece is intended to inform tourists visiting Florida's coastal regions about red tide.

The issue guide explains the process of creating red tide forecasts using satellites and water samples. This piece is best suited for use in extension.

Both of these print pieces are available to download at https://www.flseagrant.org/habs/.

INSTRUCTIONS

Follow these steps to download each item:

1) Go to https://www.flseagrant.org/habs/.
2) It is recommended that you create a folder in your computer where each file can be downloaded to. This will help keep everything organized when you post on social media, but it is not neccessary.
3) Click the file you want to download.
4) Save the file into the folder you created.

Follow these steps to publish a post on Facebook:

1) Open your organization's Facebook account account.
2) Create a new post. There is a text document with suggested captions. Copy and paste the text from word document into post text.
3) Click photo/video in Facebook post.
4) Select the desired toolkit graphic from your folder you saved it in. (Tip: If you did not save it to a specific folder when downloading, the file may be saved to your download file.)
5) Use this link to direct readers toward resources https://www.flseagrant.org/habs/.

Materials can be downloaded at

flseagrant.org/habs/

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Questions?

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Thank You!

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