# Cotton Bayou Watershed Characterization

Webinar
August 20, 2020

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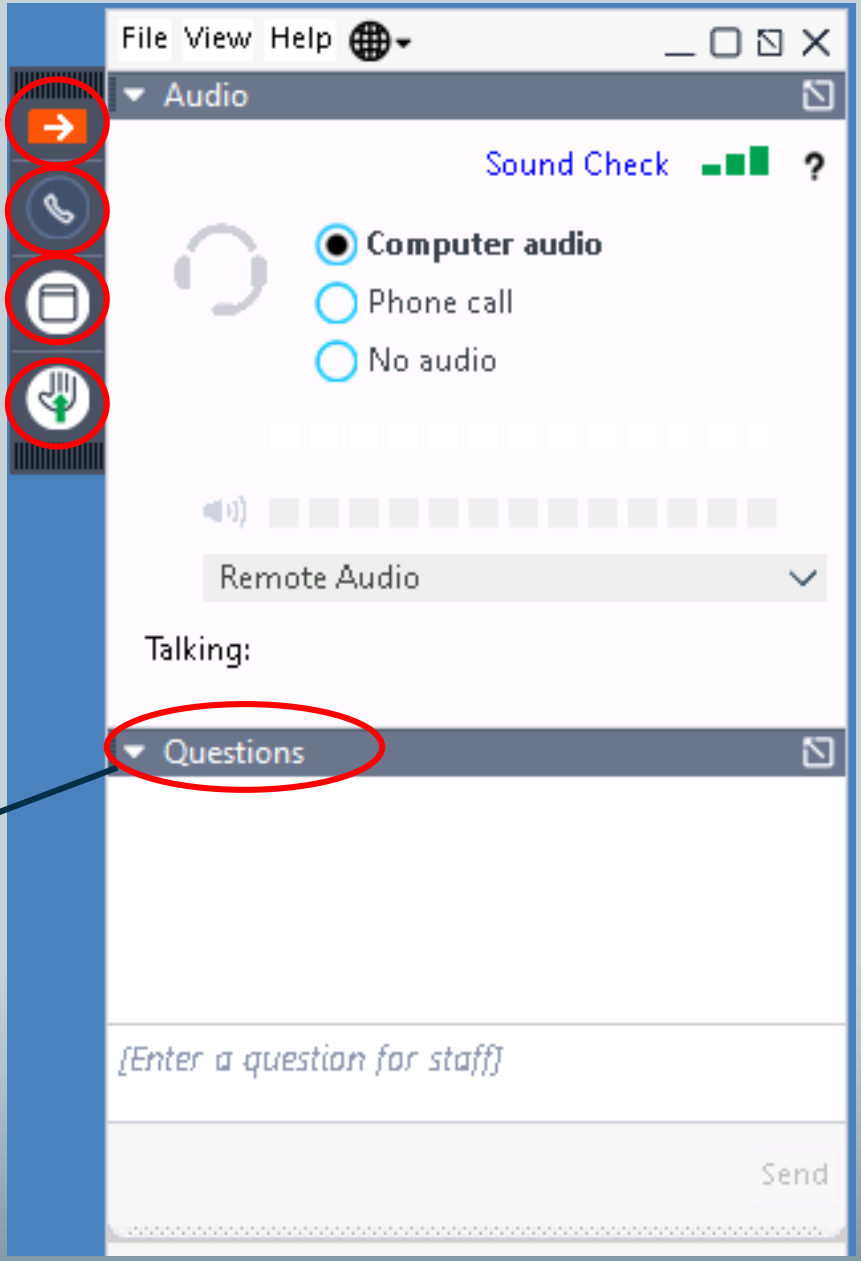


# Meeting Outline

- Introductions
- Project Overview
- Report Findings
- Progress
- Next Steps
- Discussion

# Who We Are


**Texas Commission on Environmental Quality (TCEQ)**

lead state environmental management agency


**Houston-Galveston Area Council (H-GAC)**

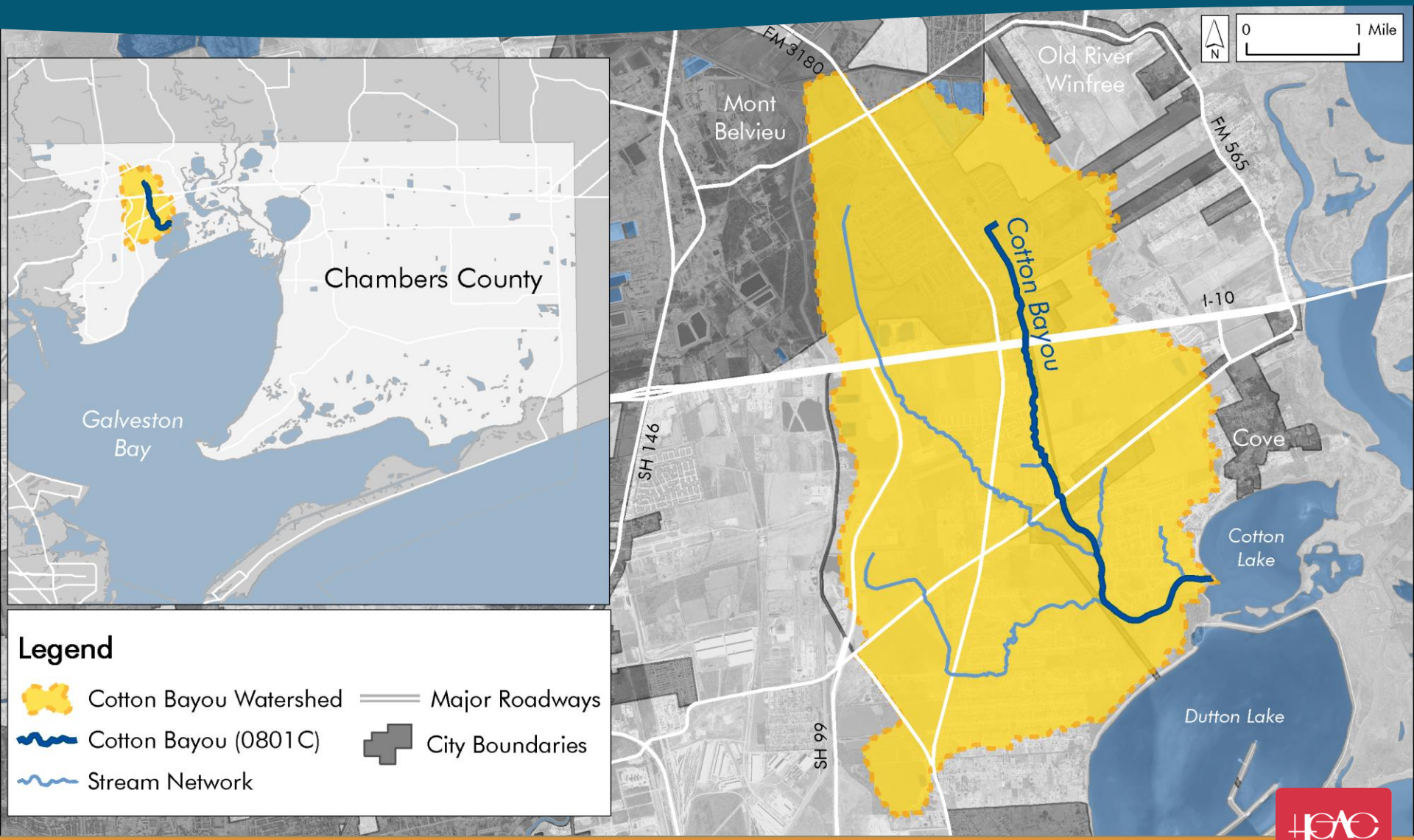
regional council of governments

# What We Do

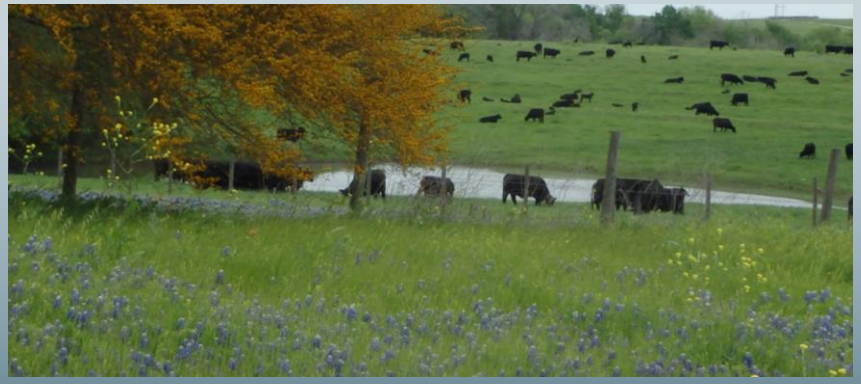

Data Analyses
Stakeholder Knowledge
Understand Water Quality
Improve Water Quality

# Project Overview

# Watershed Area



# Surface Water Uses



- Agricultural
- Municipal
- Industrial
- Recreational
- Natural

# Determining Water Quality

- Statewide monitoring
- TCEQ produces integrated report of results every two years
- Waterways exceeding standards are **impaired**

# 2020 Integrated Report

| Impairments | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Use** | **Data #** | **Unit** | **Criteria** | **Assessed Value** |
| Dissolved Oxygen Grab (Minimum) | Aquatic Life | 49 | mg/L | 3 | 1.55 |
| Bacteria (Enterococcus) | Recreation | 43 | cfu/100 mL | 35 | 137.4 |
| **Concerns** | | | | | |
| **Parameter** | **Use** | **Data #** | **Unit** | **Screening Level** | **Assessed Value** |
| Dissolved Oxygen Grab (Screening Level) | Aquatic Life | 49 | mg/L | 4 | 2.47 |
| Chlorophyll-a | General Use | 50 | µg/L | 21 | 49.52 |
| Nitrate | General Use | 51 | mg/L | 1.10 | 6.67 |
| Total Phosphorous | General Use | 44 | mg/L | 0.66 | 1.58 |

# Status of Cotton Bayou

- **Impaired** for aquatic life use and contact recreation
  - Low dissolved oxygen levels
  - High levels of fecal indicator bacteria, Enterococcus
- This project focuses on **bacteria** in Cotton Bayou

# Bacteria Sources






- **Human Waste**
  - Wastewater
  - Septic/Aerobic Systems
  - Illicit Sewage
- **Domestic Animal Waste**
  - Pets
  - Livestock
- **Wildlife and Invasive Waste**
  - Deer and Other Wildlife
  - Feral Hogs

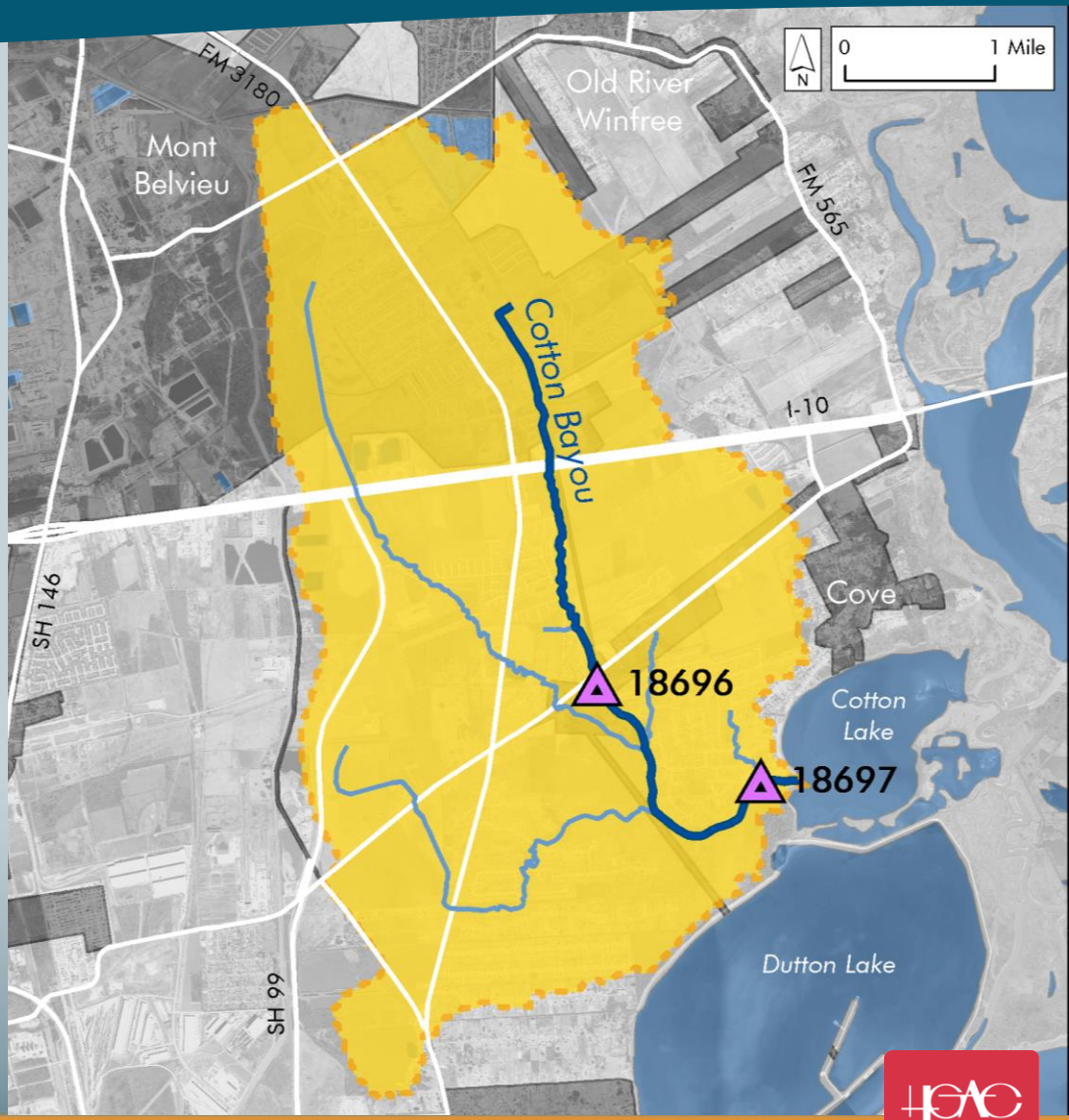
# Report Findings

# Report Purpose

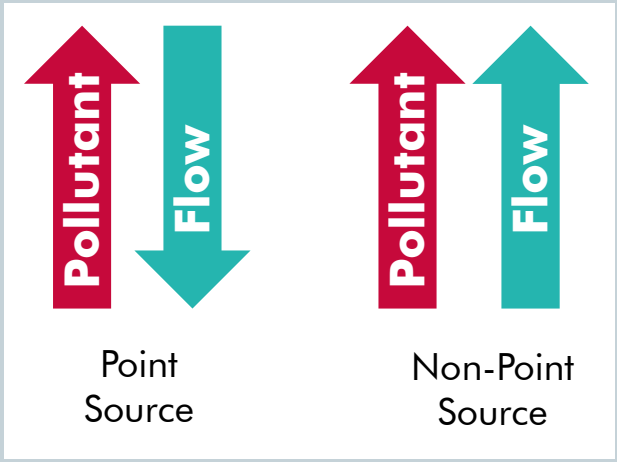
- Describes water quality and pollutant sources impacting water quality in the watershed
- Preliminary step in determining a **Total Maximum Daily Load (TMDL)** for a water body

# Ambient Monitoring

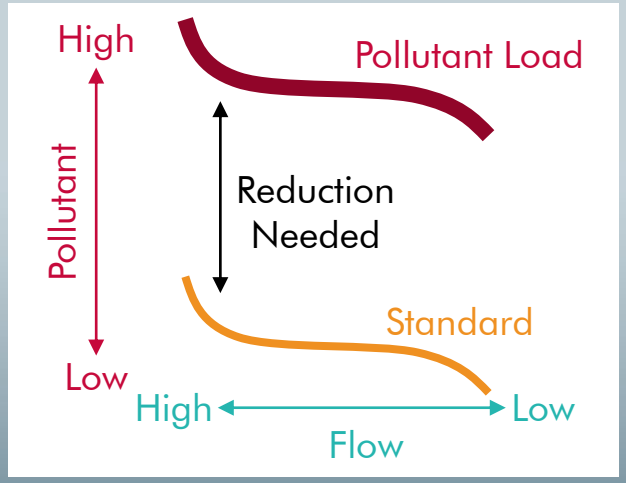
- 2 active stations monitored quarterly for Enterococcus levels
- Upstream station 18696 at FM 565 near Cove
- Downstream station 18697 at confluence with Cotton Lake



# Streamflow and Pollutant Loads




- Comparing observed pollutant levels to corresponding stream flow conditions can help us estimate sources of impairment




- Comparing a curve modeled from observed pollutant levels to the standard curve can help us estimate reductions needed for compliance

# Modeling Results

| Percent Bacteria Reduction Needed to Comply With Standard | | |
|---|---|---|
| **Flow Condition** | 18696 (upstream) | 18697 (downstream) |
| High Flows | 97% | 99% |
| Moist Conditions | 92% | 88% |
| Mid-Range Conditions | 87% | 65% |
| Dry Conditions | 81% | 36% |
| Low Flows | 74% | |

# Summary of Ambient Data

- Impairment upstream is complex and may result from a combination of point and non-point source pressures
- Impairment downstream is more likely affected by non-point sources during high flow events

# Investigating Sources

| Potential Source | Means of Measurement |
|---|---|
| **Sanitary Sewer Overflows (SSOs)** | • SSO reports<br>• Discharge Monitoring Reports |
| **Onsite Sewage Facilities (OSSFs)** | • Permitted OSSF database<br>• Presence of houses outside service areas |
| **Domestic Pets** | • Based on literature value and actual households (1.6 dogs /dog-owning household) |
| **Livestock** | • USDA data<br>• Stakeholder feedback |
| **Feral Hogs** | • Literature values<br>• Stakeholder feedback |
| **Other Wildlife** | • Literature values<br>• Anecdotal |
| **Landfills** | • Regulatory compliance<br>• Stakeholder feedback |
| **Illegal Dumping** | • Anecdotal |

# Wastewater Treatment


| Discharge Monitoring Report Data, 2011-2019 | | |
|---|---|---|
| **Parameter** | Enterococci | *E. coli* |
| **Geomean Standard** | 35 cfu/100 mL | 126 cfu/100 mL |
| **Single Sample Standard** | 104 cfu/100 mL | 399 cfu/100 mL |
| **Samples** | 29 | 285 |
| **Percent Exceedance – Geomean** | 0% | 8% |
| **Percent Exceedance – Single Sample** | 0% | 22% |

# Onsite Sewage Facilities

- Assuming between 10-15% failure rate of an estimated 355 units in the watershed
- Are there areas in the watershed that could benefit from repair or replacement of existing units?

# Dog Ownership Estimates


- Using literature values, 726 dogs are estimated
- How is pet waste managed in this watershed?
  - Dog parks
  - Pet waste stations

# Livestock Estimates

- United States Department of Agriculture census data used to estimate livestock

| | Watershed Estimate |
|---|---|
| Farms | 14 |
| Cattle | 608 |
| Pigs & Hogs | 2 |
| Sheep | 12 |
| Goats | 14 |
| Poultry | 33 |
| Horses* | 21 |

- Are there areas where agricultural land is concentrated?

# Wildlife and Feral Hog Estimates

## Wildlife

- Using literature values, 258 deer estimated
- What wildlife have you observed?

## Invasives

- Based on watershed land cover, about 31 feral hogs estimated
- Are there areas where feral hogs are regularly observed?

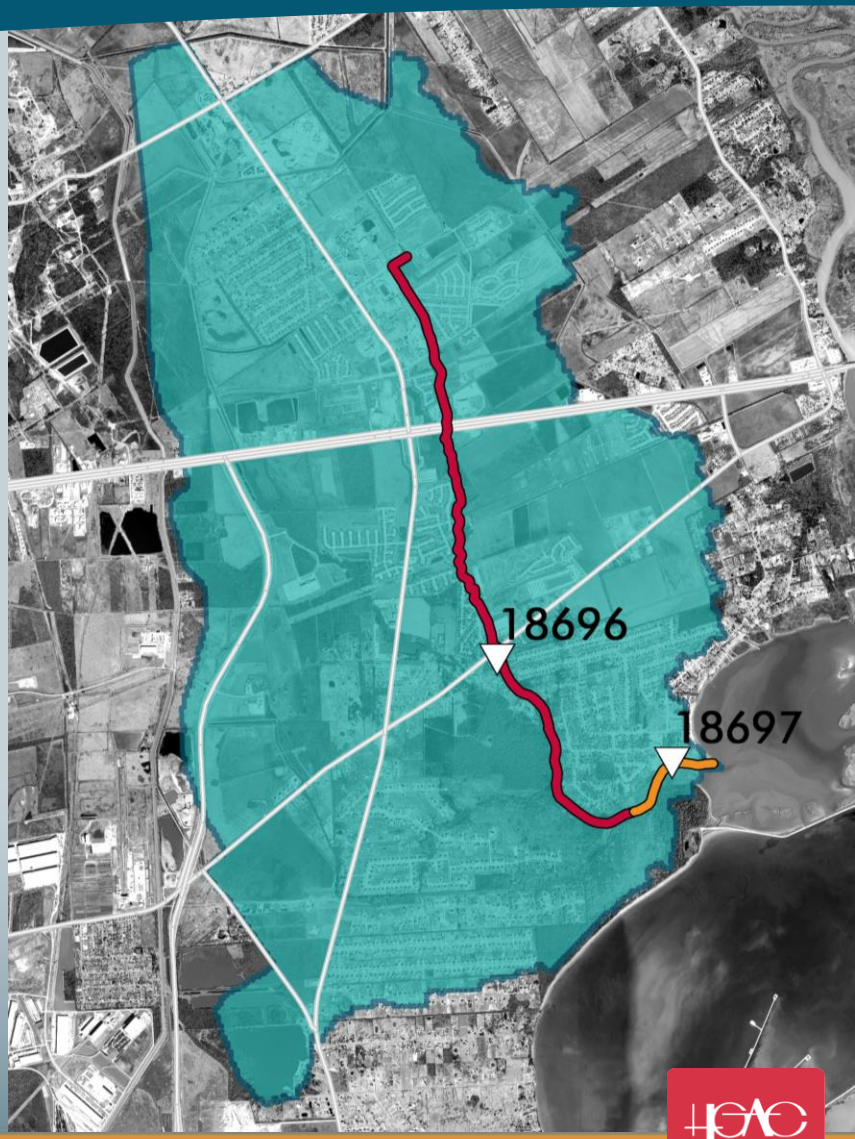

Progress

# Additional Monitoring

- New Clean Rivers Program monitoring station in Mont Belvieu
- Data will help improve understanding of upstream water quality

# Stream Characterization

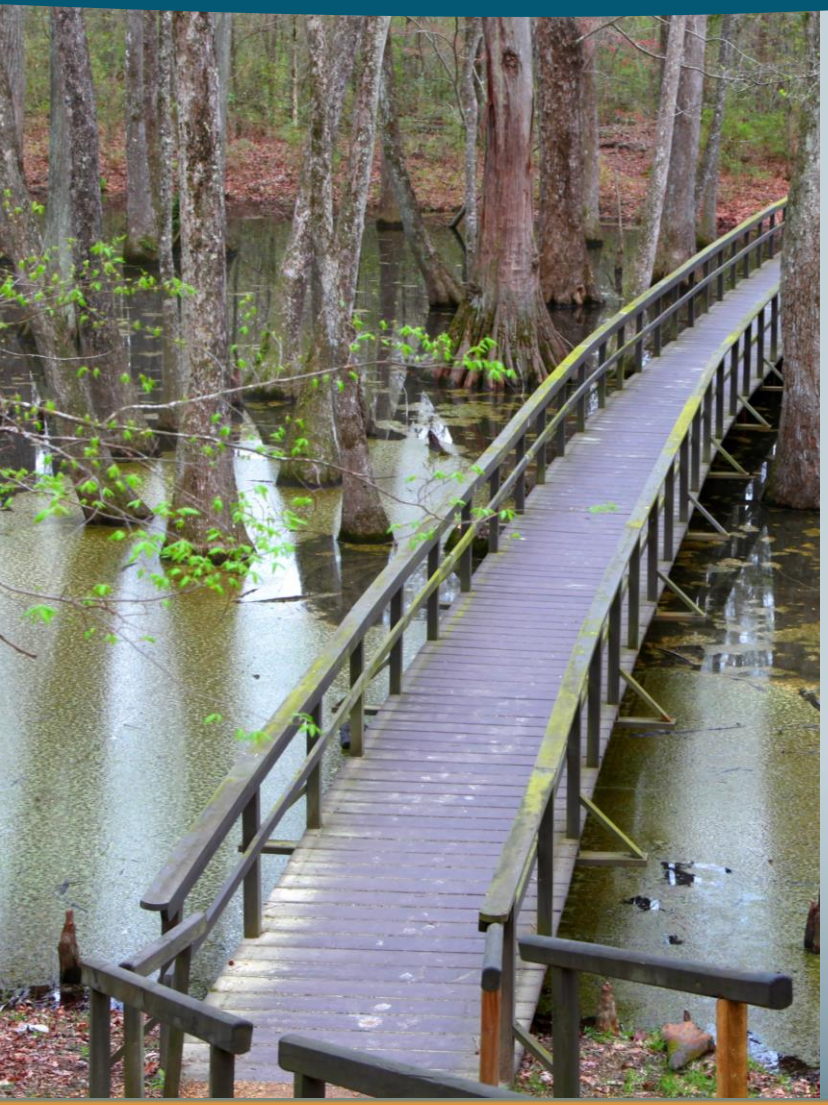
- TCEQ will reclassify the upstream portion of Cotton Bayou as an above-tidal segment
- Bacteria monitoring will target *Escherichia coli* (*E. coli*)



# Next Steps

# TMDL Timeline

# Technical Goals



- Watershed Characterization Report out for review; final version will be made publicly available
- Begin work on Technical Support Document development
  - More focused analysis of bacteria
  - TMDL calculations

# Stakeholder Engagement

- One-on-one stakeholder meetings
- Collaborate with local efforts
- Form coordination committee

# Participation Opportunities

- Share your knowledge and feedback
- Help us coordinate with local efforts
- What are your ideas for this watershed?

# Get Involved!


## Texas Stream Team

- Volunteer network monitoring water quality throughout the region
- Data can be viewed on Water Resources Information Map (WRIM)
- For more information, visit the Texas Stream Team website or email stream.team@h-gac.com

This project is funded by the Texas Commission on Environmental Quality and facilitated locally by the Houston-Galveston Area Council.

# Discussion and Questions

For more information, please contact:

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