

# WHAT IS A TMDL?

## Total Maximum Daily Load

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# Total Maximum Daily Load (TMDL)

## REQUIRED BY CLEAN WATER ACT

A TMDL equation specifies the maximum amount (load) of a pollutant that a water body can receive while still meeting water quality standards. The TMDL document allocates pollutant loadings among sources.

Example – A mug can only hold a specific amount of coffee before reaching its capacity.



# TMDL Process Milestones

1<sup>st</sup> Milestone – Process and important terms to be discussed in this presentation.

Place Water Body on 303(d) List

2<sup>nd</sup> Milestone – Determine limits to pollutant loads

TMDL Document

3<sup>rd</sup> Milestone – Develop plan to improve water quality

Implementation Plan Document

Final Goal – Meet Water Quality Standards



# 303(d) List

1. "List of Impaired Water Bodies"
2. List of water bodies not meeting Water Quality Standards, required by the Clean Water Act and approved by the EPA.
3. TCEQ assesses water quality biennially.
4. If sufficient data is available and levels exceed water quality standards, the water body is listed as impaired on the 303(d) list.



Routine Monitoring Samples  
Collected at Stream,  
River, or Lake

Data Assessed  
by TCEQ

Does water quality  
meet Standards for  
each Designated  
Use and Criteria?

No

Yes

Place on 303(d) List

1<sup>st</sup>  
Milestone  
Complete

Meets Water  
Quality  
Standards  
**No Further Action**



# Water Quality Standards

- Water Quality Standards - define the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. *From 40 CFR Section 130.3*
- Components
  - Designated Uses
    - Contact Recreation, Water Supply, Aquatic Life Use, Non-contact Recreation
  - Criteria – limit numeric pollutant concentrations
    - Geometric Mean, Single Sample Maximum, 24-hour measurements
  - Pollutant Parameters
    - Bacteria, PCBs, Nutrients, Metals, etc.



# Designated Use

- Contact Recreation - Recreational activities involving a significant risk of ingestion of water, including wading by children, swimming, water skiing, diving, and surfing. *From 30 TAC §307.3(a)(12)*
- Contact recreation criteria apply to all bodies of freshwater except where specifically designated otherwise in §307.10 of TAC.



# Changing the Designated Use

- Designated Use can only be changed if a Use Attainability Analysis confirms that an alternative use is applicable. Designated Use changes must be approved by EPA.
- Secondary form of Contact Recreation is not assigned to any water body in the current WQS's.
- For more information on the history of Designated Uses - See Standards Table.





# Criteria for Contact Recreation

- Texas Criteria for Bacteria (*E. coli*)
  - Geometric Mean (126 cfu/100mL)
  - Single Sample Max (less than 25% of sample exceed 394 cfu/100mL)
- States must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. *From 40 CFR Section 131.11*



# What if Water Quality Standards Change?

- Approved TMDLs will be revised to reflect any future changes in Water Quality Standards.
  - This includes changes in designated use and criteria.
  - However, TMDLs will not be delayed in anticipation of a change in Water Quality Standards.

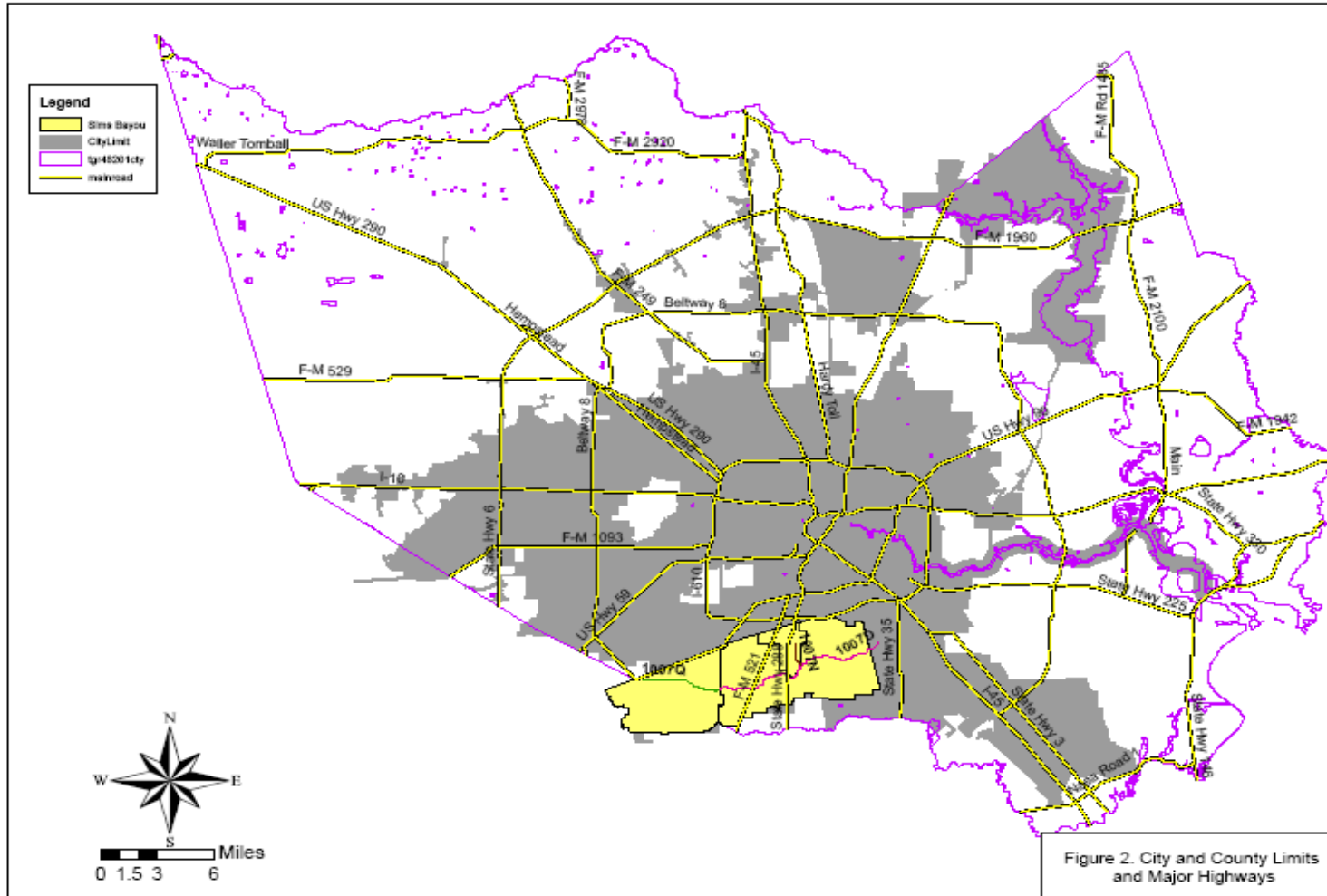
# Where Are We Now?

1. Water bodies in this watershed are on Impaired Water Body List - 303(d)
2. Review of data and preliminary sampling have been conducted
3. TMDL limits are being determined

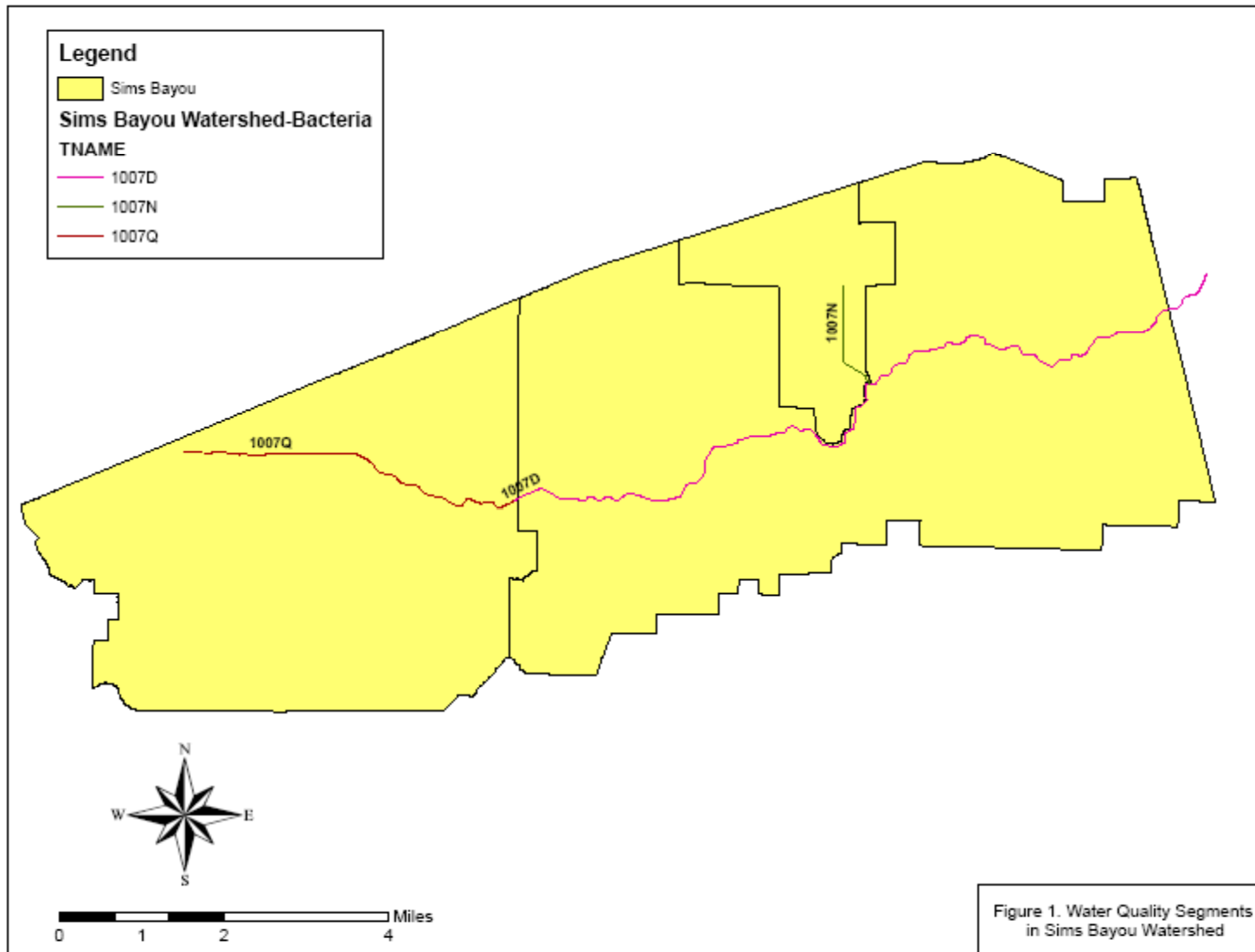


# Background and Indicator Pathogen Data

## Sims Bayou



# Sims Bayou WQ Segments



# Sims Bayou WQ Segments

1007D	Sims Bayou Above Tidal
1007N	Unnamed Non-Tidal Tributary of Sims Bayou
1007Q	Sims Bayou Above Tidal

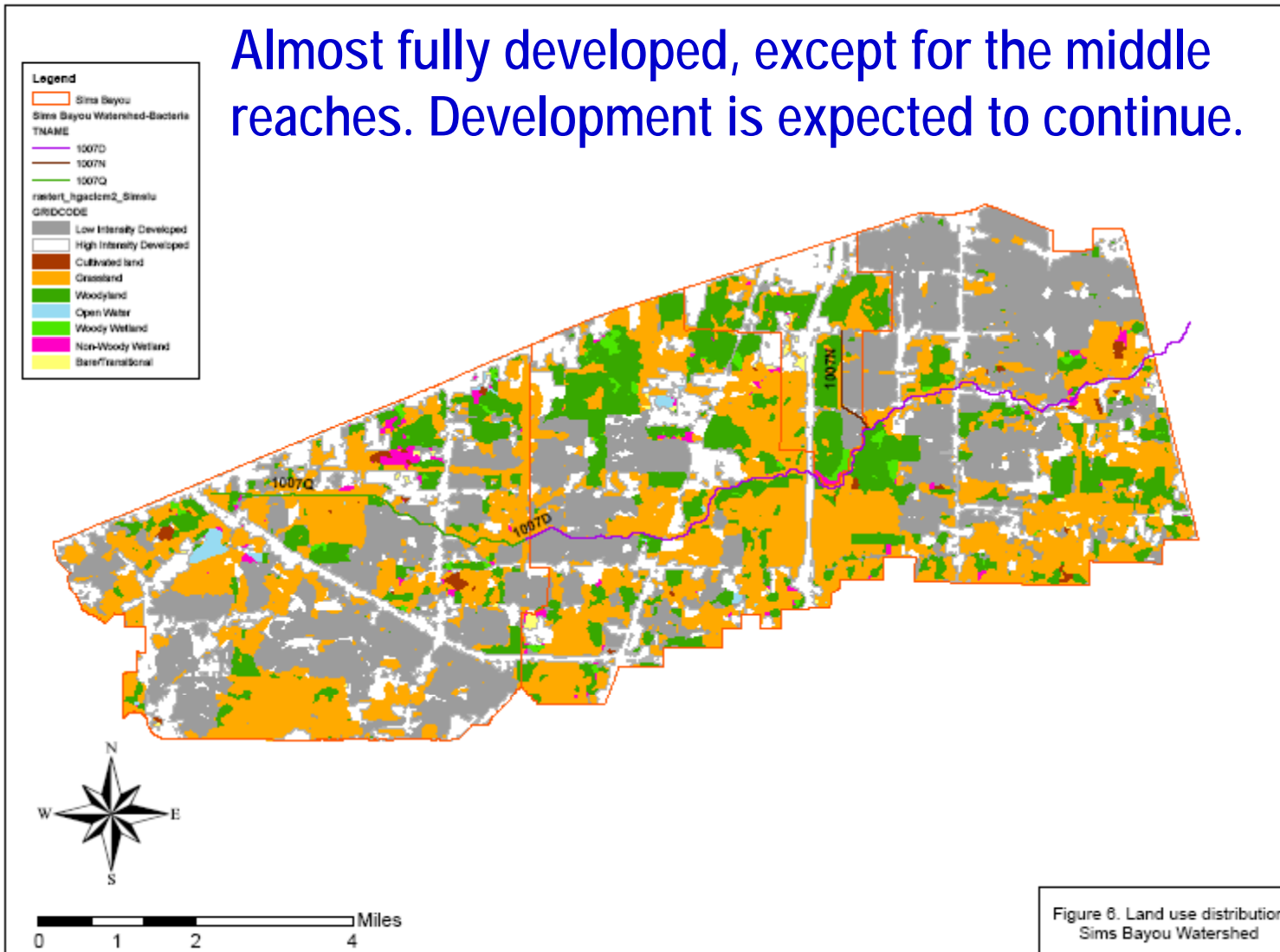
# Sims Bayou Watershed

- Located in southern Harris County. Most of the watershed is within the City of Houston.
- The upper reach of the watershed drains the City of Missouri City and the lower reach of the watershed drains the cities of South Houston and Pasadena
- Covers about 94 square miles and includes two primary streams: Sims Bayou and Berry Bayou
- The estimated population (Harris County portion) is just over 231,000



# Sims Bayou Landuse/Landcover

Almost fully developed, except for the middle reaches. Development is expected to continue.





# Sims Bayou Soils

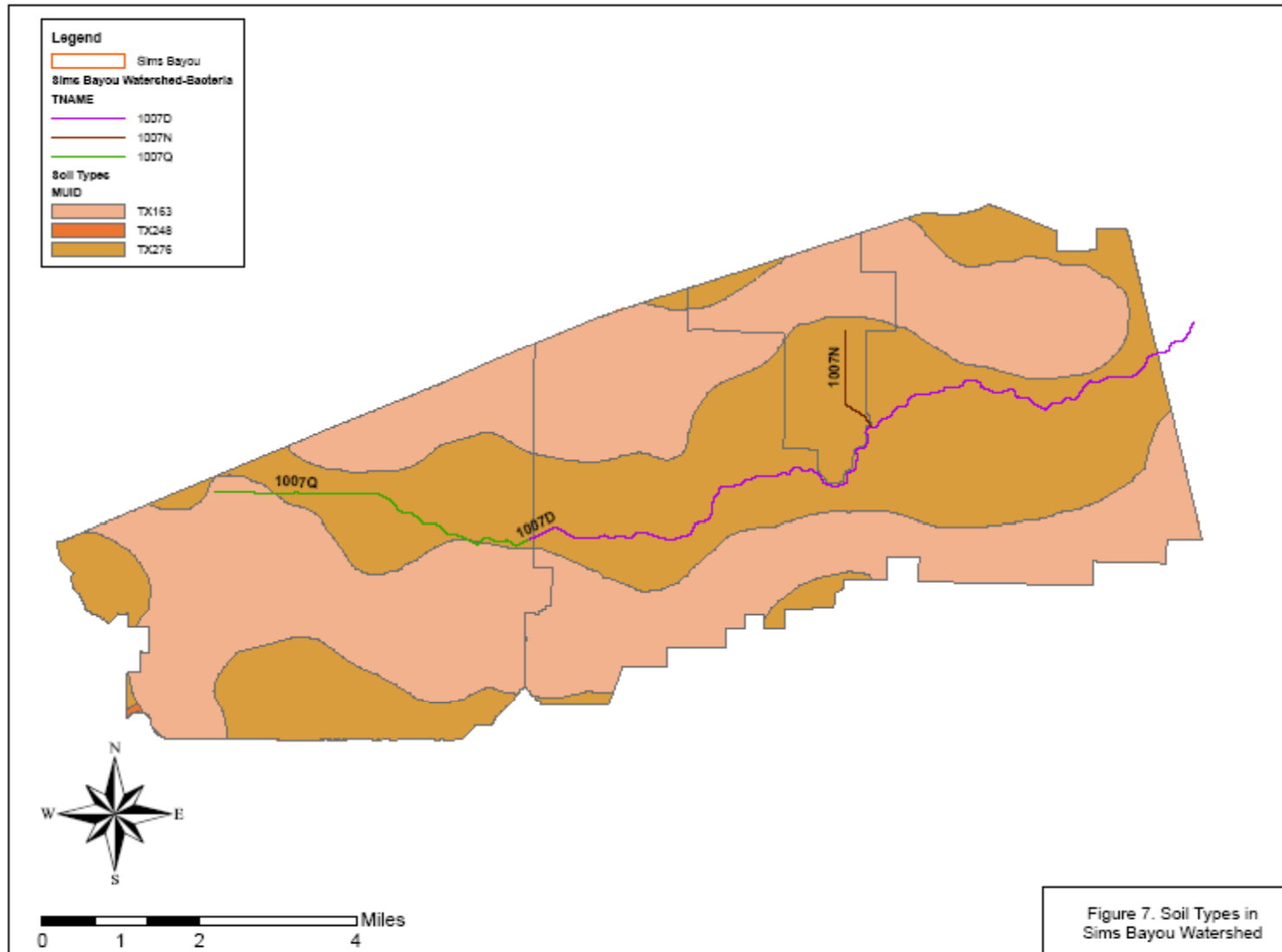


Figure 7. Soil Types in Sims Bayou Watershed

# Sims Bayou WQ Stations

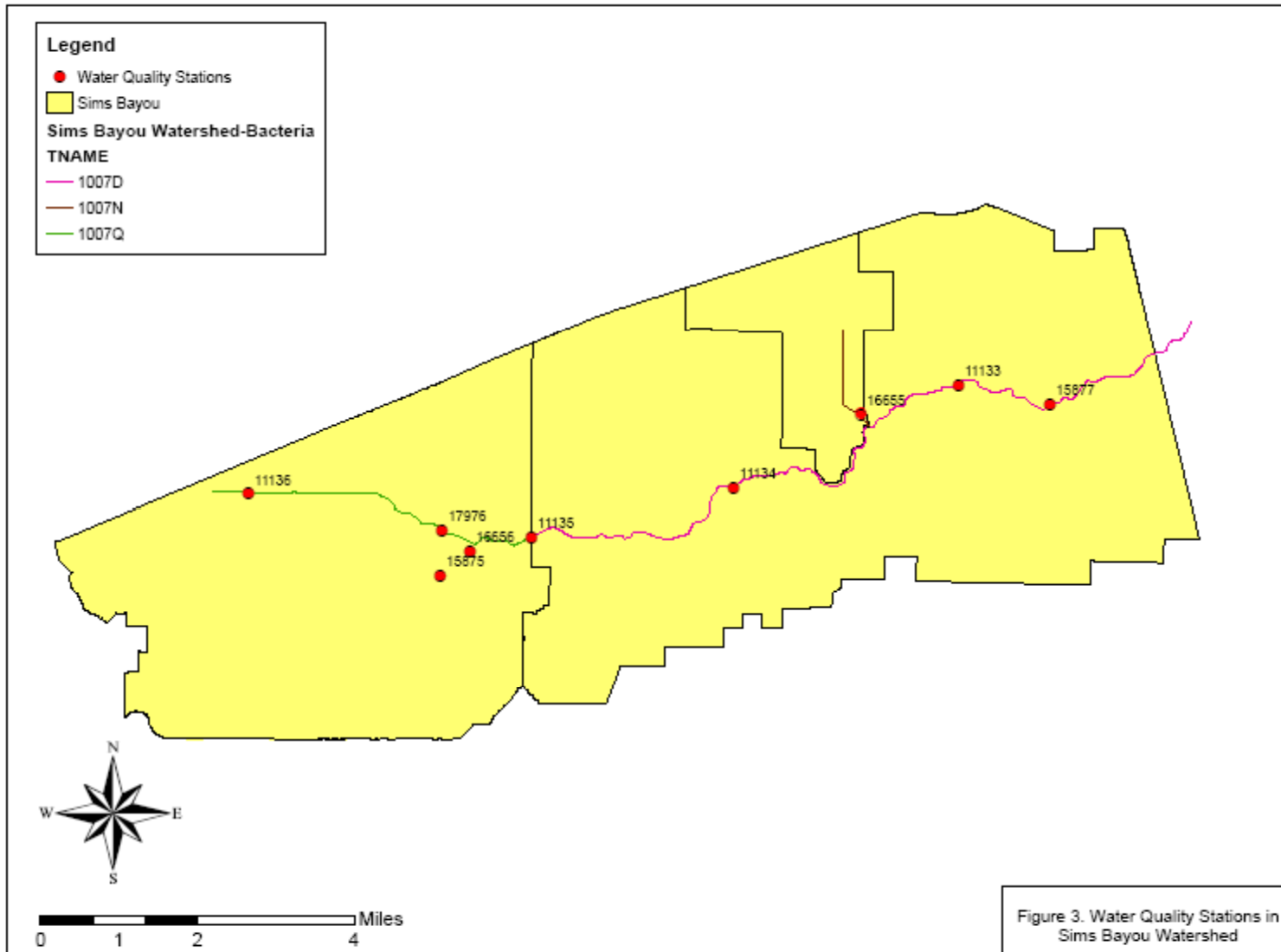
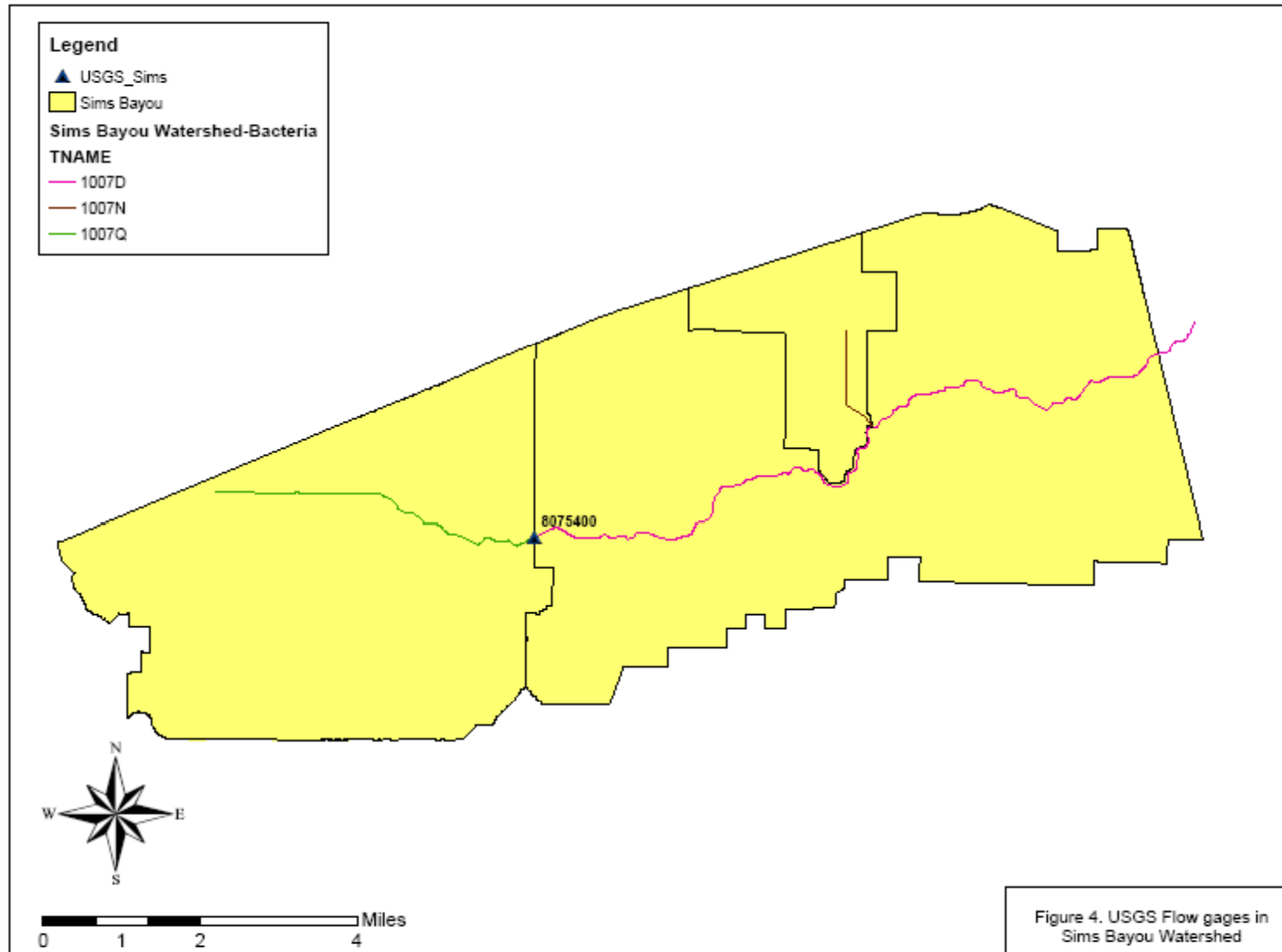
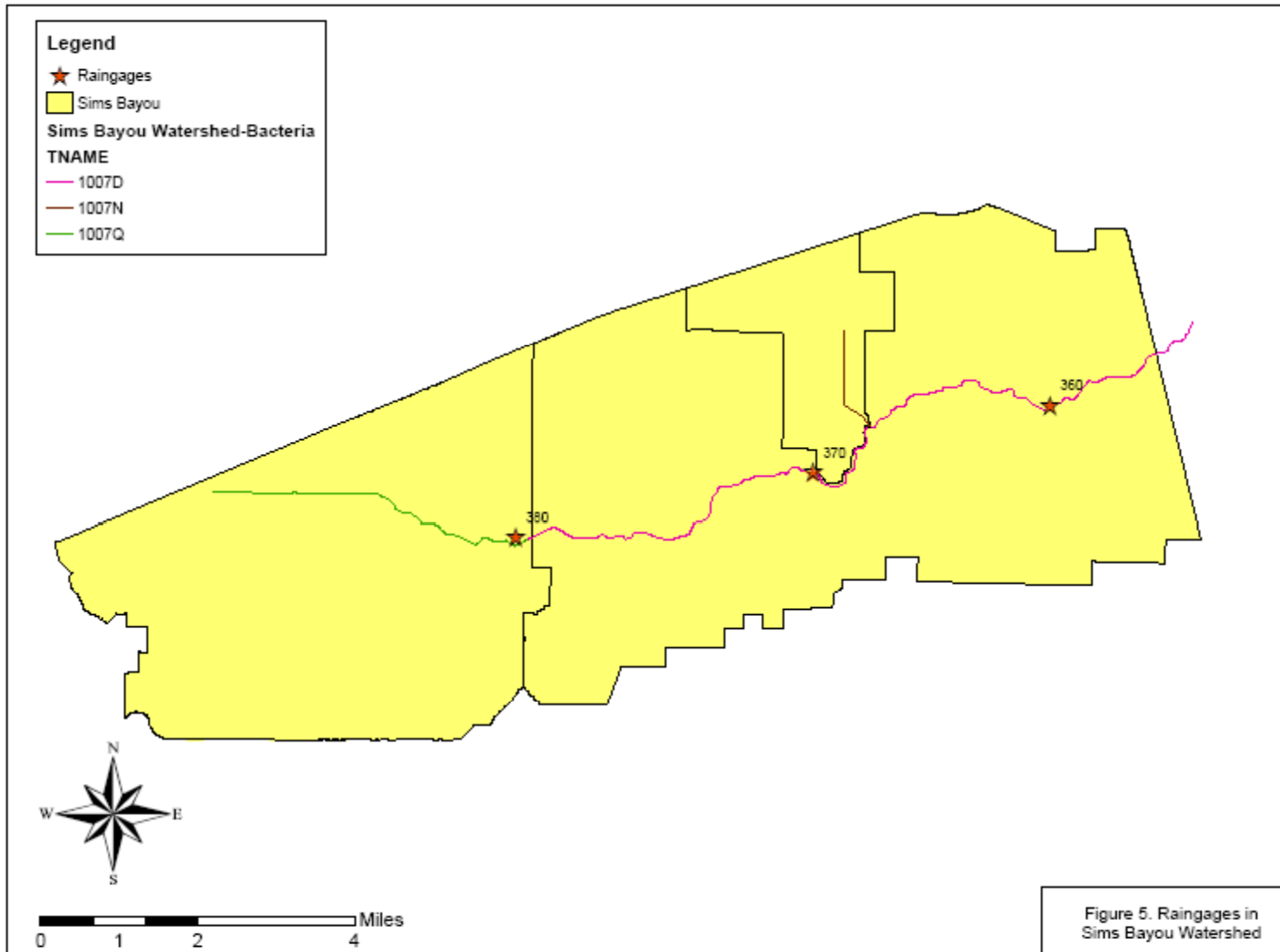


Figure 3. Water Quality Stations in Sims Bayou Watershed

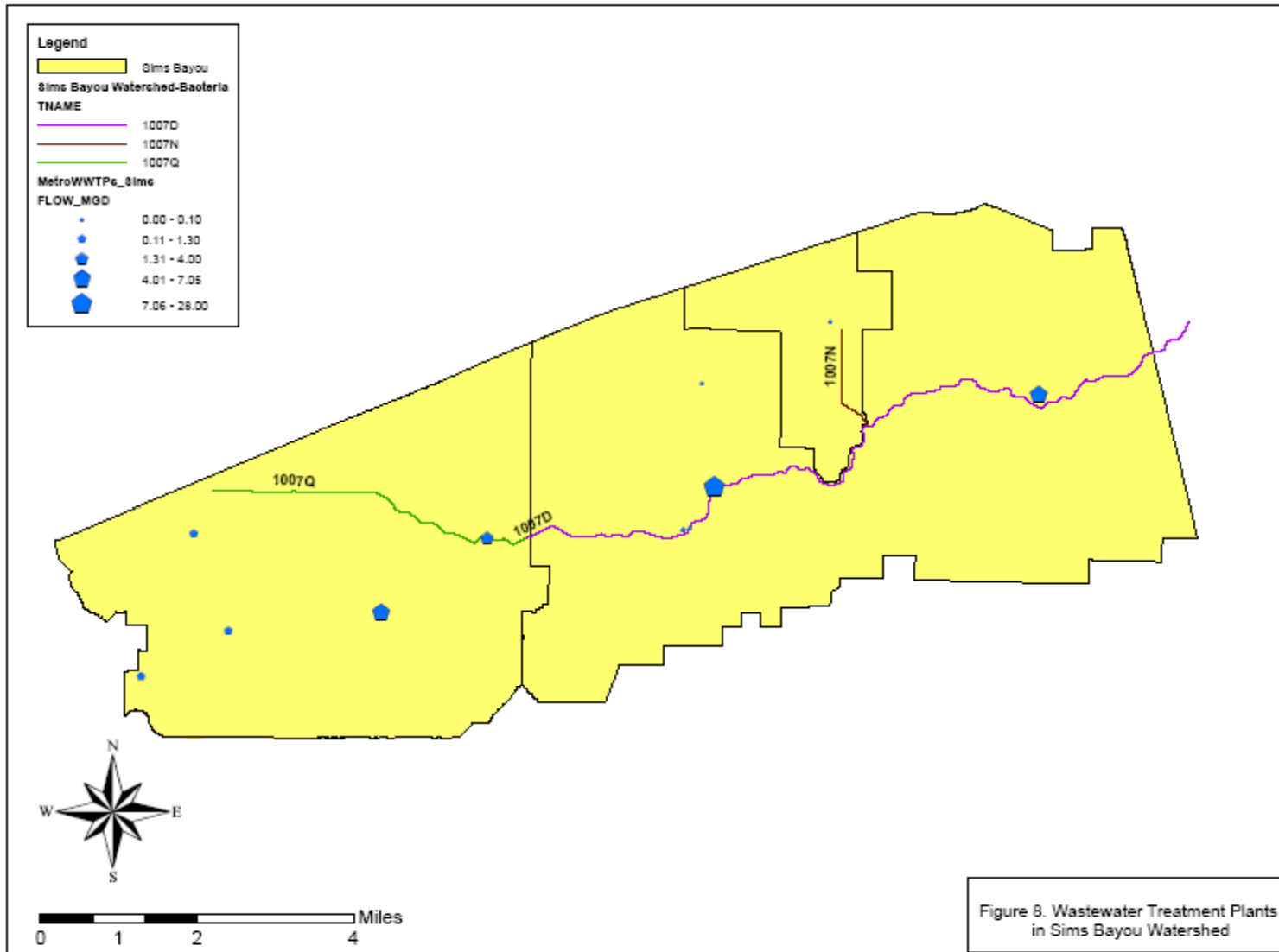
# Sims Bayou USGS Flow Gages



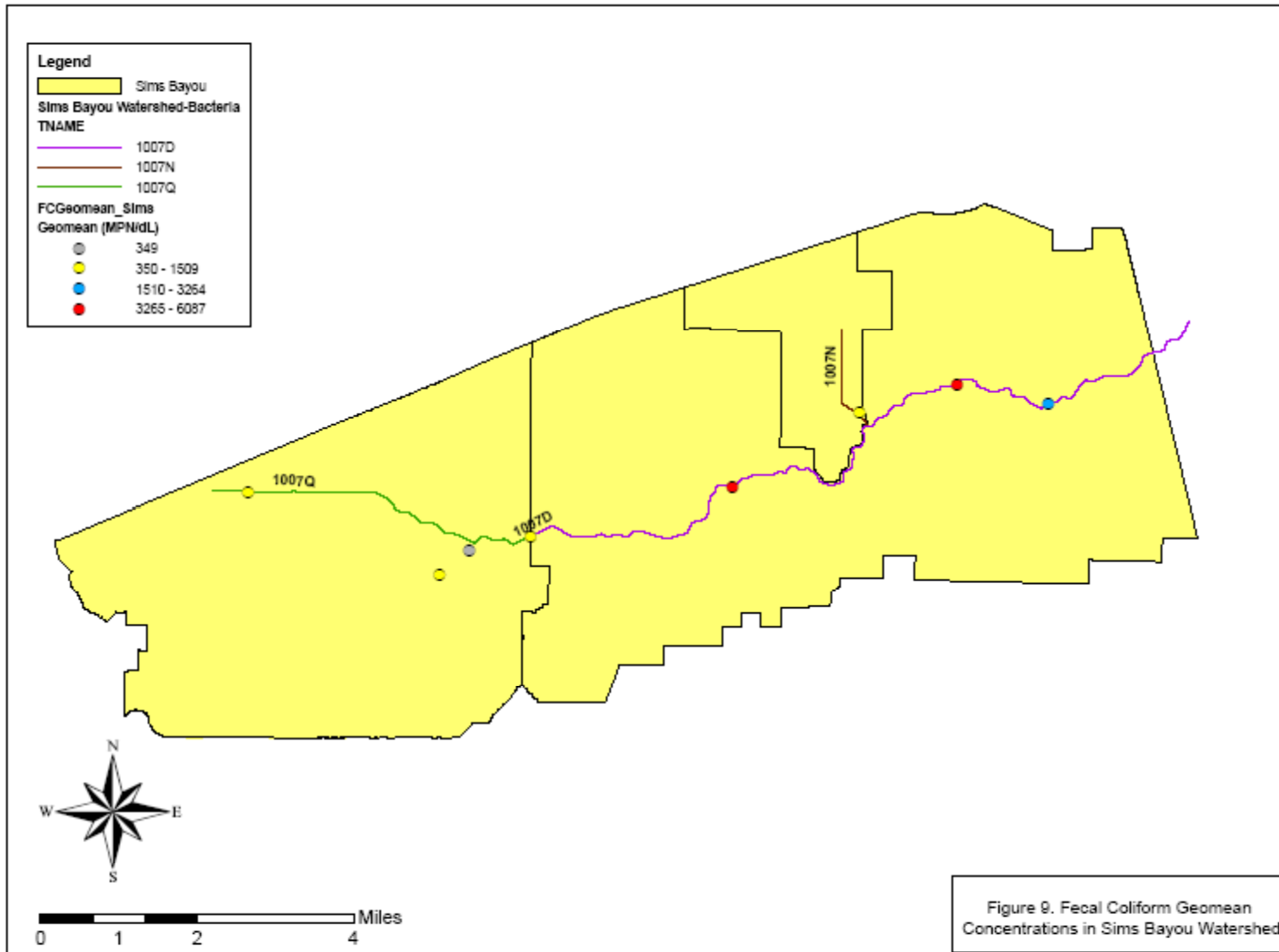
# Sims Bayou Rain Gages



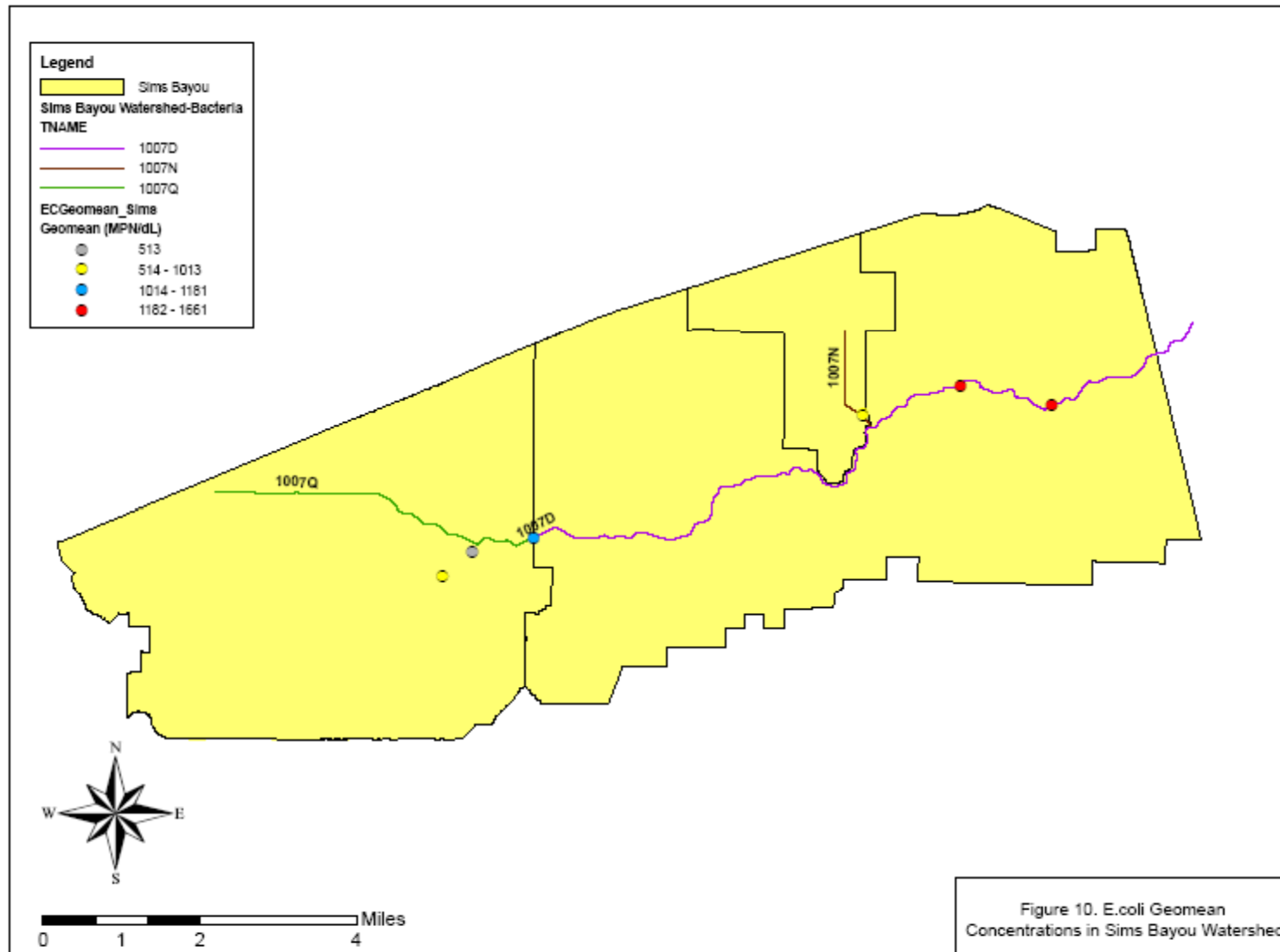
# Sims Bayou Permitted Dischargers



# Sims Bayou E. Coli Geometric Means



# Sims Bayou Fecal Coliform Geomeans



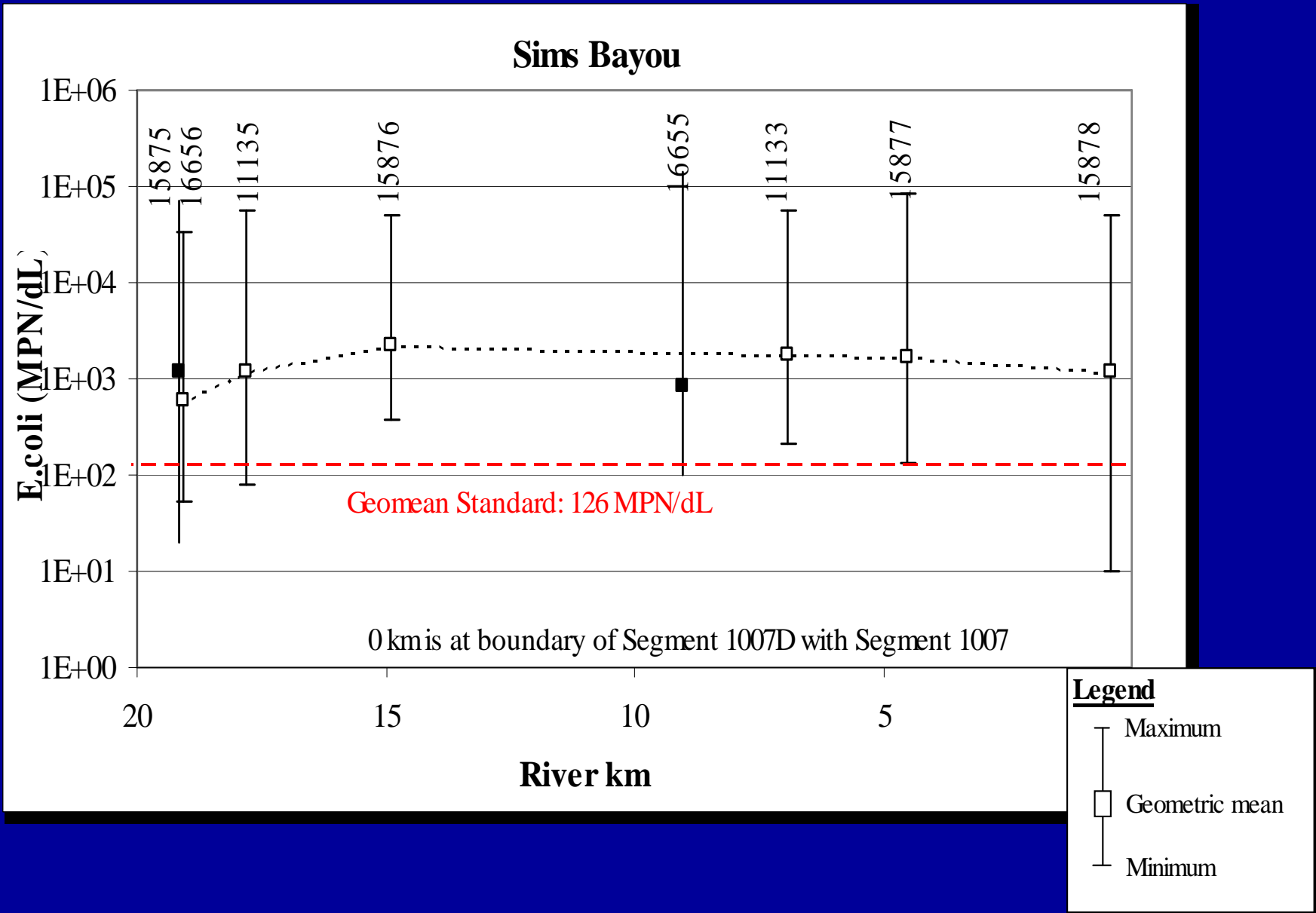
# % Exceedances for Sims Bayou

Watershed	Segment	StationID	Indicator Bacteria	Single Sample Criteria (MPN/100ml)	Geometric Mean	Number of Samples	Number of Samples Exceeding Criteria	% of Samples Exceeding
SIMS BAYOU	1007D	11133	EC	394	1661	58	52	90%
			FC	400	4755	65	56	86%
	1007D	11134	FC	400	6087	17	13	76%
	1007Q	11135	EC	394	1181	41	31	76%
			FC	400	1234	154	93	60%
	1007D	15877	EC	394	1439	41	34	83%
			FC	400	3264	35	33	94%
	1007Q	11136	FC	400	1141	11	5	45%
	1007	11132	EC	394	2018	57	55	96%
			FC	400	5991	159	132	83%
	1007Q	15875	EC	394	984	42	31	74%
			FC	400	1509	35	26	74%
	1007Q	16656	EC	394	513	41	23	56%
			FC	400	349	64	29	45%
	1007N	16655	EC	394	1022	58	40	69%
			FC	400	1130	64	45	70%



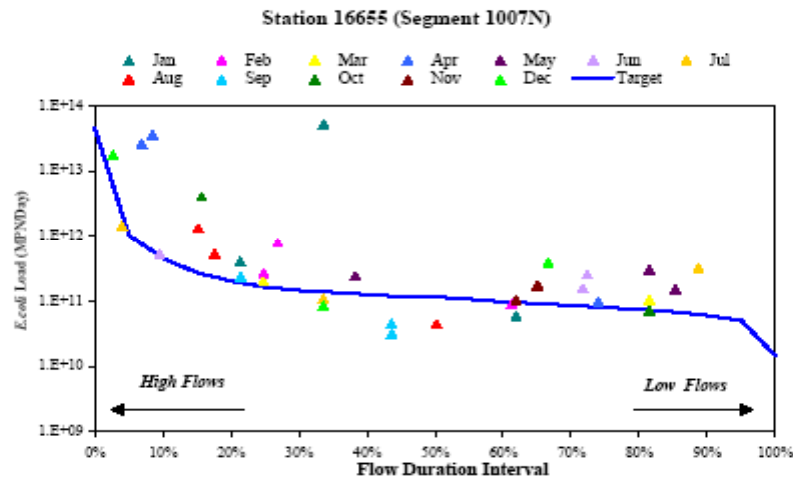
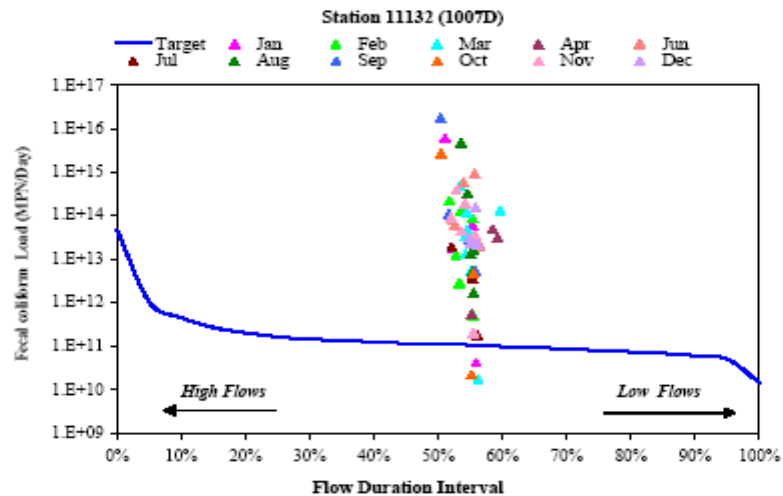


# Sims Bayou E. Coli Longitudinal Profile



# Historical LDCs for Sims Bayou

Indicator Bacteria in the Houston Metro TMDL Project



Load Duration Curves for Historical Data for Sims Bayou watershed



# For More Information

- Project Website

<http://www.tceq.state.tx.us/implementation/water/tmdl/72-houstonbacteria.html>

- TCEQ TMDL Program

<http://www.tceq.state.tx.us/implementation/water/tmdl/index.html>



# Questions?

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