Algal Blooms and Bacteria Sampling Results in City Coastal Waterways

Commission Conference

December 19, 2017

Photo credit: C.E. Rodstrom

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What is Blue-Green Algae?

- A naturally occurring aquatic micro-organism that depends on sunlight to grow, similar to plants.
- Found in freshwater environments throughout the world.
- Quickly multiply in water bodies with high nutrients.
- Certain types of algae may contains toxins

What Causes Algae Blooms?

Photo credit: www.tcpalm.com

- Warm temperatures and calm water conditions
- Common in South Florida during summer and early fall
- Blooms are often associated with significant rainstorms or freshwater releases from inland canals which discharges nutrient laden water into coastal estuaries
- Major Blue-Green Algae Bloom on Treasure Coast in 2016

What Are the Environmental Impacts?

- Under normal conditions:
  - Sunlight penetrates the water and promotes growth of aquatic plants
  - Plants produce oxygen
  - Fish thrive
- During an algae bloom:
  - Sunlight is blocked by algae
  - Excessive nutrients in water are consumed
  - Decomposing algae uses up oxygen
  - Lack of oxygen causes fish kills
  - Addl impacts if algae contains toxins

Photo credit: www.sun-sentinel.com

Photo credit: www.tcpalm.com

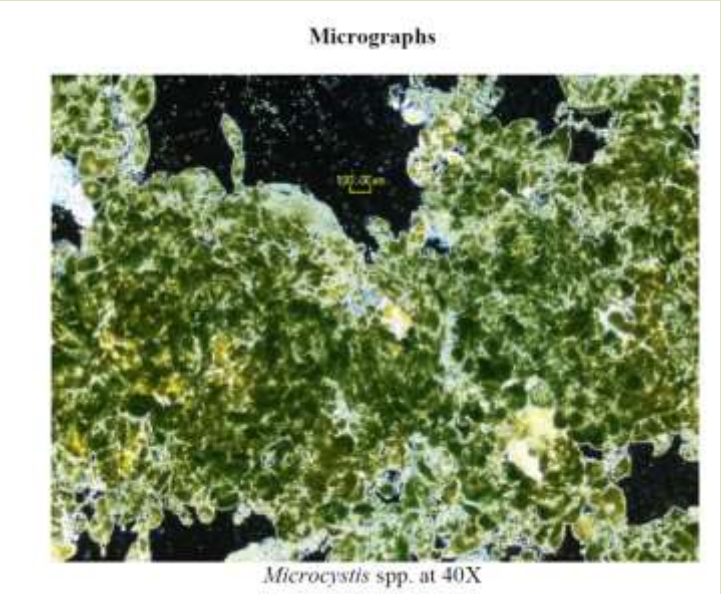
2017 Algal Bloom

- Aug 22 -First complaint received, South Fork of New River
- Aug 27 – Las Olas Isles and Lauderdale Isles
- Aug 29 – Citrus Isles

- Aug 28 - City inspects waterways and sends water sample to a private lab

City Sample Results

- Private lab identifies various algae including a potentially toxic algae: Microcystic spp
- Private lab recommends toxins analysis of original sample
- Private lab reports toxins present in the single sample submitted
- FDEP contacted but no specific action is recommended



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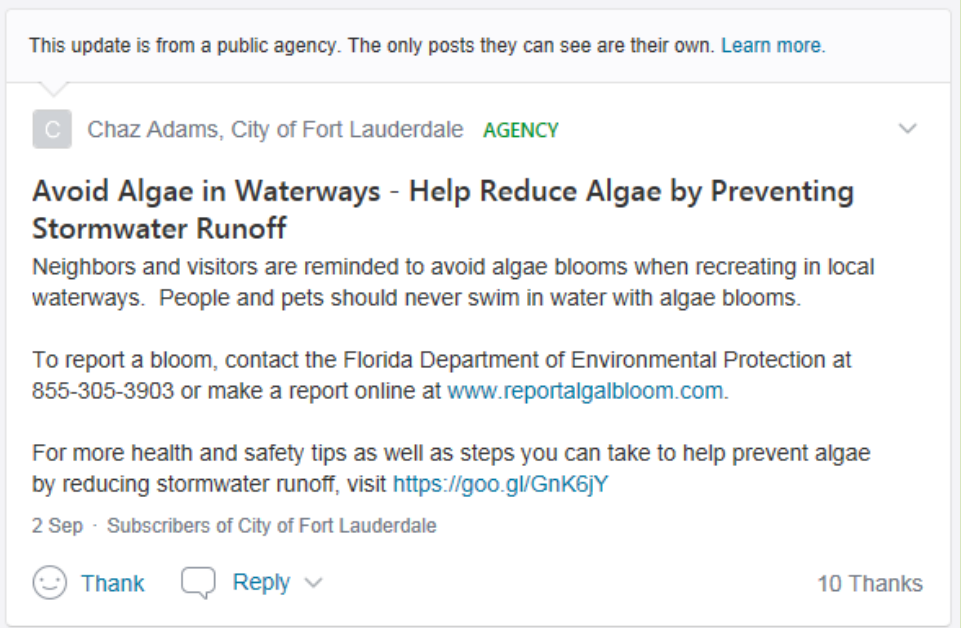
What Is Being Done about Algal Blooms?

- City inspectors continued to visually monitor the waterways
- FDEP inspected and sampled
- Broward County conducted water quality testing
- Strategic Communication provided outreach to neighbors



This update is from a public agency. The only posts they can see are their own. Learn more.

Chaz Adams, City of Fort Lauderdale AGENCY

Avoid Algae in Waterways - Help Reduce Algae by Preventing Stormwater Runoff

Neighbors and visitors are reminded to avoid algae blooms when recreating in local waterways. People and pets should never swim in water with algae blooms.

To report a bloom, contact the Florida Department of Environmental Protection at 855-305-3903 or make a report online at www.reportalgalbloom.com.

For more health and safety tips as well as steps you can take to help prevent algae by reducing stormwater runoff, visit https://goo.gl/GnK6jY

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ArcGIS Florida Algal Bloom Sample Collection View

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Legend

Site Visits - within 30 days

- Algae Sample Collection

Site Visits - past 31-60 days

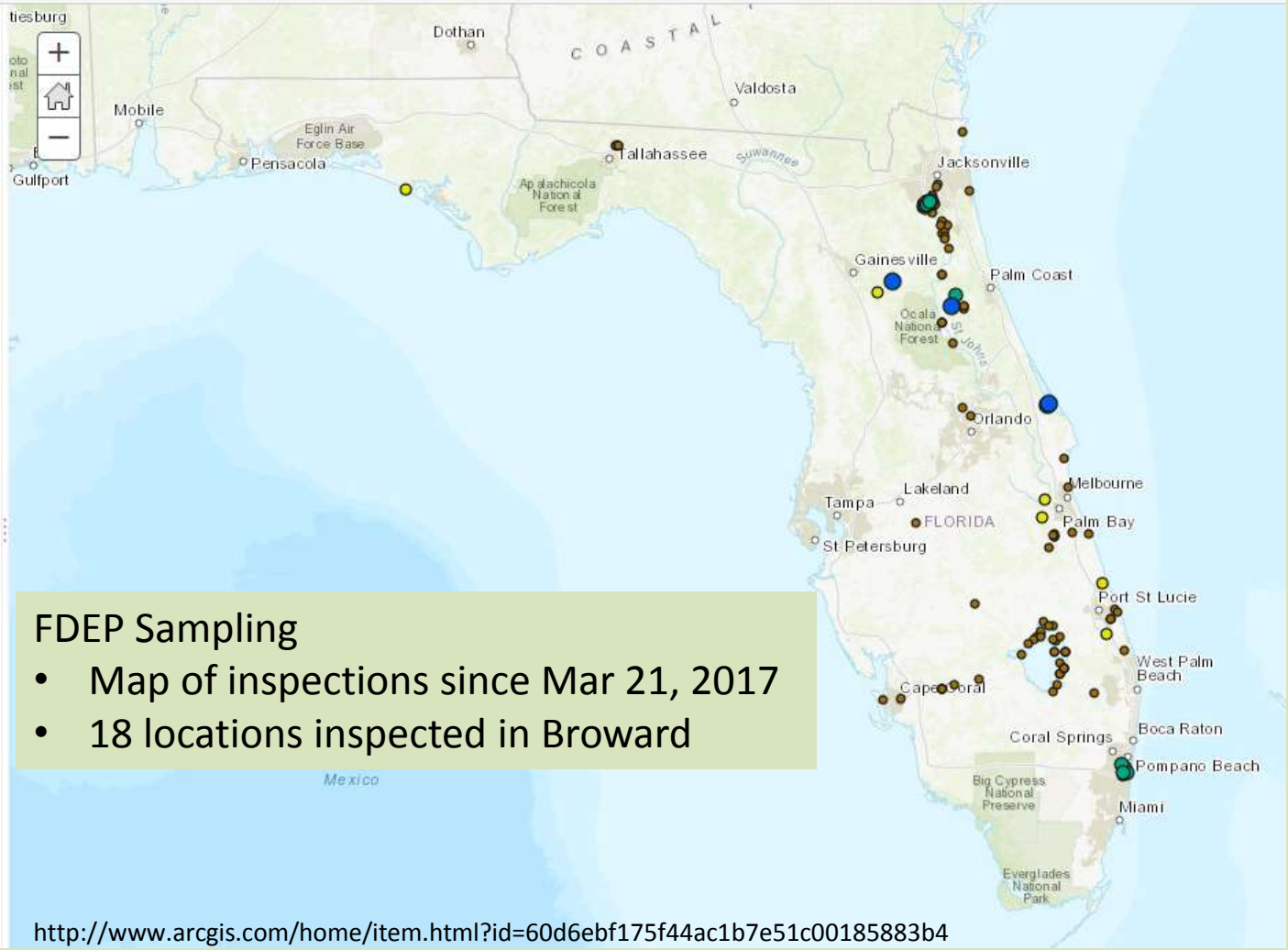
- Algae Sample Collection

Site Visits - past 61-90 days

- Algae Sample Collection

Site Visits - older than 90 days

- Algae Sample Collection



FDEP Sampling

- Map of inspections since Mar 21, 2017
- 18 locations inspected in Broward

http://www.arcgis.com/home/item.html?id=60d6ebf175f44ac1b7e51c00185883b4

ArcGIS Florida Algal Bloom Sample Collection View

Details | Basemap

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Legend

Site Visits - within 30 days

- Algae Sample Collection

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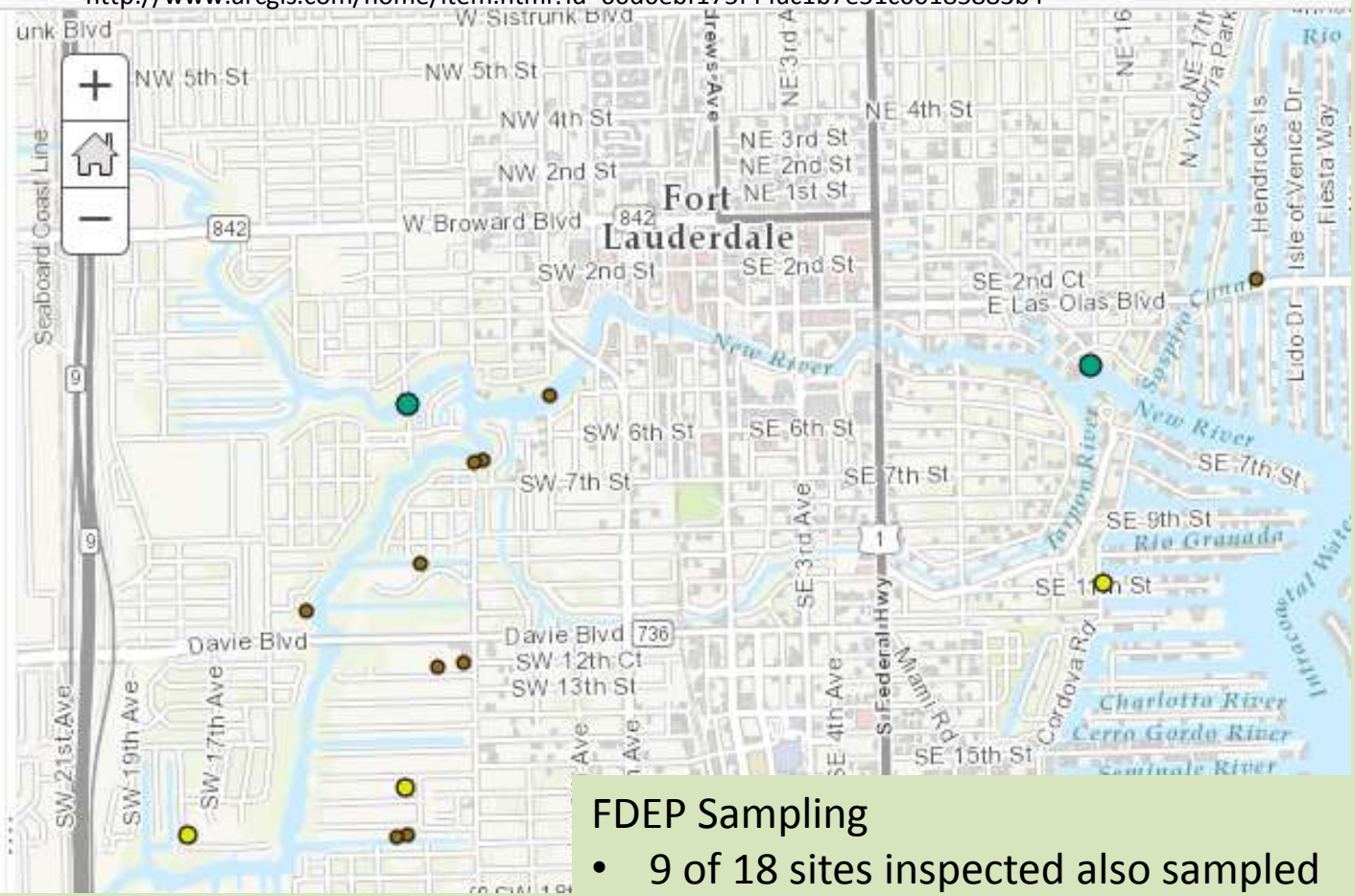
Site Visits - older than 90 days

- Algae Sample Collection



FDEP Sampling

- 9 of 18 sites inspected also sampled
- Only one tested positive for microcystin toxin on 9/25/2017
- Last recorded sample taken 10/30
- No algae blooms detected by City staff since early November

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Algae Blooms have Dissipated

Algal blooms had substantially dissipated by Nov 1.

Pictures are from Nov 15 City inspections.

Algal Bloom Water Quality Sampling

Five Sites

1) East of Royal Plaza
2) East Las Olas (Background)
3) East of Bontona
4) East of Lido
5) East of Coral Way

Four Dates

9/5*
9/20*
9/27
10/2

* DNA Bacteria Source Sampling

Algal Bloom Water Quality Sampling

Nutrients (NH_4, NO_2, NO_3, oPO_4, TKN)

- Nutrient concentrations relatively low
  - May be due to active uptake by algae

Algal Bloom Water Quality Sampling

CHLOROPHYLL a (FDEP Std -12 µg/l)

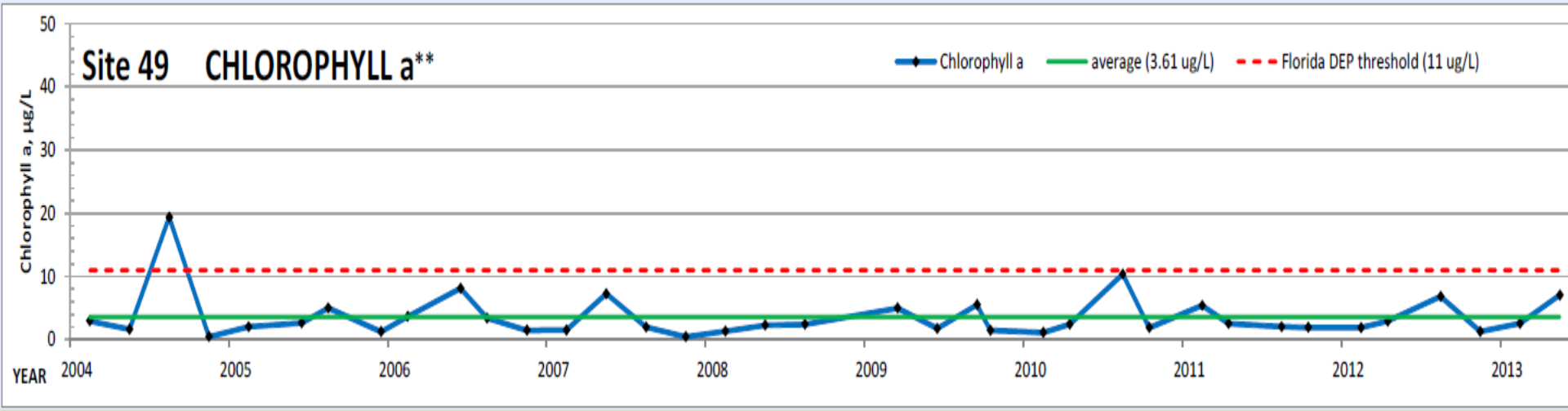
SAMPLING SITES	Times Std Exceeded
1 - East of Royal Plaza	2 of 4 (10.6-186 µg/l)
2 - East Las Olas (Background)	0 of 4 (1.98-4.45 µg/l)
3 - East of Bontona	2 of 3 (8.43-18 µg/l)
4 - East of Lido	2 of 3 (6.41-48.3 µg/l)
5 - East of Coral Way	2 of 2 (19.9-35.6 µg/l)

SITE 49 - estuarine

Sospiro Canal, Hendricks Isle, at Las Olas Isle Bridge
Water Body ID (WBID) # 3226G4

Chlorophyll is an indicator of algae and other plant materials in the water column.

Spikes common in summer and fall sampling.



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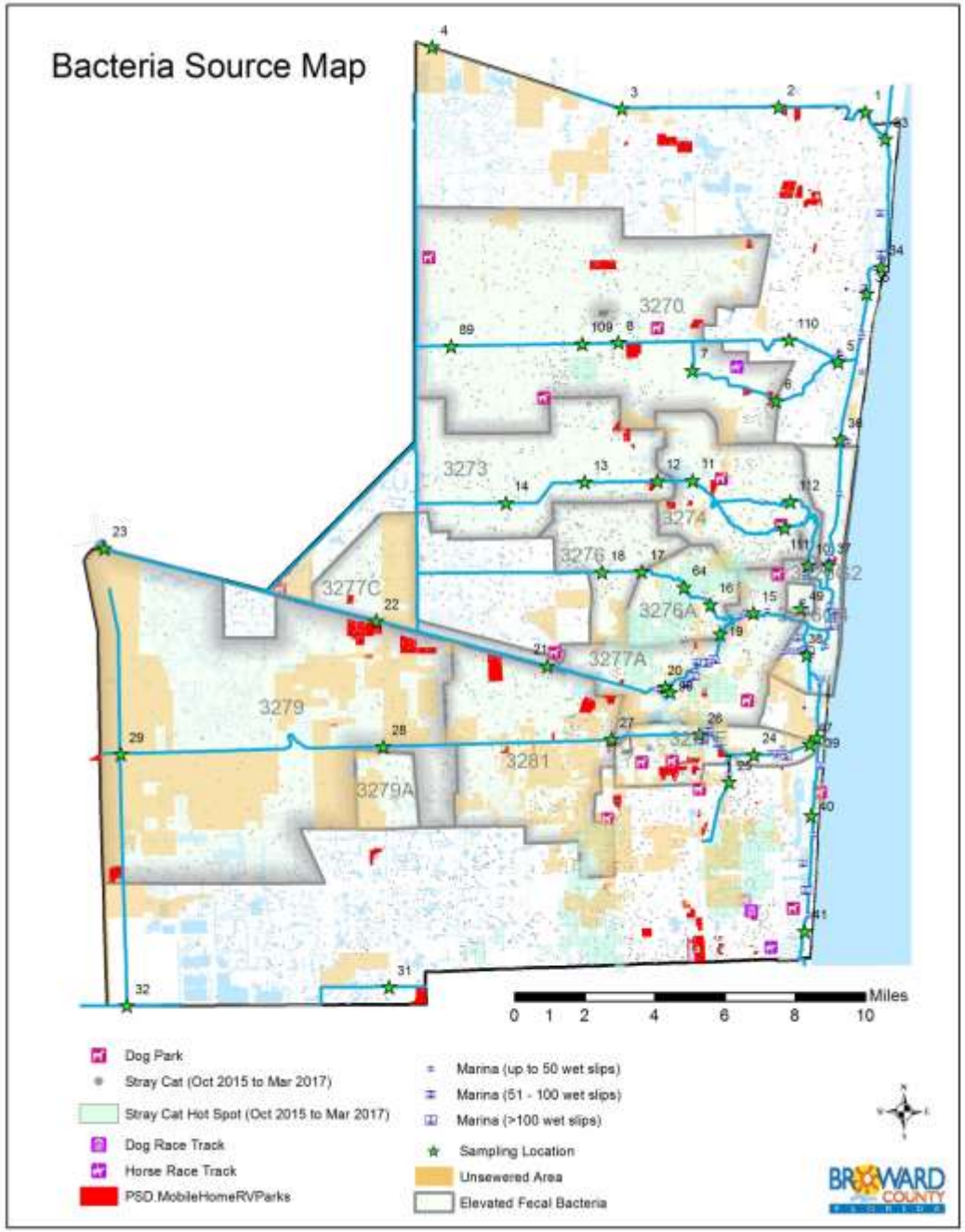
Algal Bloom Water Quality Sampling
E.coli, Enterococci and Fecal Coliform

Bacterial Test	Date of Exceedance	Sites Where Std Exceeded
E. coli		0 (16 samples)
Enterococci	Sep 27	1, 3, and 5
	Oct 2	3, 4, and 5
Fecal Coliform	Sep 20	1, 3, 4, and 5
	Oct 2	3

Algal Bloom Water Quality Sampling
DNA Source Tracking HF183

Test Indicates human source fecal contamination

- Detected at all sites for both sampling dates
- 7 of 8 samples averaged 344 HF 183 target copies for 100 ml
- One sample, Site 4 = 10,596 on Sep 20



Bacteria Source Sampling Sites in Broward County and Fort Lauderdale

- Map identifies sources of concern
- 2 rounds of sampling – Pre-Irma
- 7 dates collected
- 10 Broward sites sampled
- HF 183 detected in 17 of 18 samples

What Causes Bacteria in Coastal Waterways?

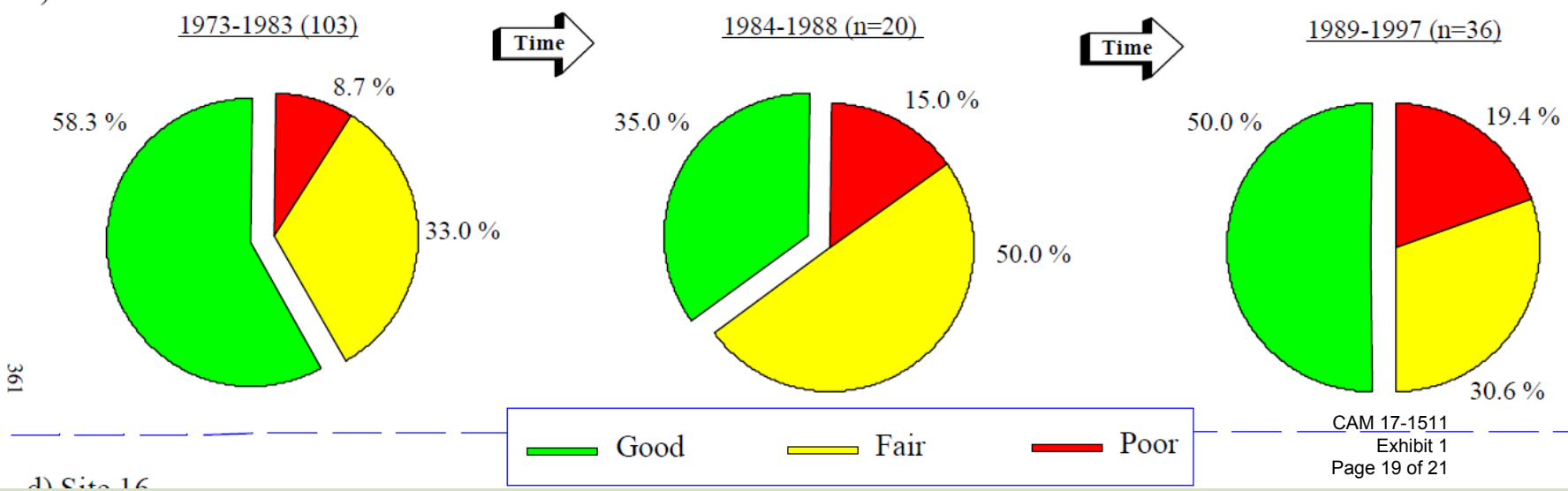
- Birds, manatees and other wildlife
- Stormwater runoff of pet waste
- Septic tanks and sewage releases
- Live-aboard boat discharges
- Warm temperatures and calm water conditions increase survivability of bacteria

Historic Concentrations of Fecal Coliform

Water Quality Site 15 = Andrews Avenue and New River. The majority of water bodies in Broward County are impaired for fecal coliform bacteria.

Figure IV.52 (Cont.). Fecal Coliform (FC) Concentrations Observed in the New River Basin over Three Time Periods. Concentrations are categorized in terms of compliance with the Broward County marine FC standards which state the monthly average shall be equal to or less than 200 colonies/100 ml (good rating) and no single reading shall be above 800 colonies/100 ml (poor rating). Values between 201 and 800 colonies per 100 ml are defined as fair.

c) Site 15

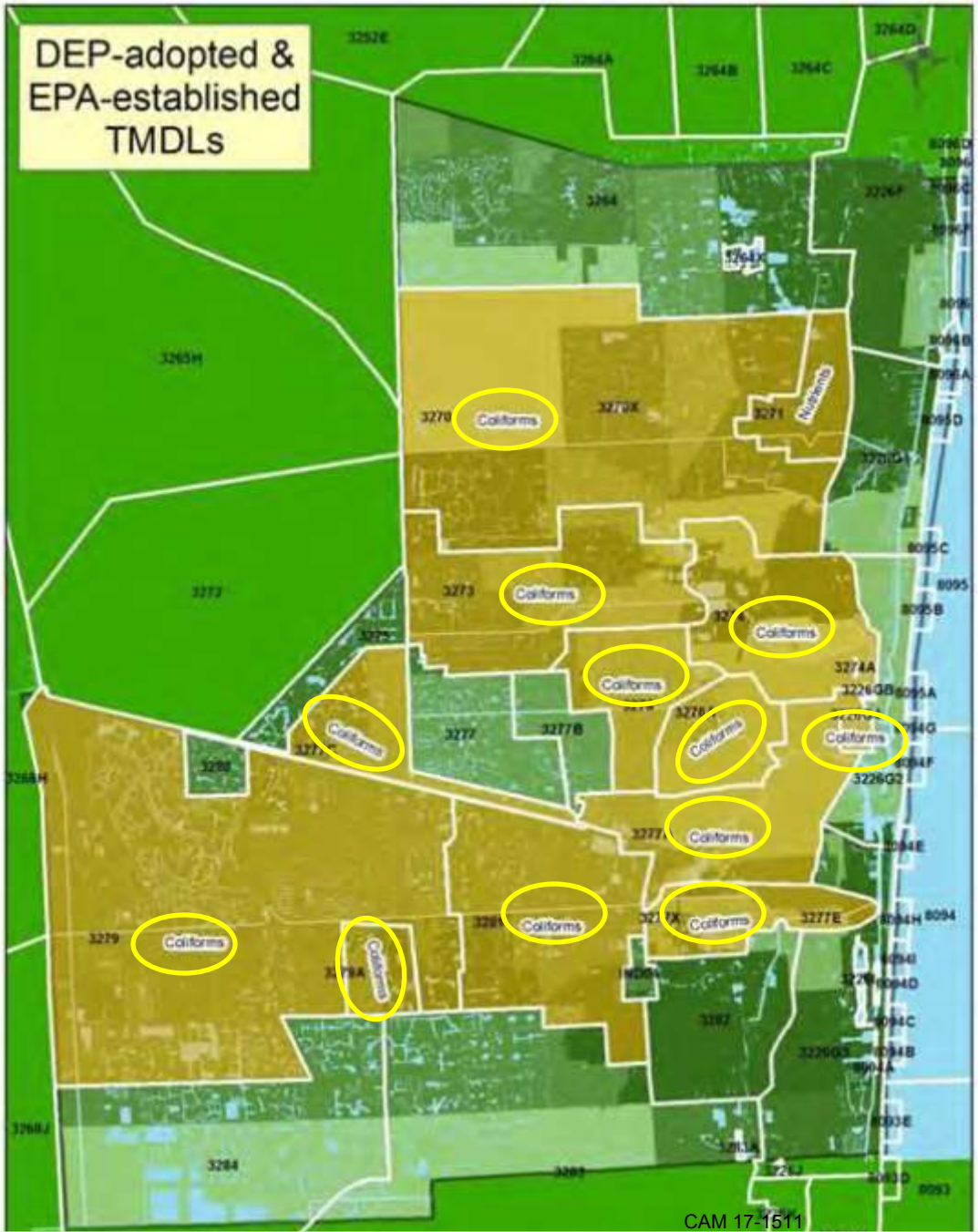


d) Site 16

Total Maximum Daily Loads (TMDLs)

"A calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards."

The majority of water bodies in Broward County are impaired for fecal coliform bacteria.



Broward County Water Resources Fact Book June 2015

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