2023 Basin Highlights Report

May 2023

Texas Rio Grande Basin Program Update

International Boundary and Water Commission, U.S. Section
Texas Clean Rivers Program

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Pictured above is Rio Grande at Anzalduas Dam.

Aspects of the Clean Rivers Program

The USIBWC is one of 15 partner agencies that collaborate with TCEQ to administer the Texas Clean Rivers Program in the 23 river and coastal basins in Texas. The main goals of CRP from the long-term plan include:

- Maintain a basin-wide routine water quality monitoring program and water quality database.

- Provide quality-assured data to the Texas Commission on Environmental Quality (TCEQ) for use in water quality decision-making.

- Identify and evaluate water quality issues and summarize in reports.

- Promote cooperative watershed planning (such as conducting Coordinated Monitoring Meetings and collaborating on watershed plans and water quality Initiatives).

- Inform and engage stakeholders (for example, conducting Basin Advisory meetings, watershed education activities, maintain an updated website, and print our annual reports).

- Maintain an efficient use of public funds.

- Adapt the program to emerging water quality issues.

Pictured above is Rio Grande at Los Ebanos.

Introduction

The Texas Clean Rivers Program (CRP) was created in 1991 to monitor and improve the quality of Texas surface waters through an ongoing partnership between the Texas Commission on Environmental Quality (TCEQ)- one of the largest environmental agencies in the United States- regional water authorities, local stakeholders, and advisory committees. Today, the TCEQ implements the CRP by contracting 15 partner agencies to monitor the 23 basins of Texas, which generates about 60% of the data used by the state to make decisions relating to surface water.

In Texas, the Rio Grande basin extends from the desert areas of El Paso to the canyons of Big Bend National Park, down the Texas valley, before reaching the Gulf of Mexico. This 1,255-mile stretch demarcates the boundary between the United States and Mexico. Monitoring and assessing these portions of the basin is a challenging task, greatly facilitated by the IBWC as an international agency created by both countries.

The USIBWC has monitored and assessed the waters of the Rio Grande, which supply drinking water and a habitat for numerous flora and fauna so in 1998, TCEQ partnered with the USIBWC to administer the CRP in the Rio Grande. Water quality data from the USIBWC is a collaboration between 13 partnerships, including USIBWC field offices, universities, municipalities, and a non-profit organization. This extensive collaboration between the USIBWC and its team of volunteer partners provides valuable information for identifying pollution sources and promoting the Rio Grande's overall health. For example, in 2022, the USIBWC CRP oversaw the monitoring of 52 water quality stations. Along with the 37 stations collected by TCEQ regional offices, IBWC managed the data for over 90 stations in the basin.

The USIBWC CRP divides the basin in Texas into four sub-regions to facilitate coordination and planning: the Pecos region and the Upper, Middle, and Lower Rio Grande regions. This report will provide a more detailed look at water quality data in the Lower Rio Grande section of the basin. These various factors impact the water quality and information on activities that aim to improve water quality. The summary statistics presented in the watershed characterization portion of the report are statistics obtained from 5 years of water quality data collected by the USIBWC CRP. The data and information referring to the TCEQ Integrated Report will have a citation. If you have questions about the data or information presented in this report, don't hesitate to contact USIBWC CRP staff.

How does the USIBWC CRP work?

The USIBW Clean Rivers Program is proud to partner with 15 partners that include:

- Two laboratoris
- Five USIBWC field offices
- Three Universities
- Three Municipalities
- A non-profit organization
- A state and federal agency

These partners have volunteered to collect water quality data in addition to their projects and work goals, and the collaboration helps monitor this large watershed.

All USIBWC CRP partners complete training provided by USIBWC CRP staff in the sampling methods outlined in TCEQ's Surface Water Quality Monitoring (SWQM) Procedures Manual, Volume 1. The monitored stations, locations, and sampling frequency are discussed and agreed upon at annual meetings. Field sheets and chain of custody records are kept by both partners and the USIBWC CRP staff so that the integrity of the data can be maintained and easily referenced if needed. All partners use the same standard equipment, which ensures uniformity of data. The water samples are adequately packaged and sent directly to laboratories accredited by the State of Texas under the National Environmental Laboratory Accreditaion Program (NELAP). This certification is a requirement for the data collected by the partners to be accepted by the State of Texas for assessment purposes. Once the sample is analyzed, the laboratory sends the reports to USIBWC CRP staff.

The USIBWC CRP coordinates all the data from the partners in the form of field data and the laboratories' in the form of lab reports. The staff checks the data against rigorous quality assurance criteria, consolidates all the data into usable information, and sends the data to the TCEQ to be reviewed. Once the TCEQ reviews these reports and confirms that the data meets its standards, it is transferred free of errors into the Surface Water Quality and Monitoring Information System (SWQMIS). This database system serves to compile all water quality data submitted to TCEQ. In addition, all data collected by the CRP partners are available to the public on the USIBWC CRP website.

Coordinated Monitoring Meetings and Basin Advisory Committee Meetings

The CRP holds several meetings throughout the year with partners and the general public. A series of annual meetings, called Coordinated Monitoring Meetins (CMM), are strictly conducted to plan and coordinate water quality monitoring efforts among different entities and partners. These meetings allow for more efficient use of agency resources and consider concerns fromt he public gathered throughout the year. They allow CRP staff to hear about local water quality interest and problems and allow attendees to bring up any questions or concerns about their area to CRP staff. Additionally, the USIBWC CRP typically hosts training for sampling partners in conjuction with these meetings. Basin Advisory Committe (BAC) meetings are held three times a year and usually revolve around presenting an annual water quality update to the public and updates about issues in the area. These issues might include fish kills, water quality concerns, and projects in the area. Meetings are open to anyone interested in the CRP's actvities and efforts.

Coordinated Monitoring Schedule

All entities that monitor the Rio Grande in Texas gather annually to discuss and coordinate monitoring activities. You can see who is collecting water quality data, where, and how often within the Rio Grande watershed on the Coordinated Monitoring Schedule.

http://cms.lcra.org/

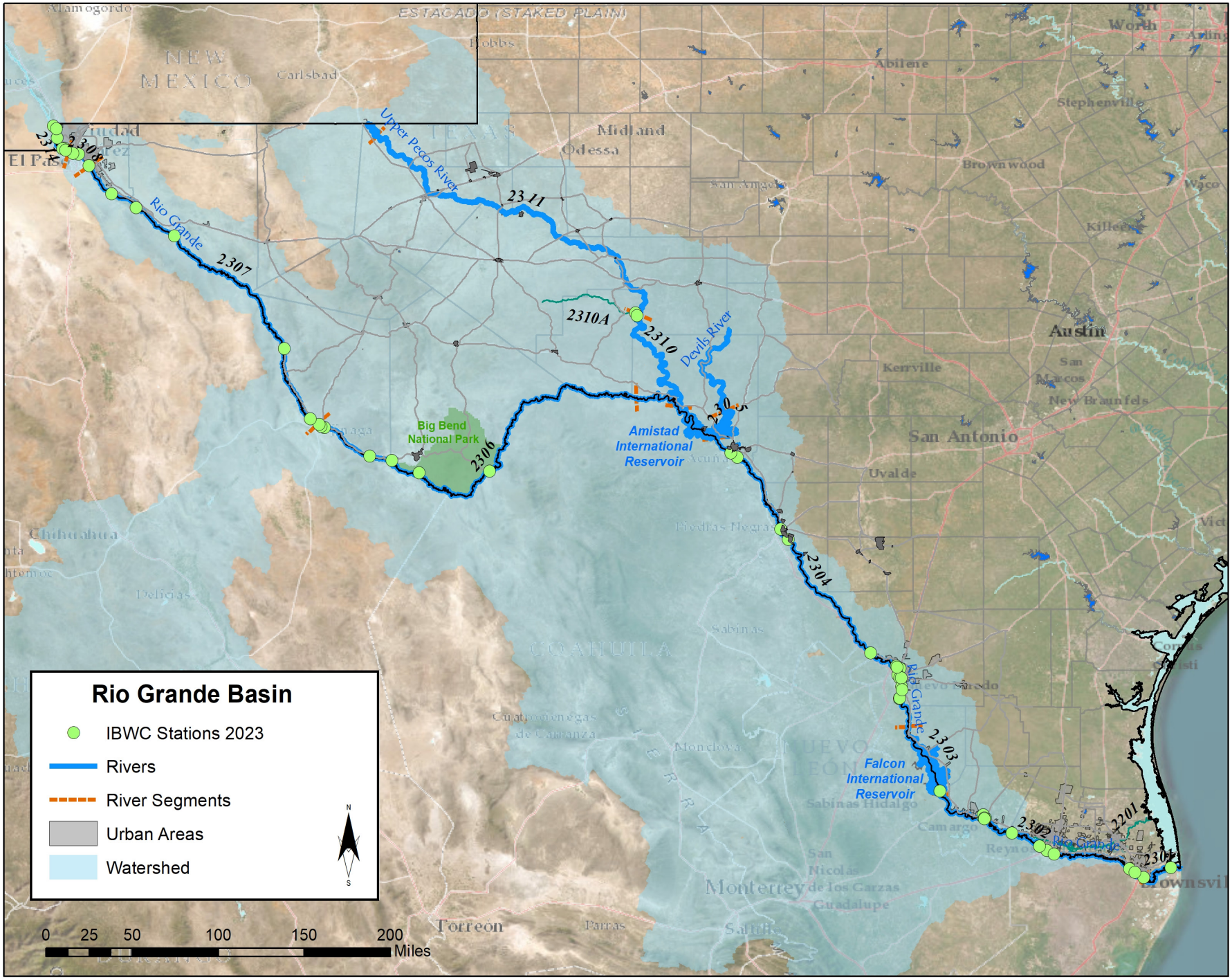


Figure 1. General Map Overview of the Rio Grande Basin in Texas

Overview of Water Quality Monitoring

During the past year, the USIBWC CRP continued to maintain its large network of water quality stations. CRP and TCEQ gain an understanding of the conditions of the water quality through routine monitoring, which is performed at fixed locations at regular intervals throughout the year. Table 1 shows the kinds of data that we analyze during routine monitoring and why.

Routine monitoring helps us understand questions about how the river can be used (Table 3), such as:

Is it swimmable?

Is it drinkable?

Is it fishable?

Is it healthy for aquatic life?

CRP partners throughout the basin collect water quality and sediment samples at about 52 routine monitoring stations. When these samples are collected for laboratory analysis, personnel also make field observations to record conditions at the time the sample was taken. Field observations include things such as weather conditions at the time of collection, recent rain events in the area, water color, and other general notes related to water quality and stream uses. Important field measurements are made using different pieces of equipment. Measurements include: water and air temperature, water depth, Secchi disk, stream flow and how that flow compares to the normal flow for that water body. Field parameters are described in more detail in Table 4.

The routine collection of field parameters together with laboratory parameters, also described in Table 1, allow us to determine the health of the river ecosystem and what potential human and ecological issues we should focus on. Data is compared with Texas State Water Quality Standards (TSWQS) criteria and screening levels in Tables 1, 2 and 4; these steps are described in the next sections.

When routine monitoring shows a water quality issue or trend, we begin more intensive monitoring and special studies, which are created to gather information to address a specific water quality issue.

Pictured above at Los Ebanos showing gaging station.

Table 1. Primary Surface Water Quality Standards for the Rio Grande

2022 Texas Surface Water Quality Standards for the Rio Grande Basin											
SEGMENT		USES			CRITERIA						
Segment	Segment Name	Recreation	Aquatic Life	Domestic Water Supply	Cl^- (mg/l)	$SO4^{2-}$ (mg/l)	TDS (mg/l)	DO (mg/l)	pH range (SU)	Bacteria geomean (#/100ml)	Temperature (deg F)
2301	**Rio Grande Tidal**	PCR1	E	-	-	-	-	5.0	6.5-9.0	35	95
2302	**RG Below Falcon Reservoir**	PCR1	H	PS	270	350	880	5.0	6.5-9.0	126	90
2303	**Falcon International Reservoir**	PCR1	H	PS	200	300	1,000	5.0	6.5-9.0	126	93
2304	**RG Below Amistad International Reservoir**	PCR1	H	PS	200	300	1,000	5.0	6.5-9.0	126	95
2305	**International Amistad Reservoir**	PCR1	H	PS	150	270	800	5.0	6.5-9.0	126	88
2306	**RG Above Amistad International Reservoir**	PCR1	H	PS	200	450	1,400	5.0	6.5-9.0	126	93
2307	**RG Below Riverside Diversion Dam**	PCR1	H	PS	300	550	1,500	5.0	6.5-9.0	126	93
2308	**RG Below International Dam**	NCR	L	-	250	450	1,400	3.0	6.5-9.0	605	95
2309	**Devils River**	PCR1	E	PS	50	50	300	6.0	6.5-9.0	126	90
2310	**Lower Pecos River**	PCR1	H	PS	1,700	1,000	4,000	5.0	6.5-9.0	126	92
2311	**Upper Pecos River**	PCR1	L	-	7,000	3,500	15,000	5.0	6.5-9.0	33	92
2312	**Red Bluff Reservoir**	PCR1	H	-	3,200	2,200	9,400	5.0	6.5-9.0	33	90
2313	**San Felipe Creek**	PCR1	H	PS	50	50	400	5.0	6.5-9.0	126	90
2314	**RG Above International Dam**	PCR1	H	PS	340	600	1,800	5.0	6.5-9.0	126	92
2315	**Rio Grande Below Rio Conchos**	PCR1	H	-	450	750	2100	5.0	6.5-9.0	126	93

PCR - Primary Contact Recreation
E - Exceptional Aquatic Life
geomean - geometric mean
ALU - Aquatic Life Use
L - Limited Aquatic Life
Cl^- - chloride
NCR - Noncontact Recreation
H - High Aquatic Life
$SO4^{2-}$ - sulfate
PS - Public Water Supply
TDS - Total Dissolved Solids
DO - Dissolved Oxygen

The indicator bacteria for freshwater is *E. coli* and *Enterococci* for saltwater (2301, 2312, 2311).
The DO criterion in the upper reach of Segment 2307 (Riverside Diversion Dam to the end of the rectified channel below Fort Quitman) is 3.0 mg/L when headwater flow over the Riverside Diversion Dam is less than 35 cfs.
The critical low-flow for Segments 2309 and 2313 is calculated according to §307.8(a)(2)(A) of the TSWQS.
A 24-hr minimum dissolved oxygen criterion of 1.0 mg/L applies to Segment 2311.

* The Standards listed above are the Proposed 2022 Revisions to the Texas Surface Water Quality Standards (TSWQS). The revisions were adopted by TCEQ in September 2022 but have not yet been approved by the EPA . More information on primary standards can be found at TCEQ's TSWQS website (https://www.tceq.texas.gov/waterquality/standards/2022-texas-surface-water-quality-standards).

Table 2. 2018 Texas Nutrient Threshold for the Rio Grande Basin			
Segment	Segment Name	Station ID	Chlorophyll-a Threshold (µg/L)
2312	**Red Bluff Reservoir**	13267	21.96

Designated Uses

The State of Texas assigns designated uses to specific water bodies. Table 3 describes the designated uses for the Rio Grande Basin, and Table 1 lists the uses and standards for each segment. Designated uses and water quality standards are defined in the TSWQS. For more info, see TSWQS website.

Contact recreation (CR) – Fishing, swimming, wading, boating, and direct water contact. *E. Coli* and *Enterococci* bacteria are used as indicators. The proposed 2014 revisions to the TSWQS created subcategories of Primary (PCR) and Secondary Contact Recreation (SCR). PCR refers to activities such as swimming, and SCR refers to non-immersing recreation activities such as canoing and fishing.

Public water supply (PS) – As a drinking water source, the primary concern is total dissolved solids (TDS). The TSWQS include a list of parameters that are screened to ensure domestic water supply use.

Aquatic life use (ALU) – To protect aquatic species. This designated use has four levels depending on the ability of a water body to support aquatic life such as fish and benthic macro-invertebrates (aquatic insects). The primary parameter is DO. The four aquatic life use categories are exceptional, high, intermediate, and limited.

Fish consumption (FC) – This applies to all water bodies where citizens may collect and consume fish. The TSWQS include a list of parameters that are screened to ensure the fish consumption use is met.

General use – To safeguard general water quality rather than for protection of one specific use.

Table 3. Designated Uses for Freshwater

Designated Uses			
Designated Use	Description	Primary Parameter	Criteria
Contact Recreation (CR)	3 levels depending on the use of the water: Fishing, swimming, wading, boating, etc	Bacteria: *E. Coli* Tidal and saline- *Enterococci* (*Entero*)	Primary Contact Recreation (significant possibility of water ingestion, i.e. swimming) Geometric mean: 126 colony forming units (CFU) for *E. Coli* 35 CFU *Entero*
			Secondary Contact Recreation (limited body contact that poses a less significant risk of ingestion of water, i.e. fishing, boating) Geometric mean 630 colony forming units (CFU) for *E. Coli* 175 CFU *Entero*
			Non- Contact Recreation: Unsuitable for contact recreation
Public Water Supply (PS)	Drinking water source	See full list of Human Health Criteria in Table 3 of the TSWQS	
Aquatic Life Use (ALU)	4 levels depending on the ability of water body to support aquatic life	DO - average values	(E) Exceptional 6.0 mg/L
			(H) High 5.0 mg/L
			(I) Intermediate 4.0 mg/L
			(L) Limited 3.0 mg/L
	Toxics in Water	See full list of Aquatic Life Criteria in Table 1 of the TSWQS	
Fish Consumption (FC)	Prevent contamination to protect human health	See full list of Human Health Criteria in Table 3 of the TSWQS Example: Mercury - 0.0122 ug/L in water & fish	
General Use (GU)	General water quality	Water Temp, High pH, Low pH, Dissolved Solids, Nutrients, and Chlorophyll-a. See Tables 2 and 4.	

Table 4. Water Quality Parameters

Field Parameters		
Parameter	Description	Effects to Water body
pH	Measure of how acidic or basic the water is. The values range from 0 to 14, with 7 being neutral. pH values less than 7 indicate acidity, whereas a pH greater than 7 indicates a base.	Values greater than 9.0 and less than 5.0 can have detrimental affects on the health of aquatic life, wildlife, and humans.
Specific Conductance	Indicator of how well the water conducts electricity. Pure water does not conduct electricity; impurities of water are what allow electricity to pass through the water. These impurities are salts and metals. Since total and dissolved metal values are very low, conductivity primarily measures how much salt is in the water. Most naturally-occurring waters have some level of conductivity.	High conductivity can cause physiological effects in animals and plants. It also has negative implications for TDS.
Dissolved Oxygen (DO)	Measure of the oxygen in the water.	Low DO values can lead to a reduced community of aquatic life in a water body. Very low levels (<2) can be indicative of higher levels of oxygen-demanding plants that use up DO during the decay process.
Secchi Depth	A measure of the transparency of water - the maximum depth at which a black and white disk is visible.	Higher transparency leads to a more robust aquatic plant life (particles in water block sunlight for photosynthesis). High transparency coupled with high nutrients can lead to negative impacts on DO and aquatic life.
Stream Flow	Volume of water moving over a location over a period of time. Low flow conditions common in the warm summer months create critical conditions for aquatic organisms.	At low flows, the stream has a lower assimilative capacity for waste inputs from point and non-point sources.
Conventional Laboratory Parameters		
Parameter	Description	Effects to Water body
Solids	Total and dissolved materials of any kind (calcium, magnesium, potassium, sodium, bicarbonates, chlorides, and sulfates).	High total dissolved solids indicate higher amounts of dissolved salts which can reduce the diversity of aquatic life and can render the water unusable for human consumption, industry and agriculture.
Nutrients	Nutrients include nitrogen compounds, ammonia, and phosphorus.	High levels can cause excessive plant growth, which can lead to reduced dissolved oxygen and fish kills, reduced stream flow and reduced navigability of the waters. Elevated ammonia can also be toxic to aquatic life.
Chlorophyll-a	Chlorophyll-a is used as an indicator of algal growth in water.	High levels for long periods may indicate low water quality and are indicative of excess nutrient levels.
Non-conventional Laboratory Parameters		
Parameter	Description	Effects to Water body
Metals	Aluminum, arsenic, barium, chromium, copper, lead, mercury, nickel, silver, and zinc. Metals can be tested as total or dissolved metals in water or metals in sediment to determine long-term accumulation.	High concentrations can result in long- and short-term effects on aquatic life and human health.
Organics	Chemicals containing carbon and hydrogen. Organic compounds analyzed are herbicides, pesticides and industrial compounds both in water and in sediment.	Organics can result in long- and short-term effects on aquatic life and human health.
Biological Parameters		
Parameter	Description	Effects to Water body
Nekton	Fish captured in the river during biological surveys using both electrofishing and seining methods	Using Index of Biological Integrity (IBI), Indicate biodiversity and overall health of river.
Benthics	Freshwater macro-invertebrates collected during a five-minute kick net method	Using IBI, this biological aquatic assemblage analysis indicates biodiversity and overall health of river. Excellent indicators of water quality.

How is the Water Quality?

What are Impaired Waters?

The State of Texas publishes the Texas Surface Water Quality Standards (TSWQS) for each river basin. USIBWC Clean Rivers Program water quality data is used to help determine whether stream segments are meeting the standards. Not every parameter of concern in the Rio Grande Basin has standards associated with it; however, screening levels exist for parameters that have historically led to environmental issues in the area. A water body is listed as "impaired" in the Texas Integrated Report if the data shows the standards are not being met. A water body is described as having a concern if it is near non-attainment to the standard (CN) or is not meeting the screening levels (CS). The EPA approved the 2022 TSWQS for the Rio Grande Basin and the 2022 Integrated Report can be found at the following links.

TSWQS

https://www.tceq.texas.gov/waterquality/standards/2022-texas-surface-water-quality-standards

Pictured to the left is station 13177, Rio Grande at El Jardin Pump Station

Pictured above is Rio Grande below Anzalduas Dam.

Table 5. Water Quality Impairments and Concerns in the Rio Grande Basin

Summary of Water Quality Impairments and Concerns in the Rio Grande Basin					
Segment	Segment Name	Parameter(s) Impaired	Year first listed	Parameter(s) of concern	Type of concern
2301	Rio Grande Tidal	No Impairments		Bacteria	CN
				Chlorophyll-a	CS
				Depressed DO	CS
				Nitrate	CS
2302	RG Below Falcon Reservoir	Bacteria	1996	Ammonia in water	CS
				Chlorophyll	CS
				Depressed DO	CS
				pH	CN
2302A	Los Olmos Arroyo	Bacteria	2004	Chlorophyll-a	CS
		Depressed DO	2022		
2303	International Falcon Reservoir	No Impairments		Ambient toxicity	CS
				Fish kill	CN
2304	RG Below Amistad International Reservoir	Bacteria	1996	Ambient toxicity	CS
				Ammonia	CS
2304B	Manadas Creek	No Impairments		Antimony in sediment	CS
				Bacteria	CN
				Nitrate	CS
				Total Phosphorus	CS
2305	International Amistad Reservoir	Chloride in water	2014	Fish kill	CN
2306	RG Above Amistad International Reservoir	Sulfate in water	2010	Chlorophyll-a	CS
2306A	Alamito Creek	No Impairments		No Concerns	
2307	RG Below Riverside Diversion Dam	Chloride in water	1996	Ammonia	CS
		Total dissolved solids	1996	Chlorophyll	CS
		Bacteria	2002	Depressed DO	CS
				Nitrate	CS
				Total Phosphorus	CS
2308	RG Below International Dam	Bacteria	2014	Ammonia	CS
				Chlorophyll	CS
				Total Phosphorus	CS
2309	Devils Rivers	No Impairments		No Concerns	
2310	Lower Pecos River	Sulfate in water	2022	No Concerns	
		Total dissolved solids in water	2020		
2311	Upper Pecos River	Depressed DO	2006	Bacteria	CN
				Chlorophyll	CS
2312	Red Bluff Reservoir	No Impairments		No Concerns	
2313	San Felipe Creek	Bacteria in water	2014	No Concerns	
2314	RG Above International Dam	Bacteria in water	2002	Chlorophyll	CS
				Nitrate	CS

CN-Concern for near-nonattainment of the Water Quality Standards
CS-Concern for water quality based on screening levels
Note: Each segment is further subdivided into assessment units (AU). The entire segment may not be impaired. The complete list of impairments and AUs can be found at the TCEQ 303(d) website.

This Year's Highlights

Lower Rio Grande Water Quality Initiative Update

While development and discussion of this project formally started in 2012, the Terms of Reference (ToR), the binational agreement and framework for the Lower Rio Grande Water Quality Initiative, was signed in 2013. The LRGWQI was developed as a binational project focused on bacteria and salinity in the Lower Rio Grande/Rio Bravo. The initiative had multiple objectives:

- Address current and future water quality issues of the Lower Rio Bravo/Rio Grande.
- Implement management procedures and programs that enable affected parties to manage wastewater discharges and improve water quality conditions.
- Evaluate current wastewater discharge infrastructure and management strategies for the potential for improving the quality of effluent discharges into the Lower Rio Bra vo/Rio Grande.
- Evaluate new mechanisms and strategies for system operations that could improve ambient water quality and address border sanitation concerns.
- Improve salinity management for return flows into the Lower Rio Bravo/Rio Grande.
- Based on the results of the evaluations carried out, implement programs and proj ects to meet these objectives as appropriate, and result in measurable and sustain able improve ments in the ambient water quality of the Lower Rio Grande/Rio Bravo.

In July 2022 the LRGWQI binational core group held its first binational meeting in Mercedes, TX after a five-year hiatus. Meeting attendees included both sections of the IBWC, TCEQ, EPA and CONAGUA. The meeting provided a review of past project activities that had been completed to date, including a brief overview of the project since its initial phase, as some people who had been involved initially had been replaced by new personnel who had limited knowledge of the project. The main purpose of the meeting was that after binational synoptic surveys, water quality samplings and river modeling, both countries had completed their respective final reports and water quality models and were prepared to present them at the meeting for formal acceptance by both sections of the IBWC and the binational core group.

Lower Rio Grande Salinity Study

As a direct result of the LRGWQI, TCEQ proposed a second phase to the LRGWQI focused specifically on salinity. The second phase would not have any additional water monitoring but would incorporate all data that had already been collected and look at only what was still needed to fill in gaps. Discussion also centered on narrowing down the parameters analyzed to only those of interest for salinity, as well as determining what scenarios to run in the water quality models. TCEQ drafted a proposal for the project to be developed into a Terms of Reference, and the U.S. Section of the IBWC provided the document for review and comment to the Mexican Section of the IBWC. There have been multiple U.S.-only meetings to discuss comments on the document, as well as two binational meetings to discuss comments with the Mexican participants. Work on the salinity study is ongoing.

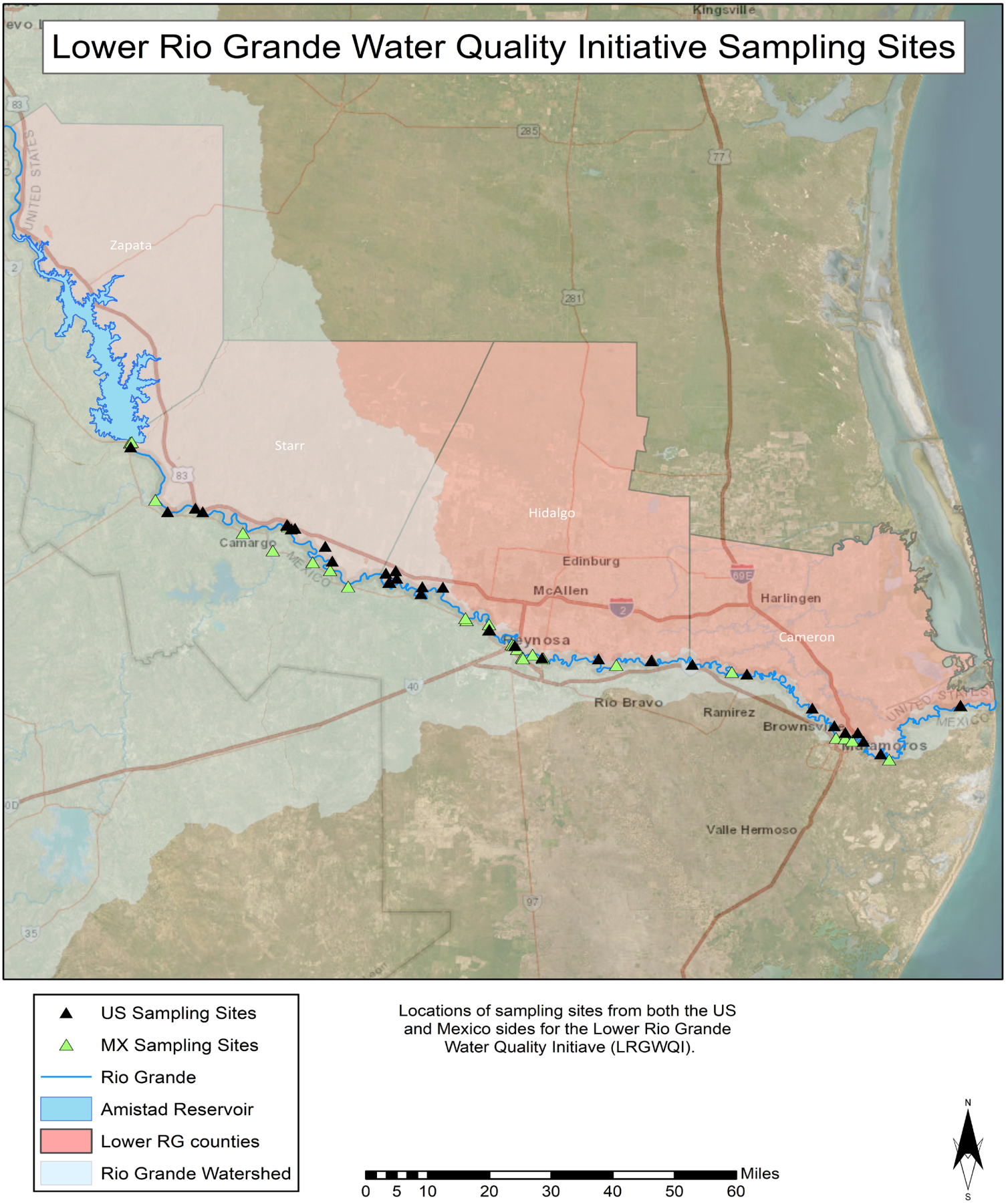


Figure 2. Lower Rio Grande Water Quality Initiative Sampling Sites

The Lower Rio Grande Sub-basin

The Lower Rio Grande Sub-basin stretches from just below International Falcon Dam to its confluence with the Gulf of Mexico (see Figure 3). This 280-mile (451-km) stretch of the Rio Grande runs through Starr, Hidalgo, and Cameron counties of Texas and forms the border between those counties and the Mexican State of Tamaulipas. Population centers along the Lower Rio Grande have grown tremendously in the past ten years. Agriculture, trade, services, manufacturing, and hydrocarbon production are the primary economic activities in this region. Major cities in the sub-basin include McAllen, Harlingen, and Brownsville, Texas, on the U.S. side of the river, and Matamoros and Reynosa, Tamaulipas, on the Mexican side. The Lower Rio Grande Sub-basin depends entirely on the Rio Grande as its source of drinking water. Anticipated increases in municipal and industrial demands resulting from rapid population growth will only further the strain on a limited resource already taxed by previous drought conditions and high agricultural use.

The Lower Rio Grande Sub-basin occupies the southeastern portion of the South Texas Brush Country region. Two significant aquifers lie beneath a central part of this region—the Carrizo-Wilcox and Gulf Coast Aquifers. Groundwater in the area is brackish, requiring the construction of a desalinization plant and the possible construction of additional plants. Studies are being conducted on the desalinization of groundwater and ocean water to supplement drinking water supplies in the Lower Rio Grande Valley due, in part, to the high salinity in the water in this region. Most agricultural and urban discharges do not enter the Rio Grande in this reach, as they are diverted to canals that ultimately empty into the Gulf of Mexico; however, excessive flows that exceed the capacity of the channels can be routed to the Rio Grande. This has been done during severe inclement weather, such as hurricanes and tropical storms.

The USIBWC has three dams along this stretch of the river: Falcon Dam, Anzalduas Dam, and Retamal Dam. Falcon Dam and Reservoir serve for conservation purposes, and water is released during scheduled water releases to both countries and during severe weather-related occurrences (hurricanes, tropical storms) that require large amounts of water to be carefully released to prevent flooding of the urban areas downstream. Anzalduas and Retamal dams are diversion dams for water accounting purposes, but either one can be used for emergency flooding situations. The Lower Rio Grande Valley also has an emergency floodway meant to divert flood waters from the Rio Grande to the Gulf of Mexico during extreme flood events, last used in 2010 during Hurricane Alex.

The USIBWC CRP has four partners in the lower Rio Grande: the USIBWC Falcon Dam field office, the USIBWC Mercedes field office, Brownsville Public Utilities Board, and the University of Texas Rio Grande Valley- Edinburg. The partners monitor 17 stations in three segments (2303, 2302, 2301), providing field, flow, and water quality data for the program. Each segment will be discussed in more detail.

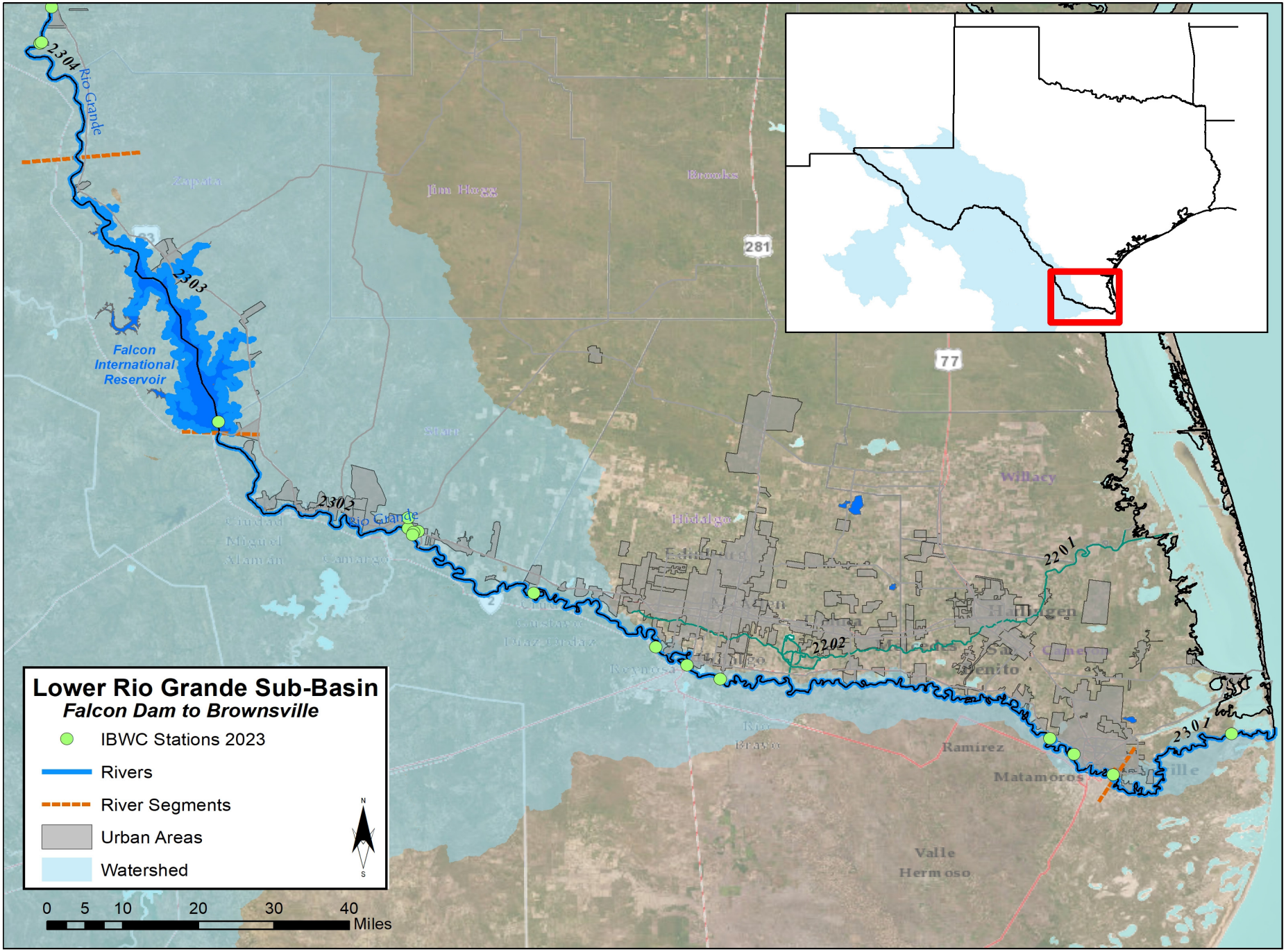


Figure 3. Map of the Lower Rio Grande Basin in Texas

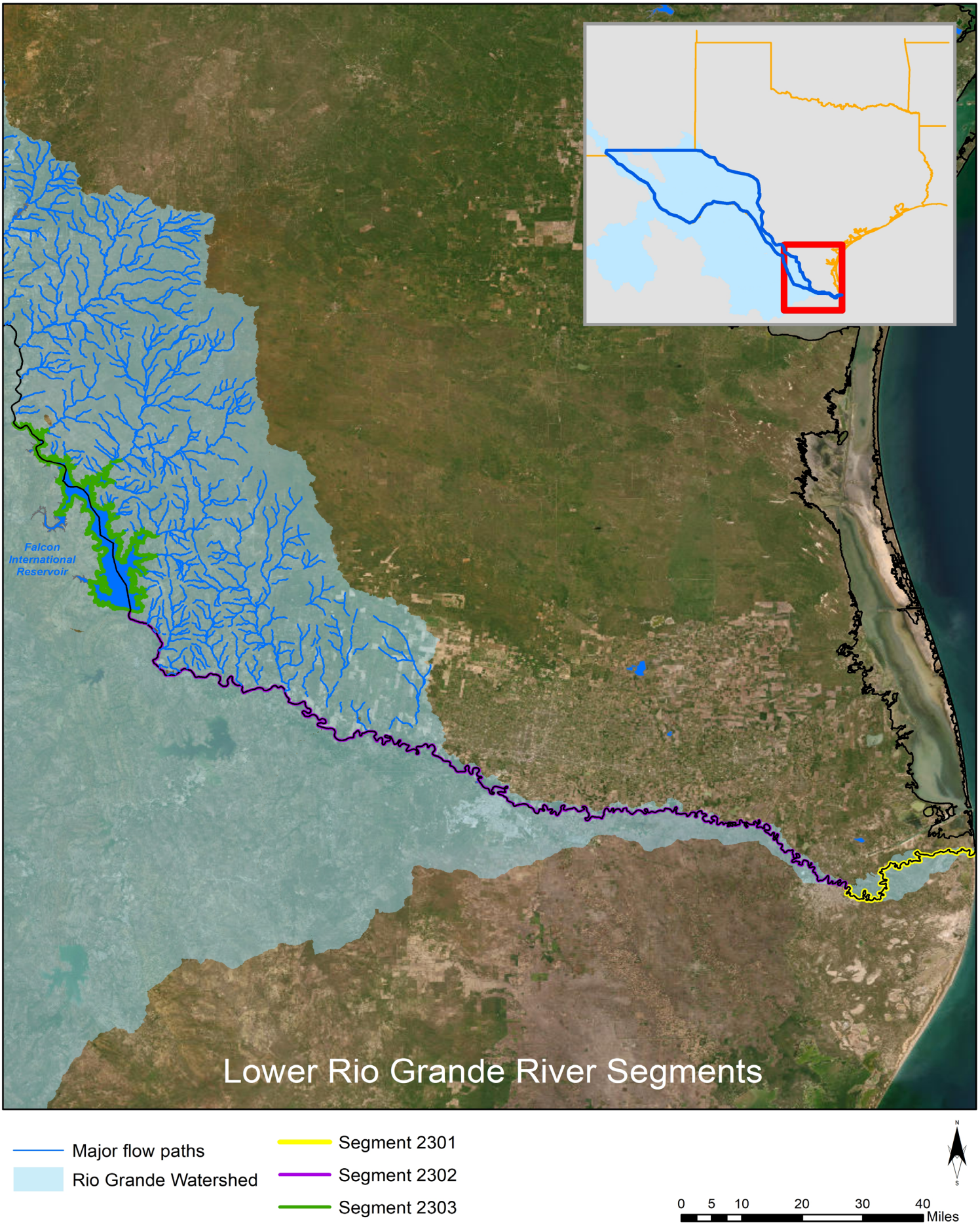
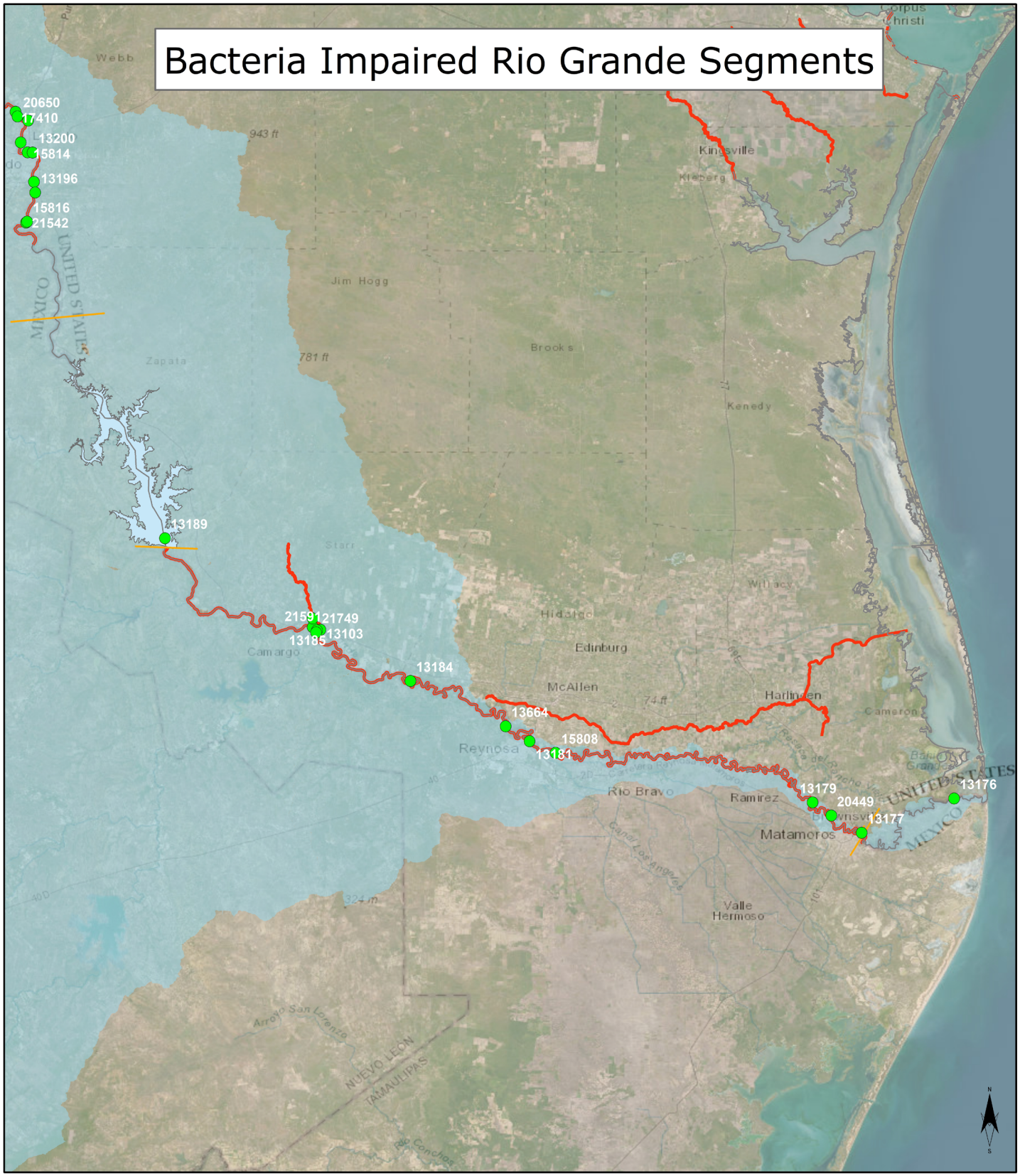


Figure 4. Map of the Lower Rio Grande river segments.

Figure 5. Map of bacteria impaired sections of the Rio Grande

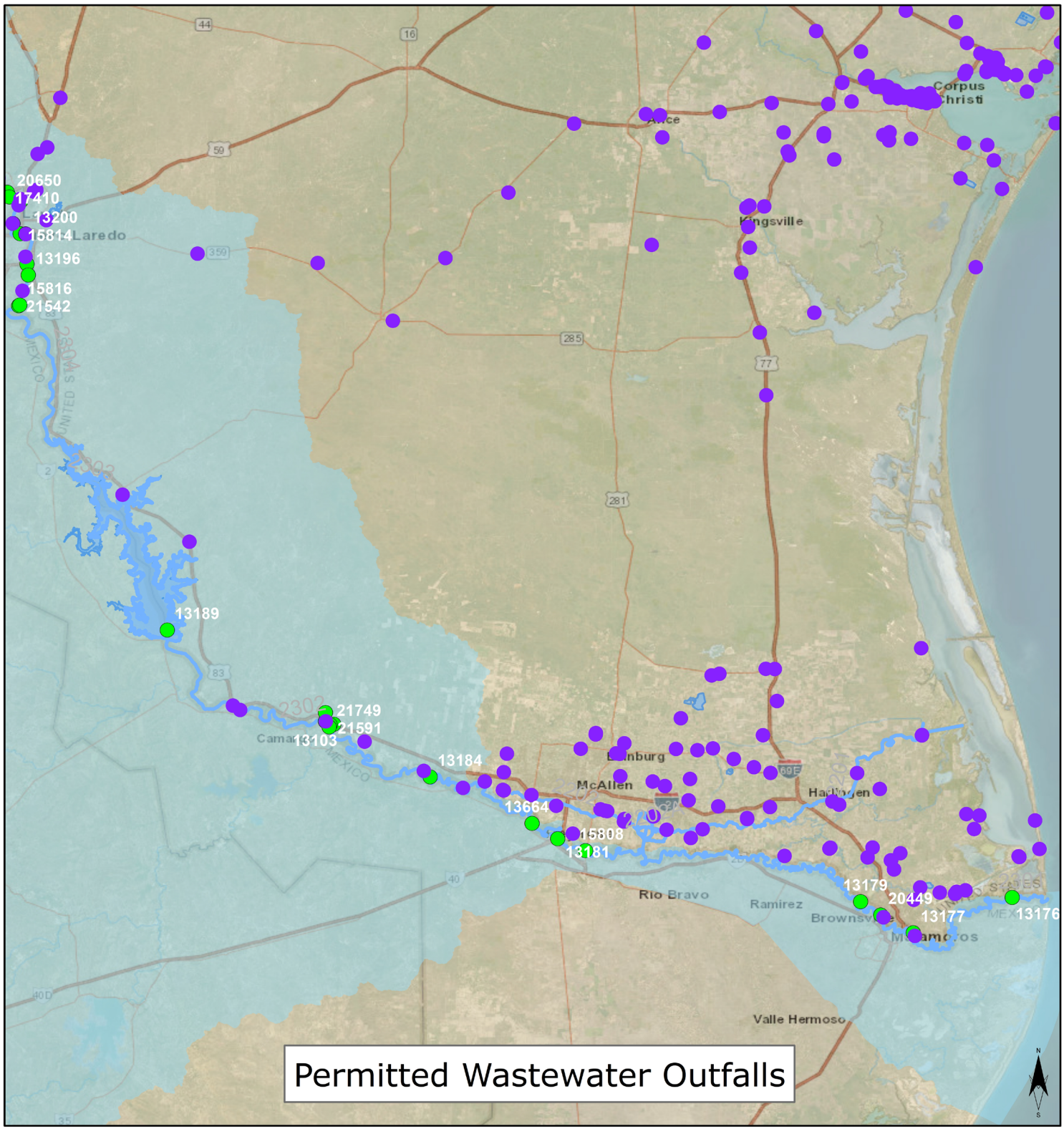


- IBWC Monitoring Stations
- Bacteria Impaired Segments
- River segments
- Falcon International Reservoir
- Rio Grande Watershed

Segments of the Rio Grande that are impaired for bacteria. Data obtained from TCEQ. Water quality data obtained from TCEQ and IBWC sampling sites.

0 5 10 20 30 40 Miles

Figure 6. Map of permitted wastewater outfalls in the Lower Rio Grande



The map shows the geographic locations of TCEQ permitted and regulated wastewater outfalls in relation to IBWC water quality monitoring stations

IBWC Monitoring Stations 2023
Permitted Wastewater Outfalls
RG Watershed Boundary

0 4.75 9.5 19 28.5 38 Miles

RIO GRANDE WATER QUALITY UPDATE

As previously stated, because of the Rio Grande Basin's size, the program has found a need to split it into four sub-basins. A table is provided for the lower sub-basin that characterizes which segments are associated with it, what active stations are in those segments, and other general information. For questions on this table, or historical or currently inactive stations, please contact USIBWC CRP staff.

Table 6. Water Quality Review for the Lower Rio Grande Sub-Basin

Water Quality Review for the Lower Rio Grande Sub-Basin					
Segment	*Uses	Stations	Length	Segment Characteristics	Water Quality Summary
2303- International Falcon Reservoir	H, PS, FC, PCR	15818, 13189	131 mi	Falcon reservoir is used for recreation, water supply, and hydroelectric power generation.	No impairments; however, there is a concern for toxicity in water near Zapata, likely from municipal effluent.
2302 - Rio Grande Below Falcon Reservoir	H, PS, GU, FC, PCR	13186, 13185, 13184, 13664, 13181, 15808, 17247, 10249, 13179, 13178, 20449, 13177, 21012, 21749, 21591	231 mi	Classified as a freshwater stream. Extends from Falcon Dam to below Brownsville and includes Anzalduas Dam and most of the Lower Rio Grande Valley (LRGV).	The majority of this segment has no impairments, but there are consistently **high bacteria** counts around urban areas such as Brownsville, Rio Grande City, and McAllen/Hidalgo, impairing the segment for contact recreation. Increased sulfate levels, indicating potential wastewater influences that can adversely affect the public water supply. The entire segment has a concern for fish consumption due to elevated **mercury** in fish. Colonias without wastewater infrastructure as well as urban runoff may contribute to the bacteria and DO issues.
2302A - Arroyo Los Olmos	L	13103, 13104	25 mi	Unclassified water body. Intermittent stream with pools, and limited aquatic life.	Impaired for **bacteria**, with exact source unknown but might be due to urban runoff and other non-point source pollution during rain events.
2301 - Rio Grande Tidal	E, GU, FC, PCR	16288, 13176	49 mi	Classified as a tidal stream. Extends from the confluence of the Rio Grande with the Gulf of Mexico to a point 6.7 miles downstream of the International Bridge in Brownsville, Cameron County.	Classified as a tidal stream. There are no impairments but closer to the Gulf there are high **chlorophyll-a** levels. The bacteria indicator is *Enterococci,* and data shows a concern for **bacteria**.

*For an explanation of the uses, please refer to Table 3, Designated Uses for Freshwater on page 9

This imagery from March 2022 obtained from Google Earth, shows the water of the Rio Grande reaching the mouth and flowing into the Gulf of Mexico

Segment 2303, International Falcon Reservoir

Segment 2303 begins at Falcon Dam in Starr County to the confluence of the Arroyo Salado (Mexico) in Zapata County, up to normal pool elevation of 301.1 feet (impounds Rio Grande). It includes the length of International Falcon Reservoir and is approximately 131 square miles in area. There are currently three sites being monitored within this segment, Stations 15817 (Rio Grande at Webb/Zapata County Line), 15818 (Falcon reservoir at San Ygnacio WTP Intake West of US 83 Intersection with FM3169) and 13189 (Falcon Lake at International Boundary Monument 1). The segment has four assessment units, or AUs:

2303_01, Area around International Monument XIV

2301_02, Area around Zapata WTP Intake

2301_03, Area around International Monument 1

2301_04, Remainder of Segment

There are currently no impairments in this segment, but there are numerous concerns for near non-attainment of water quality standards and/or based on screening levels; please see table below.

Table 7. List of concerns in segment 2303.

Segment	Segment Name	Parameter(s) Impaired	Year First Listed	Assessment Category	Parameter (s) of Concern	Level of Concern[2]
2303	International Falcon Reservoir	No Impairments	--	--	Toxicity in Water Fish kill in water	CS CN

CS- Concern for water quality based on screening levels
CN- Concern for water quality based on near non-attainment of water quality standards

Hydrologic Characteristics

The median instantaneous flow during the historical record of sampling for Station 15818 is 1489 cfs. Station 13189 is a Falcon reservoir station, and does not record flow, but it does maintain an conservation stage of 2,067 million cubic meters for its period of record. Station 15817, one of the longest monitored stations in the program, was dropped in late 2017 due to administrative issues. The Rio Grande in the Rio Grande Valley always carries water, but it is still affected by the drought, though the effects are not as severe as in other parts of the basin. The flow at Station 15818, which is just above the entry to Falcon reservoir, fluctuates seasonally. During monsoon season, which tends to be in the summer months of July and August, flows are higher due to heavy rainfall in the areas. Season occurrences, such as tropical storms or hurricanes, also impact rainfall in the area and result is high flows.

Data Analysis of Water Quality Issues

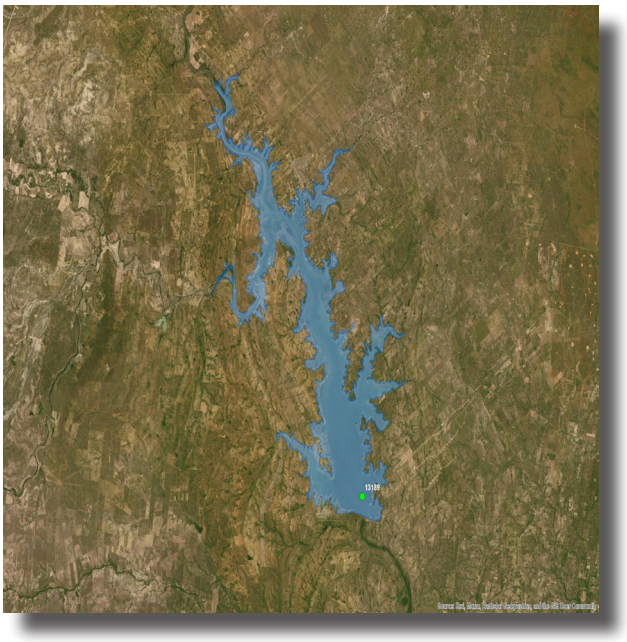
Segment 2303 has no impairments, but there are two water quality concerns for the area. Over the years, routine monitoring has shown concerns for Toxicity in water and the area has seen fish kills in the past due to varying factors.

Station 15817 was not sampled after August 2017, but data was collected for the first half of that year. The mean of 6 bacteria samples of *E.coli* bacteria that were analyzed from the water quality data was 479 MPN (most probable number). At the time, this site showed an increasing trend for high bacteria counts, which was likely due to the increasing population in the area. The water quality data indicated that dissolved oxygen levels had an average of 6.7 mg/L, was showing a slightly decreasing trend, and was lower than in the last report. Data for specific conductance shows a mean specific conductance reading of 1202 uS/cm (micro Siemens), slightly higher than the last report, and the average for pH at this station during the period of record is 8.3. Ammonia data for this station shows an average of 0.17 mg/L and shows an increasing trend. Total Phosphorus is 0.12 mg/L, and the data shows a decreasing trend. The concern for toxicity in water has been carried forward in the last TCEQ Integrated Report, and more studies would need to be done to determine if this is still an issue.

For Station 15818, the mean of 8 bacteria samples of *E.coli* bacteria that were analyzed was 372 MPN. The site shows an increasing trend for high bacteria counts, which is likely due to the increasing population and recreation in the area. The data indicated that dissolved oxygen levels showed an average of 7.45 mg/L, but is showing a slightly decreasing trend. The water quality data for specific conductance shows a mean specific conductance reading of 972 uS/cm, and the average for pH at this station during the period of record is 7.5. Ammonia data for this station is an average of 0.19 mg/L and shows an increasing trend. Total Phosphorus is 0.21 mg/L,and this data shows a decreasing trend. The concern for toxicity in water has been carried forward in the last TCEQ Integrated Report, and more studies would need to be done to determine if this is still an issue.

Small town of San Ygnacio to the righ of station 15818. The Mexicon side (to the left) shows no development. Station 15818 is located at the San Ygnacio WTP Intake West of US 83 Intersection with FM3169

For Station 13189, the mean of 18 bacteria samples of *E.coli* bacteria that were accessed from the water quality data was 75 MPN. The trend for this site is sharply decreasing, indicating an improvement in the water quality in reference to bacteria. The water quality data indicates that dissolved oxygen levels had a mean of 8.04 mg/L. Data for pH shows a mean of 8.6. Analysis of specific conductance shows a mean of 908 uS/cm and a slightly increasing trend over the period of record. Ammonia data shows an average of 0.17 mg/L and shows a slightly increasing trend. Total Phosphorus is 0.11 mg/L, and this data shows a decreasing trend. The concern for toxicity in water has been carried forward in the last TCEQ Integrated Report, and more studies would need to be done to determine if this is still an issue.



Land Use

Based on satellite imagery, Station 15818 is located near the San Ygnacio Water Treatment Plant in San Ygnacio, Texas, along the Rio Grande about a mile upstream from the Rio Grande confluence with Falcon Reservoir. Station 15817 is located upstream of Station 15818, along the river on land that is largely unpopulated and undisturbed. There are small urban developments on both sides of the border in this area, and the rest of the surrounding land is undeveloped.

Based on satellite imagery, the land around Station 13189 is a combination of unpopulated rural land and urban developments. The area in and immediately around the reservoir is popular for recreational activities (boating, fishing, swimming), with large settlements of homes on or near the shorelines. The land use of areas past the urban settlements, in the surrounding territory, is rural and largely consists of uninhabited ranch land.

There are two permitted discharges into Segment 2303 Zapata County Water Works Wastewater Treatment Plant and Zapata County Chihuahua Wastewater Treatment Plant. Zapata County Water Works Wastewater Treatment Plant is located approximately 1600 feet east of the intersection of Highway 83 and FM 2687 in Zapata County, Texas. The point of discharge is located approximately 500 feet north of FM 2687. The permit is for discharge of treated public domestic wastewater, and they are allowed to discharge up to 0.0175 million gallons per day (MGP) into Arroyo Miguel, which goes into International Falcon Reservoir.

Zapata County Chihuahua Wastewater Treatment Plant has a permit for the discharge of treated public domestic wastewater. It is located approximately 0.5 miles west of U.S. Highway 83 on Sewer Plant Road in the City of Zapata, Texas. It discharges 0.8 MGD of treated wastewater from the Zapata County Wastewater Treatment Facility directly to International Falcon Reservoir.

Possible negative impacts on water quality

Non-point sources- Segment 2303 consists of the water of the Rio Grande in Falcon Reservoir and contributing flows from the Rio Salado in Mexico. However, the section of the river that flows into Falcon reservoir is flowing downstream from the Laredo/Nuevo Laredo area, which has serious bacteria impairments. There are several small urban developments located all the way around the reservoir, which may contribute to bacteria introduction into the reservoir. The reservoir, being an impounded water source, does not flow, and this could contribute to lack of aeration and the buildup and break down of organic materials. Water fowl and horses and cattle from nearby ranchlands may further contribute to bacteria in the water, but the extent of any impact on the reservoir from wildlife is currently unknown.

Wildlife- The field crew for Station 15818 have good access to the Rio Grande, but the area sees moderate bird activity, which may contribute to the bacteria issues in this area. There are also horses and cattle grazing in and around the river, and the area has problems with feral hogs. Javalinas and other small wildlife are also common and could be small contributors to bacteria problems. The reservoir sees water fowl year-round, and some cattle and horses may come to graze and drink in the remote edges of the water line.

Urban Runoff- Station 15818 is located about a mile downstream of the small town of San Ysidro, Texas. Google Earth maps show that the main town road goes directly to the river, and many of the town's small recreation areas (parks, popular fishing spots) are along the river and directly accessible by the main road. Falcon Reservoir is impacted by runoff from the multiple communities around the shorelines, as well as by boat ramps and roads coming off the main highways.

Influences of Flow- Segment 2303 mainly encompasses Falcon reservoir, which has no flow. However, Station 15818, located just as the river is entering the Reservoir, in influenced by flows coming from upstream. Directly upstream of San Ysidro is Laredo, Rio Bravo, and El Cenizo, all of which have documented severely elevated bacteria counts. This may be influencing the bacteria counts at the station, contributing to the increasing trend for high bacteria counts, and may be negatively impacting the quality of the water going into the reservoir.

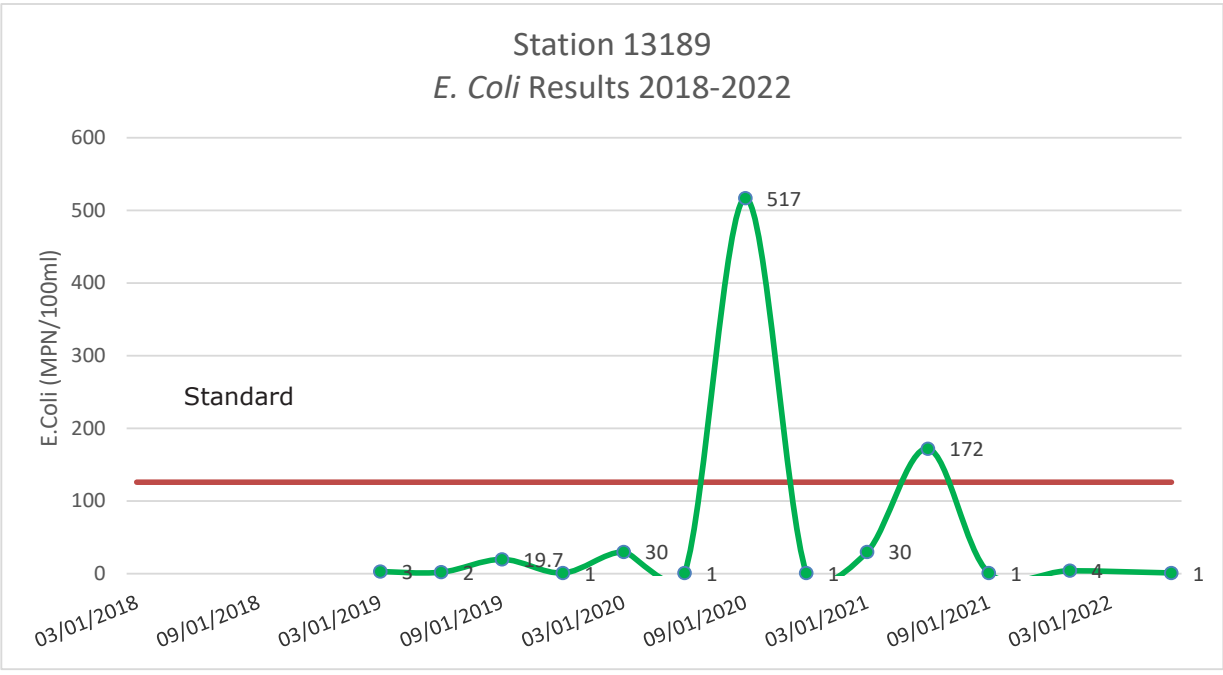
Agricultural- There are some private ranchlands in the surrounding areas, but farming takes place downstream of the reservoir and has little to no impact here. The ranchlands have goats, cattle and horses, as these are frequently seen grazing along the river near San Ygnacio.

Potential Stakeholders

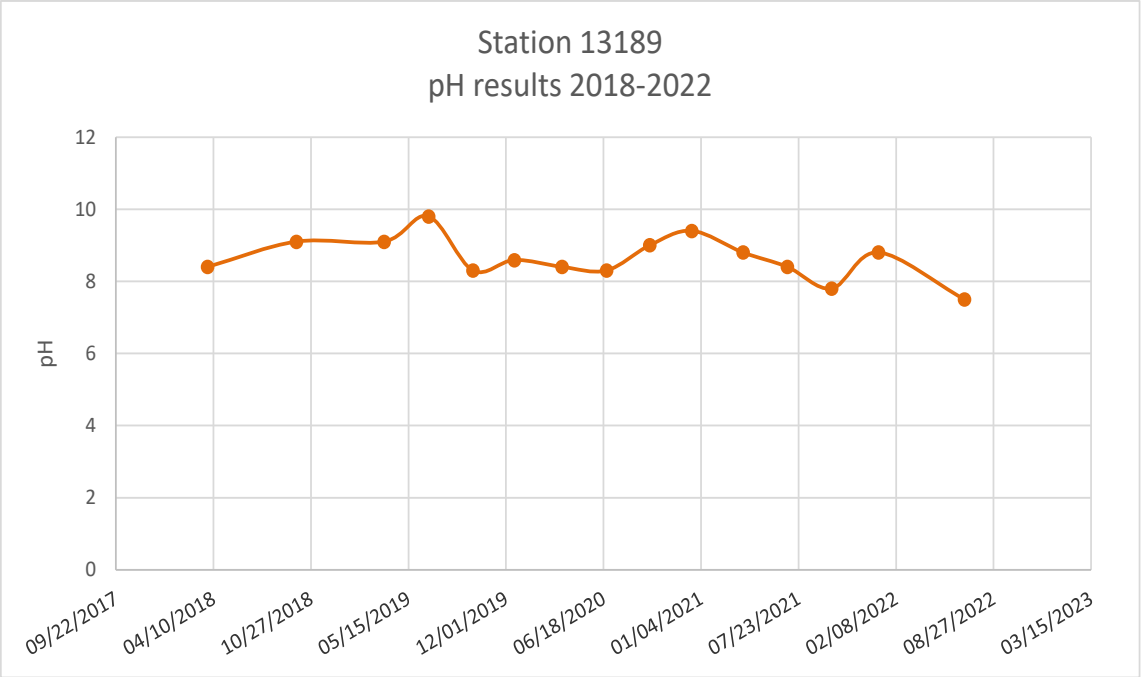
Landowners
TCEQ Regional Offices
City of Laredo, TX
Border cities and towns on MX side
Towns of Rio Bravo, El Cenizo, San Ygnacio, TX on U.S. side
TCEQ Watermaster Office US Fish & Wildlife Service
TX Parks and Wildlife
Webb and Zapata Counties
Nuevo Laredo, MX

Recommendations

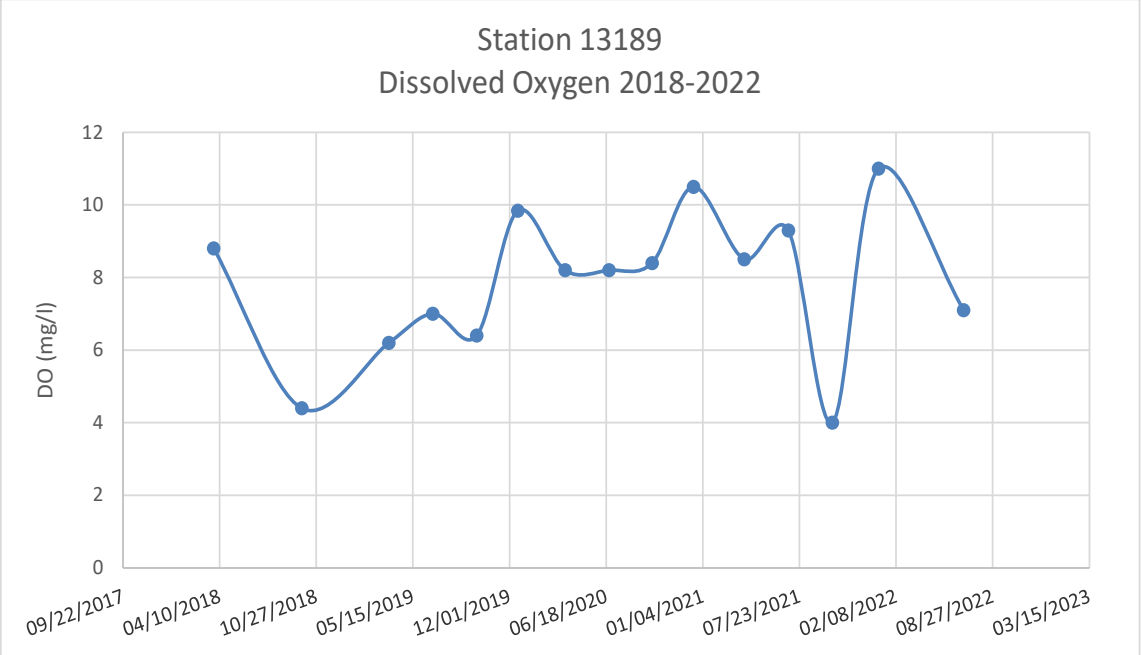
The USIBWC CRP will continue the routine monitoring for a full assessment in 2023. The program will continue to monitor and look at increasing or decreasing trends for parameters to identify water quality issues and needs in this area.



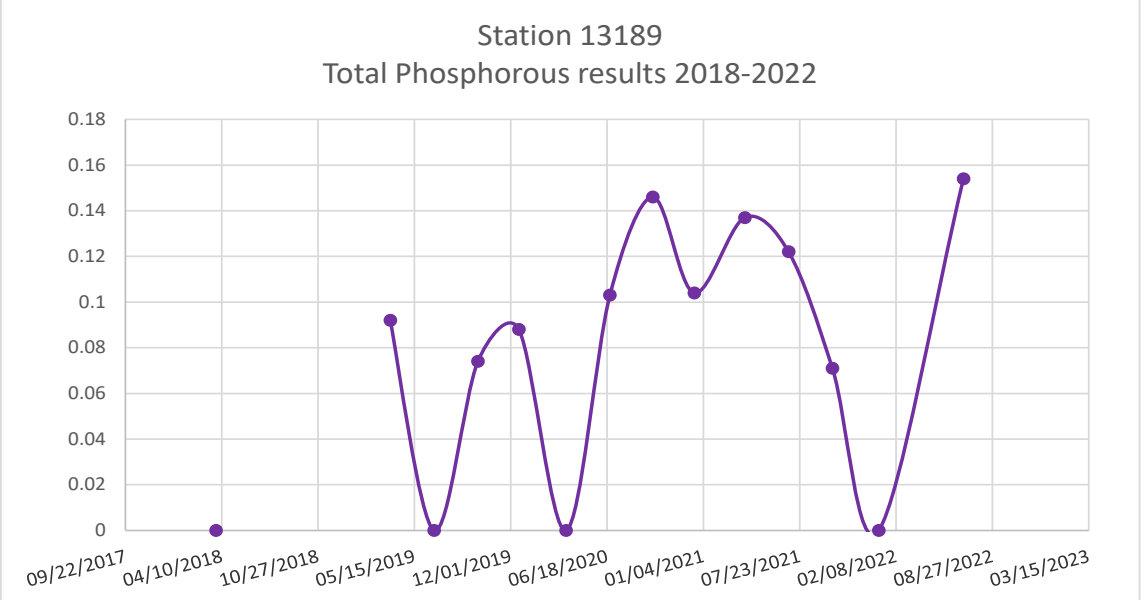
Graph to the left indicates *E.Coli* results for station 13189 for the years between 2018-2022. Data indicates a decrease in bacteria. *E.Coli* standard is 126 MPN/100ml.



Graph to the left indicates pH results for station 13189 for the years between 2018-2022. Date indicates pH is decreasing



Graph to the left indicates DO results for station 13189 for the years between 2018-2022.



Graph to the left indicates Total Phosphorous results for station 13189 for the years between 2018-2022. Break in the graph indicates no available data.

Segment 2302, Rio Grande Below Falcon Reservoir and 2302A, Arroyo los Olmos

Segment 2302 is described from a point 10.8 km (6.7 miles) downstream of the International Bridge in Cameron County to Falcon Dam in Starr County. It is the segment located just below International Falcon Reservoir, stretching to the tidal segment of the Rio Grande and is approximately 231.5 miles long. The segment has seven assessment units, or AUs, and one unclassified water body:

Segment 2302, Rio Grande Below Falcon Reservoir

2302_01, From El Jardin Pump Station upstream to the Rancho Viejo Floodway

2302_02, From the Rancho Viejo Floodway upstream to the Progresso Int'l Bridge (FM 1015)

2302_03, From the Progresso Int'l Bridge (FM 1015) upstream to the McAllen Int'l Bridge (US Hwy 281)

2302_04, From the McAllen Int'l Bridge (US Hwy 281) upstream to Anzalduas Dam)

2302_05, From Anzalduas Dam upstream to the Los Ebanos Ferry Crossing

2302_06, From the Los Ebanos Ferry Crossing upstream to the Arroyo los Olmos con fluence

2302_07, From the Arroyo los Olmos confluence upstream to the Falcon Dam

Segment 2302A, Arroyo los Olmos

2302A_01 From Rio Grande confluence at Rio Grande City to El Sauz in Starr County

There are 17 active stations within these segments:

10249, Rio Grande River 285 meters South and 30 meters West from the intersection of FM Road 813/Cantu Road and Avilia Road 6.3 KM downstream from San Benito pumping station

17247, Rio Grande River 100 M upstream of FM 1015 at Progresso, Texas

21012, Rio Grande River off Sherbach RD/Airfield RD 1.05 KM South and 340 meters East from the intersection of Shuerbach RD and Military RD South of Mission Cams 792

13186, Rio Grande River 4.1 km Downstream of the Confluence with Rio Alamo near Fronton, TX

13185, Rio Grande River at Fort Ringgold 1.6 km Downstream of Rio Grande City

13104, Arroyo los Olmos at SH 755 NW of Rio Grande City

21749, Rio Grande Approx 380 meters Downstream of Confluence with Los Olmos Creek

13103, Los Olmos Creek at US 83/East 2nd Street South of Rio Grande City

21591, Arroyo Los Olmos 400 m Upstream of Confluence with Rio Grande near Rio Grande City

13184, Rio Grande River at FM 886 Near Los Ebanos

13664, Rio Grande River 0.8 km Downstream of Anzalduas Dam and 16.4 km Upstream from Hidalgo, TX

13181, Rio Grande River at Hwy 281/International Blvd in Hidalgo

15808, Rio Grande River 300m Upstream of the Pharr International Bridge/US 281 East of Hidalgo, TX

13179, Rio Grande River at River Bend Golf Course Boat Ramp West of Brownsville

20449, Rio Grande River at Brownsville PUB Water Treatment Plant Number 1 Intake Between WTP Reservoir and Rio Grande Levee 910 m and 335 m South to the Intersection of West Elizabeth Street and South Military Road

13177, Rio Grande River at El Jardin Pump Station Located 350m West of Intersection of Monsees Road and Calle Milpa Verde

Both Segment 2302 and 2302A are currently impaired for bacteria, each in one assessment unit; only three stations are within these two AUs and will be discussed below. Segment 2302_07 was first listed on the Texas Integrated Report as impaired for bacteria in 1996, and 2302A_01 was listed in 2004. There are numerous concerns for near non-attainment of water quality standards and/or based on screening levels in this area as well; please see table below.

Table 8. List of parameters of concern for segment 2302 and 2302A.

Segment	Segment Name	Parame-ter(s) Im-paired	Year First Listed	Parameter (s) of Concern	Level of Concern[2]
2302	Below International Falcon Reservoir	*E. coli*	1996	Ammonia Chlorophyll-a Depressed DO pH	CS CS CS CS
2302A	Los Olmos Arroyo	*E. coli*	2004	Chlorophyll-a Depressed DO	CS CS

CS- Concern for water quality based on screening levels
CN- Concern for water quality based on non-attainment of water quality standards

Hydrologic Characteristics

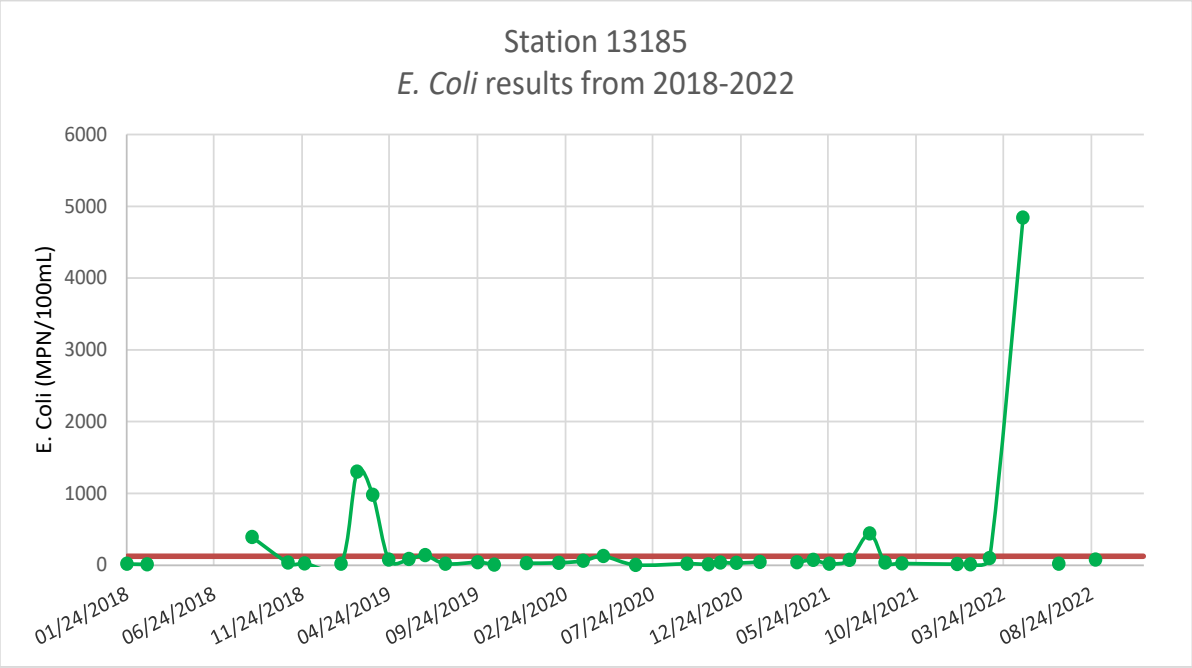
AU 2302_07 includes stations 13185 and 13186, and AU 2302A_01 includes station 13103. The mean flow for Station 13185 it is 2,645 cfs, and for Station 13186 the mean flow is 1820 cfs. The median instantaneous flow at Station 13103 (AU 2302A_01) for the period of record is 3 cfs, so the flow that is contributes to the river is minimal. The flows at these stations fluctuate seasonally. During monsoon season, which tends to be in the summer months of July and August, flows are higher due to heavy rainfall in the areas. Season occurrences, such as tropical storms or hurricanes, also impact rainfall in the area and result is high flows. Irrigation also impacts flow, and flows will be higher when they are releasing water from Falcon Reservoir.

Data Analysis of Water Quality Issues

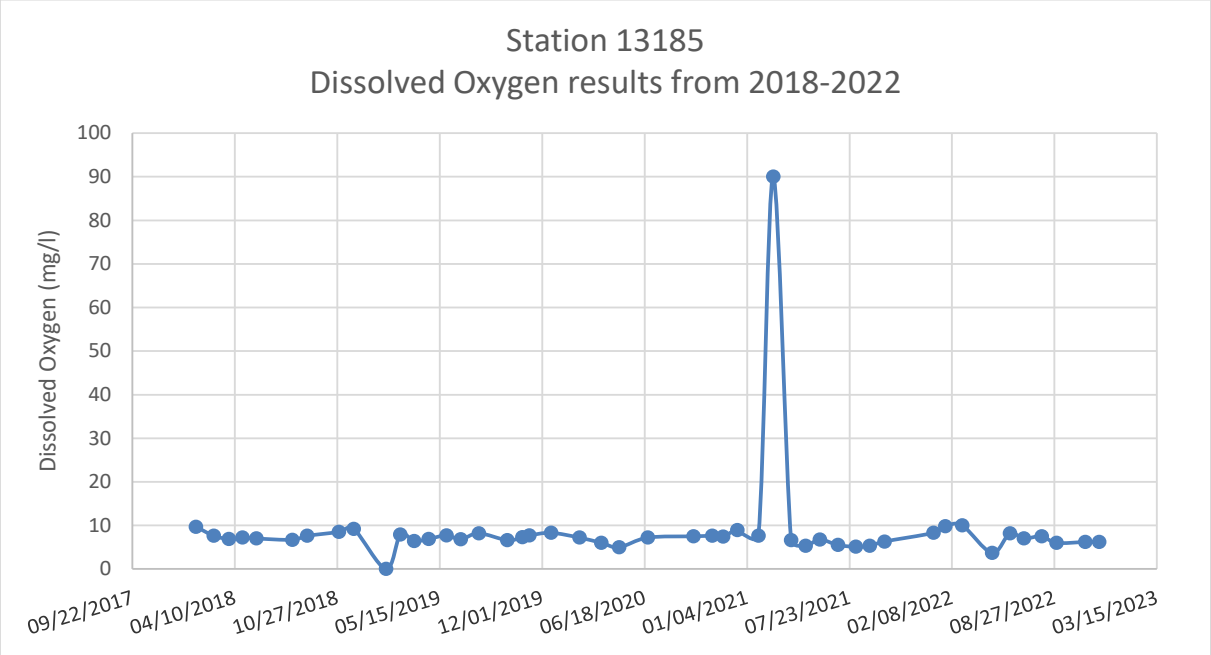
Assessment unit 2302_07 has an impairment for bacteria, as well as other water quality concerns for the area. Over the years, routine monitoring has shown concerns for Ammonia, chlorophyll-a and depressed dissolved oxygen and pH. This AU includes stations 13185 and 13186. AU 2302A_01 is impaired for bacteria as well, and also has a concern for chlorophyll-a and depressed dissolved oxygen.

Activities in this region are having a negative impact on water quality. The water quality data indicated that dissolved oxygen had a mean of 7.6 mg/L and the data shows an increasing trend toward higher values. Analysis of water quality data for pH shows a mean of 7.9. Data for specific conductance shows a mean of 920 uS/cm and a slightly increasing trend over the period of record. The chlorophyll-a data shows an average of 8.6 ug/L and shows a slightly increasing trend.

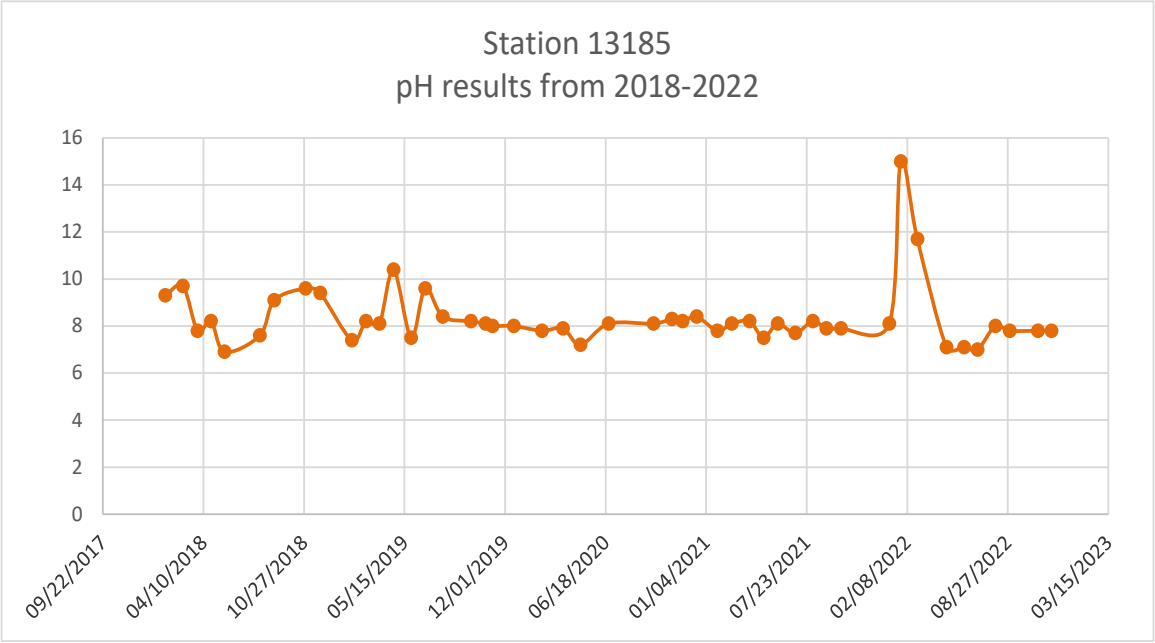
For Station 13185, the mean of 134 bacteria samples of *E.coli* bacteria that were analyzed was 495 MPN. The trend for this site is steadily decreasing, indicating an improvement of water quality around this station. The water quality data indicated that dissolved oxygen levels had a mean of 7.8 mg/L and the data shows an increasing trend for higher values. Data for pH shows a mean of 7.9. Specific conductance data shows a mean of 1036 uS/cm and a slightly increasing trend over the period of record. The chlorophyll-a data shows an average of 10.6 ug/L and a slightly increasing trend.



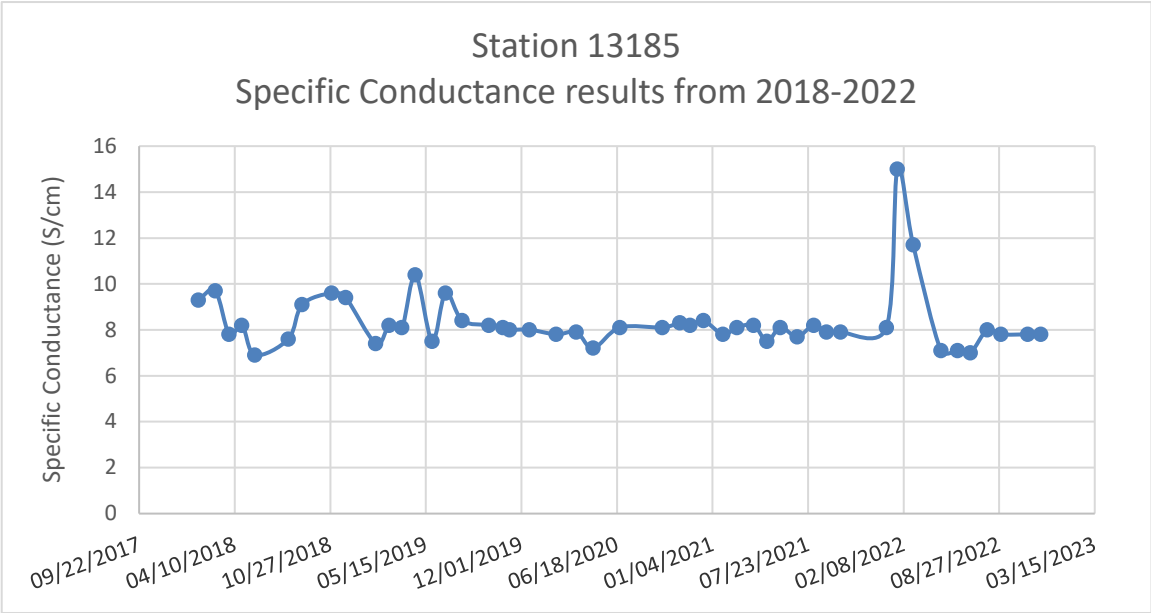
Graph to the left indicates *E.Coli* results for station 13185 for the years between 2018-2022. Break in graph indicates data not available.



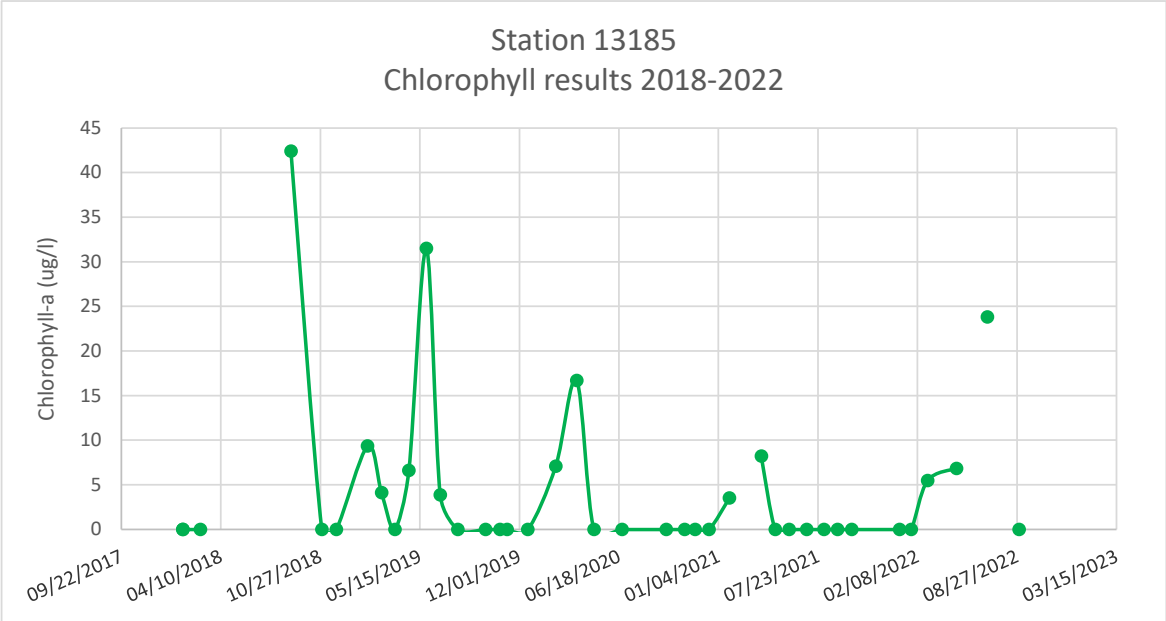
Graph to the left indicates Dissolved Oxygen results for station 13185 for the years between 2018-2022.



Graph to the left indicates pH results for station 13185 for the years between 2018-2022.



Graph to the left indicates Specific Conductance results for station 13185 for the years between 2018-2022.



Graph to the left indicates Chlorophyll results for station 13185 for the years between 2018-2022. Break in graph indicates no available data.

Station 13186, the mean of 96 bacteria samples of *E.coli* bacteria that were analyzed was 75 MPN. The trend analysis for bacteria water quality data at this station is steadily increasing, indicating

For Station 13103, the mean of 19 bacteria samples of *E.coli* bacteria that were analyzed was 1464 MPN. The site shows an increasing trend for high bacteria counts, which is likely due to the increasing population in the area, aging infrastructure and agricultural return flow. The water quality data indicated that dissolved oxygen levels were 7.2 mg/L, but is showing a decreasing trend. This could be due to no or very low flows, coupled with stagnant water, when there is no water released. This station has not flowed consistently since the drought began in 2010. Specific conductance data shows a mean of 7381 uS/cm, which is high, and the average for pH at this station during the period of record is 8.1. The chlorophyll-a data shows an average of 97.7 ug/L.

Based on statistical analysis of 15 years of water quality data for the two stations in Segment 2302 and the station in Segment 2302A, water quality is being negatively affected as we proceed downstream. The bacteria counts and other data are within standard limits at station 13186, but in the area surrounding station 13103, which is the furthest downstream of the three stations, the bacteria problems are a serious concern. This segment also has

Pictured above is station 13103, Arroyo Los Olmos.

issues with salinity, and farmers and irrigators have concerns that the water is not suitable for irrigation use. Although the area is not yet impaired for Total Dissolved Solids (TDS), the salinity over time has been increasing steadily. Possible sources of this salinity are described further in this report.

It is important to note that the in the last TCEQ Integrated Report assessment period (2014 Integrated Report), an AU in Segment 2302 was delisted. 2302_01 (From El Jardin Pump Station upstream to the Rancho Viejo Floodway) was delisted for bacteria. This indicates that water quality in this area improved enough that the data collected during the assessment period fully supported the water quality standards for bacteria. This is a major improvement for this area. Part of the improvement is attributed to the Matamoros Wastewater Treatment Plant that went online in 2008; we have been monitoring a steady decrease since 2008.

Land Use

Based on satellite imagery, there is land at the beginning of the segment that is undeveloped, but proceeding downstream there are small and large urban developments on both sides of the border in this area. There are very small developments dotting the land that follows the river throughout the entire segment on both sides of the border, and may presumably be colonias, or very poor communities with access to little or no wastewater infrastructure and poor sanitary conditions.

The Lower Rio Grande Valley is heavily influenced by agriculture, and a large part of the lands near the river are agricultural crop lands. There are several large industrial buildings on the Mexican side of the border. This area has ports of entry as well, which see heavy traffic, commercial and private, on a daily basis.

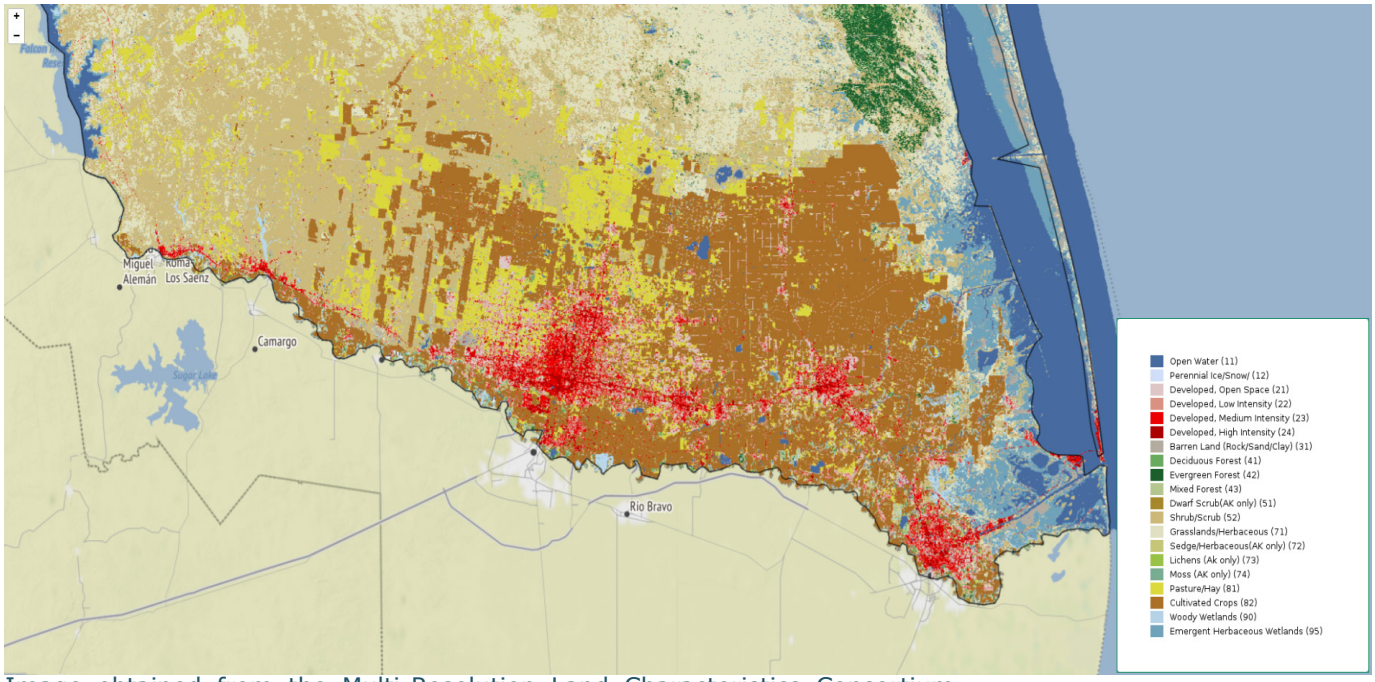
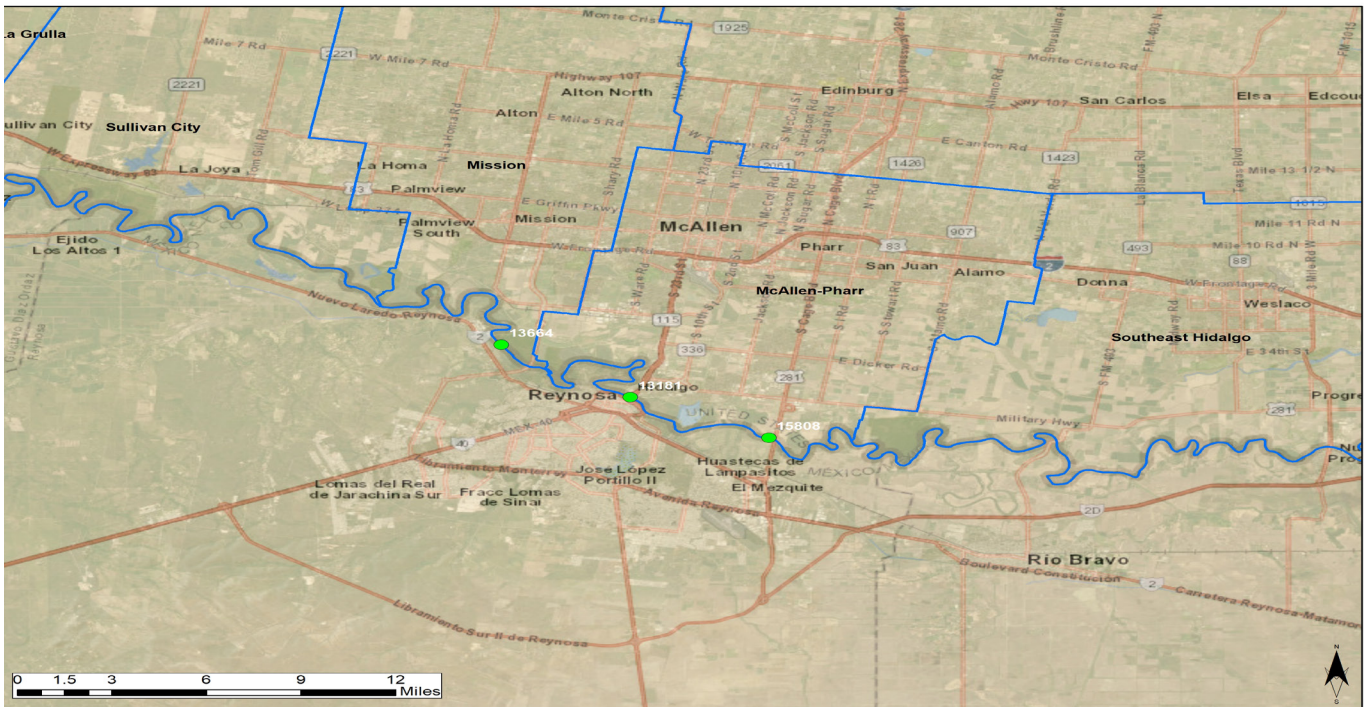
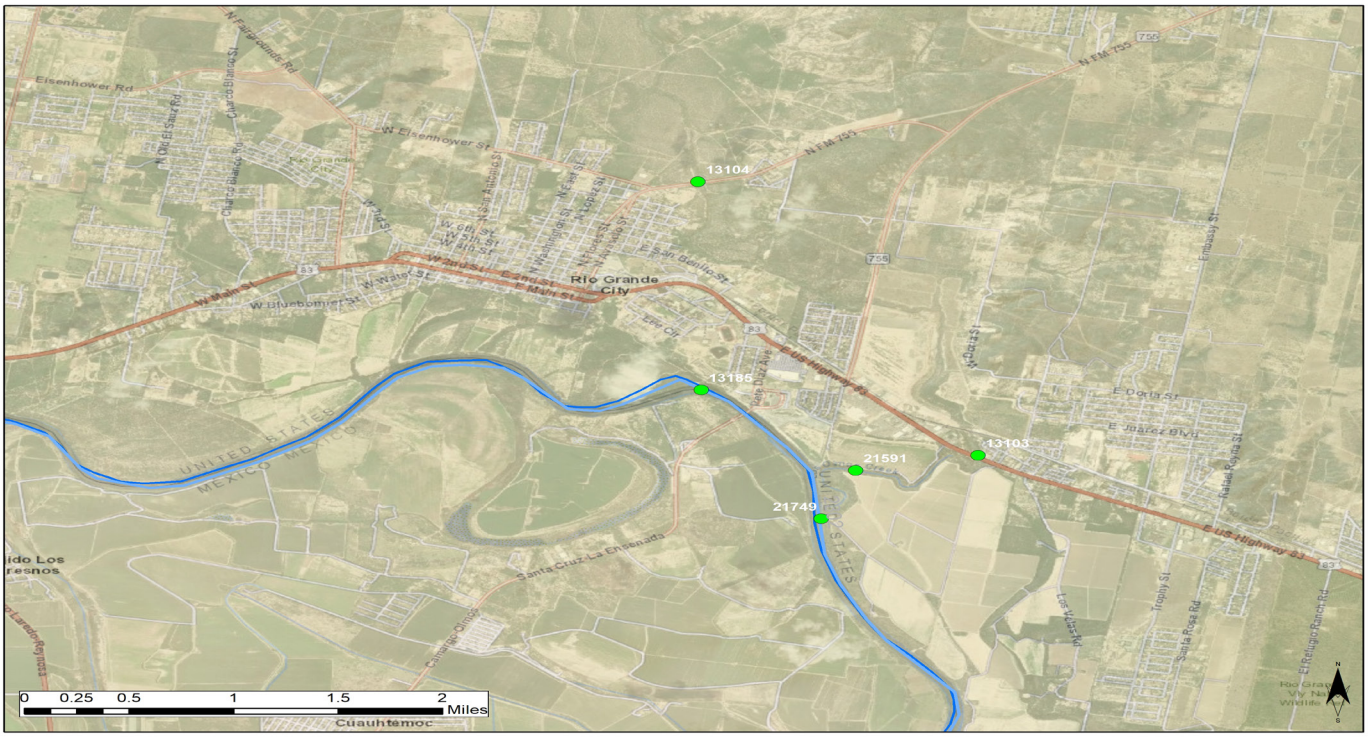


Image obtained from the Multi-Resolution Land Characteristics Consortium (MRLC). Data for land cover in the lower Rio Grande is from 2019.

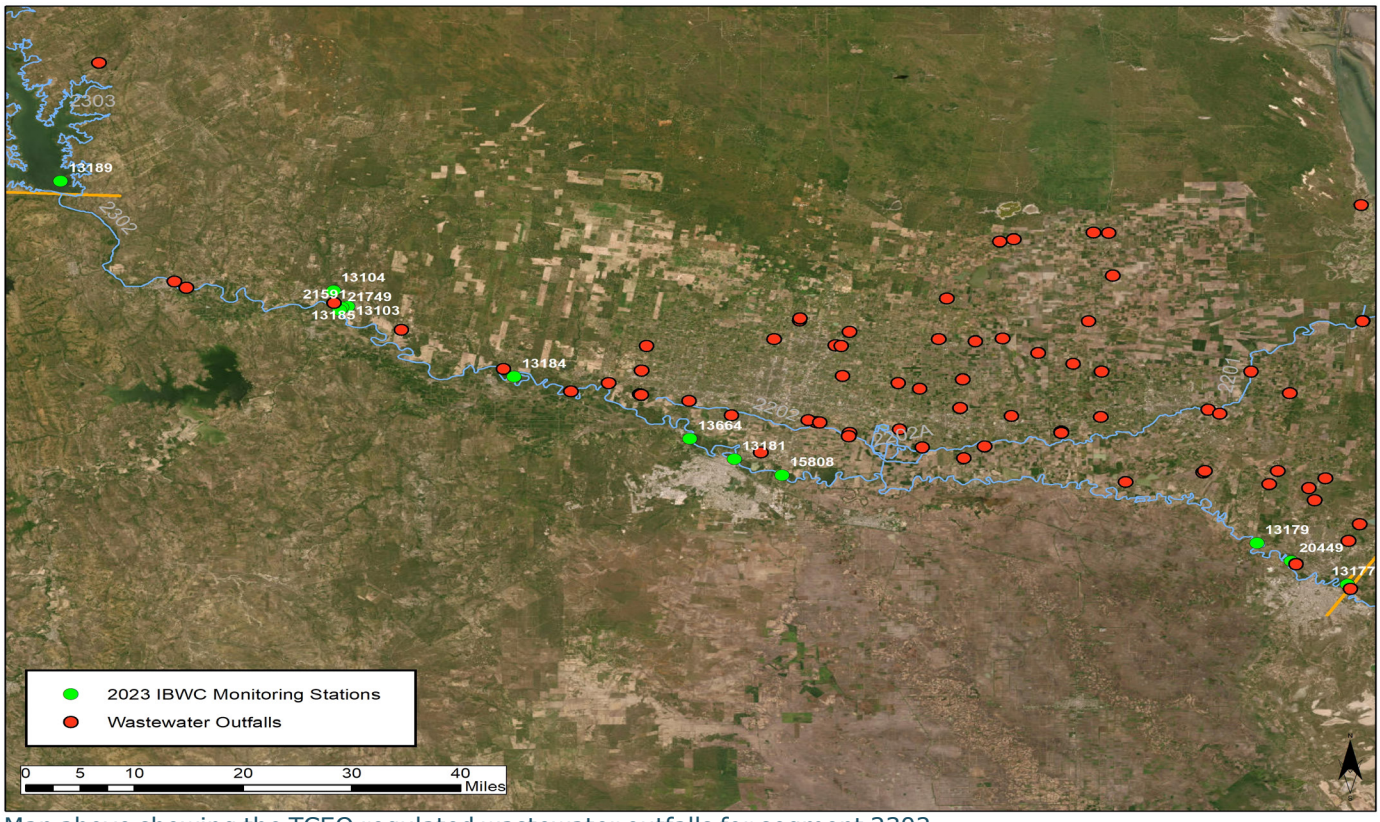


Map above shows the urban area of McAllen, TX and Reynosa, MX. Stations 13664, 13181 and 15808 are located within this urban area.



Map above shows the urban of Rio Grande City, TX. Stations 13104, 13185. 21591, 13103, and 21749 are located within this area.

There are 16 permitted dischargers that discharge into Segment 2302. The permits include one for conventional water treatment, one permit for industrial wastewater treatment, two permits for private domestic wastewater treatment, 8 permits for public domestic wastewater treatment.



Map above showing the TCEQ regulated wastewater outfalls for segment 2302.

Possible Negative Impacts on Water Quality

Nonpoint sources- The Rio Grande is heavily impacted not only by small and large urban developments on both sides of the border, but also by the lower-income communities that have limited or no access to sewer systems. These areas are more likely to have inadequate sewer hookups, leaky septic tanks or no infrastructure at all, which can contribute to the bacteria problems in the area. Water fowl and livestock from nearby ranchlands may further contribute to bacteria in the water, but the extent of any impact on the water quality from wildlife is currently unknown.

Agricultural- This segment is heavily impacted by the agricultural industry, and the majority of the land is crop land. This can easily be verified through satellite imagery. There are some private ranchlands in the surrounding areas that have livestock. Agricultural return flows may contribute to high salinity in the water being returned to the river, and may also have a negative impact on the bacteria counts. It is important to note that return flows are received from both the U.S. and Mexico, and both may be contributing to the problem. Agricultural return flows are also high in nutrients, which can contribute to algal blooms. Livestock that are to graze near the river can also be a contributing source of bacteria allowed.

Wildlife- Access to the river at the stations in this segment is relatively easy, though the landscape was drastically changed by the flooding caused by Hurricane Alex in 2010. The area is a popular stop for migratory birds, which may contribute to the bacteria issues in this area. There is also livestock grazing around the river due to private ranches. Other small wildlife are also common and could be small contributors to bacteria problems.

Urban Runoff- There are multiple communities along the river in this span of the basin. Roma, Rio Grande City, Mercedes, McAllen, Weslaco, La Joya, Harlingen and many other cities border the river until it reaches the Gulf on the U.S. side, while numerous towns and cities border the river on the Mexican side as well.

Google Earth maps show multiple roads in every one of these cities that go directly to the river. Many of the town's small recreation areas (parks, popular fishing spots) are along the river and directly accessible by boat ramps off of main roads. This segment is impacted by runoff from the multiple communities around the shorelines, as well as by boat ramps and roads coming off the main highways. Ports of Entry at each city are also a major contributor of pollution to the Rio Grande water quality, especially during heavy rain events, as these see heavy pedestrian, private vehicle and commercial vehicle traffic on a daily basis.

Influences of Flow - Segment 2302 is heavily influenced by releases from Falcon Reservoir, but this area also sees several rain events throughout the year. Since the first station below Falcon Reservoir, 13186, does not have any immediate water quality issues (though the assessment unit itself is impaired), it appears that the impacts to the water quality are coming from other sources as the water flows downstream.

Potential Stakeholders

Landowners

TCEQ Watermaster Office

US Fish & Wildlife Service

TCEQ Regional Offices

TX Parks and Wildlife

TX A&M Kingsville

UTRGV- Edinburg

Starr, Willacy, Hidalgo, Cameron Counties

Cities of Zapata, Roma, McAllen, La Feria, Pharr, Mercedes, Weslaco, Edinburg, Mission, Rio Grande City

Cameron County Water Improvement District No. 10 and 16

Cameron County Irrigation District No. 2 and 6

Donna Irrigation District- Hidalgo County No. 1

Hidalgo and Cameron County Irrigation District No. 9

Hidalgo County Irrigation District No. 1, 2, 6, 13, 16, 19

Hidalgo County Water Control and Improvement District No. 18

Hidalgo County Water Improvment District No. 3, 5

Hidalgo County Municipal Utility District No. 1

La Feria Irrigation District- Cameron County No. 3

Santa Maria Irrigation District- Cameron County No. 4

United Irrigation District of Hidalgo County

Valley Acres Water District

Valley Municipal Utility District No. 2

Recommendations

The USIBWC CRP will continue the routine monitoring for a full assessment in 2016. The program is currently a participant in the Lower Rio Grande Water Quality Initiative, a pilot binational project that aims to look at bacteria and salinity in the Lower Rio Grande Basin and establish protocols to try and implement a binational watershed protection plan. More information on this project can be found later in the report.

Segment 2301, Rio Grande Tidal

Segment 2301 is from the confluence with the Gulf of Mexico in Cameron County to a point 10.8 km (6.7 miles) downstream of the International Bridge in Cameron County and is approximately 48.31 miles long. The segment has two assessment units, or AUs:

2301_01, From the mouth of the Rio Grande (lower segment boundary) to a point 71.7 km (44.6mi) upstream

2301_02, From a point 71.7 km (44.6 mi) upstream of the mouth of the Rio Grande to the upper segment boundary 10.8 km (6.7 mi) downstream of the International Bridge

There are 2 stations currently being monitored within this segment:

16288, Rio Grande River at Sabal Palm Sanctuary 370 meters south and 310 meters east from the Intersection of Dakota Ave and Sabal Palm Grove Road

13176, Rio Grande River Tidal at the end of Quicksilver Ave 375 meters south from the Intersection of Boca Chica Blvd and Quicksilver Ave

In the 2022 Intergrated Report, Segment 2301 does not have any impairments at this time, but does have concerns for bacteria, chlorophyll-a, and nitrate; please see table below.

Table 9. List of parameters of concern for segment 2301.

Segment	Segment Name	Parameter(s) Impaired	Year First Listed	Assessment Category[1]	Parameter (s) of Concern	Level of Concern[2]
2301	Rio Grande Tidal	No Impairments	--	--	*Enterococci* Chlorophyll-*a* nitrate	CN CS CS

CS- Concern for water quality based on screening levels
CN- Concern for water quality based on non-attainment of water quality standards

Hydrologic Characteristics

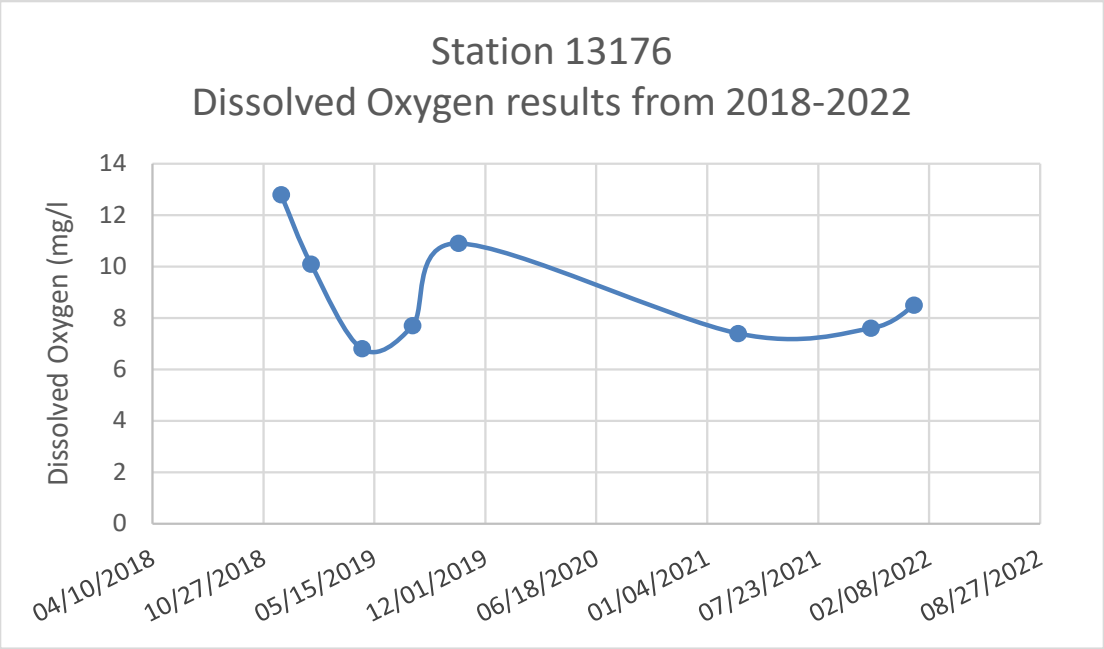
AU 2301_01 includes station 13176, and AU 2302A_02 includes station 16288. The mean flow for Station 16288 is 767 cfs, and for Station 13176 the mean flow is 588 cfs. The flows at these stations fluctuate seasonally. During monsoon season, which tends to be in the summer months of July and August, flows are higher due to heavy rainfall in the areas. Season occurrences, such as tropical storms or hurricanes, also impact rainfall in the area and result is high flows. Because this segment is so close to the Gulf of Mexico, there may also be tidal influences from high tides and storm surges. Irrigation also impacts flow, and flows will be higher when they are releasing water from Falcon Reservoir and drop when irrigation ceases.

Data Analysis of Water Quality Issues

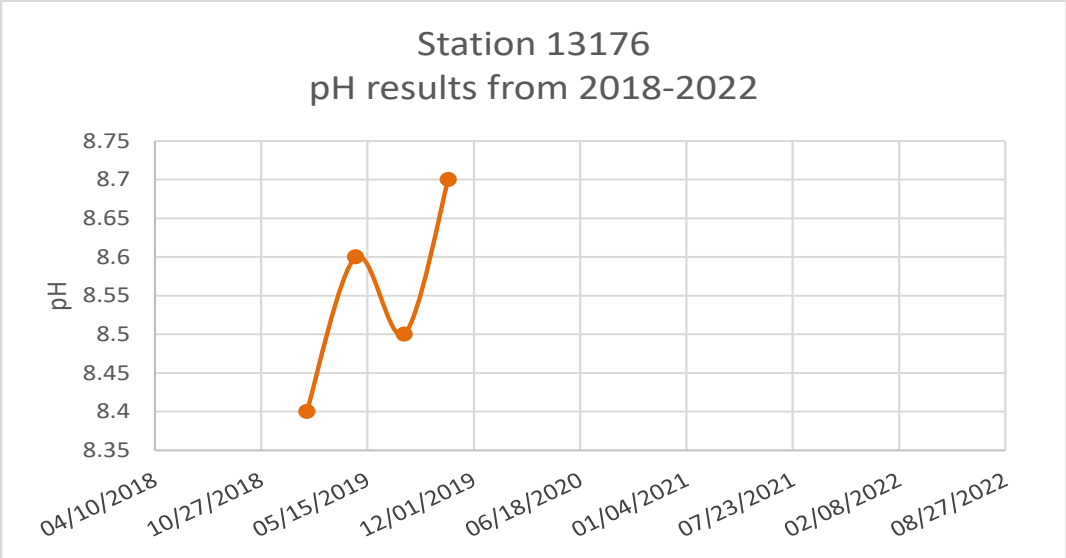
Segment 2301 has no impairments, but does have concerns for bacteria, chlorophyll-a and nitrate. AU 2301_01, which includes Station 13176, has a concern for chlorophyll-a. AU 2301_02, which includes Station 16288, has concerns for bacteria and nitrate.

For Station 16288, the mean of 23 water quality samples analyzed over the period of record of 15 years was 764 MPN for *Enterrococcus*. The data at this station indicates a steadily decreasing trend, which points to an improvement of water quality in this region. The water quality data indicates that dissolved oxygen levels had a mean of 8.1 mg/L and the trend remains constant (no increase/decrease). Data for pH shows a mean of 8.0. Specific conductance shows a mean of 1699 uS/cm and a slightly decreasing trend over the period of record. The nitrate data shows an average of 1.5 mg/L and a decreasing trend.

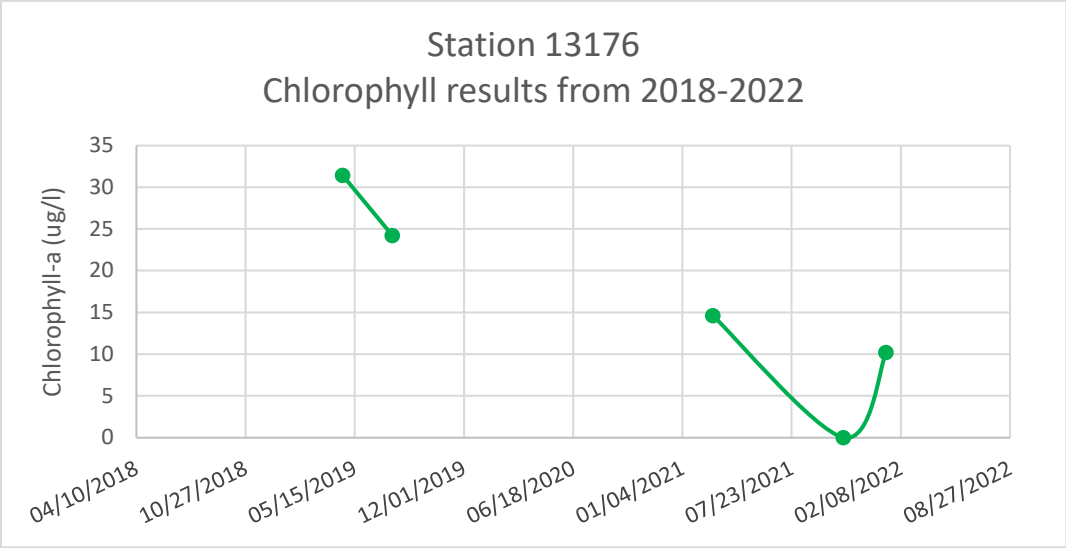
For Station 13176, the mean of 17 bacteria samples that were analyzed was 53 MPN for *Enterrococcus*. The trend for this site is steadily increasing, indicating activities in this area are having a negative impact of water quality around this station. The analysis showed that dissolved oxygen had a mean of 8.9 mg/L. Water quality data for pH shows a mean of 8.2. Specific conductance shows a mean of 4121 uS/cm and a slightly decreasing trend over the period of analysis. The chlorophyll-a data shows an average of 20.5 ug/L and a slightly decreasing trend.



Graph to the left indicates Dissolved Oxygen results for station 13176 for the years between 2018-2022.



Graph to the left indicates pH results for station 13176 for the years between 2018-2022 (No data available after March 2021).



Graph to the left indicates Chlorophyll results for station 13176 for the years between 2018-2022. Break in the graph indicates there was no available data.

Land Use

Based on satellite imagery, there are small and large urban developments on both sides of the border in this area. There are very small developments dotting the land that follows the river throughout the entire segment on both sides of the border, and may presumably be colonias, or communities with access to little or no wastewater infrastructure and poor sanitary conditions. A large portion of the lands near the river on both sides of the border are wetlands, with agricultural lands right before that.

There are 1 permitted discharger that discharges into Segment 2301. The permit belongs to the Brownsville Public Utilities Board (BPUB), which discharges treated public domestic wastewater. The BPUB facility, the Southside Wastewater Treatment Facility, is located at 2800 East University Boulevard, in southeast Brownsville, in Cameron County, Texas. It discharges 12.8 MGD of treated wastewater from Southside Wastewater Treatment Facility directly to Rio Grande Tidal in Segment 2301.

Possible negative impacts on water quality

Nonpoint sources- The Rio Grande is heavily impacted not only by small and large urban developments on both sides of the border, but also by the lower-income communities that have limited or no access to sewer systems. The population in the McAllen, Harlingen and Brownsville areas have doubled in the past ten years, and this places a heavy strain on the treatment facilities in these communities. These areas are more likely to have leaky and/or old septic tanks, aging infrastructure, and facilities that are too small for the communities they serve, which can contribute to the bacteria problems in the area. Water fowl and livestock from nearby ranchlands may further contribute to bacteria in the water, but the extent of any impact on the reservoir from wildlife is currently unknown.

Agricultural- This segment is heavily impacted by the agricultural industry, and the majority of the land is crop land. This can be verified through satellite imagery. There are some private ranchlands in the surrounding areas that have livestock. Agricultural return flows may contribute to salinity in the water being returned to the river, and may also have a negative impact on the bacteria counts. It is important to note that return flows are received from both the U.S. and Mexico, and both may be contributing to the problem. Agricultural return flows are also high in nutrients, which can contribute to algal blooms. Livestock that are allowed to graze near the river can also be a contributing source of bacteria.

Wildlife- Access to the river at the stations in this segment is relatively easy, though the landscape was drastically changed by the flooding caused by Hurricane Alex in 2010. Some stations are also behind the border fence, so access at these sites requires prior coordination with U.S. Border Patrol. The area is a popular stop for migratory birds, which may contribute to the bacteria issues in this area. There is also livestock grazing around the river due to private ranches. Other small wildlife are also common and could be small contributors to bacteria problems. The area has wildlife refuges and preserves, and several protected areas.

Urban Runoff- There are multiple communities along the river in this span of the basin. La Joya, Harlingen, Brownsville and the many cities across the international border are all located along the river. Google Earth maps show multiple roads in every one of these cities that go directly to the river. Many of the town's small recreation areas (parks, popular fishing spots) are along the river and directly accessible by boat ramps off of main roads. Pollution related to trash from recreation are also problems. This segment is impacted by runoff from the multiple communities around the shorelines, as well as by boat ramps and roads coming off the main highways. Ports of Entry at each city are also a major contributor of pollution to the Rio Grande water quality, especially during heavy rain events, as these see heavy pedestrian, private vehicle and commercial vehicle traffic on a daily basis.

Influences of Flow - Segment 2301 is heavily influenced by weather in the Gulf region, and the region sees several rain events throughout the year. This is the furthest downstream segment of the basin, and is receiving water from the upstream segments that are impaired. Because the segment is so close to the Gulf, the area is affected by tidal influences, from the tide back flowing and mixing with the river water, and well as by storm surges from tropical storms and hurricanes. These factors, combined with the increasing salinity of the water as it flows downstream from further up the river basin, all contribute to the salinity in this area. The agricultural return flows may also have an impact on the water quality, although there are currently no impairments or concerns for high salinity.

Potential Stakeholders

Landowners

US Fish & Wildlife Service

TX Parks and Wildlife

Matamoros and other cities in Tamaulipas, MX

Adams Garden Irrigation District No. 19

Harlingen Irrigation District- Cameron County No. 1

TCEQ Watermaster Office

TCEQ Regional Offices

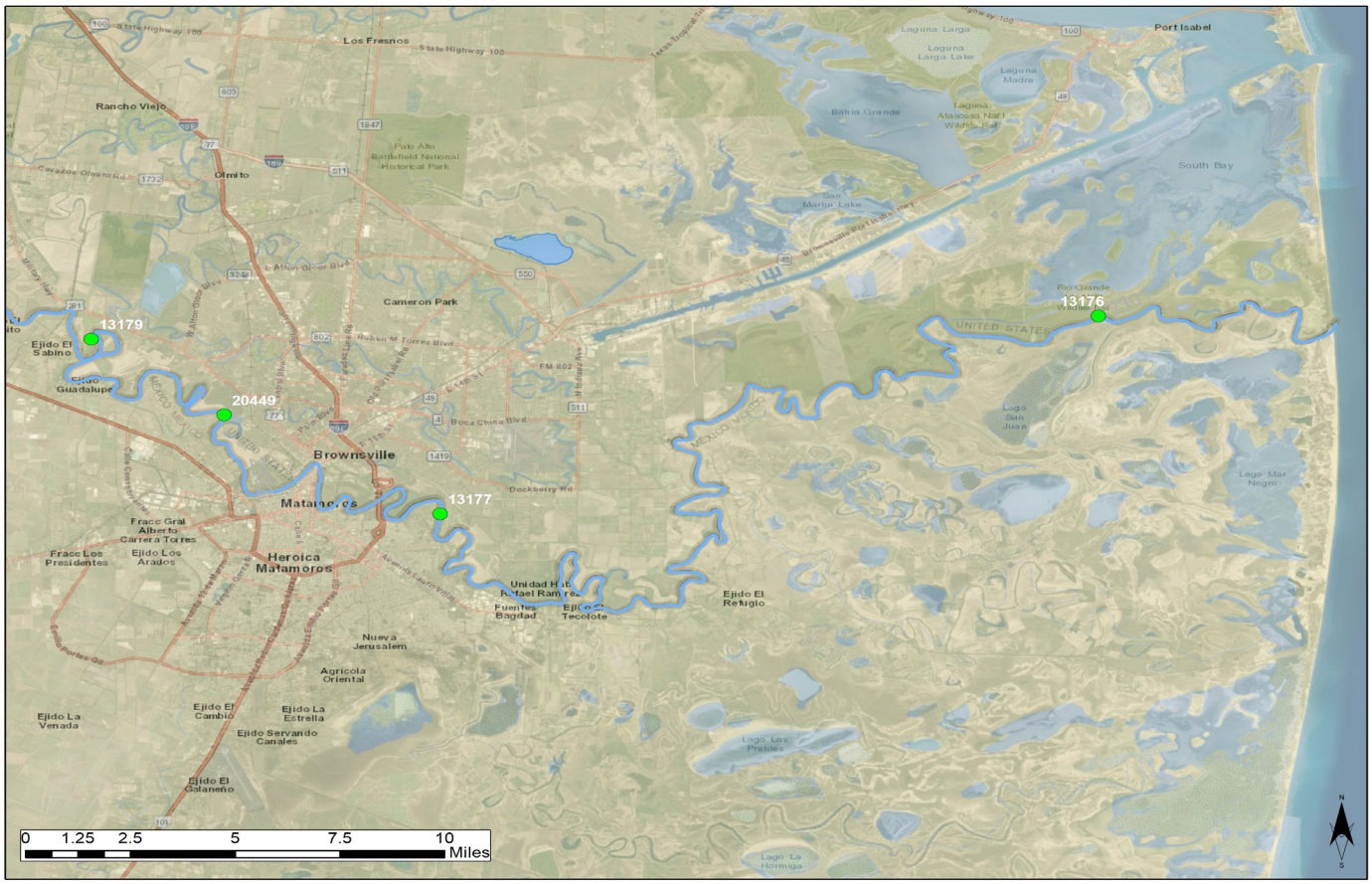
Cities of Harlingen, La Joya, Brownsville

UTRGV- Brownsville

Brownsville Irrigation District

Recommendations

The USIBWC CRP will continue the routine monitoring for a full assessment in 2016. The program is currently a participant in the Lower Rio Grande Water Quality Initiative, a pilot binational project that aims to look at bacteria and salinity in the Lower Rio Grande Basin and establish protocols to deal with them. More information on this project can be found later in the report.



Map above shows the metropolitan area of Brownsville, TX and Matamoros, Tamaulipas, Mexico. To the far right is the Gulf of Mexico. Stations 13179, 20449, 13177, and 13176 are located within the area.

Pictured above is station 20449, monitored by BPUB.

Pictured above station 13178, Rio Grande near the Brownsville International Port of Entry.

Who are the CRP Partners in the Lower Rio Grande Valley?

The Texas Clean Rivers Program relies heavily on volunteer partners to collect the water quality samples in their areas of the basin. Without these partners, the scope of the program would be very limited. We would like to take this opportunity to highlight the CRP partners in the Lower Rio Grande Valley.

USIBWC Falcon Dam Field Office

The USIBWC Falcon Dam Field Office monitors five routine monitoring stations in the Valley: Stations 13189, 13186, 13185, 17596, and 13103. They have been a CRP partner since the program began in 1998, and they bring a wealth of knowledge and experience to the program not only through their sample collection, but also in their knowledge of the region. Mr. Eli Mendoza, pictured at right in the brown shirt, has been taking samples for many years.

Pictured above Falcon Field Office hydrotechs Eli Mendoza and Lauro Cantu collecting field samples and calibrating instrument.

USIBWC Mercedes Field Office

The USIBWC Mercedes Field Office collects samples at routine monitoring stations in the Valley: Stations 13664, 13177, 13181, 15808, and 13184. They have been a CRP partner since the program began in 1998, and they also bring a wealth of knowledge and experience to the program through their sample collection and knowledge of the region. Mr. Joe Bazaldua (right) continues collecting the samples for the program.

Pictured Above: Raul Montemayor, Hydrotechnician

Pictured Above: Joe Bazaldua, Hydrotechnician

UTRGV- Edinburg

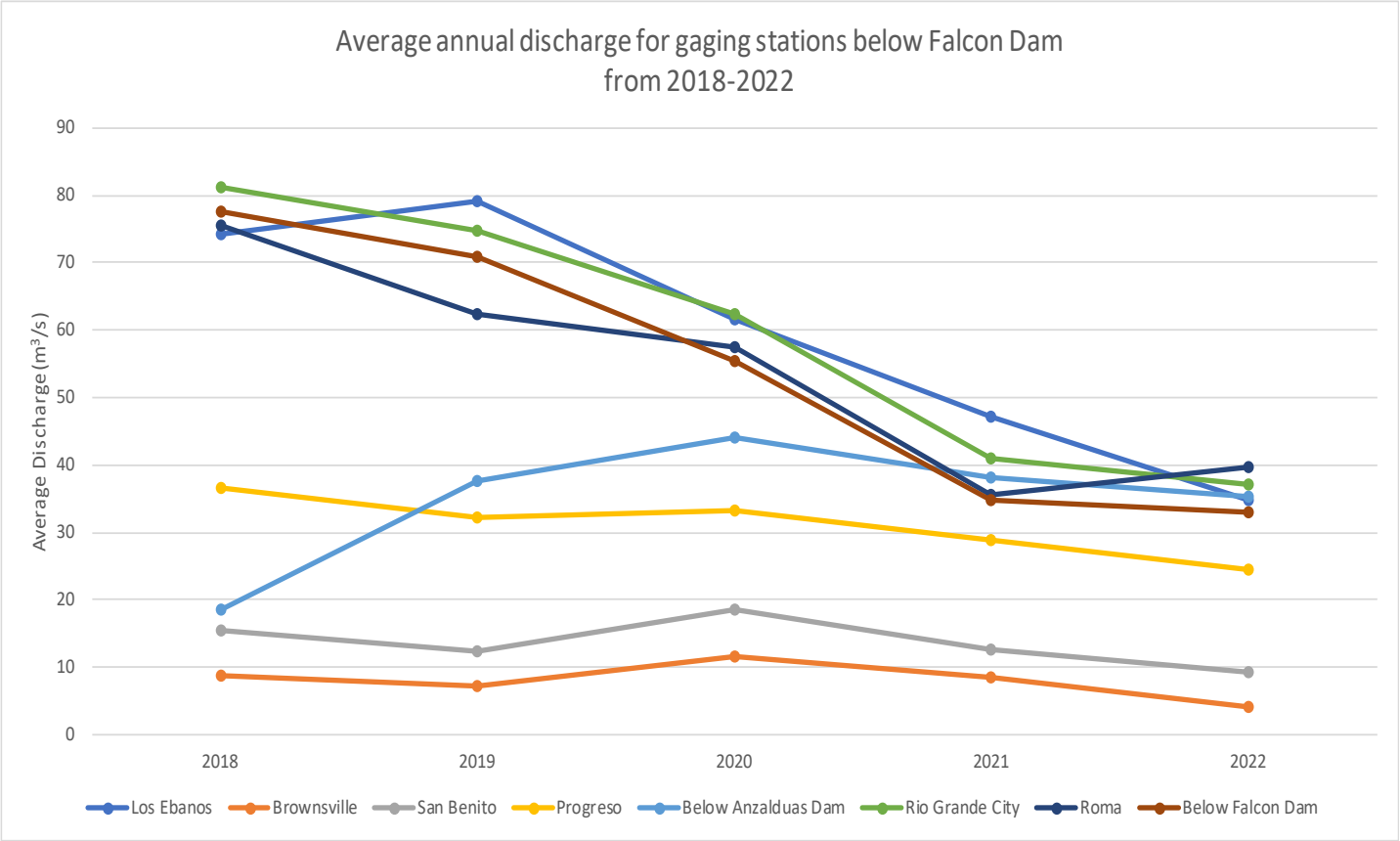
Formerly UT-Pan American, UTRGV-Edinburg has been a CRP partner since 2016. Dr. Jungseok Ho and his students collect samples at Stations 13176 and 13179. Dr. Ho incorporates the CRP sampling into his curriculum, allowing his students to gain experience and have the data they collect put to use.

Brownsville Public Utilities Board (BPUB)

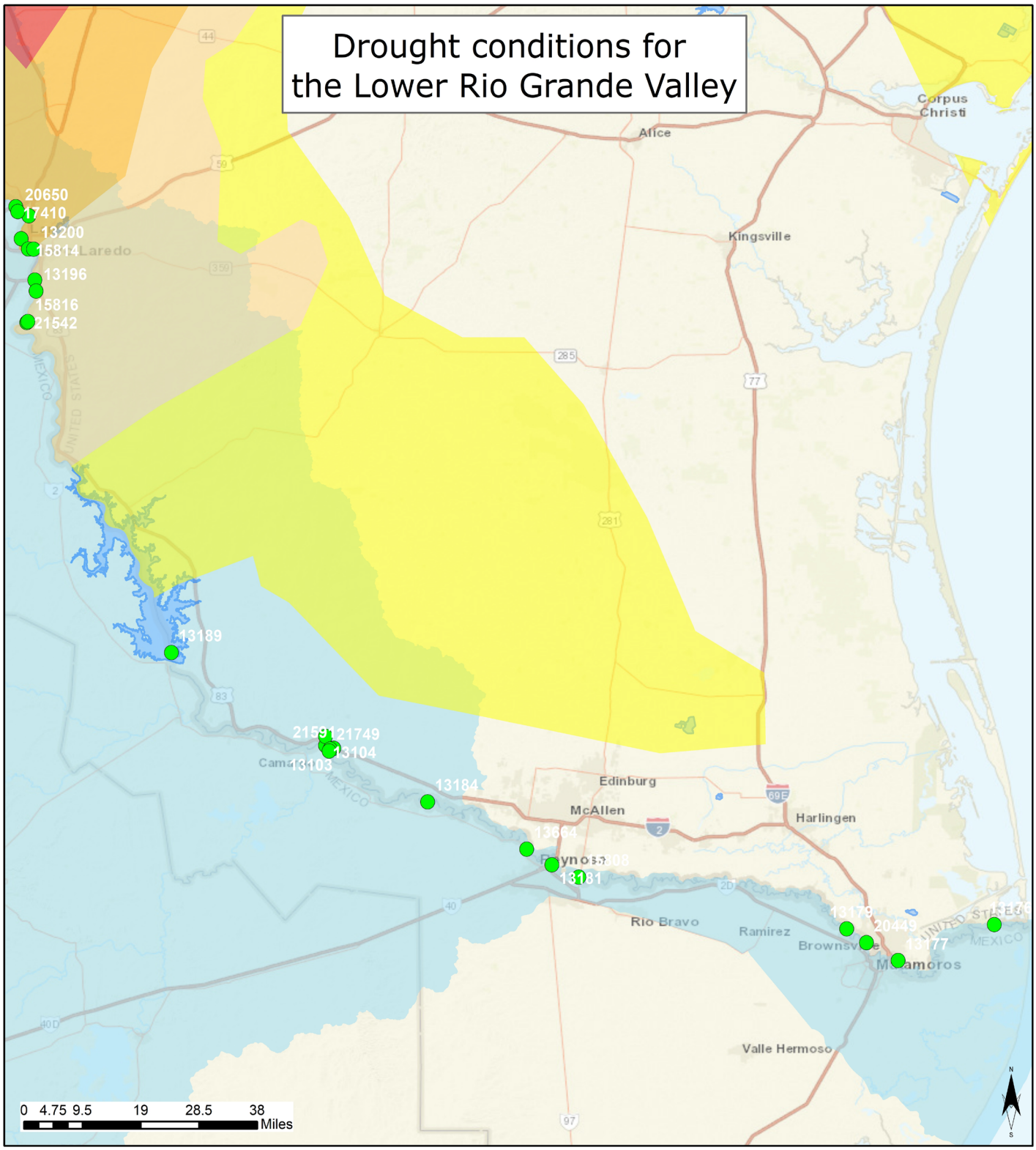
BPUB joined the CRP in 2008. They had been attending the annual Coordinated Monitoring Meetings for some years and decided they wanted to join the program as a partner. They voluntarily provide the data they take for the City of Brownsville at the Brownsville water intake, Station 20449, which is a great source of information for the program. They also provide analysis of *Enterococcus* bacteria for the tidal stations, which are collected by UTRGV-Edinburg.

Drought in the Lower Rio Grande

Drought is a prolonged period of abnormally dry weather or precipitation deficiency, leading to a shortage of water for human, animal, and plant populations. It is a natural disaster that occurs when there is a significant decline in available water resources, such as surface water, groundwater, and soil moisture. Droughts can be caused by various factors, including a lack of rainfall, high temperatures, and increased evaporation rates. The impacts of drought can be severe and far-reaching, including crop failures, water shortages, and increased risk of wildfires, which can affect ecosystems, economies, and human health and safety. While drought is a natural disaster that can impact many areas around the world, some regions are particularly susceptible due to their geography and climate. One such region is the Lower Rio Grande. This region is a semi-arid region and has a long history of experiencing droughts, which can have severe impacts on the region's water resources, agriculture, and ecosystems. The Lower Rio Grande Valley is a critical agricultural region that produces a significant portion of the nation's winter vegetables, citrus fruits, and cotton. However, the valley's agriculture relies heavily on irrigation, which places significant demands on the region's water resources. The valley's growing population and industrial development have led to increased water consumption and competition for limited water resources as well. During drought conditions, the area downstream from Falcon Dam can experience decrease in flow as shown in the graph below. Annual average data from 2018-2022 was obtained from eight gaging stations below Falcon Dam. Although current conditions for th area are moderate, historical data from 2018-2022 suggest that the area has been experiencing extreme to exceptional drought. Current and historical conditions are depicted in map below.

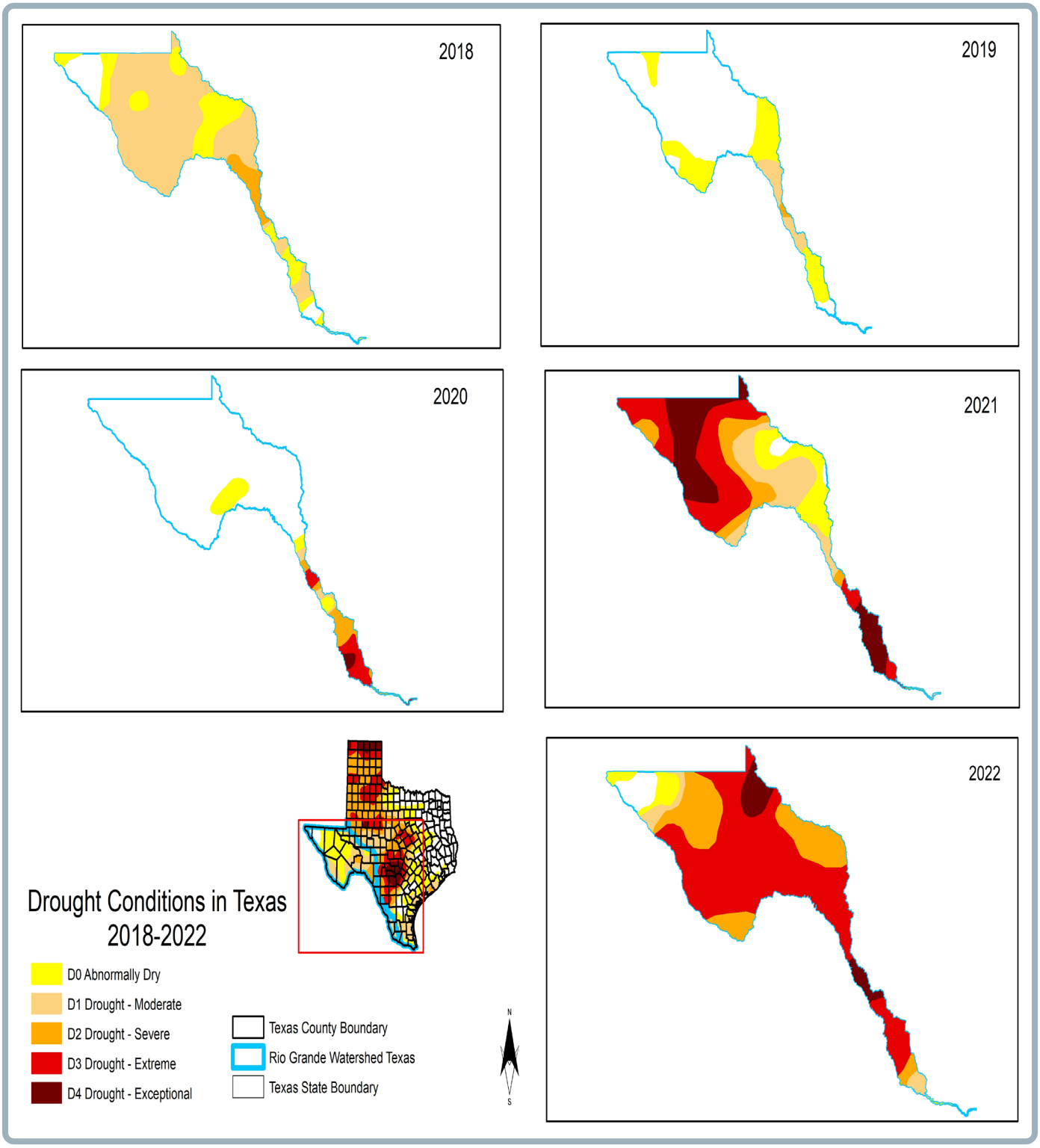


The graph above show the average discharge data obtained from eight gaging stations below Falcon Dam. Annual discharge data was from the years 2018-2022.



Drought data uses broad scale conditions, local conditions might vary.
Drought data is obtained with parameters such as
precipitation, soil moisture, vegetation index, and stream flow.
Data valid through May 2, 2023.

droughtmonitor.unl.edu



The above figure shows the drought patterns for the Texas portion of the Rio Grande watershed from 2018-2022. Areas in white indicate no impact from drought. The data shows that from the year 2020-2022 the Lower Rio Grande Valley was heavily impacted by drought conditions ranging from extreme to exceptional.

Invasive and Exotic species

Infestations of invasive aquatic weeds such as hydrilla (*Hydrilla verticillata*), water hyacinth (*Eichhornia crassipe*) and giant cane have been problematic in the Lower Rio Grande Sub-basin. These aquatic plants obstruct sections of the river, prevent boat navigation, impede water flow, and increase water loss through consumption and evapotranspiration. However, control methods including mechanical removal and biological control using triploid grass carp have helped to reduce the problem.

Control of invasive species is important, both for the native vegetation and habitat and the native wildlife. Many of these plants did not start off as invasive species, but were introduced for such things such as erosion control or for aesthetic purposes. However, since that time they have escaped into the habitat and become a threat to the natural environment of the region. They are difficult to control since they spread by natural means (wind, water, and animal movement), and the main method of spreading is by human and vehicle use.

There are currently multiple efforts to control invasive and exotic species by TX Parks and Wildlife, the U.S. Department of Agriculture, and the Lower Rio Grande Valley National Wildlife Refuge of the U.S. Fish & Wildlife Service. Eradication efforts are chosen by investigating what is most useful against the targeted vegetation or wildlife, and what is least detrimental to the environment. This requires the employment of many different methods, including pest management, mechanical removal, prescribed burns, and the application of herbicides. The Lower Rio Grande Valley has a number of invasive plants: hydrilla (*Hydrilla verticillata*), water hyacinth (*Eichhornia crassipe*), Eurasian watermilfoil (*Myriophyllum spicatum*), parrotfeather (*Myriophyllum aquaticum*), elephant ear (*Colocasia esculenta*), giant cane (*Arundo donax*), and salt cedar (*Tamarix spp*). The region also has problems with feral hogs and Nilgail Antelope, and the Lower Rio Grande National Wildlife Refuge has permitted professional trapping programs and permitted hunting to control these animals.

Giant cane and salt cedar bush are problems in other parts of the Rio Grande basin, and recently the State Legislature passed Senate Bill 1734, the Carrizo Cane Eradication Effort, which tasks the Texas State Soil and Water Conservation Board to create a plan to eradicate giant cane from the river banks and flood plains.

Pictured above are aquatic weeds, possibly hydrilla, completely covering a canal in the Lower Rio Grande Valley.

Pictured above: Feral hog.

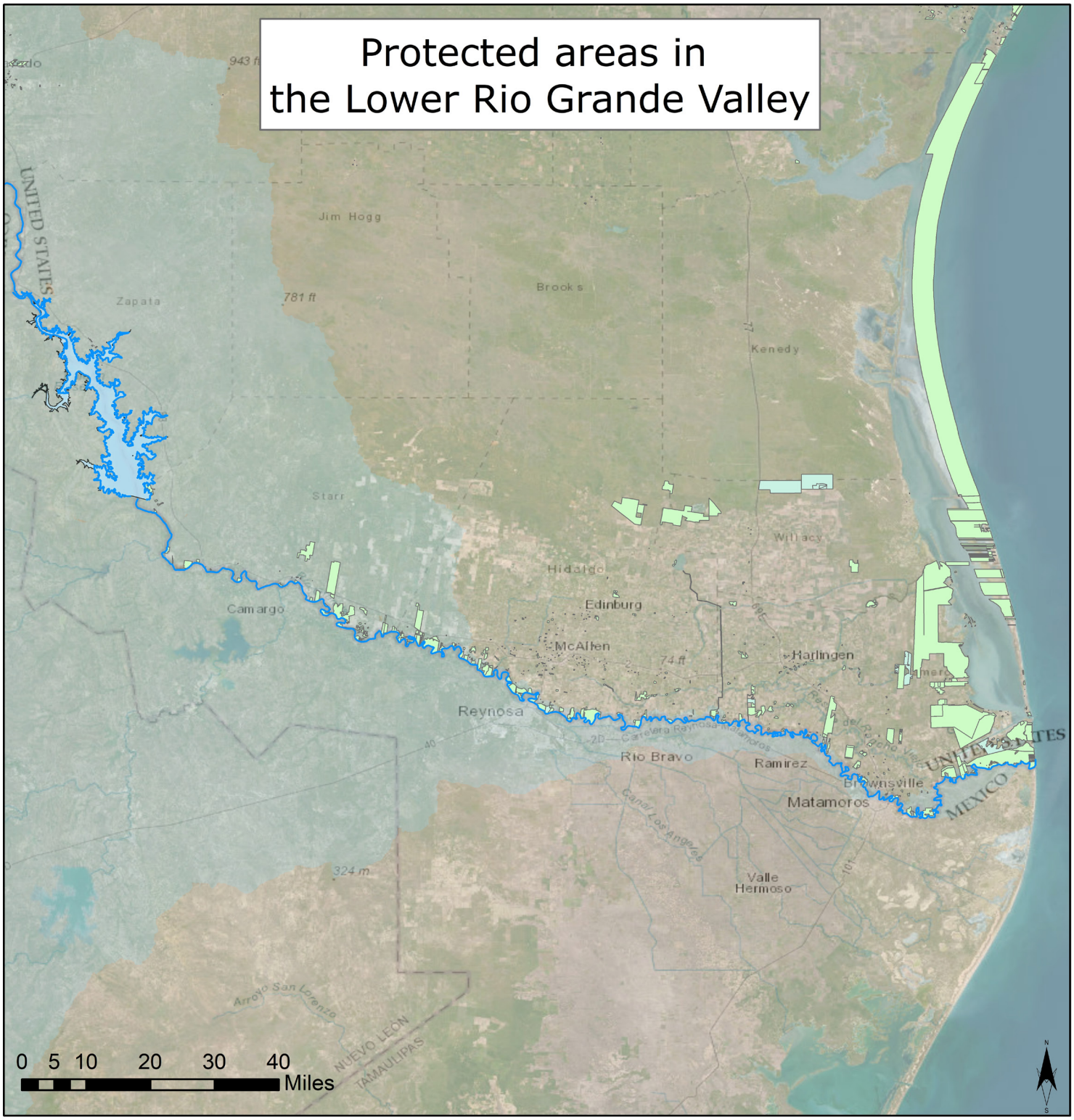
Threatened and Endangered species

The Lower Rio Grande Valley is home to a diverse range of plant and animal species, many of which are threatened or endangered. One such species is the ocelot, a medium-sized wild cat with a beautiful spotted coat. The ocelot's habitat has been severely fragmented due to urban development and agriculture, leading to a decline in population. Another threatened species in the area is the Texas tortoise, a land-dwelling reptile that is coveted in the pet trade. Habitat destruction, road mortality, and poaching have all contributed to its endangered status. The endangered Aplomado falcon, a bird of prey with distinctive black and white markings, has also suffered from habitat loss and persecution by humans. These species are just a few examples of the many plants and animals that face significant threats in the Lower Rio Grande Valley, highlighting the importance of conservation efforts to protect and preserve their habitats. There are several conservation efforts underway in the Lower Rio Grande Valley to protect threatened and endangered species and their habitats. One such effort is habitat restoration, which involves restoring degraded areas to their natural state by planting native vegetation, removing invasive species, and creating corridors between fragmented habitats. Another conservation effort is the establishment of protected areas, such as wildlife refuges and conservation easements, which provide a safe haven for threatened species to thrive. Additionally, education and outreach programs are used to raise awareness about the importance of conservation and the impacts of human activities on the environment. Finally, research and monitoring programs help to gather data on species populations, habitat health, and ecosystem dynamics, which can inform future conservation strategies. Together, these efforts aim to mitigate the threats facing the Lower Rio Grande Valley's threatened and endangered species and promote their recovery and long-term survival. For a full list of threatened and endagered species follow the Texas Parks and Wildlife Department's website.

Ocelot *(Leopardus pardalis)*

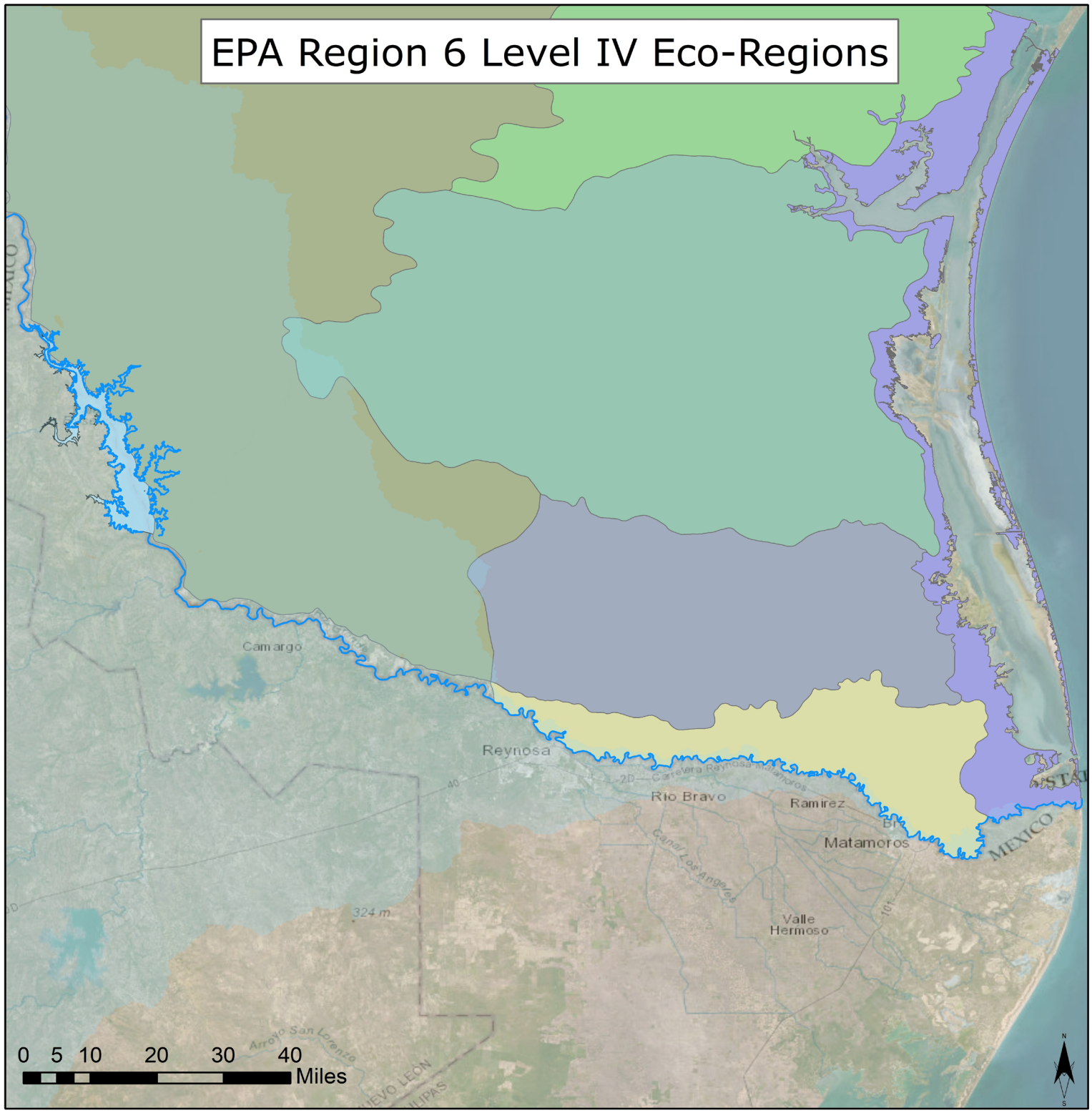
Northern Aplomado Falcon *(Falco femoralis)*

Texas Tortoise *(Gopherus berlandieri)*



Protected Areas
Rio Grande Watershed
Rio Grande

The data was obtained from the US Geological Survey (USGS). The USGS Protected Areas Database of the United States (PAD-US) is a comprehensive inventory of protected areas in the nation. This inventory includes both public land and private protected areas that have been voluntarily provided. Areas are dedicated to preserving biodiversity and other natural, recreational, or cultural uses. These areas are managed for their intended purposes through legal or other effective means. The PAD-US has expanded its scope in recent years to include all open space, public and nonprofit lands, and waters.



Rio Grande

Rio Grande Watershed

Region 6 Level IV

Eco-Regions

- Coastal Sand Plain
- Laguna Madre Barrier Islands and Coastal Marshes
- Lower Rio Grande Alluvial Floodplain
- Lower Rio Grande Valley
- Southern Subhumid Gulf Coastal Prairies
- Texas-Tamaulipan Thornscrub

The data was obtained from the Environmental Protection Agency (EPA). Ecoregions represent regions with comparable ecosystems, and environmental resources in terms of type, quality, and quantity. have direct practical relevance to state agencies, such as determining regional stream reference sites, formulating biological criteria and water quality standards, and defining management objectives for nonpoint-source pollution. Additionally, they play a crucial role in the pursuit of integrated ecosystem management, a primary objective for several federal and state resource management agencies.

CRP Website and References

Watershed Characterization Report

The goal of the USIBWC CRP is to ensure that the public and stakeholders are informed of the water quality related activities occurring throughout the basin. The intent of the basin reports is to disseminate that information and also demonstrate the effective use of program data. The Watershed Characterization Report is an in-depth look at a river basin. Future basin reports from the USIBWC CRP will be in similar format for the Middle and Upper Rio Grande Basin. We invite partners, stakeholders and members of the public to submit small summaries of projects occurring in the basin. We seek people/issues/projects that should be highlighted that we could include in these reports, or any other issues pertinent to our river basin. We ask the public to submit pictures of the river, recreational activities, natural scenery and wildlife.

The USIBWC CRP maintains a website with a wealth of information for the public:

- About CRP: An introduction to the Rio Grande Basin
- Contact Information: Contacts for the USIBWC CRP and program information
- Study Area: Contains maps of the Rio Grande Basin and of the monitoring locations
- Monitoring Station Data: USIBWC CRP and TCEQ water quality data in Excel files by station; information about quality assurance, parameters, and standards.
- Other Information: A calendar provides information on upcoming meetings and activities. There are links to studies and publications about the Rio Grande Watershed and the USIBWC Adopt-a-River program. Partner links provide resources for monitoring partners, links to other planning agencies, and links to environmental groups and resources for the Rio Grande.
- Media Gallery: Photo albums and videos about monitoring, research, geography, wildlife, and outreach. Our video gallery now includes a number of videos, the most recent being about water quality in the Rio Grande.

Additional Resources and Links:

TSWQS: https://www.tceq.texas.gov/waterquality/standards/2014standards.html

SWQM: http://www.tceq.texas.gov/waterquality/monitoring

Integrated Report: https://www.tceq.texas.gov/waterquality/assessment/public_comment

Coordinated Monitoring Schedule: http://cms.lcra.org/

EPA Recreational WQ Criteria: http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/

The Disappearing Rio Grande http://riogrande.texastribune.org/

TPWD Kills and Spills team: https://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/

Water Resources: http://www.twdb.texas.gov/waterplanning

RGISC: http://rgisc.org/

USIBWC website: http://www.ibwc.gov/home.html

U.S. Army Core of Engineers, A Survey of the Invasive Aquatic and Riparian Plants of the Lower Rio Grande

Map References:

Texas Commission on Environmental Quality, SWQM Stations, Wastewater Outfalls, Bacteria impaired segments, GIS Data Hub, https://gis-tceq.opendata.arcgis.com/

Drought Conditions, U.S. Drought Monitor, Richard Tinker, NOAA/NWS/NCEP/CPC, https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?TX

US Geological Survey (USGS) Protected Areas, https://www.sciencebase.gov/catalog/item/61794fc2d34ea58c3c6f9f69

Environmental Protection Agency (EPA), Region 6 Level IV Eco-Regions, https://www.epa.gov/eco-research/ecoregion-download-files-region#pane-06

Aerial Images and basemaps obtained from ESRI on-line resources

Endagered Wildlife: The Ocelot, photo: Texas Coop Power, https://passporttotexas.org/endangered-wildlife-the-ocelot/

Texas Parks and Wildlife, Wild Thing: Texas Tortoise is Threatened but still in the race, photo by D. Robert Franz, https://tpwmagazine.com/archive/2010/oct/scout3/

Santa Ana National Wildlife Refuge, UTRGV Digital Library, The University of Texas – Rio Grande Valley. Accessed via https://scholarworks.utrgv.edu/santaana

USIBWC CRP Website
http://www.ibwc.gov/CRP/index.htm

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Lisa.Torres@ibwc.gov

TCEQ CRP
Katrina Smith
TCEQ CRP Project Manager
(512) 239-5656
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International Boundary and Water Commission,
U.S. Section
Texas Clean Rivers Program
4191 N. Mesa St., Ste. C-100, El Paso TX 79902
915-832-4770
www.ibwc.gov/CRP/index.htm
crp@ibwc.gov

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