



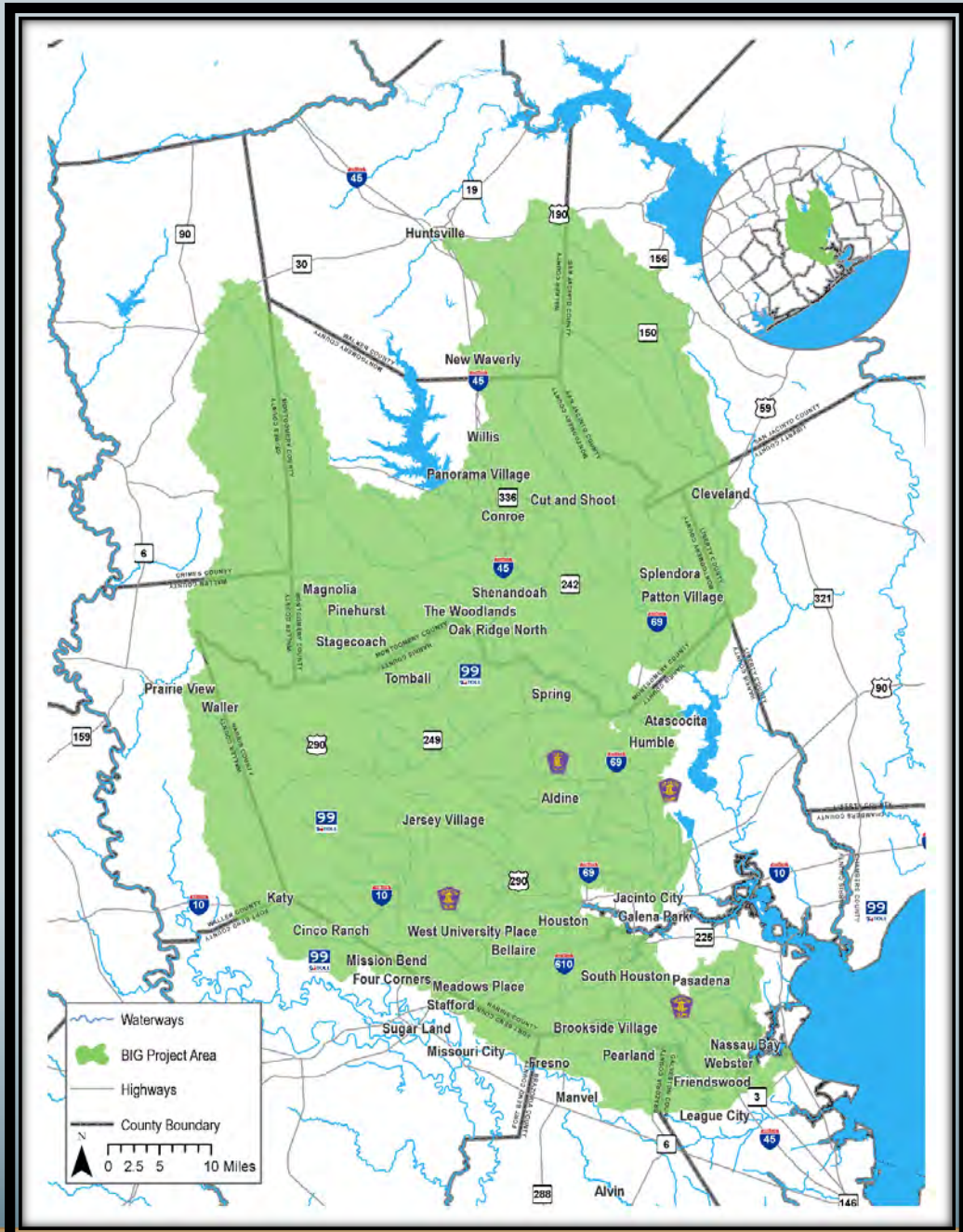
BACTERIA IMPLEMENTATION GROUP (BIG)

**Spring Meeting
May 23, 2023**



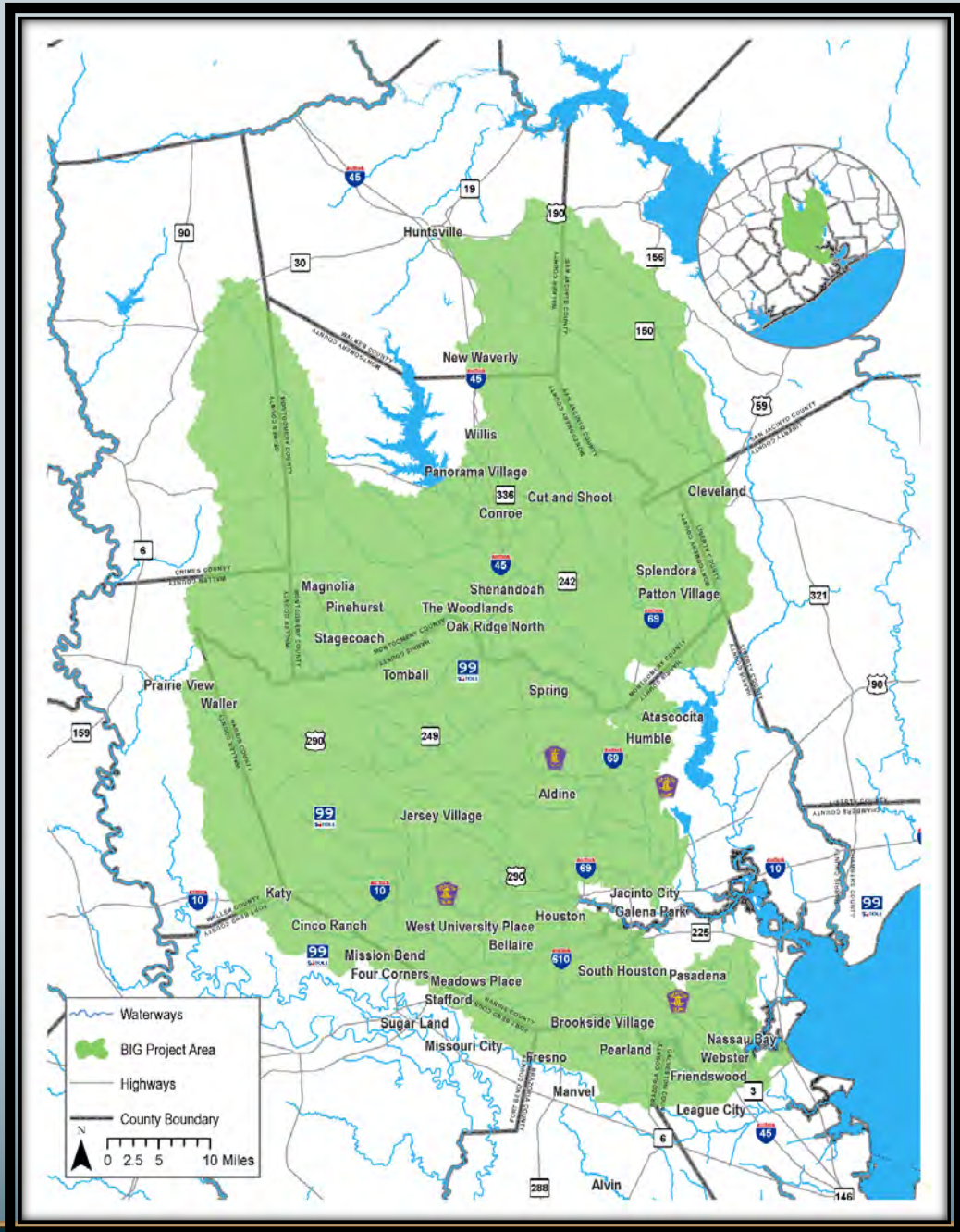
AGENDA

- Call to Order/Introductions
- Quorum Certification
- Review and Approve Changes to the BIG Roster
- Review and Approve Minutes
- Public Comment
- Item One: I-Plan Update
- Item Two: 2022 Annual Report
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- Adjourn



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ROSTER UPDATES

■ BIG Membership

- **Chris Baecke** (Urban County) Harris County
- **Jamie Shakar** (Large City) City of Houston

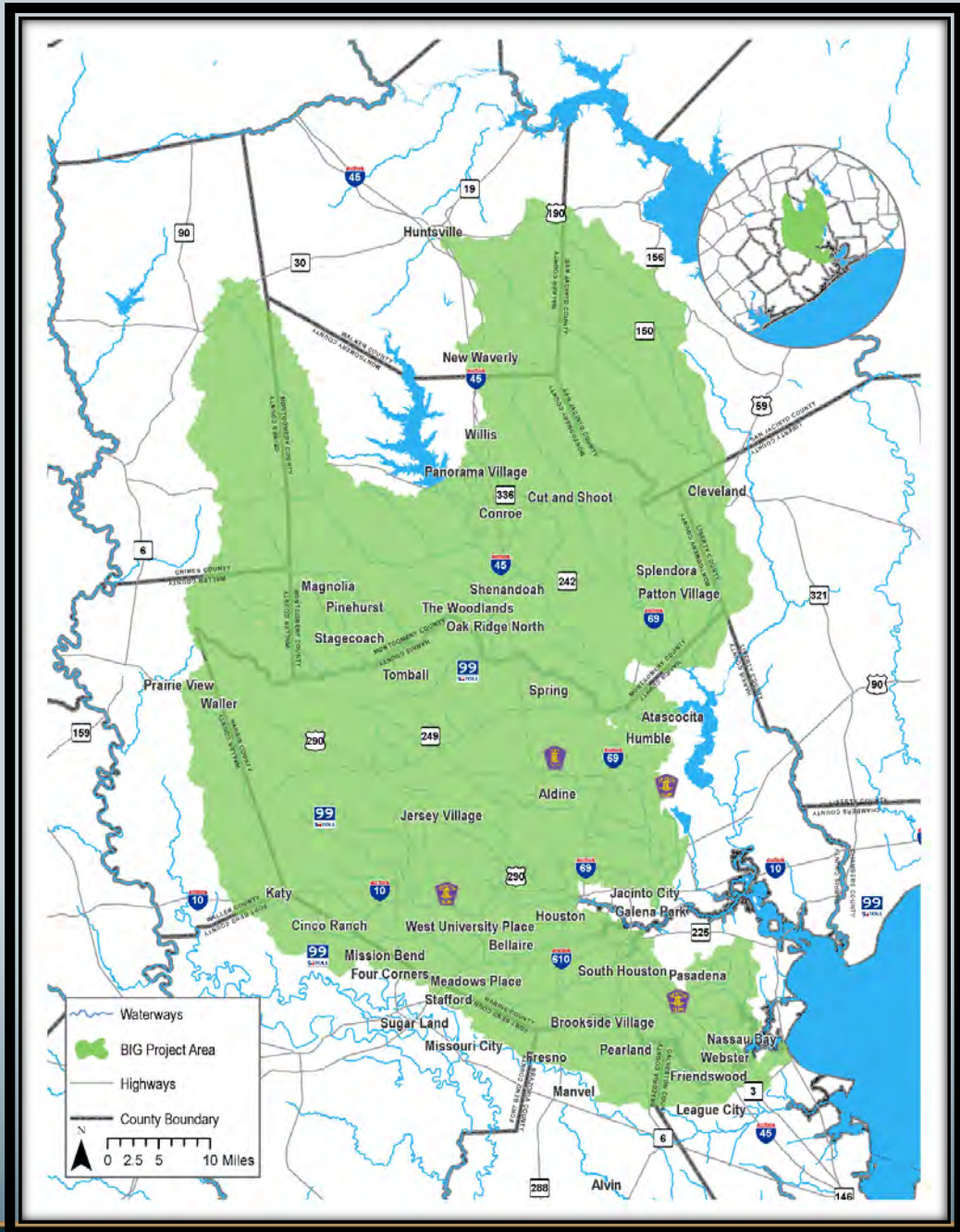
■ Alternates

- **Camila Biaggi** (Business/Industry) Quiddity Engineering
- **Jeff Lu** (Urban County) Harris County
- **Zulimar Lucena** (Resource Agency/Academia) US Geological Survey



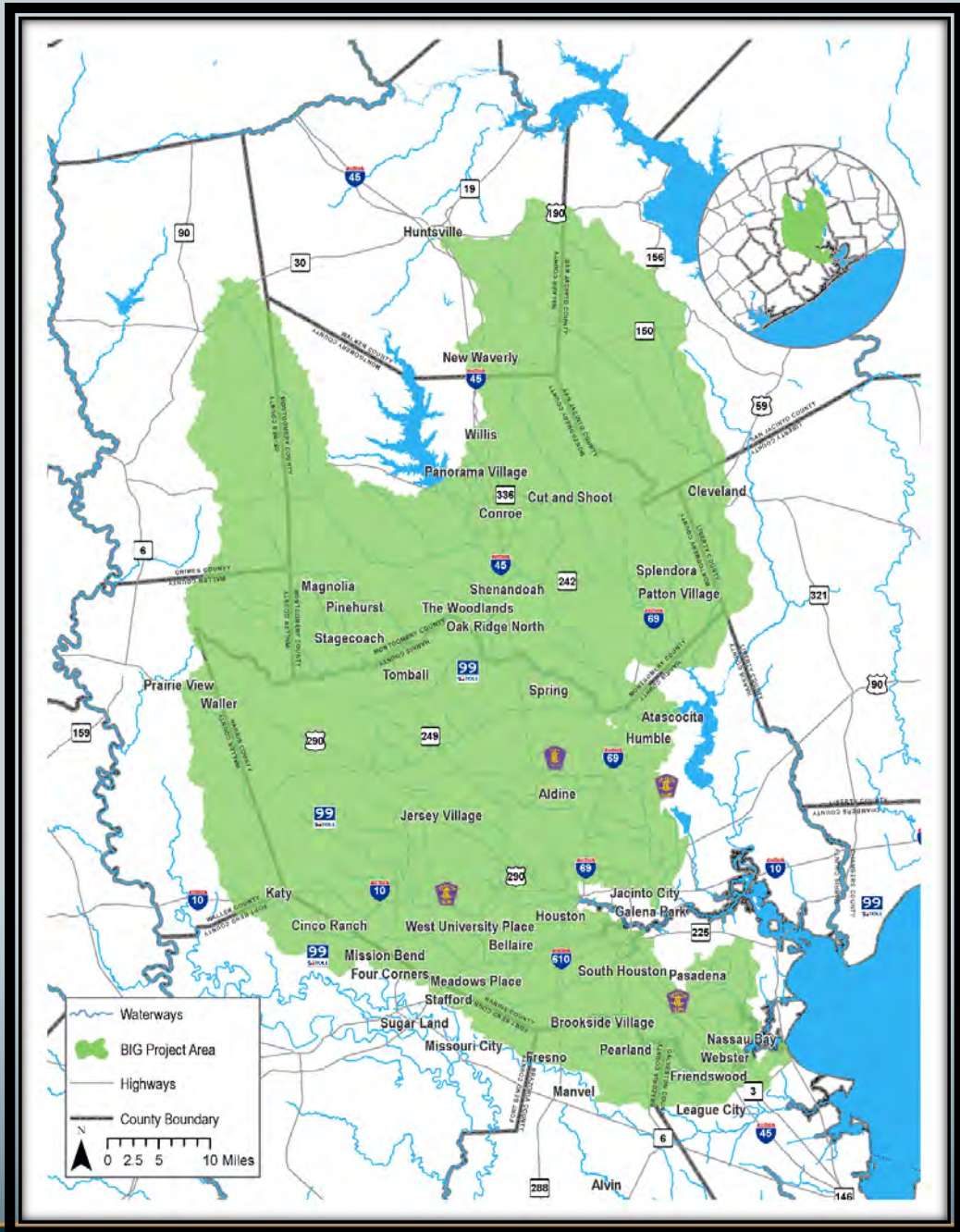
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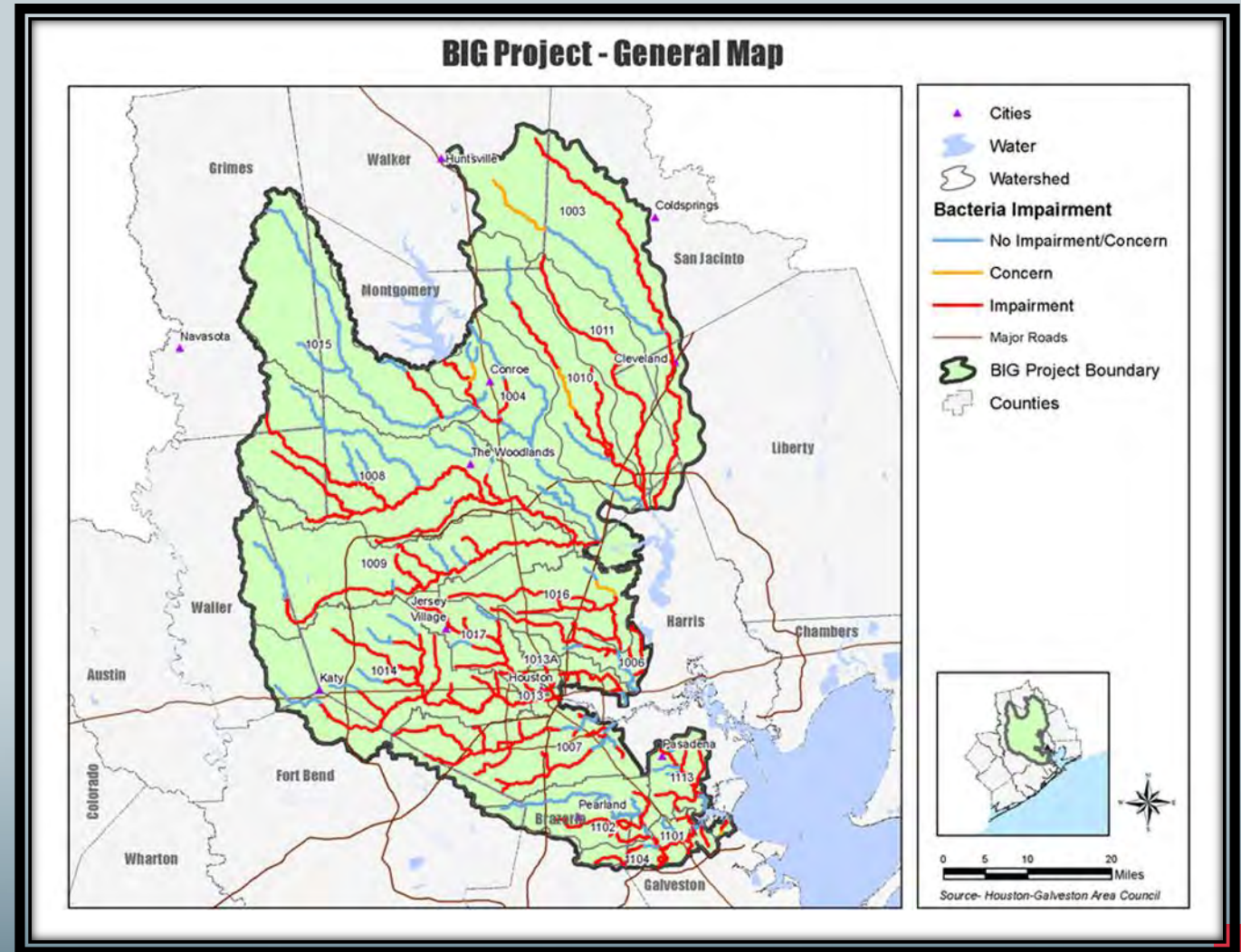
For Total Maximum Daily Loads for Bacteria
in the Houston-Galveston Region

I-Plan Update



I-Plan Format

- Essentially the same
- Strategy Summary
- Activity
 - Action
 - Background
 - Metric
 - Milestone
 - Monitoring



Document Editing



Form an editing and content team:

- 5-10 volunteers
- Review sections of the document
- Revise content as needed
- Revise format as needed
- Report work to Coordination and Policy

I-Plan Update Timeline



July - August

- Review and Comment

July

- Work groups

August

- Coordination and Policy

September

- Publication Format

September

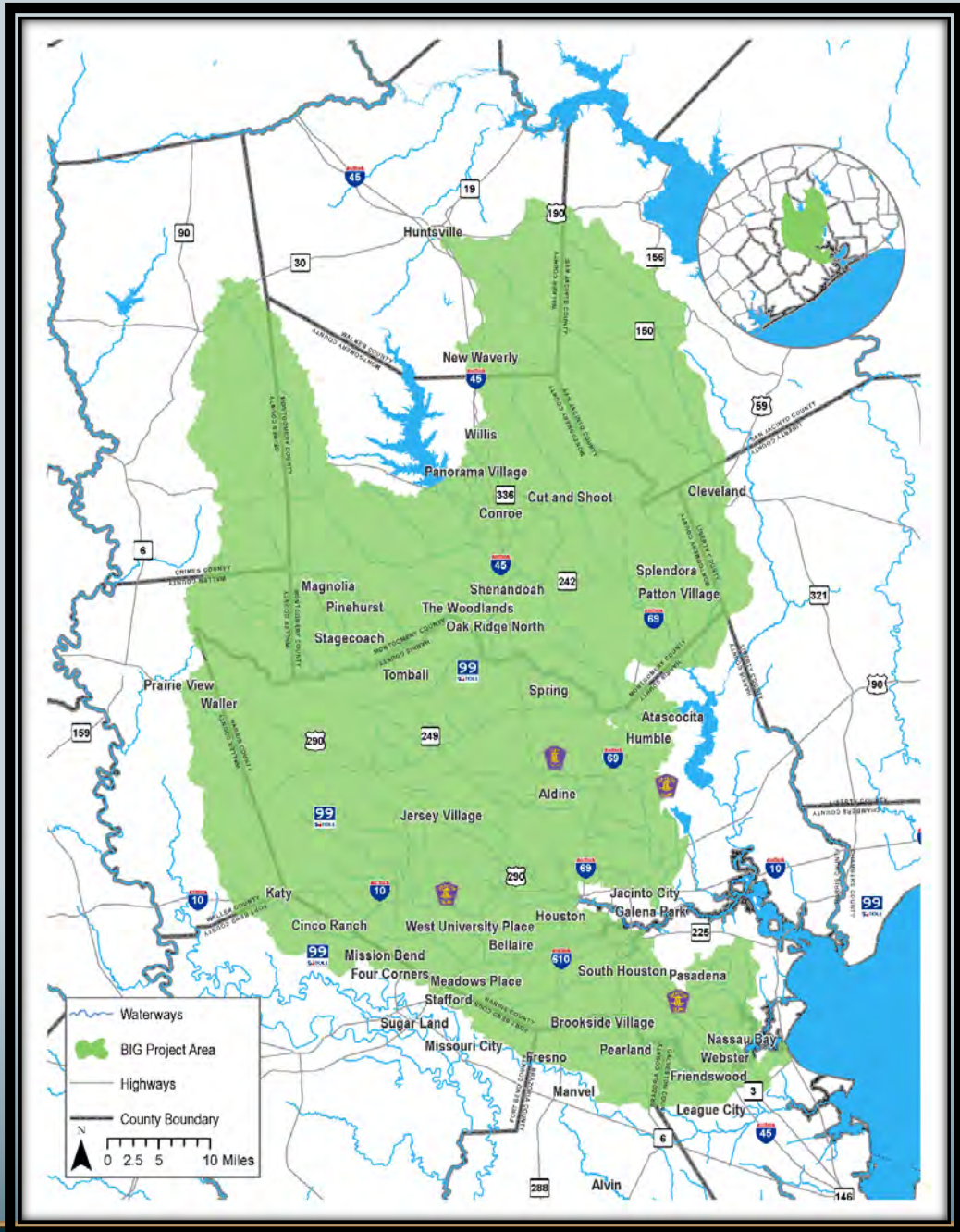
- Coordination and Policy

October

- BIG Fall Meeting

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2022 Annual Report

- Calendar Year 2021
- Three Success Stories
- Three BIG Ideas
- Implementation Progress

BIG

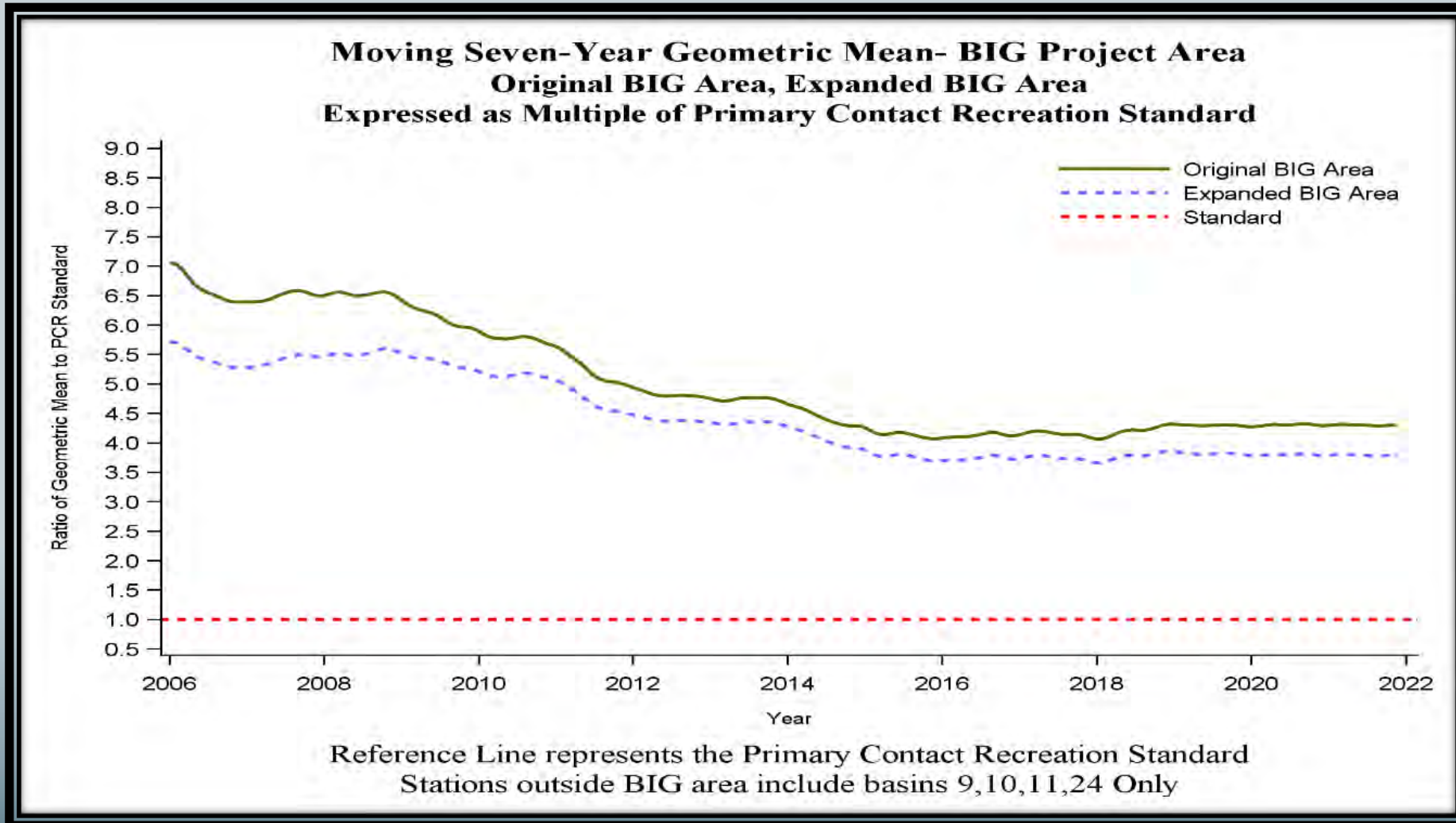
BACTERIA IMPLEMENTATION GROUP

2022 ANNUAL REPORT

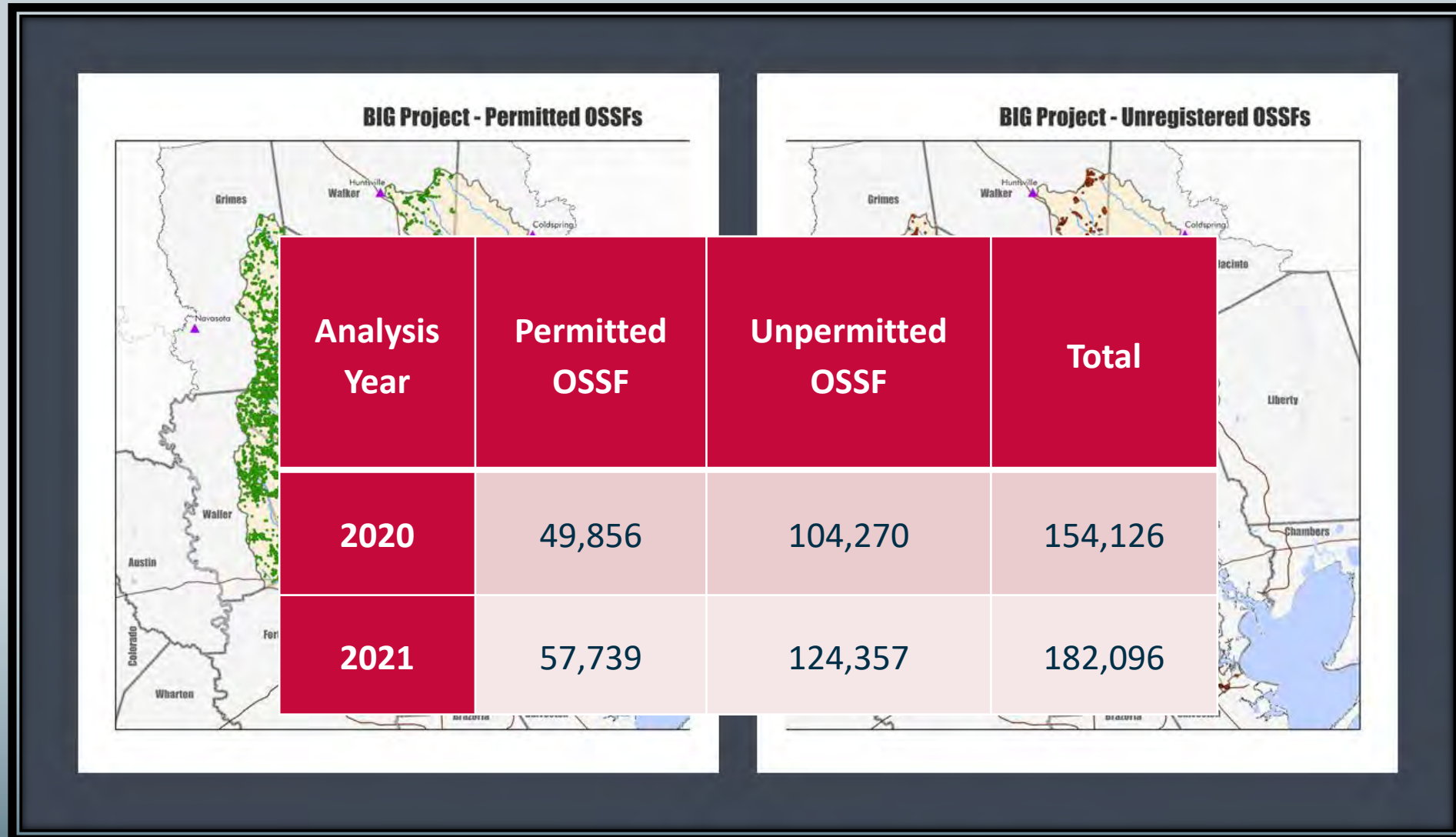
JANUARY 1, 2021–DECEMBER 31, 2021



Bacteria Reduction Trend



BIG Project Area OSSFs



The logo for the Bacteria Implementation Group (BIG) features the letters 'BIG' in a large, bold, blue font with a white, grainy texture. The letters are set against a white background.

BACTERIA IMPLEMENTATION GROUP

2022 ANNUAL REPORT

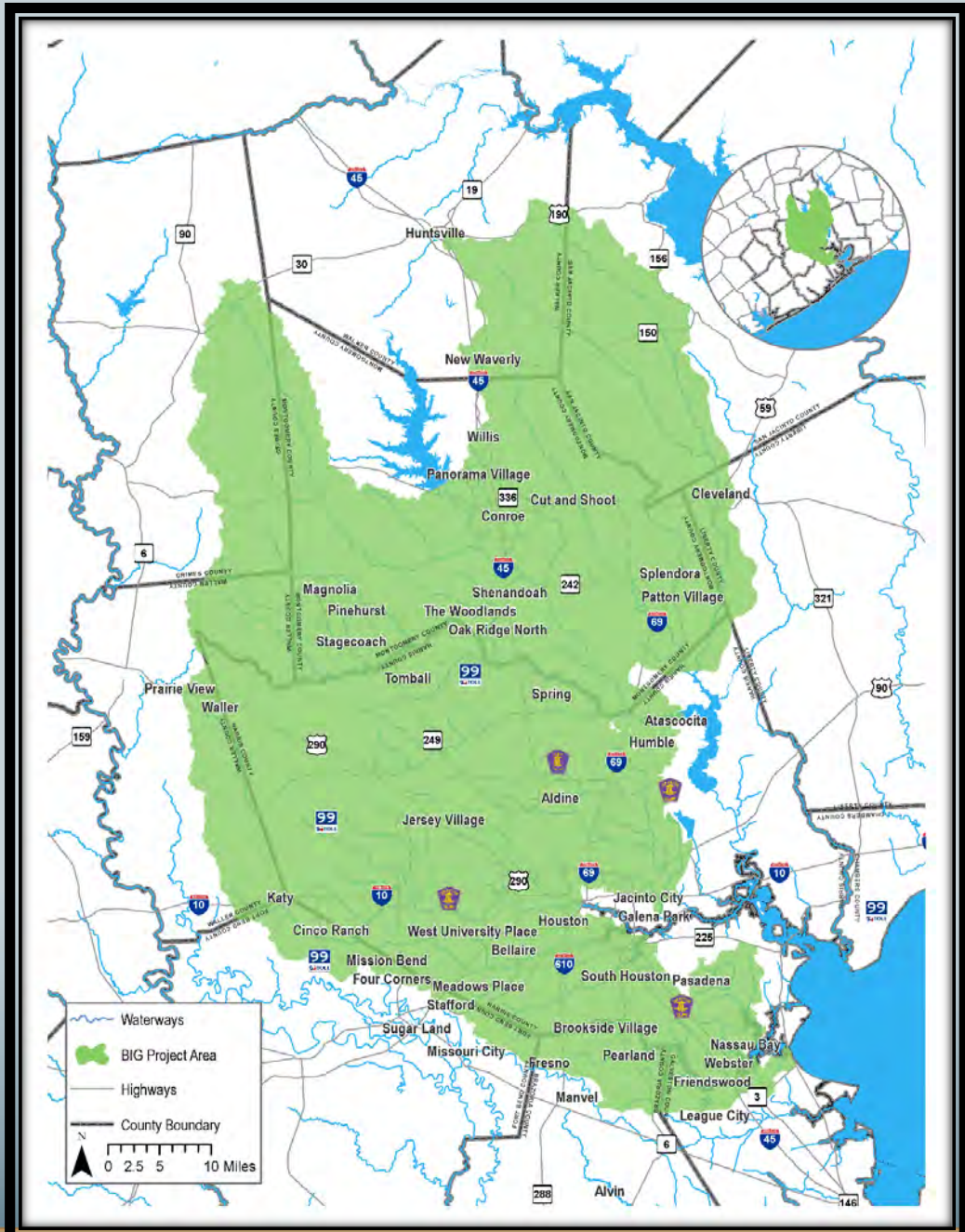
JANUARY 1, 2021–DECEMBER 31, 2021



2022 Annual Report Approval

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2023 Annual Report

BIG

BACTERIA IMPLEMENTATION GROUP

2022 ANNUAL REPORT

JANUARY 1, 2021–DECEMBER 31, 2021



Draft H-GAC Service Area WWTF Discharge Monitoring Report Compliance 2022

Data Source and Analysis	WWTF Number
Permittees in TCEQ Outfall Layer	1,363
Permittees in EPA Registry	1,313
Permittees Submitting DMR Data (any type)	1,026
Permittees Submitting DMR Bacteria Data	899



Reported Bacteria Results	Geometric Mean	Daily Maximum or Grab Sample
Total Results Reported	8,661	8,843
Total Exceeding Limit	70	242
Percent Compliance	99.19	97.26



Relative Plant size	WWTF Number	Geometric Mean	Daily Maximum or Grab Sample
0.1-0.5 MGD	223	1.2	2.1
0.5-1 MGD	143	0.2	2.1
1-5 MGD	149	0.8	4.0
5-10 MGD	34	.	5.5
< 0.1 MGD	276	1.0	2.0
> 10 MGD	21	.	6.7
Variable/Intermittent Discharge	67	1.5	1.8

Draft H-GAC Service Area WWTF Discharge Monitoring Report vs. Harris County Pollution Control Inspection Data 2022

Relative Plant Size	DMR Grab/Max Sample Results	Percentage Exceeding Limit	Percent in Compliance	HCPC Inspection Samples	HCPC Inspection Daily Max PCT Exceedance	Percent Compliance, HCPC Samples
Variable/Intermittent Discharge	301	1.0	99.0	27	7.4	92.6
< 0.1 MGD	570	0.9	99.1	126	11.9	88.1
0.1-0.5 MGD	1,047	1.0	99.0	83	4.8	95.2
0.5-1 MGD	1,019	2.0	98.0	73	4.1	95.9
1-5 MGD	990	3.3	96.7	69	13.0	87.0
5-10 MGD	228	3.1	96.9	18	0.0	100
> 10 MGD	108	13.9	86.1	9	11.1	88.9

2023 Annual Report

- Calendar Year 2022
- Need Three Success Stories
- Three BIG Ideas – Stay the same?
- Implementation Progress based on I-Plan.
- Revise the document look

BIG

BACTERIA IMPLEMENTATION GROUP

2022 ANNUAL REPORT

JANUARY 1, 2021–DECEMBER 31, 2021



2023 Annual Report Timeline



July

- Work groups meet

July -
August

- Draft document, solicit further data

August

- Coordination and Policy

Aug. –
Sept.

- Revise and edit

Sept.

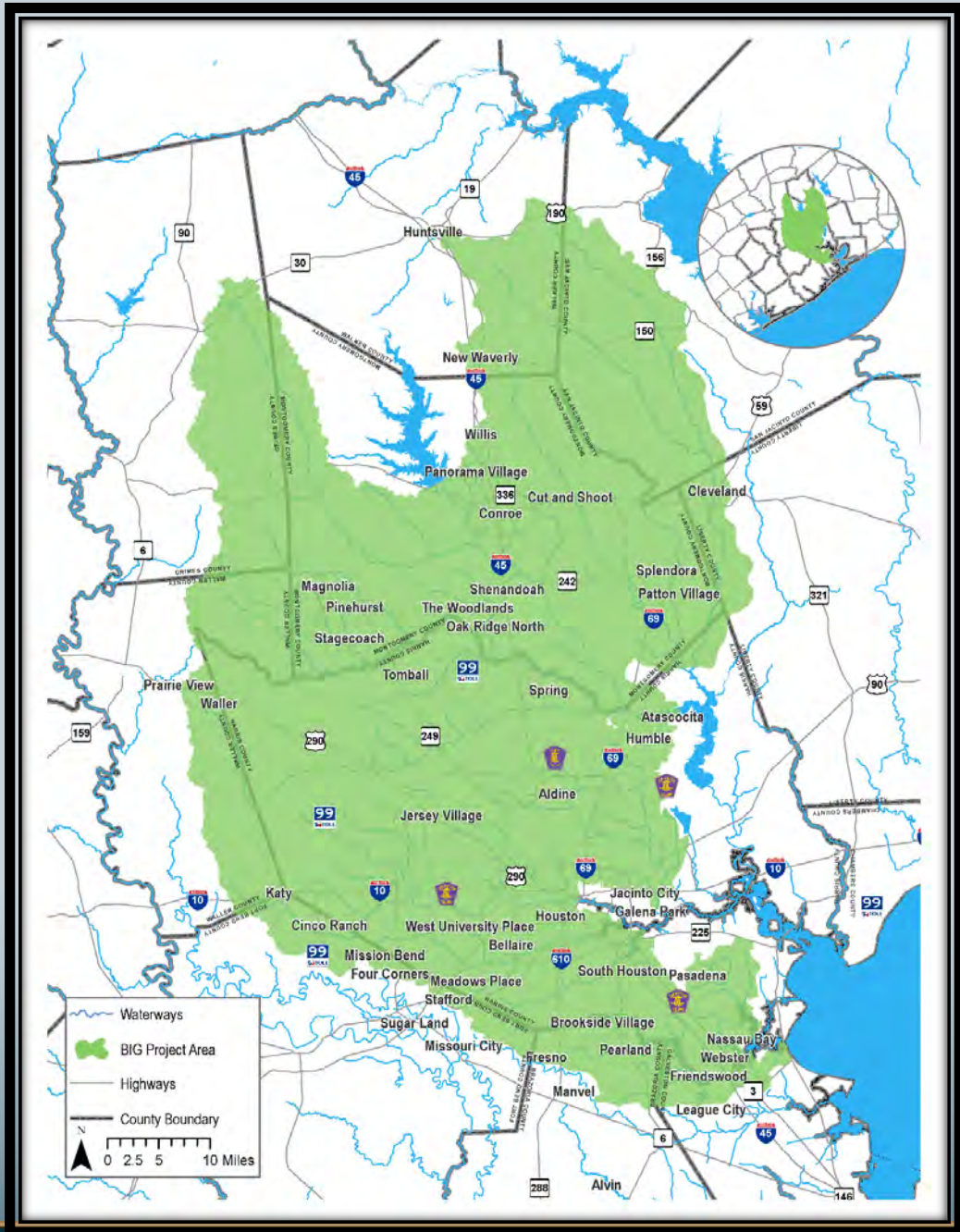
- Coordination and Policy

Oct. 31

- BIG Fall Meeting

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TMDL Updates



Mr. Jimmy Millican, Texas
Institute for Applied
Environmental Research -
*Status of Additions to Indicator
Bacteria TMDLs in the Lake
Houston and Jarbo Bayou
Watersheds.*

email: jmillican@tarleton.edu

Status of Additions to Indicator Bacteria TMDLs in the Lake Houston and Jarbo Bayou Watersheds

TCEQ TMDL Project Manager

Nicole Reed

Project Staff:

Jimmy Millican

Todd Adams

Texas Institute for Applied Environmental Research (TIAER)

Tarleton State University

Stephenville, Texas

May 23, 2023

Acknowledgements

- Agency Lead:
Texas Commission on Environmental Quality (TCEQ)
- Support Funding:
U.S. Environmental Protection Agency (EPA)

Major Presentation Topics

- Previously completed TMDLs
- Overview & status of two new TMDL projects

Previously Completed Indicator Bacteria TMDLs for Watersheds in Lake Houston, East and West Fork San Jacinto River, and Crystal Creek

Adopted by TCEQ: Aug. 24, 2016; Approved by EPA: Oct 7, 2016

Segment Name	Segment Number	Assessment Unit (AU)
Lake Houston	1002	1002_06
East Fork San Jacinto River	1003	1003_01, 1003_02, and 1003_03
West Fork San Jacinto River	1004	1004_01 and 1004_02
Crystal Creek	1004D	1004D_01

Previously Completed Addendum One to Seven TMDLs for Watersheds in Lake Houston, East and West fork San Jacinto River, and Crystal Creek

Added by Addendum by TCEQ: Oct. 2018; Approved by EPA: Feb.
2019

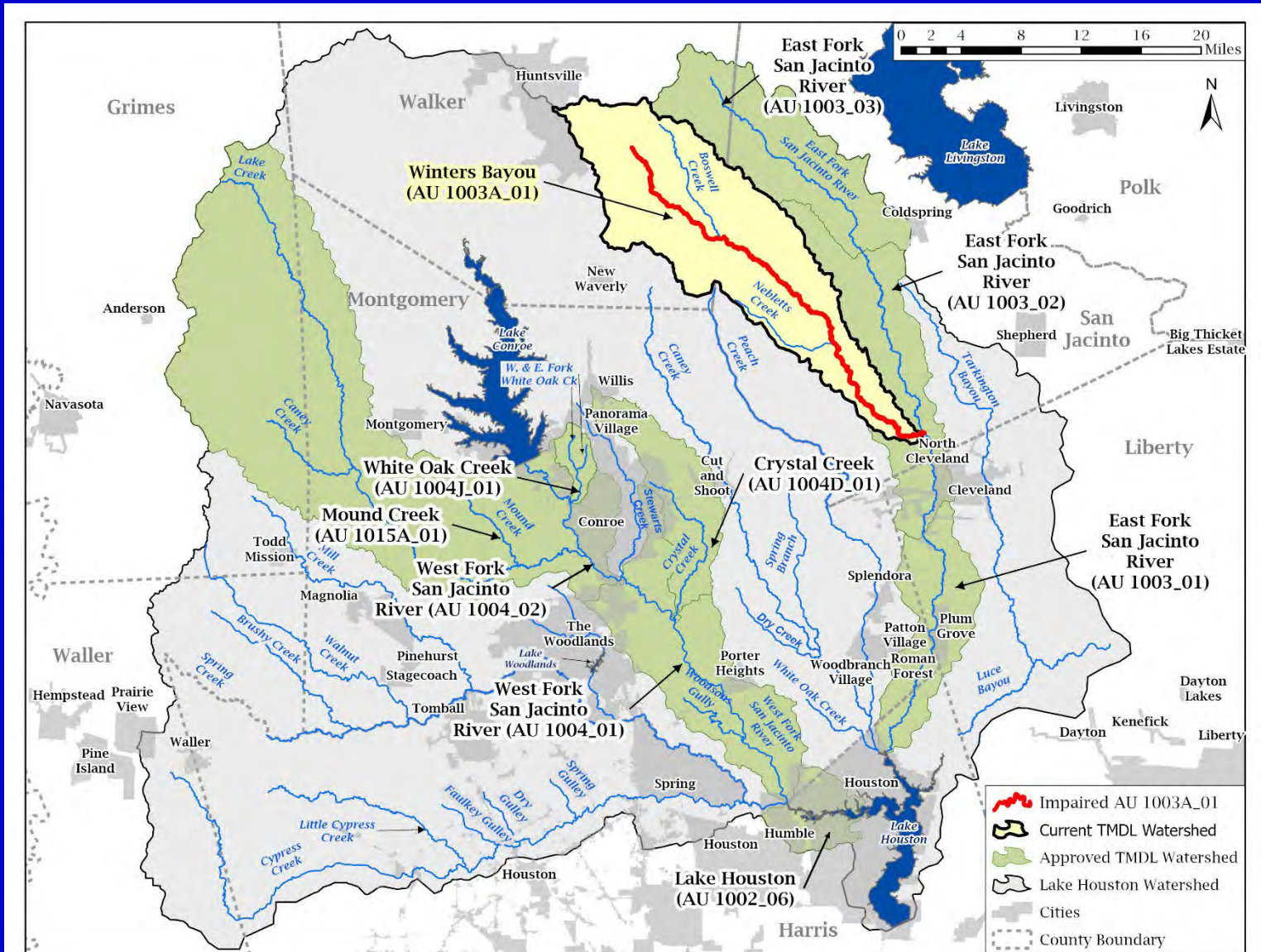
Segment Name	Segment Number	Assessment Unit (AU)
Mound Creek	1015A	1015A_01

Previously Completed Addendum Two to Seven TMDLs for Watersheds in Lake Houston, East and West fork San Jacinto River, and Crystal Creek

Submitted to EPA in January 2023 and is pending approval

Segment Name	Segment Number	Assessment Unit (AU)
White Oak Creek	1004J	1004J_01

Lake Houston Watershed showing areas of nine completed TMDLs

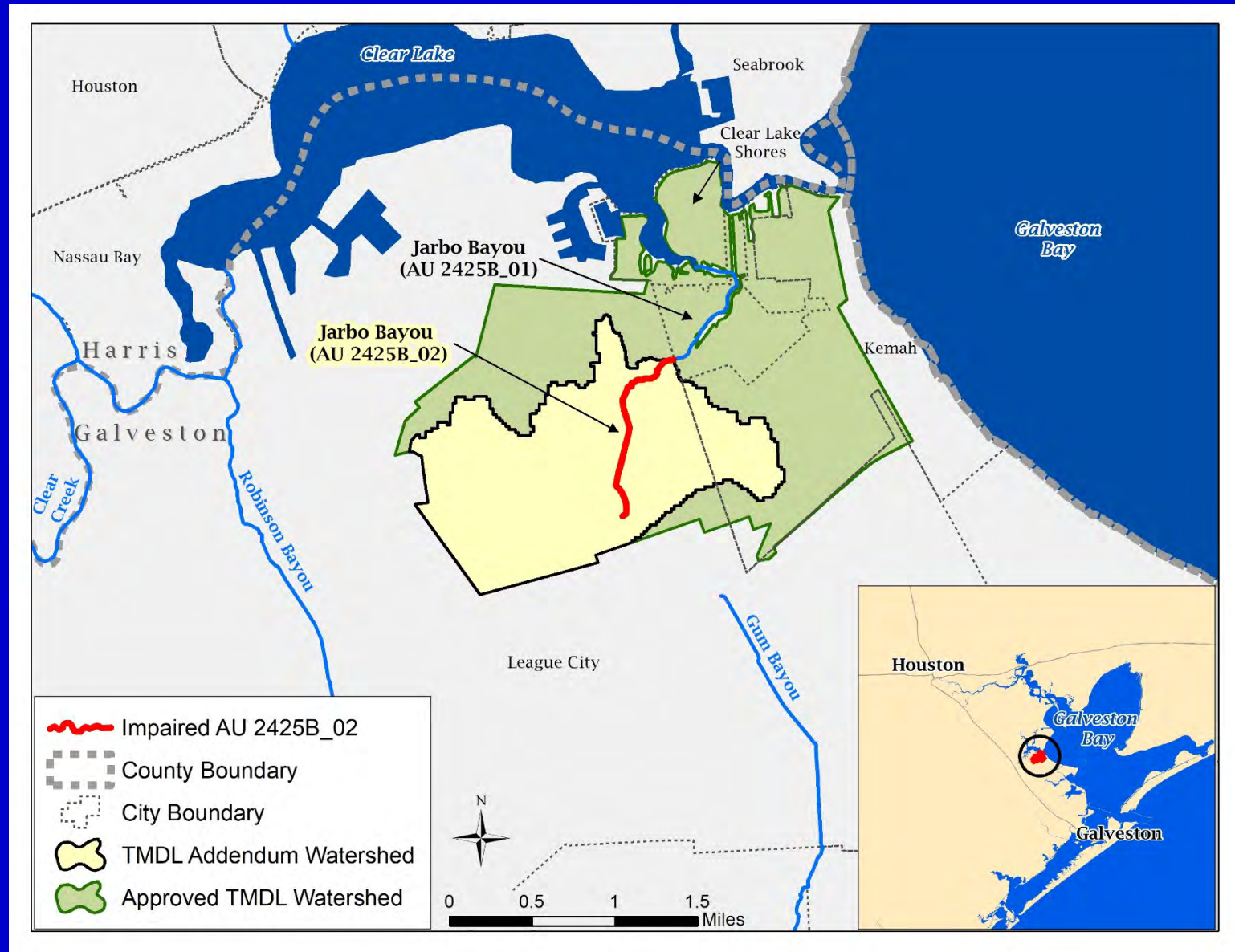


Previously Completed Indicator Bacteria TMDL for Jarbo Bayou

Adopted by TCEQ: Jan. 24, 2018; Approved by EPA: Mar. 29, 2018

Segment Name	Segment Number	Assessment Unit (AU)
Jarbo Bayou	2425B	2425B_01

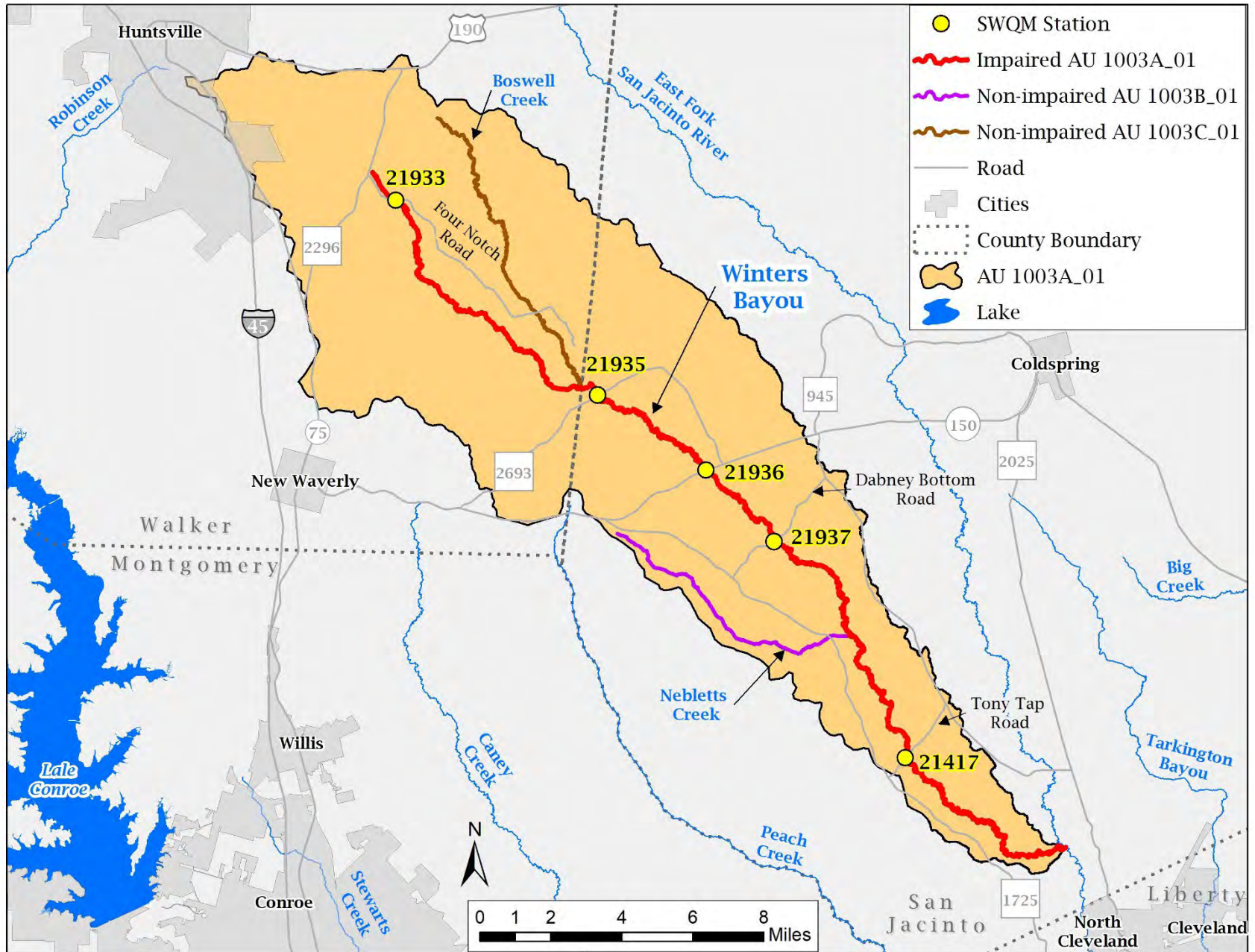
Jarbo Bayou Watershed showing area of completed TMDL



FIRST NEW PROJECT

Addendum Three to *Seven TMDLs for Indicator Bacteria in Lake Houston, East & West Fork San Jacinto river, and Crystal Creek Watersheds*

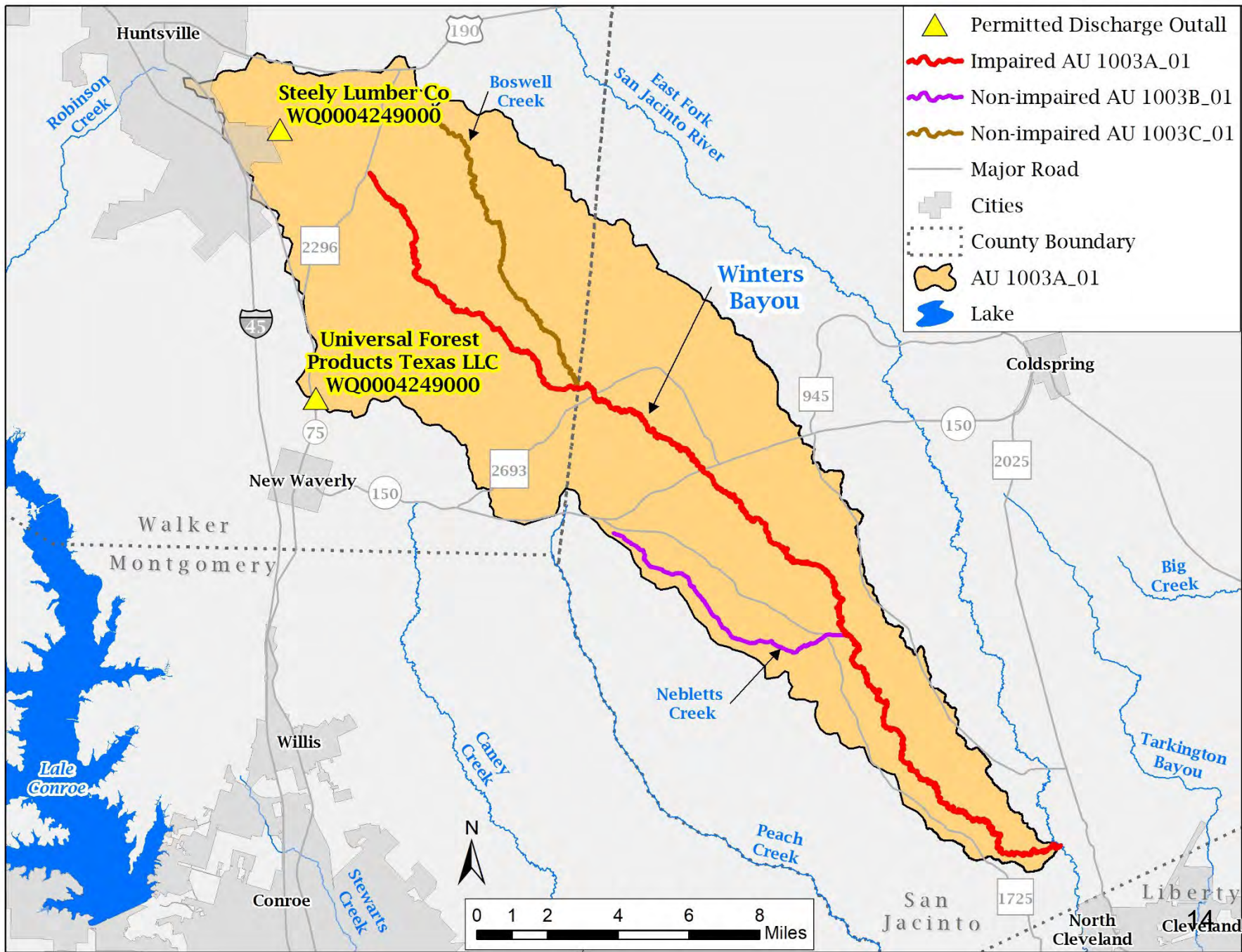
- Project water body
 - Winters Bayou (1003A_01)
- Approach for TMDL – FDCs/LDCs












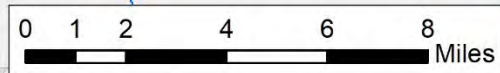
Summary Integrated Report Findings for *E. coli* Assessment (criterion = 126 CFU/100 mL)

Integrated Report Year	AU	Stations	No. of Samples	Data Date Range	Geometric Mean (CFU/100 mL)
2022	1003A_01	21417, 21933, 21935, 21936, 21937	63	2013-2020	164

Key features within the watershed as they pertain to bacteria TMDL development

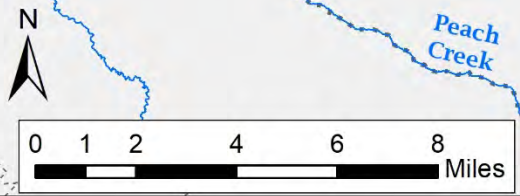
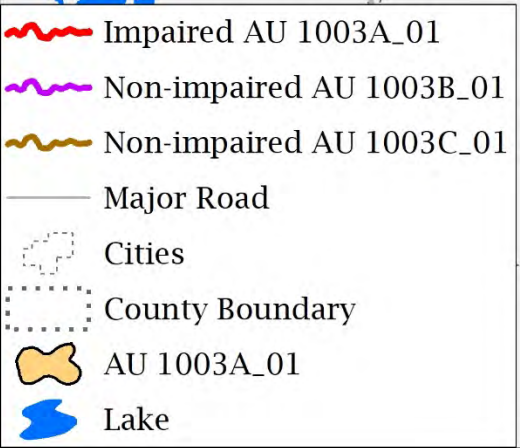
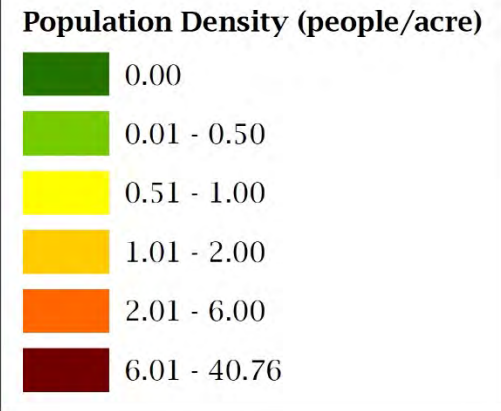
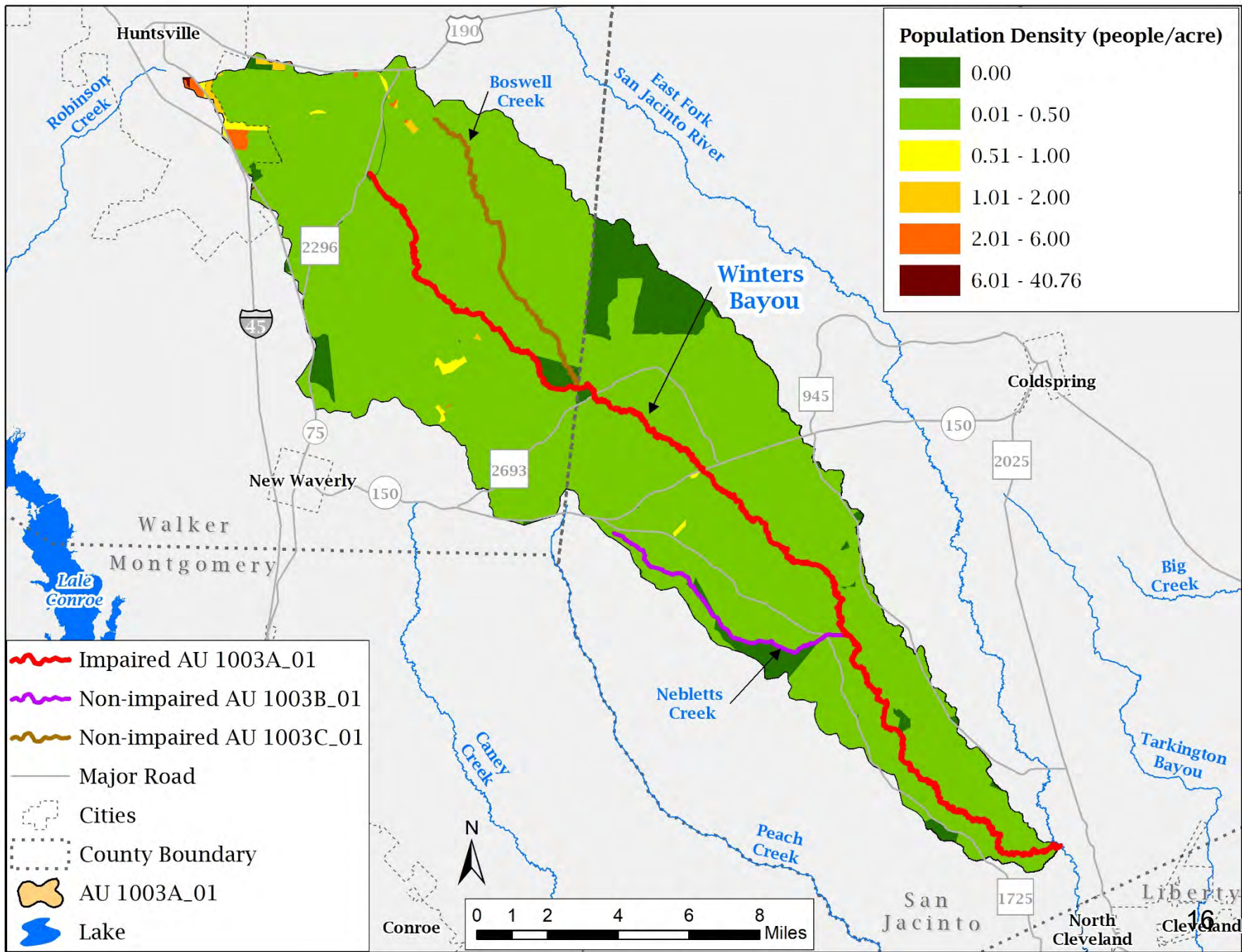


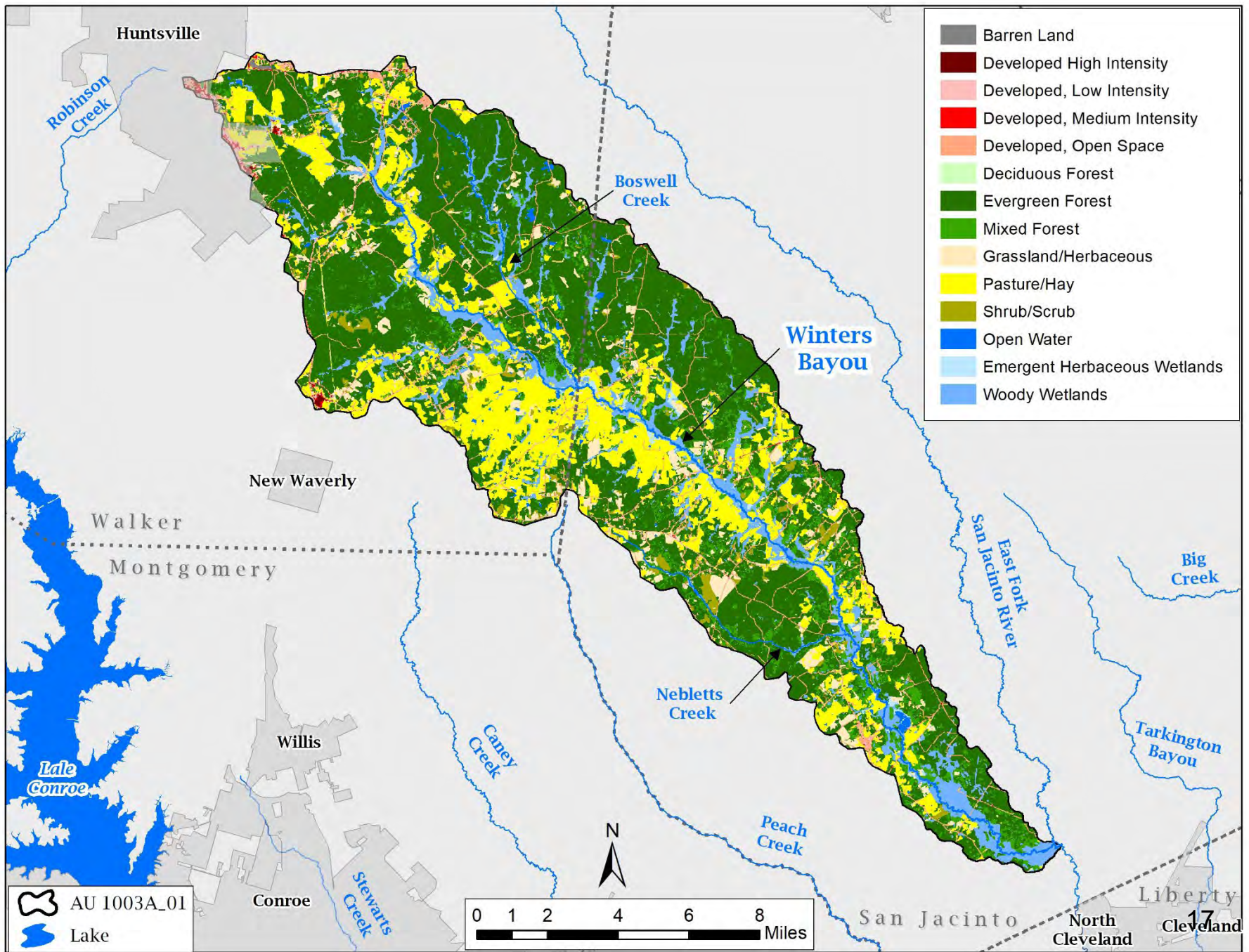
-  Permitted Discharge Outfall
-  Impaired AU 1003A_01
-  Non-impaired AU 1003B_01
-  Non-impaired AU 1003C_01
-  Major Road
-  Cities
-  County Boundary
-  AU 1003A_01
-  Lake

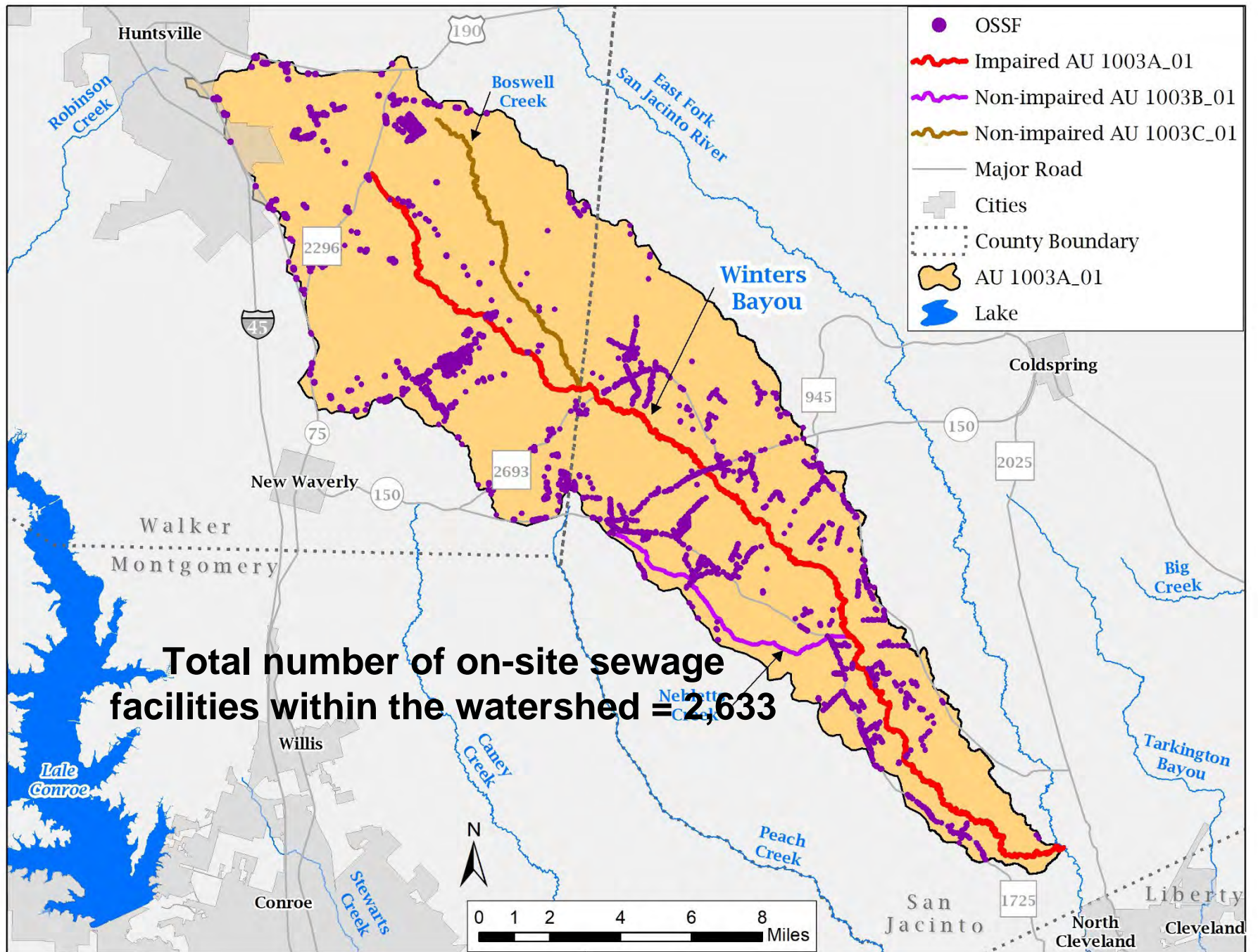


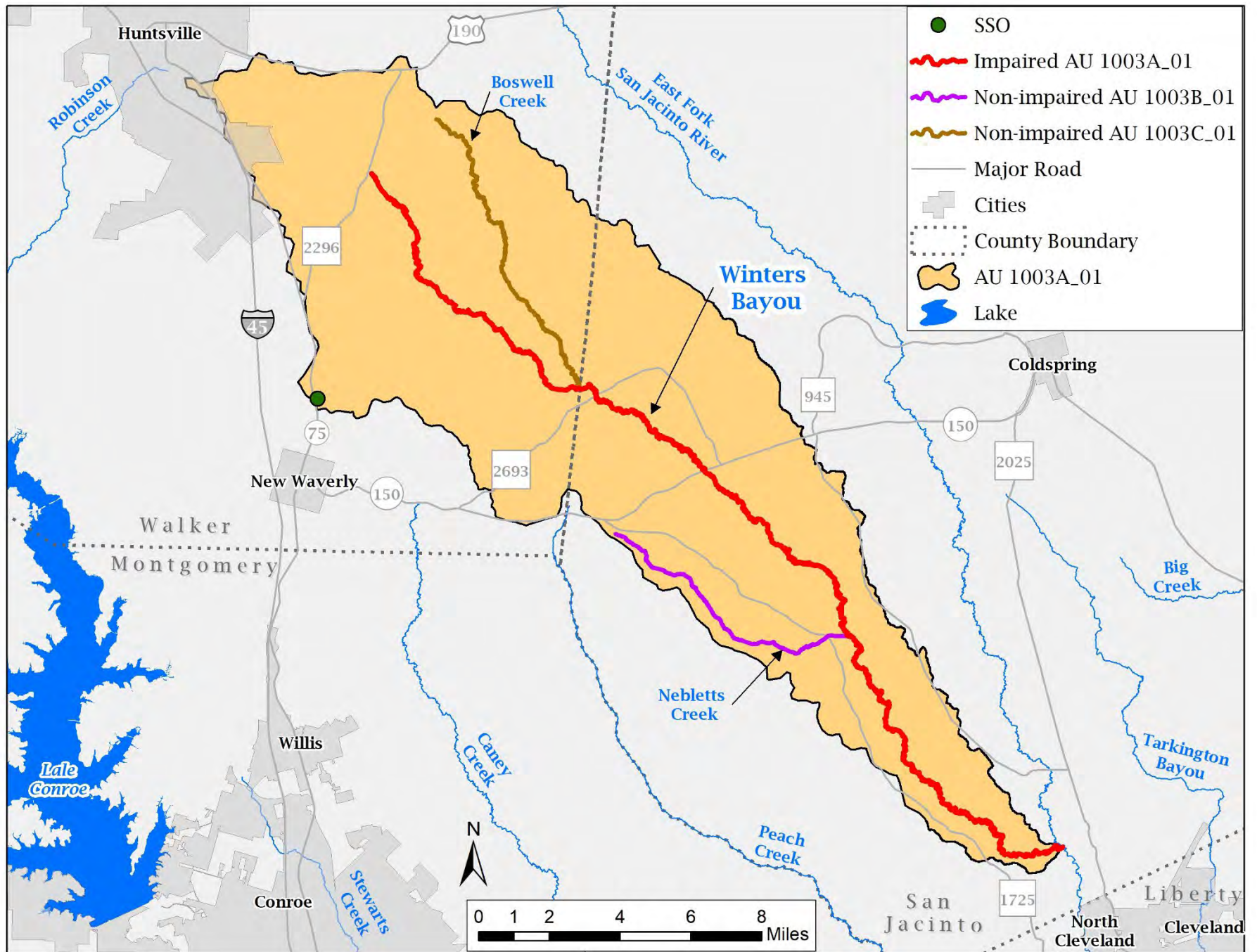
Estimated Area under Stormwater Permit Regulations

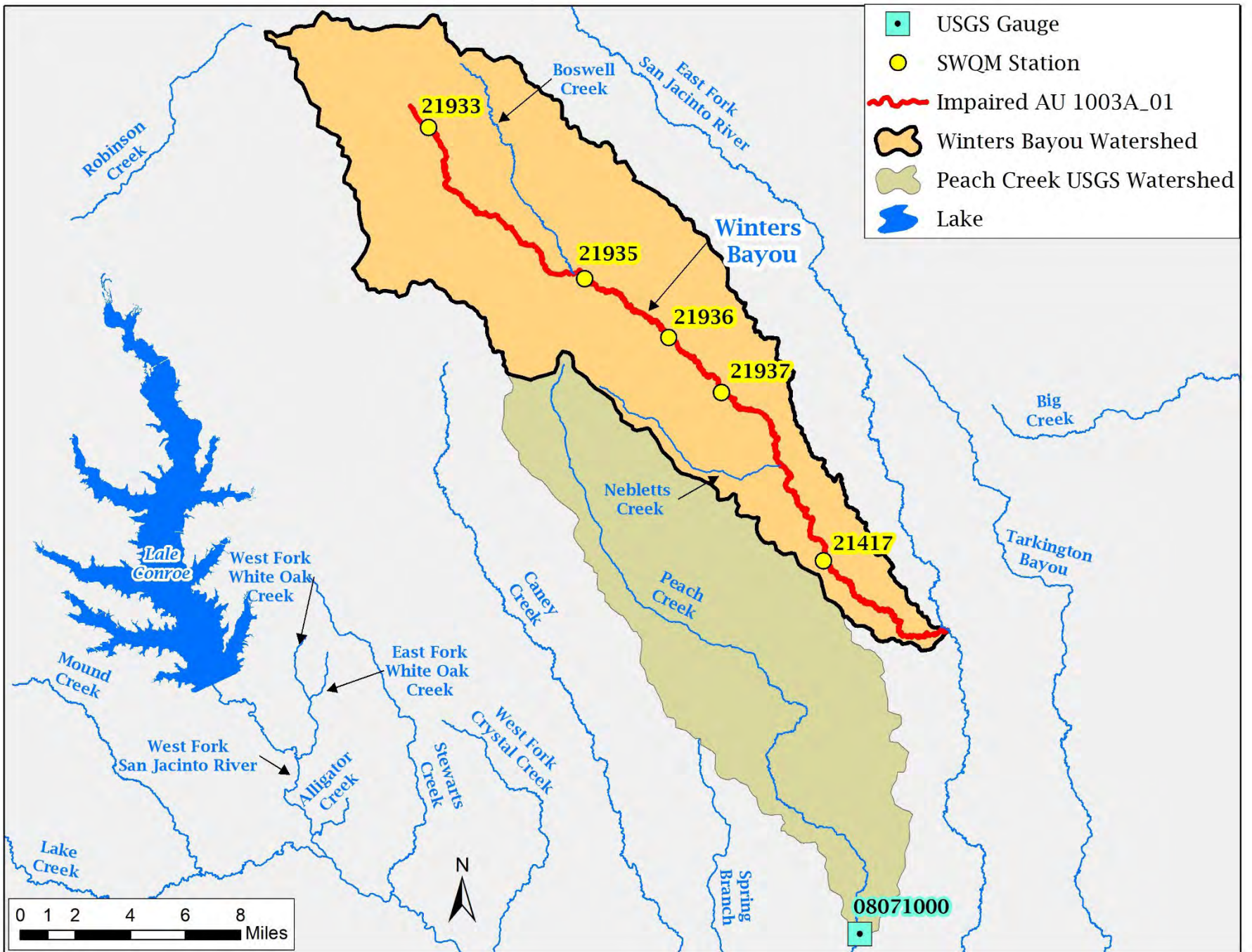
AU	AU Area within 2010 Urbanized Areas (acres)	AU Area under stormwater permits (acres)	AU watershed area (acres)	Percentage of drainage area under stormwater regulation (%)
1003A_01	0	62	109,266	0.06%







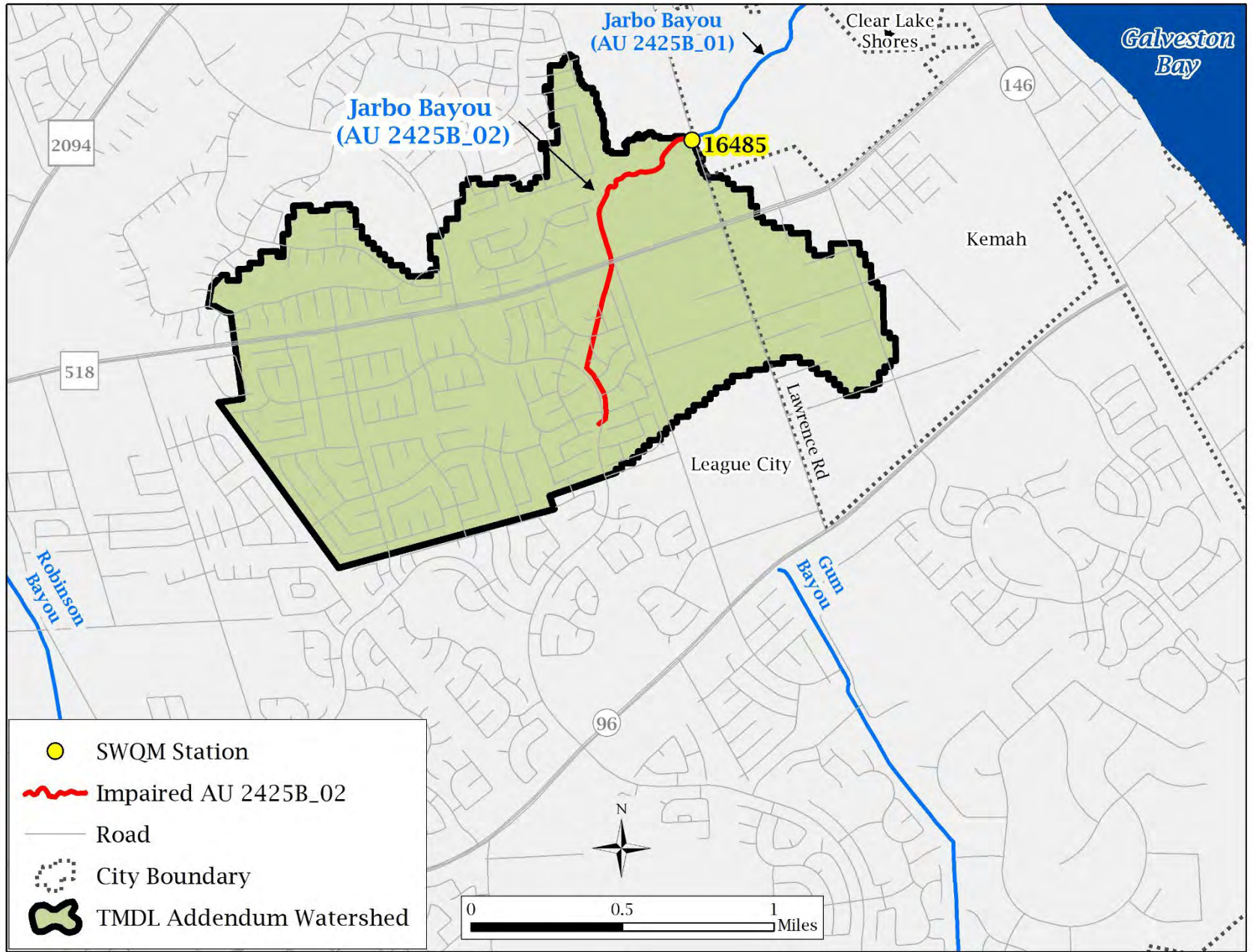




Second NEW PROJECT

Addendum to *One TMDL for Indicator Bacteria in Jarbo Bayou*

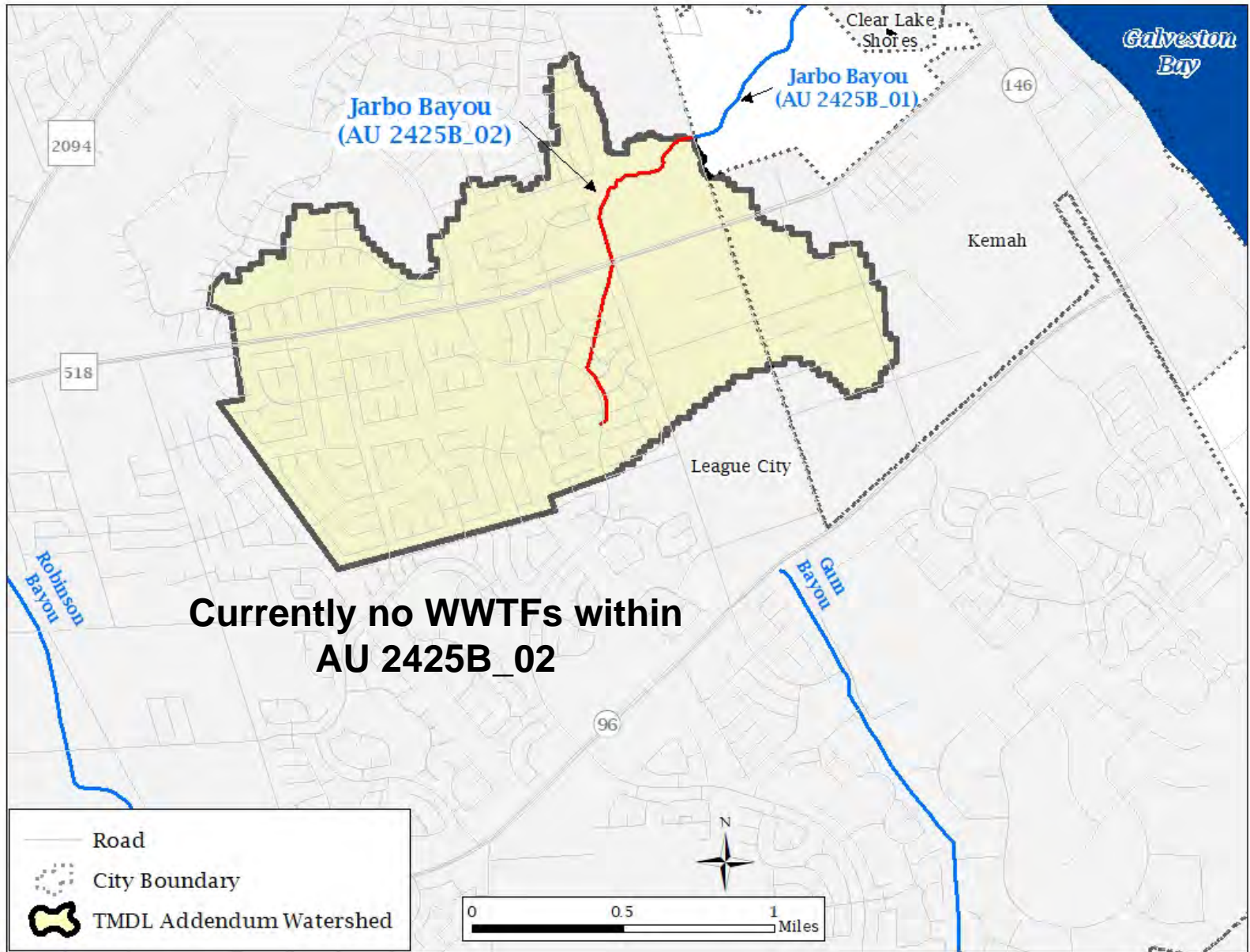
- Project waterbody
 - Jarbo Bayou (2425B_02)
- Approach for TMDLs – Modified LDC Method

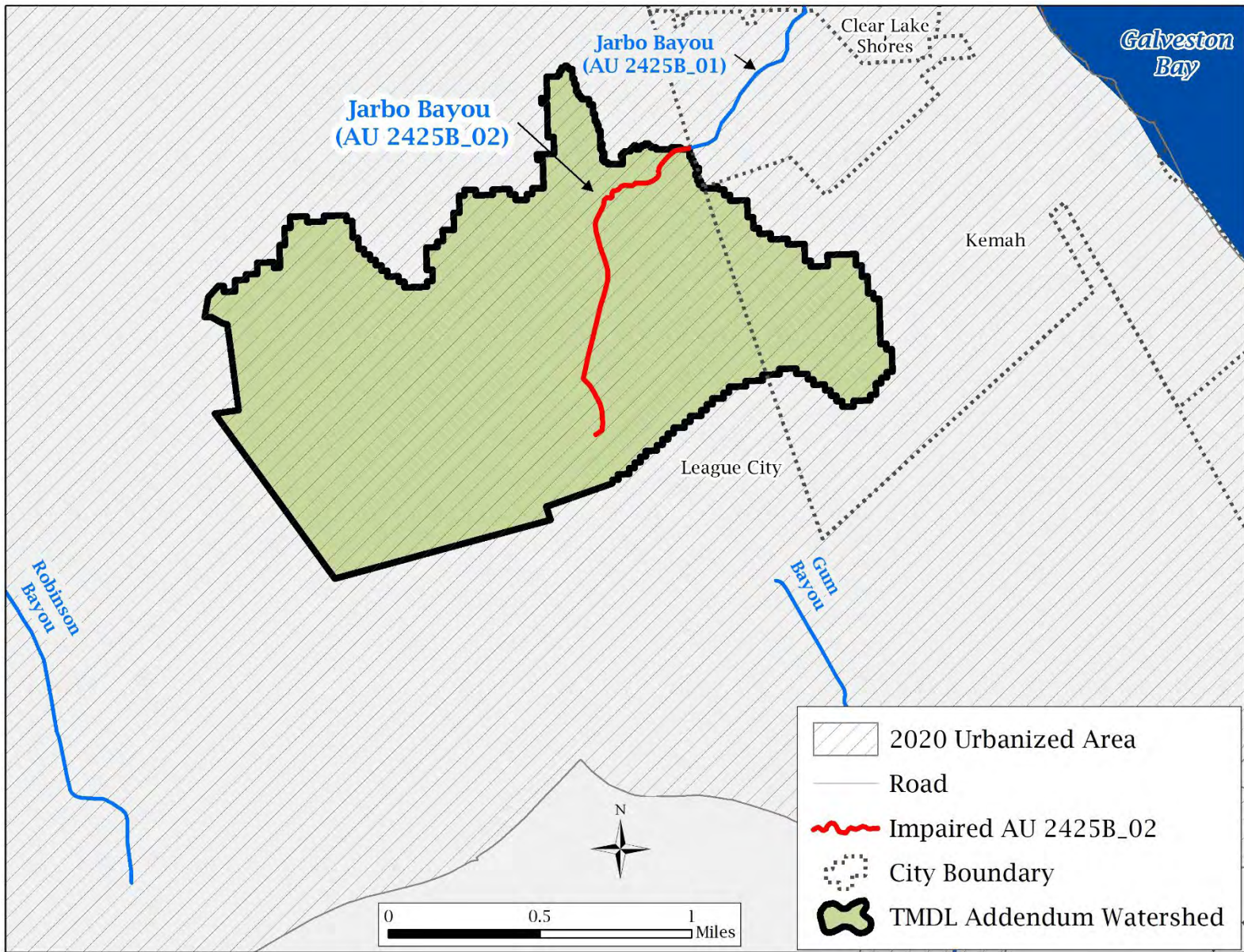


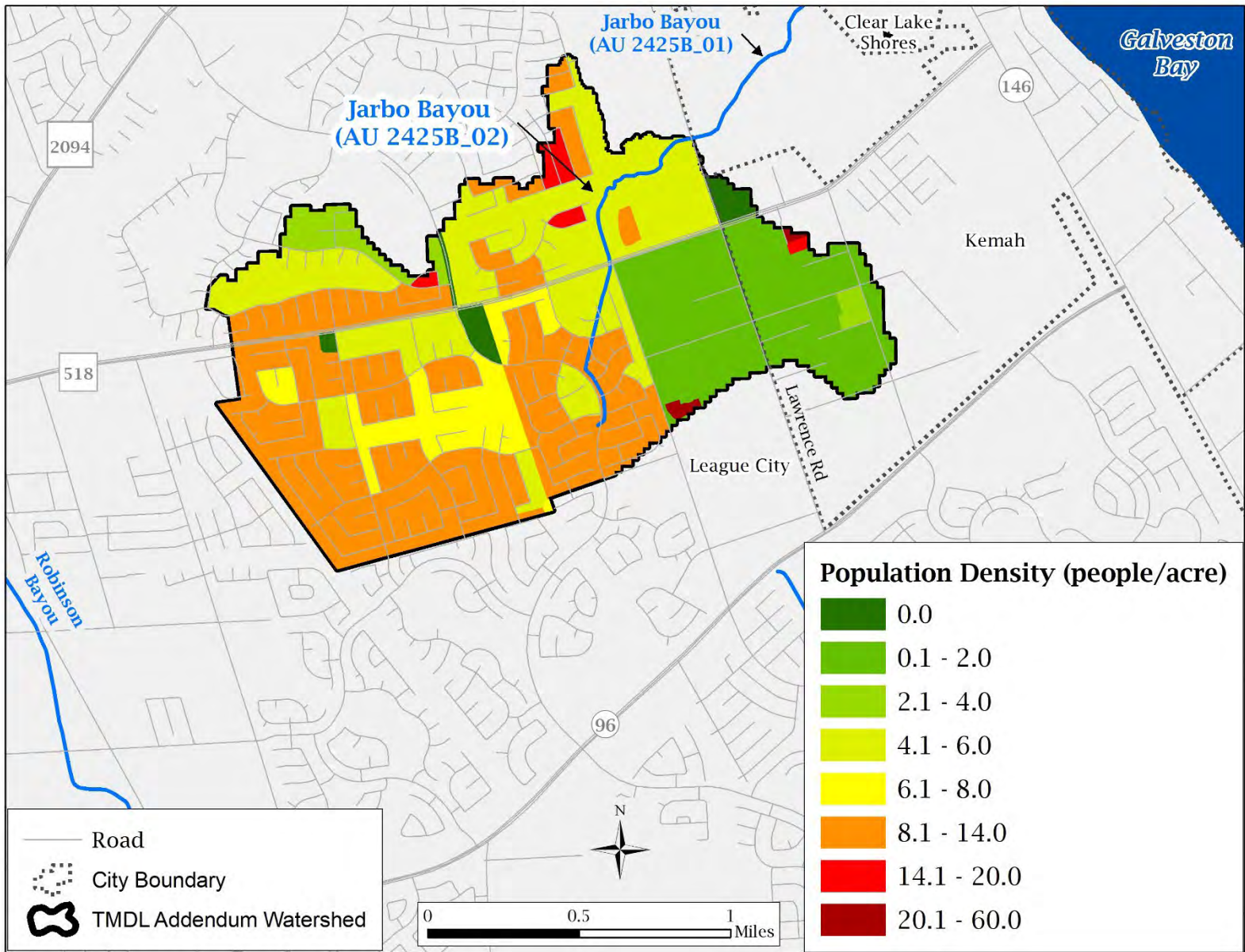
Summary Integrated Report Findings for *Enterococcus* Assessment (criterion = 35 CFU/100 mL)

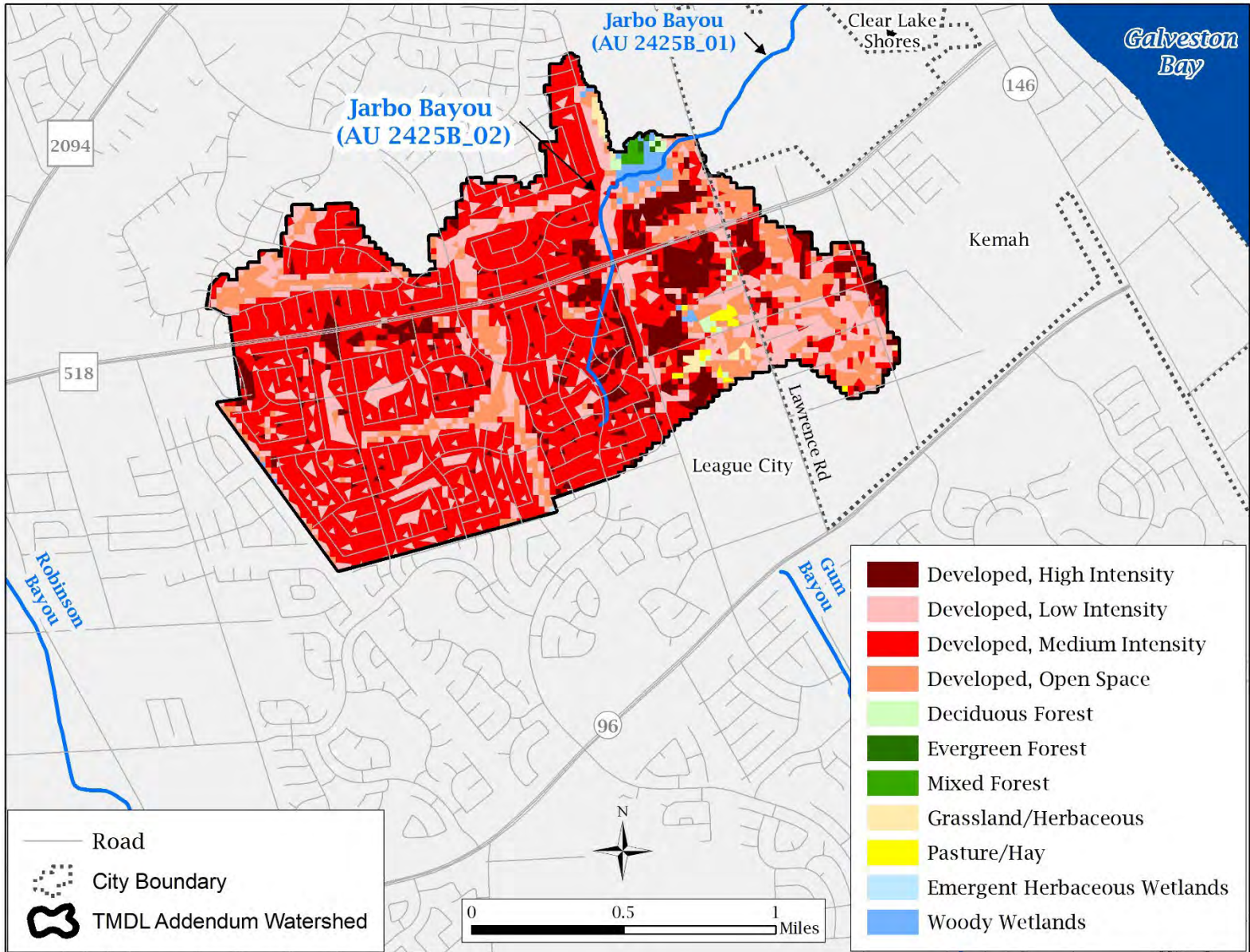
Integrated Report Year	AU	Stations	No. of Samples	Data Date Range	Geometric Mean (CFU/100 mL)
2022	2425B_02	16485	22	2013-2020	127

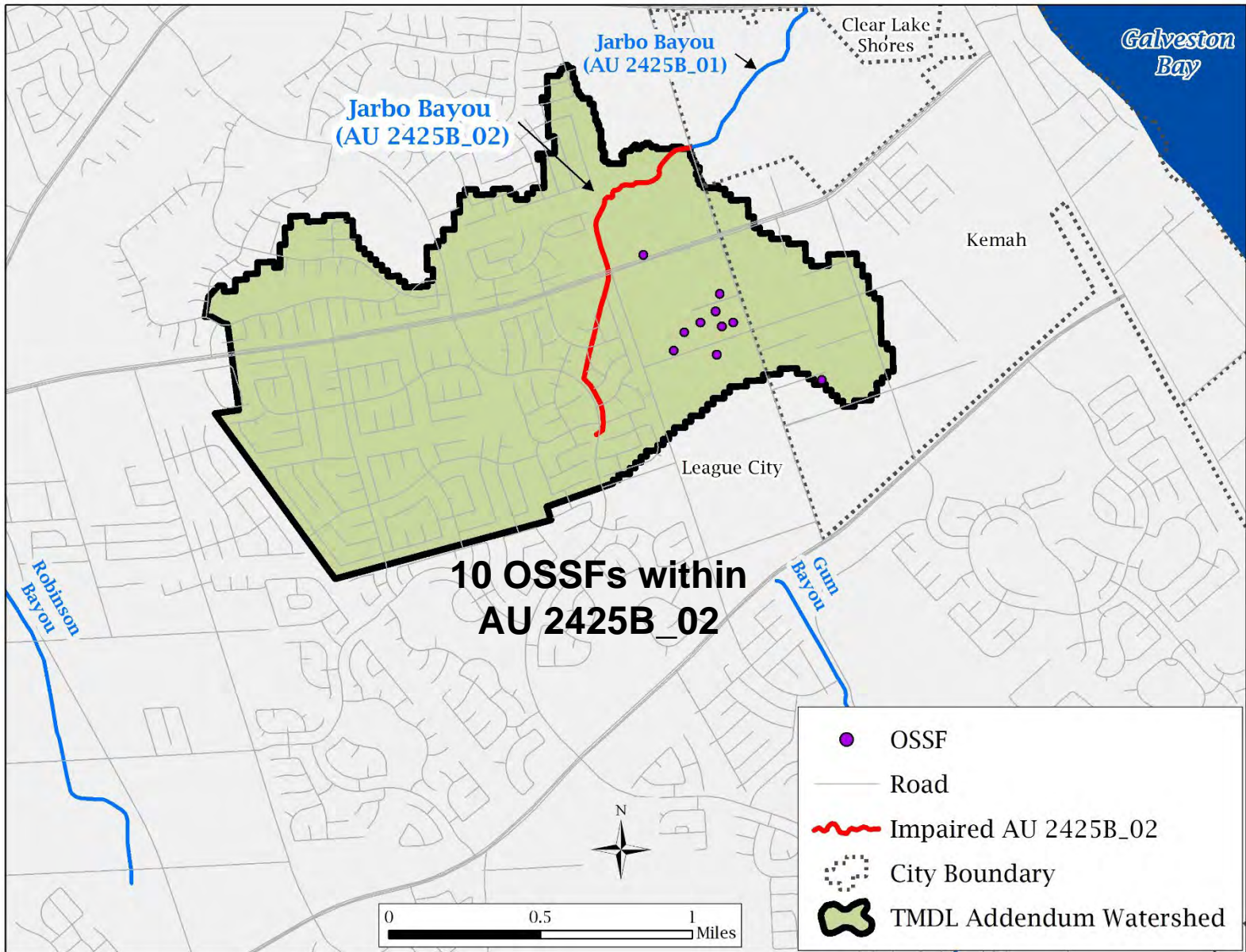
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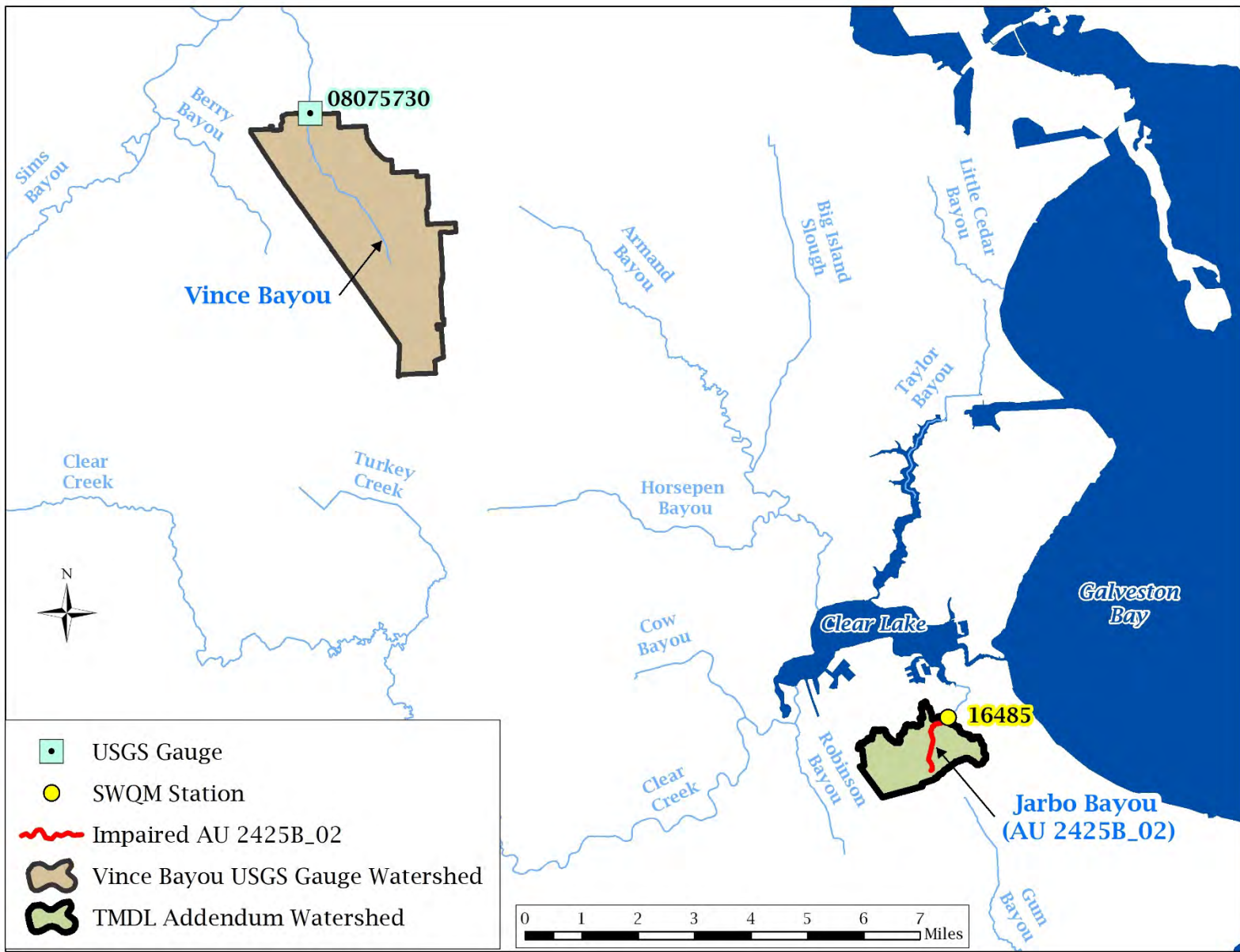












Status of TMDL Development

- Technical Support Documents (TSDs) to be completed by the end of Aug. 2023
- TSDs will be posted on TCEQ website (TCEQ will notify BIG when they are available for public review and comment)
- TCEQ will use TSDs to develop addenda to be included in Water Quality Management Plan updates

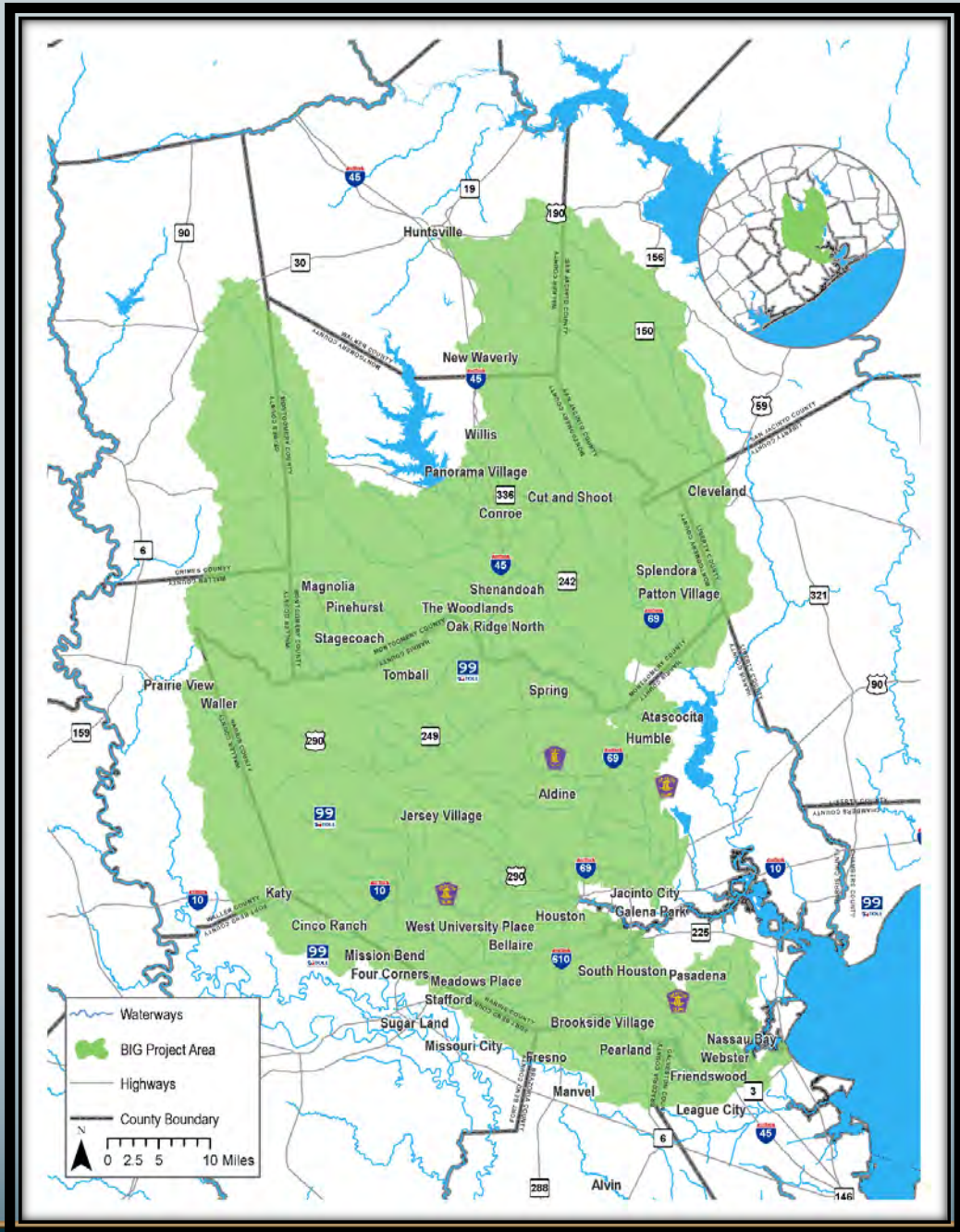
Thank You

Any Questions?

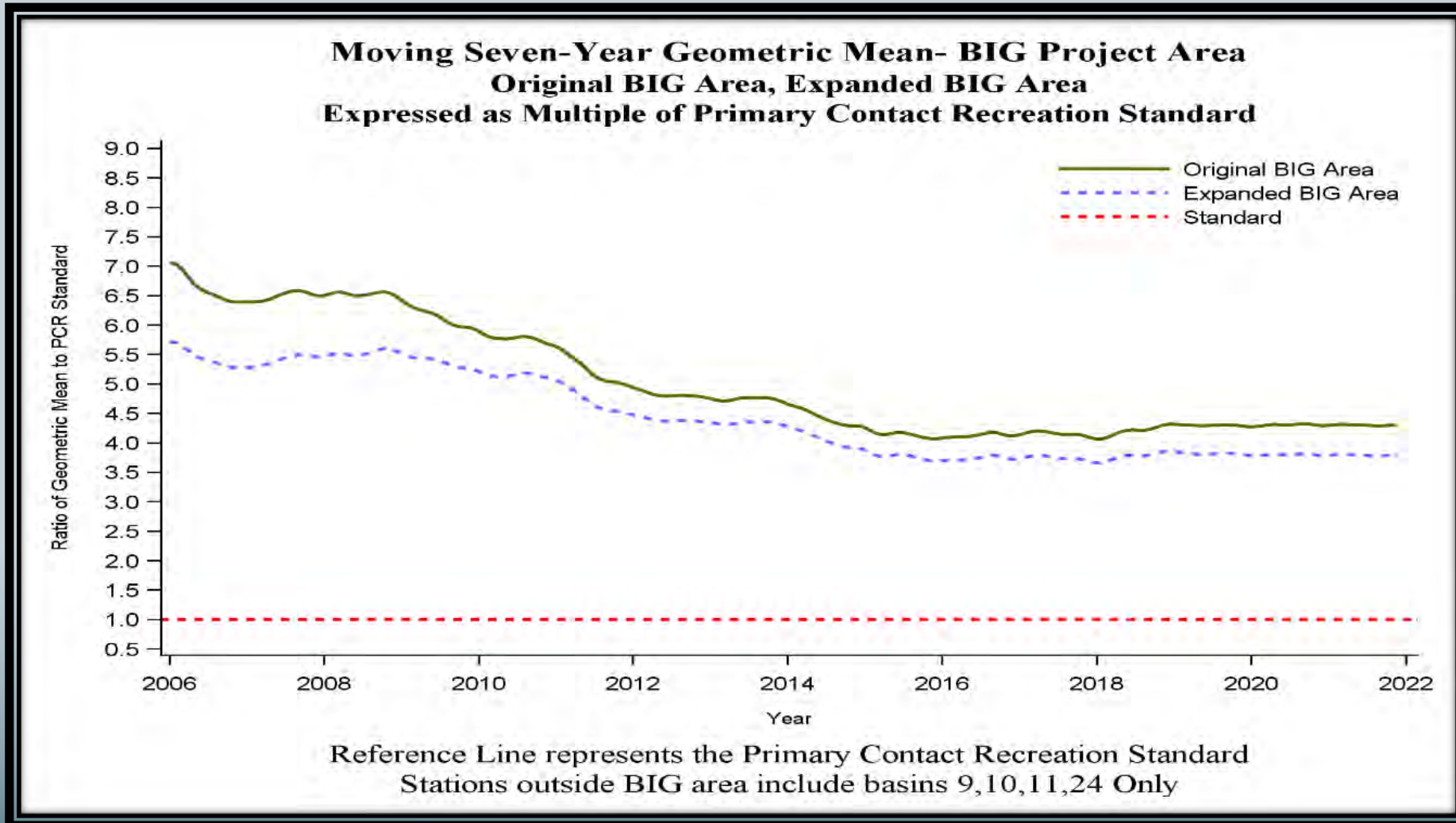
Jimmy Millican
email: jmillican@tarleton.edu

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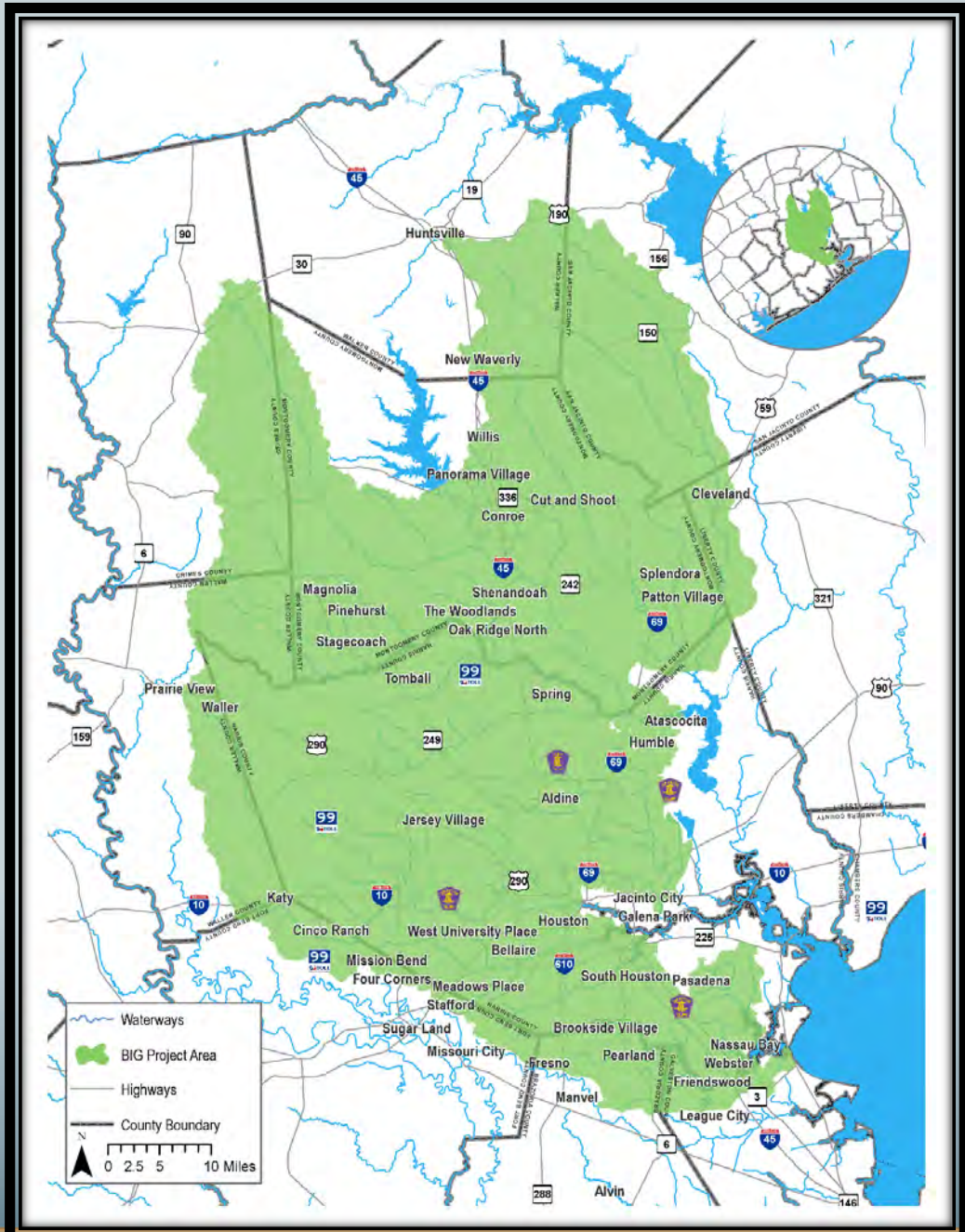


REFLECTONS ON FECAL INDICATORS



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Presentations - *Partner Highlight*

Galveston Bay Foundation Outreach Programs – *Ms. Natasha Zarnstorff*





GALVESTON BAY
FOUNDATION

Guardian of Galveston
Bay since 1987

Galveston Bay Foundation's Water Quality Programs

Natasha Zarnstorff, Water Quality Programs Manager

Mission

The mission of Galveston Bay Foundation is to preserve and enhancing Galveston Bay as a healthy and productive place for generations to come.



Vision

We envision a future Galveston Bay that is brimming with vitality, connected to people, and contributing to the community in every possible way.



Galveston Bay Foundation Program Areas



Education



Restoration



Water Protection



Conservation



Advocacy



How Are You Connected to the Bay?



GALVESTON BAY STARTS
IN OUR BACKYARD

Galveston Bay Bacteria Reduction Plan

I. Wastewater Treatment Facilities (WWTFs)

- Sanitary Sewer Overflows
- Facility malfunction or flooding

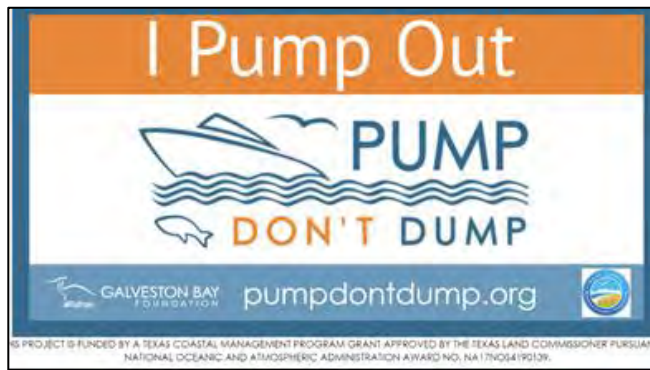
II. On-Site Sewage Facilities (OSSFs)

III. Stormwater Runoff

- Nonpoint source pollution
- Behavior from residents
- Wildlife & Pets

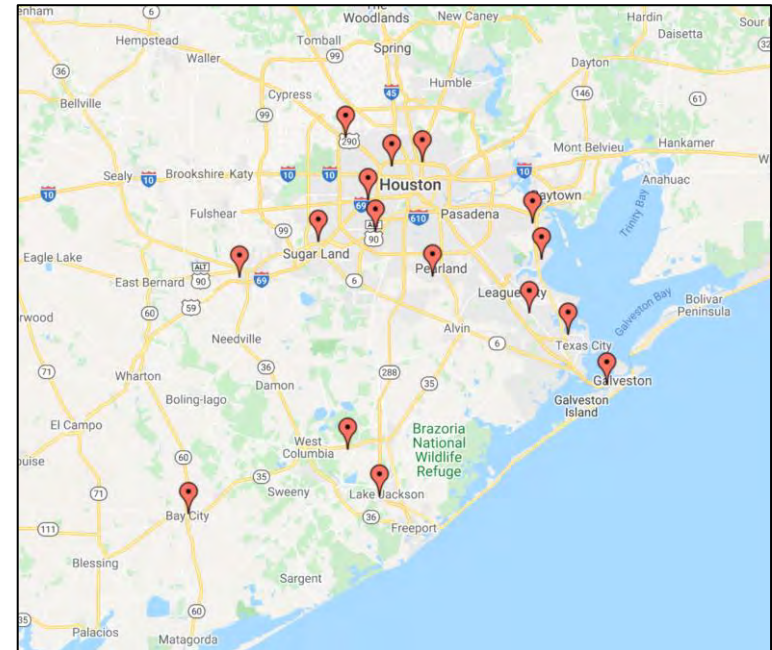


Pollution Prevention Tools



Cease the Grease

- Always throw your cooking waste, such as fats, oils, and grease, in the trash –never down the drain!
- Use a scraper or funnel to save your FOG in a jar to reuse, recycle, or throw out.
- Visit ceasethegrease.net to find a cooking oil recycling station near you!



Pump Don't Dump

- Increase the number and use of pump-out stations
- Raise the level of enforcement
- Enhance education and outreach
- Measure behavior change



I PUMP OUT

**PUMP
DON'T DUMP**

pumpdontdump.org GALVESTON BAY FOUNDATION

**KEEP OUR MARINA CLEAN
USE PUMP-OUTS
AVOID FINES UP TO \$500 PER DAY**

Learn how and where to pump out waste:  GALVESTON BAY FOUNDATION

Visit pumpdontdump.org

Galveston Bay Action Network
GALVESTON BAY FOUNDATION

Report suspected boat sewage or pollution:
Download the Galveston Bay Action Network app or report at galvbay.org/GBAN

ENSURE THE FASTEST POLLUTION CLEANUP!



THIS PROJECT IS FUNDED (IN PART) IF APPROPRIATE BY A TEXAS COASTAL MANAGEMENT PROGRAM GRANT APPROVED BY THE TEXAS LAND COMMISSIONER PURSUANT TO NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AWARD NO. NA16HQ04190155.

Anti-Pollution Signage

- Resource originally requested by City of La Porte Public Works
- Sharing with other municipalities, businesses, parks, and neighborhood groups
- Open to a variety of designs!



Water My Yard

- Free weekly (custom!) watering recommendations
- Based on your location and sprinkler type
- 50 percent of household irrigation water is wasted
- Efficient watering can
 - Ensure adequate freshwater inflows to Galveston Bay
 - Increase resilience
 - Decrease subsidence
 - Reduce runoff



HARRIS-GALVESTON
SUBSIDENCE DISTRICT



Water_{My}Yard 



Rain Barrel Workshops

- Less water pulled from rivers and streams
 - Consistent environment for plants and animals (salinity)
 - Less subsidence
 - Reduces demand on storm drains during rain events
- Reduced run-off pollution in urban areas

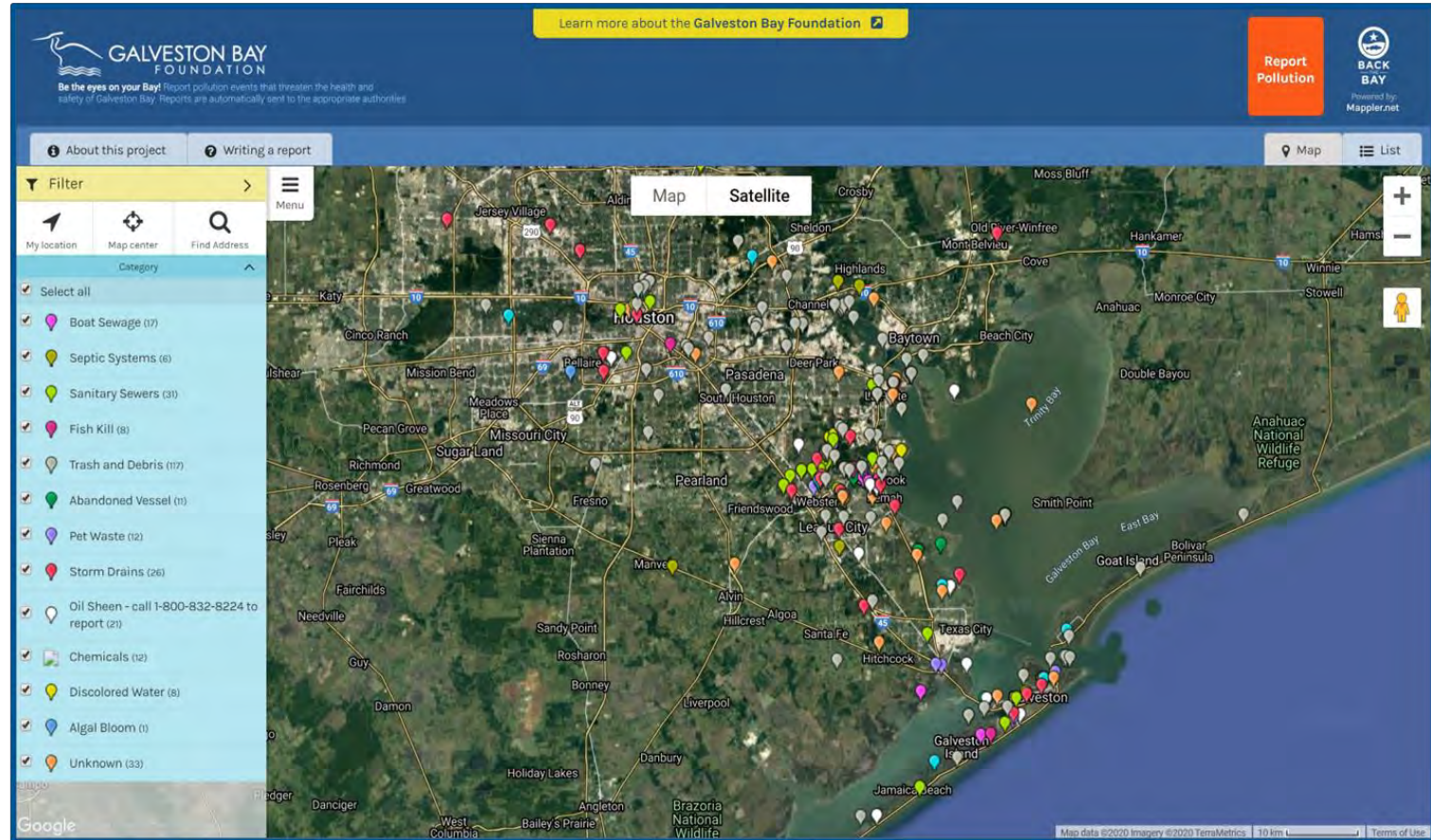
Impact since 2013:

- Over 2,400 attendees, ~3,200 barrels
- 1,050 gallons saved per year per barrel
- 3,269 rain barrels = 3.4 million gal. of water per year



Galveston Bay Action Network (GBAN)

- Report pollution on GBAN
 - Polluted water, fish kills, debris in street or drains
 - Automatically sent to appropriate authorities



Effects of Trash on Our Community & Bay

Impacts water quality

- Blocks light and natural flow
- Reduces oxygen levels
- Leaches chemicals

Increases flood risks

- Physically clogs storm drains

Can impact tourism interest

- Unsightly during recreation
- Costly ~\$21 million/year in Houston

Dangerous for wildlife

- Entanglement
- Ingestion
- Carries on in food chain



Marine Debris Projects

NOAA MDMAP Surveys

- Over 18,250 pieces catalogued and removed
- Conducted monthly at 7 locations

Micro Plastics

- Less than 5 mm
- One survey location
- Mississippi State University Coastal Research and Extension Center

Nurdle Surveys

- Over 45,000 nurdles removed
- NurdlePatrol.org

Used for:

- Contributions to national research
- Engagement
- ID locations needing help!



Water Monitoring Team

- About:

- 10 years old
- Part of Texas Stream Team

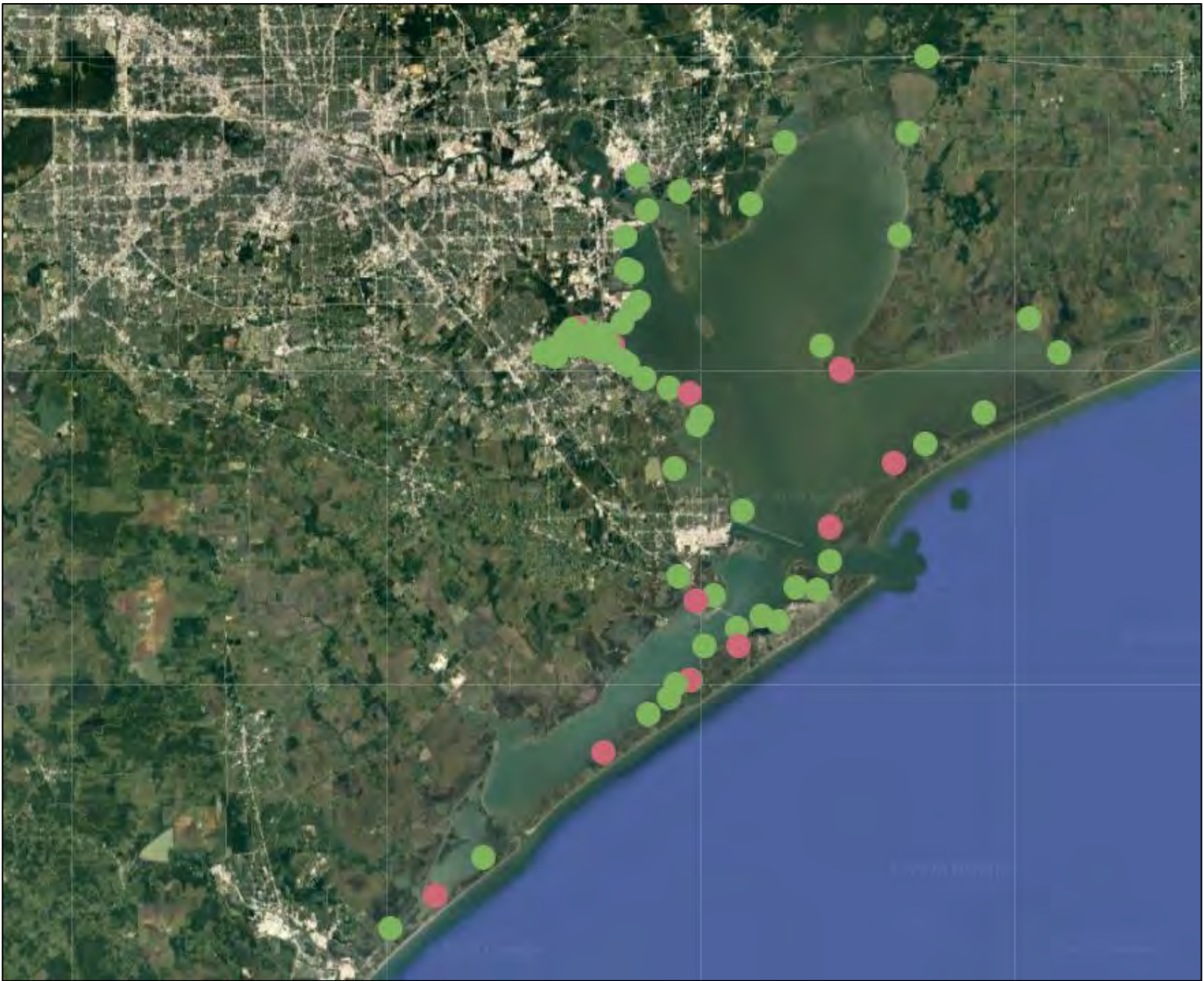
- Sample for:

- WQ indicators: Air and water temperature, DO, pH, Salinity, Turbidity, Depth
- Observations: odor, algae, color, weather, tide
- Enterococcus bacteria

- Uploaded to:

- Swim Guide
- Website - <http://waterdata.galvbay.org/>





See the data - <http://waterdata.galvbay.org/>

The screenshot shows the website's header with the Galveston Bay Foundation logo and social media icons for Facebook, Twitter, YouTube, and Instagram. A navigation bar contains links for MAP, ABOUT, and DOWNLOAD DATA. The main content area is titled "WATER QUALITY DATA VISUALIZATION PORTAL" and contains the following text:

Galveston Bay Foundation's Water Monitoring Team collects monthly water quality data at locations around Galveston Bay. This data portal allows you to select, view, interact with, understand, and download the data.

For each location, you can select a date range and a parameter to view the data findings. The line charts show how each parameter has changed over time at that site. The pie charts highlight the percentage of healthy or safe values for each parameter, based on the selected time range. Click on a location to get started!

Data can also be downloaded from the "Download Data" tab.

Below the text is a satellite map of Galveston Bay with numerous monitoring sites marked by colored dots. A legend at the bottom indicates that green dots represent "Active Sites" and red dots represent "Inactive Sites". A tooltip for one site reads "Galveston Bay at Topwater Grill".



WATERKEEPER/AFFILIATE

SWIM GUIDE



IS IT SAFE TO SWIM?



DISCOVER YOUR LOCAL BEACHES

GALVESTON BAY FOUNDATION

DOWNLOAD THE APP



OVERALL HEALTH OF THE BAY

HUMAN HEALTH RISKS

WATER QUALITY

COASTAL CHANGE


WILDLIFE

POLLUTION EVENTS & SOURCES

Join Our Mission to Protect Your Backyard Bay
galvbaygrade.org | www.galvestonbay.org

Category	Score
Human Health Risks	C
Water Quality	A
Coastal Change	C
Wildlife	C
Pollution Events & Sources	C



Water_{my}Yard 



GALVESTON BAY FOUNDATION

Volunteer Water Quality Monitor

galvbay.org/watermonitor



CEASE THE GREASE
 A GALVESTON BAY FOUNDATION PROGRAM

Thank you!



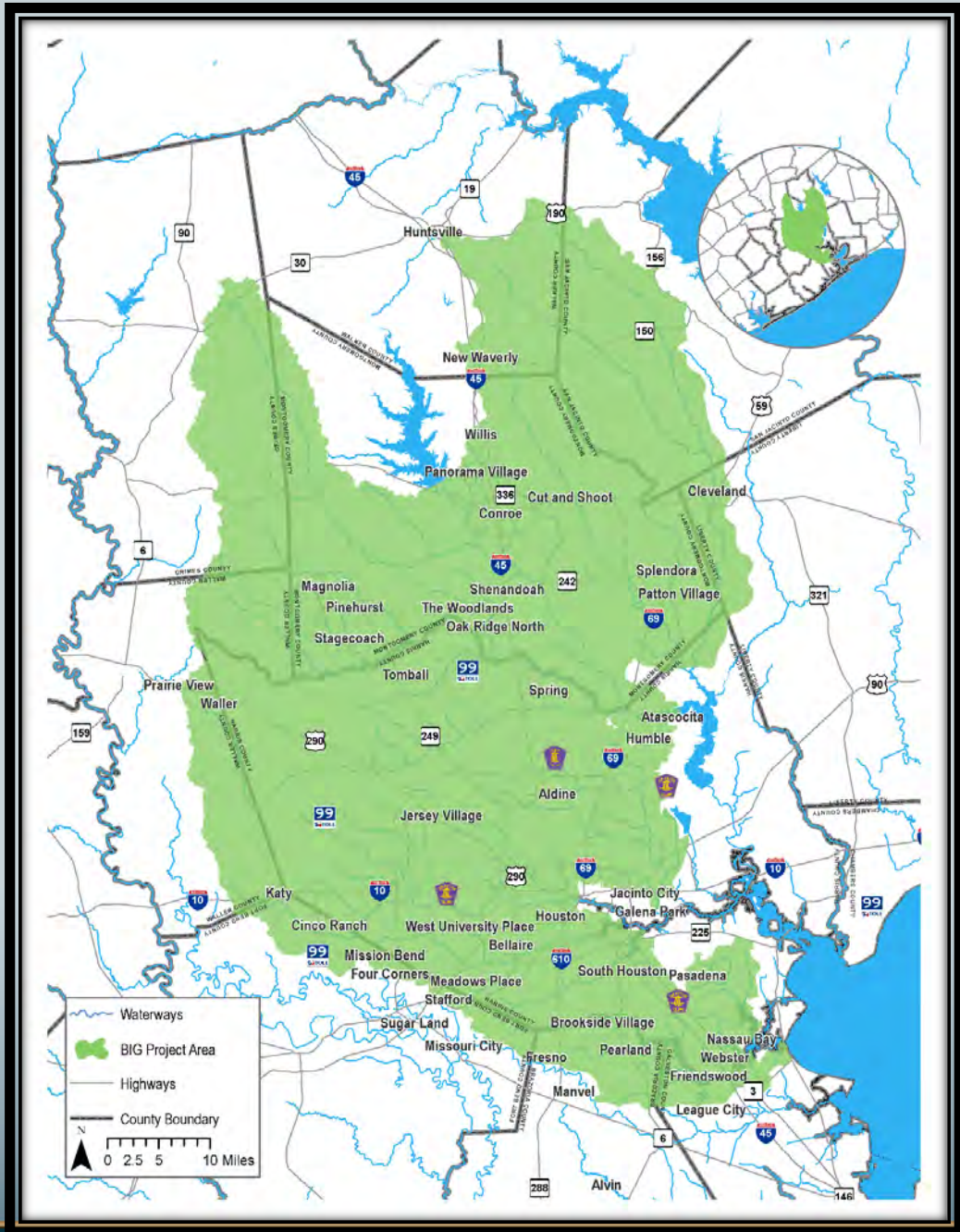
Presentations – H-GAC

- Targeted Monitoring –
Ms. Jean Wright
- Watershed Protection Planning -
Ms. Rachell Windham
- Green Infrastructure Project –
Ms. Jessie Casillas
- Region TMDL Projects –
Mr. Steven Johnston



AGENDA

- Call to Order/Introductions
- Quorum Certification
- Review and Approve Changes to the BIG Roster
- Review and Approve Minutes
- Public Comment
- Item One: I-Plan Update
- Item Two: 2022 Annual Report
- Item Three: 2023 Annual Report
- Item Four: TMDL Program Update
- Item Five: Fecal Indicator Discussion
- Item Six: Implementation Project Presentations
- Item Seven: **Other Business**
- Adjourn



WATERSHED PROTECTION PLANS

Rachel Windham, Senior Planner
Houston-Galveston Area Council

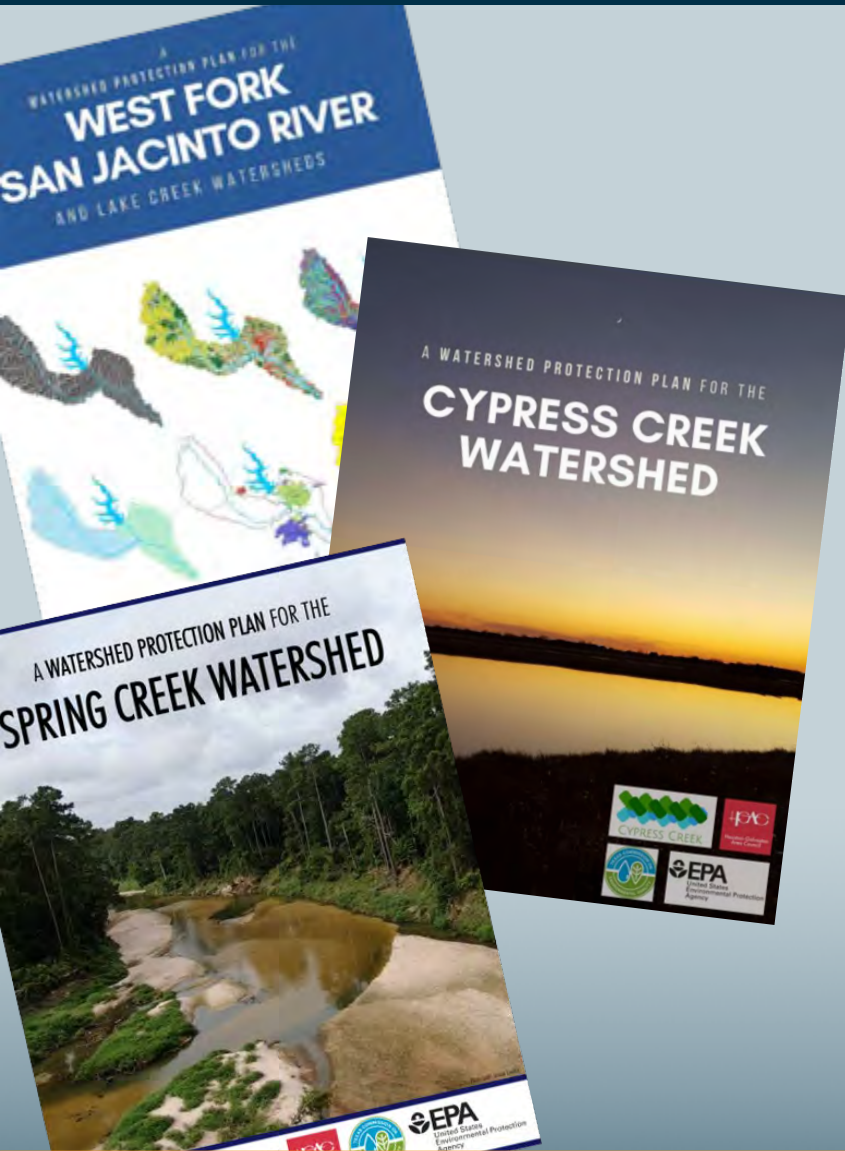
Bacteria Implementation Group – Spring Meeting
May 23, 2023





H-GAC Plans

Watershed Protection Plans (WPPs)



- Non-regulatory, adaptive management roadmaps
- Data-based strategies enhanced by local knowledge
- Developed by stakeholder partnerships
- Can target multiple water quality concerns

Clear Creek



Densely developed watershed

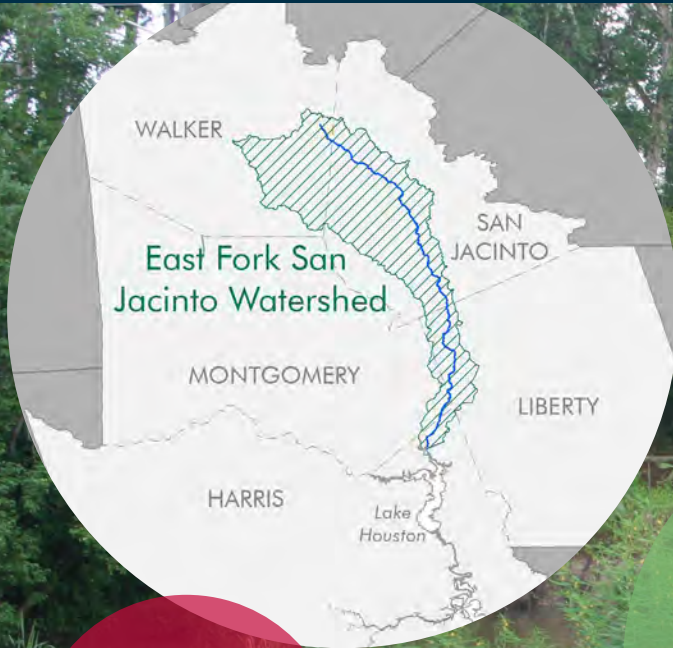
Project initiated in 2021

Held public meetings to refine technical analyses and select implementation strategies

Drafting watershed protection plan

Contact Justin Bower for more!

East Fork San Jacinto River



Primarily rural watershed

Project initiated in 2022

Holding public meetings to review preliminary technical analyses

Revised results will determine reductions needed and guide selection of implementation strategies

Contact Rachel Windham for more!

Implementation Project



Mixed
land use
watershed

Project
initiated in
2022

Coordinating
with key
stakeholders on
implementation
priorities

Supporting
outreach and
education
efforts

Contact
Rachel
Windham
for more!



Coordination

Role of the BIG

- Support implementation
- Connect with key partners
- Share with stakeholders



More Information

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Rachel Windham

Senior Planner

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 rachel.windham@h-gac.com

- [LINK: Watershed-Based Plan Viewer](#)
- www.clearcreekpartnership.com
- www.eastforkpartnership.com



Green Infrastructure Project

BIG Spring Meeting – May 23, 2023

Purpose

Produce performance database based on local (preferential), state, and national data



Develop recommended GI practice list



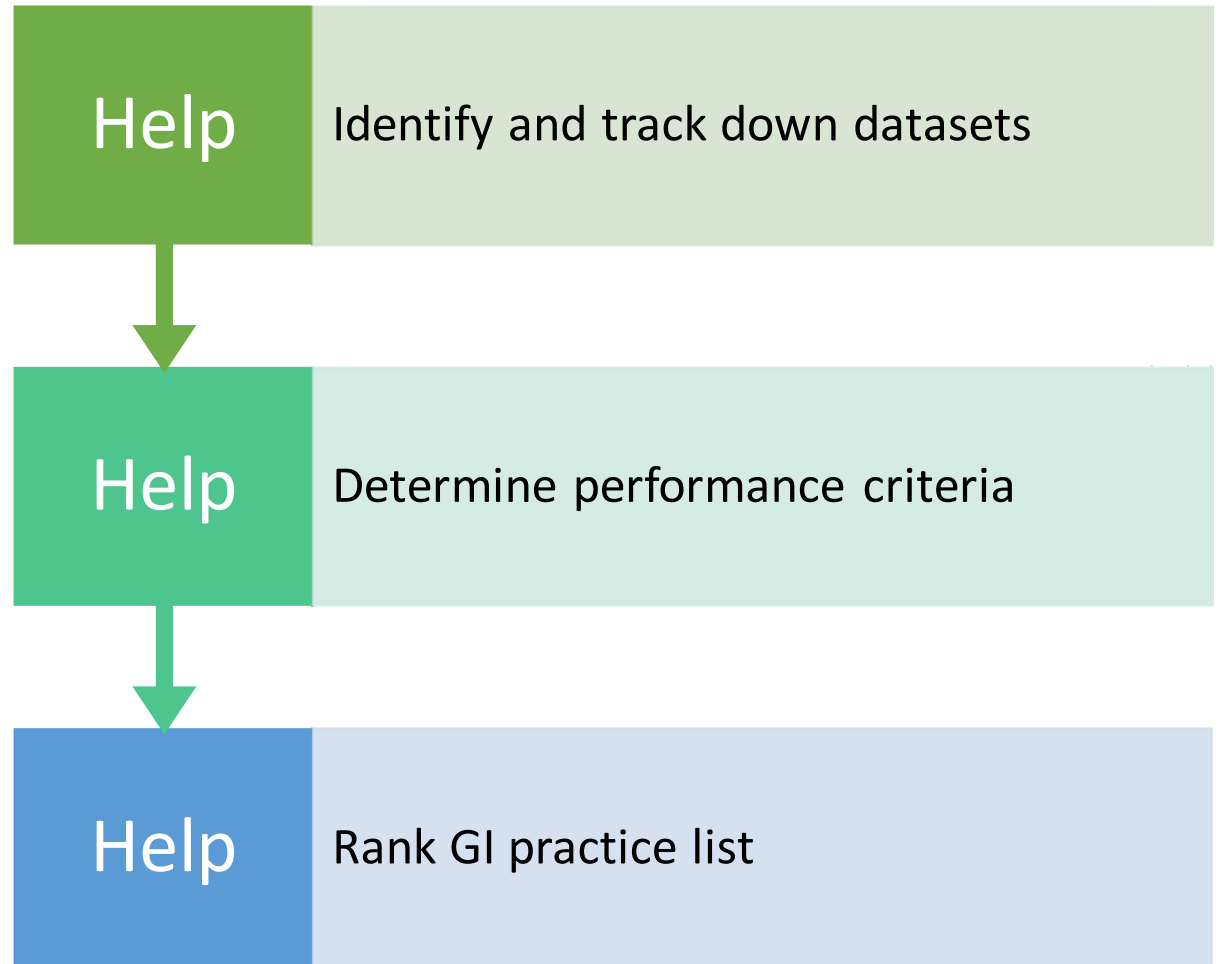
Outreach:

One-on-one meetings

Workshop

Website

Committee Role



Timeline





Contact Information

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Upcoming Meetings and Events

- May 31st – Clean Rivers Basin Steering Committee Meeting
- June 28th - Chocolate Bay Stakeholder Meeting
- June 29th – Oyster Creek Stakeholder Meeting
- July 10th – Regional Conservation Initiative/Parks and Natural Areas
- October 31st - BIG Fall Meeting



ADJOURN

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- 281-681-2579

