

Florida Department of Health Aquatic Toxins Program

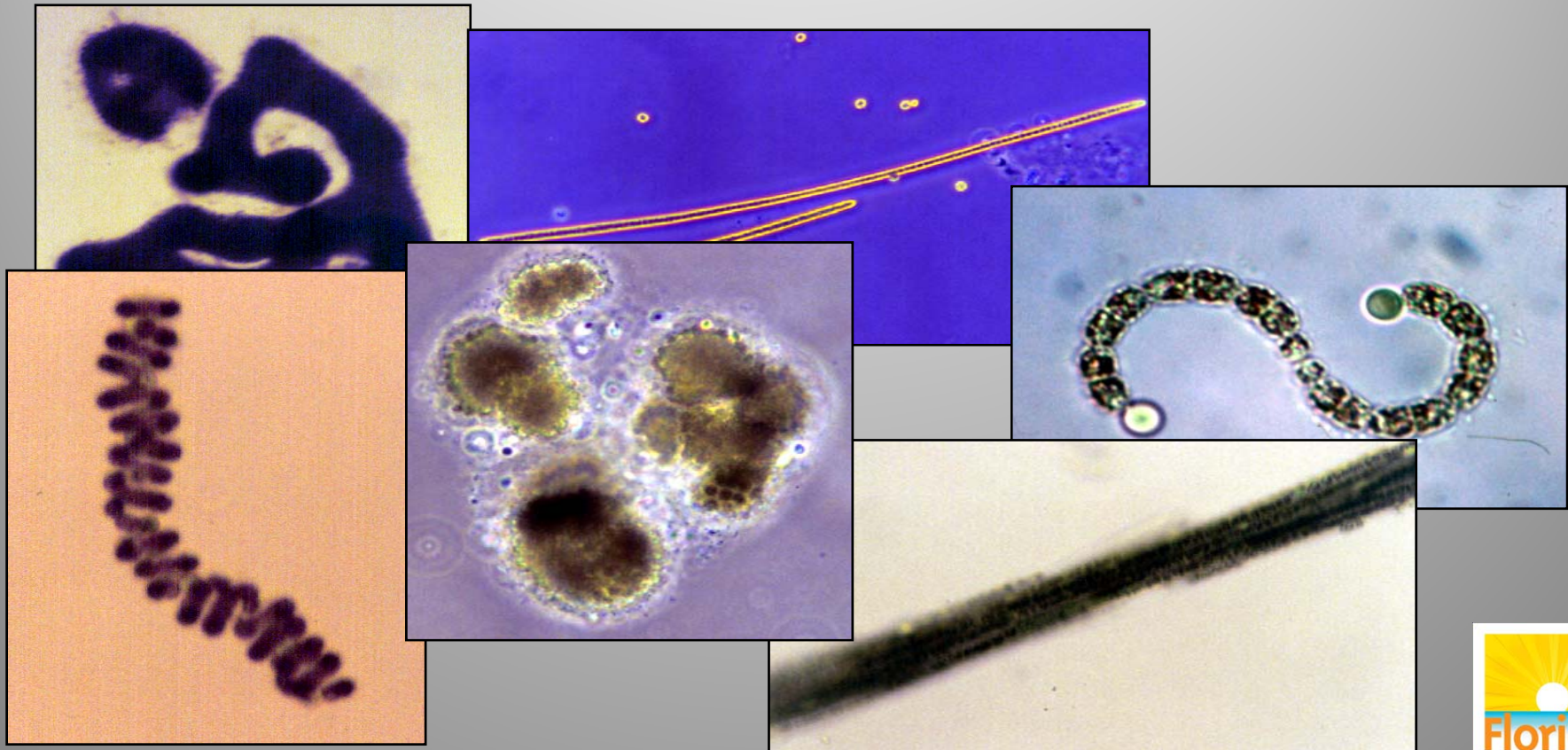
Environmental Protection Agency (EPA) Region 5
Harmful Algal Bloom/Clean Water Act/Safe Drinking Water Act
Workshop and Public Meeting, Chicago, IL April 27 – 29, 2016



Andrew Reich, MS, MSPH, RRT
Administrator: Public Health Toxicology Section
Bureau of Environmental Health

Freshwater: Cyanobacteria

Microcystis, *Cylindrospermopsis*, *Lyngbya*,
Anabaena, *Oscillatoria*, *Aphanizomenon*



Freshwater: Cyanobacteria



Target Audience

- Health care providers
- Residents
- Visitors
- Workers

BLUE GREEN ALGAE
have you been slimed?

TOP 10 BLUE GREEN ALGAE FACTS

1. Blue green algae, also called cyanobacteria, are tiny organisms naturally found in all types of water.
2. Algal blooms can look like a thick mat or foamy scum. Blooms can change the water color to blue, green, brown, orange, or red and may give off an unpleasant odor.
3. Not all blue green algae are found on the water surface. Some attach to aquatic plants, while some grow along the bottom.
4. Algal blooms can appear year-round but are more frequent in summer and fall.
5. There are hundreds of types of these algae and many are known to produce natural chemicals called toxins.
6. Blue green algae sometimes produce toxins and other times do not. It is not known why this happens. You cannot look at a bloom and tell if it is toxic.
7. Swimming in blooms can result in ear, eye and skin reactions. Reactions are not very common but can also include hay-fever like symptoms and/or flu-like symptoms including diarrhea.
8. Even non-toxic algae can create problems in the water environment. Blooms can remove oxygen from the water causing large fish kills.
9. To learn more about blue green algae issues go to www.myfloridaeh.com and choose aquatic toxins.
10. To report human illness or for questions related to human health call 1-888-232-8635. This is the Aquatic Toxins Hotline staffed by trained medical personnel 24 hours a day, 7 days a week.

don't get slimed
or sick from
BLUE GREEN ALGAE

HEALTH AND SAFETY TIPS:

1. Do not swallow, swim or wade in water where algae blooms are present. Wash your skin and clothing with soap and water if you have contact with algae, discolored or smelly water. Contact your doctor if rashes, diarrhea or other symptoms occur after swimming in areas with algae.
2. Keep pets away from algae mats. Pet illness and death have been linked to pets drinking from contaminated water or licking and swallowing algae while cleaning their fur. Contact a veterinarian if the pet becomes lethargic, has diarrhea or convulsions.
3. Do not use personal watercraft, water ski or boat in areas with severe algae blooms.
4. Never drink from untreated water. Do not cook with or clean dishes with untreated water. Boiling water will not eliminate blue green algae toxins. You cannot see, smell or taste all algal toxins. Pets and livestock should have a different source of water when algae blooms are present.
5. Do not fill your pool or use an outdoor shower from water sources with algal blooms. Illness has been reported when these toxins become aerosolized.
6. Fillets (muscle) from healthy fish caught in freshwater lakes affected by a bloom are safe to eat.
7. Blue green algae supplements are generally safe to use as directed; however, checking with the manufacturer to ensure that the product is free of algae toxins is a good precaution.

AQUATIC TOXINS HOTLINE: 1-888-232-8635

DEPARTMENT OF ENVIRONMENTAL HEALTH

Target Audience (continued)

- Veterinarians
- Farmers
- Pet Owners

Cyanotoxins and the Health Impacts on Pets, Livestock, and Wildlife

Bucky Loomis, MSPE
Andrew Rich, MS, MSPE
Dr. Sarah, DVM
and Dr. Blackmore, DVM, PhD



FVMA ADVOCATE

Animal Safety Alert

BLUE-GREEN ALGAE BLOOMS When in doubt, it's best to keep out!



What is a blue-green algae bloom?

Cyanobacteria, sometimes called blue-green algae, are microscopic organisms found naturally in all types of water.

- Blue-green algae grow quickly, or bloom, when the water is warm, stagnant, and full of nutrients.
- Algae blooms usually occur during the summer and fall. However, they can occur anytime during the year.
- When a bloom occurs, scum might float on the water's surface.
- Blooms come in different colors, from green or blue to red or brown.
- As the bloom dies off, you may smell an odor like rotting plants.

What is a toxic bloom?

Sometimes, blue-green algae produce toxins.

- The toxins can be present in the algae or in the water.
- Swallowing water with algae that are producing toxins can cause serious illness.

You cannot tell if a bloom is toxic just by looking at it.



Centers for Disease
Control and Prevention
National Center for
Environmental Health

Animal Safety Alert

Health and safety tips for pets and livestock

1. Do not let your pets or livestock graze near, drink, or swim in water where you see blue-green algae blooms, foam, or scum on the surface.
2. If your animal gets in water with a bloom, immediately wash it off with clean water. Do not let the animal lick algae off of its fur.
3. Call a veterinarian if your animal shows any of these symptoms of blue-green algae poisoning: loss of energy, loss of appetite, vomiting, stumbling and falling, foaming at the mouth, diarrhea, convulsions, excessive drooling, tremors and seizures, or any unexplained sickness that occurs within a day or so after being in contact with water.

You can help protect your pets and livestock from blue-green algae blooms by taking the following actions:

- Visit <http://www.cdc.gov/hab> to learn more about blue-green algae.
- Know what a bloom looks like and avoid contact.
- Keep pets and livestock away from the water if you see signs of blue-green algae.
- Call your veterinarian if your animals are sick.
- Call your state or local health department to report pets or livestock made sick by blue-green algae.

To report a blue-green algae bloom or a related health event:

- Call the Centers for Disease Control and Prevention, National Center for Environmental Health Harmful Algal Blooms program (HABISS) at: 866-556-0544.

Call your local or state health department:



Medical Fact Sheets

Medical Fact Sheet Harmful Algae Bloom Series

Blue-Green Algae Toxin (Cyanotoxin) Illness



FLORIDA DEPARTMENT OF HEALTH

DIVISION OF
Environmental Health

Version 2 – 10/03/2007

CAUSATIVE AGENT: Blue-green algae toxin (cyanotoxin) illness results from exposure to the toxins associated with organisms known as cyanobacteria. Their complexity, diversity and number of species involved makes the assessment of health impacts an emerging research and medical issue. Species of blue-green algae that form HABs in marine and fresh water include *Microcystis aeruginosa*, *Anabaena circinalis*, *Anabaena flos-aquae*, *Aphanizomenon flos-aquae*, *Cylindrospermopsis raciborskii*, *Lyngbya wollei* and *Oscillatoria*. Exposure can occur through ingestion of contaminated drinking water, inadvertent ingestion via recreational water activities, use of contaminated dietary supplements and possibly from inhalation of aerosols containing cyanotoxins and dermal contact with algae and/or surface water. The cyanotoxins belong to diverse groups of chemical substances with specific toxic mechanisms including neurotoxins (anatoxin-a, anatoxin-a(s), saxitoxin, neosaxitoxin), hepatotoxins (microcystins, nodularins, cylindrospermopsin), tumor promoters (microcystins) and dermatotoxins (include aphanizomenon and lyngbyatoxin, also potent tumor promoters and protein kinase C activators) and lipopolysaccharides, aka LPS (also gastroenteritis and possibly causing dermatitis).

SIGNS/SYMPTOMS: Skin contact has been reported to produce rash, hives, or skin blisters (especially on the lips and under swimsuits). Inhaling water droplets from irrigation or water-related recreational activities have been reported to cause runny eyes and nose, a sore throat, asthma-like symptoms, or allergic reactions. Ingestion can cause acute, severe gastroenteritis (including diarrhea, vomiting), liver toxicity (nausea, vomiting and acute liver failure), kidney toxicity, and neurologic effects such as salivation, muscle cramps, twitching, paralysis and cardiac or respiratory failure (these are the symptoms most often seen in dogs who have been exposed to anatoxin). There is poor understanding of the health effects from chronic exposures.

ONSET/DURATION: With exposure to neurotoxic cyanotoxins, symptoms can appear within minutes to few hours of exposure, but may take up to 36 hours to manifest themselves. Hepatotoxin symptoms can appear rapidly within hours, but may occur as late as several days following exposure to high amounts of cyanotoxins.

DIAGNOSIS: Diagnosis is based on a clinical evaluation of symptoms and exposure history. Environmental samples should include assessment by microscopic identification of cyanobacteria and analytical testing by HPLC/MS and ELISA. Increased serum levels of liver enzymes have been associated with hepatic injury after cyanotoxin ingestion. Clinical laboratory tests are not presently available for the diagnosis of cyanotoxin poisoning in humans. Research efforts are underway to assess the potential to detect certain cyanotoxins in blood.

TREATMENT: In general, the only treatment available for exposure to the blue green algal toxins is supportive medical treatment after complete removal from exposure. If the exposure was oral, administration of activated carbon to decrease gut absorption may be efficacious if given within hours of exposure. Artificial respiration with exposure to the neurotoxins (such as saxitoxin) should also be considered. Based on past outbreaks, monitoring of volume, electrolytes, liver and kidney function should all be considered in the case of acute gastroenteritis associated with some of the blue green algal toxins.

RISK GROUPS: All persons are susceptible to cyanobacteria. However, young children, the elderly and those individuals with underlying immunologic, neurologic, hepatic or kidney disease may be at increased risk. Effects on pregnancy and fetal health is unknown. Animals drinking raw water contaminated with toxin-producing cyanobacteria are especially prone to acute poisonings.

PREVENTATIVE MEASURES: Avoid contact with water or algae if visibly present (foam, scum, or mats of algae). Restrict swimming, boating and other activities in blooms. If exposed, rinse off with fresh water as soon as possible. Pets or livestock should not swim in or drink from areas where the water has. If pets (especially dogs) do swim in scummy water, rinse them off immediately—do not let them lick the algae (and toxins) off their fur. Algaecides may temporarily increase the amount of toxins in the water.

REPORTING REQUIREMENTS: None. At present, cyanotoxin illness is not a reportable disease in Florida. To improve their surveillance of this illness, the Florida Department of Health asks health care providers to report suspect cases to the Aquatic Toxin Hotline at 1-888-232-8635 or the Aquatic Toxins Program at the Florida Department of Health.

ADDITIONAL INFORMATION

Aquatic Toxins Hotline (24/7 medical information): 1-888-232-8635
The Florida Department of Health's Aquatic Toxins Program at www.myfloridahh.com

AQUATIC TOXINS PROGRAM

Protecting Florida's citizens and visitors from Harmful Algal Blooms and related illnesses through
RESEARCH • SURVEILLANCE • EDUCATION

Cyanotoxin Case Definitions

Note: Cyanotoxin illness is currently not reportable in Florida, however suspect cases are requested to be reported to the Aquatic Toxins Hotline to improve surveillance.

Developed and Proposed by North Carolina Department of Health
J. Newton MacCormack, MD, MPH
Occupational & Environmental Epidemiology Branch

Microcystin Poisoning

Possible case: Confirmed exposure (ingestion OR immersion) to water with confirmed bloom of cyanobacterial species capable of microcystin production AND clinical evidence of hepatic dysfunction [e.g., painful hepatomegaly; aminotransferase (AST/ALT) level at least 2 times normal] developing within 48 hours of exposure AND other causes of hepatic dysfunction have been excluded.

Probable case: Meets criteria for "possible case" AND there is laboratory documentation of microcystin toxin in water.

Confirmed case: Meets criteria for "probable case" AND/OR positive assay for microcystin toxin in clinical specimen (blood or tissue)

Cylindrospermopsin Poisoning

Possible case: Confirmed exposure (ingestion OR immersion) to water with confirmed bloom of cyanobacterial species capable of cylindrospermopsin production AND development of at least one of the following within 48 hours:

- clinical evidence of hepatic dysfunction [e.g., painful hepatomegaly; aminotransferase (AST/ALT) level at least 2 times normal]
- GI symptoms (e.g., nausea, vomiting, diarrhea, abdominal cramps)
- Proteinuria, hematuria, or other signs of acute renal damage.

Probable case: Meets criteria for "possible case" AND laboratory documentation of cylindrospermopsin toxin in water.

Confirmed case: Meets criteria for "probable case" AND positive assay for cylindrospermopsin toxin in clinical specimen (blood or tissue)

ADDITIONAL INFORMATION:

Florida Department of Health: www.myfloridahh.com under Food and Waterborne Surveillance Program; Aquatic Toxins Program
Aquatic Toxins Hotline (24/7 medical information): 1-888-232-8635



Public Health Surveillance Tools

EpiCom

- Public health bulletin board



Florida Poison Information Centers

- Tampa, Jacksonville, Miami



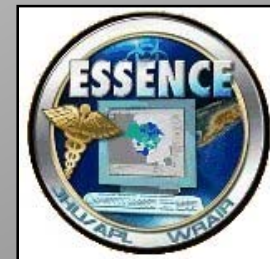
Florida reportable disease system

- Merlin



ESSENCE

- Syndromic surveillance
- Includes Florida hospital emergency department and acute care facility data



ESSENCE - Florida

“Electronic Surveillance System for Early Notification of Community-based Epidemics”

The screenshot shows the ESSENCE - Florida Data Query web application running in a Microsoft Internet Explorer browser. The address bar displays the URL: https://essenceweb.isf.com/FloridaMPC_5/servlet/DataQuery/WizardServlet. The application features a navigation bar with tabs for History of ESSENCE, Syndrome Definitions, Detector Algorithms, Data Dictionary, and Help. Below these are buttons for Alert List, Event List, Overview Portal, Query Portal, Matrix Portal, Weekly Percent, Map Portal, Bookmarks, and User Admin. A bookmark bar is visible below the navigation bar. The main content area is titled "ESSENCE - Florida Data Query" and contains a "Current Data Query Selections" section. A "Next Selections:" dropdown menu is open, showing a list of options: Testing - Poison Control Center, Emergency Room Data by Patient Location, Emergency Room Data by Hospital Location, Percentage ER Data by Hospital Location, Merlin Reportable Diseases, and Testing - Poison Control Center. Three callout boxes are present: one pointing to the "Merlin Reportable Disease Database" option in the dropdown, another pointing to the "Testing - Poison Control Center" option, and a third pointing to the "Florida-Based Emergency Dep't Data" option. The Windows taskbar at the bottom shows several open applications, including FPCIN Query Builder, Mushroom poisoning, Mushroom_Results, and ESSENCE-PC.

ESSENCE - Florida Data Query

Current Data Query Selections

Next Selections:

- Testing - Poison Control Center
- Emergency Room Data by Patient Location
- Emergency Room Data by Hospital Location
- Percentage ER Data by Hospital Location
- Merlin Reportable Diseases
- Testing - Poison Control Center


“Merlin” Reportable Disease Database

Florida Poison Control Centers

Florida-Based Emergency Dep’t Data

EpiCom System

Full text subscribers = 309; "Title" only subscribers = 78




The Florida Department of Health

[Forums](#)
[Edit Profile](#)
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[Inbox](#)
[ServFL.Com](#)
[Dashboard](#)
[Logout](#)

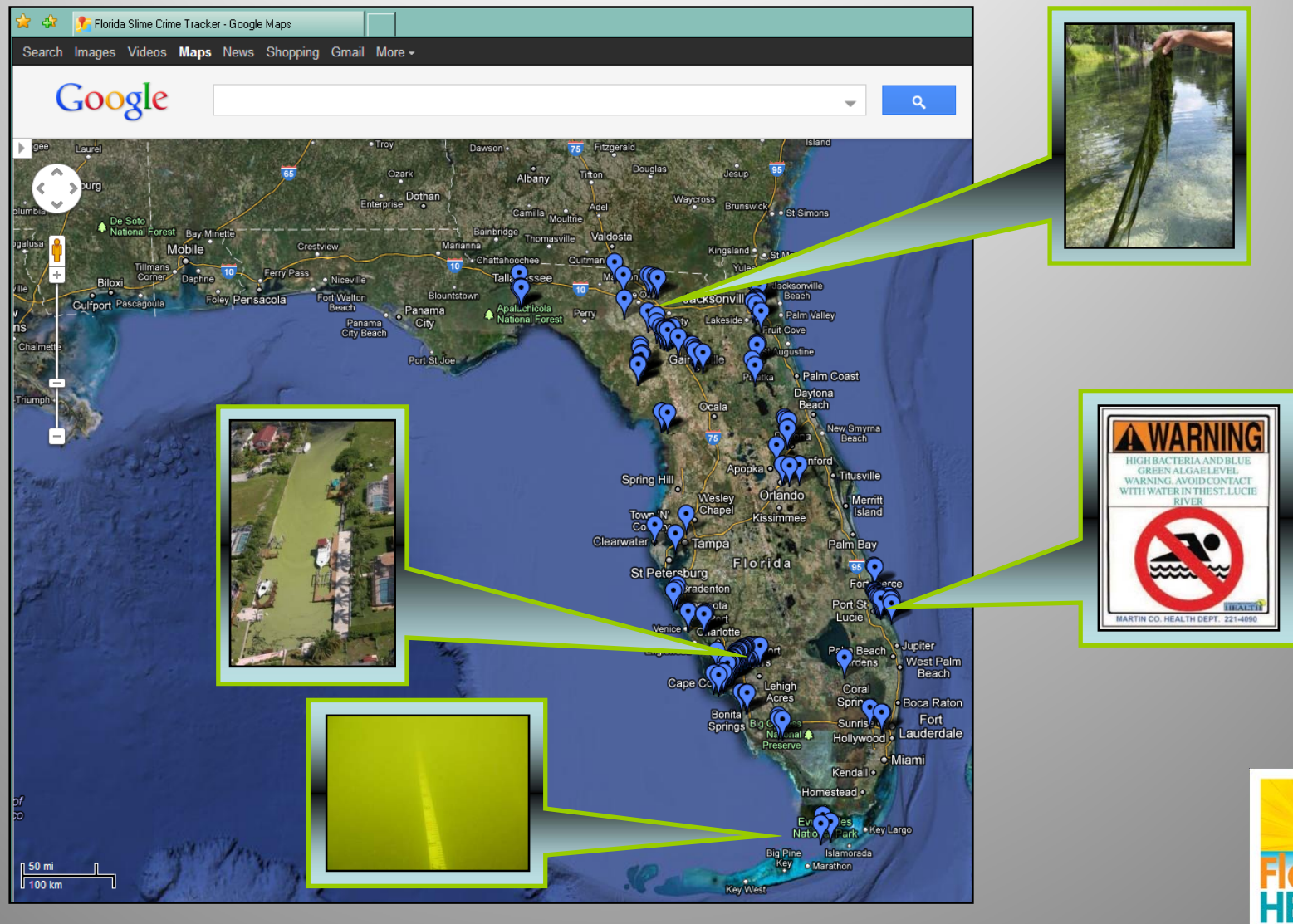
Forums View All		Last Update	Message Count
Forum			
+ 2015 Hurricane Season		8/28/2015 @ 6:40 PM by Janet Hamilton	1
+ Anthrax		8/11/2011 @ 11:01 AM by Richard Hopkins	7
+ Antimicrobial Resistance		7/18/2013 @ 2:33 PM by Diane King	9
- Aquatic Toxins		3/25/2016 @ 9:57 AM by Andrew Reich	299

Aquatic Toxins "Forum"



Topics	
Title	
+ Blue Green Algae	Create New Message View All Messages (20 Messages Last updated 3/25/2016 @ 9:57 AM by Andrew Reich)
+ Red Tide	Create New Message View All Messages (279 Messages Last updated 9/29/2014 @ 5:41 PM by Andrew Reich)

Florida "Slime Crime" Tracker



Cyanobacteria Tracking Website

In 2012, the Florida Department of Health developed an online tracking module for coordinating statewide cyanobacteria bloom response.

Caspio Web Hosting Site:

- <http://www.caspio.com/>
- Multi-user capability
- User name/password protected
- Somewhat “development” friendly
- Redacted public portal also available



HABs Tracking Website: Caspio

Harmful Algal Bloom Tracking Module

Welcome to the Florida Harmful Algal Bloom (HAB) Online Tracking Module. This site is designed to be a secure electronic database.

PRIVACY DISCLAIMER: This site should not be used to collect HIPAA protected health information, the name and address of a private citizen or details about a person's health status. This includes health complaints related to a bloom, contact the Florida Department of Health's Aquatic Toxins Branch, at: 850-245-4187.

- Format for all dates and times is MM/DD/YYYY and HH:MM AM/PM EST
- Size limit for attachments is 15MB per submission and up to 60MB cumulatively (initial submission)
- (*) Indicates the field is required

Descriptive Bloom ID*

Format: AgencyName_Date_WaterBody

-Note: Use the name of the agency you represent- Examples: FDOH, CHD, FDEP, FDACS, FWCOMB

Contains information on the location of bloom events, environmental conditions, site visit observations, & laboratory results

Date Bloom Report Received

Searchable Database of Bloom Records

Bloom Contact ID

Descriptive Bloom ID

Name of Water Body

Bloom Recorder's First Name

Bloom Recorder's Last Name

Date Record Was Added

Date Record Was Last Modified

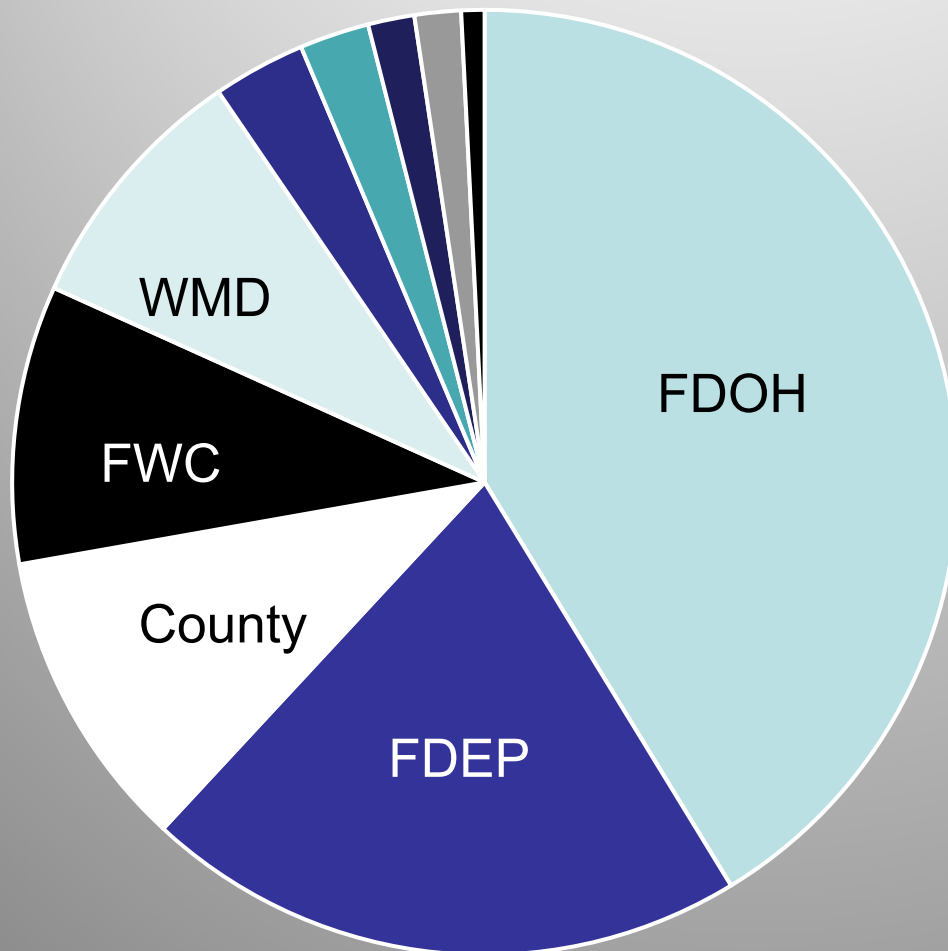
Any

Contains a searchable database for retrieving data



Caspio Subscribers by Entity

March 2016 n = 128



- FL Dept of Health (FDOH)
- FL Dept of Environmental Protection (FDEP)
- County Govt (County)
- FL Fish and Wildlife (FWC)
- FL Water Management District (WMD)
- Military
- National Aeronautics and Atmospheric Administration
- FL Dept of Agriculture and Consumer Services
- Private Lab
- External - State



Public Access Bloom Records

Searchable Database of Bloom Records

Waterbody Name

-- Any --

Date/Time Bloom Was Seen

-- Any --

Nearest Town

-- Any --



County

-- Any --



Search

Public Access Bloom Records

Searchable Database of Bloom Records

Waterbody Name

-- Any --



Search



Public Access Bloom Records

Bloom Information

Bloom Contact ID
Descriptive Bloom ID
Algal ID
Species of Algae Detected
Latitude
Longitude
Lat/Lon Comment Box
County
State
Date Time Received
Date Added
Agency of Recorder

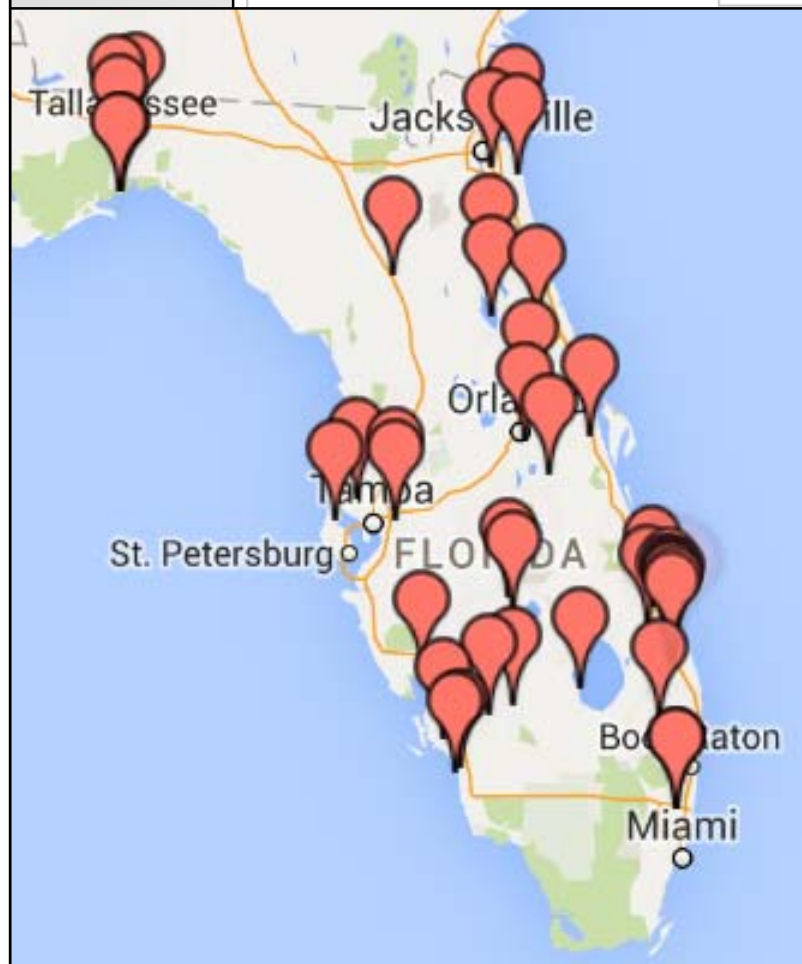
Searchable Database of Bloom Records

Waterbody Name

-- Any --

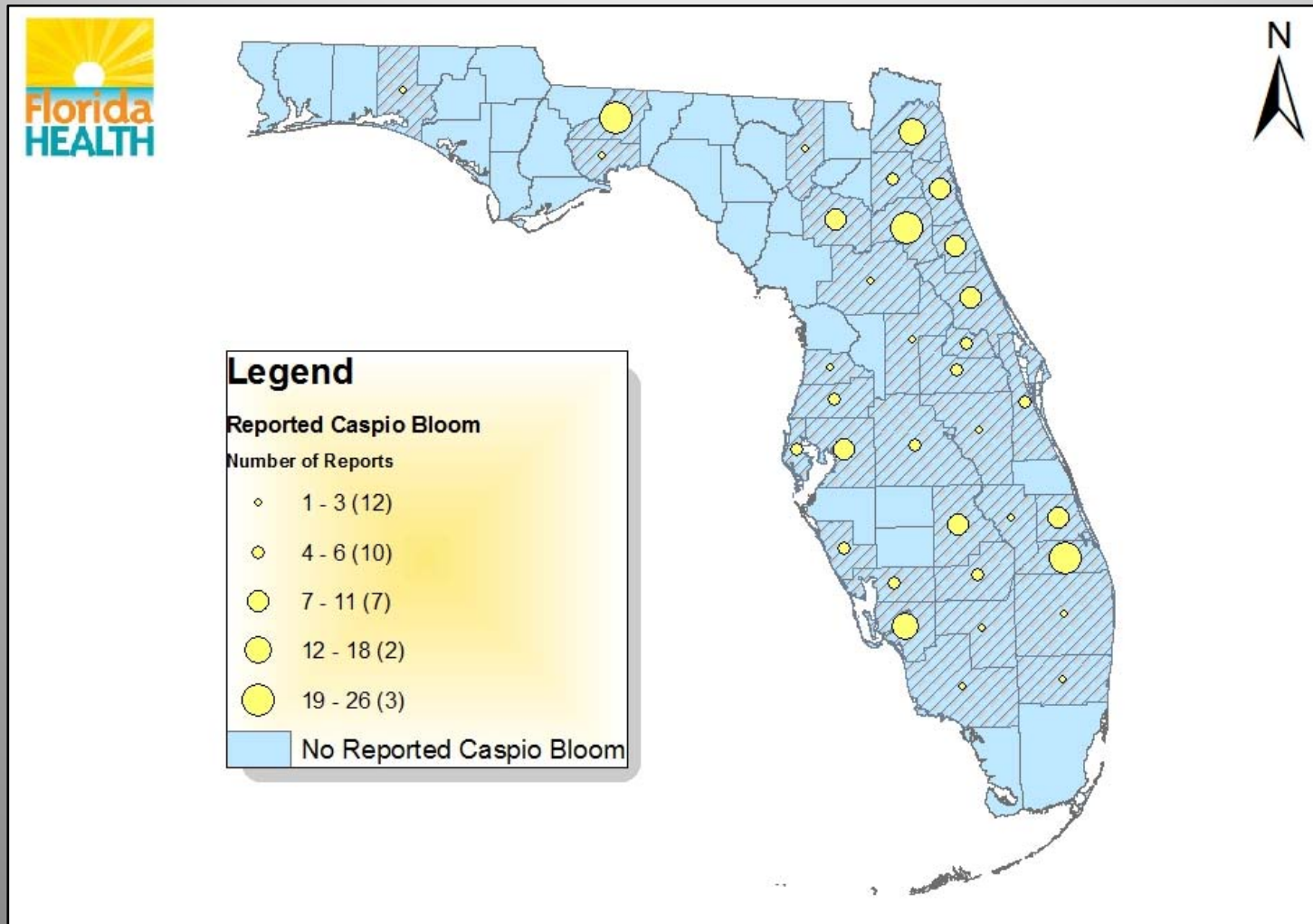


Search



Caspio – 270 records

Many counties represented (33)



Andrew Reich MS, MSPH, RRT

Division of Disease Control and Health Protection

andy.reich@flhealth.gov

850.245.4187

www.floridahealth.gov/environmental-health/

