

ADVISORY AND WARNING ANALYSES IN ALABAMA AND NORTHWEST FLORIDA BEACHES

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Basin Management Action Plan (BMAP)

Bayou Chico, Pensacola, FL

February 17, 2010

Geosyntec
consultants

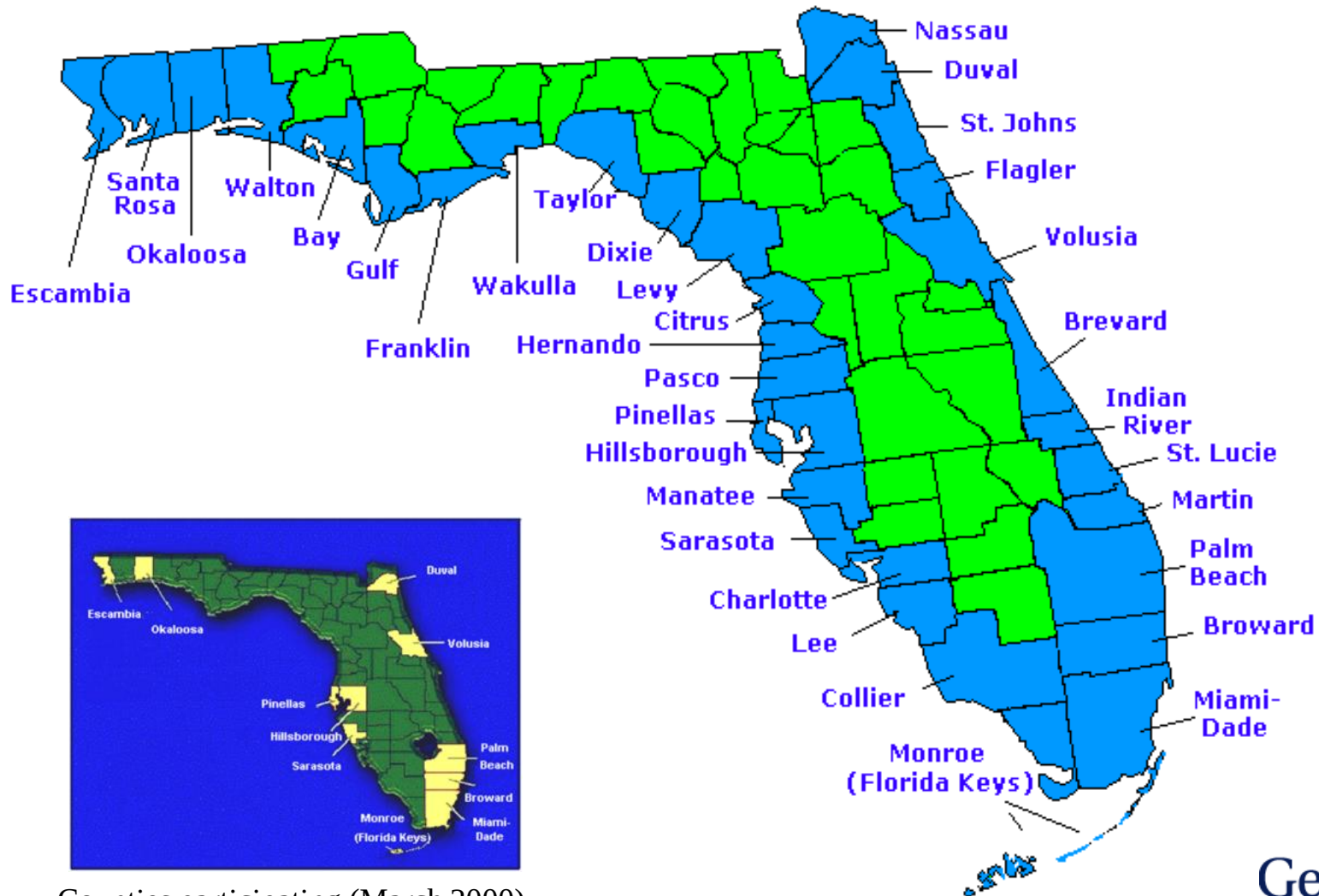
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Agenda

- ◆ Florida Healthy Beaches Program
 - ◆ Focus on Escambia, Santa Rosa, Okaloosa, and Walton Counties
- ◆ Coastal Alabama Beach Monitoring Program
- ◆ Advisories/Warnings
- ◆ Potential Contributing Factors
- ◆ Conclusions

Florida Healthy Beaches Program

To review the beach water sampling results for reporting counties, **click on a county name** on the map or in the table below. Each county page also has a link to data collected since August 2000.



Counties participating (March 2000)

Florida Healthy Beaches Program

- ◆ Monitor the quality of beach water
- ◆ Started in 1998
- ◆ State Legislation in 2000
- ◆ Beach Act
- ◆ Currently collected at 34 counties – Weekly
- ◆ Covers approximately 825 miles of coastline

Friday, April 24, 2009

Bayou Grande health alerts rescinded at two locations

The Escambia County Health Department on Thursday rescinded health alerts for Bayou Grande south of Gibbs Road and Sanders Beach.

Officials said water quality has improved in those areas according to weekly test results.

Alerts remain in effect for Bayou Chico at Lakewood Park, Bayou Grande in Navy point north of the Sunset Avenue Bridge and Bayou Texar at Bayview Park.

Tests in these areas show bacteria levels exceed state guidelines. Health department officials advise against swimming, fishing and other water-related activities in these areas until water quality improves.

Details: Call 595-6786.

Coastal Alabama Beach Monitoring Program

ADEM/ADPH

Coastal Alabama Beach Monitoring Program

Alabama's coastal beaches are a major tourist attraction as well as a lifestyle staple for Alabama residents. Alabama has approximately 50 miles of Gulf Beach and an estimated 65 to 70 miles of bay beaches where the adjacent waters are classified for swimming under the State's Water Use Classification System. Bacterial contamination in Alabama's coastal recreational waters can originate from sources, including shoreline development, wastewater collection and treatment facilities, septic tanks, urban runoff, disposal of human waste from boats, bathers themselves, commercial and domestic animals and natural animal sources such as wildlife. People who swim and recreate in waters contaminated with such bacterial pollution are at an increased risk of becoming ill. Pathogens associated with this type of pollution can cause ear, eye, skin and respiratory infections, gastrointestinal illness, and more serious diseases such as meningitis and hepatitis.

In June 1999, Alabama Department of Environmental Management (ADEM), in cooperation with the [Alabama Department of Public Health \(ADPH\)](#), initiated a program to routinely monitor bacteria levels at five select swimming beaches on the Gulf Coast. The effort was later expanded to include six additional sites along the Gulf Coast and Mobile Bay. In October of 2000 the federal Beaches Environmental Assessment and Coastal Health (BEACH) Act was signed into law. This act mandates the monitoring and assessing of coastal recreational waters and the prompt notification of the public when applicable water quality standards are not being met. The act also authorizes [EPA](#) to award grants to help governments implement monitoring and notification programs consistent with published EPA guidance and criteria. The ADEM was designated as the State's lead agency and was awarded grant money to carry out this program. Through the BEACH Act, the ADEM and the ADPH have greatly expanded and enhanced monitoring and notification efforts for Alabama's public recreational waters. The goal of this program is to increase public awareness and provide valuable water quality information to help the public make more informed decisions concerning their recreational use of Alabama's natural coastal waters.

This program now involves the routine collection of water samples from 25 high use and/or potentially high risk public recreational sites from Perdido Bay to Dauphin Island. The selection of sites and the frequency of sampling are determined using a risk based evaluation and ranking process. This process considers a number of factors for a given site, most importantly the amount of use and the amount of risk. Depending on the site, samples are collected twice per week, once per week or once every other week during the swimming season (June through September) and once per month during the cooler months. These samples are analyzed for the indicator bacteria Enterococci. Enterococci bacteria are endemic to the guts of warm blooded creatures. These bacteria, by themselves, are not considered harmful to humans but often occur in the presence of potential human pathogens. The indicator bacteria used and the threshold concentration, which triggers an advisory, are based on recommendations provided by the EPA in the documents *Ambient Water Quality Criteria for Bacteria* (1986) and *Water Quality Standards Handbook, second addition* (1983).

How this site works:



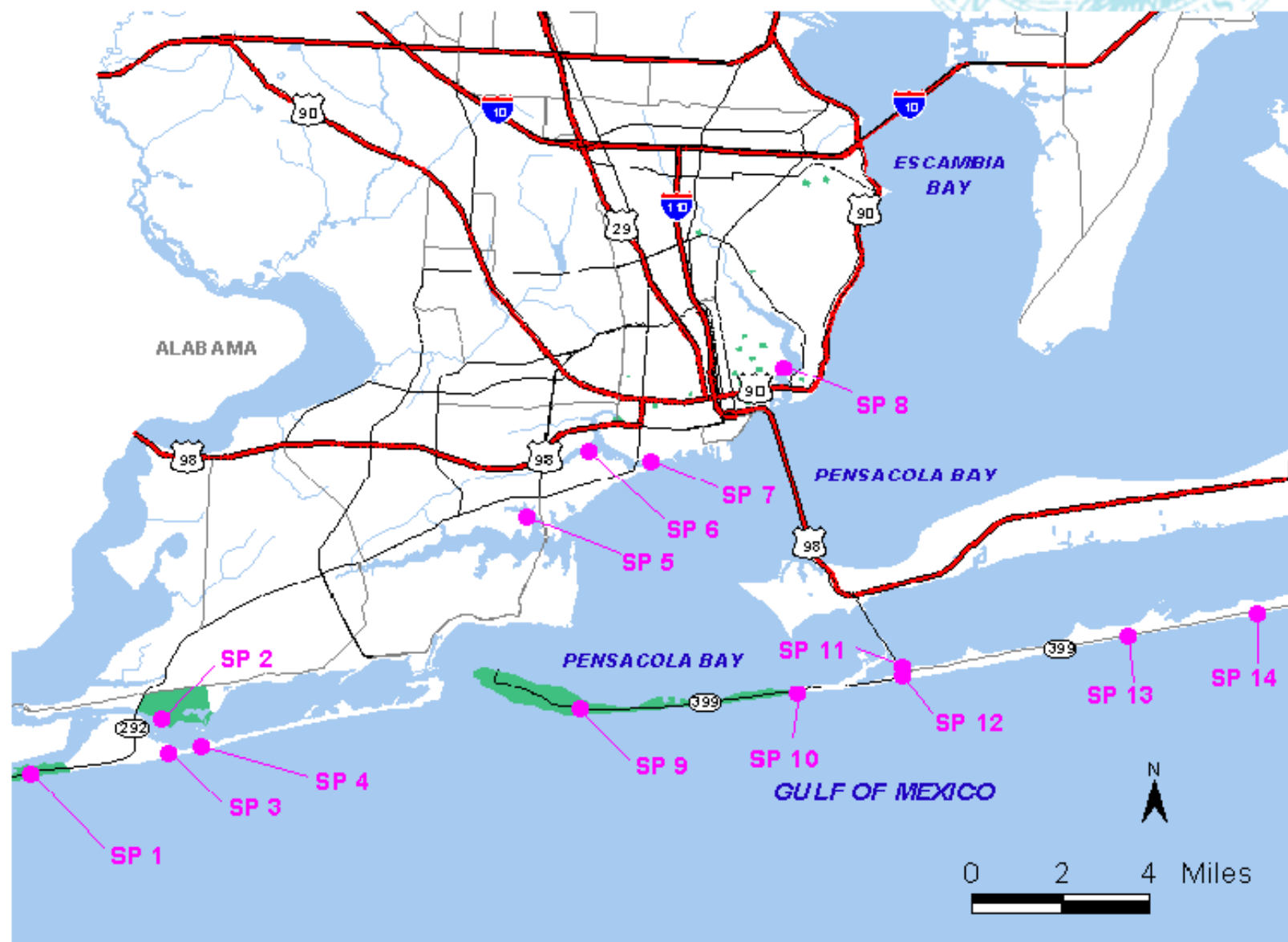
The associated [map of Coastal Alabama \(Water Quality Summary\)](#) indicates the locations of the monitoring sites. Click on the location name of interest on either the map or the list of monitoring sites below for the most recent advisory status and bacteriological testing results. A three tiered color coded water quality status system is used to help the public make a more informed decision concerning water quality and risk of illness associated with swimming. A green status means that, based on the most recent test, water quality is acceptable. Enterococci levels were at or below the EPA threshold of 104 colonies per 100 ml of water. A yellow status means the most recent test results for a given site exceeded the EPA threshold of 104 Enterococci colonies per 100 ml of water. There may be an increased risk of illness associated with swimming in such water. Because elevated bacteria levels are often transient and usually fall quickly, these sites undergo immediate retesting. The yellow status will be revised to red or green based on the results of the retest. A red status means that repeat testing of a site has again revealed bacteria levels over the EPA threshold of 104 Enterococci colonies per 100 ml of water. There may be an increased risk of illness associated with swimming in such water. Because elevated bacteria levels have persisted, a public health advisory has been issued. Because bacteriological testing requires a 24 hour incubation period, it should be emphasized that even the most recent data (and thus the reported water quality status) are at least 24 hours old, and may not reflect current water quality conditions at these sites.

Coastal Alabama Beach Monitoring Program

- ◆ Started in 1999 in cooperation of the Alabama Department of Public Health
- ◆ Currently collected at 25 locations
- ◆ Sampling based on risk and ranking process
- ◆ Covers approximately 120 miles of coastline

EscambiaCounty

Sample Locations



Beach Water Sampling Results for the Period Starting on 5/4/2009

Beach Water Sampling Results for the Period Starting on 5/4/2009

Sample Point (SP)	Location Click on a Location Name to review sampling history. * Entries indicate resampling events.	Enterococcus	Enterococcus Geometric Mean	Fecal Coliform	Advisory / Warning Issued
1	PERDIDO KEY STATE PARK	Good	Good	Good	No
2	BIG LAGOON STATE PARK	Good	Good	Good	No
3	JOHNSON BEACH	Good	Good	Good	No
4	JOHNSON BEACH- SOUND SIDE	Good	Good	Good	No
5	NAVY POINT	Good	Poor	Good	Yes
6	BAYOU CHICO	Good	Poor	Good	Yes
7	SANDERS BEACH	Good	Good	Good	No
8	BAYVIEW PARK PIER	Good	Poor	Good	Yes
10	COUNTY PARK WEST	Good	Good	Good	No
11	QUIET WATER BEACH	Good	Good	Good	No
12	PENSACOLA BEACH	Good	Good	Good	No
13	COUNTY PARK EAST	Good	Good	Good	No

Enterococcus Results Description

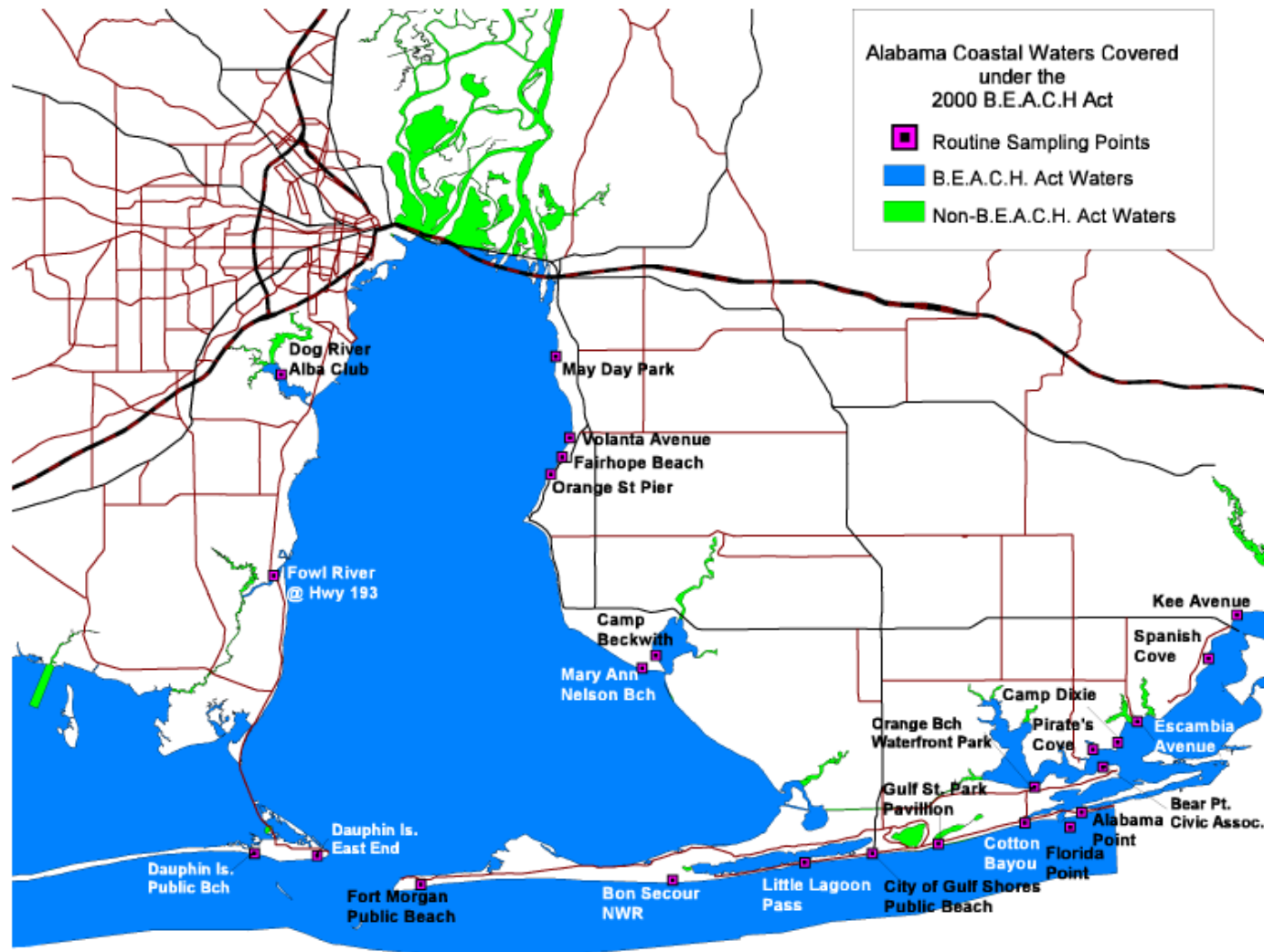
GOOD	MODERATE	POOR*
0-35 <i>Enterococcus sp</i> per 100 ml of marine water 0-35 CFU/100 mL <i>Enterococcus sp</i> Geometric Mean	36-104 <i>Enterococcus sp</i> per 100 ml of marine water	105 or greater <i>Enterococcus sp</i> per 100 ml of marine water 36 and over CFU/100 mL <i>Enterococcus sp</i> Geometric Mean

Fecal Coliform Results Description

GOOD	MODERATE	POOR*
0-199 fecal coliform organisms per 100 ml of marine water	200-399 fecal coliform organisms per 100 ml of marine water	400 or greater fecal coliform organisms per 100 ml of marine water

*A Poor rating may result in a resampling event to confirm poor conditions, otherwise a Health Advisory or Warning will be issued immediately. These indicate that contact with the water at this site may pose increased risk of infectious disease, particularly for susceptible individuals. A reading of **NR** means "No Result." This could indicate that no sample was taken at this point because of weather or other factors, or that an analysis result was not obtained from the laboratory.

Coastal Alabama Beach Monitoring Program



Coastal Alabama Beach Monitoring Program

Water Quality Status Summary			
Site		Date of last sample	Status
Baldwin County			
Alabama Point		9/8/2009	
Bear Point Civic Association		9/8/2009	
Bon Secour NWR		9/8/2009	
Camp Beckwith		9/8/2009	
Camp Dixie		9/8/2009	
Cotton Bayou		9/8/2009	
Escambia Ave.		8/26/2009	
Fairhope Public Beach		9/8/2009	
Florida Point		9/8/2009	
Fort Morgan Public Beach		9/8/2009	
Gulf Shores Public Beach		9/8/2009	
Gulf State Park Pavillion		9/8/2009	
Kee Ave.		9/2/2009	
Spanish Cove		9/2/2009	
Little Lagoon Pass		9/8/2009	
Mary Ann Nelson Beach		8/31/2009	
MayDayPark		9/2/2009	
Orange Beach Waterfront Park		9/8/2009	
Orange Street Pier/Beach		9/8/2009	
Pirate's Cove		9/8/2009	
VolantaAve.		9/8/2009	
MOBILE COUNTY			
Dauphin Island East End		9/2/2009	
Dauphin Island Public Beach		9/2/2009	
Dog River at Alba Club		9/2/2009	
Fowl River at HWY 193		9/2/2009	

Advisory Key	
	The most recent testing of water from this site revealed enterococci levels below the EPA recommended threshold. Water quality is acceptable.
	The most recent testing of water from this site revealed Enterococci levels of illness associated with swimming at this site. Because elevated bacteria levels are often transient and usually fall quickly, this site is now being retested. The status will be revised to red or green based on the results of the retest.
	Repeat testing of this site has again revealed Enterococci levels over the EPA recommended threshold. There may be an increased risk of illness associated with swimming at this site. Because elevated bacteria levels have persisted, a public health advisory will be issued. This site will be retested.

Advisory / Warning - Florida

◆ Advisory

- ◆ Enterococcus single sample maximum is greater than **104** colony forming units (CFU) per 100 milliliters.
- ◆ Enterococcus geometric mean (5 weeks) is greater than **35** (CFU) per 100 milliliters.

◆ Warning

- ◆ Fecal coliform simple sample maximum exceeds **400** fecal coliform organisms per 100 milliliters.

Advisory Status- Alabama

♦ Green Status

- ♦ Enterococcus single sample maximum is lower than **10⁴** colony forming units (CFU) per 100 milliliters.

♦ Yellow Status

- ♦ Enterococcus single sample maximum is higher than **10⁴** colony forming units (CFU) per 100 milliliters. Immediate retest.

♦ Red Status

- ♦ Enterococcus single sample maximum after resampling is higher than **10⁴** colony forming units (CFU) per 100 milliliters.

Descriptive Statistics – NW Florida

- ◆ 40 sites
 - ◆ 12 Escambia County
 - ◆ 7 Santa Rosa County
 - ◆ 12 Okaloosa County
 - ◆ 9 Walton County
- ◆ Sampling Period:
July 2000 – March 2009
- ◆ 15,653 samples



Descriptive Statistics - Alabama

- ♦ 25 sites (26 with Boggy Point)
 - ♦ 21 Baldwin County
 - ♦ 4 Mobile County
- ♦ Sampling Period:
August 2000 – September 2009
 - ♦ 6,726 samples



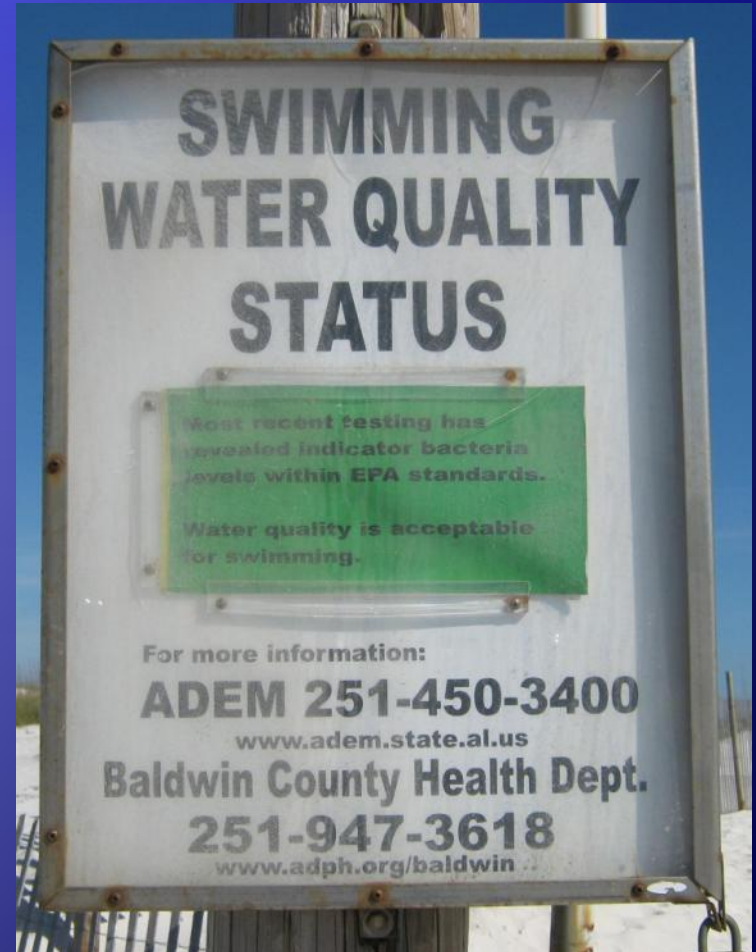
NW Florida Findings (40 sites)

- ◆ 7 sites had advisory frequencies larger than 30%
- ◆ 14 sites with no advisories
- ◆ 19 sites had advisory frequencies smaller than 15%

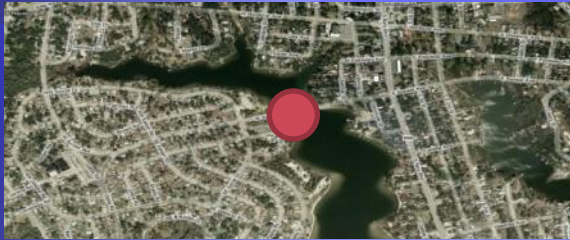


Alabama Findings (26 sites)

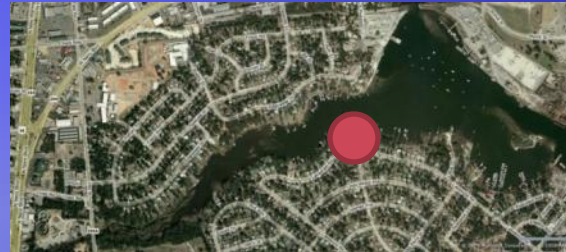
- ◆ 7 sites had advisory frequencies smaller than 5%
- ◆ 13 sites with no advisories
- ◆ 6 sites had advisory frequencies between 5% and 12%



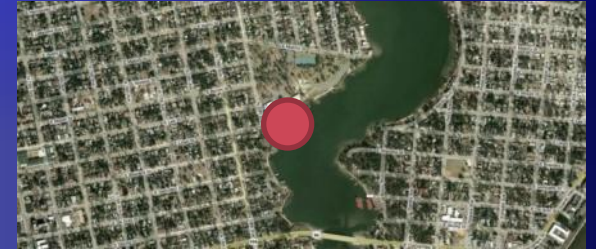
Number of Advisories >30% (7) - NW Florida



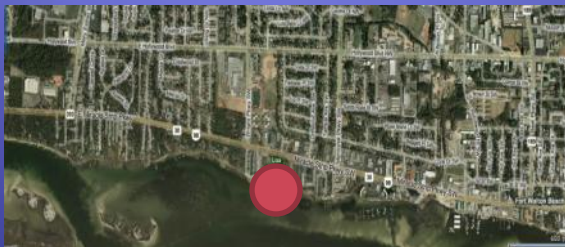
ES SP5 – Navy Point (42%)



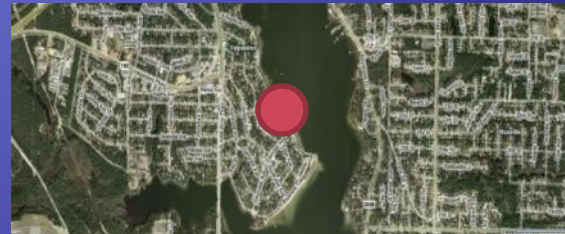
ES SP6 – Bayou Chico (53%)



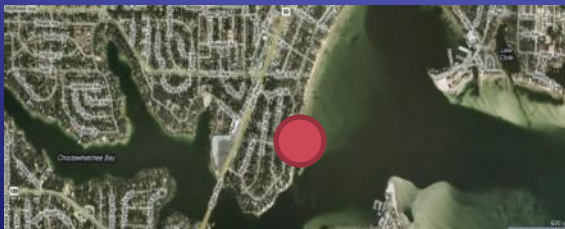
ES SP8 - Bayview Park Pier (30%)



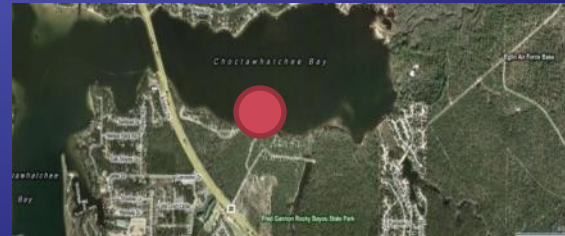
OK SP1 – Liza Jackson Park (34%)



OK SP8 - Lincoln Park (39%)

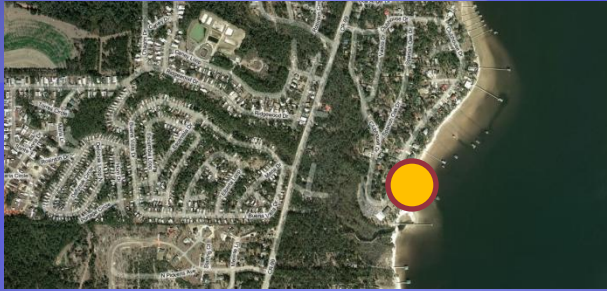


OK SP2 – Garniers Park (31%)



OK SP10 – Rocky Bayou State Park (38%)

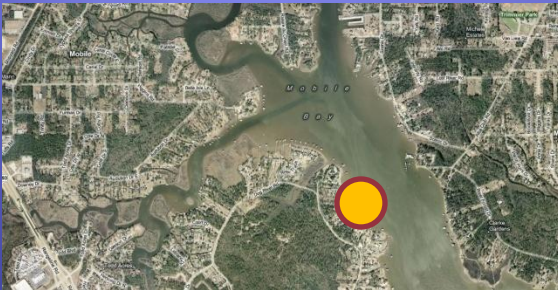
Number of Advisories between 5% -12 % - Alabama



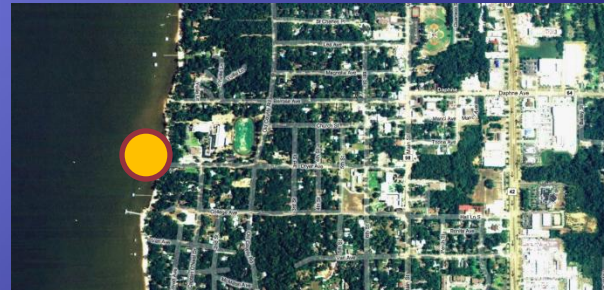
Spanish Cove (12%)



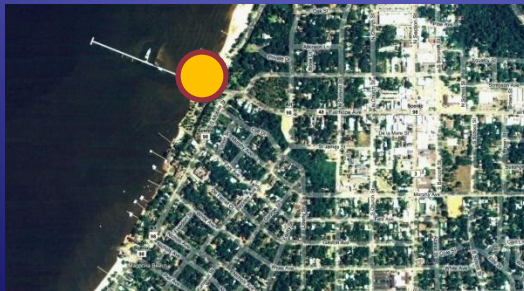
Mary Ann Nelson Beach (11%)



Alba Club, Dog River (10%)



May Day Park (10%)

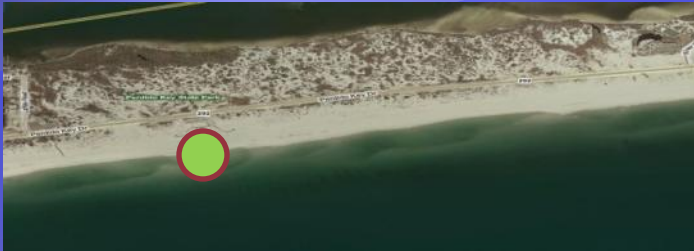


Fairhope Beach (6%)



Dauphin Island East End (5%)

No Advisories (14)

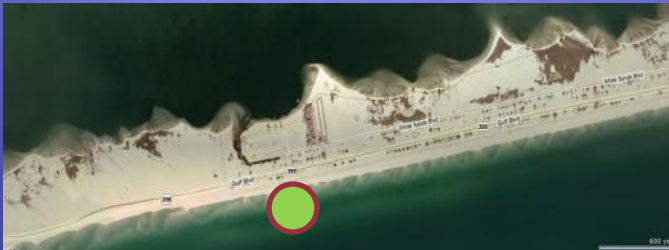


ES SP1 – Perdido Key State Park



ES SP10 – County Park West

SA SP4 – Homeport (1 advisory)

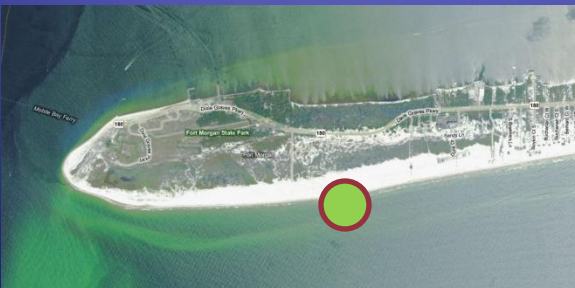


SA SP3 – Navarre Beach West

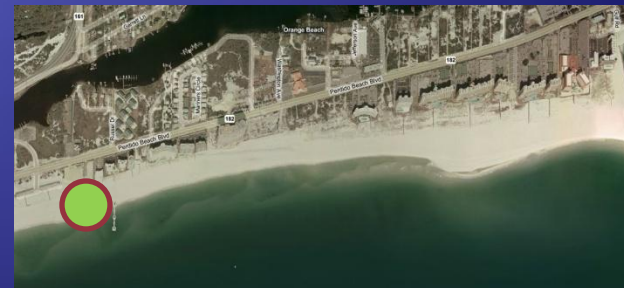


SA SP7 – Juana's Beach

SA SP6 – Navarre Beach Pier



Fort Morgan



Cotton Bayou

Escambia
(5)

Santa
Rosa
(3)

AL
(13)

Number of Advisories < 15% (19)

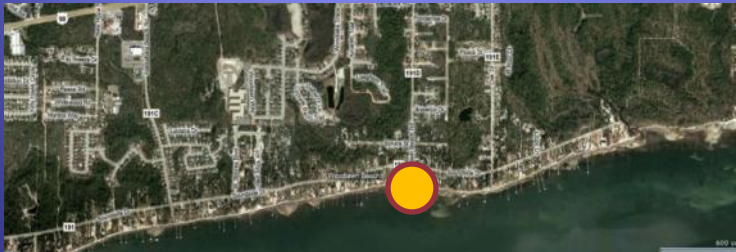


ES SP7 – Sanders Beach (15%)

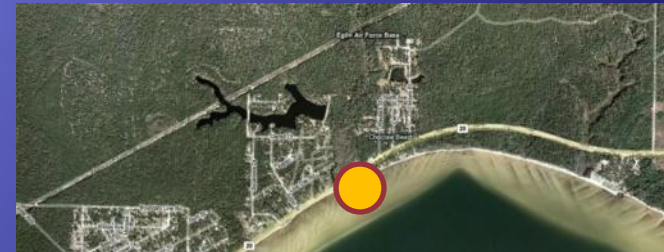


ES SP11 – Quiet Water Beach (1%)
ES SP12 – Pensacola Beach

Escambia
(4)

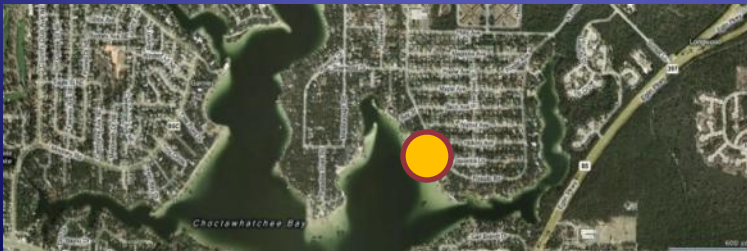


SA SP2 – Woodlawn Beach (2%)

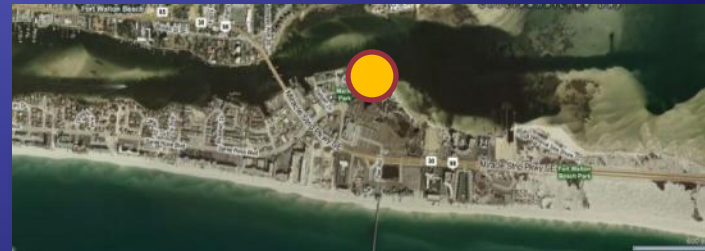


WA SP2 – Choctaw Beach County Park (2%)

Santa Rosa
(4)
Walton
(3)

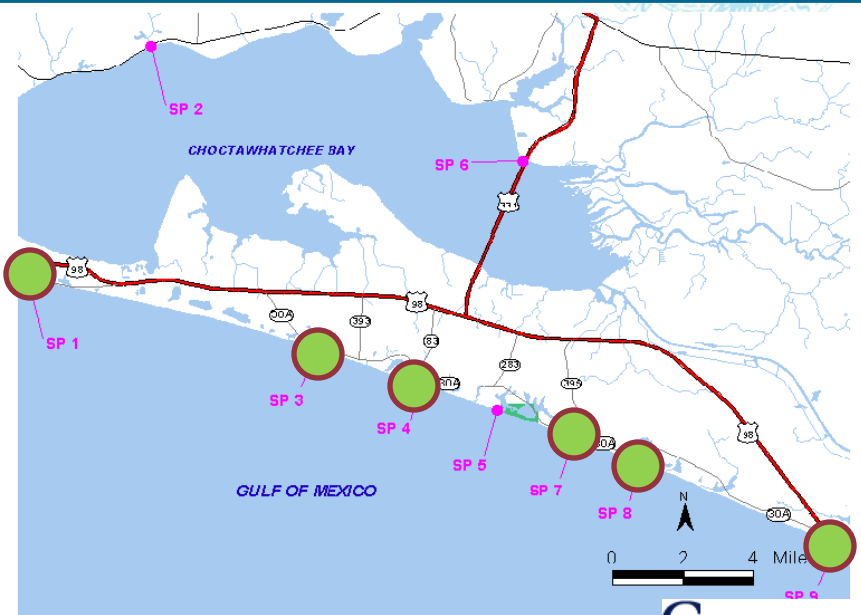
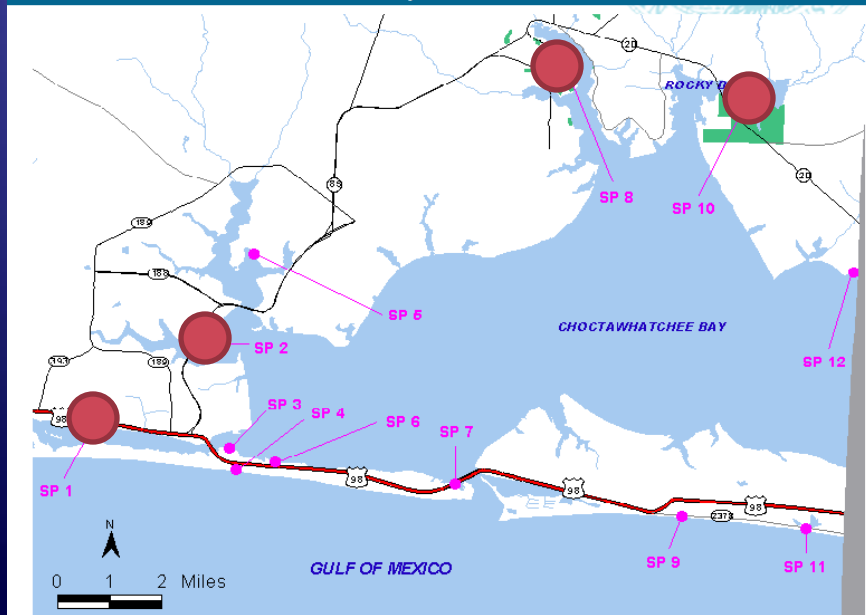
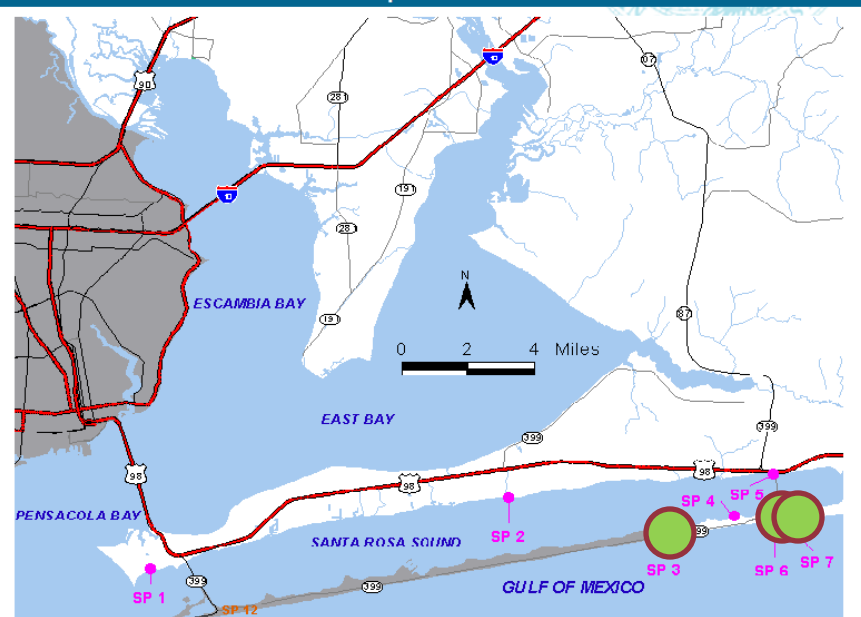
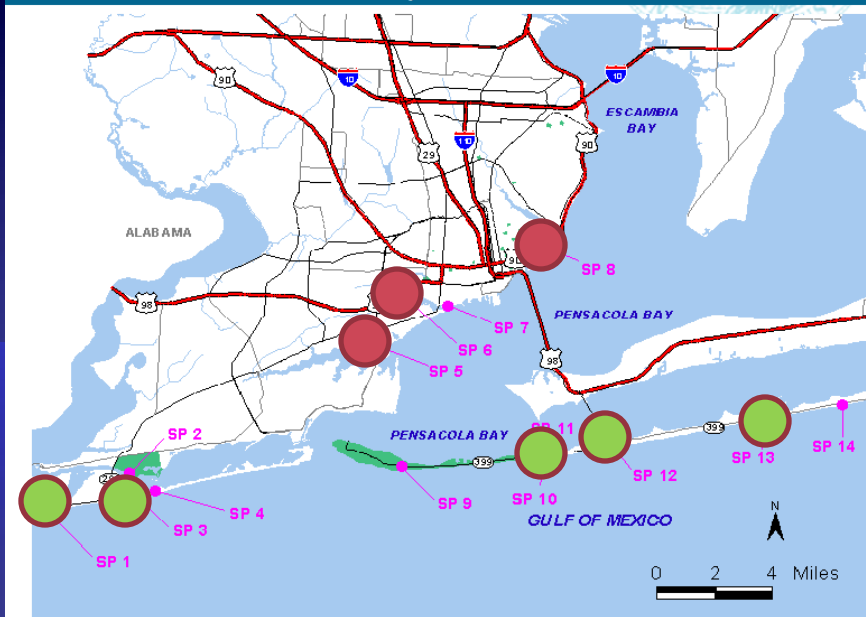


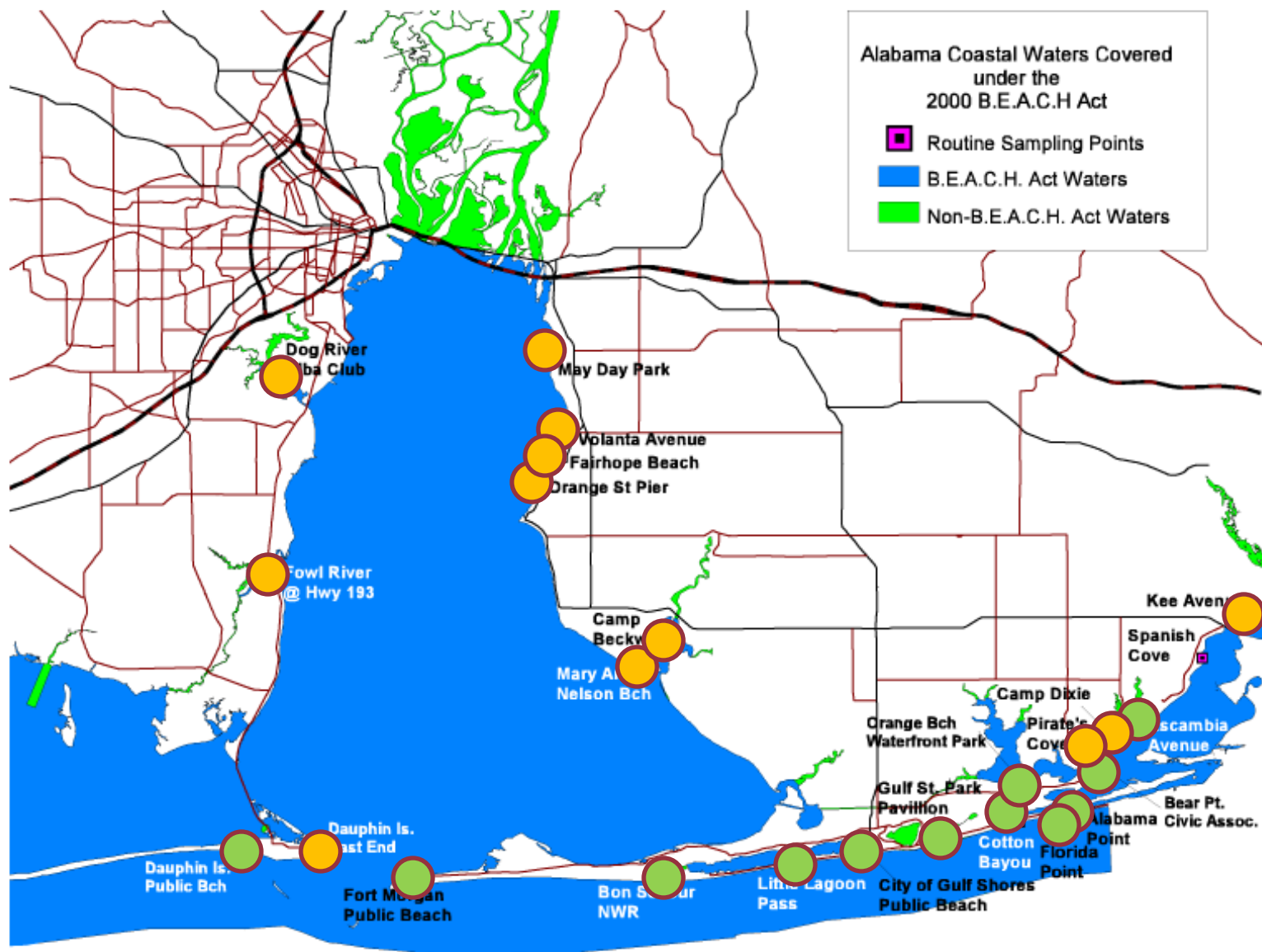
OK SP5 – Poquito Park (8%)



OK SP3 – Marler Park (8%)

Okaloosa
(8)

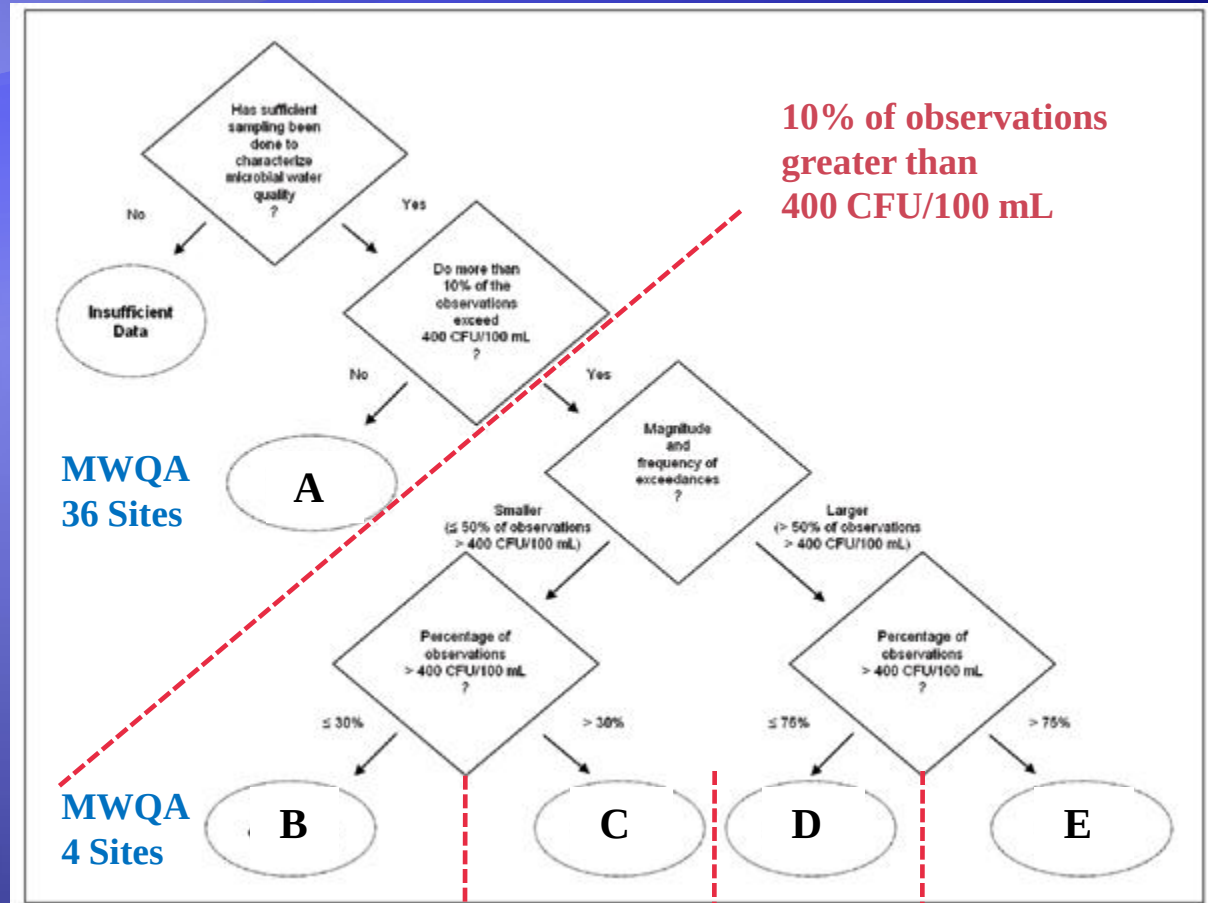




"Beating Bacteria" – Stormwater Magazine



- ES SP5 – Navy Point (42%)
- ES SP6 – Bayou Chico (53%)
- ES SP7 – Sanders Beach (15%)
- ES SP8 - Bayview Park Pier (30%)



Decision-Support Tool
(Wapnick et al.)

30%

50%

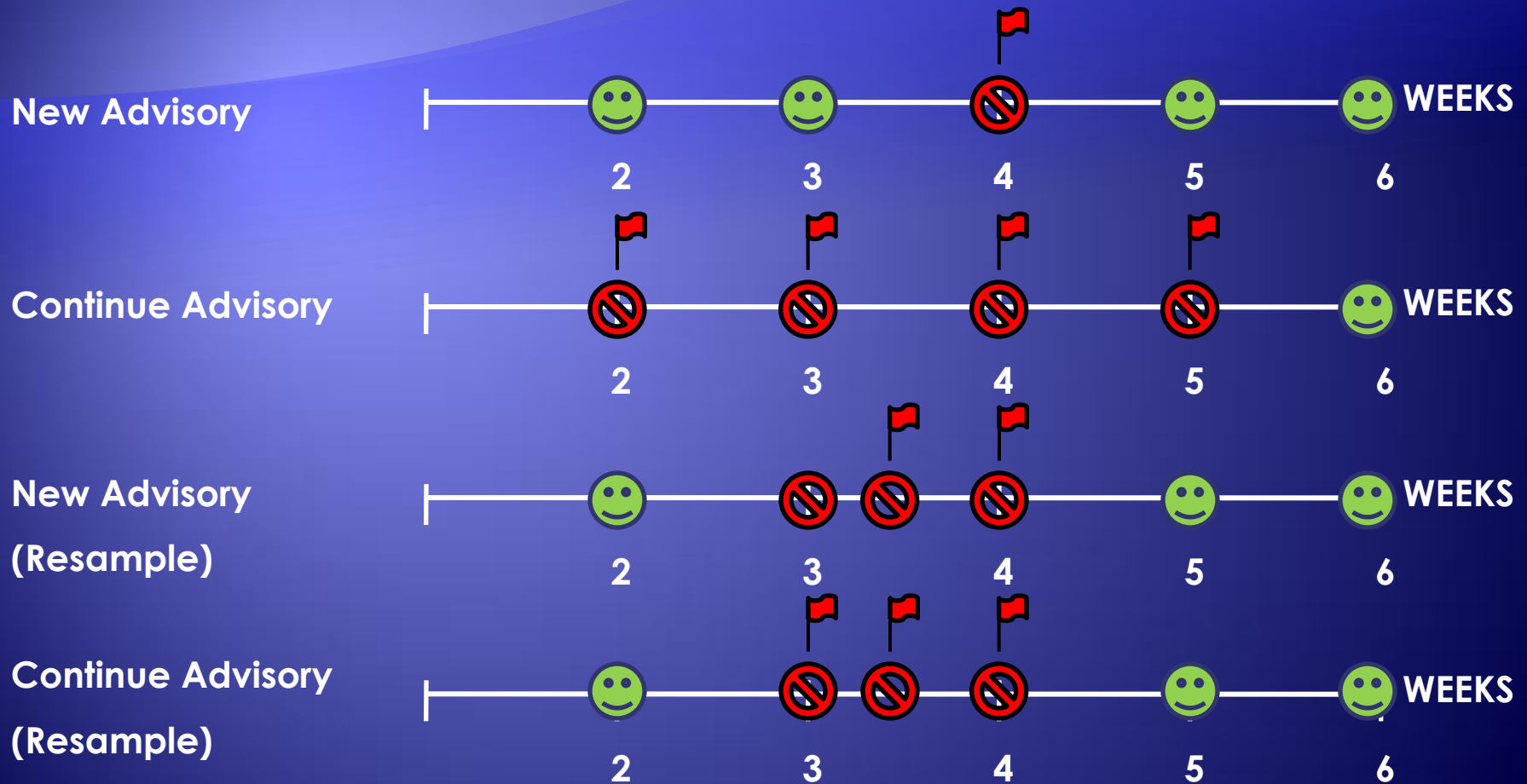
75%

Microbial Water-Quality Assessment (MWQA)

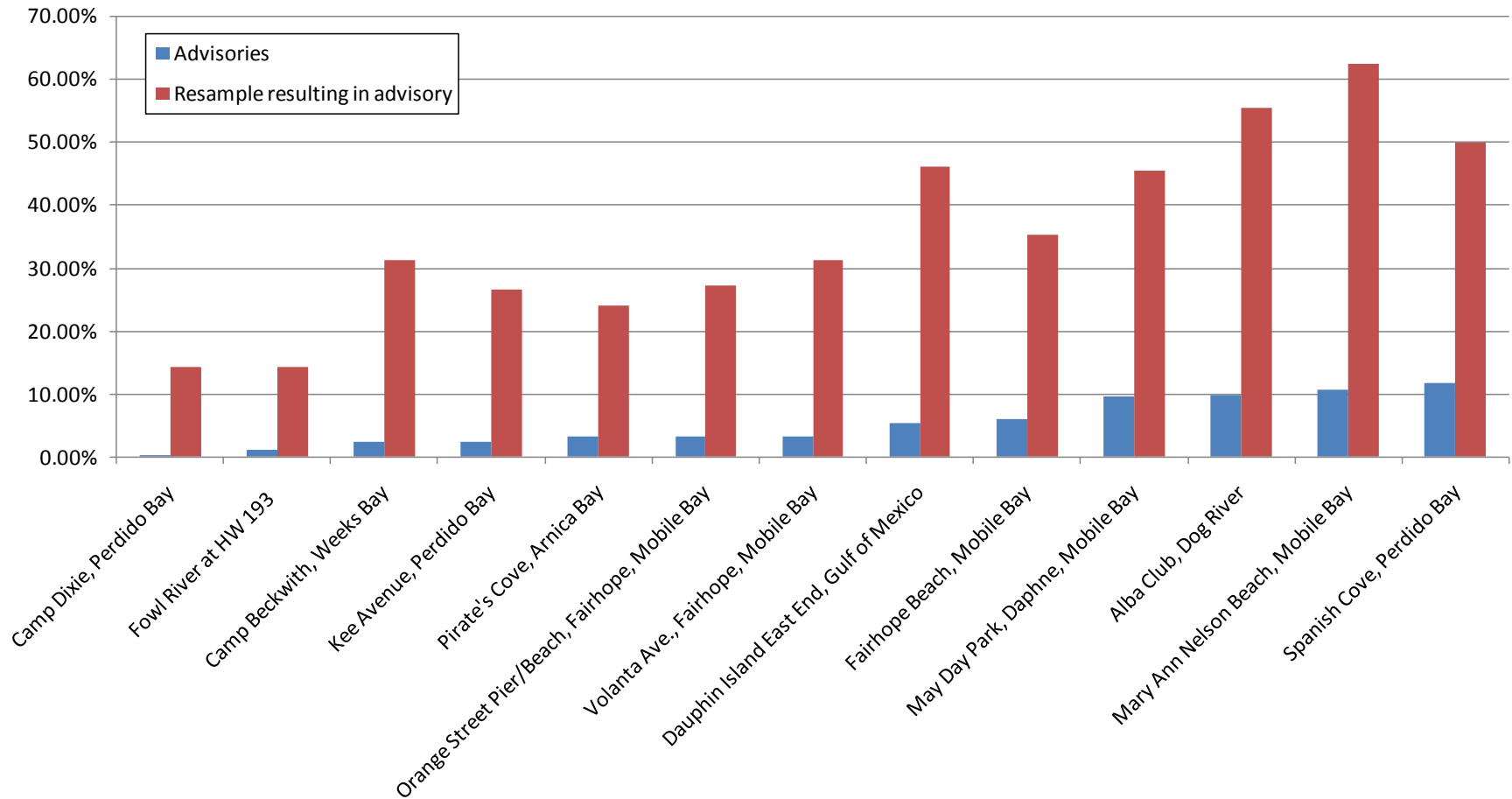
Site	Advisories / Warnings %	Fecal Coliform >400 CFU/ 100mL %	MWQA
ES SP5 – Navy Point	42	18	B
ES SP6 – Bayou Chico	53	21	B
ES SP7 – Sanders Beach	15	13	B
ES SP8 - Bayview Park Pier	30	14	B
OK SP1 – Liza Jackson Park	34	7	A
OK SP2 – Garniers Park	31	9	A
OK SP8 - Lincoln Park	39	6	A
OK SP10 – Rocky Bayou State Park	38	5	A

*

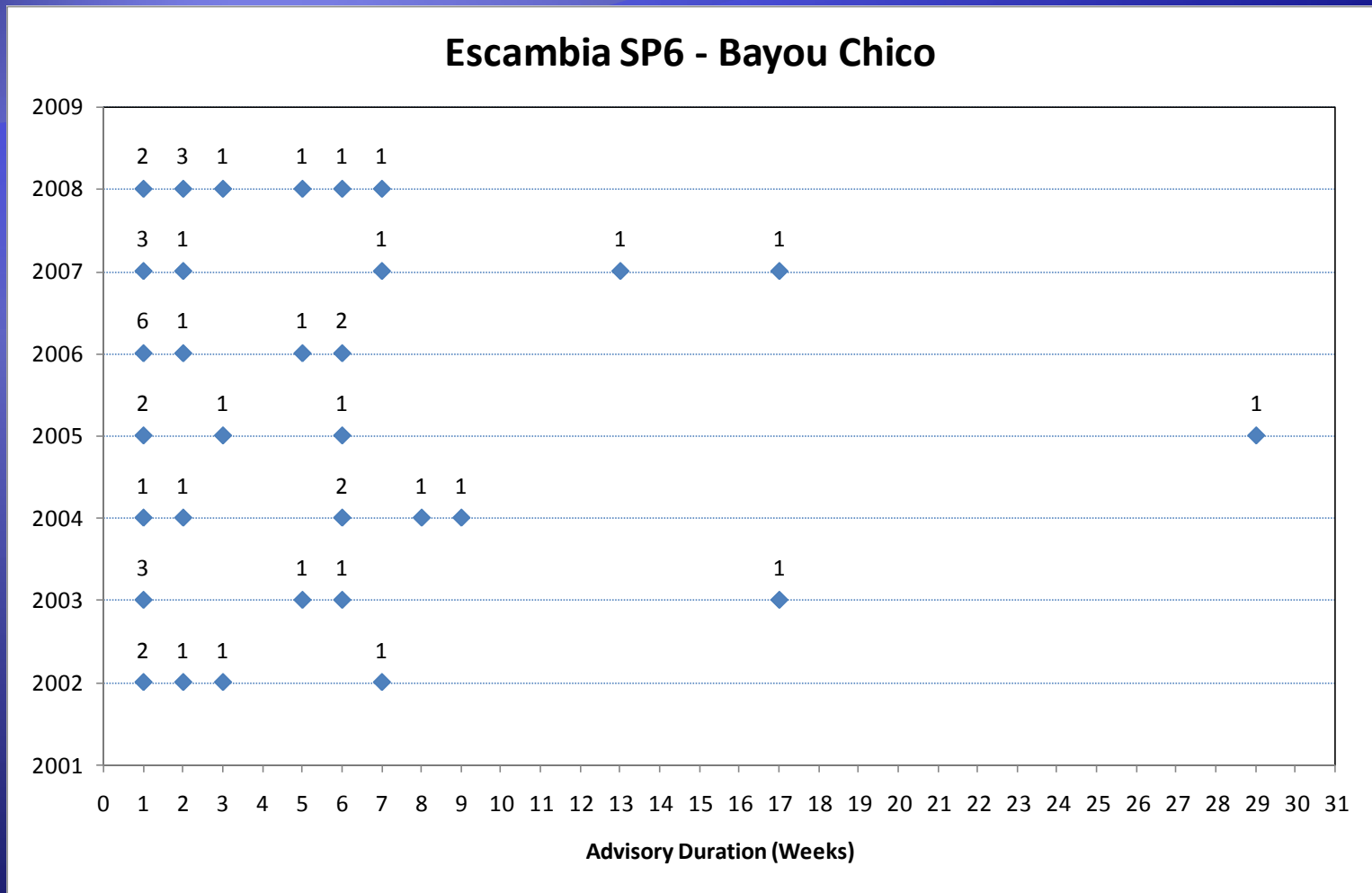
Advisories/Warnings



Resample / New Advisories



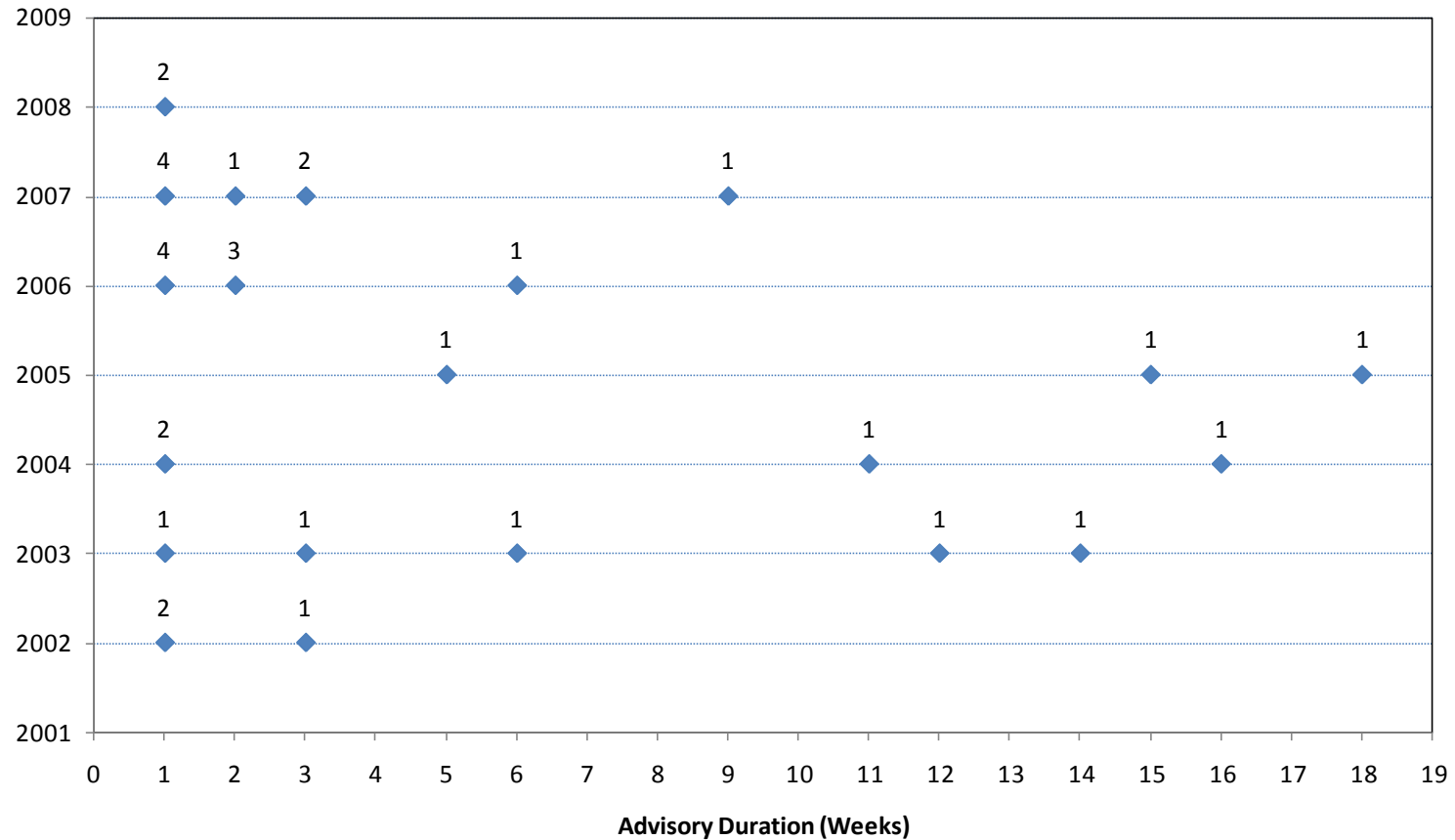
Continuous Weeks



* Represents the frequency of each time duration

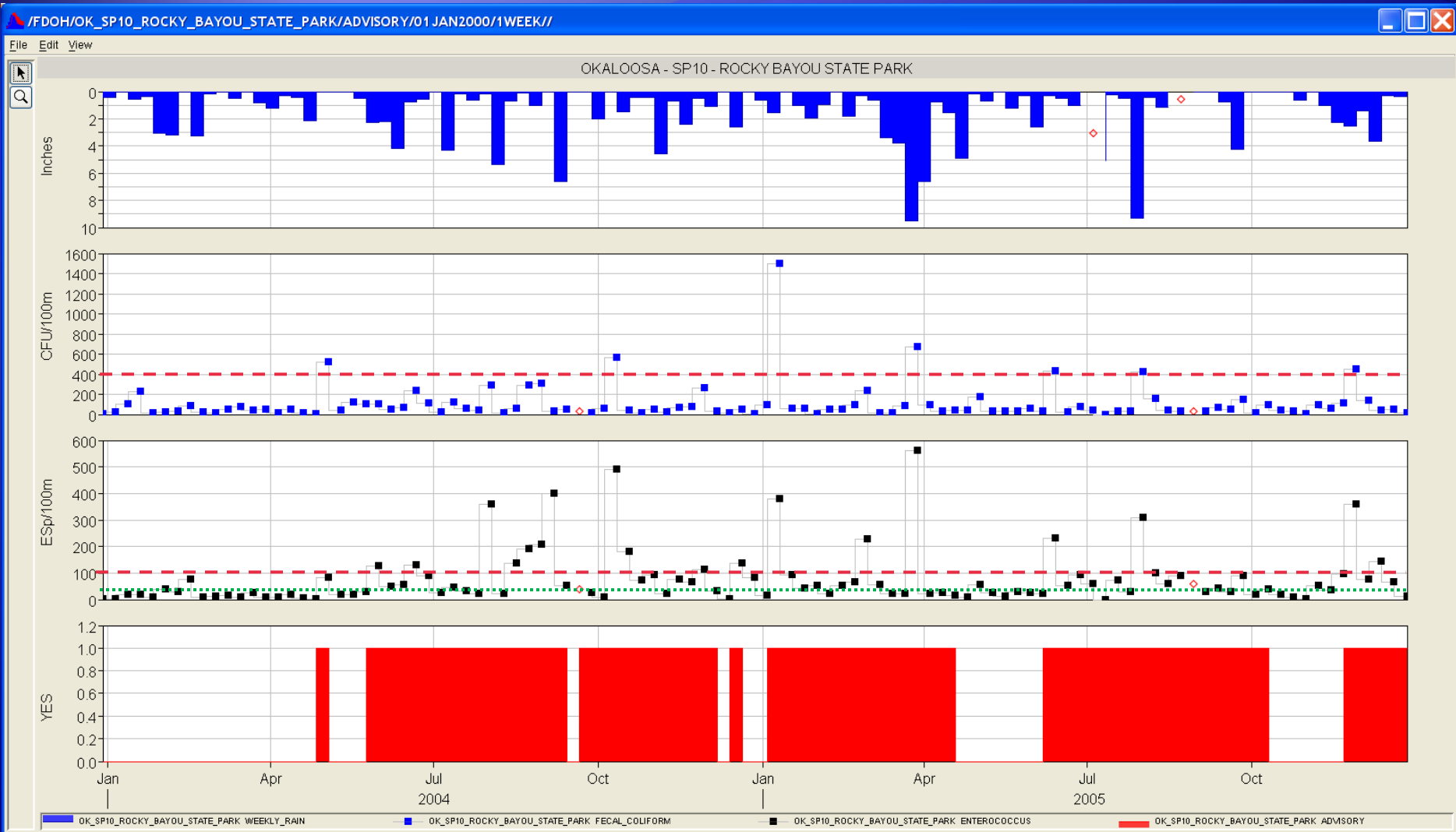
Continuous Weeks

Okaloosa SP10 - Rocky Bayou State Park

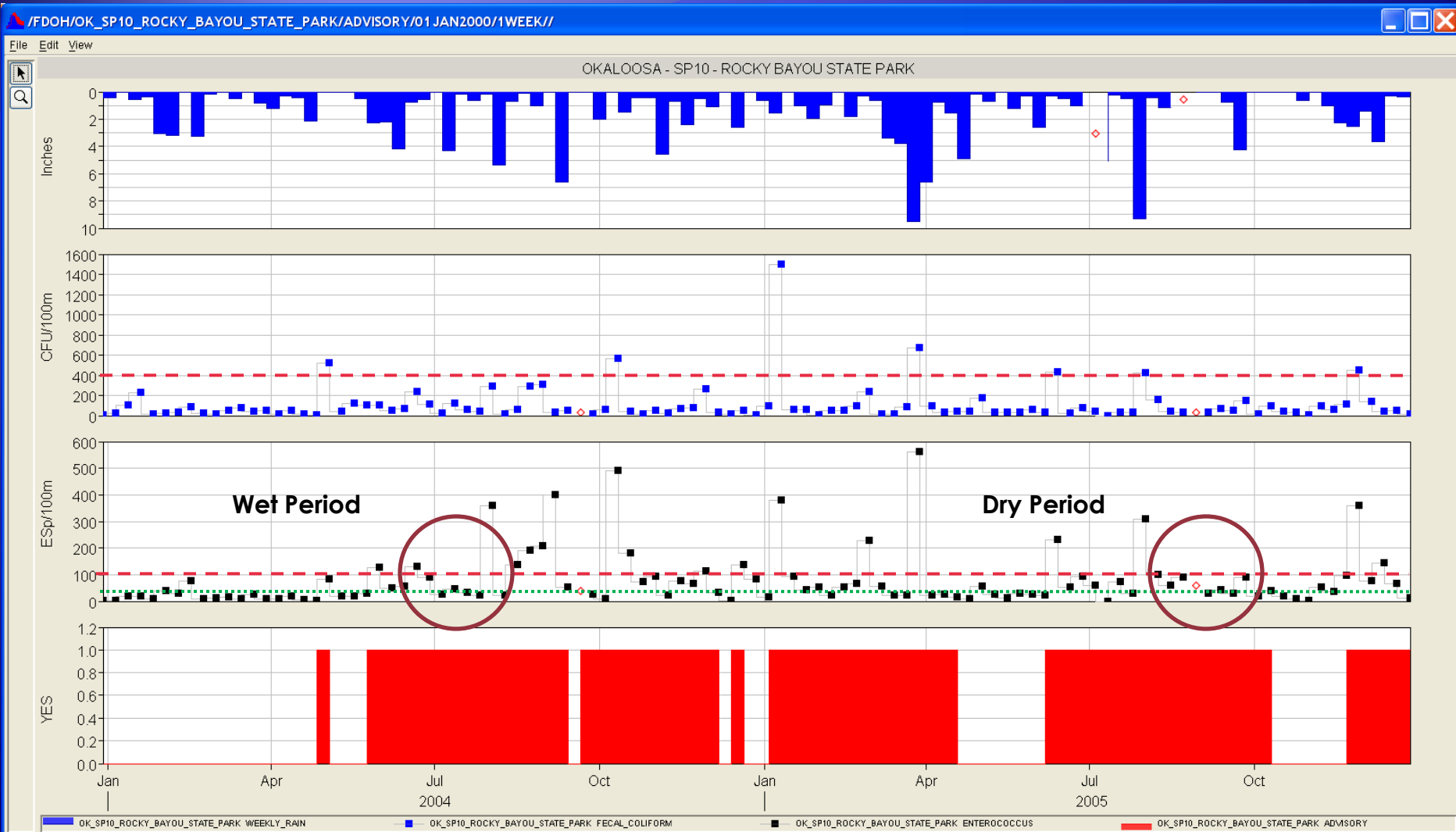


* Represents the frequency of each time duration

Precipitation Analysis



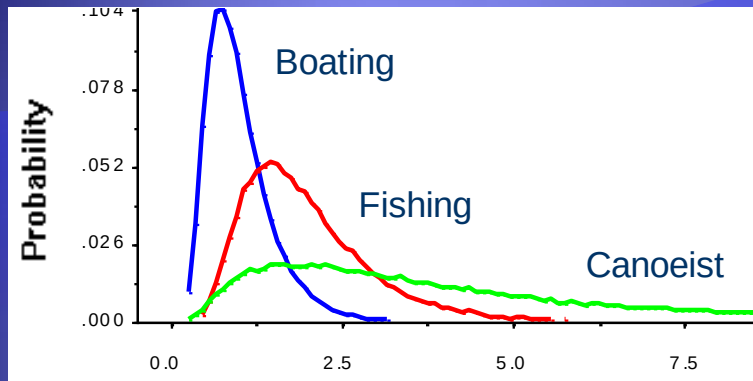
Precipitation Analysis



Why this is important?

- ◆ Microbial Risk Assessment
- ◆ TMDLs
- ◆ Prioritize Actions
- ◆ Identify/Eliminate Sources

Similar Cases – Microbial Risk Assessment

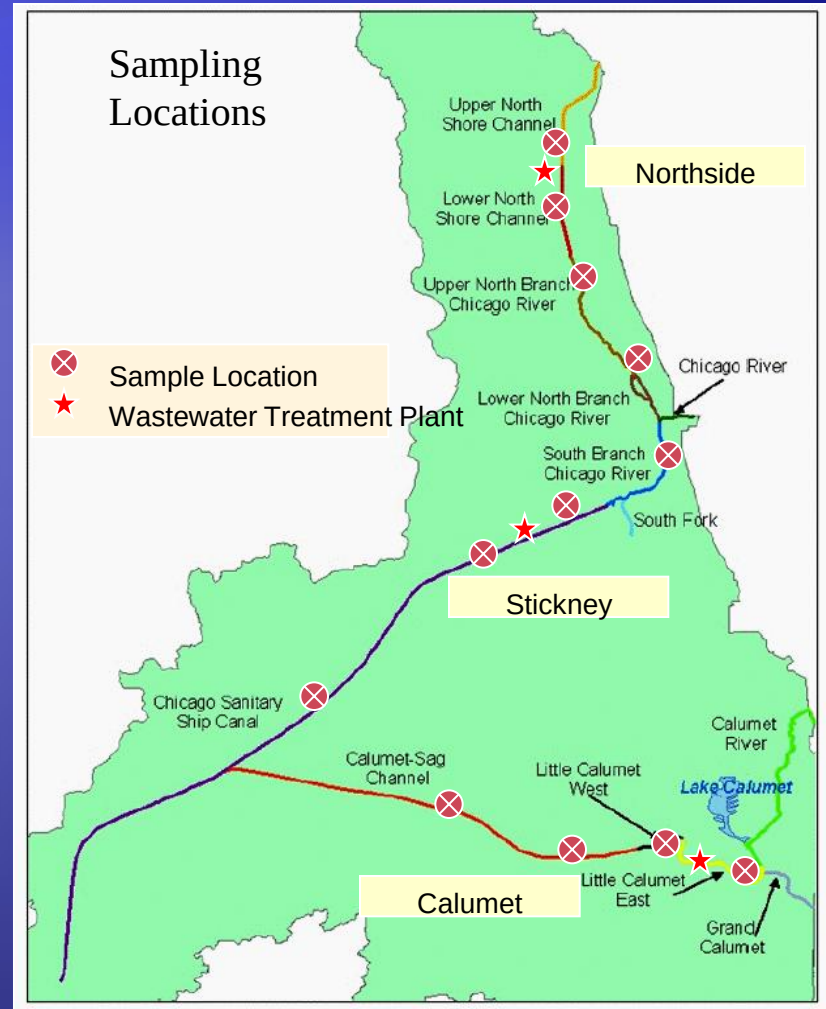


What activities are associated with the highest risk?

Proportion of Recreational User Type Contributing to Expected Gastrointestinal Illnesses

Recreational Use	Waterway		
	North Side	Stickney	Calumet
Canoeing	37.6%	11.5%	3.3%
Fishing	60.3%	56.2%	53.3%
Boating	2.1%	32.3%	43.3%

Illness rates are related to BOTH the intensity of exposure and the proportion of activity on the waterway.



Chicago Area Waterway

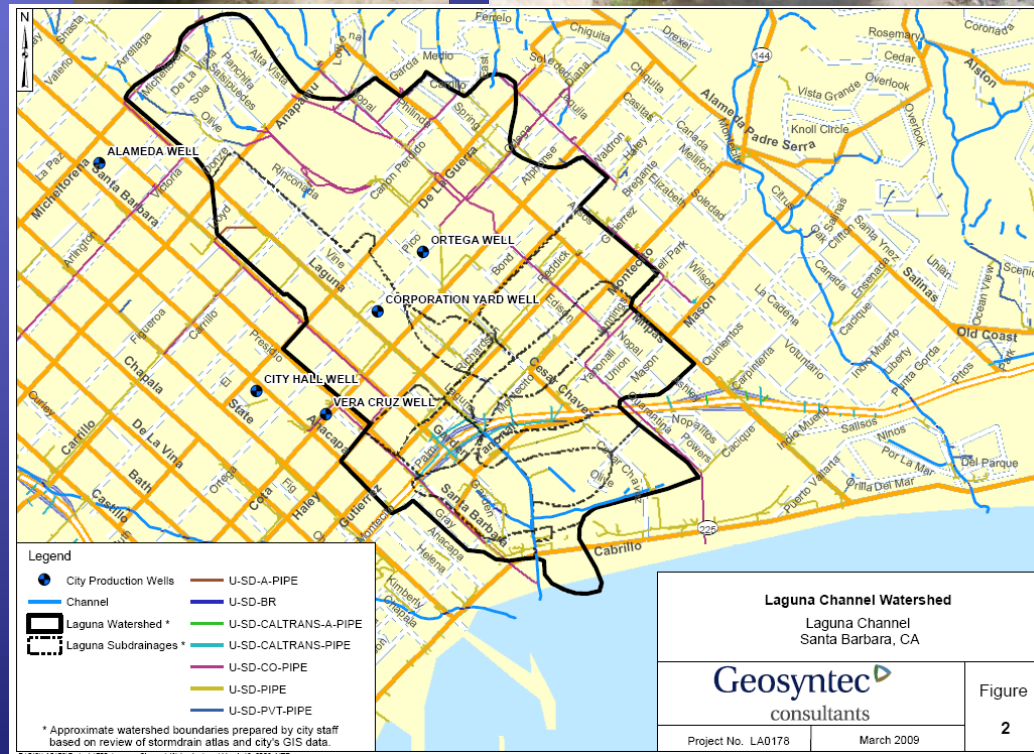
Similar Cases – Laguna Channel, Santa Barbara



A) View looking downstream of groundwater seepage in cracks in the Gutierrez Stormdrain Line at monitoring location 11



B) Drop inlet wall at southern corner of Ortega Park with groundwater trickling into crack in the inlet wall.



Conclusions

- ◆ There is an elevated probability that a resample will cause beach closure on those locations with high advisory frequencies.
- ◆ The majority of advisories were issued for elevated concentration of Enterococcus, not by Fecal Coliform, which has been selected as indicator organism by FDEP and the existent decision support tools.

Conclusions (cont...)

- ◆ Elevated number of advisories appeared to be related with human activity especially in medium to high density urban areas.
- ◆ Sites with elevated counts usually have longer periods of beach closures.
- ◆ The most frequent beach closure length was one week.

Acknowledgements

- ◆ David Polk (Florida Department of Health)
- ◆ Julie Terrell, Donna Howsden, and Alison McDowell (Choctawhatchee Basin Alliance)
- ◆ Russie Oaks and Peggy Tiller (Okaloosa County Health Department)



Questions...

Thank you

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Notes...

Note:	Geometric mean is calculated from no fewer than 5 samples collected at a given station over not more than a 30 day period at intervals not less than 24 hrs.					
ADEM coastal whole body water contact standard for fecal coliform	= 100col/100ml (geo. mean).					
ADPH and EPA whole body water contact guidelines for enterococci	= 104 col/100ml (single sample max)					
All fecal coliform analyses performed by ADEM Mobile Branch Lab using EPA standard method 9222D.						
All enterococci analyses performed by ADPH Mobile Laboratory using EPA standard method 1600						
* On 5/15/00 the method used for enterococci analyses was changed from EPA standard method 9230B to EPA method 1600.						
nd: no data						