

Lessons learned from the 2018 Microcystin poisoning of dogs in Stuart , FL

Dr. Nancy Mettee, Emergency Veterinarian



**PET EMERGENCY
OF MARTIN COUNTY**

IMAGINE A PLACE...

WHERE WARM WATERS
MEET PERFECT WAVES.

WHERE SOFT SAND
BEACHES SET THE
BACKDROP FOR
SUNBATHING, SWIMMING,
AND SNAPSHOTS.

WHERE THE GREAT
OUTDOORS STILL
FEELS NATURAL,
AND TIME ISN'T
THE ONLY THING
THAT'S PRESERVED.

GOOD NEWS:
YOU DON'T HAVE TO IMAGINE.



Discover Martin County

The legacy of old Florida lives on in Martin County, where the arts and cultural attractions embody the natural beauty of classic Florida. Dance, music, theatre, visual arts, and historic preservation are an integral part of the community.

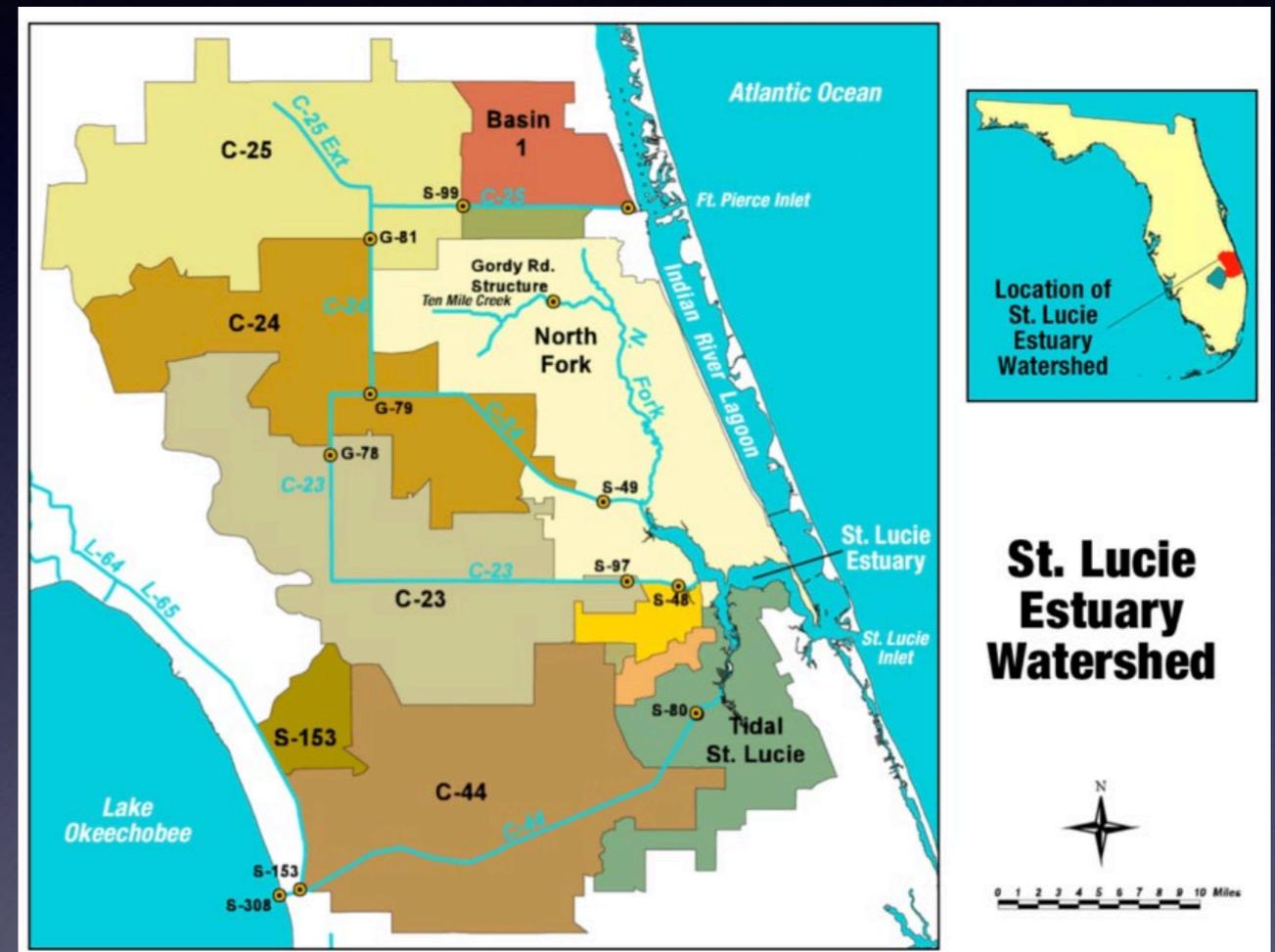
Explore a Preservationist's Paradise

Miles of beautiful beaches line Martin County, and provide the perfect setting for breathtaking outdoor venues, as well as world-class fishing, water sports, and eco-adventures. Martin County is home to over 98,000 acres of parks and conservation land, over 77 parks, and the most bio-diverse lagoon ecosystem in the Northern Hemisphere. Building height restrictions allow for stunning views throughout the county, making it a naturalist's playground.

- Population 160,000
- Median age 51.6 years
- Median home value \$233K
- More than 77 parks
- “The most bio diverse lagoon ecosystem in the Northern hemisphere”

The trouble is...

- Historically, the St. Lucie river was freshwater with no connection to Lake Okeechobee or the Atlantic Ocean
- In the late 19th century a series of modifications was undertaken for flood control, navigation, and water supply purposes
- Intermittent discharge from Lake Okeechobee has a negative impact on water quality throughout the basin



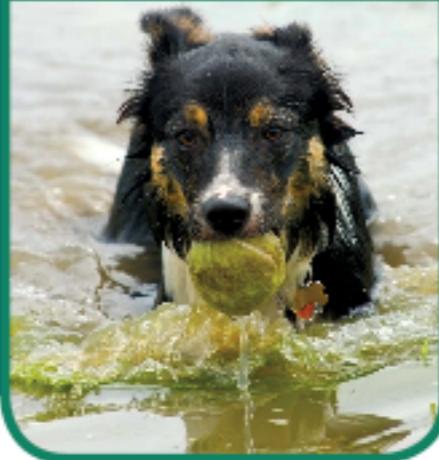
CDC alert had been issued

- Alert posted on FloridaHealth.gov website in April 2018
- Despite alerts pet owners continued to allow access to contaminated water
- Despite alerts humans continued to swim and fish in contaminated water
- This alert was not communicated to Florida veterinarians or specifically those practicing in Martin County



Animal Safety Alert

CYANOBACTERIA BLOOMS
When in doubt, it's best to keep out!



What is a cyanobacteria bloom?

- Cyanobacteria, sometimes called blue-green algae, are microscopic organisms found naturally in all types of water.
- Cyanobacteria grow quickly, or bloom, when the water is warm, stagnant, and full of nutrients.
- Cyanobacteria 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, cyanobacteria produce toxins.

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

Health and Safety Tips for Pets and Livestock

- Do not let your pets or livestock graze near, drink, or swim in water where you see cyanobacteria blooms, foam, or scum on the surface.
- If your animal gets in water with a bloom, immediately wash it off with clean water. Do not let the animal lick cyanobacteria off of its fur.
- Call a veterinarian if your animal shows any of these symptoms of cyanobacteria 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 cyanobacteria blooms by taking the following actions:

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

To report a cyanobacteria bloom or a related health event:

- Call your local or state health department.

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

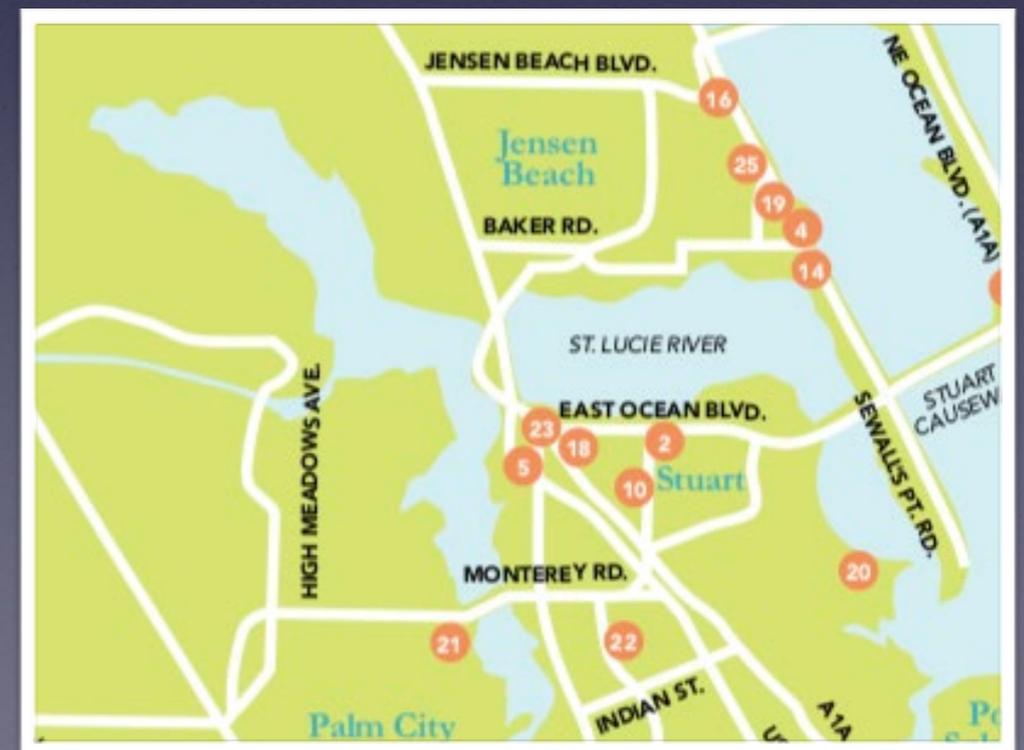
 Centers for Disease Control and Prevention
National Center for Environmental Health

4/2018

Then it got very, very hot



- Seven cases of acute liver failure in dogs presented to Pet Emergency of Martin County: 8/26, 8/27, 9/1, 9/3, 9/4, 9/8, 9/8. By the third case a syndrome was identified.
- All patients had access to the St Lucie River at some point before becoming ill.



Common symptoms

- Low blood sugar
- Vomiting
- Elevated liver values on blood work
- Low platelet count
- Extensive bleeding (coagulopathy)
- Shock
- Abdominal pain
- Dark, tarry diarrhea



Suspect HAB, what is next?



- Only available testing to confirm Microcystin in patients is in liver biopsy (cost per sample \$200.00).
- No established local resource to collect data from surrounding veterinary practices. (how many other cases???)
- ASPCA toxicologists report 99% mortality with Microcystin toxicosis.
- Media involvement by September 9 2018.

Differential diagnosis:

- rodenticide
- mushroom toxin
- aflatoxin
- xylitol toxicity
- other liver toxin
- Leptospirosis infection

URGENT UPDATE

September 09, 2018

Pet Emergency of Martin County is currently working with the Martin County Sheriff's Dept. and the Martin County Dept. of Health to investigate seven cases of acute hepatopathy in dogs in the last 2 weeks. The timeline of onset varies, but in the most severely affected vomiting begins within 6 hours of exposure. No etiologic agent has yet been identified, however, blue green algae, aflatoxin, ricin, and Amanita mushroom toxicity are potential causes.

Samples of tissues and fluids, and gastric contents have been sent out to various laboratories for histology and microcystin toxin testing.

Patients have all had access to the St. Lucie River.

Regardless of the inciting cause the cases have several notable similarities including: acute vomiting, severe elevation in ALT, critically low platelet count, coagulopathy, and abdominal effusion.

Several but not all cases have also had hypoglycemia, ventricular tachycardia, pleural effusion, melena, and collapse.

At this time no etiologic agent has been identified but treatment for acute hepatopathy including: acetylcysteine, dextrose support, gastroprotectants, cholestyramine, and transfusion of fresh frozen plasma has been successful in most cases.

We will share information as available. If you have a suspect case please call Sgt. Pat Coloussano of the Martin County Sheriff's Dept. at 772-220-7000.

The single mortality allowed extensive testing

- Admitted 9/4/2018 to Pet Emergency of Martin County
- 9 year old Male neutered Standard Poodle, Finn
- Escaped from yard and returned wet 2 hours later
- Acute vomiting, diarrhea, and weakness developed within 2 hours
- Died within 12 hours of exposure
- Owners graciously agreed to full autopsy with lab testing
- Pet Emergency of Martin County paid for both



Samples collected

- Formalin-fixed tissues →
- Aseptically collected and frozen:
 - Liver
 - Kidney
 - Spleen
 - Lung
 - Gastric contents
 - Small and large intestine
 - Urine
 - Bile
 - Heart blood
 - Frontal lobe of brain

 Necropsy Tissue Checklist			
Organs to Evaluate and Sample	Circle One: Abnormal or Normal	Check box if tissue taken*	Notes: Describe all abnormal tissues or unusual findings below (measure, quantify consistency, color, distribution, etc)
External exam (eyes, ears, nose, mouth, anus, genitals)	Normal/Abnormal	<input type="checkbox"/>	
Essential organs *			
Skin with skeletal muscle	Normal/Abnormal	<input type="checkbox"/>	
Heart (atrium, ventricle and intraventricular septum)	Normal/Abnormal	<input type="checkbox"/>	
Lung (sections of all lobes)*	Normal/Abnormal	<input type="checkbox"/>	
Liver (sections of all lobes)*	Normal/Abnormal	<input type="checkbox"/>	
Gallbladder	Normal/Abnormal	<input type="checkbox"/>	
Spleen*	Normal/Abnormal	<input type="checkbox"/>	
Lymph node (write location taken)*	Normal/Abnormal	<input type="checkbox"/>	
Adrenal glands	Normal/Abnormal	<input type="checkbox"/>	
Kidney (left and right)*	Normal/Abnormal	<input type="checkbox"/>	
Stomach	Normal/Abnormal	<input type="checkbox"/>	
Small and Large Intestine*	Normal/Abnormal	<input type="checkbox"/>	
Caecum (include sacculus rotundus in rabbits)	Normal/Abnormal	<input type="checkbox"/>	
Urinary bladder	Normal/Abnormal	<input type="checkbox"/>	
Gonad	Normal/Abnormal	<input type="checkbox"/>	
Brain	Normal/Abnormal	<input type="checkbox"/>	
Bone/bone marrow	Normal/Abnormal	<input type="checkbox"/>	
Thymus (young animals)	Normal/Abnormal	<input type="checkbox"/>	
Non-essential organs †			
Eye	Normal/Abnormal	<input type="checkbox"/>	
Tongue	Normal/Abnormal	<input type="checkbox"/>	
Spinal cord	Normal/Abnormal	<input type="checkbox"/>	
Thyroids/parathyroids	Normal/Abnormal	<input type="checkbox"/>	
Other:	Normal/Abnormal	<input type="checkbox"/>	
* If tissue is abnormal, describe and be sure to take areas of abnormal with areas of normal for comparison. If tissue not observed or taken, write reason in notes. † Take non-essential tissues if abnormal or are affected based on clinical signs, gross findings, or history. ‡ Take fresh and fixed samples			

All formalin-fixed tissues <1cm³

Fishhead Labs, LLC. Dr. Susan Fogelson,
MS, DVM, Dip1 ACVP



Back at the clinic



- Aggressive treatment for acute liver failure
- Treatment for shock, hypoglycemia, vomiting, diarrhea, GI ulceration, heart issues, excessive bleeding, abdominal pain
- Success with only one of seven dogs dying, but average cost of treatment was \$3,000.00

Government Resources contacted:

- Florida Department of Environmental Protection
- Florida Department of Agriculture
- Florida Association of Veterinarians
- Florida State Veterinarian
- Martin County Department of Health
- CDC Harmful Algal Bloom Reporting System

Contacts that were actually helpful

- Dr. Brandi Gallagher, local veterinary internal medicine specialist
- Dr. Susan Fogelson, local veterinary pathologist
- Martin County Sheriff's department, especially Sgt. Pat Collusano
- Treasure Coast Veterinary Medical Association
- Local water testing laboratory: Green water, established testing in urine, fur, and vomit with publication pending
- ASPCA poison control toxicology, BTW, treatment recommendations have been updated

ALERT MARTIN

- Provided by Martin County Emergency Management
- “Reverse 911”
- All listed phone numbers in Martin County were called with recorded warning
- First use for the HAB on September 19, 2018
- Last case presented September 19, 2018



Recommendations:

- Coordinate local health professionals DVMs and MDs for centralized reporting suspect events. How many cases were not identified?
- Create funding source for testing to confirm diagnosis. Owners face huge medical bills already.
- Utilize local emergency alert systems once toxin is confirmed
- Have plan for media interaction

