Public Health Response to Algal Blooms

In Florida

Andrew Reich, Bureau of Environmental Health

Karenia brevis Red Tide

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

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

TC Palm (USA Today) 8/9/18
Karenia brevis Red Tide

Ben Depp, National Geographic  8/8/18
Red Tide in Florida?

Bipartisan legislation secures federal funding to combat algae blooms
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 12:32 PM, Oct 15, 2018
Woods Hole Oceanographic Institution

“Other” Red Tides

California.  
Italian Alps.  
Hong Kong.  
Mexico.  
China.
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

Legend
Historic FWRI Positive Sample Results 1954-Present
- High (>1,000,000 cells/L)
- Medium (100,000 to 1,000,000 cells/L)
- Low b (50,000 to 100,000 cells/L)
- Low a (10,000 to 50,000 cells/L)
- Very Low b (5,000 to 10,000 cells/L)
- Very Low a (<1,000 to 5,000 cells/L)
- Present (normal levels of 1,000 cells/L or less)
Approved Shellfish Harvesting Areas
# Red Tide Events

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*Reports of fish kills; no duration*
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Red Tide Sampling 1954 - 2013
NOAA Gulf of Mexico

**Harmful Algal Bloom Bulletin**

**Gulf of Mexico Harmful Algal Bloom Bulletin**

**Region: Southwest Florida**

**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 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: Manatee, Sarasota, Lee and Collier

Red tide fish: Manatee, Sarasota, Lee and Collier

**Definition of respiratory irritation levels:**

<table>
<thead>
<tr>
<th>RESPIRATORY IRITRATION LEVEL</th>
<th>NOOS</th>
<th>CHRONIC RESPIRATORY CONDITION</th>
<th>MORTALITY OR RED TIDE</th>
<th>GENERAL PUBLIC (SAFETY)</th>
<th>GENERAL PUBLIC (MEDICAL)</th>
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**Additional Resources**

Health Information:


Other resources: [https://fmg.usgs.gov/fwm/p](https://fmg.usgs.gov/fwm/p)

Recent Local Observations and Data:

Mote Marine Laboratory Daily Beach Conditions: [http://visitbeaches.org](http://visitbeaches.org)


The image above is the top layer in a series of maps for 06-13-18 to 06-15-18 displaying the highest level of potential respiratory irritation forecasts in each region.
**HAB Bulletin**

- *Potential for Respiratory Irritation*

<table>
<thead>
<tr>
<th>County Region</th>
<th>Mon 08/13</th>
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<td>high</td>
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<tr>
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<tr>
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</table>
Bubble-mediated Transport
Mote Marine Laboratory and Aquarium
Mote Marine Laboratory and Aquarium

Sarasota County: Inland Transect Sampling Locations
Cyanobacteria/Blue-Green Algae

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, cylindrospermosins, 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

WARNING: ALGAE ALERT
SWIM AT OWN RISK
NO DRINKING
BY HUMANS OR ANIMALS
NO EATING FISH
CITY OF CAPE CORAL

WARNING: ALGAE ALERT
STAY OUT OF WATER
NO DRINKING
BY HUMANS OR ANIMALS
NO EATING FISH

HIGH BACTERIA
AND BLUE-GREEN ALGAE
AVOID CONTACT WITH THE WATER
MARTIN CO. HEALTH DEPT. (772) 224-2204
www.martincountyhealth.com

HARMFUL ALGAE MAY BE PRESENT
AVOID CONTACT WITH ALGAE BLOOMS
For Additional Info: www.MartinCountyHealth.com

City of Stuart’s
HEALTHY TRAIL

BLUE-GREEN ALGAE
AVOID CONTACT WITH THE WATER
FOR MORE INFORMATION CONTACT:
FLORIDA DEPARTMENT OF HEALTH IN MARTIN COUNTY
(772)221-4000

(Cyanobacteria)
BLUE GREEN ALGAE
Have you been exposed?
If so, please notify your physician or nurse.

MARIN HEALTH SYSTEM
Potential Exposure Pathways

- Direct Skin Contact
- Ingestion of Food
- Incidental Ingestion
- Drinking Water
- Inhalation of Aerosols
Hydrogen Sulfide Testing
www.floridahealth.gov/algaeblooms
Health reports

Emergency Department Visits
Health reports

Florida Poison Control Exposure Calls
Health reports

Florida Poison Control Exposure Calls

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 “cyanobacteria” 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.
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?

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.

Fillets 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 thin 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 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, algae blooms or illnesses:
Fish Kill Hotline: Florida Fish and Wildlife Conservation Commission, 1-800-656-0511
Human Illness: Florida Poison Control Center, 1-800-222-1222

**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 algae (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 tide occurs 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, 1-888-323-9675
Human Illness: Florida Poison Control Center, 1-800-222-1222

**Florida Shoreline**

9,000+ miles

Salty & Fresh Florida shoreline

Know when to:

9,000+ miles of

Salty & Fresh Florida shoreline

Swim it

With a buddy. When safety tags & signs say swim-when-safe.

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 tiring things near the shoreline & be cautious of 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 protective mask and using antihistamines can help. 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.

Seafod farmed from areas with a red tide:
- Crabs and oysters (molluscs) can contain red tide toxins that cause Neurototoxic Shellfish Poisoning. Check local harvesting status before collecting at FreshFromFlorida.com.
- Fish, frog fish, conch and healthy can be eaten if filtered and rinsed thoroughly.
- Edible sea urchins and lobsters can be eaten (do not eat the tarry— the green digestive gland of shellfish).
- Do not eat discolored or animals found dead under any circumstances.

For current red tide conditions, visit: myfwc.com/redtidestatus or http://visitbeaches.org or call 941-REACHES (732-4237).
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
FWC Web Site

http://myfwc.com/REDTIDESTATUS
FDEP Web Site

https://floridadep.gov/AlgalBloom
FDEP Web Site

REPORT ALGAL BLOOMS
Click Here or Call 855-305-3903

Site Visit Details:
- Date: 9/4/2018, 10:50 AM
- Location: Lake Okeechobee near L001
- County: Okeechobee
- Sample Taken: Yes
- Sample Description: Surface grab
- Sample Depth (meters): 0.30
- Analyzed By: DEP

Florida Department of Environmental Protection
Contact Information

andy.reich@flhealth.gov
(813) 307-8015 x 5961