

# Stormwater Impacts on Surface Water Quality

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**Tampa Bay Regional Planning Council 3/10/16**



Agriculture



Pets



Sewage & Runoff



Wildlife



**Fecal contamination degrades water quality**

Stormwater



**We all depend on clean water!**



# We Rely Almost Exclusively on Fecal Indicator Bacteria to Warn of Contamination



- Act as a warning signal of fecal pollution and increased risk of associated pathogens in water



# What Are Fecal Indicator Bacteria?



- **Bacteria found in the feces of most animals**
- **...e.g. fecal coliforms, *E. coli*, enterococci**
- **A general alarm signaling fecal contamination**
- **Sometimes correlated with human health risk due to exposure to water.**

# FIB are not...

- ...pathogenic (harmful to humans)
- ...useful for determining the source of fecal pollution

- FIB are 
- Not 



# How Do We Get More Specific? Microbial Source Tracking (MST)



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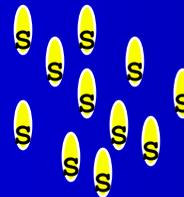


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# Microbial Source Tracking

- Certain microorganisms are found only in gastrointestinal tract of specific animals or humans.
- Host-specific microorganisms can be used to “track” pollution back to its source.



# Who Poos There?



Bob Paty



# Summer 2015 Flooding



# Flooding and Sewage Mixing



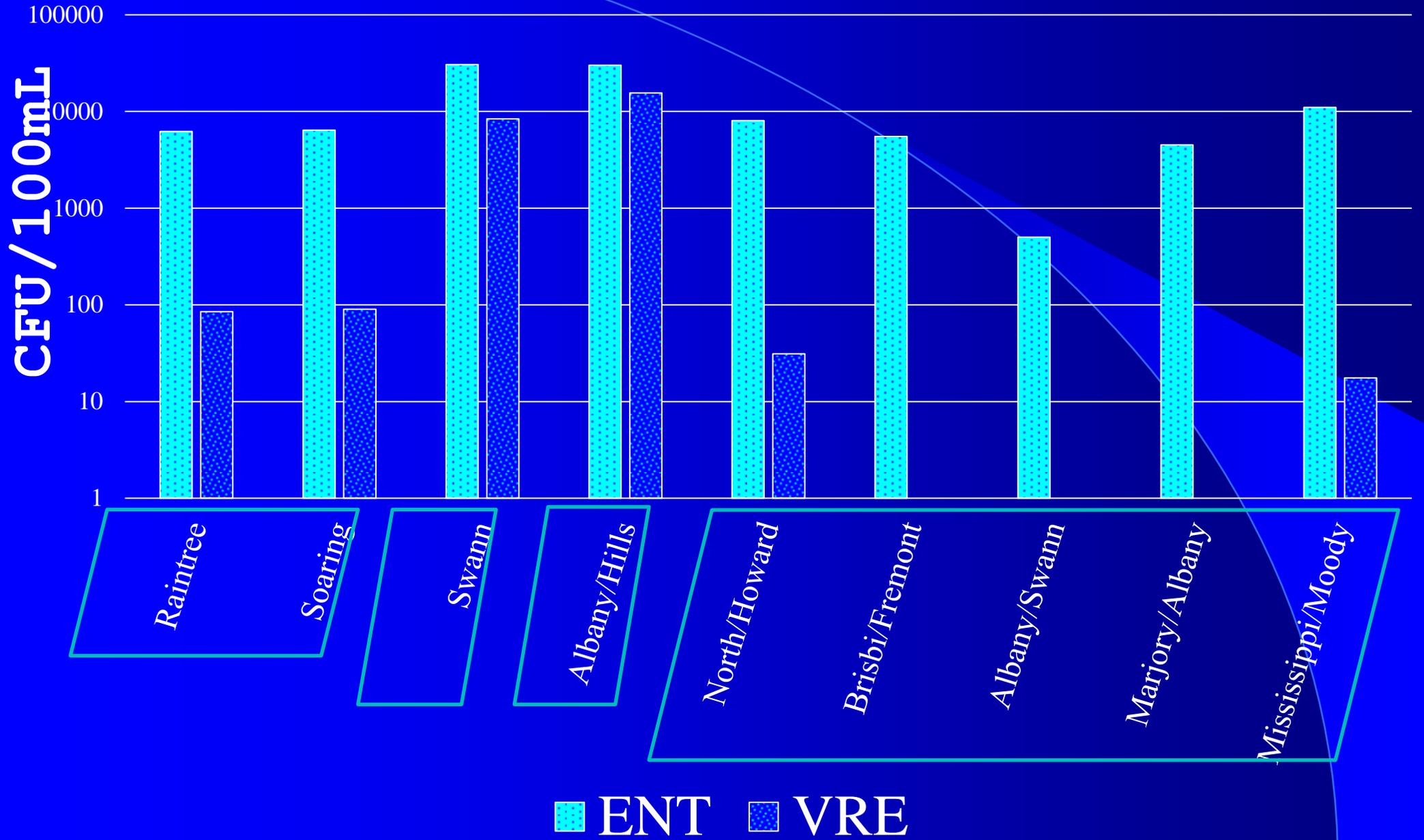
Photos: Tampa Bay  
Times

# Sewage infiltrates floodwaters due to aging wastewater system

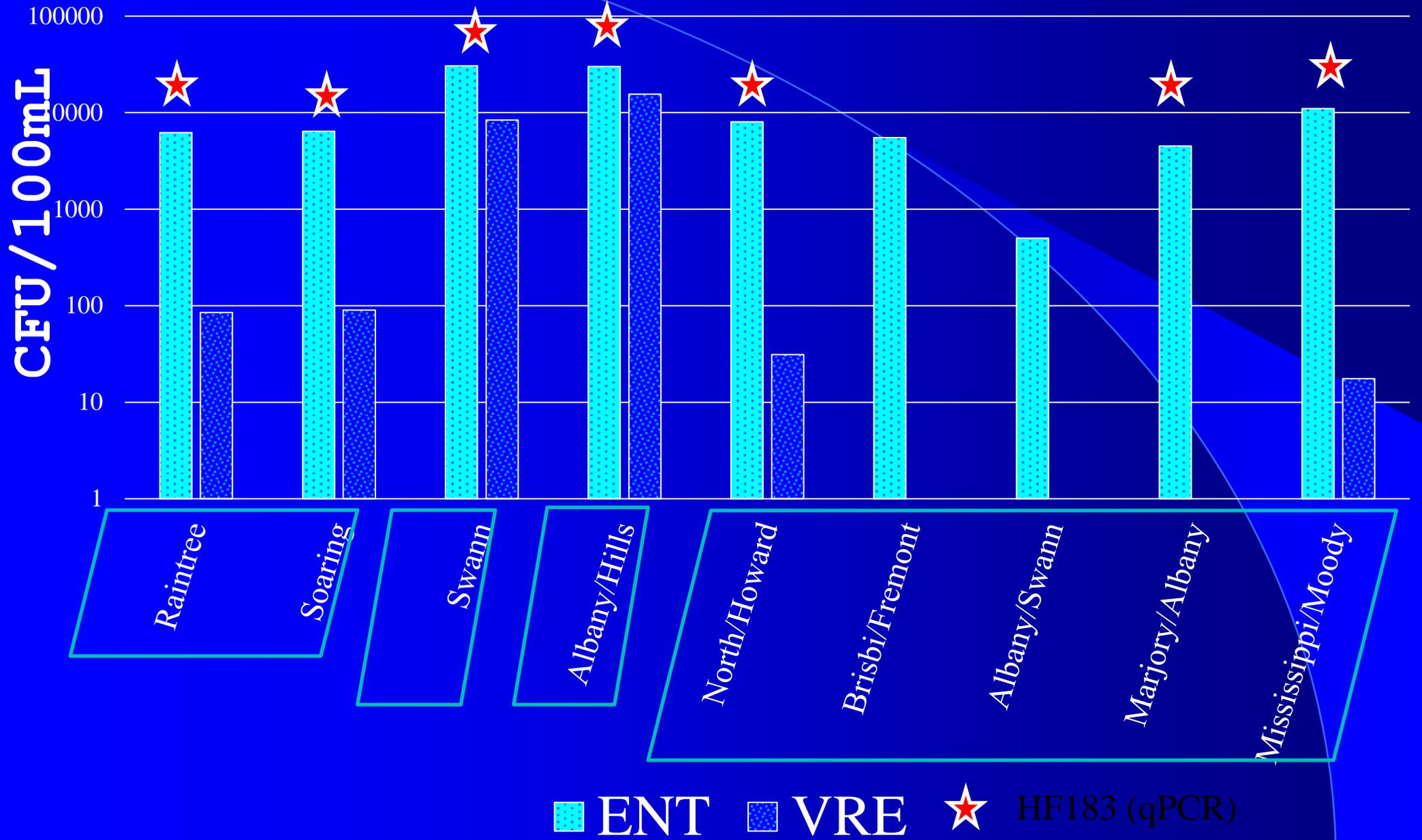


July 2015 Flooding  
in Tampa Bay

# Tampa Floodwaters Summer 2015



# Tampa Floodwaters: Preliminary Data



# Tampa Bay Water Quality Data

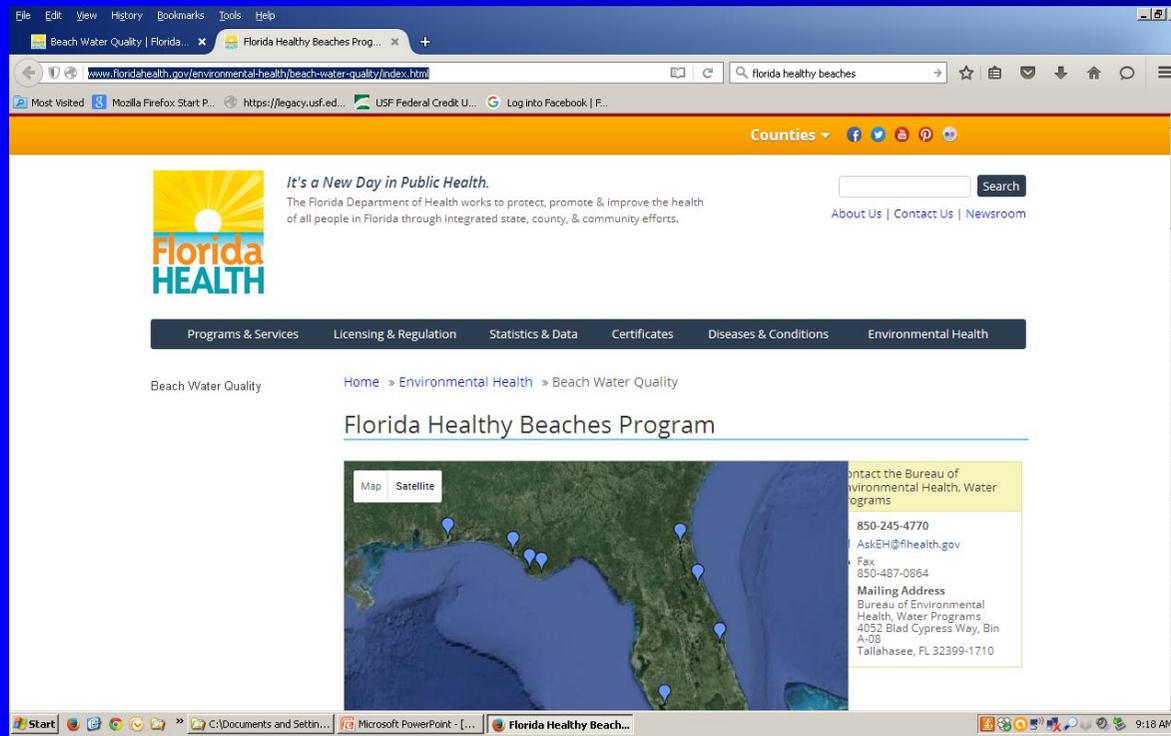
- Hillsborough Environmental Protection Commission

<http://www.epchc.org/index.aspx?NID=219>

The screenshot displays a web browser window with the URL [www.epchc.org/index.aspx?NID=219](http://www.epchc.org/index.aspx?NID=219). The page features a search bar with the text "Tampa bay water atlas" and a Google search button. Below the search bar, there is a section titled "EPC Water Quality Monitoring" which includes a map of Hillsborough County showing various water quality monitoring stations. The map is overlaid with a grid and shows several numbered stations (e.g., 173, 158, 111, 102, 103, 64, 46, 60, 47, 42, 65, 60, 63, 61, 40, 41). To the left of the map, there is a sidebar with the EPC logo and text: "EPC Administers several water quality monitoring programs within Hillsborough County and throughout Tampa Bay comprising over 200 stations many dating back to the 1970's. Clicking on a station brings up the...". The browser's taskbar at the bottom shows the Start button, several open applications, and the system clock indicating 9:14 AM.

# Tampa Bay Water Quality Data

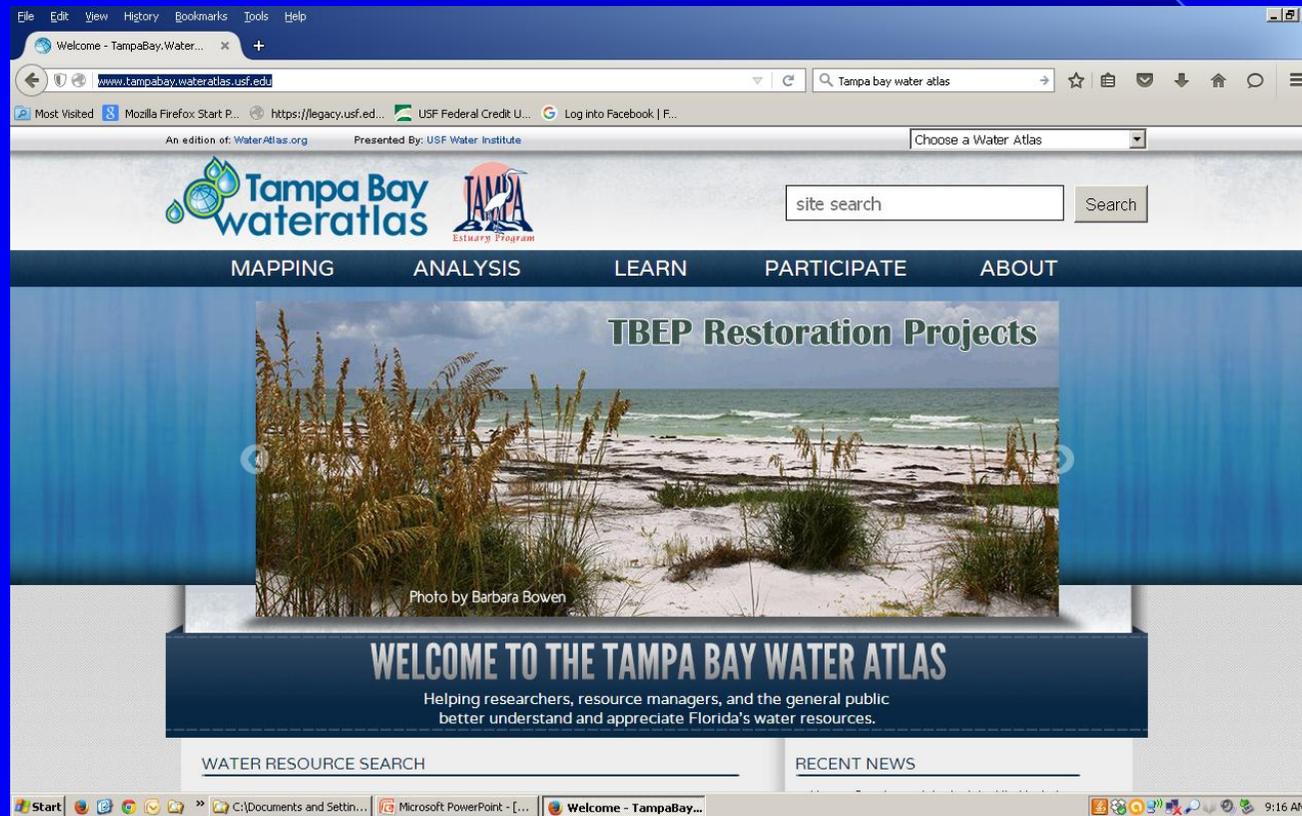
- Florida Health Beaches (Dept of Health)
- <http://www.floridahealth.gov/environmental-health/beach-water-quality/index.html>



The screenshot displays a web browser window with the URL [www.floridahealth.gov/environmental-health/beach-water-quality/index.html](http://www.floridahealth.gov/environmental-health/beach-water-quality/index.html). The page features the Florida Health logo and the tagline "It's a New Day in Public Health." Below the logo, there is a navigation menu with options like "Programs & Services" and "Environmental Health". The main content area is titled "Florida Healthy Beaches Program" and includes a map of Florida with blue location markers. To the right of the map, there is contact information for the Bureau of Environmental Health, Water Programs, including a phone number (850-245-4770), an email address (AskEH@flhealth.gov), and a mailing address in Tallahassee, FL.

# Tampa Bay Water Quality Data

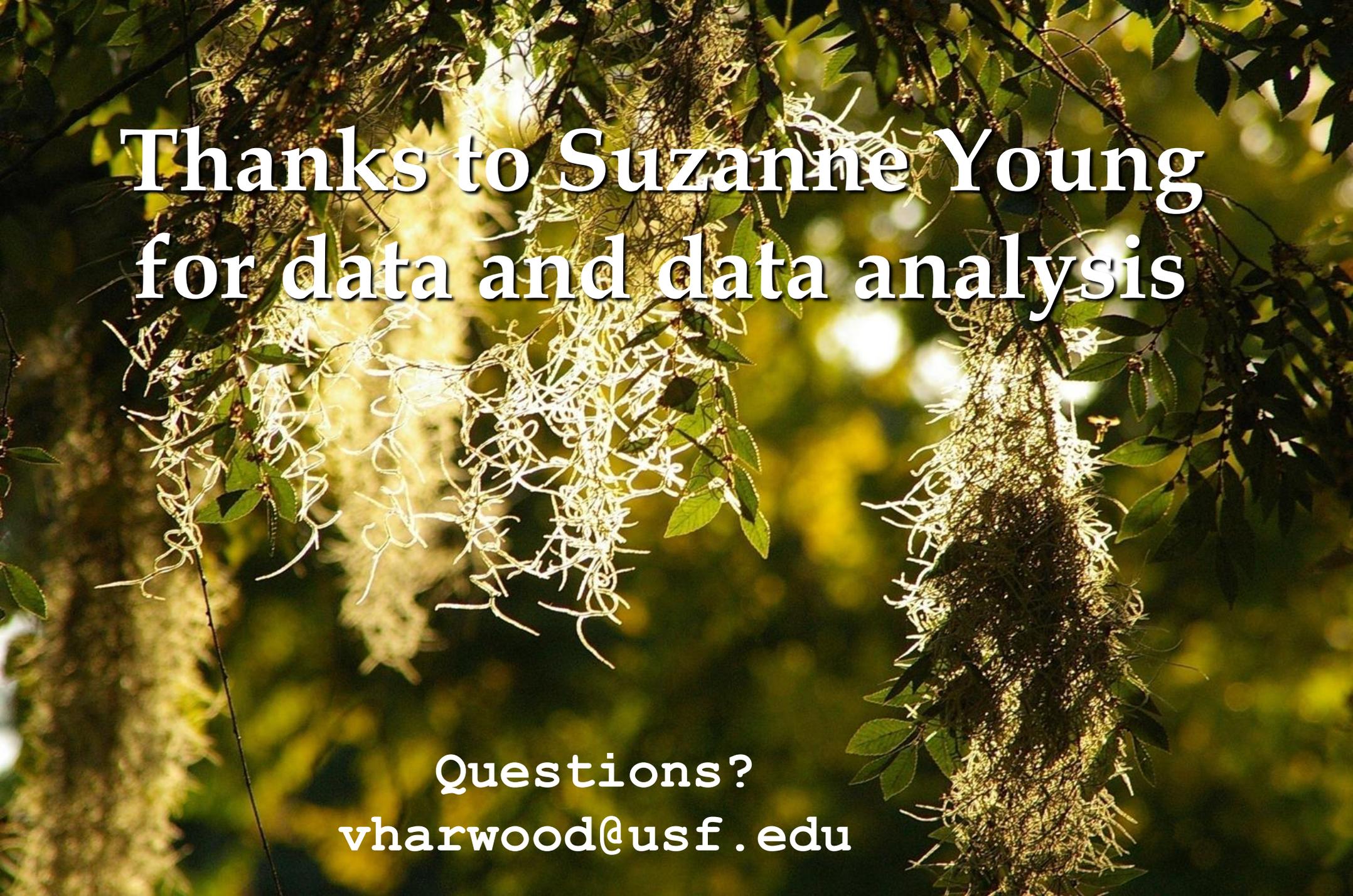
- Tampa Bay Water Atlas  
<http://www.tampabay.wateratlas.usf.edu/>



# Reducing Fecal Indicator Bacterial Levels in Beach Waters

- Don't!!

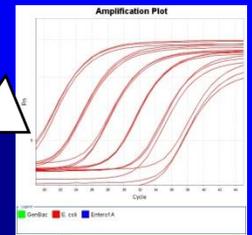
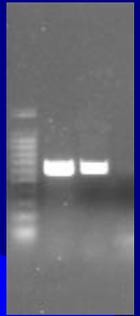
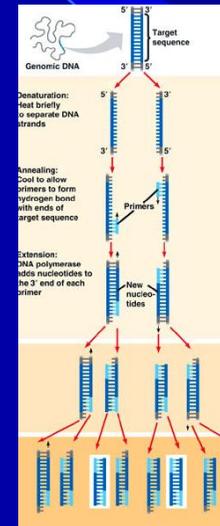
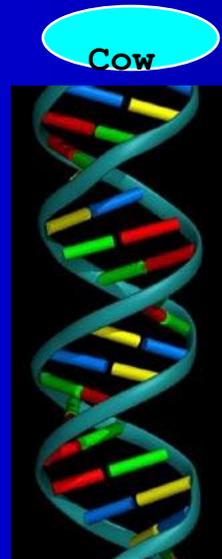




Thanks to Suzanne Young  
for data and data analysis

Questions?  
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# How Do We Test for the Host-Specific MST “Markers” ?



- Polymerase chain reaction targets a specific gene & copies it
- Forensic-type evidence for contamination source