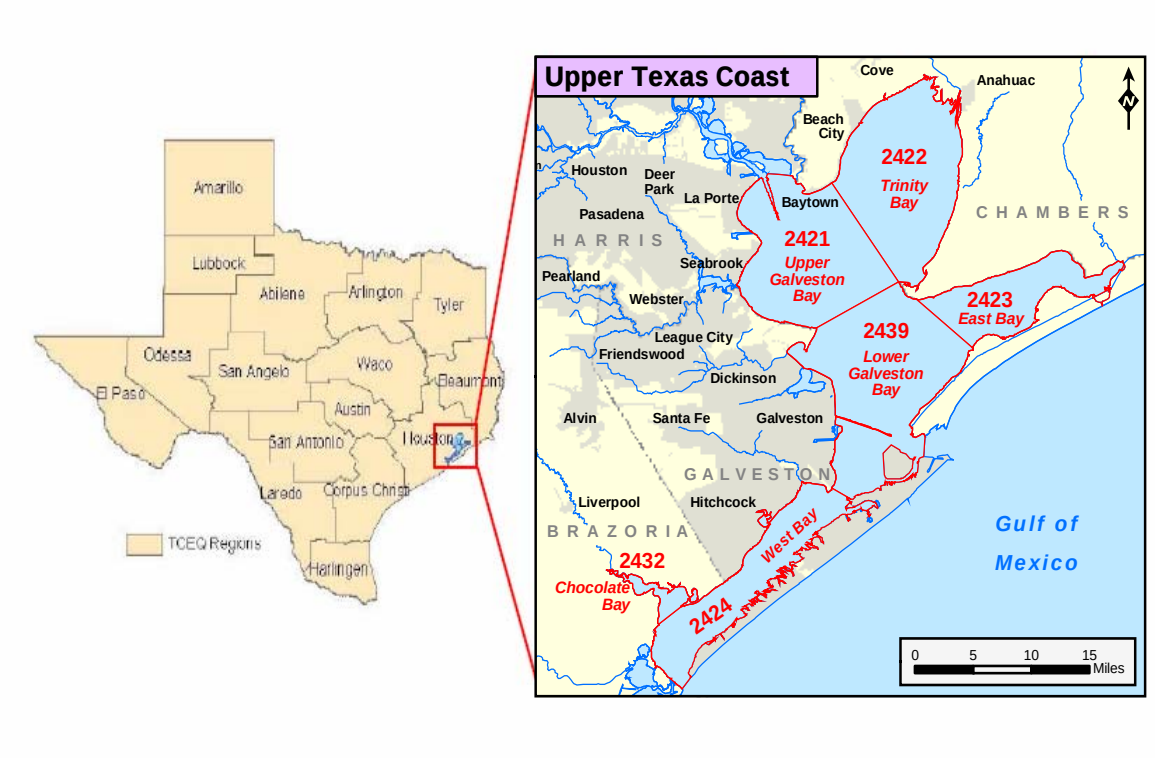
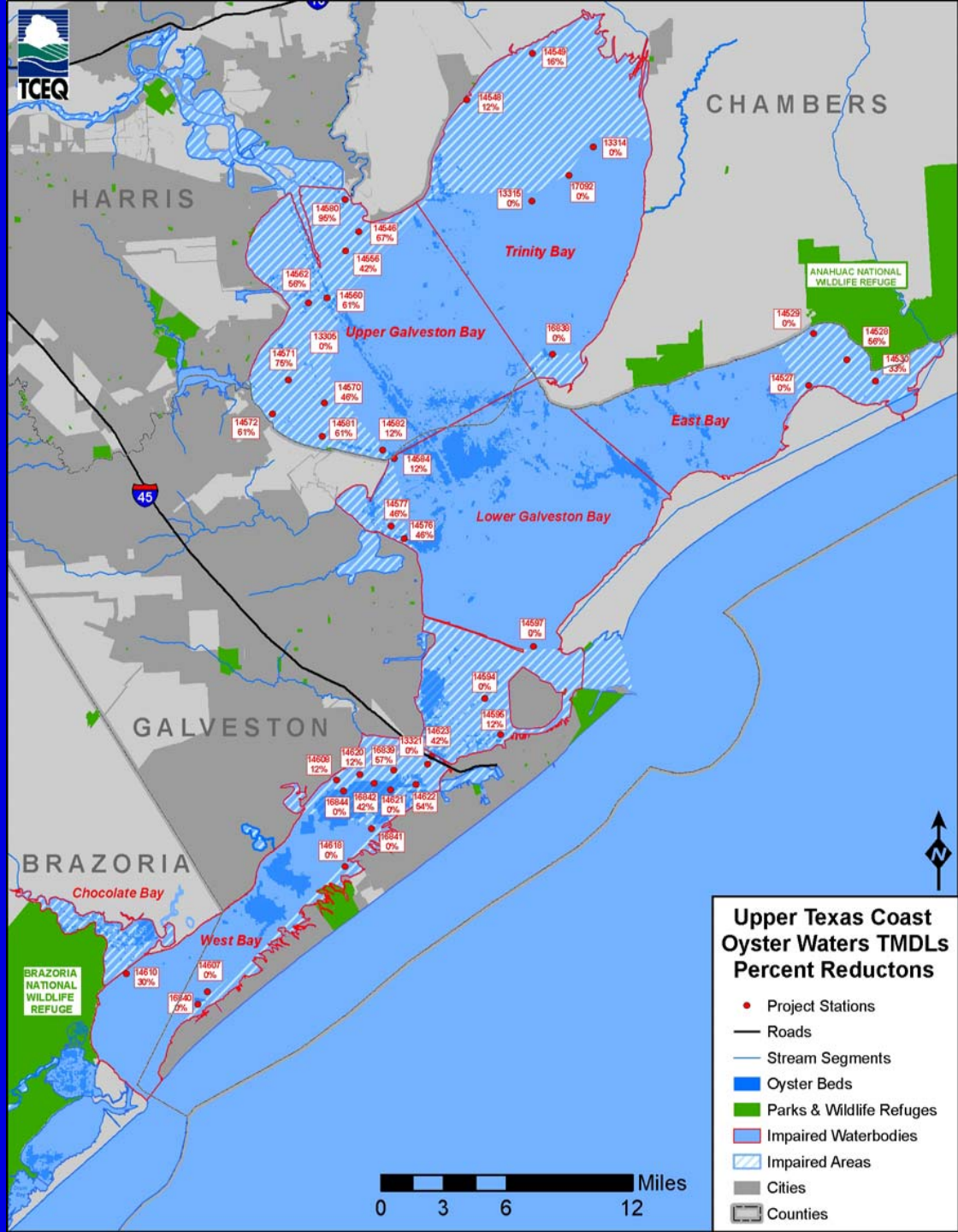
Upper Coast Oyster Water TMDL for Bacteria



Texas Commission on Environmental Quality
Casey Johnson & Ron Stein
CasJohns@tceq.state.tx.us 512-239-1505
RStein@tceq.state.tx.us 512-239-4507

Upper Coast Oyster TMDL

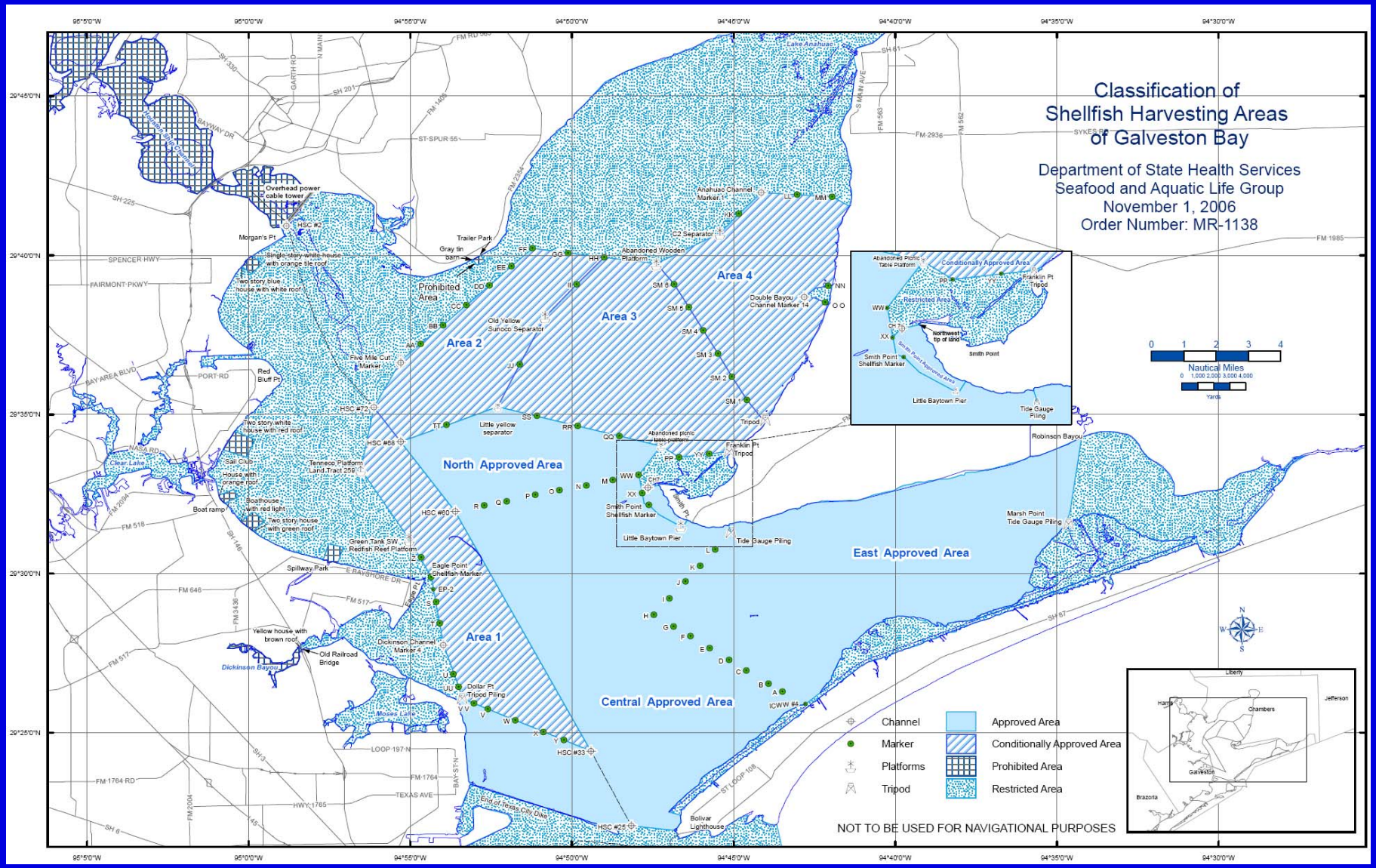
- Project Description
- Pollutant Sources
- Concentration Limits Allocations



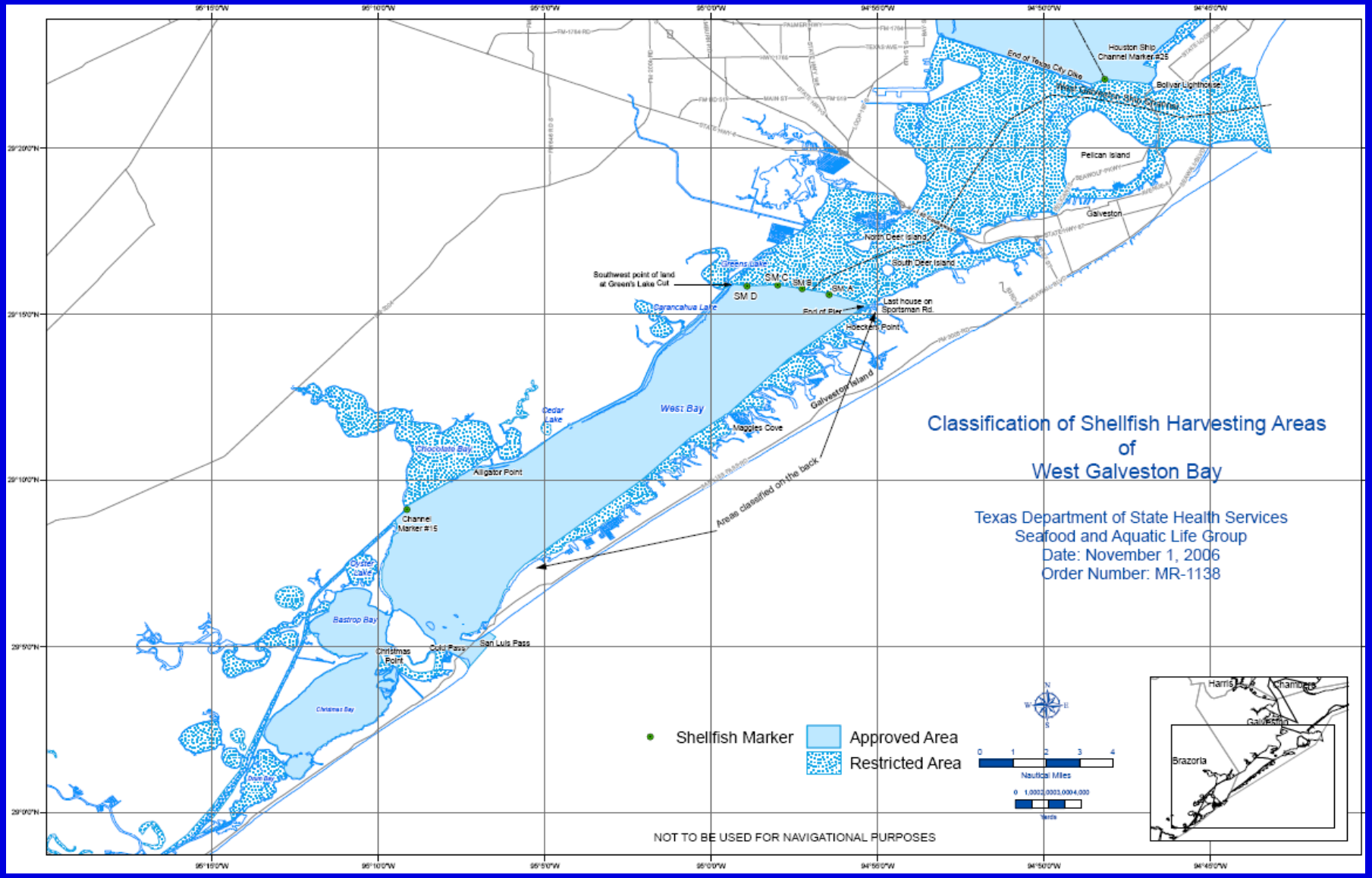
Oyster Project Overview

- Six Bay Segments Listed
- 1000 Foot Shoreline Buffer Zone (Contact Rec.)
- 303(d) Listing
  - Based on TDSHS Maps
  - Restricted Harvest Zones (RHZ) = Impaired
- Oyster Criteria
  - Median $\leq$ 14 Fecal/100mL
  - 90th Percentile $\leq$ 43 Fecal/100mL

Oyster Harvesting Map



Oyster Harvesting Map



Proportions of RHZ

Segment Name	Segment Number	Year Listed	Area in the impaired Restricted Harvest Zone
Upper Galveston Bay	2421	1996	47%
Trinity Bay	2422	2000	48%
East Bay	2423	1998	25%
West Bay	2424	1996	37%
Chocolate Bay	2432	1996	100%
Lower Galveston Bay	2439	1996	27%

Oyster Water Use

- **Oyster Waters** – Waters producing edible species of clams oysters, or mussels. *30 TAC §307.3(a)(37)*

Criteria for Oyster Waters

- Texas Criteria (Fecal coliform)
  - Median (<14cfu/100mL)
  - 90th Percentile (<43cfu/100mL)

Concentrations Currently Exceed Standards

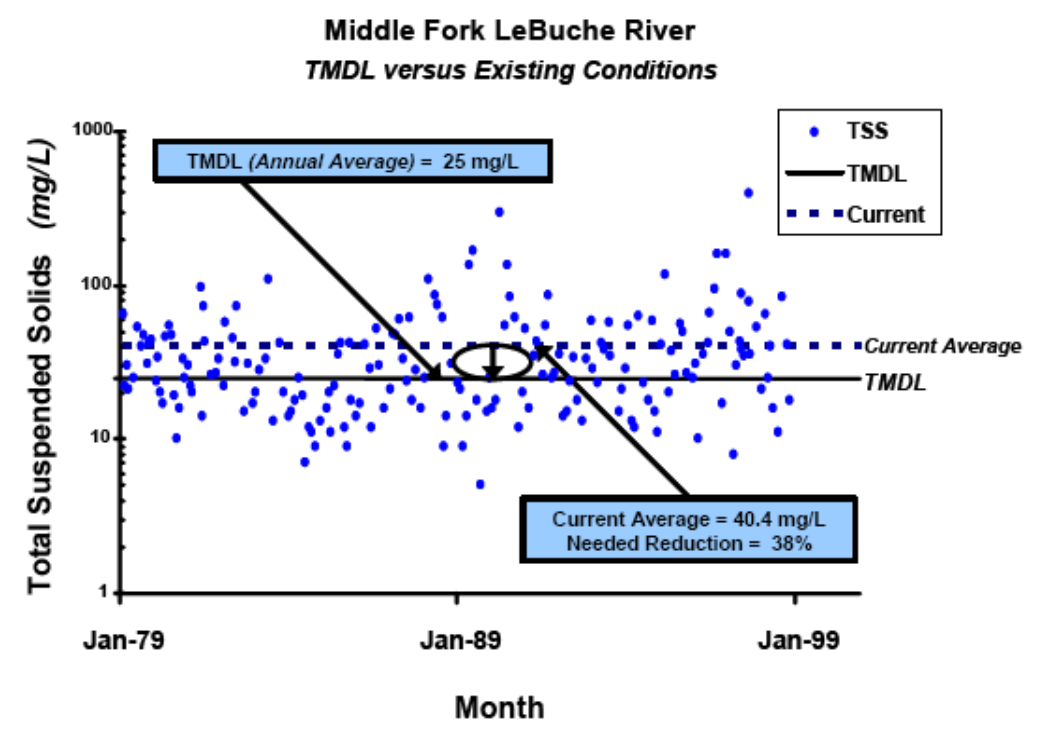
Calculations

RHZ Breakdown by Segment

Segment Name	Number of Samples from RHZ	Median in RHZ (CFU of Fecal Coliform)	90th Percentile in RHZ (CFU of Fecal Coliform)	Local Exceedance in RHZ?
Upper Galveston Bay	947	8.0	130.0	Yes
Trinity Bay	376	2.0	33.0	Yes
East Bay	199	2.0	36.2	Yes
West Bay	515	5.0	49.0	Yes
Chocolate Bay	37	5.0	61.0	Yes
Lower Galveston Bay	707	2.0	49.0	Yes

Concentration Based Analysis

- Site specific analysis for each station

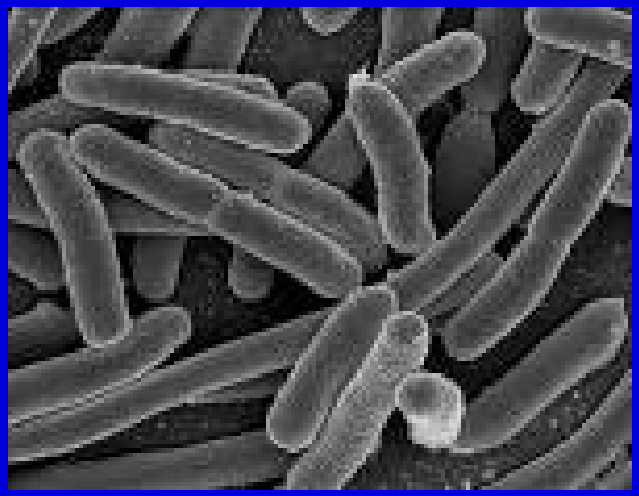


EPA's *Options for Expressing Daily Loads* – Appendix B

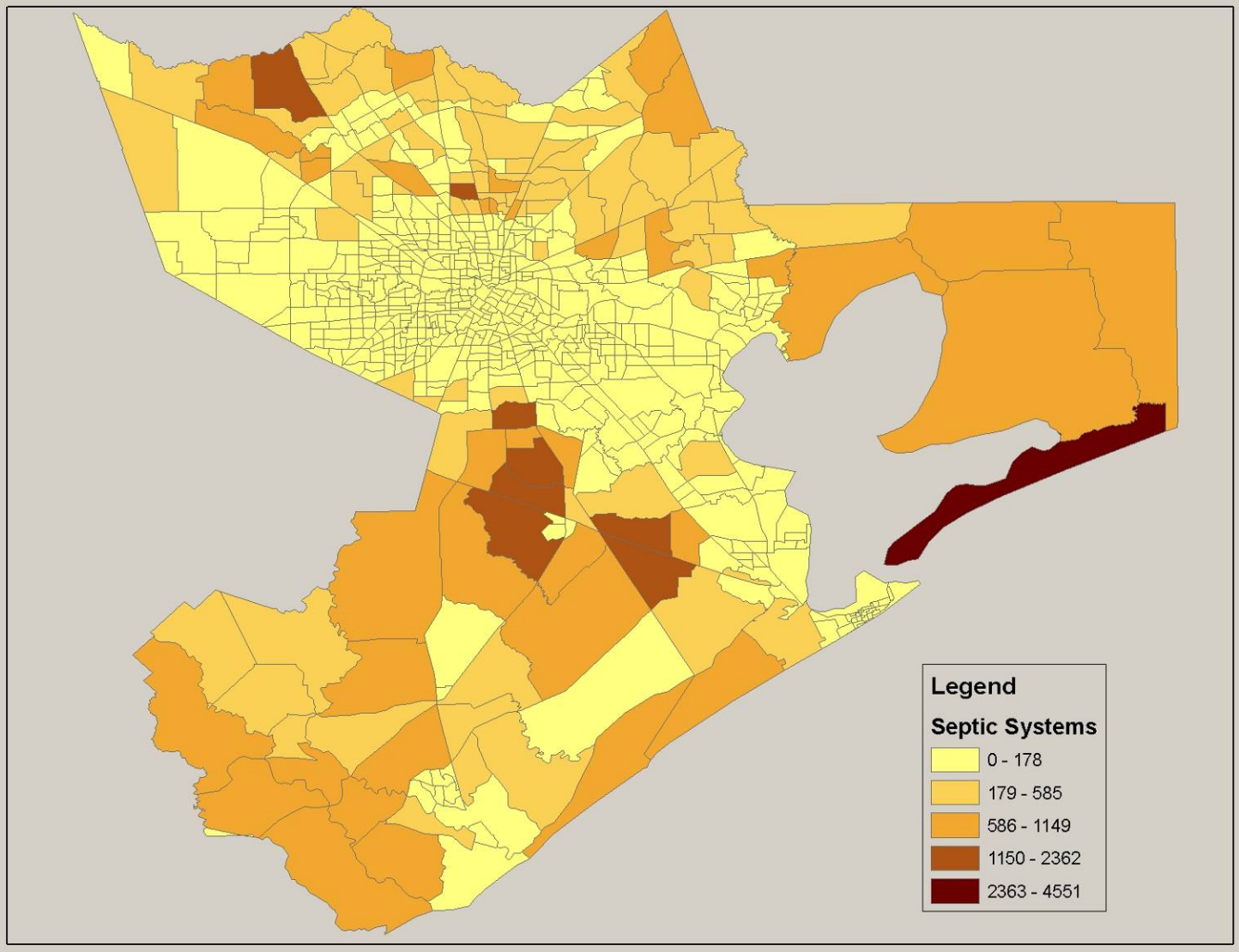
$$\frac{(\text{Concentration} - \text{Criteria})}{\text{Criteria}} \times 100 = \%\ \text{Reduction}$$

Sources of Fecal Bacteria

- Waste Water Treatment Facilities (WWTF)
- Storm Water – Regulated (MS4) & Non-Regulated
- Septic Systems
- Marinas, Ships, & Recreational Boaters
- Birds

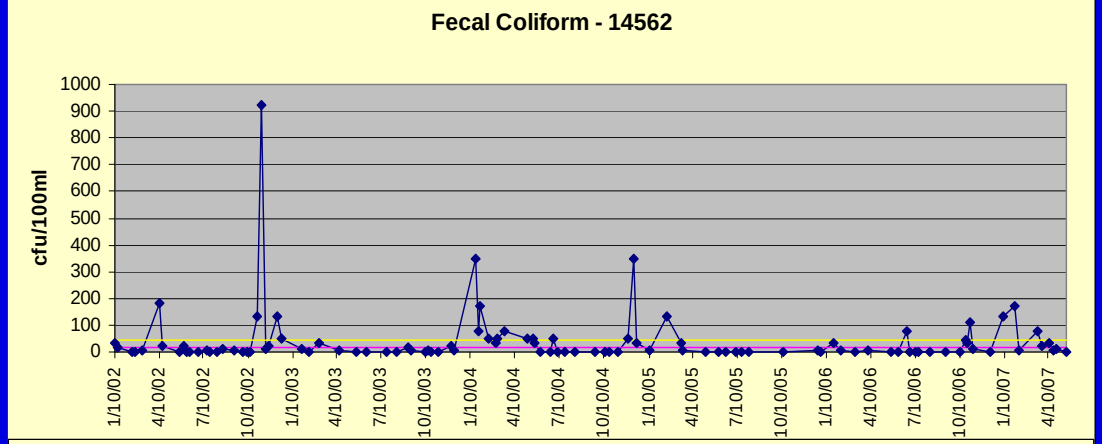


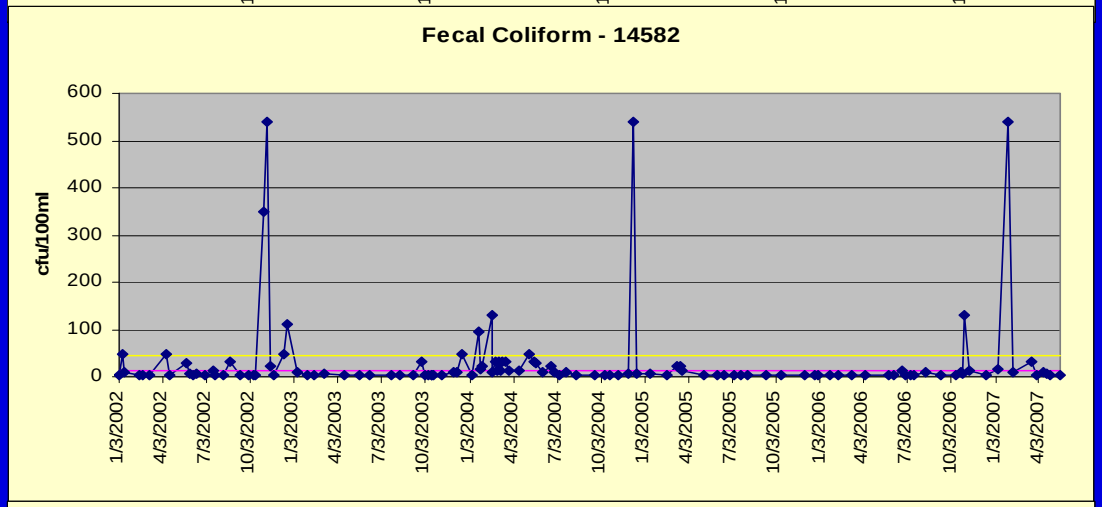
Septic Systems (OSSFs)

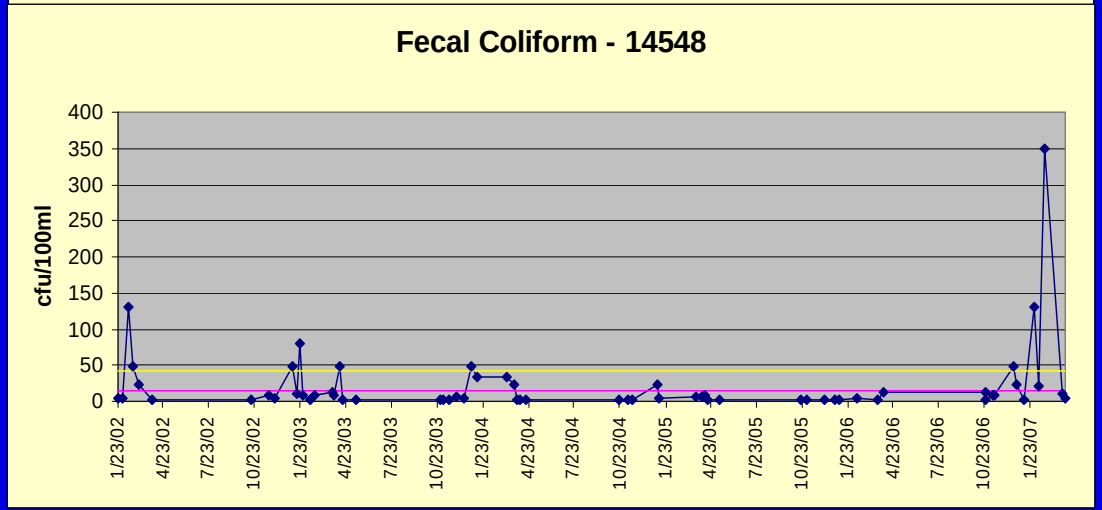


Marinas

- 35 Marinas
- 12 Marinas with Pump Out Stations







BIRDS

Seasonal Variation Analysis

- Station by Station
- Winter Peaks
- Winter average precipitation tends to be less than summer precipitation.
- Data suggests a link between winter bird migrations and seasonal impairments of water quality sampling stations.

Waste Load Allocation Concentrations

Table 13. Concentration-Based Pollutant Wasteload and Load Allocations for Upper Gulf Coast Segments

Pollutant Waste Load Allocations[a]		
	Fecal coliform densities for Discharges to the RHZ	**For Discharges to Adjacent Watersheds and the 1,000 foot Buffer Zone[b]**
WWTFs[c]	Discharges directly to the RHZ are not possible[d]	Fecal Coliform 200 per 100 mL OR *E. coli* 126 per 100 mL OR Enterococcus 35 per 100 mL
MS4s[c]	Discharges directly to the RHZ are not possible[d]	Numerical concentrations requirements are unreasonable for storm water runoff. This TMDL will require MS4s to follow implementation of bacteria reduction efforts.

Load Allocation Concentrations

Pollutant Load Allocations[a]		
OSSFs	Discharges directly to the RHZ are not possible[d]	0 per 100 mL
Recreational Boat and Ship Discharges	0 per 100 mL	0 per 100 mL
Marina	Discharges directly to the RHZ are not possible[d]	0 per 100 mL
Non-Regulated Municipal Runoff	Discharges directly to the RHZ are not possible[d]	Numerical concentrations requirements are unreasonable for storm water runoff. Incentive based options will be developed for municipalities with non-regulated runoff. Bacteria reductions will be achieved through the implementation of the resulting I-plan.
Direct Deposition into Segment[e]	While managing over-populations of wildlife remains as an option available to local stakeholders, the reduction of wildlife or changing a natural background condition is not the intended goal of a TMDL.	

For More Information

- Project Website
  http://www.tceq.state.tx.us/implementation/water/tmdl/74-uppercoastoyster.html

- Casey Johnson – CasJohns@tceq.state.tx.us
  or 512.239.1505
- Ron Stein – RStein@tceq.state.tx.us
  or 512.239.4507