



DOUBLE BAYOU WPP: INITIAL SAMPLING – BACTERIA SUMMARY & GRAB SAMPLE GRAPHS

Double Bayou Watershed Partnership Stakeholder Meeting
November 18, 2014
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BACTERIA

- *Escherichia Coli (E. coli)*
 - Rod-shaped bacteria normally found in the digestive tracks of warm blooded animals
 - Freshwater samples
- Enterococcus
 - Spherical-shaped bacteria normally found in the digestive tracks of warm blooded animals
 - Tidal water samples
- Both indicate possibility of presence of disease-causing pathogens
- Sampling Units for Bacteria
 - SELECT model: Colony-forming units (CFUs)
 - Culture tests: Most Probable Number (MPN)/100 mL



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SAMPLING

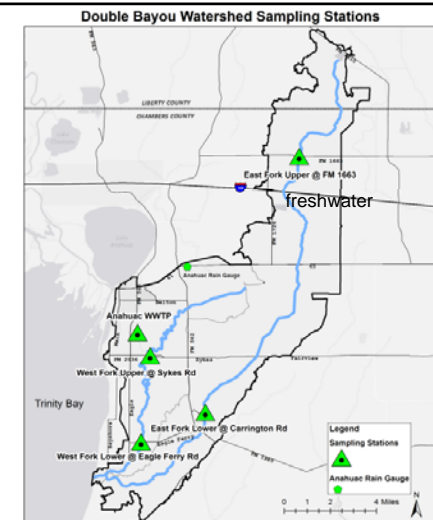
- Sampling Period: 10/22/13 – 8/12/14
(full Quality Assured data set)
- Routine = Scheduled Sampling
 - Currently includes approximately twice monthly sampling at all stations
 - Used to assess baseline conditions
- Targeted Rain Event = Unscheduled Sampling
 - Occurs as rain events occur
 - Often shows “worst-case” scenario of bacteria levels
 - Can identify sources of bacteria not seen during typical dry weather conditions



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SAMPLING STATIONS

- Five Sampling Stations:
 - Two on each Fork
 - One at Anahuac Wastewater Treatment Plant
- Initial Sampling results include 17 routine events and 4 targeted rain events at each station



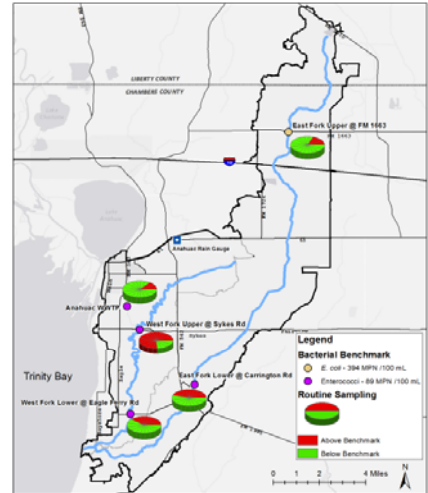
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VARIATION IN BACTERIA BY SAMPLING STATION

- Routine Sampling
- Represents 17 sampling events per station



Double Bayou Watershed: Results of Routine Sampling 10/23/13-8/12/14



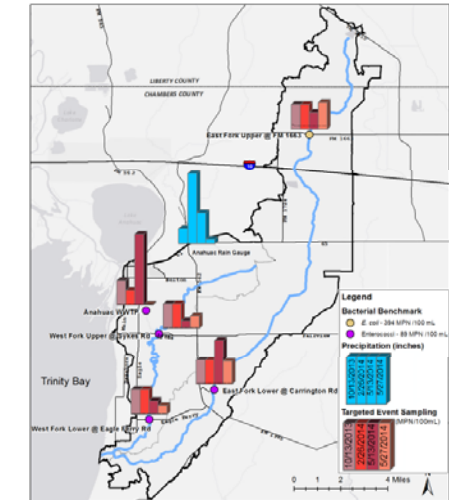
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VARIATION IN BACTERIA BY SAMPLING STATION

- Targeted Rain Event Sampling
- Represents 4 total sampling events per station



Double Bayou Watershed: Results of Targeted Rain Event Sampling 10/23/13-8/12/14



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VARIATION IN BACTERIA OVER SEASON SAMPLES FROM 10/22/13 – 8/12/14

Bacteria	Number of Routine Samples	Number of Routine Samples Above Benchmark	Percent of Routine Samples Above Benchmark	Number of Targeted Rain Event Samples	Number of Targeted Rain Event Samples Above Benchmark	Percent of Targeted Rain Event Samples Above Benchmark
Fall Total (Sept. - Nov.)	20	13	65%	5	5	100%
Winter Total (Dec. - Feb.)	25	7	28%	5	5	100%
Spring Total (Mar. - May)	15	4	27%	10	9	90%
Summer Total (June - Aug.)	25	9	36%	0	0	--

Benchmarks

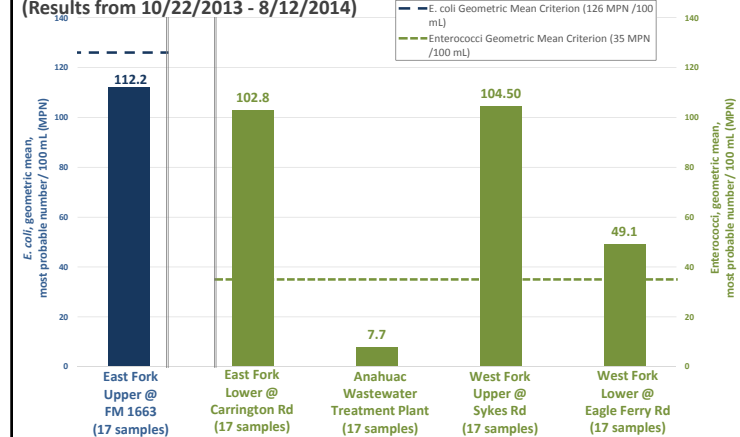
Non-tidal: East Fork Upper
E. coli, 394 MPN /100 mL

Tidal: Anahuac WWTP, West Fork Stations, East Fork Upper
Enterococci, 89 MPN/100 mL

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Double Bayou Watershed: Sampling station results compared to State bacteria criteria (Results from 10/22/2013 - 8/12/2014)

* Geometric means include only routine samples



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INDICATIONS FROM INITIAL BACTERIA SAMPLING RESULTS

- High Geomeans
 - All the *tidal* bayou stations had bacteria geomeans above State criteria in routine sampling (mostly dry weather).
- High Targeted Rain Events Results
 - Bacteria levels associated with rain events were well above benchmarks, especially for the WWTP.
 - Rain patterns in bacteria levels showed the importance of not just the rain event, but also days since last rain event.
- Seasonal Variations
 - Possible Fall pattern of exceeding bacteria benchmark for routine sampling



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GRAB SAMPLE GRAPHS

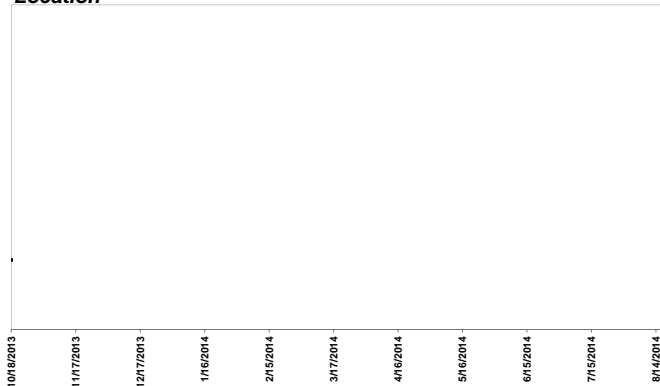
- Data graphs will show the variation in grab sample values for a constituent (such as bacteria, dissolved oxygen or nutrients) over the sampling period of:
October 22, 2013 through August 12, 2014



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GRAB SAMPLE GRAPHS – TITLE AND X-AXIS

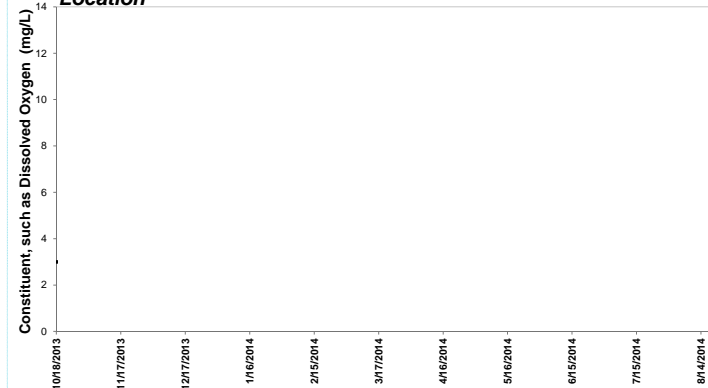
Variation in *Constituent* Over the Sampling Period:
Location



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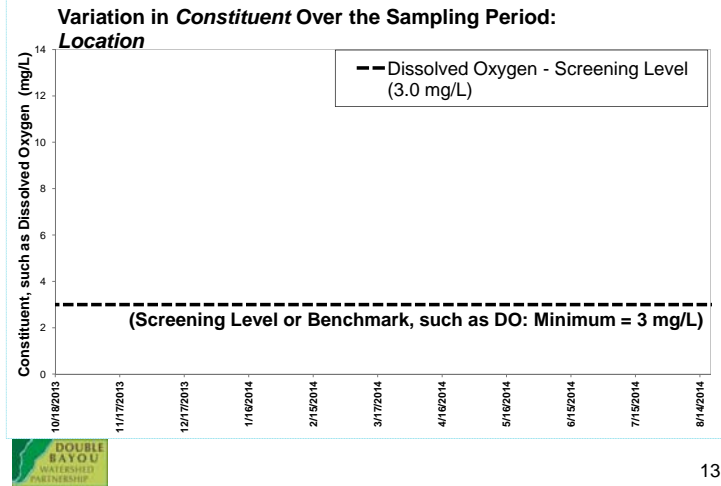
GRAB SAMPLE GRAPHS – Y-AXIS

Variation in *Constituent* Over the Sampling Period:
Location



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GRAB SAMPLE GRAPHS – REFERENCE LINE



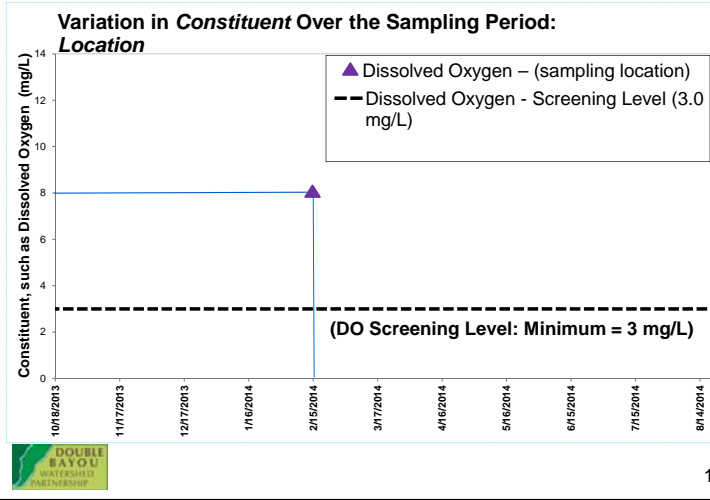
GRAB SAMPLE GRAPHS

- For bacteria, or nutrients, the values need to be below the screening / benchmark / criterion level.
- For DO, the values need to be above the screening / benchmark / criterion level.



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GRAB SAMPLE GRAPHS – SAMPLE RESULT



GRAB SAMPLE GRAPHS – DO EXAMPLE

