



# HARMFUL ALGAL BLOOMS AND THE BLUE-GREEN ALGAE TASK FORCE

**HARBOR BRANCH**

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Executive Director*

# FLORIDA HAS AN ALGAE PROBLEM...

## Florida Tourism Not Seeing Green as Toxic Algae Chokes Business

FLORIDA TREND REAL ESTATE

### Water releases, algae threatening home values

CNN

U.S. » Crime + Justice | Energy + Environment | Extreme Weather | Space + Science

Live TV

U.S. Edition +



A toxic algae bloom in Florida is slaughtering marine life by the masses

### Supercharged by Pollution, Florida's Toxic Algae Crisis Continues Unabated

By Julie Dermansky • Thursday, August 16, 2018 - 15:57

Are the toxic algae blooms along Florida's coasts making people sick?

USA TODAY NETWORK Amy Bennett Williams, Fort Myers News-Press

# WHAT ARE HARMFUL ALGAL BLOOMS OR HABs?

OCCURRENCES OF PHYTOPLANKTON THAT CAUSE NEGATIVE ECOSYSTEM  
(OR HUMAN) IMPACTS



# WHAT ARE PHYTOPLANKTON?

MICROSCOPIC PLANTS, COMMONLY CALLED ALGAE  
MANY SPECIALIZED ADAPTATIONS

50  $\mu\text{m}$



# HOW DO PHYTOPLANKTON & HABs GROW?

HARMFUL PHYTOPLANKTON (LIKE ALL PLANTS) TYPICALLY NEED THREE MAIN CONDITIONS TO BLOOM (GROW):

## OPTIMAL LIGHT

*HIGHER LIGHT PROMOTES FASTER GROWTH*

## OPTIMAL TEMPERATURE

*WARMER TEMPERATURES PROMOTE FASTER GROWTH*

## OPTIMAL NUTRIENTS

*MORE NUTRIENTS = MORE BIOMASS*

# HOW ARE ALGAL BLOOMS HARMFUL?

TOXINS (SAXITOXIN, MICROCYSTINS, BREVETOXIN, DOMOIC ACID...)

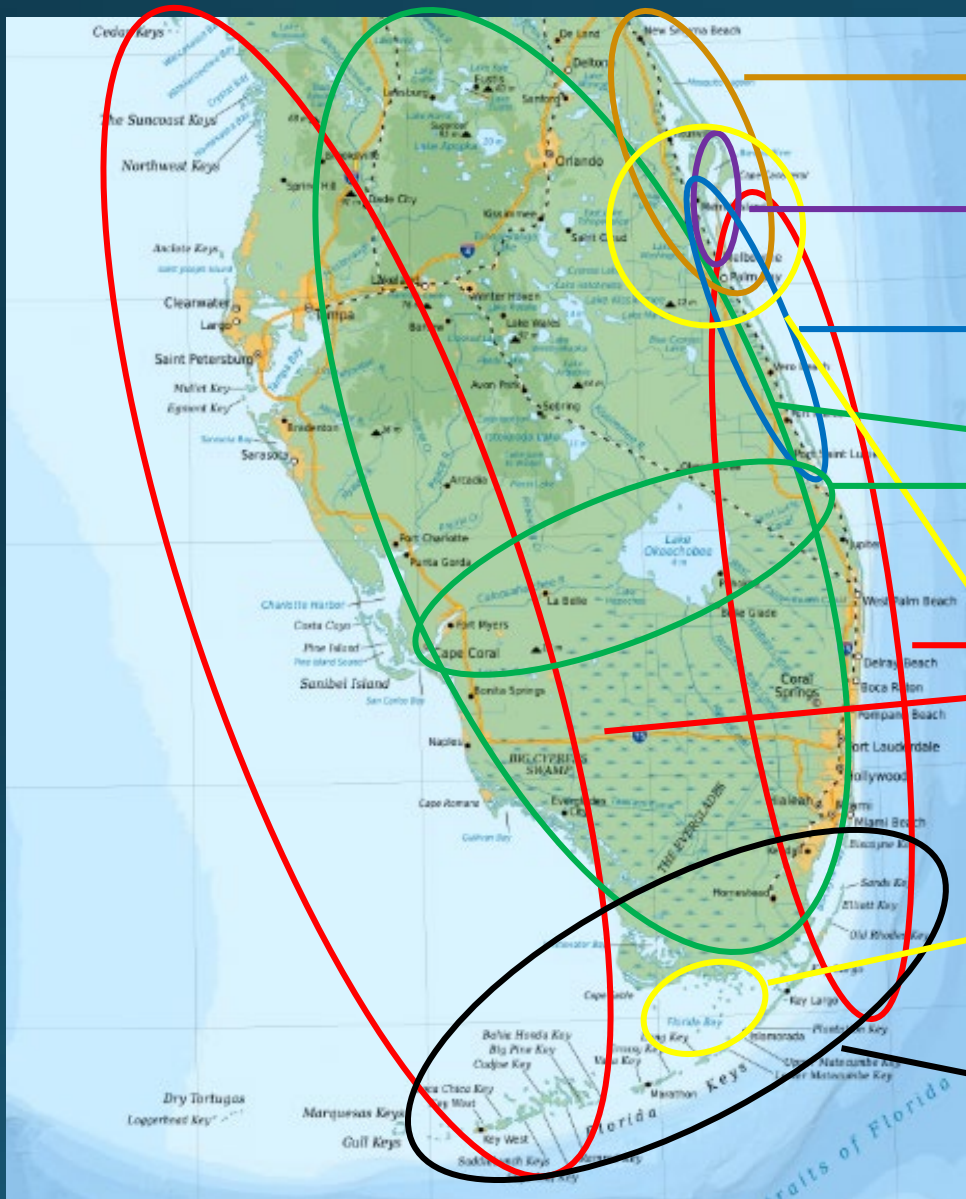
HIGH BIOMASS (HYPOXIA/ANOXIA, SHADING)

MECHANICAL DAMAGE (MUCOUS, SURFACTANTS, SERRATIONS)

ECONOMICS (TOURISM, RECREATION, PROPERTY VALUES, FISHERIES...)



# CURRENT HAB THREATS IN SOUTH FLORIDA



*AUREOUMBRA* (NON-TOXIC?)

*PYRODINIUM* (SAXITOXIN)

*PSUEDONITZCHIA* (DOMOIC ACID)

*MICROCYSTIS* (MICROCYSTIN)

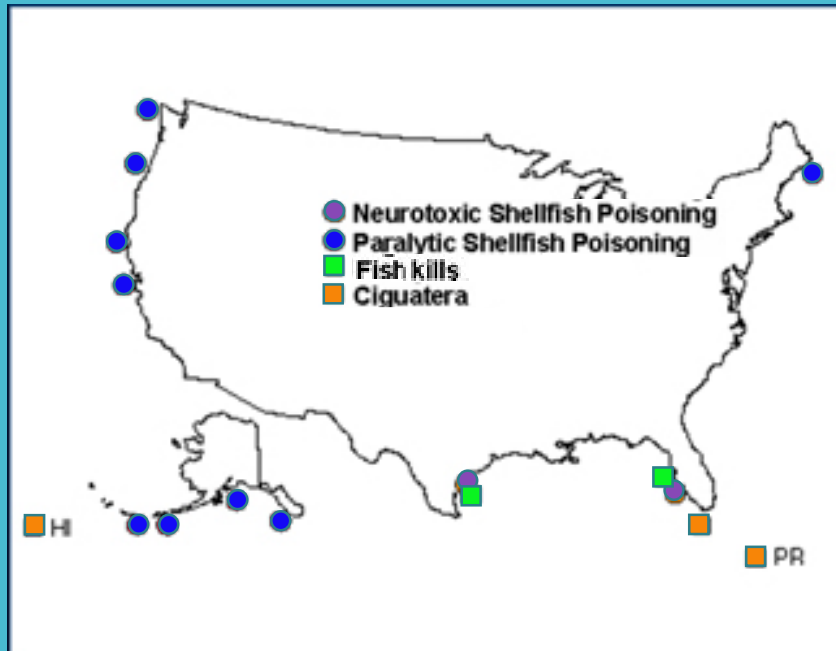
*KARENIA* (BREVETOXIN)

*CYANOBACTERIA/PICOPLANKTON*  
(NON-TOXIC?)

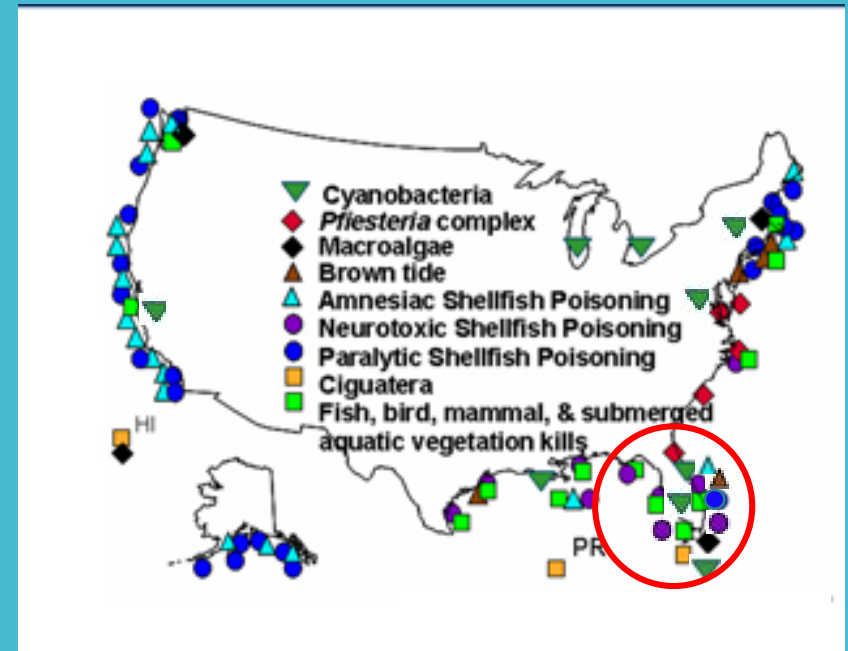
*GAMBIERDISCUS* (CIGUATERA)

WORLDWIDE, HABs ARE INCREASING NOT ONLY IN GEOGRAPHICAL LOCATIONS, BUT ALSO IN TYPE, FREQUENCY, DURATION AND SEVERITY

## REPORTED HAB OCCURRENCES



~1972



NOW

FLORIDA IS ONE OF THE MOST IMPACTED STATES IN THE US

# WHY ARE HAB EVENTS INCREASING?

## 1. NUTRIENT POLLUTION (EUTROPHICATION)

NUTRIENTS “FERTILIZE” OUR WATERSHEDS, SUSTAIN BLOOMS, INCREASE BIOMASS

## 2. GLOBAL WARMING & CLIMATE CHANGE

WARMING- INCREASING RANGES, GROWTH RATES & GROWING SEASONS  
CHANGING PRECIPITATION - INCREASED STORMS, RAIN & RUNOFF, DROUGHT

## 3. HUMAN ECOSYSTEM MODIFICATIONS

LAND USE PRACTICES, WATER MANAGEMENT, INCREASED RUNOFF, DREDGING,  
TRANSPORT OF SPECIES, FOOD CHAIN EFFECTS...

# WHAT IS THE STATE DOING?

## Ron DeSantis names Florida blue-green algae task force

“The toxic algae has been a massive problem. It’s been a problem on the southwest coast of Florida and may very well have been a contributor to why the red tide was so bad,” DeSantis said.



GOVERNOR'S APPOINTEE:

BLUE GREEN ALGAE TASK FORCE

FL SENATE PRESIDENT'S APPOINTEE:

FLORIDA RED TIDE MITIGATION AND  
TECHNOLOGY DEVELOPMENT  
INITIATIVE ADVISORY COUNCIL

# WHAT IS THE STATE DOING?

## Blue-Green Algae Task Force

<https://floridadep.gov/Blue-GreenAlgaeTaskForce>

*MISSION: TO GUIDE AND EXPEDITE IMPROVEMENTS IN REGULATORY AND POLICY STRUCTURE TO IMPROVE FLORIDA'S DEGRADED WATERBODIES (WATER QUALITY STANDARDS, NUTRIENT REDUCTION, REMEDIATION, RESTORATION, PUBLIC HEALTH, NEW TECHNOLOGY, ETC.)*

5 MEMBERS: MYSELF, EVELYN GAISER (FIU), WENDY GRAHAM (UF), MIKE PARSONS (FGCU), VAL PAUL (SMITHSONIAN) AND WITH FLORIDA'S CHIEF SCIENCE OFFICER TOM FRASER (UF) ACTING AS CHAIR

# WHAT IS THE STATE DOING?

THE BGATF HAS CONSIDERED TWO PRIMARY STRATEGIES TO ADDRESS THE PROBLEM:

PREVENTION AND/OR MITIGATION

HOW DO WE STOP ALGAE FROM GROWING?

~~LIGHT~~ — ~~TEMPERATURE~~ — NUTRIENTS



# NUTRIENT POLLUTION (NITROGEN & PHOSPHORUS)

## MAJOR SOURCES IN FLORIDA:

SEPTIC SYSTEMS

AGRICULTURAL OPERATIONS

(BIOSOLIDS & OTHER FERTILIZER RUNOFF)

URBAN STORMWATER RUNOFF

(STORMWATER TREATMENT SYSTEMS, RESIDENTIAL FERTILIZERS)

SEWER OVERFLOWS

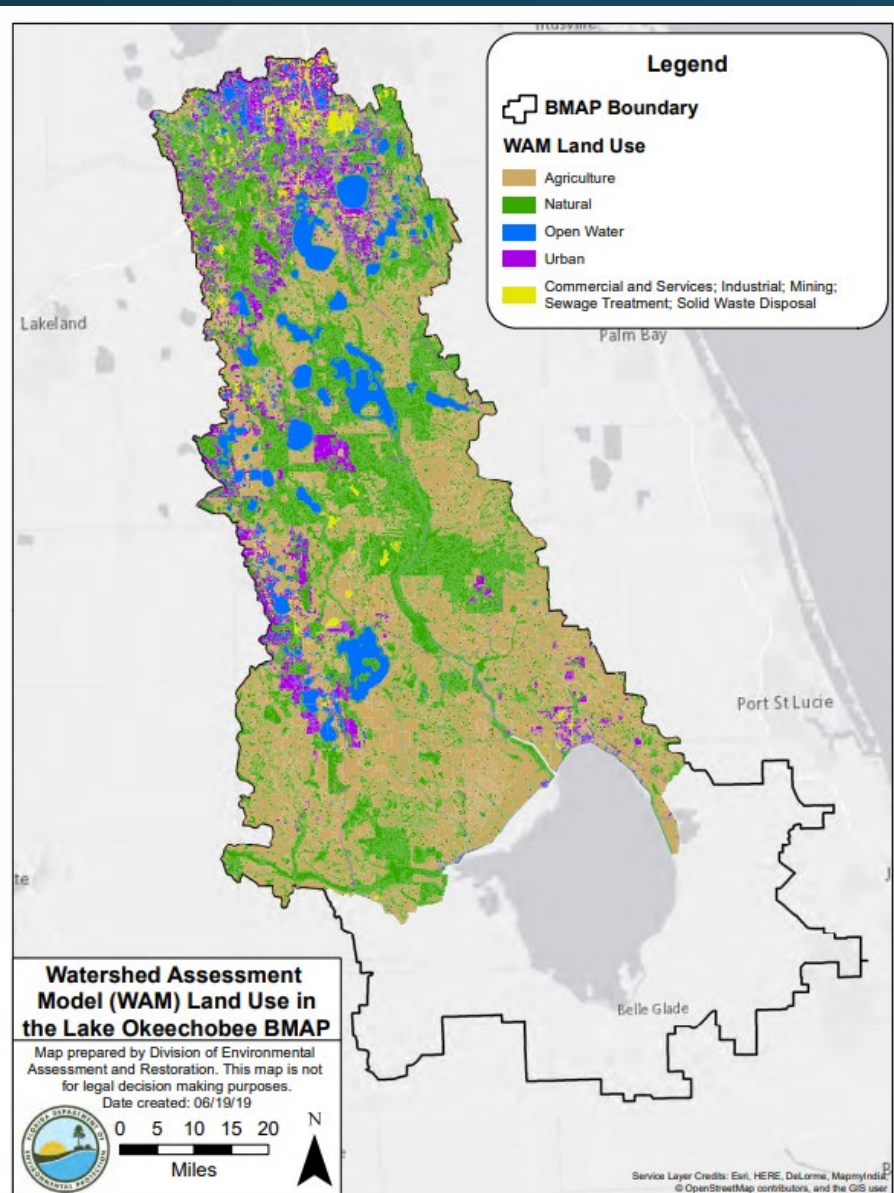
(TREATMENT PLANTS, FAILING INFRASTRUCTURE PIPES)

LEGACY NUTRIENT LOADS

OTHER (HERBICIDES, REUSE WATER, ETC.)

*THE RELATIVE IMPORTANCE OF THESE SOURCES DEPENDS ON THE  
LOCATION OF THE WATERSHED*

# NUTRIENT POLLUTION (NITROGEN & PHOSPHORUS)



Source	TP Load (%)
Natural Lands	14
Urban Stormwater	7
Agriculture	78

# WHAT IS THE STATE DOING?

MULTIPLE TASK FORCES PROVIDING SCIENCE-BASED RECOMMENDATIONS ON POLICY/MANAGEMENT/RESPONSE/REGULATIONS

FORT MYERS

## **Blue-green algae task force releases first set of recommendations to combat toxic algae**

Florida Gov. Ron DeSantis mostly follows Blue-Green Algae Task Force recommendations

By Tyler Treadway

INCREASED PUBLIC EDUCATION, OUTREACH AND WARNINGS

# WHAT IS THE STATE DOING?



## Algal Bloom Sampling Status

Best experienced with Google Chrome or Microsoft Edge browsers

Dashboard Help Dashboard Details

### Algal Bloom Monitoring and Response Quick Links

VIEW/SUBSCRIBE TO WEEKLY UPDATES

REPORT ALGAL BLOOMS

FIELD AND LAB DETAILS

FRESHWATER ALGAL BLOOM FAQs

HEALTH QUESTIONS / CONCERNS

CURRENT RED TIDE STATUS

PROTECTING FLORIDA TOGETHER

Areas of Interest

Add



Caloosaha...



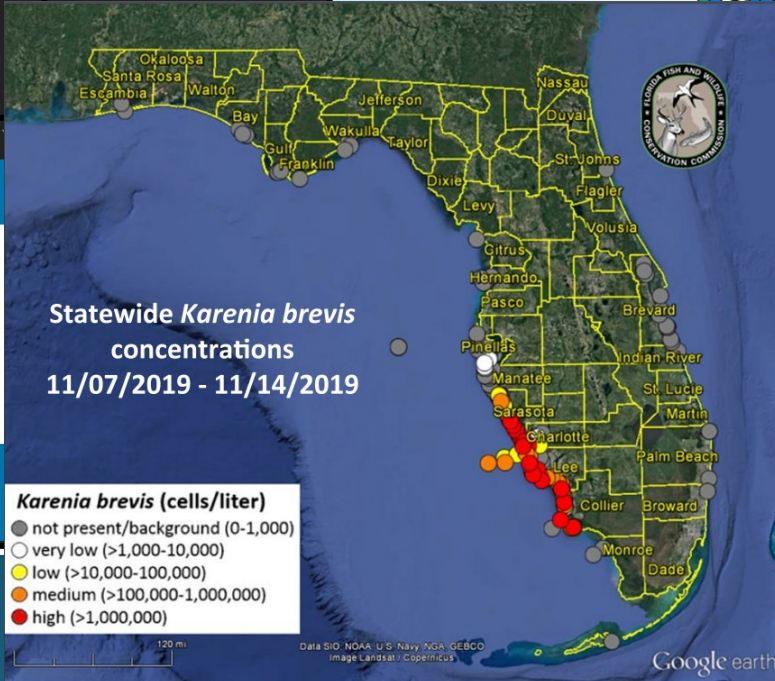
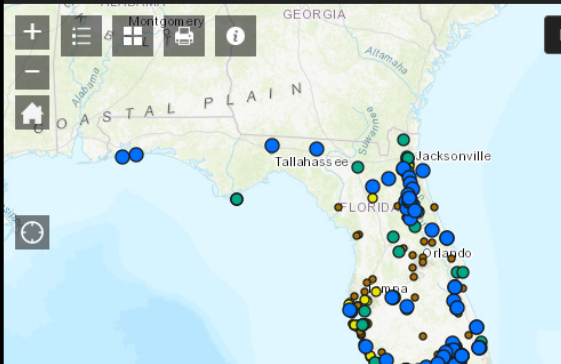
Lake Okee...



St. Lucie R...



St. Johns R...



### 30-Day Algal Bloom Observations



Observations of algal bloom-like conditions at sampling locations visited in the last 30 days. Hover over graphic for values.



## BLUE-GREEN ALGAL BLOOM WEEKLY UPDATE

Reporting August 30 - September 5, 2019

### SUMMARY

There were only three reported site visits in the past week (8/30 - 9/5) due to Hurricane Dorian, with all three site visits resulting in samples collected. Algal bloom conditions were not observed by the samplers at any of those sites.

The most recent NOAA satellite imagery for Lake Okechobee that is not obscured by cloud cover is from 8/30/19. It indicated that the bloom potential was patchy and was reduced to approximately 20% of the lake. Imagery also indicated that structures remained free of bloom potential. South Florida Water Management District collected samples at the 578 and 579 structures on 9/4 and at the 5308C structure on 9/5. Toxins were not detected in the 578 or 579 samples and neither had a dominant algal species. The 5308C sample results are pending. South Florida Water Management District had to postpone this week's on-lake sampling to next week due to the hurricane.

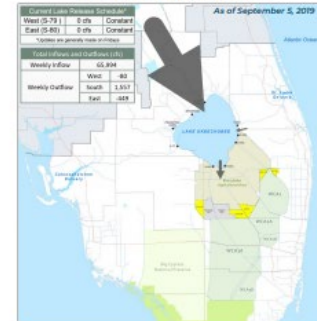
From last week's update for which analytical results were still pending, no toxins were detected in the sample collected on 8/29 at the C44580 structure that was dominated by *Microcystis aeruginosa*. The sample collected by the St. Johns Water Management District staff collected samples at Sator-East South Fork WMA in Broward County was dominated by *Microcystis aeruginosa* and had 0.45 ppb total microcystin and 0.34 ppb anatoxin-a.

Only four bloom reports were received on DEP's Report Algal Blooms webpage this past week. Bloom surveillance by DEP and SFWMD staff will return to normal next week.

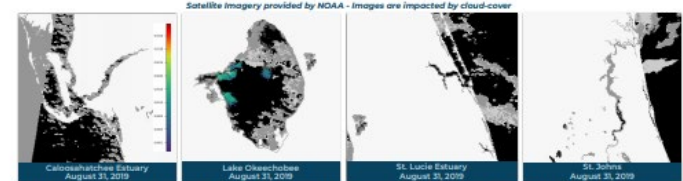
This is a high-level summary of the sampling events for the reported week. For all field visit and analytical result details, please refer the complete algal bloom map with data table by clicking the "Field and Lab Details" Quick Link from the Algal Bloom Dashboard. Different types of blue-green algal bloom species can look different and have different impacts. However, regardless of species, many types of blue-green algae can produce toxins that can make you or your pets sick if consumed or possibly cause skin and/or eye irritation due to contact. We advise to stay out of water where algae is visibly present as quickly, walk or wear a discolored (pale-green, blue-green or brownish-red). Additionally, pets or livestock should not come into contact with the algal bloom-impacted water, or the algal bloom (water) or fish in the shoreline.

### LAKE OKEECHOBEE OUTFLOWS

Current Lake Release Schedule	As of September 5, 2019
West (5-7)   8   9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24   25   26   27   28   29   30   31	West (5-7)   8   9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24   25   26   27   28   29   30   31
East (5-6)   7   8   9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24   25   26   27   28   29   30   31	East (5-6)   7   8   9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24   25   26   27   28   29   30   31
Volume in gallons (mcf)	Volume in gallons (mcf)
Weekly Inflow	45,994
Weekly Outflow	100
Weekly Storage	1,897
Year	189



### SITE VISITS FOR BLUE-GREEN ALGAE



**REPORTS FROM HOTLINE**

33 August 29

24 August 28

17 August 27

4 August 26

**REPORT PUBLIC HEALTH ISSUES**

**HUMAN ILLNESS**

Florida Poison Control Centers can be reached 24/7 at 800-222-3322 (DOH provides grant funding to the Florida Poison Control Centers)

**OTHER PUBLIC HEALTH CONCERNS**

**CONTACT DOH**  
(DOH county office)  
FloridaHealth.gov/  
all-county-locations.html

**CONTACT FWC**  
800-436-0311 (Fish kill/s)  
888-404-3322 (Invasive Alert)  
MyFWC.com/RedTide

**REPORT ALGAL BLOOMS**

**SALTWATER BLOOM**

- Observe stranded wildlife or a fish kill
- Information about red tide and other saltwater algal blooms

**FRESHWATER BLOOM**

- Observe an algal bloom in a lake or freshwater river
- Information about blue-green algal blooms

**CONTACT DEP**  
855-305-3903  
(to report freshwater blooms)  
FloridaDEP.gov/AlgalBloom

# WHAT IS THE STATE DOING?

## Florida launches water quality website

by Gary Detman | Tuesday, November 5th 2019



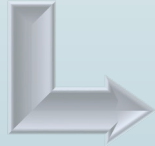
# WHAT IS HBOI DOING?

HARBOR BRANCH OCEANOGRAPHIC INSTITUTE  
FOUNDATION

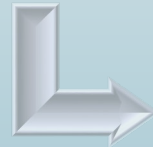
## FLORIDA CENTER FOR COASTAL & HUMAN HEALTH

*Est. August 2018 at FAU Harbor Branch*

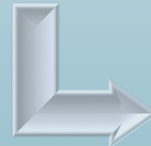
FAU/HBOI & Partner  
Expertise



Florida HAB Crisis



Population Health  
Impacts



Healthy Environment &  
Population

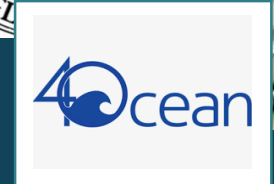
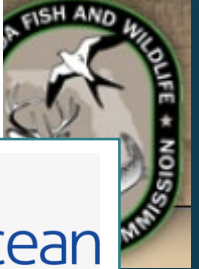
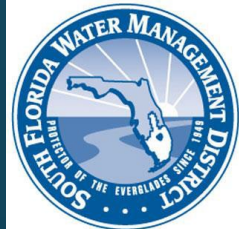
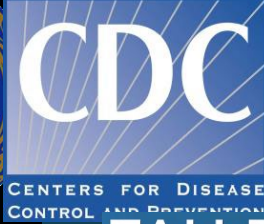


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# FLORIDA CENTER FOR COASTAL & HUMAN HEALTH

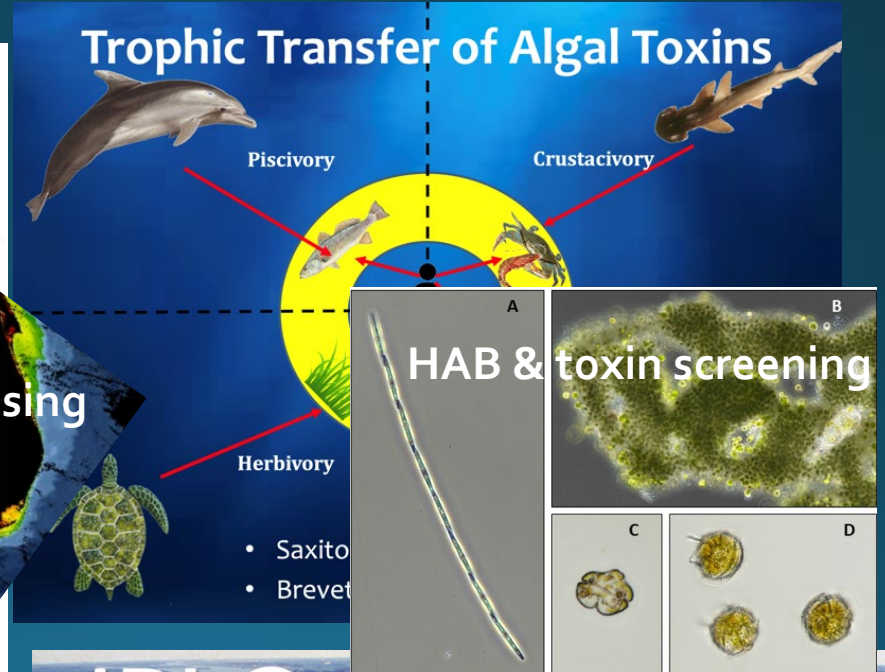
## RECRUITING STAKEHOLDERS & STRATEGIC PARTNERS



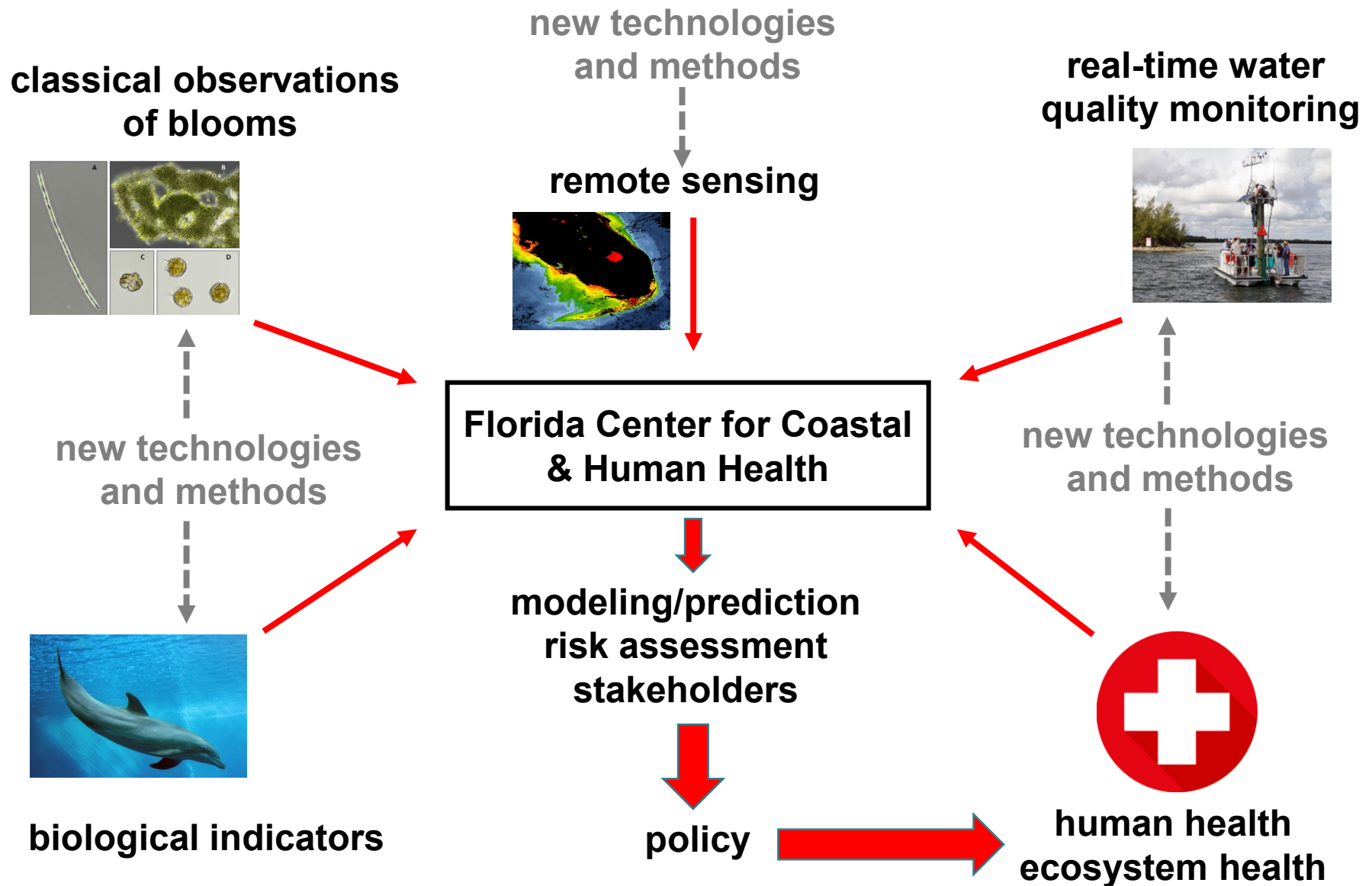
FAU BRAIN INSTITUTE

## CONDUCTING CRITICAL RESEARCH

FAU Harbor Branch tests people for levels of toxin released from blue-green algae



# SCIENCE BASED POLICY & MANAGEMENT



# WHAT CAN YOU DO?

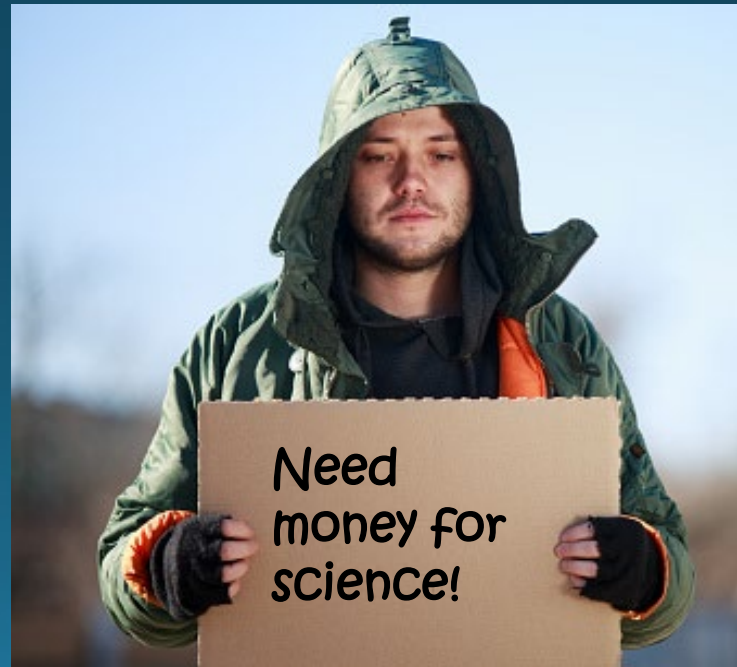
DON'T FORGET ABOUT THIS PROBLEM DURING THE "OFF SEASONS"

EDUCATE YOURSELF AND UNDERSTAND ANY RISKS

PRESSURE YOUR REPRESENTATIVES!

DEMAND ACTION AND **FUNDING** TO FIGHT THE PROBLEM

RESEARCH IS EXPENSIVE...



An aerial photograph of a large, clear blue body of water, possibly a bay or lagoon. In the background, a city with many buildings and trees is visible. In the foreground, there is a small, green island with some vegetation. The water shows varying shades of blue and green, indicating different depths and possibly some underwater features like reefs or sandbars.

THANKS!

QUESTIONS OR COMMENTS?