



Northern and Central (N&C) Watershed Protection Plan

Regional Communities Workshop

August 4th, 2026

Presented By:

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Rebeca Santos

Grant Overview and Funding

- Clean Water Act's (319 Nonpoint Source Pollution Program)
- Funding provided by the Texas Commission on Environmental Quality through a Clean Water Act § 319(h) grant from the U.S. Environmental Protection Agency.
- This funding is to address non-point source (urban runoff, stormwater runoff) pollution problems.



N&C Watersheds Study Timeline



2019 - 2021
Watershed
Characterization
Phase I

- **Lead:** UTRGV
- **Objective:** Identified Watershed Boundaries and potential sources of pollution



2022 - 2026
Watershed
Characterization
Phase II

- **Lead:** RATES, Inc (Data Collection)
- **Objective:** To assess watershed conditions and pollution sources to support data-driven water quality management, stakeholder engagement, and the development of effective watershed protection strategies.
- **Project In-Kind:** Stormwater Task Force, Community Outreach (MOA): Ex: Voluntary Time/Labor, Facilities, Equipment, Materials, Supplies, Food for Outreach Events



2024 - 2027
Partial Watershed
Protection Plan
Phase I

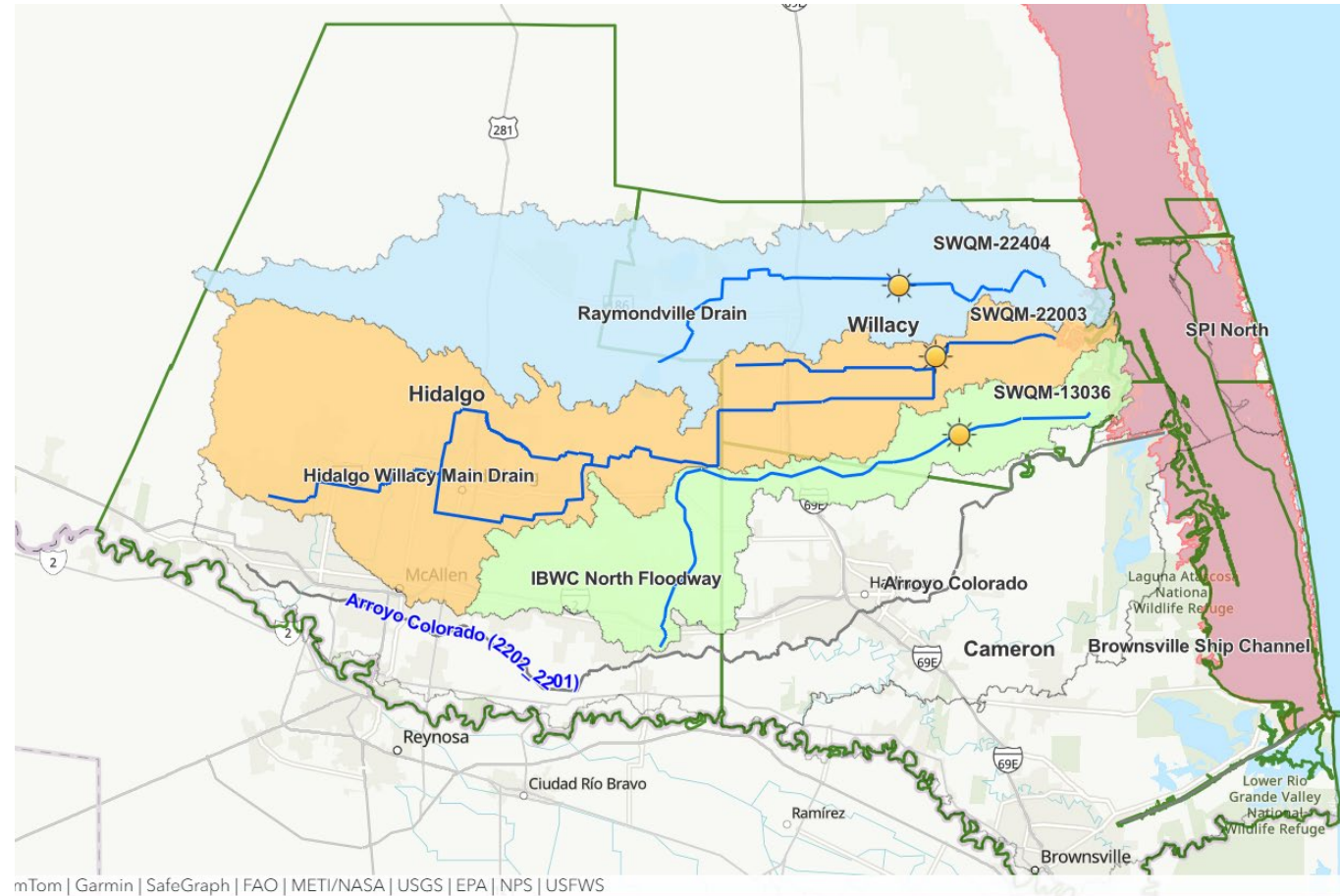
- **Lead:** RATES, Inc (Data Collection)
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- **Project Sub-Contractor:** Stormwater Task
- **Project In-Kind:** Stormwater Task Force and Community Outreach

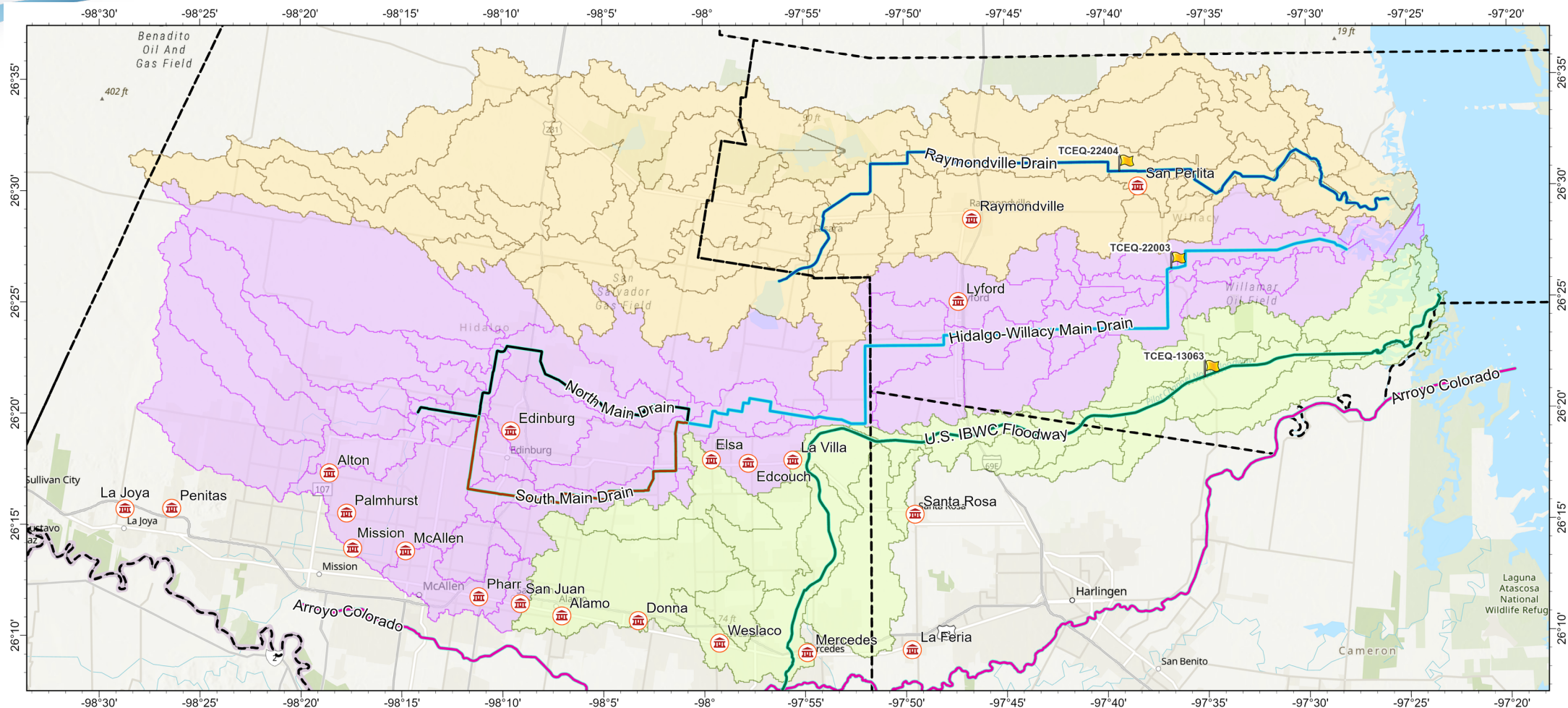
2027
Final Watershed
Protection Plan

- Future Funding Project

- **The Lower Laguna Madre (LLM)** tributaries contribute to **Non-Point Source (NPS)** pollution due to high bacterial concentration & low dissolved oxygen (DO)
- **The North & Central Waterways** are tributaries of the **LLM**, may transport **NPS** contaminants into the LLM, and require characterization:
 - Raymondville Drain (RVD) (SWQMIS ID 22404)
 - Hidalgo Willacy Main Drain (HWMD) (SWQMIS ID 22003)
 - IBWC North Floodway (IBWCNF) (SWQMIS ID 13036)
- **Two Active Projects**
 - Watershed Characterization Phase II
 - Partial Watershed Protection Plan I

Project Overview





SYMBOLGY

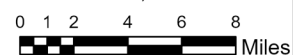
- Cities
- LRGV Major Waterways
- Arroyo Colorado
- Brownsville Ship Channel
- Hidalgo-Willacy Main Drain
- North Main Drain
- Raymondville Drain
- South Main Drain
- U.S. IBWC Floodway
- LRGV Counties
- N&C Watersheds
- HWMD
- US-IBWC
- RVD
- Monitoring Stations

NOTES

A SELECT model will be developed based on currently available data and stakeholder feedback. SELECT uses spatial data in a GIS framework and literature values to characterize bacteria sources' extent and spatial distribution.

SCALE:

1 : 300,000



TITLE:

Northern and Central Watersheds: Study Area

PRODUCED BY:



Watershed Characterization Phase II - Monitoring

Continuous Data

- Aqua Troll 500: Temp, Salinity, DO, Specific conductivity, Nitrate
- Real-Time water surface elevation (WSE) and stage height
- Remote weekly checks: review data availability and quality
- Monthly field visits: QAQC sondes, stations monthly, calibration checks.

Instantaneous Data

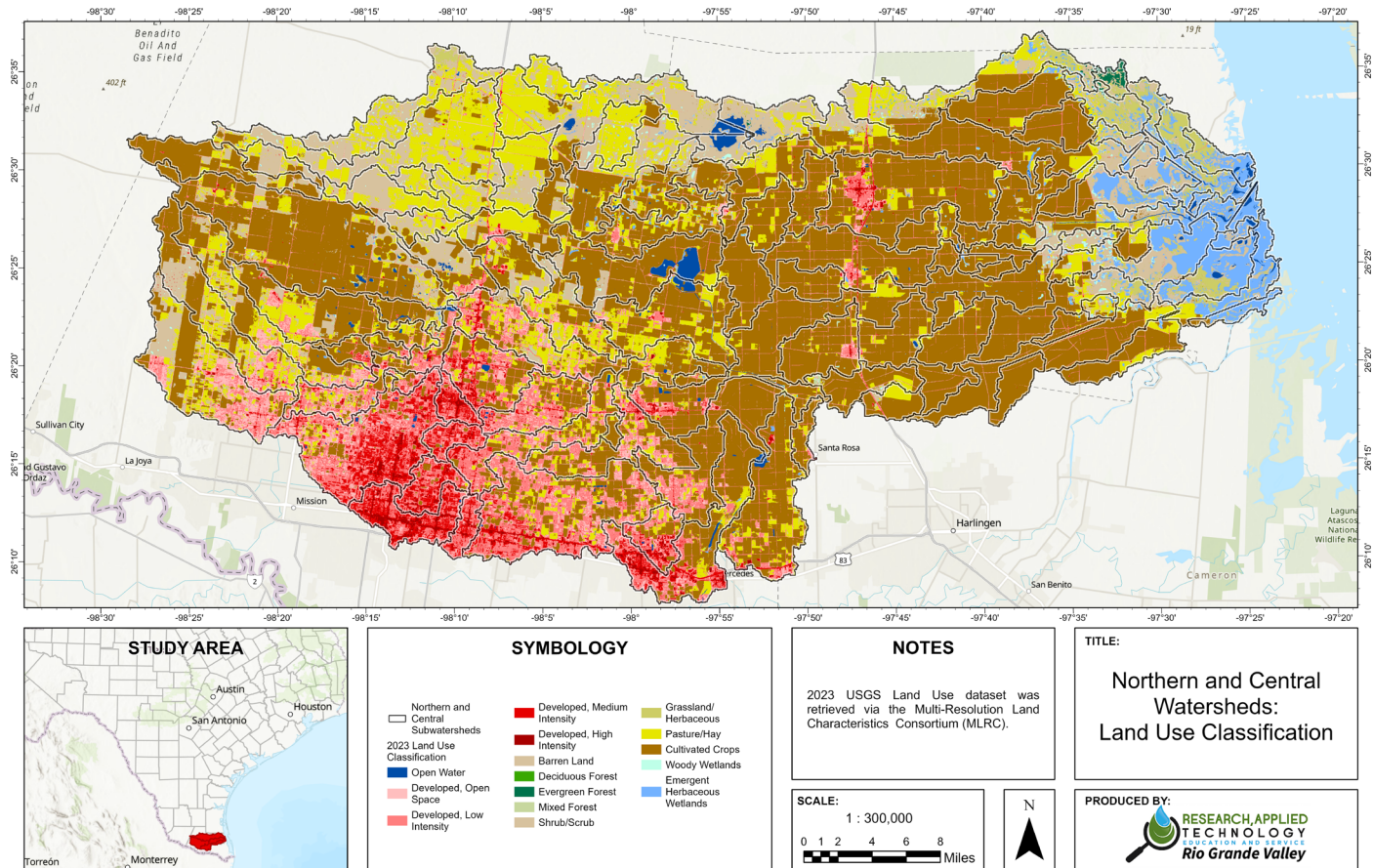
- Data collected: Flow, water quality parameters, bacteria, nutrients
- Three contact recreation criteria set water quality standards
- Quarterly basis (6/6 completed). Data uploaded to TCEQ via SWQMIS



Watershed Characterization Phase II - Modeling

Modeling Components

- Modeling QAPP approved Fall 2024, and efforts in progress.
- Water Quality Analysis: gather discharge loads and mass of nutrients
- Load Duration Curves: identify sources of pollution



Contract Info

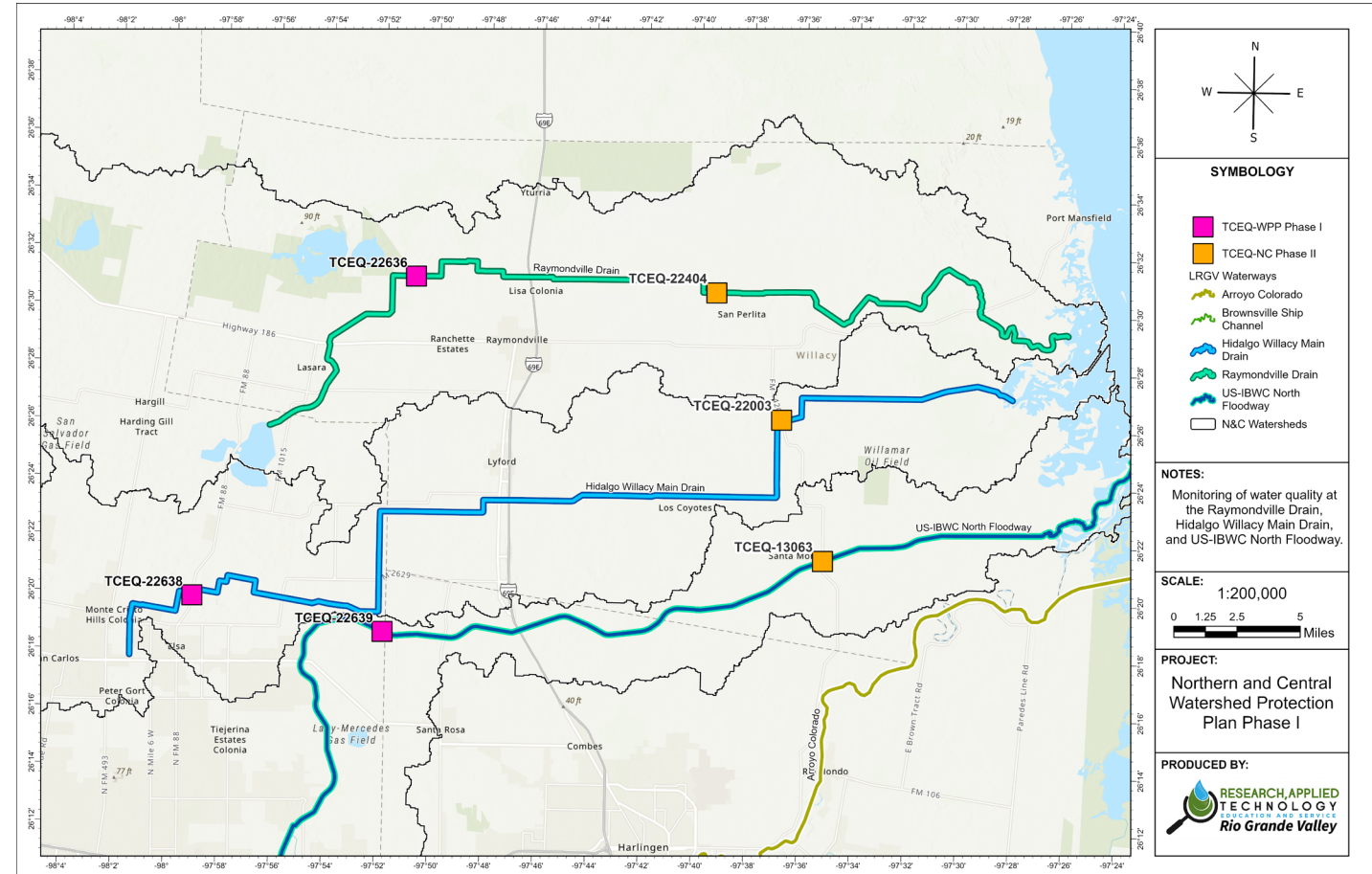
- Number: #23-40229
- Date: 2022 - 2025

Partial Watershed Protection Development - Phase I

- Expanding data collection upstream to characterize causes and sources of NPS contamination
- Data will be applied to quantify pollutant loads and sources
- SELECT Modeling
 - Bacteria Load Characterization: SELECT predicts bacterial discharge loads

Contract Info

- Number: #25-00054
- Date: 2024-2027



Project Status

- Watershed Characterization Phase II
- Partial Watershed Protection Development Phase I

Watershed Characterization

Phase II

Data Collection Report

- Draft submitted.

Data Analysis Report

- Draft in review.

Final Participation Plan

- Draft is ongoing

Final Report

- Draft is ongoing

- Monitoring conducted in accordance with the approved **QAPP** and **three amendments**.
- **Six routine sampling events** completed with field notes and calibration records.
- Continuous monitoring performed at **RTHS stations** (water level, temperature, specific conductance, and dissolved oxygen).
- **Monthly maintenance and calibration** ensured high-quality continuous monitoring data.
- **Quarterly water quality and flow measurements** collected over an **18-month** monitoring period.
- Validated monitoring data submitted to **SWQMIS** for public access.

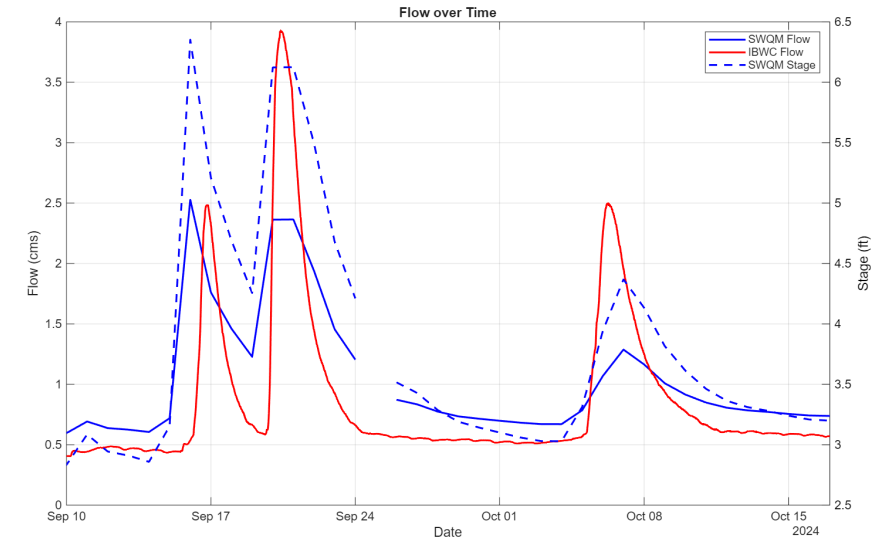


Data Collection Report

Table 3. Parameters measured during routine sampling events.

Parameter	Matrix	Method
Flow (instantaneous)	Water (in-situ)	USGS ADCP TM3-A22
pH	Water (in-situ)	USEPA 150.1
Water temperature	Water (in-situ)	TCEQ SOP V1
Specific Conductance	Water (in-situ)	TCEQ SOP V1
Dissolved Oxygen	Water (in-situ)	TCEQ SOP V1
Total Kjeldahl Nitrogen	Water (grab)	EPA 351.2.2
Total-Phosphorus	Water (grab)	EPA 365.3
Nitrate + Nitrate	Water (grab)	EPA 9056
E. coli	Water (grab)	SM 9223

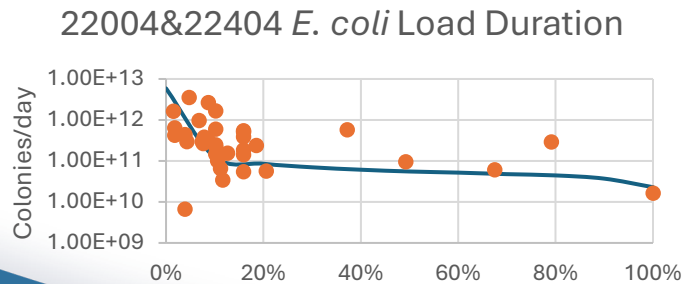
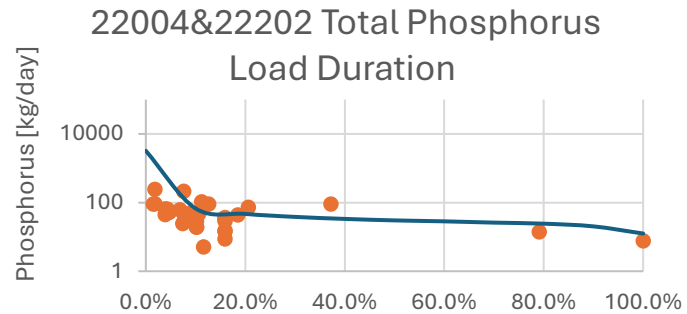
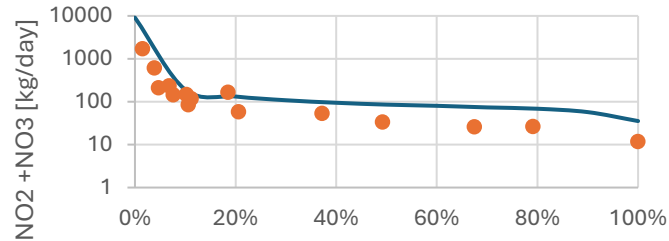
- Compiled and evaluated **historical and newly collected** water quality data.
- Analyzed **routine and continuous monitoring** datasets from three watershed monitoring stations.
- Developed **flow rating curves** to estimate streamflow from continuous stage measurements.
- Performed **flow duration** and **load duration curve (LDC)** analyses to assess pollutant loading.
- Identified **water quality impairments, pollutant sources, and data gaps** to support future watershed



Data Analysis Report

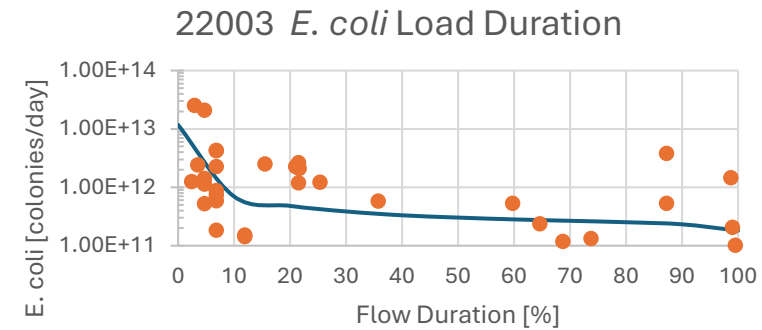
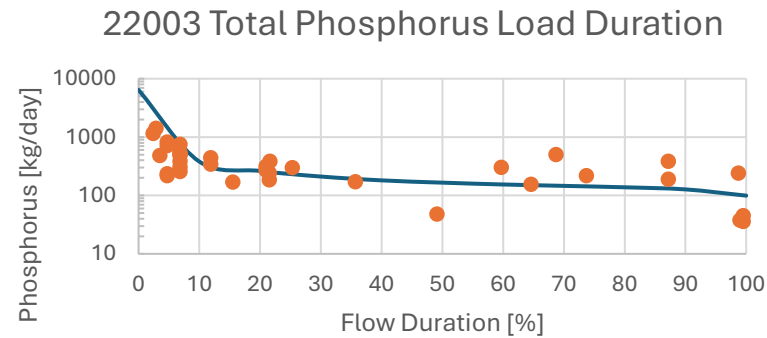
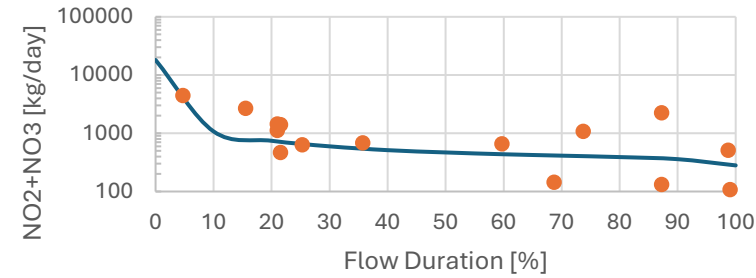
RVD Waterway

22004&22404 NO₂+NO₃ Load Duration



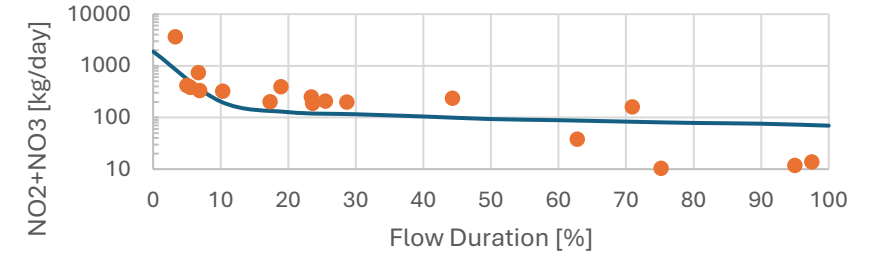
HWMD Waterway

22003 NO₂+NO₃ Load Duration

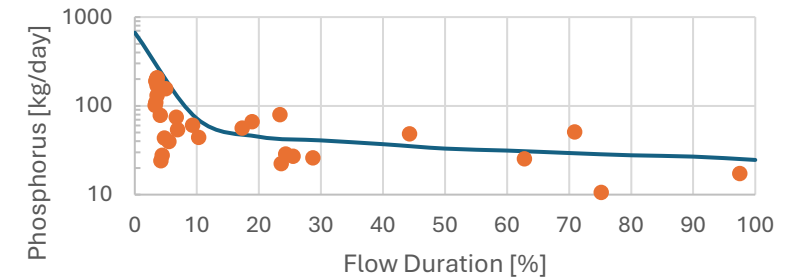


IBWC Waterway

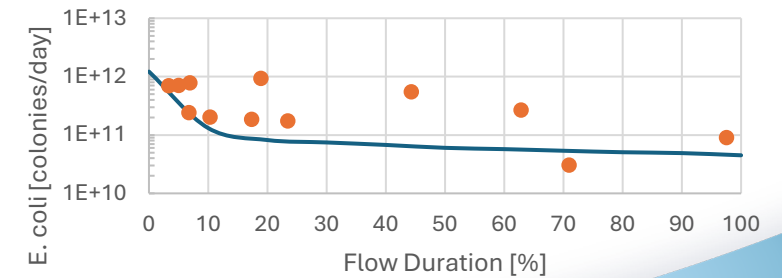
13036 NO₂+NO₃ Load Duration



13036 Total Phosphorus Load Duration



13036 *E. coli* Load Duration

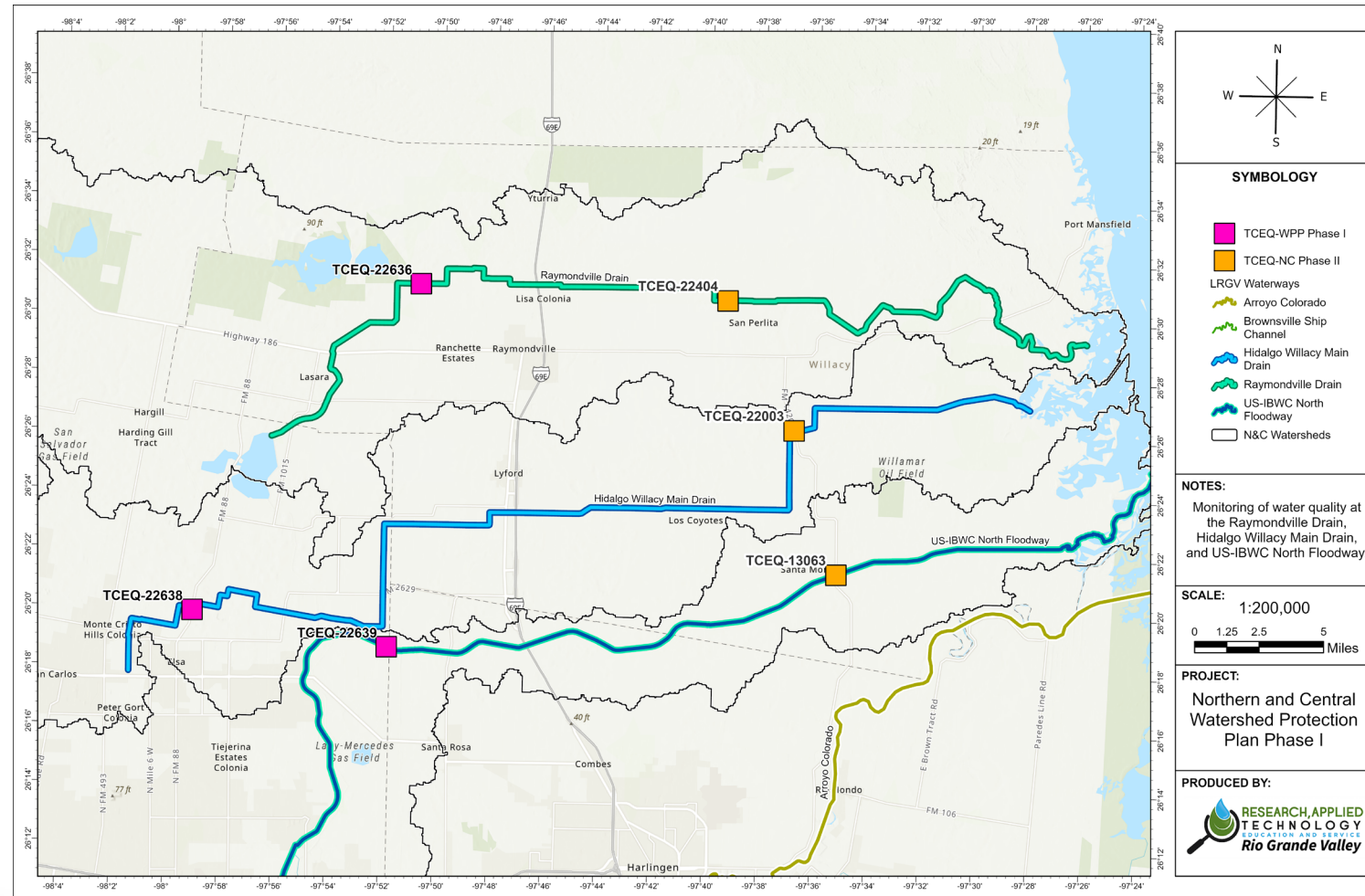


Partial Watershed Protection Development

Phase I

- **Continuation of monitoring sites from Phase II**
- **Addition of three sites** upstream to characterize urban areas, expanding data monitoring to characterize NPS contamination
 - SWQM 22636
 - SWQM 22638
 - SWQM 22639
- **All six sites with Water quality sonde and Shell sensor.**
 - QAPP approved to begin field activities
 - 18 months of continuous and instantaneous monitoring for all stations
 - Data collection started this Summer

Partial Watershed Protection Development Phase I



Future Work



- Watershed Characterization Phase II
 - Finalized Project by August 2026
 - Final Report
- Partial Watershed Protection Development Phase I
 - Underscore public participation feedback
 - Continuation of monitoring just commenced
- Future work BSC

Lower Laguna Madre-Brownsville Ship Channel (LLM-BSC) Water Quality Monitoring

Project Overview

- **Contract Number:** 582-26-00129
- **Funding Source:** EPA-TCEQ
- **Project Start:** 09/30/2025
- **Project Completion:** 08/31/2027
- (48 months)
- **Project Type:** 604 (B)

Project Scope

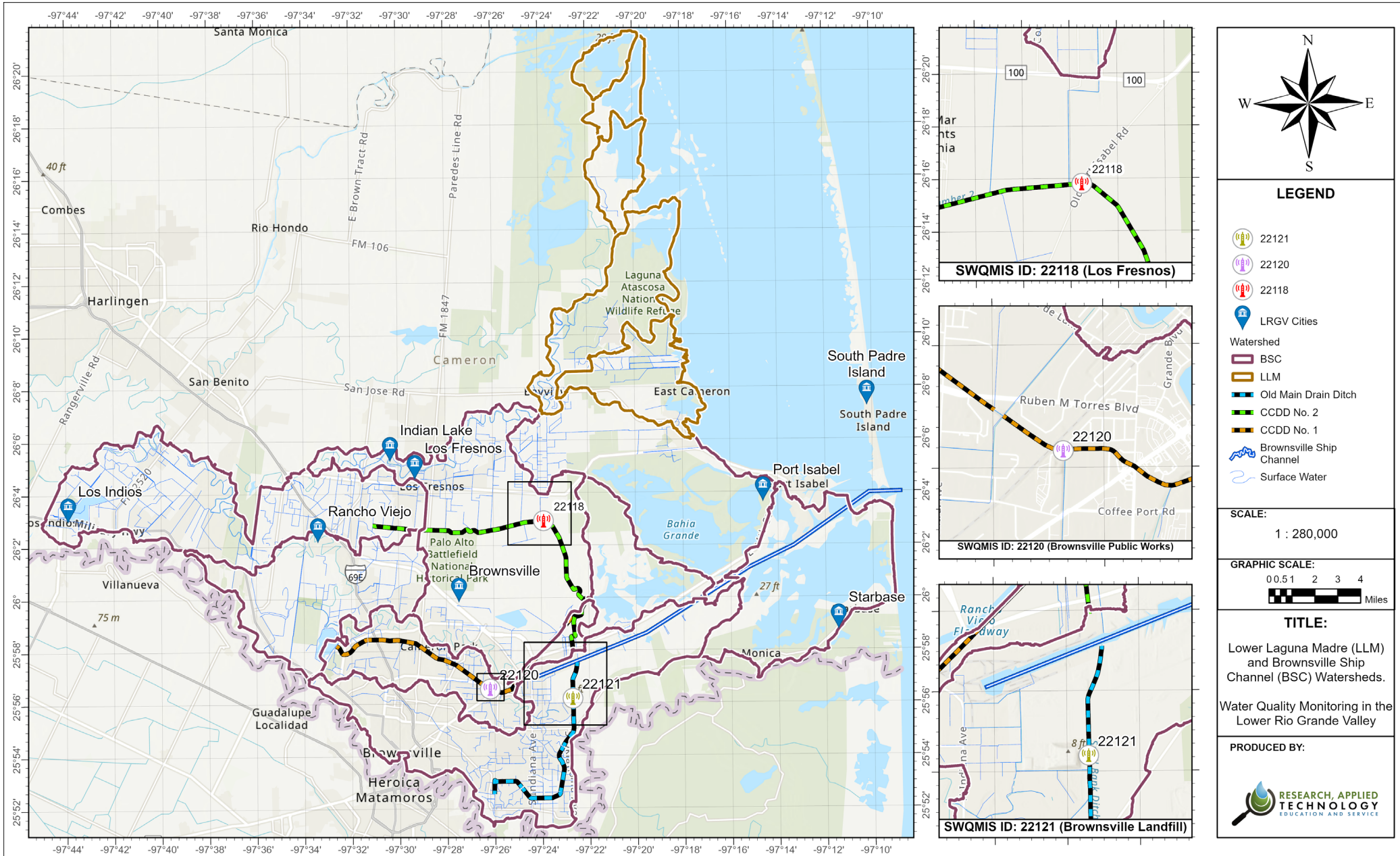
Collect water quality and hydrologic data to characterize sub-basin contributions of nonpoint source (NPS) pollution constituents of concern to Brownsville Ship Channel and the impaired San Martin Lake.

Water Quality Monitoring (Instantaneous Measurements)

- RATES will collect samples and in-situ field measurements at a quarterly rate.
- In-situ field measurements will include:
 - pH, specific conductance, dissolved oxygen, water temperature and flow. Parameters measured in grab samples include Nitrate + Nitrite; Total-Kjeldahl Nitrogen; Total Phosphorus; and bacteria (*E. Coli*).
- Results will be submitted into the TCEQ Surface Water Quality Monitoring Information System (SWQMIS).

Hydrologic Monitoring (Continuous Measurements)

- The RTHS stations will continuously measure:
 - Barometric pressure, water temperature, and stage height at three previously installed SWQM monitoring stations (Station IDs: 22118, 22120, and 22121).
- Service visits twice each year to ensure quality of continuous monitoring equipment.
- Continuous hydrologic data supports modeling efforts such as load duration curves and tidal flux analysis in estuarine segments.



Previous Efforts

LLM/BSC Watershed Characterization (UTRGV/TWRI)

Performance Period:
09/01/15 - 08/31/18

Project Outcomes:

- Sub-basin delineation
- Routine monitoring sampling along the Ship Channel and Port Isabel causeway landing.
- NPS Characterization.
- Status: Project Closed

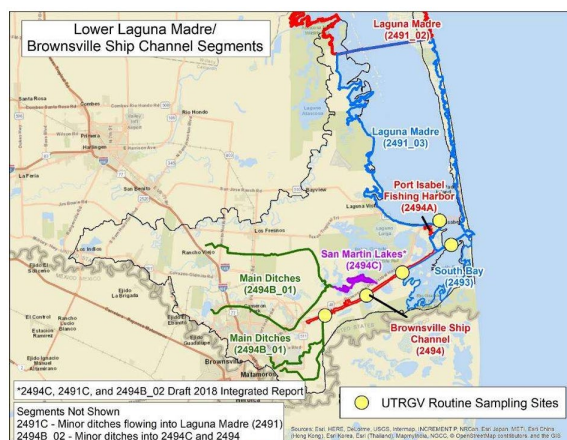


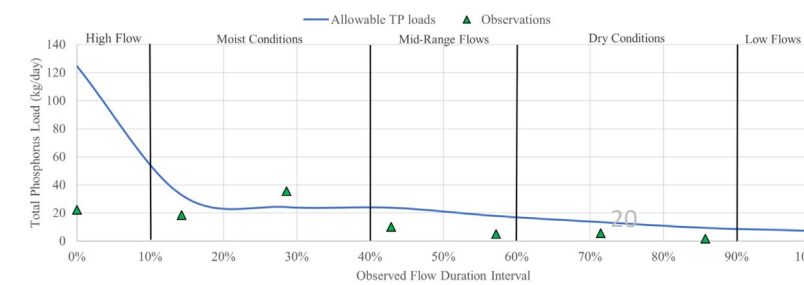
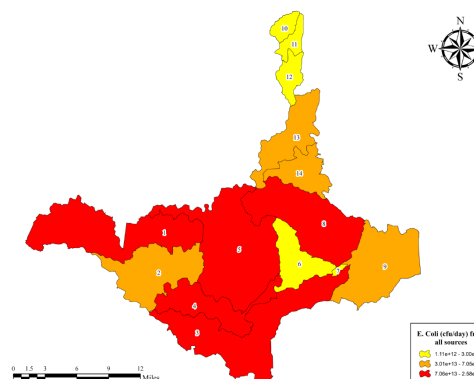
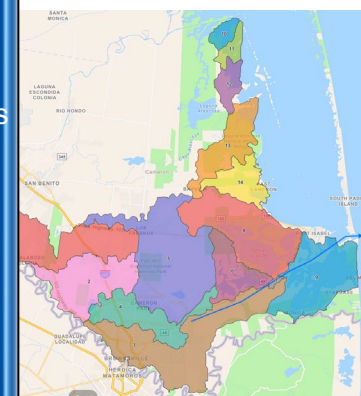
Figure 4-2: Locations of UTRGV sampling sites.

LLM/BSC Watershed Protection Plan Phase I (UTRGV/RATES)

Performance Period:
09/01/2019 - 08/31/2022.

Project Outcomes:

- Watershed delineation
- Continuous water quality monitoring, bacteria coliforms (E. Coli) modeling.
- Development of LDCs and SELECT models.
- Installation of 3 RTHS Stations.
- Status: Project Closed



Final Participation Plan (N&C)

- **Public Participation Plan (PPP)** identifies stakeholders to participate in the WPP process, and raise public awareness & outreach
 - Stakeholder Groups: Hidalgo Main, North Floodway, Raymondville, Others
- **Key Stakeholder Meetings (4x a year)**
 - Small meetings to discuss WPP
- **Regional Watershed Stakeholder Meetings (1x a year)**
 - Stakeholders reunite to discuss project overviews, data demos, and presentations.
- **Public Outreach Events**
 - Create public awareness for Watershed Planning Project
 - Marketing: newsletter, website, public outreach --> educate citizens about water quality & watershed functions
 - Task Force created effective plan to reach target audiences
 - Public participation from stakeholders & data collection is an area of improvement for the next phase.



E-NEWSLETTER (MAR - MAY 2026) FY26Q3

NORTH AND CENTRAL WATERSHEDS

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Project sub-contractor: Stormwater TaskForce \$90K (\$30K per year)
Project in Kind: Stormwater Taskforce, Community Outreach (MOA)

2027
Final Watershed Protection
Plan

Future Funding Project

PHASE I PARTIAL WATERSHED PROTECTION PLAN GOAL

Extend Phase II Lower Rio Grande Valley-North and Central (N&C) Watershed Characterization. Provide a combination of continuous and event-based monitoring (modeled after Lower Laguna Madre-Brownsville Ship Channel Watershed Protection Plan).

RTHS - stream monitoring:
Leverages 6 monitoring stations commissioned by Texas Water Development Board-Fresh Water Flows:

- SWQM 22404 - Raymondville Drain
- SWQM 22003 - Hidalgo-Willacy Main Drain
- SWQM 13036 - USIBWC North Floodway
- SWQM - 22636
- SWQM - 22638
- SWQM - 22639

Quarterly - water quality and hydrodynamic measurements

- DO, Water Temp, Conductivity, pH, Nitrate/Nitrite, Total Phosphorus, TKN, and *E. coli*
- ADCP discharge transects and flow measurements to develop discharge rating curves as a function of stage height
- Continuous data:
 - Water quality
 - Stream stage height

Location of the stations



PROJECT STATUS:

- **N&C Phase I Partial Watershed Protection Plan:** Team working on QAPP Amendment to include SWQMIS IDs for new monitoring stations.
- **N&C Phase II Watershed Characterization:** Team working on Draft Water Quality Data Collection Report and Data Analysis Report. Re-install SWQMIS station 13036 on the IBWC North Floodway.
- **Next Meetings:** To be announced

For more information please visit <https://www2.ratesresearch.org/> or email us at info@ratesresearch.org



E-NEWSLETTER (MAR - MAY 2026) FY26Q3

NORTH AND CENTRAL WATERSHEDS

DELIVERABLES (FY26Q3)

- QPR (FY26Q2)
- Quarterly Call Notes (FY26Q2)
- Draft monitoring QAPP Revision 1
- Monitoring QAPP R1 Annual Review and Revision Year 2 of 3
- Monitoring QAPP R0 Annual Review and Revision Year 3of3
- Stakeholder list (FY26Q2)
- Invoice (FY26Q2)
- Documentation of webpage updates (FY26Q2)
- Invoice (FY26Q2)
- Final Updated Public Participation Plan
- Final E-Newsletters (FY26Q2)

Monitoring activities this quarter:

- All field notes and instrument calibration sheets from first sampling event (within 30 days of event)
- Calibration Sheets from First Sampling Event (within 30 days of event)
- Results of internal monitoring systems audit
- Documentation of Routine Sampling events, in PRs (1of6)
- Monitoring data submissions, with PRs (1of6)
- Documentation of service visits, including QA/QC data, data loss reports, and technician observations, minimum of two per quarter during monitoring (2of12)
- Documentation of field monitoring readiness review before first sampling event.
- Scheduled date of internal monitoring system audit

In coordination with
regional partnerships:



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SCAN TO ACCESS:



RTHS Data:
Continuous water quality monitoring and stage height data available.



Stakeholder Input Survey:
The goal is to calculate *E. coli* (Bacteria) daily loads.



Stakeholder Sign-up Form: Engages stakeholders (e.g., landowners, farmers, local government) in WPP development, meeting TCEQ and EPA requirements for Section 319 projects.

Registration ongoing!

**South Texas Urban County,
Coastal, and Stormwater
Leadership Conference.**

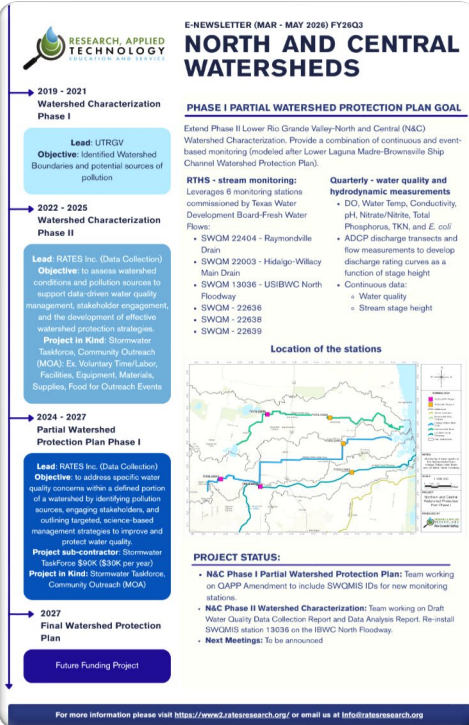
May 20-22nd

Margaritaville Beach Resort, South Padre Island,
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310 Padre Blvd, South Padre Island, TX 78597



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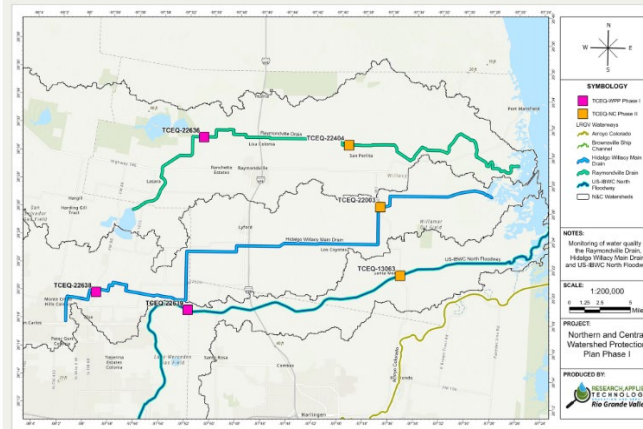
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- Final E-Newsletters (FY20Q2)

SCAN TO ACCESS:

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Register now

Stakeholder sign-up form

We value your feedback

Please provide us your feedback if you have any! We want to improve!

Signup and Feedback for Newsletter



Thank you!

Questions?

Ivan Santos, M.S.

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Rebeca Santos,

Communication and Outreach Associate, RATES

Linda Navarro, M.S., EIT

Project Manager, RATES

