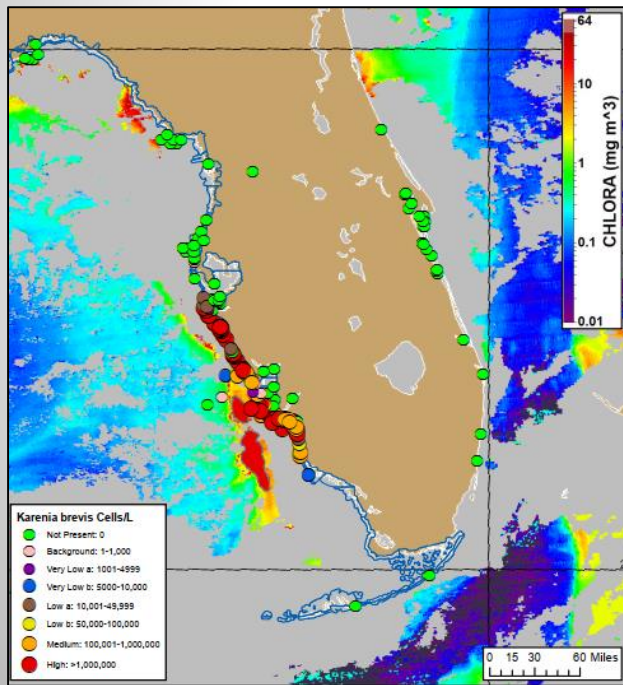


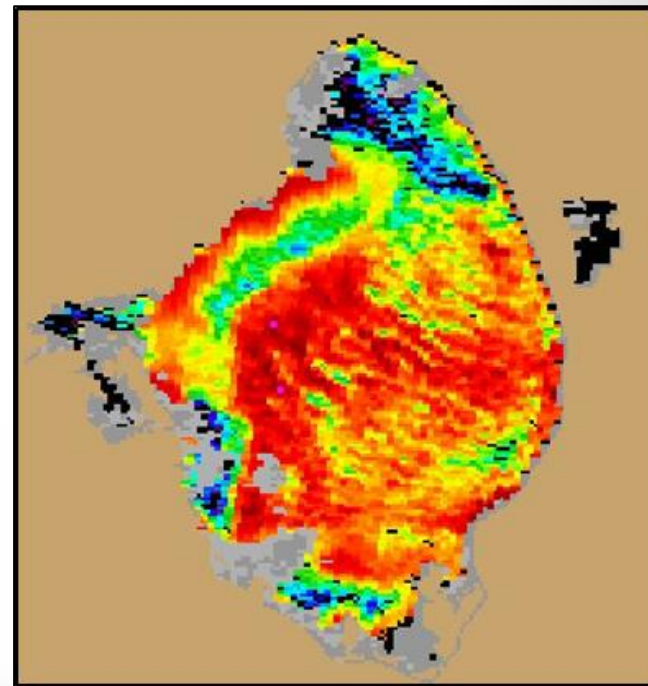
Public Health Response to Algal Blooms In Florida

Andrew Reich, Bureau of Environmental Health



Gulf of Mexico HAB Bulletin: NOAA 8/13/18

Karenia brevis Red Tide



Lake O', Sentinel 3 Image: NOAA 7/10/18

Cyanobacteria Bloom

Press Reports

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

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

Published 2:53 p.m. ET Aug. 7, 2018 | Updated 7:53 p.m. ET Aug. 7, 2018

Florida red tide update: Algae blooms blamed for sickening people, killing marine life

Updated 9:57 AM; Posted Aug 8, 4:38 PM



Blue-green algae bloom in St. Lucie River 10 times too toxic to touch, DEP tests show

Tyler Treadway, Treasure Coast Newspapers Published 2:55 p.m. ET Aug. 8, 2018 | Updated 9:19 a.m. ET Aug. 9, 2018



TC Palm (USA Today) 8/9/18

Karenia brevis Red Tide



Ben Depp, National Geographic 8/8/18

Red Tide in Florida?

FLAPOL[HOME](#) [HEADLINES](#) [LEG., INFLUENCE & POLICY](#) [COMMUNITIES](#) [FEDERAL](#)FEDERAL

Bipartisan legislation secures federal
funding to combat algae blooms

floridapolitics.com

WIKIMEDIA COMMONS

Red Tide in Florida?

Experts: Hurricane Michael failed to end Florida's red tide

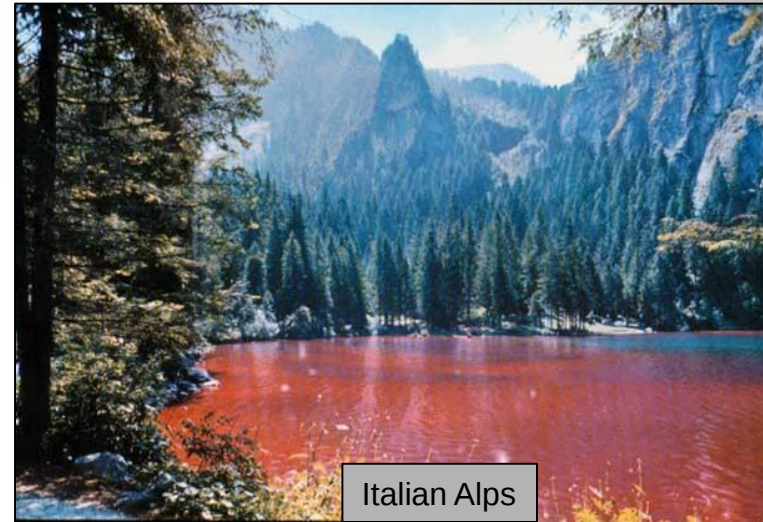


Image Source: Pixabay / MGN

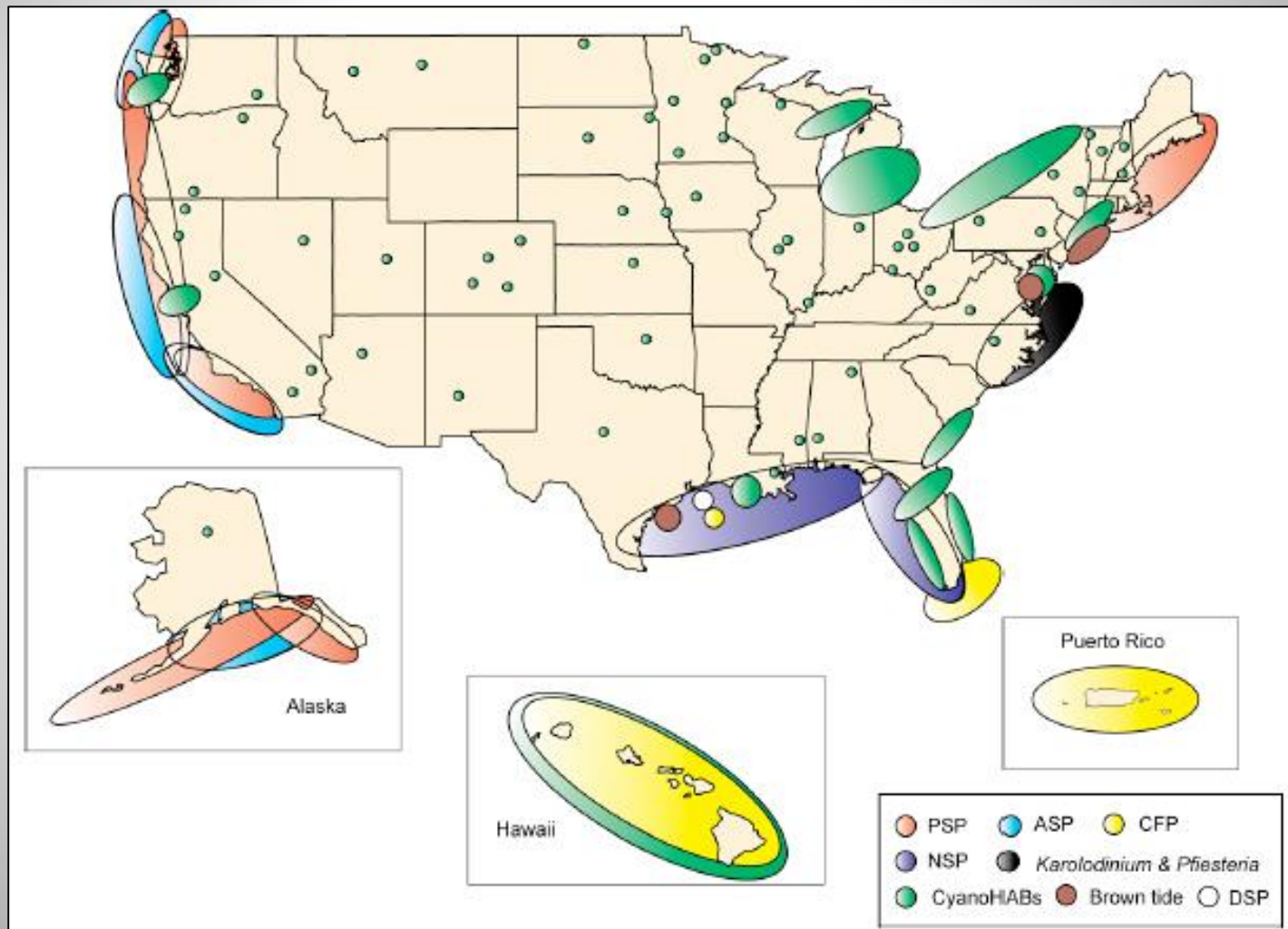
By JENNIFER KAY, Associated Press | Updated: Mon 12:52 PM, Oct 15, 2018



“Other” Red Tides



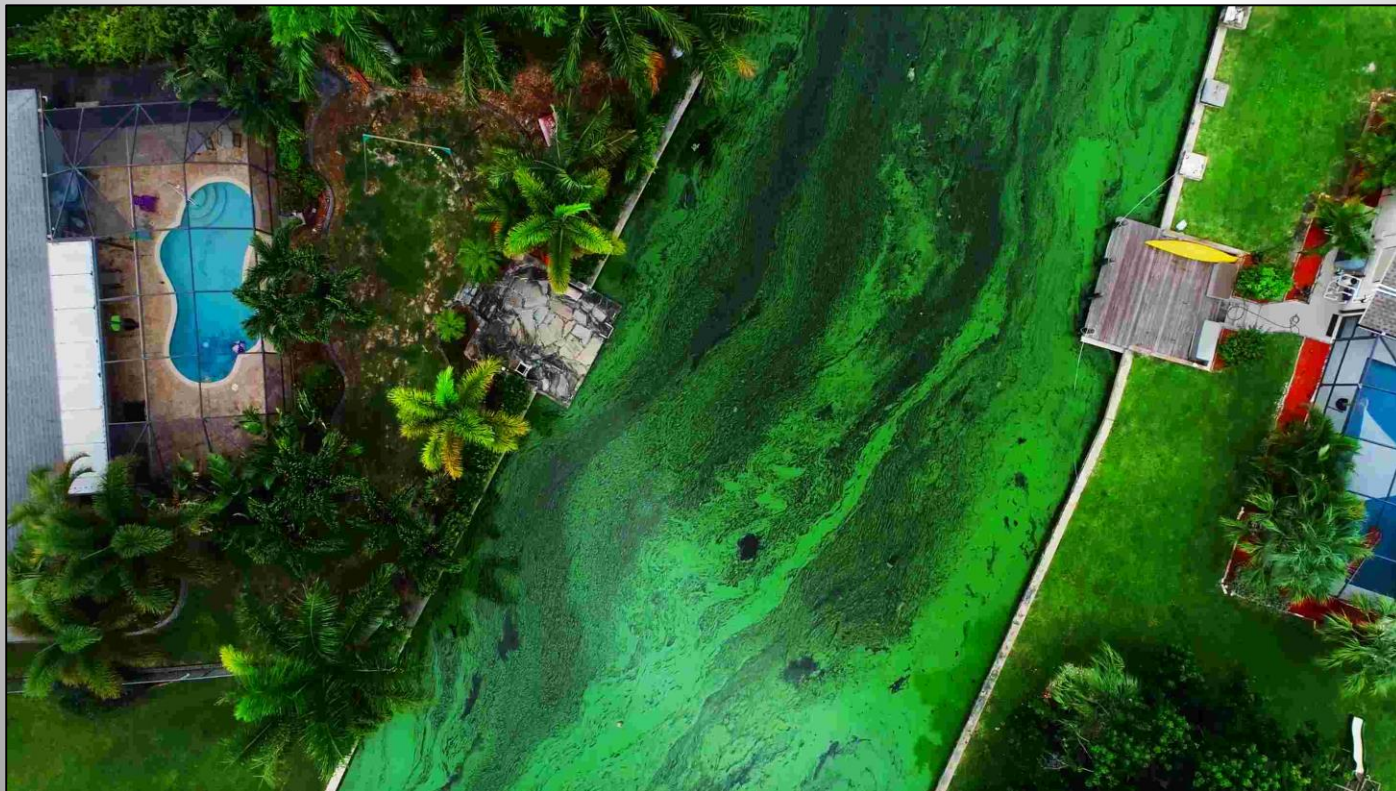
Distribution of HABs in the US



Source: U.S. National Office for Marine Biotoxins and Harmful Algal Blooms

Freshwater: Cyanobacteria

- *Microcystis*, *Anabaena*, *Cylindrospermopsis*
Oscillatoria, *Aphanizomenon*



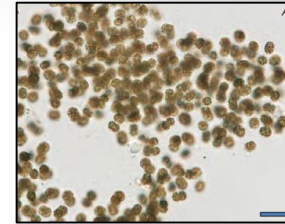
News-Press (USA Today) 7/14/18 Cape Coral, Florida

Red Tide vs. BG algae



Compare

- Single Cells
- Aquatic Organisms
- Photosynthetic
- Produce Toxins
- Naturally Occurring
- Do not accumulate in fish fillets

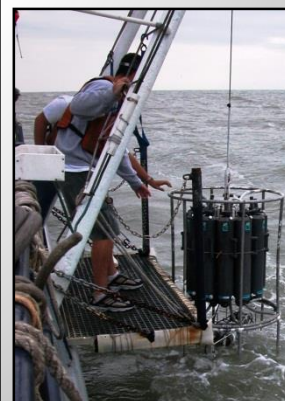
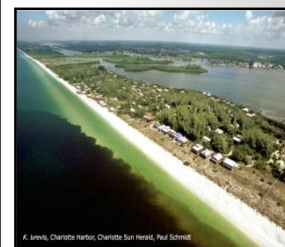
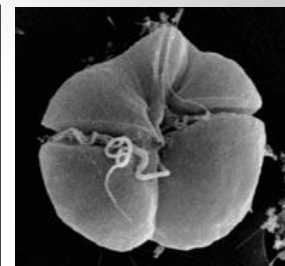
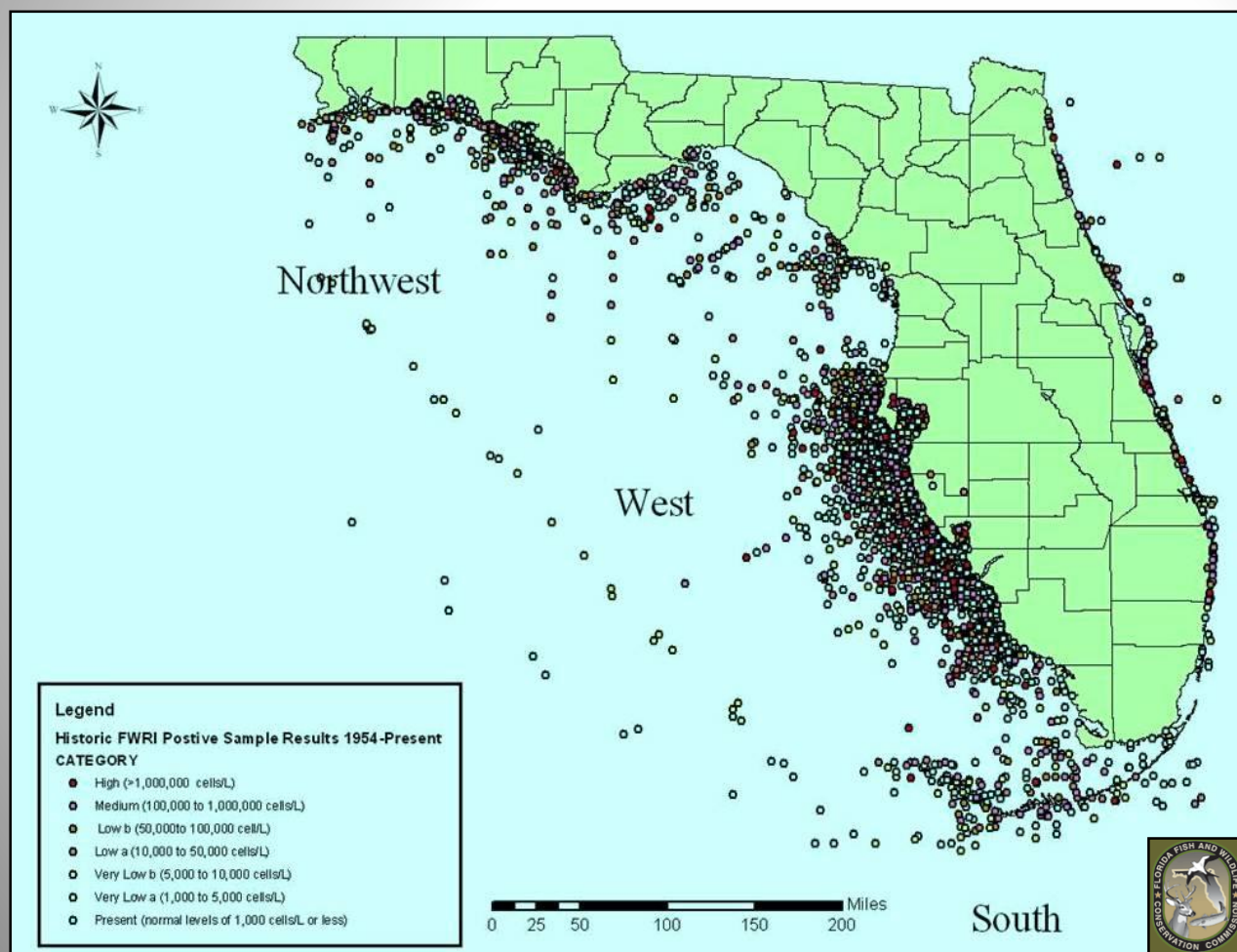


Contrast

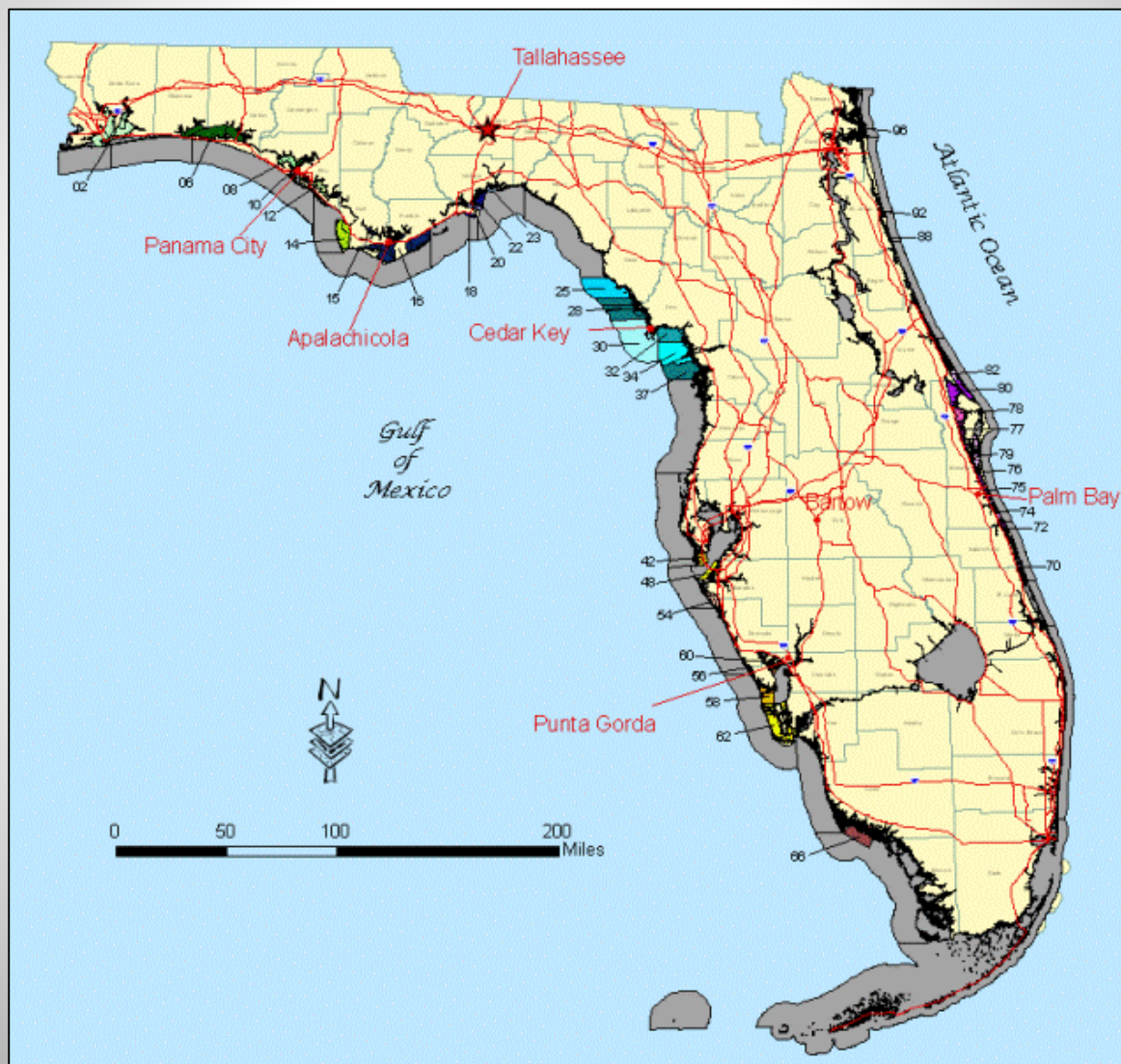
- Marine vs. Freshwater
- One vs. Many Species
- One vs. Many Toxins
- Aerosols vs Not Airborne
- Unknown why bloom vs. known association with nutrients

Florida Red Tide

Positive Samples, 1954 to Present



Approved Shellfish Harvesting Areas



Red Tide Events

	Red Tide (MEDIUM levels or greater)											
	Suspected continuance of red tide*											
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1844	Reports of fish kills; no duration											
1854	Reports of fish kills; no duration											
1856	Reports of fish kills; no duration											
1865	Reports of fish kills; no duration											
1878												
1879	Reports of fish kills; no duration											
1880												
1882												
1883	Reports of fish kills; no duration											
1884	Reports of fish kills; no duration											
1885												
1908	Reports of fish kills; no duration											
1916												
1935	Reports of fish kills; no duration											
1946												
1947												
1948	Reports of fish kills; no duration											
1952												
1953												
1954												
1955												



Red Tide Events

Red Tide (MEDIUM levels or greater)												
Suspected continuance of red tide[*]												
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1957												
1958												
1959												
1960												
1961												
1962												
1963												
1964												
1966												
1967												
1968												
1970												
1971												
1972												
1973												
1974												
1975												
1976												
1977												
1978												
1979												



Red Tide Events

Red Tide (MEDIUM levels or greater)												
Suspected continuance of red tide [*]												
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1980												
1981												
1982												
1983												
1984												
1985												
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1987												
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1989												
1990												
1991												
1992												
1993												

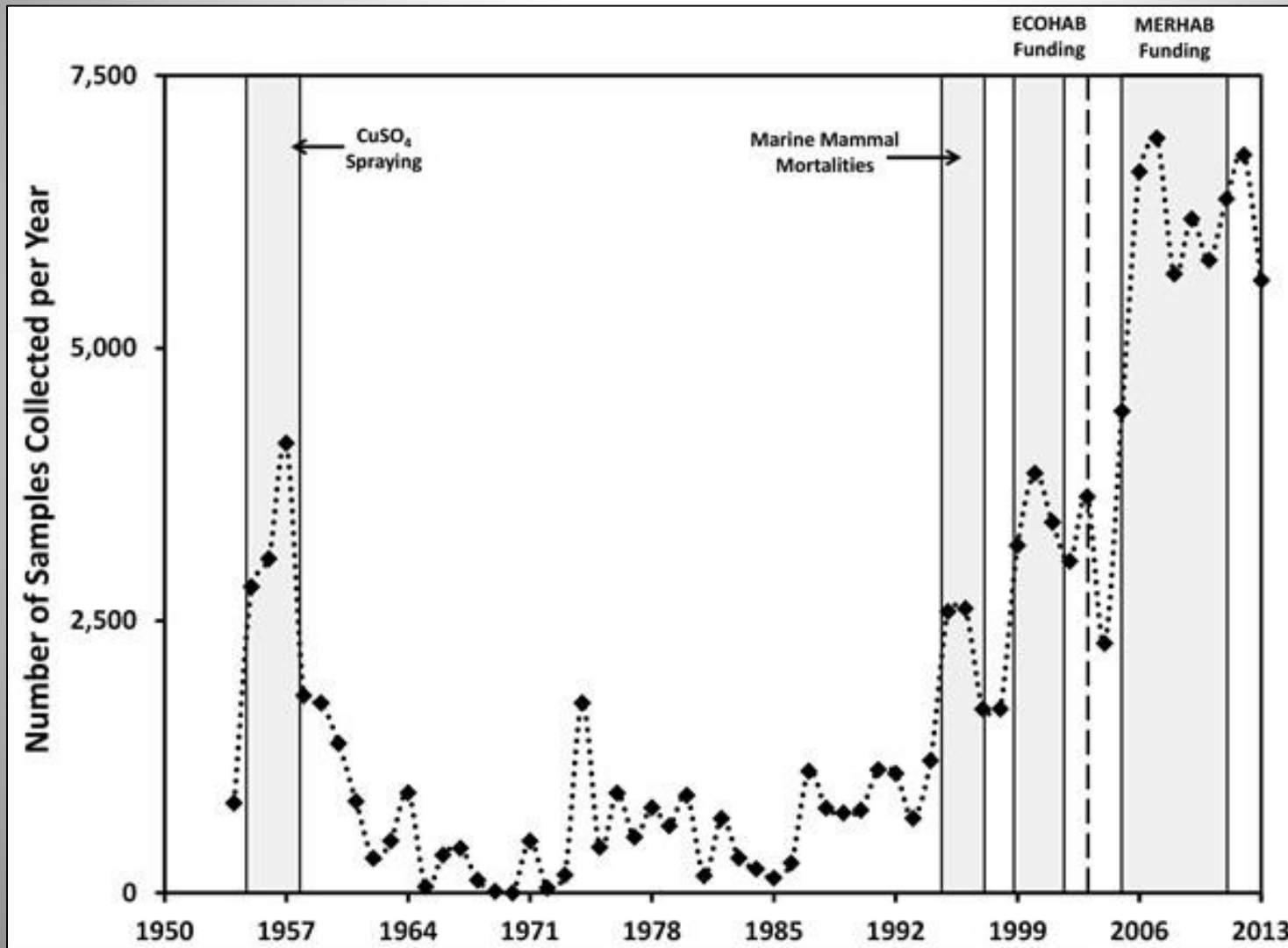


Red Tide Events

Red Tide (MEDIUM levels or greater)												
Suspected continuance of red tide*												
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1994												
1995												
1996												
1997												
1998												
1999												
2000												
2001												
2002												
2003												
2004												
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2017												
2018												

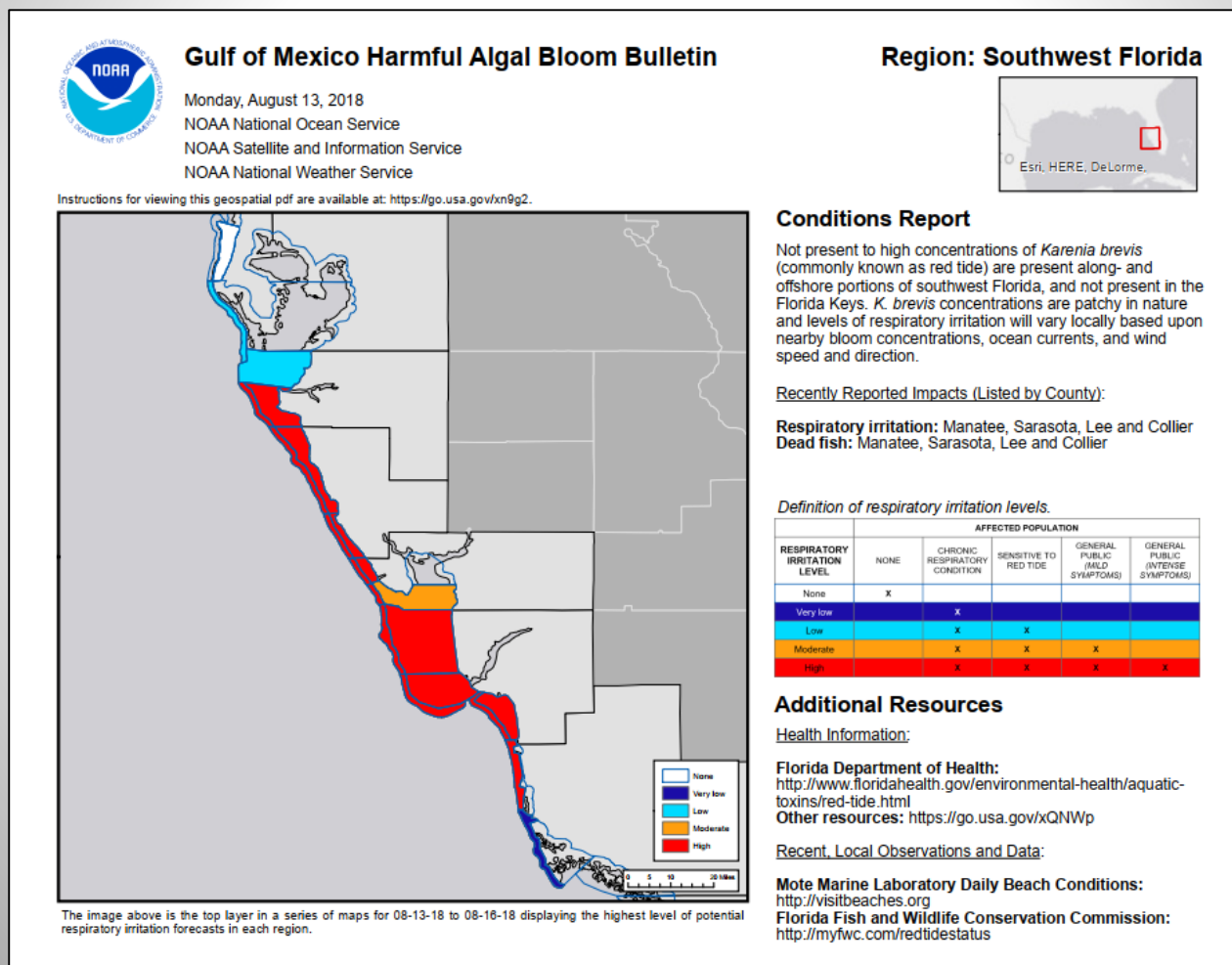


Red Tide Sampling 1954 - 2013



NOAA Gulf of Mexico

• *Harmful Algal Bloom Bulletin*

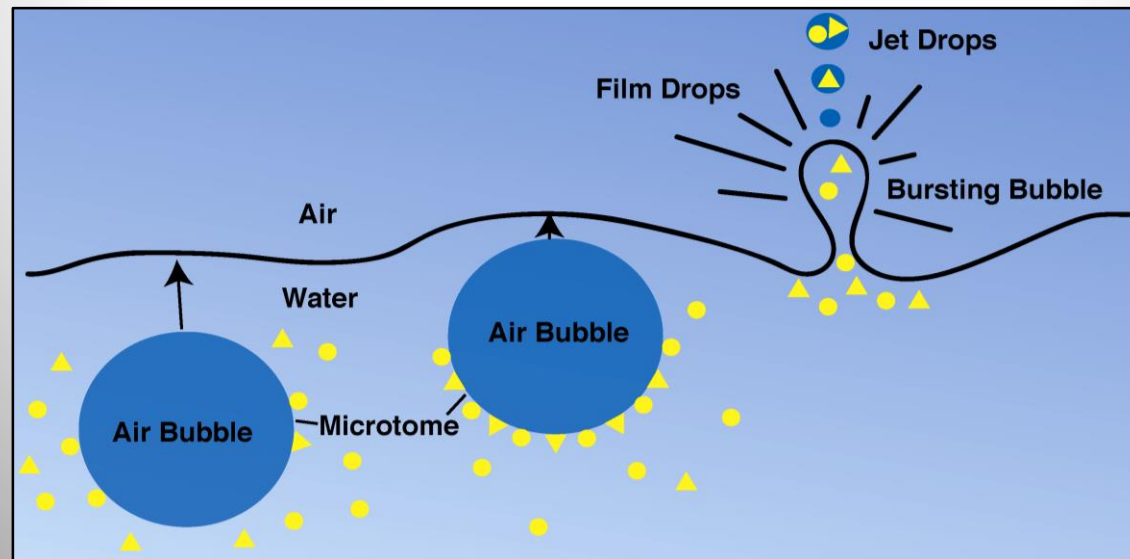
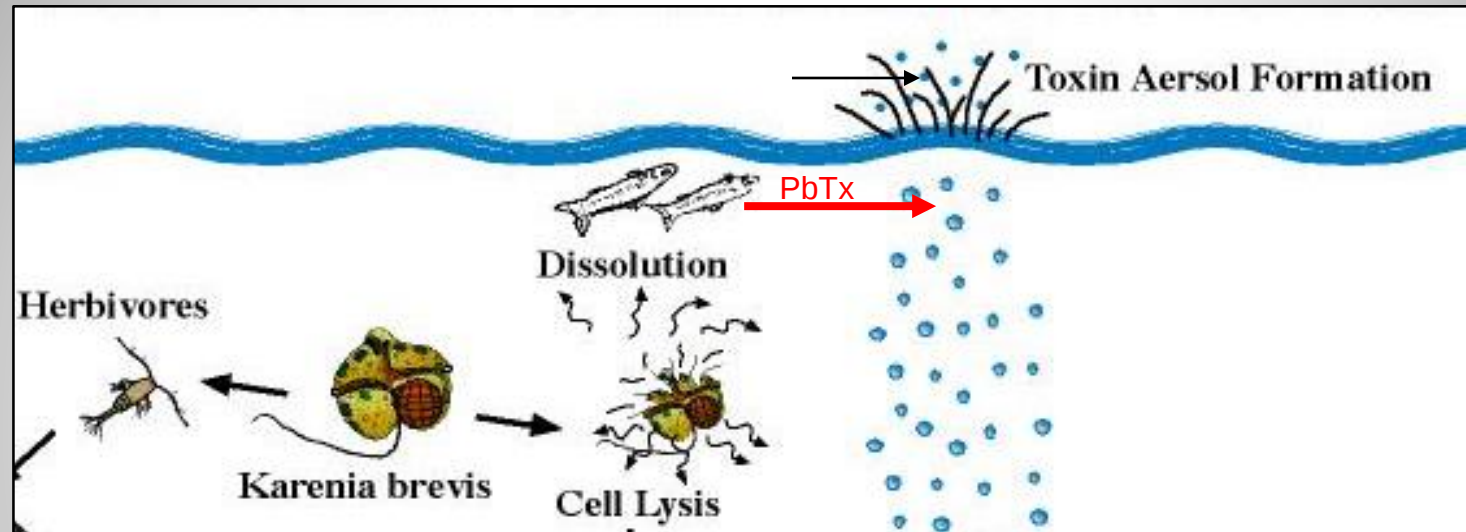


HAB Bulletin

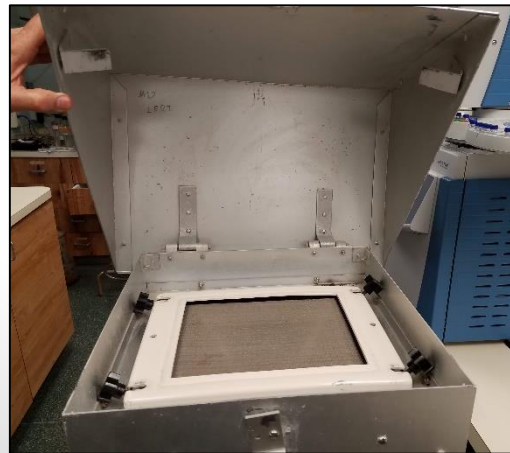
- *Potential for Respiratory Irritation*

County Region	Mon 08/13	Tue 08/14	Wed 08/15	Thu 08/16
Northern PINELLAS County-Bay Regions	none	none	none	none
Northern PINELLAS County, Upper Bay Area-Bay Regions				
Southern PINELLAS County-Gulf Coast	low	low	low	very low
Southern PINELLAS County-Bay Regions				
PINELLAS and Northern MANATEE County-Bay Regions	low	low	low	very low
South MANATEE County-Gulf Coast	high	high	high	high
South MANATEE County-Bay Regions	high	high	high	high
North SARASOTA County-Gulf Coast	high	high	high	moderate
North SARASOTA County-Bay Regions	high	high	high	high
Southern SARASOTA County-Gulf Coast	high	high	high	moderate
Southern SARASOTA County-Bay Regions	high	high	high	moderate
North CHARLOTTE County-Gulf Coast	high	high	high	moderate
North CHARLOTTE County-Bay Regions	high	high	high	high
Southern CHARLOTTE County-Gulf Coast	high	high	high	moderate
Southern CHARLOTTE County-Bay Regions	moderate	moderate	moderate	moderate

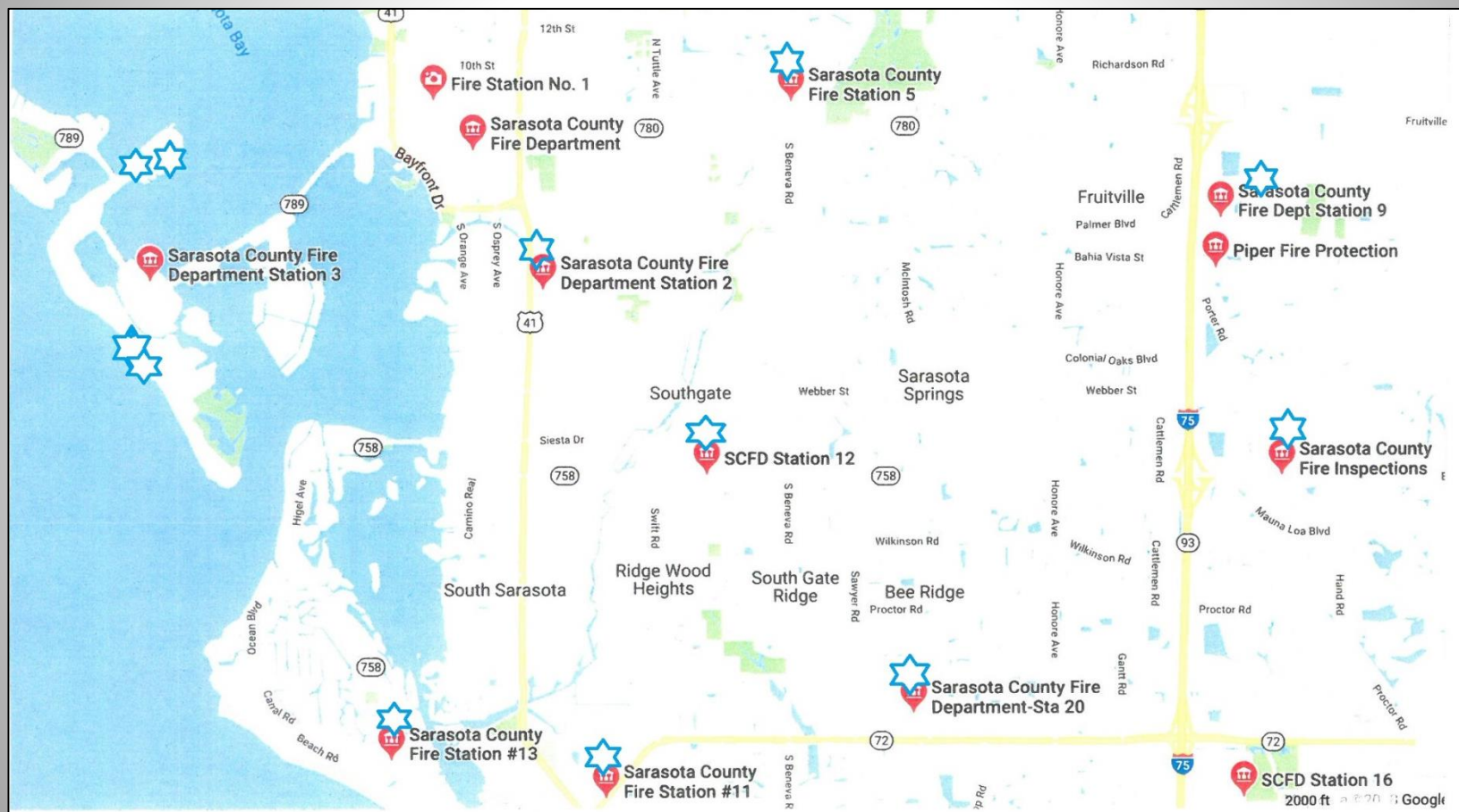
Bubble-mediated Transport



Mote Marine Laboratory and Aquarium



Mote Marine Laboratory and Aquarium



Sarasota County: Inland Transect Sampling Locations

Cyanobacteria/Blue-Green Algae



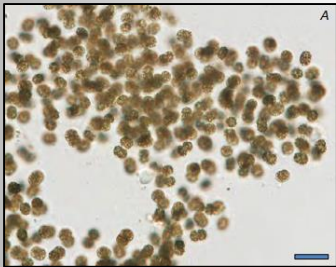
Chad Gillis, Fort Myers News-Press
Sept. 14, 2018



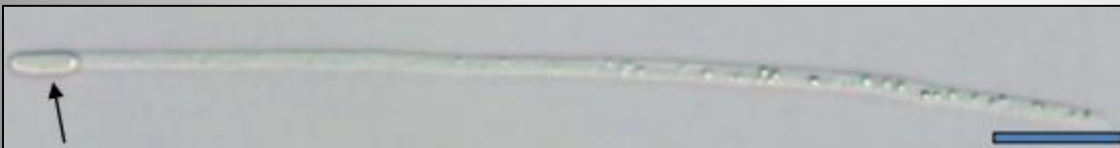
Shepard Park on the St. Lucie River near downtown
Stuart June 12, 2018. (Allen Eyestone / The Palm
Beach Post

Cyanobacteria/Blue-Green Algae

- Cyanotoxins: microcystins, anatoxins, cylindrospermopsins, etc.

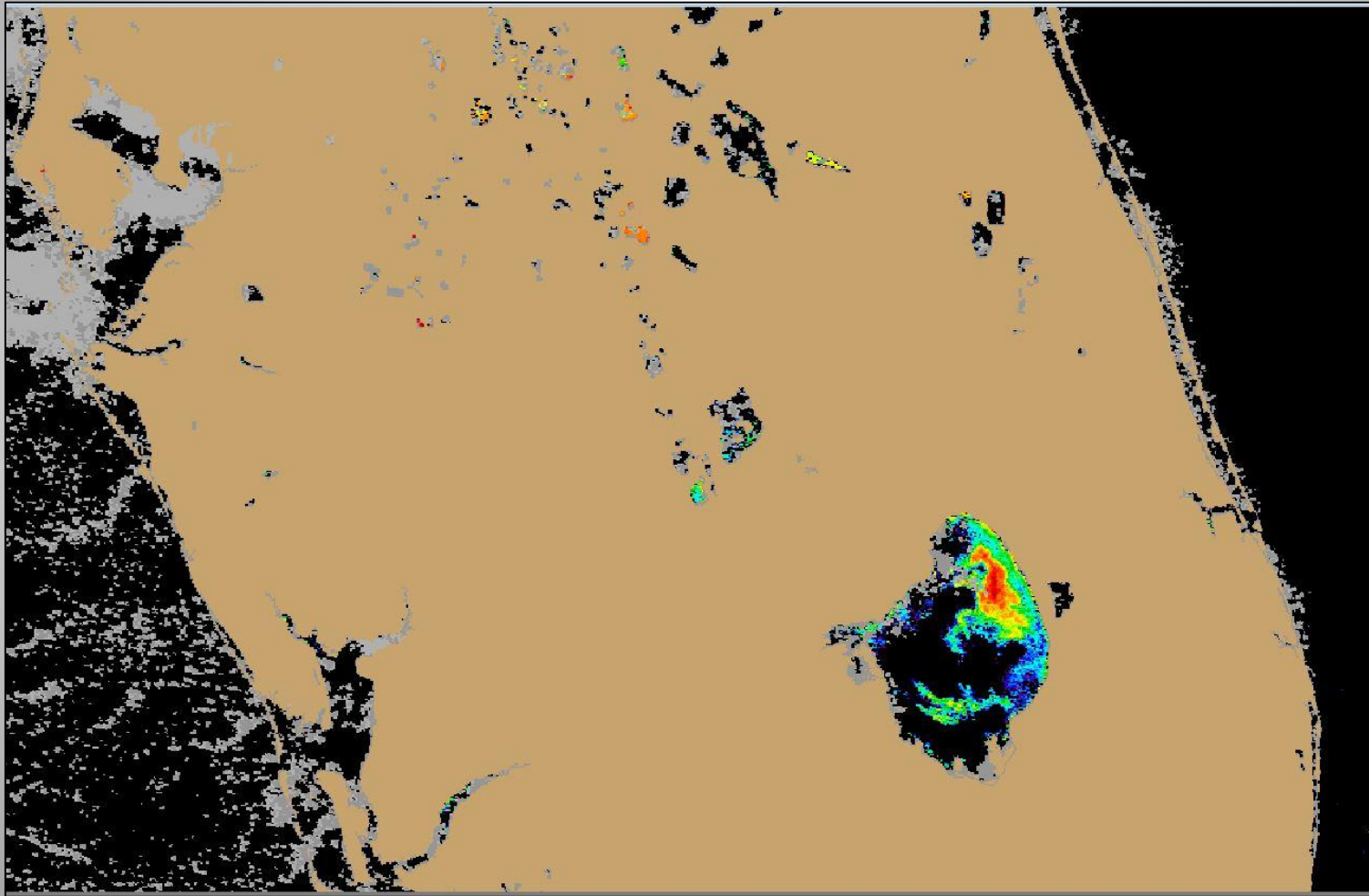


- No taste or smell
- Heat, acid stable
- Toxic



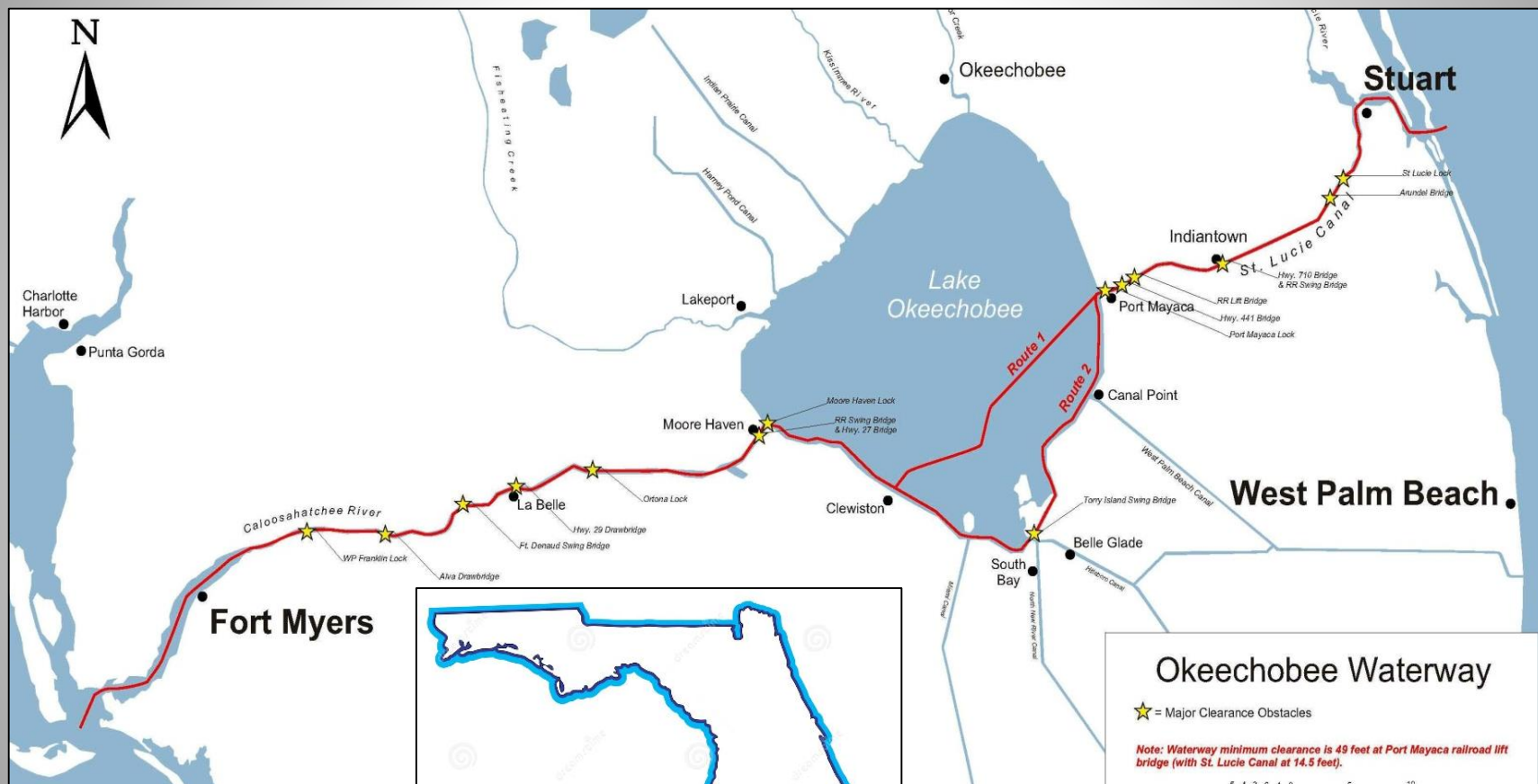
Rosen et al, 2017

Cyanobacteria Satellite Imagery



National Aeronautics and Atmospheric Administration, 8/10/18

Lake Okeechobee Waterway



Signage



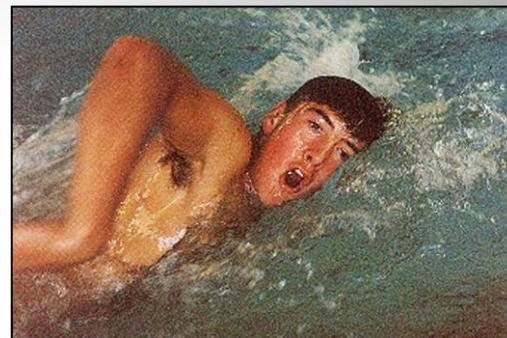
Potential Exposure Pathways



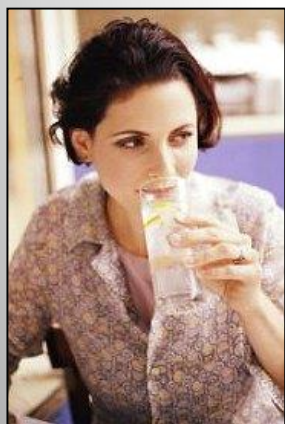
Direct Skin Contact



Ingestion of
Food



Incidental
Ingestion



Drinking
Water



Inhalation of
Aerosols

Hydrogen Sulfide Testing



www.floridahealth.gov/algaeblooms



It's a New Day in Public Health.

The Florida Department of Health works to protect, promote & improve the health of all people in Florida through integrated state, county, & community efforts.

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Programs & Services

Licensing & Regulation

Statistics & Data

Certificates

Diseases & Conditions

Environmental Health

Aquatic Toxins

[Home](#) » [Environmental Health](#) » Aquatic Toxins

Aquatic Toxins and Animal Health

Ciguatera Fish Poisoning

Cyanobacteria/Blue-Green Algae Blooms and Public Health

Red Tide Blooms

Shellfish Poisonings

Program Partners

Caspio Bloom Mapping Tool

Health Reports

Where Is Red Tide?

Where is Blue Green Algae?

Aquatic Toxins



Harmful Algal Blooms (HABs) and Your Health

Florida features 1,200 miles of coastline, 11,000 miles of rivers, streams and creeks, 7,700 lakes and more large springs than any other state. The Florida Department of Health (DOH) works to keep these waters safe from harmful algal blooms (HABs) and their toxins (or poisons). This work helps keep people safe from HABs when they play in or near water bodies or when they eat Florida seafood.

Aquatic Toxins Program

☎ 850-245-4250

✉ ph toxicology@FLHealth.gov

☎ Fax
850-414-9069



Health reports

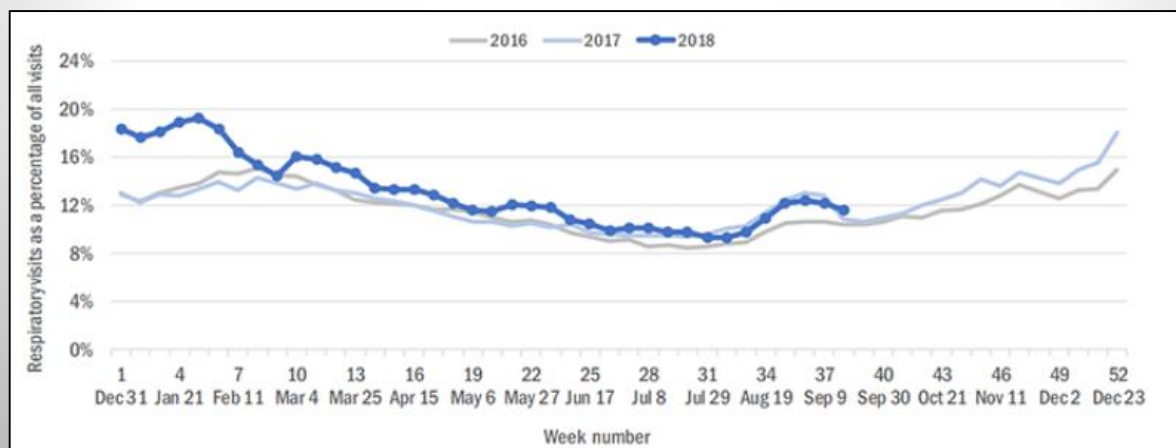
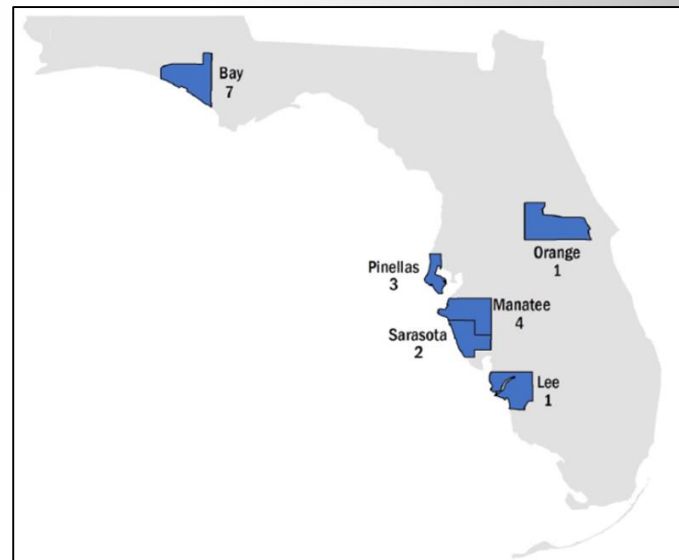
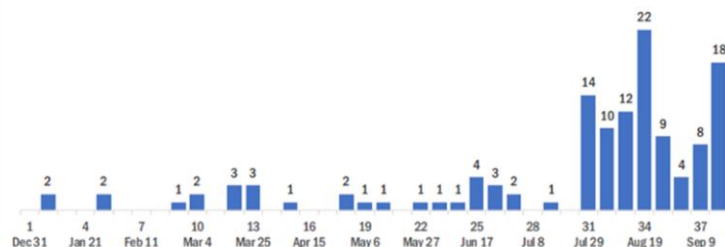
RED TIDE WEEKLY REPORT

Red tide health effects

Weekly report for September 16 to September 22, 2018 (week 38)

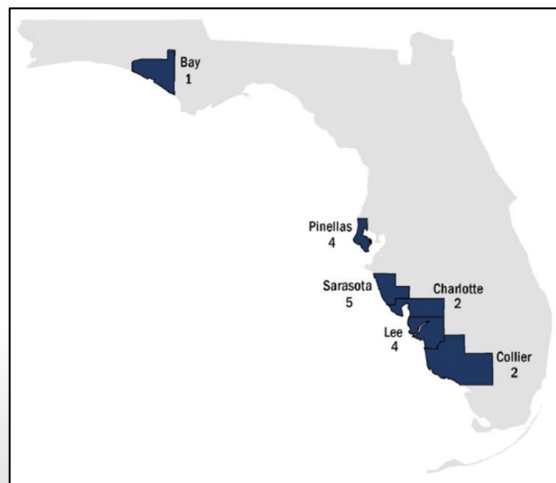
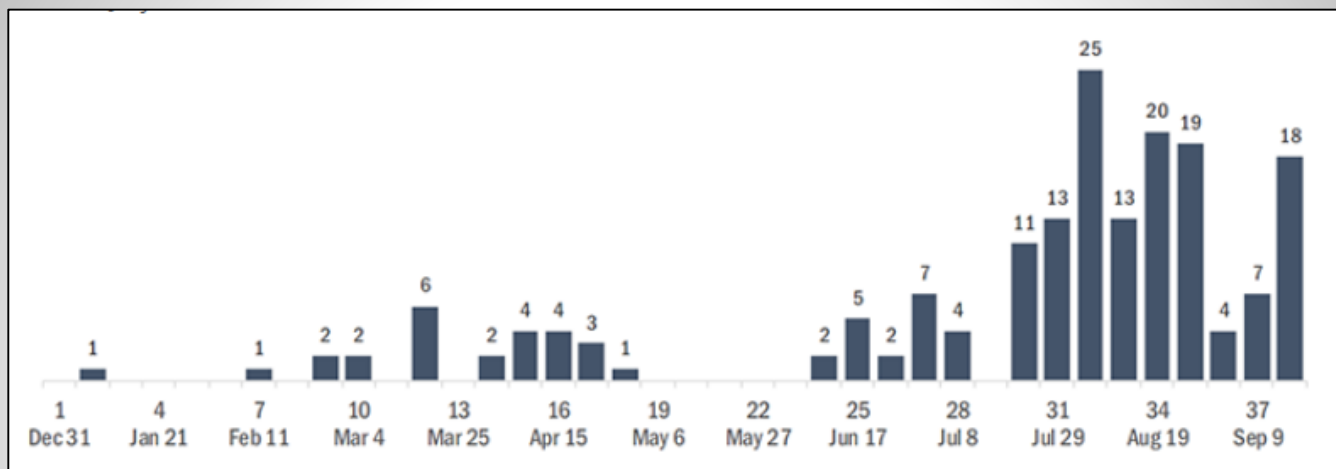
Most human health effects caused by exposure to red tide (caused by *Karenia brevis*) are mild (e.g., irritation of the eyes, nose, and throat) and go away without the need for medical treatment. If you are experiencing mild health effects from red tide, please contact your Florida poison control center at 800-222-1222 to report your illness. If you have more serious symptoms, please see your health care provider for evaluation.

Visits to emergency departments in Florida with reported exposure to red tide or algae increased from the end of July 2018, peaked in mid-August and have since decreased. The number of visits increased last week (September 16 to September 22).



Emergency Department Visits

Health reports



Florida Poison Control Exposure Calls

Health reports

BLUE-GREEN ALGAE WEEKLY REPORT

Blue-green algae health effects

Weekly report for September 16 to September 22, 2018 (week 38)

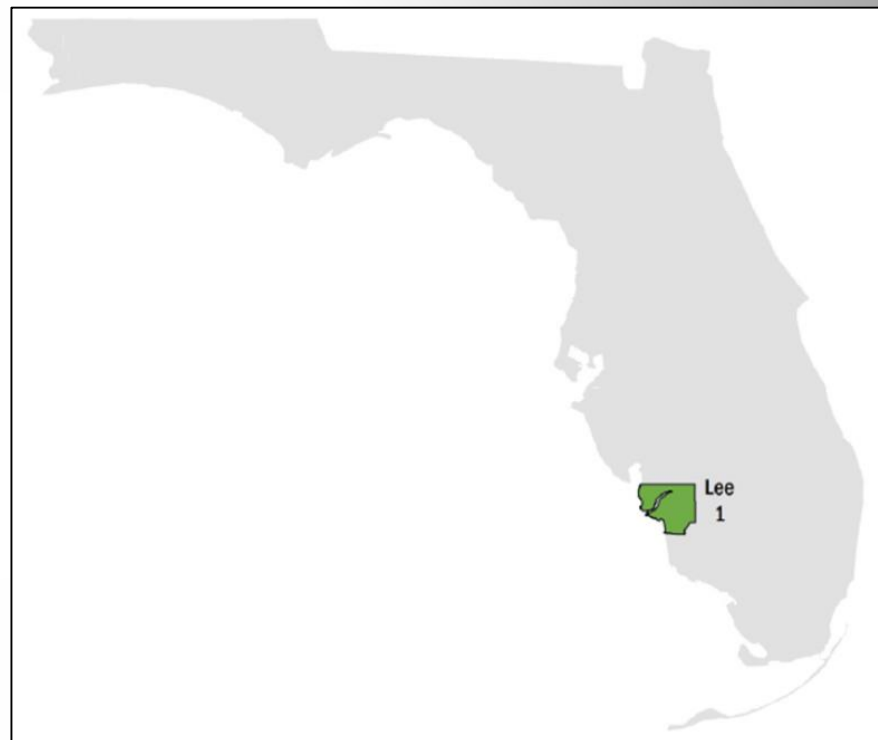
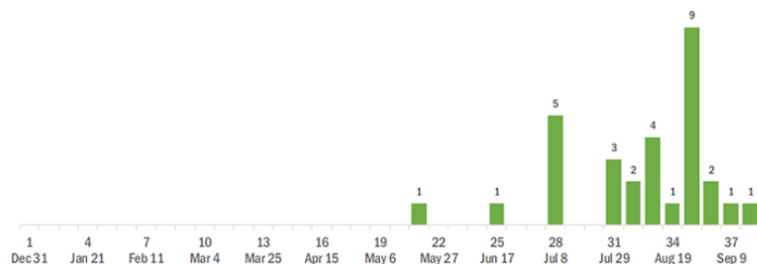
Human health effects caused by exposure to blue-green algae (cyanobacteria) are very rare. At high levels of exposure, such as when domestic animals drink untreated surface water with thick cyanobacteria blooms, cyanotoxins can cause significant health impacts. However, cyanotoxins do not aerosolize to significant amounts and exposure via inhalation is not a risk to the general public.

Information on how to keep your family safe while enjoying Florida's waterways.

If you are experiencing mild health effects from possible exposure to blue-green algae, please contact your Florida poison control center at 800-222-1222. If you have more serious symptoms, please see your health care provider for evaluation.

The terms "blue green algae" and "cyanobacter" are not found in the statewide emergency department data; therefore, those data are not presented here. Please see the poison control centers call data for health complaints associated with blue-green algae.

In Florida, the number of blue-green algae-associated calls to Florida poison control centers increased in August 2018.



Florida Poison Control Exposure Calls

Department's Web Site

Cyanobacteria/Blue-Green Algae Blooms and Public Health

- Some blue-green algae produce chemicals called cyanotoxins.
- At high concentrations, cyanotoxins can affect the liver, nervous system and skin.
- Most problems occur when substantial amounts of water containing high toxin amounts is swallowed such as when people drink untreated surface water.
- Besides drinking the affected surface water, it is difficult to get cyanotoxins into the body as they do not become easily airborne and do not pass through the skin readily.
- Most people avoid a blue-green algae bloom because they tend to be icky-looking and smelly.

Guidance

What are some tips for avoiding cyanobacteria/blue-green algae?

Avoid swimming in or drinking water containing blue-green algae. It is best not to come in to contact with water in areas where you see foam, scum, or mats of algae on the water.

What should I do if I come in contact with cyanobacteria/blue-green algae?

If you come into contact with an algae bloom, wash with soap and water. If you experience an illness, please contact your healthcare provider.

Department's Web Site

- Red Tide Blooms

- People in coastal areas can experience varying degrees of eye, nose and throat irritation.
- When a person leaves an area with a red tide, symptoms usually go away.
- People with severe or chronic respiratory conditions such as asthma or chronic lung disease are cautioned to avoid areas with active red tides.
- If you experience irritation, get out and thoroughly wash off with fresh water. Swimming near dead fish is not recommended.
- Wearing a particle filter mask may lessen the effects, and using over-the counter antihistamines may decrease symptoms.

Outreach/Education

Know when to

swim it

With a buddy.
When safety flags
& signs say
thumbs-up!

shore it

If you have a cut on
your skin,
your immune system
is weak, or
you don't have a
buddy with you.

dodge it

Stay clear of living
things near the
shoreline & in the
water like
mosquitoes &
algae blooms.



Learn more at FloridaHealth.gov/SwimIt-ShoreIt



Dodge it

blue green algae?

dodge it

Stay clear of living things near the shoreline & in the water like mosquitoes & algae blooms.

Enjoy Florida's waters—know when to swim it, shore it or dodge it.

Blue green algae are organisms naturally found in all types of water—large concentrations are called blooms. Blooms can form a thick mat that can be foamy, scummy and give off a bad odor.

Don't swallow, swim, wade, use personal watercrafts, water ski or boat in waters where there are blooms.

Blooms can cause ear, eye and skin reactions, and hay fever and flu-like symptoms (diarrhea). Wash your skin and clothing with soap and water if you touch blooms, or discolored or smelly water. See your doctor if you have symptoms.

Waters where there are blooms are not safe for animals.

Don't cook or clean dishes with water contaminated by blooms. Boiling water will not eliminate chemicals.

Filletts from healthy fish caught in freshwater lakes experiencing blooms are safe to eat. The Florida Department of Health recommends that fish are not harvested from areas near or in the bloom.



Outreach Cards



blue green algae?

dodge it!

Don't wade, swim or swallow water where there are algae blooms.

With so many places in Florida to explore, we sometimes forget our beaches, lakes and rivers are natural places that change with the seasons. Enjoy Florida's wild and not-so-wild areas, and know when to swim it, shore it or dodge it.

Blue green algae are tiny organisms naturally found in all types of water
Blue green algae (also known as cyanobacteria) can grow in many of Florida's waterbodies. Large concentrations, called blooms, can change the water color to blue, green, brown, orange or red. Blooms can appear year-round but are more frequent in summer and fall.

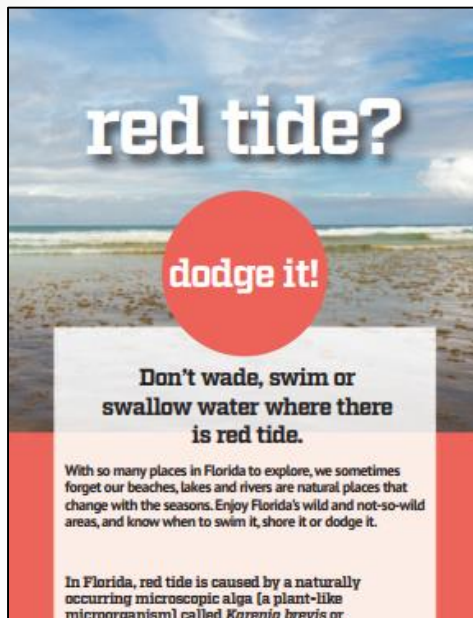
Algae blooms can look like a thick mat
Blue green algae can grow rapidly and sometimes form a foamy surface scum and an unpleasant odor.

Stay away from blooms
Swimming in water with blue green algae blooms may cause ear, eye and skin reactions, and hay fever and flu-like symptoms (including diarrhea)—these reactions aren't common. Because blooms can remove oxygen from the water, fish kills can occur.

Report fish kills, algal blooms or illnesses
Fish Kill Hotline: Florida Fish and Wildlife Conservation Commission, 1-800-636-0511
Algal blooms: Florida Department of Environmental Protection, 1-855-305-3903 or <https://depnewsroom.wordpress.com/algal-bloom-monitoring-and-response/>
Human illnesses: Florida Poison Control Center, 1-800-222-1222

Florida Health

Florida Health Office of Communications 08/14/18



red tide?

dodge it!

Don't wade, swim or swallow water where there is red tide.

With so many places in Florida to explore, we sometimes forget our beaches, lakes and rivers are natural places that change with the seasons. Enjoy Florida's wild and not-so-wild areas, and know when to swim it, shore it or dodge it.

In Florida, red tide is caused by a naturally occurring microscopic alga (a plant-like microorganism) called *Karenia brevis* or *K. brevis*
K. brevis produces a toxin that can affect the central nervous systems of fish, birds, mammals and other animals. Large concentrations, called blooms, can change the water color to red, light or dark green, or brown.

Red tides occur all over the world
No single factor causes a red tide. *K. brevis* is found almost exclusively in the Gulf of Mexico but has been found on the east coast of Florida and off the coast of North Carolina.

Red tide blooms can last days, weeks or months
Blooms can change daily due to wind conditions and water currents. Onshore winds normally bring it near the shore and offshore winds drive it out to sea.

Report fish kills or illnesses
Fish Kill Hotline: Florida Fish and Wildlife Conservation Commission, 1-800-636-0511
Human illnesses: Florida Poison Control Center, 1-800-222-1222

Florida Health

Florida Health Office of Communications 08/14/18



9,000+ miles of SALTY & FRESH Florida shoreline

Know when to:

swim it
With a buddy.
When safety flags & signs say thumbs-up!

shore it
If you have a cut on your skin, your immune system is weak, or you don't have a buddy with you.

dodge it
Stay clear of living things near the shoreline & in the water like mosquitoes & algae blooms.

Avoid blooms and dead fish. Some people who swim in red tide experience skin irritation and eye irritation. After contact, thoroughly wash off with fresh water. Red tide can also produce airborne chemicals, called toxins, that can cause you to cough, sneeze and tear. For most people, these are temporary symptoms. Wearing a particle mask and using antihistamines can help with symptoms. If you have a chronic respiratory problem like severe asthma, be careful near red tide areas, and check current marine conditions.

Do not swim in areas where there are dead fish in the water including when a red tide is present.

Commercial seafood. Commercial seafood purchased in restaurants, grocery stores and seafood markets is safe to eat.

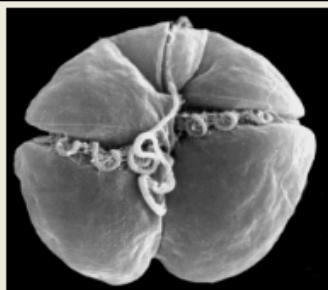
Seafood harvested from areas with a red tide:

- Clams and oysters (mollusks) can contain red tide toxins that cause Neurotoxic Shellfish Poisoning. Check local harvesting status before collecting at FreshFromFlorida.com.
- Finfish caught live and healthy can be eaten if filleted and rinsed thoroughly.
- Edible meat of crabs, shrimp and lobsters (shellfish) can be eaten (do not eat the tamarley—the green digestive gland—of shellfish).
- Do not eat distressed or animals found dead under any circumstances.

For current red tide conditions, visit:
MyFWC.com/REDTIDESTATUS, or Visit Beaches.org or call 941-BEACHES (232-2437).

Florida Health

FWC Web Site



Red Tide

A red tide is a higher-than-normal concentration of a microscopic alga (plant-like organism). In Florida, the species that causes most red tides is *Karenia brevis* (*K. brevis*).

Red Tide Current Status

FWC reports on the current status of *Karenia brevis* blooms using tables, static maps, and interactive Google Earth maps. Archived status maps can be found in our Flickr gallery.

Red Tide FAQ

Do you have questions about Florida's red tide? Find the answers here.

HAB General Information

Learn about algae blooms in Florida, including red tide.

Tools for Tracking Red Tides

FWC scientists combine field sampling with tools maintained by state and federal partners to track red tides and their effects.

Labs and People

About | Current Staff

HAB Monitoring

About | Current Projects | Past Florida Events | HAB Monitoring Database

HAB Research

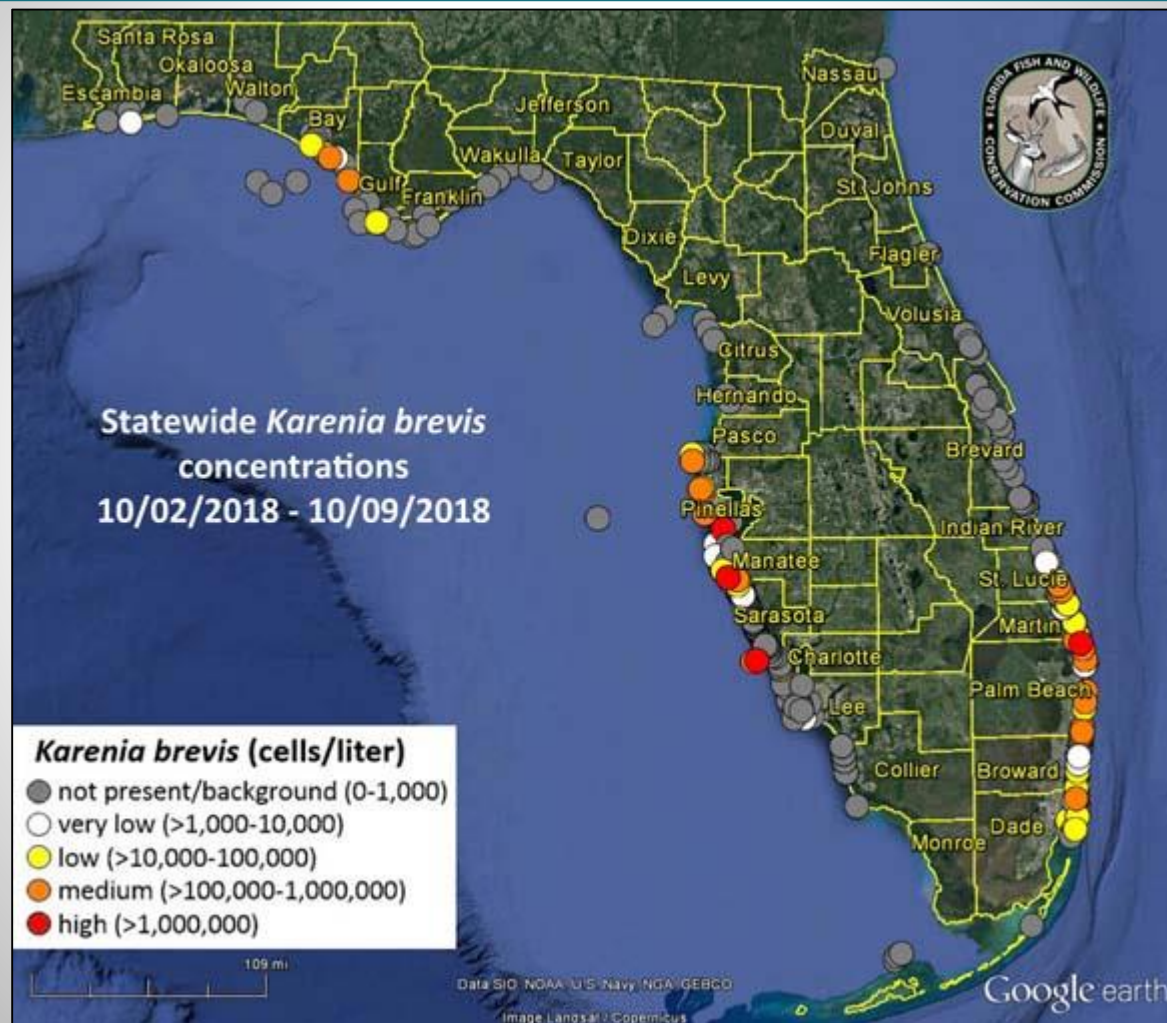
Current Research | Scientific Products

Social Media and Outreach

Facebook | Flickr | HAB Factsheets | Red Tide Guide | Other Products

<http://myfwc.com/research/redtide/>

FWC Web Site



<http://myfwc.com/REDTIDESTATUS>

FDEP Web Site

Algal Bloom Monitoring and Response

[Home](#) » [Divisions](#) » [Division of Environmental Assessment and Restoration](#) » Algal Bloom Monitoring and Response

Algal Bloom Monitoring and Response Quick Links

- [Algal Bloom Sampling Results](#)
- [2018 Emergency Response](#)
- [2018 Harmful Algal Bloom Management Grant](#)
- [Algal Bloom Contacts](#)
- [Health and Wildlife Impacts](#)
- [Beach Closures](#)
- [Fact Sheet - Harmful Algal Blooms](#)
- [All Algal Bloom Monitoring and Response Content](#)

REPORT ALGAL BLOOMS

Click Here or Call 855-305-3903

REPORT FISH KILL OR WILDLIFE IMPACT

FWC's Fish Kill Hotline at 800-636-0511
FWC's Wildlife Alert Hotline at 888-404-3922

The Report Algal Blooms hotline and online submission form are for freshwater blue-green algae reports only.

To report red tide blooms, visit the [FWC Red Tide Status website](#).

WHO TO CONTACT

Harmful Algal Bloom Management GRANT

ALGAL BLOOM RESULTS

Current Status RED TIDE



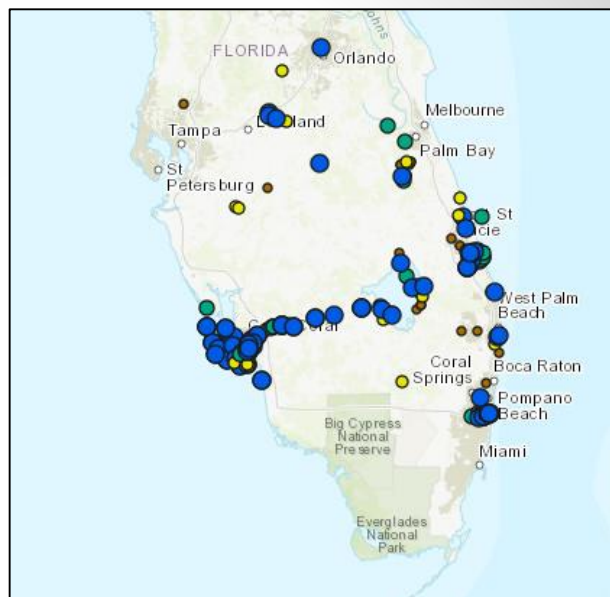
<https://floridadep.gov/AlgalBloom>



FDEP Web Site

**REPORT
ALGAL BLOOMS**

Click Here or Call 855-305-3903



Site Visits - within 30 days Site Visits - past 31-60 days Site Visits - past 61-90 days Site Visits - older than 90 days FWCC/FWRI_algal - v							
Options Filter by map extent Zoom to Clear selection Refresh							
Site Visit Date and Time	Sample Location	County	Site Visited By	Sample Taken?	Sample Depth Description	Sample Depth (meters)	Analyzed By
9/4/2018, 10:50 AM	Lake Okeechobee near L001	Okeechobee	SFWMD	Yes	Surface grab	0.30	DEP

27 features 0 selected



Contact Information

andy.reich@flhealth.gov
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