

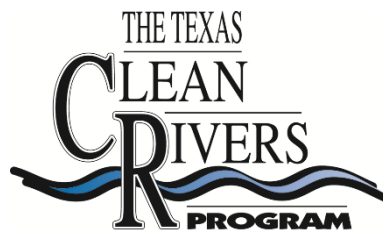


Nueces River Authority

2022 Watershed Characterization Report

Basin 22 Nueces-Rio Grande Coastal Basin & Southern Portions of Basin 24 Bays and Estuaries

May 2022



**Prepared in cooperation with the Texas Commission on Environmental Quality
Clean Rivers Program**

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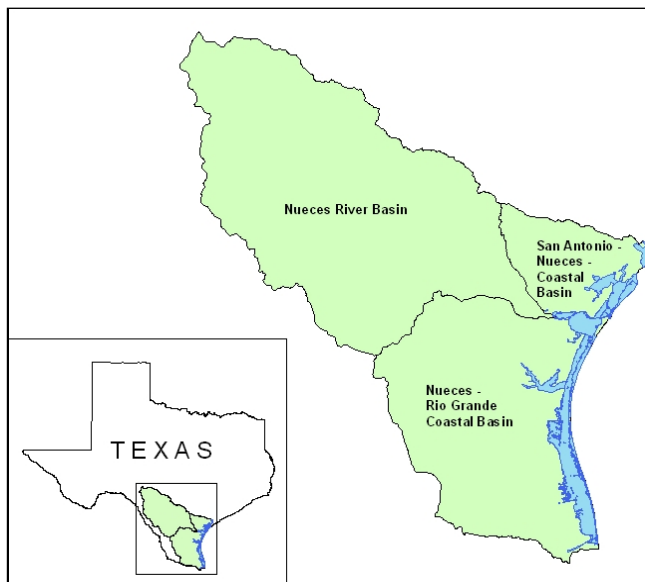
List of Acronyms

AU	Assessment Unit
BCRAGD	Bandera County River Authority and Groundwater District
BMP	Best Management Practices
CAFO	Confined Animal Feeding Operations
CBBEP	Coastal Bend Bays and Estuary Program
CCIH	Corpus Christi Inner Harbor
CCSC	Corpus Christi Channel Ship
cfu	Colony Forming Units
CR	County Road
CRP	Clean Rivers Program
CWQM	Continuous Water Quality Monitoring
DDE	Dichlorodiphenylethylene
DO	Dissolved Oxygen
DSHS	Department of State Health Services
FM	Farm to Market
Hr	Hour
ICWW	Intracoastal Waterway
IH	Interstate Highway
km	Kilometers
m	Meters
mg/l	Milligrams Per Liter
mL	Milliliter
MSL	Mean Sea Level
NCR	Non-contact Recreation
NRA	Nueces River Authority
PCB	Polychlorinated biphenyl
PCR	Primary Contact Recreation
RR	Ranch Road
RRC	Railroad Commission of Texas
RUAA	Recreational Use Attainability Analysis
SCR1	Secondary Contact Recreation 1
SCR2	Secondary Contact Recreation 2
SH	State Highway
su	Standard Units
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TGLO	Texas General Land Office
TIAER	Texas Institute of Applied Environmental Research
TMDL	Total Maximum Daily Load
TPWD	Texas Parks and Wildlife Department
TSS	Total Suspended Solids
TSSWCB	Texas State Soil and Water Conservation Board
TWRI	Texas Water Resources Institute
µg/l	Micrograms Per Liter
US	United States (Highway)
WPP	Watershed Protection Plan
WWTP	Wastewater Treatment Plant

INTRODUCTION and 2021 HIGHLIGHTS

Introduction

In 1991, the Texas Legislature passed the Texas Clean Rivers Act requiring basin-wide water quality assessments to be conducted for each river basin in Texas. Under this act, the Clean Rivers Program (CRP) has developed an effective partnership involving the Texas Commission on Environmental Quality (TCEQ), other state agencies, river authorities, local governments, industry, and citizens. Using a watershed management approach, the Nueces River Authority (NRA) and TCEQ work together to identify and evaluate surface water quality issues and to establish priorities for corrective action. Under CRP, NRA is responsible for the San Antonio – Nueces Coastal Basin, the Nueces River Basin, the Nueces – Rio Grande Coastal Basin, and the adjacent bays and estuaries, an area roughly 31,500 square miles, ranging from the hill country in Edwards County to San Antonio Bay in Refugio County to the Brownsville Ship Channel in Cameron County.



NRA's Basins of Responsibility

Basin 22 - Nueces – Rio Grande Coastal Basin

The Nueces – Rio Grande Coastal Basin covers approximately 10,400 square miles, encompassing all or part of 12 counties in South Texas. The basin is bordered by the Nueces River Basin and the San Antonio – Nueces Coastal Basin to the north, bays, estuaries, and the Gulf of Mexico to the east, and the Rio Grande River Basin to the south and southwest. The inland area of the basin is dominated by large ranches, including the King Ranch. State-operated recreational areas are primarily along the coast and include Mustang Island State Park, Port Isabel Light House State Historic Park in Port Isabel, and the Padre Island National Seashore.

Water quality in the Nueces – Rio Grande Coastal Basin is subject to many factors. With its relative lack of topography, lower average rainfall amounts, and a lack of spring flow compared with other river basins in Texas, water quality is largely determined by domestic and municipal wastewater and permitted effluent, return flows from agriculture, and rain events that contribute stormwater runoff to local streams and drainage ditches. In the lower Rio Grande Valley, many of the streams that convey water have been altered, straightened, or dredged to drain water as quickly as possible to avoid flooding out many of the communities in the watershed. To complicate things further, there are no surface water streams between the Baffin Bay tributary streams and the Lower Rio Grande Valley. Much of the rain that falls in this area is absorbed into the soil and/or runs off as sheet flow across the landscape.

Basin 24 - Bays and Estuaries

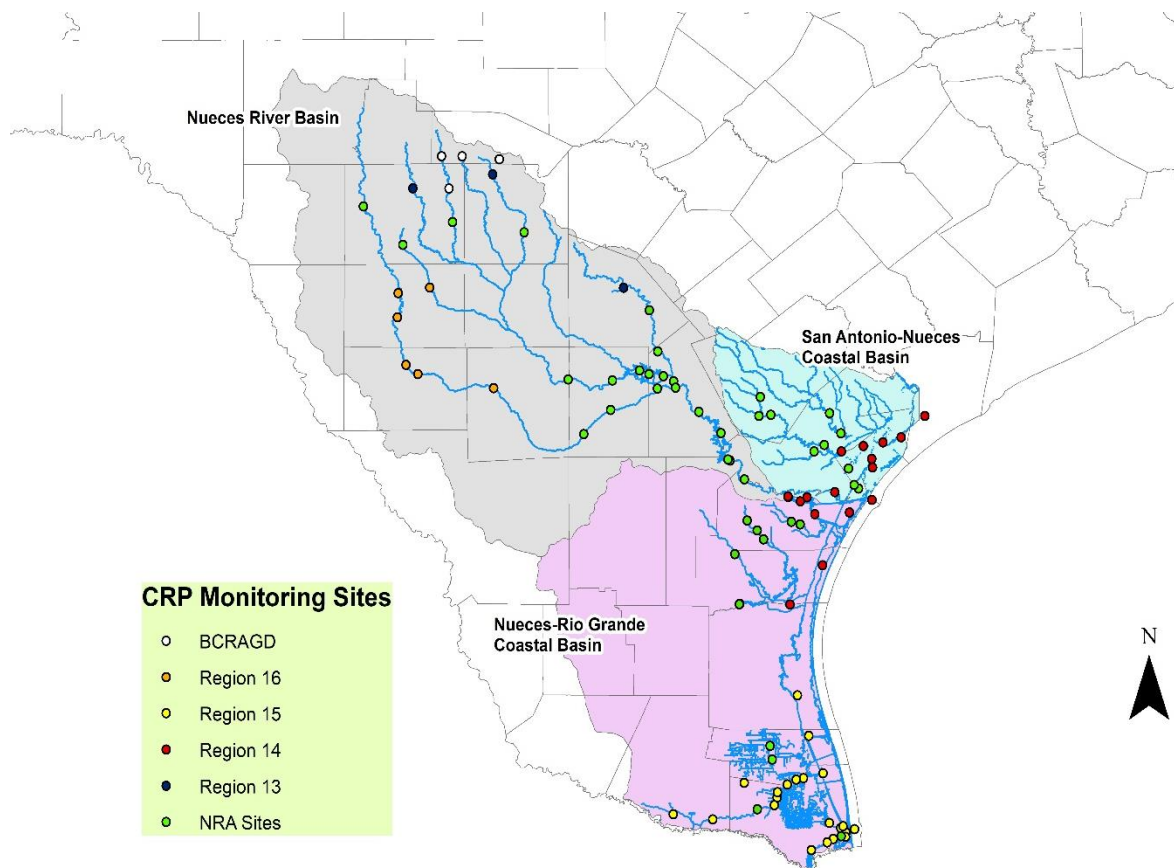
Basin 24 covers 2,002 square miles of the Texas Coast and includes 48 classified estuarine segments and marine waterbodies along nine major bay systems on the western shore of the Gulf of Mexico. Located in the Western Gulf Coastal Plain ecoregion, Basin 24 includes tidally influenced streams, marshes, mud and sand flats, seagrass beds, oyster reefs, and soft-bottom bay systems that are semi-enclosed by long sandy barrier islands. These habitats serve as nursery grounds for many fish and shellfish species, including shrimp, oysters, crab, and scallops.

2021 HIGHLIGHTS

2021 did not see any tropical storm activity on the Lower Texas Coast, but numerous rainfall events did contribute significant periodic flows. Petronila Creek Above Tidal (Segment 2204) saw three high flow events of approximately 2,000 ft³/sec between May and July 2021. Water quality projects in the Baffin Bay Watershed kicked into high gear in 2021 with the development of a Watershed Protection Plan (WPP) by the Texas Water Resource Institute (TWRI) for elevated bacteria and chlorophyll-a concentrations on Petronila and San Fernando creeks.

WATER QUALITY MONITORING

Surface water quality monitoring in South Texas is conducted by the Nueces River Authority (NRA) through the Texas Clean Rivers Program (CRP) and by the Texas Commission on Environmental Quality (TCEQ) through the Surface Water Quality Monitoring (SWQM) Program. Most of the monitoring stations have been monitored for many years and provide valuable information with respect to trends and/or changing conditions. Routine water quality samples are analyzed for conventional and bacteria parameters. These samples are usually collected four times per year, once per quarter. Field parameters are also recorded as part of the sampling events. Parameters analyzed for conventional monitoring include alkalinity, ammonia, total dissolved solids (TDS), total suspended solids (TSS), total phosphorous, chlorides, sulfate, hardness (freshwater sites), nitrates, chlorophyll-a, pheophytin, and total organic carbon. Routine bacteria analysis includes enterococcus in saltwater bodies and tidal segments and *E. coli* for freshwater sites. Additional bacterial analysis is being conducted for some of the special studies. Measured field parameters in the NRA CRP include dissolved oxygen (DO), salinity (saltwater and tidal sites), flow (freshwater sites), pH, water temperature, air temperature, conductivity, secchi depth, and wind speed and direction. Observations such as water color, water odor, surface conditions, turbidity, current weather, recent rainfall amounts, and evidence of primary contact recreation are noted. Low DO concerns are more thoroughly evaluated with 24-Hour (Hr) DO measurements. This monitoring is conducted when adequate flow conditions exist. Metals in water analysis samples are collected at select stations for various reasons including water supply protection, monitoring historic impairments, and to provide baseline data on new water bodies before permitted facilities are constructed. Specific sites and the type of monitoring being conducted during FY 2020 are listed in summary tables at the beginning of each basin subsection. Detailed information is available on the Statewide Coordinated Monitoring Schedule, <http://cms.lcra.org/>, maintained by the Lower Colorado River Authority (LCRA). A map of routine quarterly monitored sampling locations and program partners involved in water quality monitoring in the Nueces River Basin, San Antonio-Nueces Coastal Basin, and Nueces-Rio Grande Coastal Basin is provided below.



Monitoring Sites in the Nueces River Basin, San Antonio-Nueces Coastal Basin, and Nueces-Rio Grande Coastal Basin

WATER QUALITY CONDITIONS

Water Quality Terminology

In this report, you will see many references to the 2020 IR. This refers to the 2020 Texas Integrated Report (IR). The IR assesses suitable data in the State's water quality database (Surface Water Quality Monitoring Information System (SWQMIS)) for a 7-year period, and a new 7-year data set is assessed every two years. In most cases, a minimum of 10 samples is required to conduct the assessment. In some cases, the 10 samples are obtained by using a slightly longer period of time. The 2020 IR includes data from December 1, 2011 through November 30, 2018. For this report, the analysis and discussion of the concerns and impairments in each segment is based on the 2020 IR. Prior to 2010, water quality assessments conducted by the TCEQ were called the Water Quality Inventory.

TCEQ assessed a variety of parameters including DO, pH, water temperature, total phosphorus, nitrates, ammonia, chlorophyll-*a*, and bacteria (*E. coli* for freshwater segments and *Enterococcus* on tidal and marine segments) values on each assessment unit (AU) of a classified segment where ample data were available. Metals data were assessed where applicable. A single segment can consist of one to several AUs. TDS, chloride, and sulfate are assessed for the entire segment and only on freshwater segments. AU boundaries are occasionally modified to be more representative and provide for a more accurate analysis.

Impairments for the following parameters are defined as follows:

Parameter	Criteria	Calculation Used for Impairment*
Total Dissolved Solids (TDS), chloride, and sulfate	Segment specific	Average of samples are above the criteria
Dissolved Oxygen (DO) - for High Aquatic Life Use	3.0 mg/l** grab sample 5.0 mg/l 24-Hr average or Segment specific	10% of samples are below either criterion
pH	6.5 su*** and 9 su	10% of samples are above or below the criteria
<i>E. coli</i>	126 cfu****	Geometric mean is greater than the criteria
Enterococci	35 cfu	Geometric mean is greater than the criteria

*The percent of samples exceeding the criteria or screening level varies somewhat with small sample sizes (between 10 and 20). When sample sizes are greater than 20 samples, the percentage shown in the calculation column is much more accurate.

**mg/l: milligrams per liter

***su: standard units

****cfu: colony forming units

Concerns for the following parameters are defined as follows:

Parameters for the following parameters are defined as follows:			
Parameter	Calculation Used for Concern		
	Stream	Tidal Stream	20% of samples are above the criteria
Ammonia-Nitrogen	0.33 mg/l	0.46 mg/l	
Nitrate	1.95 mg/l	1.10 mg/l	
Total phosphorus	0.69 mg/l	0.66 mg/l	
Chlorophyll-a	14.1 µg/l**	21.0 µg/l	

*Screening levels to identify concerns have been developed by the State to enable an assessment of water quality for some parameters, primarily nutrients that only have a narrative criterion. The levels were developed by calculating the 85th percentile for all water quality data in the TCEQ's water quality database over a 10-year period.

**µg/l: micrograms per liter

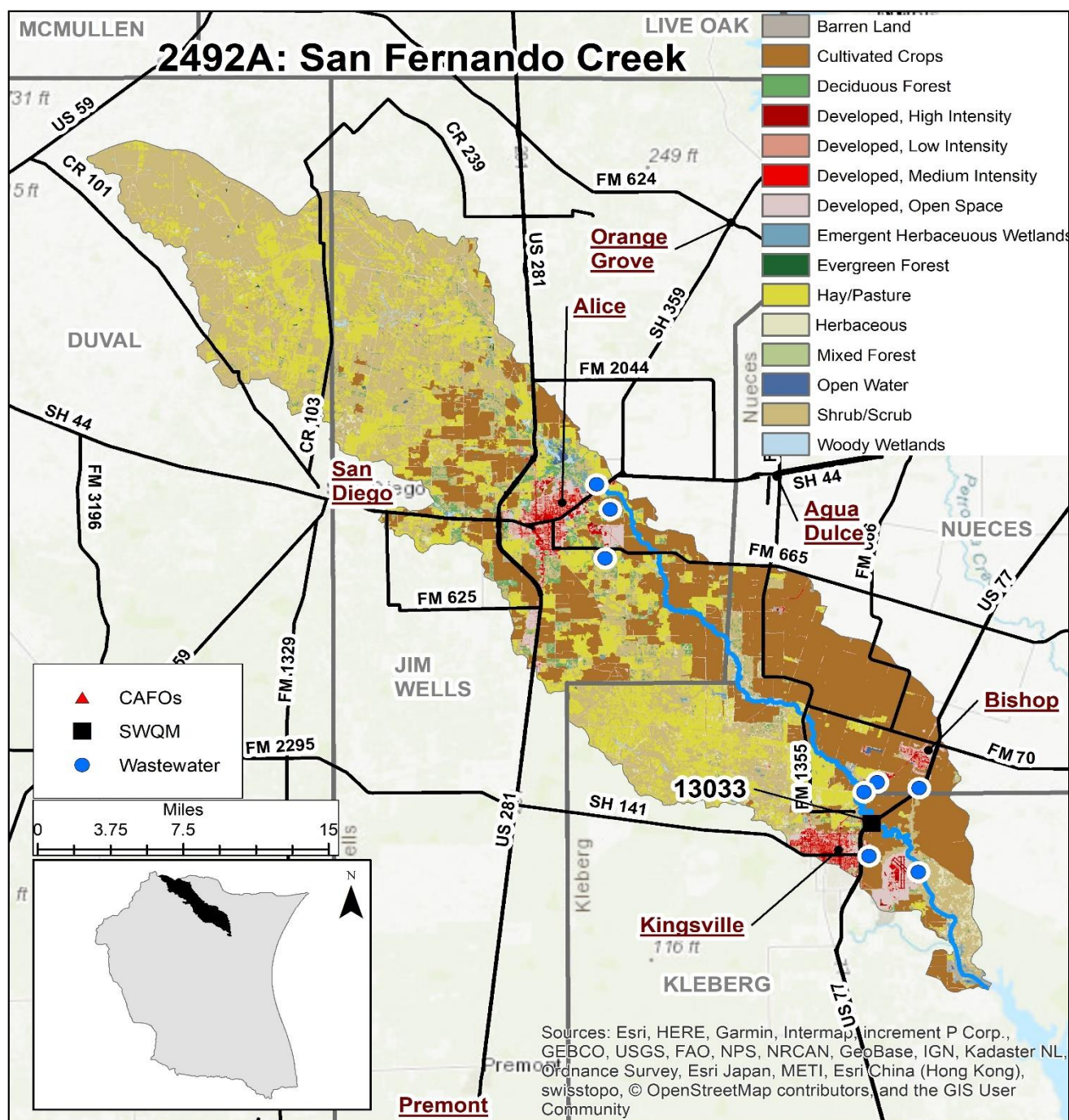
The following chart explains the potential impacts when the water quality standards are not met and the most common causes for concerns or impairments.

Parameter of Concern or Impairment	Impact	Cause
DO	Organisms that live in water need oxygen to live. In waters with depressed DO levels, organism may not have sufficient oxygen to survive.	Modifications to the riparian zone, human activity that causes water temperatures to increase, and increases organic matter, bacteria, and over abundant algae.
pH	Most aquatic life is adapted to live within a narrow pH range. Different organisms can live and adjust to differing pH ranges, but all fish die if pH is below 4 (the acidity of orange juice) or above 12 (the pH of ammonia).	Industrial and wastewater discharge, runoff from quarry operations, and accidental spills.
Ammonia	Elevated levels of ammonia in the environment can adversely affect fish and invertebrate reproductive capacity and reduced growth of the young.	Ammonia is excreted by animals and is produced during the decomposition of plants and animals. It is an ingredient in many fertilizers and is also present in sewage, storm water runoff, certain industrial wastewaters, and runoff from animal feedlots.
Nutrients Nitrates Total phosphorus	These nutrients increase plant and algae growth. When plants and algae die, the bacteria that decompose them use oxygen so that is no longer available for fish and other living aquatic life. The more dead plants in the water, the more bacteria are produced to decompose the dead leaves. High levels of nitrate and nitrites can produce Nitrite Toxicity, or "brown blood disease," in fish. This disease reduces the ability of blood to transport oxygen throughout the body.	Nutrients are found in effluent released from wastewater treatment plants (WWTPs), fertilizers, and agricultural runoff carrying animal waste from farms and ranches. Soil erosion and runoff from farms, lawns, and gardens can add nutrients to the water.
Chlorophyll-a	Chlorophyll-a is the photosynthetic pigment found in all green plants, algae, and cyanobacteria. Elevated levels indicate abundant plant growth which could lead to reduced DO levels.	Modifications to the riparian zone, human activity that causes water increases in organic matter, nutrients, bacteria, and over abundant algae.
TSS	TSS measures particles that are suspended in water and which will not pass through a filter. It can also affect light penetration. Deposition of these particles can bury and/or destroy benthic habitat for most species of aquatic insects, snails, and crustaceans.	TSS originates from multiple point and nonpoint sources but most commonly results from erosion of soils substrates. A good measure of the upstream land use conditions is how much TSS rises after a heavy rainfall.
TDS, Chloride, Sulfate	High levels of these parameters may affect the aesthetic quality of water, interfering with washing clothes and corroding plumbing fixtures. They can also affect the permeability of ions in aquatic organisms.	Mineral springs, carbonate deposits, salt deposits, and sea water intrusion are natural sources of these parameters. Other sources can be attributed to oil exploration, drinking water treatment chemicals, storm water and agricultural runoff, and wastewater discharges.

Watershed Summaries

This section contains detailed information for the Nueces – Rio Grande Coastal Basin (Basin 22) and the Bays and Estuaries (Basin 24). Information included for each of the basins contains a map of the basin, a description of the basin, a summary of concerns and impairments identified in the 2020 IR, a table of the FY 2020 sampling locations, and summaries for each segment within the basin.

The map shows the segment boundaries; includes land use/land cover information of the contributing watershed (see key below); the location of sampling sites, wastewater treatment plants (WWTPs), and confined animal feeding operations (CAFOs); the names of nearby cities and major roads; and an inset of the watershed's location within the basin. Below is a sample map.



Sample Map – Segment 2492A – San Fernando Creek

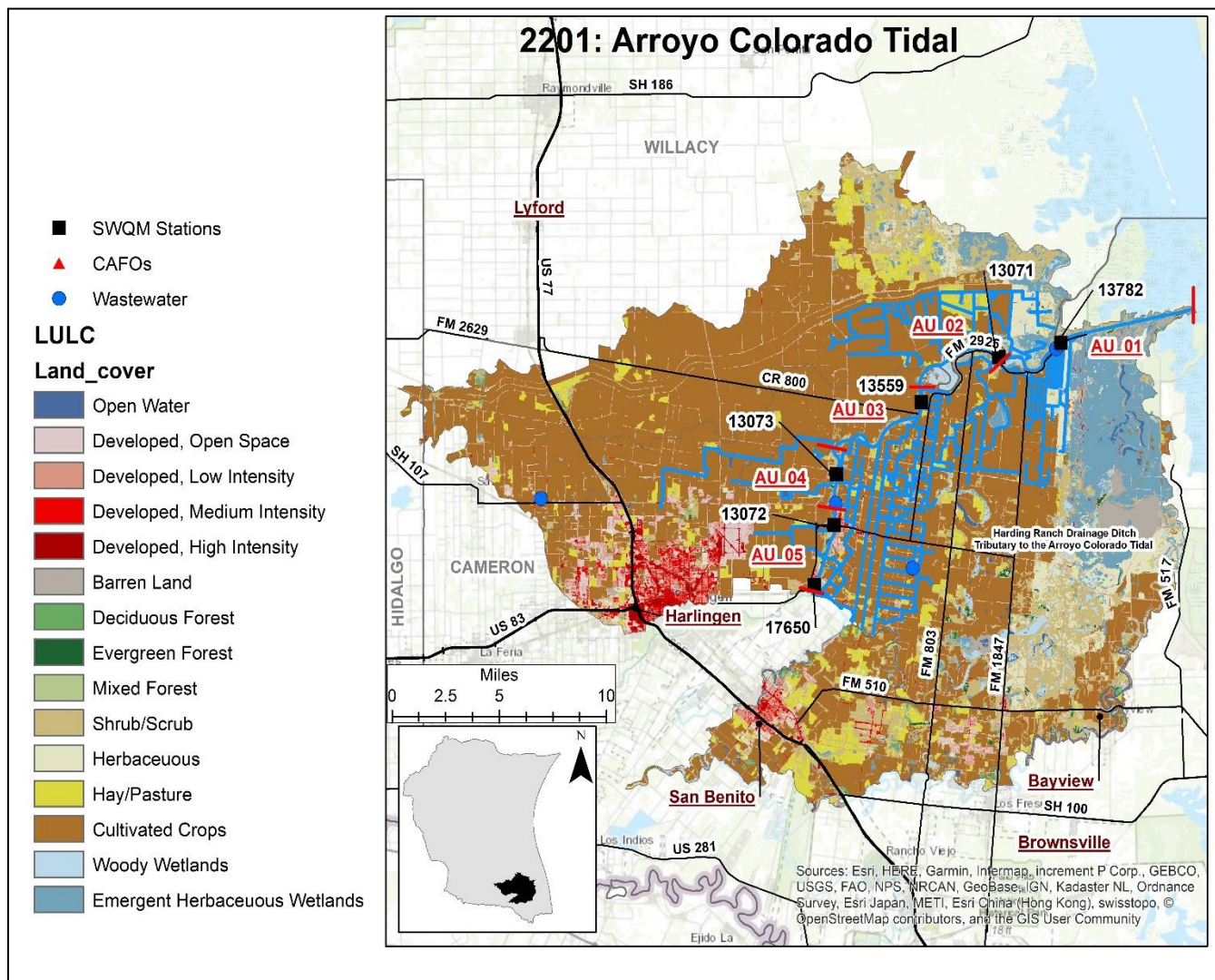
Monitoring Stations

- NRA CRP Stations
- TCEQ SWQM Stations

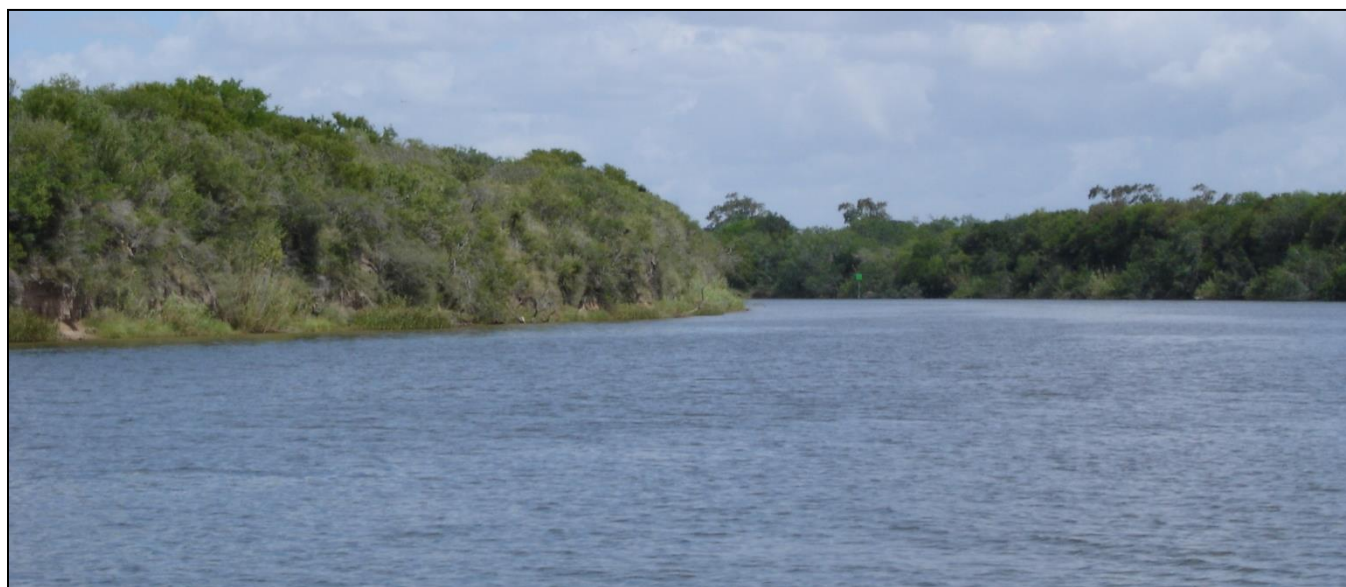


CRP and SWQM Sites in the Nueces – Rio Grande Coastal Basin

Segment Name	Station Id #	Description	Monitoring Entity	Conventional, Field	Other
2201 Arroyo Colorado Tidal	13782 (AU_01)	Near Channel Marker 16 at Arroyo City 492 m downstream of confluence with Arroyo Colorado and Arroyo Colorado cutoff	TCEQ Region 15	Quarterly	
	13071 (AU_02)	At Mile 10 Marker 22 81 m upstream from San Vicente drain ditch	TCEQ Region 15	Quarterly	
	13073 (AU_04)	At Camp Perry north of Rio Hondo 177 m downstream from confluence with unnamed ditch west side of Arroyo Colorado	TCEQ Region 15	Quarterly	
	13072 (AU_05)	At FM 106 bridge at Rio Hondo	TCEQ Region 15	Quarterly	
2202 Arroyo Colorado Above Tidal	13074 (AU_01)	At low water bridge at Port Harlingen at Cemetery Road bridge	TCEQ Region 15	Quarterly	
	13079 (AU_02)	At US 77 in SW Harlingen	NRA	Quarterly	
	13081 (AU_03)	At FM 1015 south of Weslaco	TCEQ Region 15	Quarterly	
	13084 (AU_04)	At US 281 south of Pharr	TCEQ Region 15	Quarterly	
2203 Petronila Creek Tidal	13090	1.2 km upstream of the confluence with Tunas Creek	TCEQ Region 14	Quarterly	
2204 Petronila Creek Above Tidal	13094 (AU_01)	At FM 892 southeast of Driscoll	NRA	Quarterly	Monthly TDS, chloride, sulfate, nutrients, flow
	13096 (AU_02)	At FM 665 east of Driscoll	NRA	Quarterly	Monthly TDS, chloride, sulfate, nutrients, flow
	20806 (AU_02)	At 181 m West and 6 m south from the intersection of Alice Road and Lost Creek Road	NRA	Quarterly	Monthly bacteria and nutrients



Segment 2201 – Arroyo Colorado Tidal



Station 13073 – Arroyo Colorado Tidal at Camp Perry north of Rio Hondo

Segment 2201: Arroyo Colorado Tidal

Segment Description - The segment flows 26 miles from 110 yards downstream of Cemetery Road south of the Port of Harlingen to its confluence with the Laguna Madre. The segment forms part of the county line between Cameron and Willacy Counties. The segment is divided into five AUs; from the downstream end of the segment to the confluence with San Vicente Drainage Ditch (AU_01), from the confluence with San Vicente Drainage Ditch to the confluence with an unnamed drainage ditch at 26.31 N, -97.53 W (AU_02), from an unnamed drainage ditch at 26.31 N, -97.53 W to the confluence with the Harding Ranch Ditch tributary (AU_03), from the confluence with the Harding Ranch Ditch tributary to just upstream of the City of Hondo wastewater discharge point (AU_04), and from just upstream of the City of Rio Hondo wastewater discharge point to the upstream end of the segment (AU_05). The area is predominately farmland. The Arroyo Colorado Tidal segment serves as the waterway from the Laguna Madre to the Port of Harlingen. Its watershed is 294,591 acres. The City of Rio Hondo is just downstream of the Port. Arroyo City is located along the southern shore, with many homes lining the river.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Arroyo Colorado Tidal	13782	01	Near Channel Marker 16 at Arroyo City	TCEQ Region 15	Routine Quarterly
	13071	02	At Mile 10 Marker 22 upstream of San Vicente Drain	TCEQ Region 15	Routine Quarterly
	13073	04	At Camp Perry north of Rio Hondo	TCEQ Region 15	Routine Quarterly + 2x 24-hour DO
	13072	05	At FM 106 bridge at Rio Hondo	TCEQ Region 15	Routine Quarterly

Water Quality – All AUs have listed water quality **impairments** for **bacteria** (enterococcus) and **concerns** for **chlorophyll-a** and **nitrate** in the 2020 IR Assessment. The impairment for bacteria for primary contact recreation is based on limited data. Due to the eight-hour holding time and because there are no local labs accredited for enterococci analysis, routine bacteria sample collection has been suspended.

AUs 04 and 05 are also **impaired** for **depressed dissolved oxygen** (24-hour minimum) and have **concerns** for **total phosphorus**. AU-04 and AU_05 have been impaired for depressed DO since the 1996 IR Assessment, generally attributed to the physical properties of the segment, including the Port of Harlingen and manipulation by dredging and other mechanical changes to the river. At times, barge traffic to the Port causes the anoxic water near the bottom of the channel to rise to the surface which results in fish kills. This report also lists AU_05 as having a **concern** for **depressed dissolved oxygen** (24-hour average). Additional 24-Hr DO monitoring will be needed to fully evaluate the concern.

Fish consumption warnings continue for AU_05 for **PCBs** and **Mercury in edible fish tissue**. More information on fishing advisories and bans are available at <http://dshs.texas.gov/seafood/advisories-bans.aspx>.

Special Studies – Numerous water quality studies have been conducted on the segment by multiple entities over the past two decades. The Watershed Protection Plan (WPP) Phase 1 was completed in 2007 by Texas Water Resources Institute (TWRI). Phase 1 of the WPP describes the state of the watershed and presents a strategic plan to improve environmental conditions, and to address impairments and concerns listed in the 2004 IR Assessment. That document can be found at: <https://arroyocolorado.org/media/gthk4kpd/watershed-protection-plan-phase-i-final-jan-11-2007.pdf>

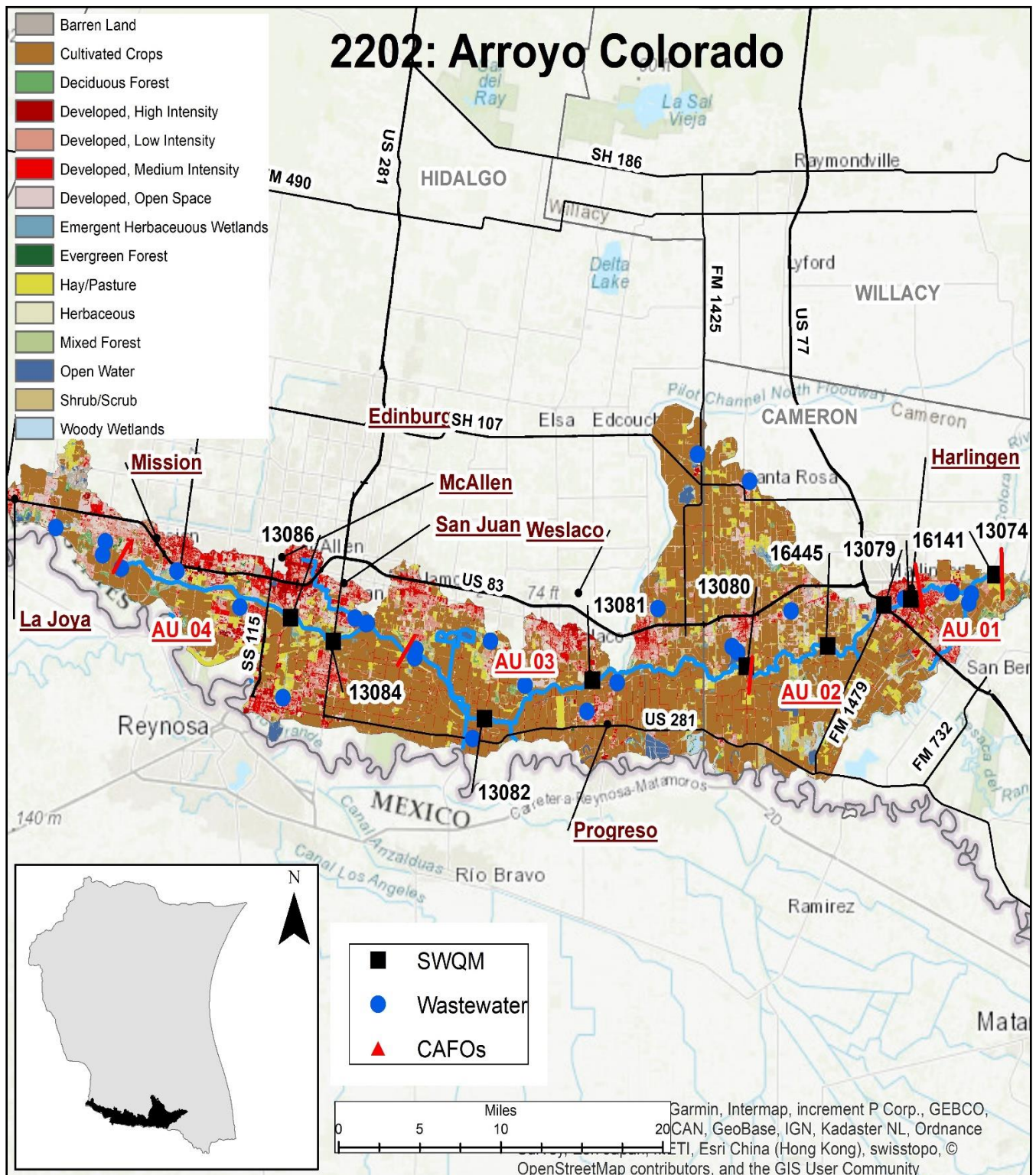
The Arroyo Colorado Watershed Partnership, which is a coalition of public and private organizations was created to provide collaboration with stakeholders to determine goals and priorities. More information about the WPP can be found at: <https://arroyocolorado.org/about/wpp/>

An update to the WPP was completed by the Arroyo Colorado Watershed Partnership and approved by EPA in 2017. The technical Report for the project can be found at: <https://arroyocolorado.org/media/wwmsqzx/arroyo-colorado-wpp-final-optimized.pdf>

Segment 2201B: Unnamed Drainage Ditch Tributary in Cameron County Drainage District #3

Segment Description - The unclassified water body flows from 17.6 km upstream of the FM 510 crossing to the confluence with the Arroyo Colorado Tidal in the Rio Hondo turning basin.

There are no active monitoring sites on the segment. Data were collected during 2001 and 2002 as part of the Arroyo Colorado TMDL study. No additional sampling has taken place, but a bacteria impairment and concerns for nitrates and chlorophyll-*a* are carried forward in the 2020 IR and addressed by the WPP.



Segment 2202 – Arroyo Colorado Above Tidal

Segment 2202: Arroyo Colorado Above Tidal

Segment Description - The segment flows 63 miles from FM 2062 in Hidalgo County to 110 yards downstream of Cemetery Road south of the Port of Harlingen. The segment is divided into four AUs; from the downstream end of the segment to the confluence with Little Creek just upstream of State Loop 499 (AU_01), from the confluence with Little Creek to the confluence with La Feria Main Canal just upstream of Dukes Highway (AU_02), from confluence with La Feria Main Canal just upstream of Dukes Highway to the confluence with La Cruz Resaca just downstream of FM 907 (AU_03), and from the confluence with La Cruz Resaca to the upstream end of the segment at FM 2062 (AU_04). Its watershed is 252,633 acres. There are numerous cities along US 83 just north of the Arroyo Colorado, with farming activities in between. The Arroyo Colorado is the primary conveyance of wastewater and agricultural runoff for this area.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Arroyo Colorado Above Tidal	13074	01	At Low Water Bridge at Port Harlingen at Cemetery Road	TCEQ Region 15	Routine Quarterly
	13079	02	At US 77 in Harlingen	NRA	Routine Quarterly
	13081	03	At FM 1015 south of Weslaco	TCEQ Region 15	Routine Quarterly
	13084	04	At US 281 south of Pharr	TCEQ Region 15	Routine Quarterly

Water Quality – All four AUs have **impairments** for **bacteria** (*E. coli*) and have been impaired since the 1996 Assessment. They remain listed in the 2020 IR Assessment. All four AUs also have water quality **concerns** for **chlorophyll-a**, **nitrate**, and **total phosphorus**.

Fish consumption warnings continue for all AUs for **PCBs** and **Mercury in edible fish tissue**. More information on fishing advisories and bans are available at <http://dshs.texas.gov/seafood/advisories-bans.aspx>.

Special Studies – The Watershed Protection Plan (WPP) Phase 1 was completed in 2007 by Texas Water Resources Institute (TWRI). Phase 1 of the WPP describes the state of the watershed and presents a strategic plan to improve environmental conditions, and to address impairments and concerns listed in the 2004 IR Assessment. That document can be found at: <https://arroyocolorado.org/media/gthk4kpd/watershed-protection-plan-phase-i-final-jan-11-2007.pdf>. An update to the WPP was completed by the Arroyo Colorado Watershed Partnership and approved by EPA in 2017. The technical Report for the project can be found at: <https://arroyocolorado.org/media/wwmmsqzx/arroyo-colorado-wpp-final-optimized.pdf>

To address the bacteria (*E. coli*) impairment and to help TCEQ determine the appropriate bacteria standard for the stream, NRA conducted a Recreational Use Attainability Analysis (RUAA) in 2011. The project consisted of conducting site surveys on 20 publicly accessible stream crossings. The final report for the project can be found at: [Arroyo-Colorado-RUAA.pdf](#) (nrcleanriversprogram.org)



Station 13074 – Arroyo Colorado at Cemetery Road

Segment 2202A: Donna Reservoir

Segment Description - The unclassified water body is an off-channel irrigation reservoir pumped from the Rio Grande River near the City of Donna. There are no active monitoring sites on the segment.

Special Studies - The unclassified water body has been impaired for Polychlorinated biphenyl (PCB) in edible fish tissue since the 1996 Assessment. A TMDL was conducted, and an Implementation Plan was approved in 2001. This pollutant is considered a background source that reflects the site-specific application histories and loss rates. Any continuing source of pollutant loadings occur from nonpoint source runoff, leaching, or erosion of sinks that may exist within the watershed. Residual PCB contamination from a site near the Donna Canal is likely to remain a continuing source until site investigation and remediation is completed. No authorized point source discharges of this pollutant are allowed by law. The Implementation Plan is available at

https://www.tceq.texas.gov/assets/public/waterquality/tmdl/07arroyoleg/07-implan_arroyo.pdf.



No Fishing sign at Donna Reservoir

Segment 2202B: Unnamed Drainage Ditch Tributary (B) to Arroyo Colorado

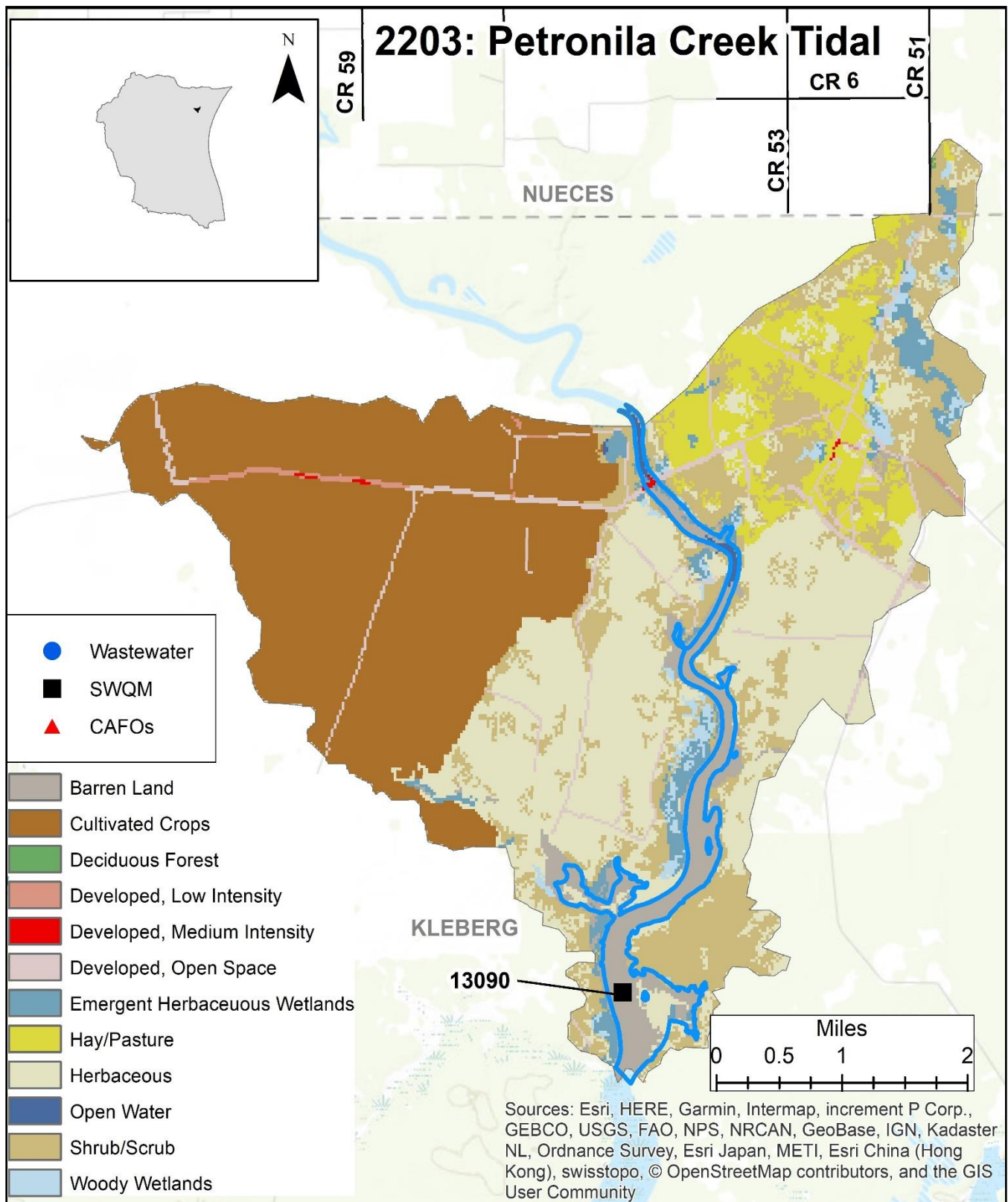
The unclassified water body is perennial drainage ditch that flows into the Arroyo Colorado in Harlingen.

There are no active monitoring sites on the segment. Data were collected as part of the Arroyo Colorado TMDL study. No additional sampling has taken place, but concerns for bacteria, ammonia, and chlorophyll-a identified during the study are being carried forward in the 2020 IR and addressed by the WPP.

Segment 2202C: Unnamed Drainage Ditch Tributary (C) to Arroyo Colorado

The unclassified water body is from a point 1.1 miles upstream of US 281 to the confluence with the Arroyo Colorado southeast of Donna.

There are no active monitoring sites on the segment. Data were collected as part of the Arroyo Colorado TMDL study. No additional sampling has taken place but concerns for bacteria and ammonia identified during the study are being carried forward in the 2020 IR Assessment and addressed by the WPP.



Segment 2203 – Petronila Creek Tidal

Segment 2203: Petronila Creek Tidal

Segment Description - The segment flows 14 miles from a point 0.6 miles upstream of a private road crossing near Laureles Ranch in Kleberg County to the confluence with Chiltipin Creek/Alazan Bay in Kleberg County. Its watershed is 10,918 acres.

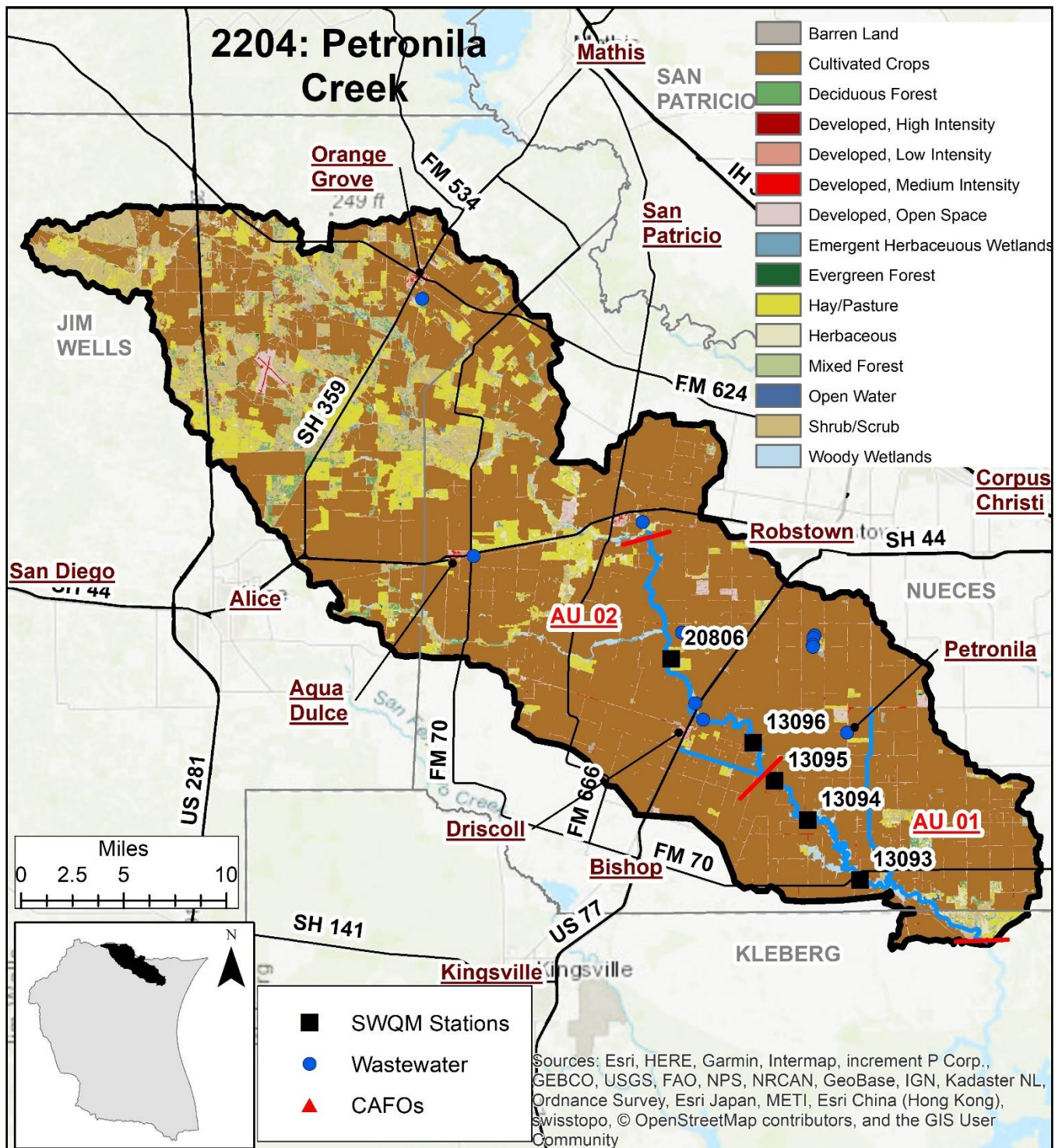
Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Petronila Creek Tidal	13090	01	Upstream of the confluence of Tunas Creek	TCEQ Region 14	Routine Quarterly

Water Quality - The segment has been listed as being **impaired** for **bacteria** (Enterococcus) for primary contact recreation since the 2010 IR Assessment. The impairment carries forward in the 2020 IR Assessment. The segment also has a water quality **concern** for **chlorophyll-a**. The segment was delisted for elevated pH in the 2018 IR Assessment.

Special Studies - A Watershed Protection Plan (WPP) is being developed for the Baffin Bay watershed due to water quality concerns and impairments in the bay and tributaries including Petronila and San Fernando creeks. Texas Water Resource Institute (TWRI), in partnership with Texas State Soil and Water Conservation Board (TSSWCB), NRA, Texas A&M University, Coastal Bend Bays and Estuaries Program (CBBEP), and Texas Sea Grant are working on the WPP. For more information, visit their website: <https://twri.tamu.edu/baffinwpp>



Segment 2203 - Petronila Creek Tidal



Segment 2204 – Petronila Creek Above Tidal

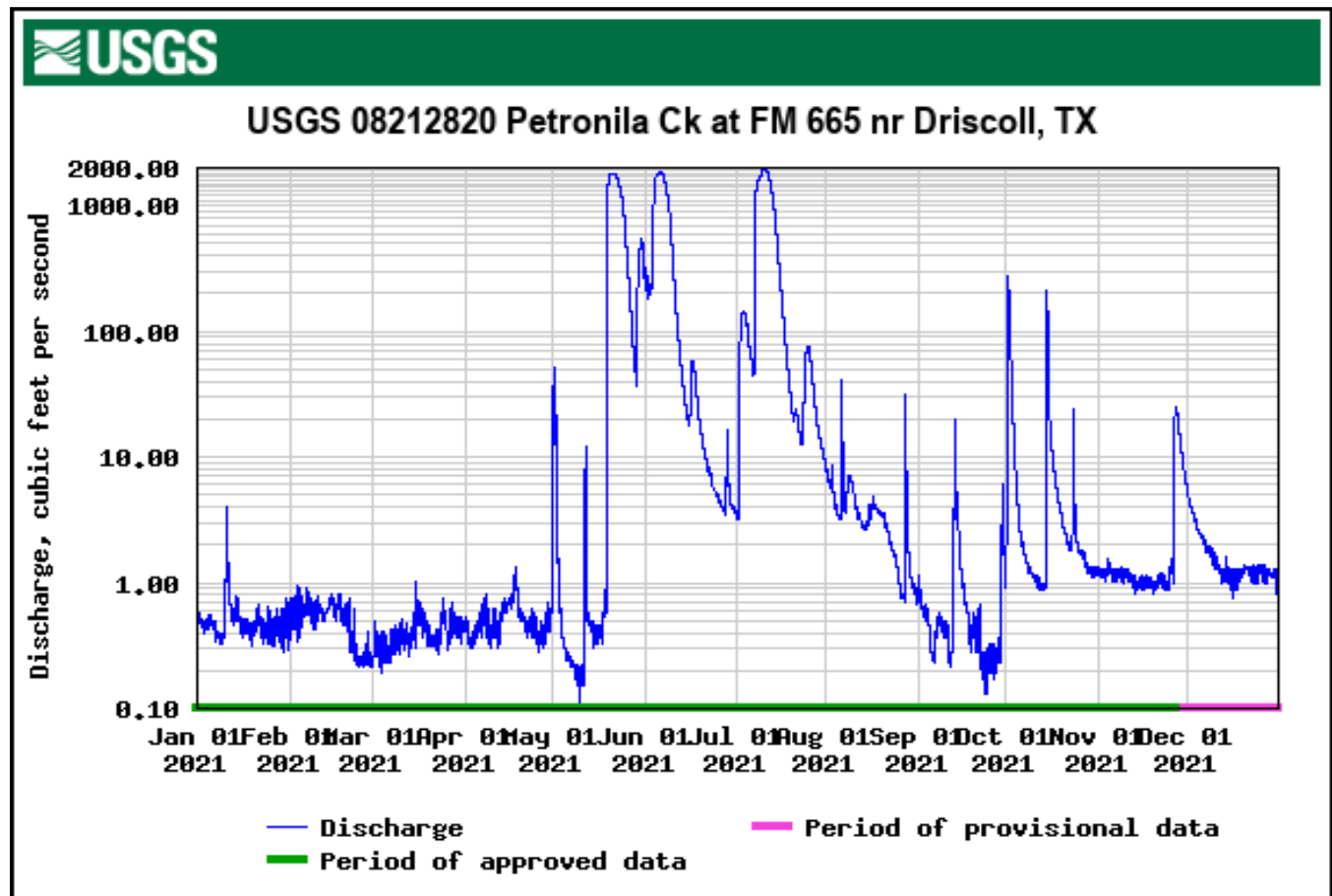
Segment 2204: Petronila Creek Above Tidal

Segment Description - The segment flows 44 miles from the confluence of Agua Dulce and Banquete Creeks in Nueces County to a point 0.6 miles upstream of a private road crossing near Laureles Ranch in Kleberg County. The segment is part of the Baffin Bay watershed. The segment is divided into two AUs; from the downstream end of the segment to the confluence with 2204A (AU_01), and from the confluence with 2204A to the upstream end of the segment (AU-02). Its watershed is 1,867,755 acres. The segment is primarily farmland interspersed with several small communities and cities. It flows through the City of Driscoll (pop. 631), at US 77, and several colonias. There are nine WWTPs that discharge to this segment and a storm water discharge permit for a hazardous waste landfill.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Petronila Creek Above Tidal	13094	01	At FM 892 southeast of Driscoll	NRA	Routine Quarterly
	13096	02	At FM 665 east of Driscoll	NRA	Routine Quarterly
	20806	02	At the end of Alice Road	NRA	Routine Quarterly

Water Quality - The segment has been **impaired** for **TDS**, **chloride**, and **sulfates** since the 1999 IR Assessment. Excessive concentrations of these three parameters occur east of U.S. Hwy 77, in an area where man-made nonpoint sources such as produced water, brine pits, and brine injection wells are most numerous. Segment 2204 is also **impaired** for **bacteria** (*E. coli*) and has water quality **concerns** for **chlorophyll-a** in both AUs.

2021 saw multiple minor floods on Petronila Creek mid-year. CRP monitoring was conducted on July 12th during peak flow (~2,000 ft³/s) on the third high flow event. The water quality was excellent during the event, with all water quality parameters meeting their assessment criteria.



Hydrograph of streamflow at Petronila Creek at FM 665 (Station 13096)



Flooding on Petronila Creek at FM 892 (Station 13094)

Special Studies – In 2000, water quality monitoring indicated impairments exist due to elevated levels of total dissolved solids (TDS), sulfate, and chloride. To address the impairments, three **Total Maximum Daily Load (TMDL)** studies were developed by the TCEQ and adopted in 2007. Results of the study concluded that the impairments were the result of historic oil and gas operations. The Railroad Commission of Texas (RRC) has been working with identified operators to properly plug abandon wells and to remove contaminated soils. Where operators cannot be identified, the RRC has been doing work as funding is available. The TMDL report can be found at: <https://www.tceq.texas.gov/assets/public/waterquality/tmdl/32petronila/32-petronilatmdlapproved.pdf>

NRA completed a review of the Implementation Plan (IP) in FY 2014. Continued routine monitoring and monthly monitoring in the creek and tributaries were recommended and implemented. The IP also recommended a **continuous water quality monitoring (CWQM)** station and a program to properly plug and abandon wells that are no longer active. The CWQM instrumentation was installed by TCEQ at Station 13093 at FM 70 in December 2006. NRA performed the routine maintenance/instrument calibrations. The CWQM station was discontinued in February 2016 after it was determined that sufficient data had been gathered to help understand the relationship between water level and pollutant concentrations.

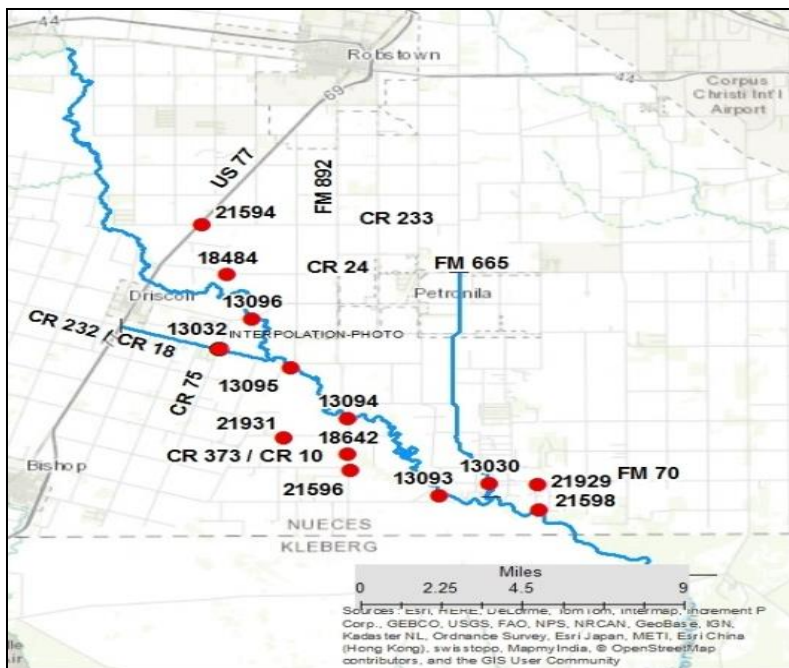


Calibrating CAMS 731 on Petronila Creek at FM 70

NRA conducts monthly monitoring for TDS, sulfate, and chloride under TCEQs TMDL Program at 13 stations (9 tributary and 4 main stem stations). The area most impacted from historic brine pollution exists east of US 77 where groundwater seeps contribute brackish and, in some areas, saline water to surface water flows.

For Fiscal Year 2020, NRA was awarded a grant from the Coastal Bend Bays and Estuaries Program to add monthly nutrient analysis to the ongoing TMDL monitoring program on Petronila Creek. Nutrient parameters included: nitrate, nitrite, total phosphorus, ammonia, total kjeldahl nitrogen (TKN), dissolved total kjeldahl nitrogen (DTN), and chlorophyll-a. Results from the nutrient study indicate episodes of high concentrations of nutrients (nitrate, TKN, DTKN, phosphorus) occur in late spring. Concentrations of chlorophyll-a were typically highly elevated whereas ammonia concentrations were typically very low. The final report for the FY2020 CBBEP funded project can be found at:

<https://www.cbbep.org/manager/wp-content/uploads/2003-Final-Report-FINAL.pdf>



A Watershed Protection Plan (WPP) for Petronila and San Fernando creeks is being developed by the Texas Water Resources Institute (TWRI), due to elevated bacteria and nutrient concentrations. Partners of the project include Texas State Soil and Water Conservation Board (TSSWCB), Coastal Bend Bays and Estuaries Program (CBBEP), Texas A&M AgriLife, and Texas Sea Grant. For more information, visit: <https://twri.tamu.edu/baffinwpp>



Watershed Protection Plan Meeting in Bishop

List of Impairments and Concerns in the Nueces – Rio Grande Coastal Basin

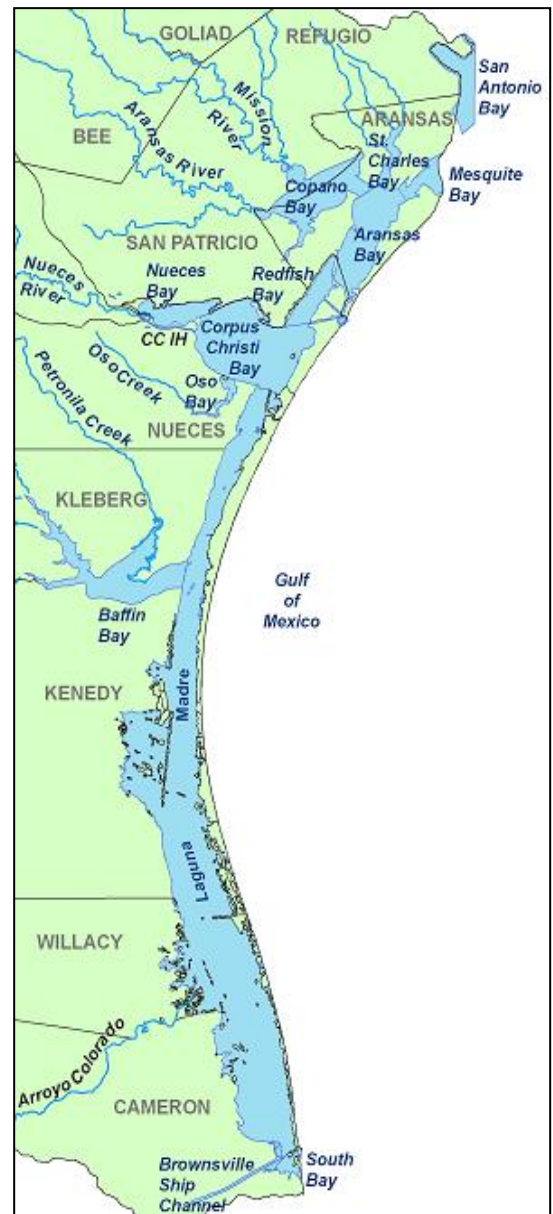
Segment Name	AU	Description	Impairment	Concern
2201 Arroyo Colorado Tidal	01	From the downstream end of the segment to the confluence with San Vicente Drainage Ditch	Bacteria	Chlorophyll-a, Nitrate
	02	From the confluence with San Vincente Drainage Ditch to the confluence with an unnamed drainage ditch at 26.31 N, -97.53 W	Bacteria	Chlorophyll-a, Nitrate
	03	From an unnamed drainage ditch at 26.31 N, -97.53 W to the confluence with the Harding Ranch Ditch tributary	Bacteria	Chlorophyll-a, Nitrate
	04	From the confluence with the Harding Ranch Ditch tributary to just upstream of the City of Hondo wastewater discharge point	Bacteria, DO	Chlorophyll-a, Nitrate
	05	From just upstream of the City of Rio Hondo wastewater discharge point to the upstream end of the segment	DO, Bacteria, Mercury in edible tissue, and PCBs in edible tissue	Chlorophyll-a, Nitrate, Total Phosphorus
2201B Unnamed Drainage Ditch Tributary (B) in Cameron County Drainage District #3	01	Entire water body	Bacteria	Chlorophyll-a
2202 Arroyo Colorado Above Tidal	01	From the downstream end of the segment to the confluence with Little Creek just upstream of State Loop 499	Bacteria, Mercury, in edible tissue, PCBs in edible tissue	Chlorophyll-a, Nitrate, Total Phosphorus
	02	From the confluence with Little Creek to the confluence with La Feria Main Canal just upstream of Dukes Highway	Bacteria, Mercury in edible tissue, PCBs in edible tissue	Chlorophyll-a, Nitrate, Total Phosphorus
	03	From confluence with La Feria Main Canal to the confluence with La Cruz Resaca just downstream of FM 907	Bacteria, Mercury in edible tissue, PCBs in edible tissue	Chlorophyll-a, Nitrate, Total Phosphorus
	04	From the confluence with La Cruz Resaca to the upper end of segment at FM 2062	Bacteria, Mercury in edible tissue, PCBs in edible tissue	Chlorophyll-a, Nitrate, Total Phosphorus
2202A Donna Reservoir	01	Entire Reservoir	PCBs in edible fish tissue	None
2202B Unnamed Drainage Ditch Tributary (B) to S. Arroyo Colorado	01	Entire segment	None	Ammonia, Bacteria, Chlorophyll-a
2202C Unnamed Drainage Ditch Tributary (C) to S. Arroyo Colorado	01	Entire segment	None	Ammonia, Bacteria,
2203 Petronila Creek Tidal	01	Entire segment	Bacteria	Chlorophyll-a
2204 Petronila Creek Above Tidal	01	From the downstream end to the confluence with 2204A	Bacteria, TDS, Chloride, Sulfate	Chlorophyll-a

Basins 24 & 25 - Bays and Estuaries and Gulf of Mexico

Several TMDLs and special studies have been conducted in the basin. Segment 2485, Oso Bay for bacteria and depressed DO; Segment 2485A for bacteria; and Segment 2491, Laguna Madre for depressed DO.



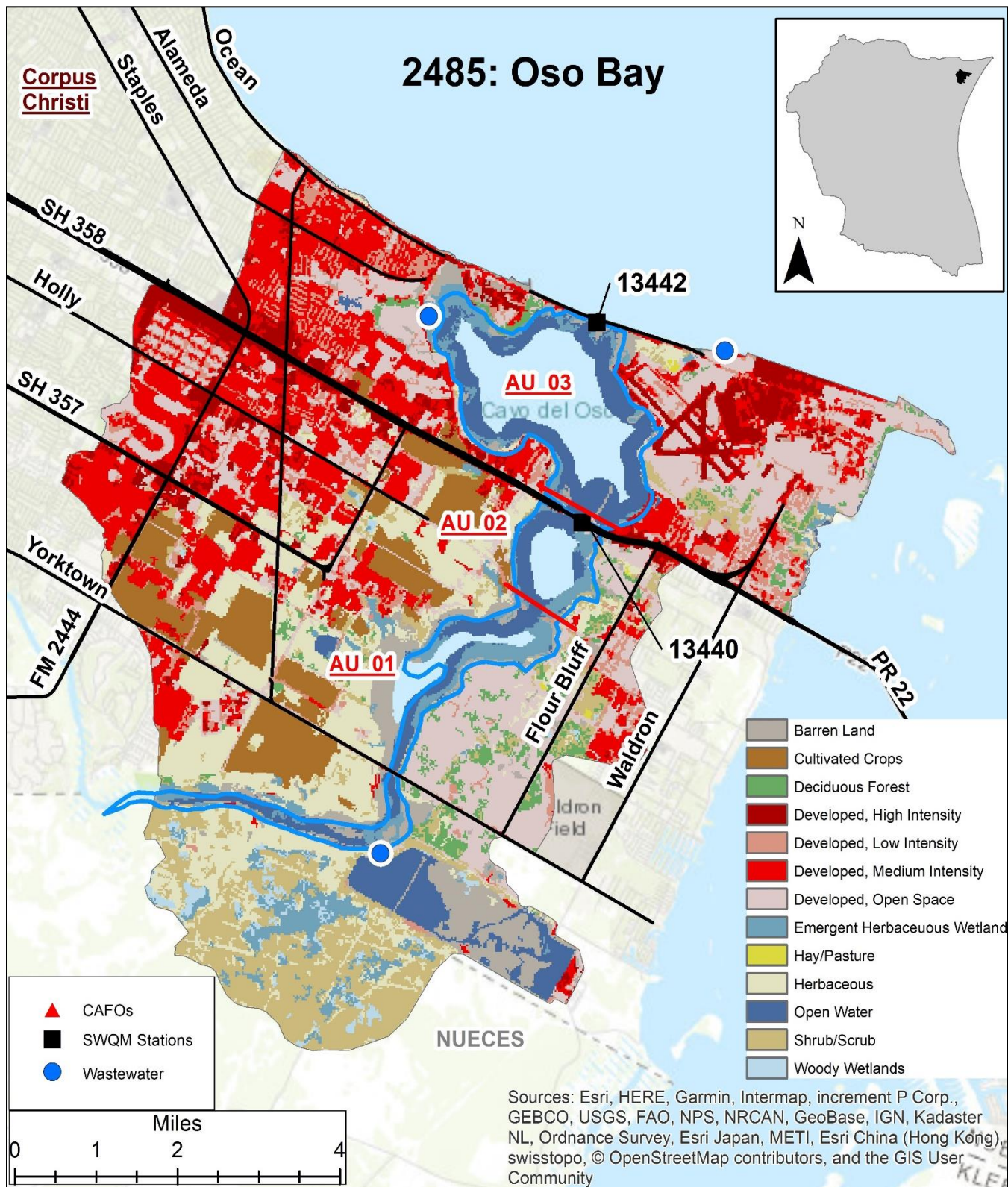
Corpus Christi Bay in Basin 24 – Bays and Estuaries



Bays and Estuaries and
Gulf of Mexico

CRP and SWQM Sites in the Bays and Estuaries

Segment Name	Station Id	Description	Monitoring Entity	Conventional Bacteria, Field	Other
2485 Oso Bay	13440	Immediately offshore at tip of peninsula at Padre Island Drive/southbound SH 358	NRA	Quarterly	
	13442	40 m upstream of Ocean Drive and approx. 50 m west of eastern landfall of bridge	NRA	Quarterly	
2485A Oso Creek	13028	Immediately downstream of SH 286 south of Corpus Christi	NRA	Quarterly	
	13029	Immediately downstream of FM 783 southwest of Corpus Christi	NRA	Quarterly	
2491 Laguna Madre	13445 (AU_01)	at ICWW approx. 1.6 km southwest from the southernmost point of south Bird Island	TCEQ Region 14	Quarterly	
	13446 (AU_03)	ICWW at Marker 129 east of Port Isabel	TCEQ Region 15	Quarterly	
	13447 (AU_02)	Intersection of ICWW and Arroyo Colorado	TCEQ Region 15	Quarterly	Field only
	13448 (AU_01)	Intersection of ICWW and Port Mansfield Channel	TCEQ Region 15	Bi-annually	
	13449 (AU_01)	CM C-225A north of Port Mansfield	TCEQ Region 15	Bi-annually	
	14870 (AU_03)	200 yds off Laguna Vista shoreline	TCEQ Region 15	Quarterly	
2491B North Floodway	20930	North Floodway at US 77 south of intersection of US 77 and FM 2629 in Sebastian	TCEQ Region 15	Quarterly	
2491C_01 Hidalgo Main	22003	At FM 1420 1.65 km south of intersection with FM 490 east of Raymondville	NRA	Quarterly	
2491_03 Raymondville Drain	22004	At Willacy County Road 445 800 m north of intersection with FM 3142 east of Raymondville	NRA	Quarterly	
2492 Baffin Bay / Alazan Bay / Cayo Del Grullo / Laguna Salada	13450	At Channel Marker 14	TCEQ Region 14	Quarterly	
	13452	At Channel Marker 36	TCEQ Region 14	Quarterly	
2492A San Fernando Creek	13033	At US 77 at Kingsville	NRA	Quarterly	
2492B Los Olmos Creek	13034	At US 77 south of Riviera	NRA	Quarterly	
2493 South Bay	13459	Near ship CM 17	TCEQ Region 15	Quarterly	
	14865	Middle of bay	TCEQ Region 15	Quarterly	
2494 Brownsville Ship Channel	13460	Near ship CM35 / black buoy	TCEQ Region 15	Quarterly	
	14871	Mid-channel 595 m east of SH 48 at Foust Rd.	TCEQ Region 15	Quarterly	
	14875	Mid-channel at entrance to San Martin Lake	TCEQ Region 15	Quarterly	
2494A Port Isabel Fishing Harbor	13285	Port Isabel Fishing Harbor	TCEQ Region 15	Quarterly	
2494C San Martin Lake System	22170	Mid estuary 2.04 km east and 0.80 km north of the HWY 48 bridge northeast of Brownsville	NRA	Quarterly	



Segment 2485 – Oso Bay

Segment 2485: Oso Bay

Segment Description - Oso Bay is located in the City of Corpus Christi (pop. 326,554) in Nueces County. The bay is divided into three AUs; the upper bay from Holly Road to CR 24 (AU_01), middle bay from Park Road 22 to Holly Road (AU_02), and from Ocean Drive to Park Road 22 (AU_03). Its watershed is 29,661 acres. The northwest portion of the bay between Ward Island and Ennis Joslin Road in AU_03 is known as the Blind Oso. Oso Bay receives much of the storm water runoff from the City of Corpus Christi as well as the cooling water from the Barney Davis Power Plant. The housing developments around the bay range from large, multi-acre tracts to neighborhoods with many houses per acre, to apartment complexes.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Oso Bay	13440	02	At South Padre Island Drive SH 358 Bay Bridge	NRA	Routine Quarterly
	13442	03	At Ocean Drive Bay Bridge	NRA	Routine Quarterly

Water Quality – According to the 2020 IR Assessment, AU_01 has a water quality **concern** for **chlorophyll-a**. AU_02 has a water quality **impairment** for **depressed dissolved oxygen** (24-hour minimum) and has water quality **concerns** for **bacteria** (enterococcus), **chlorophyll-a**, and **total phosphorus**. AU_03 has a water quality **impairment** for **bacteria** (enterococcus) and has water quality **concerns** for **chlorophyll-a** and **total phosphorus**. AU_03 has had an impairment for bacteria for primary contact recreation and oyster waters since 2004.

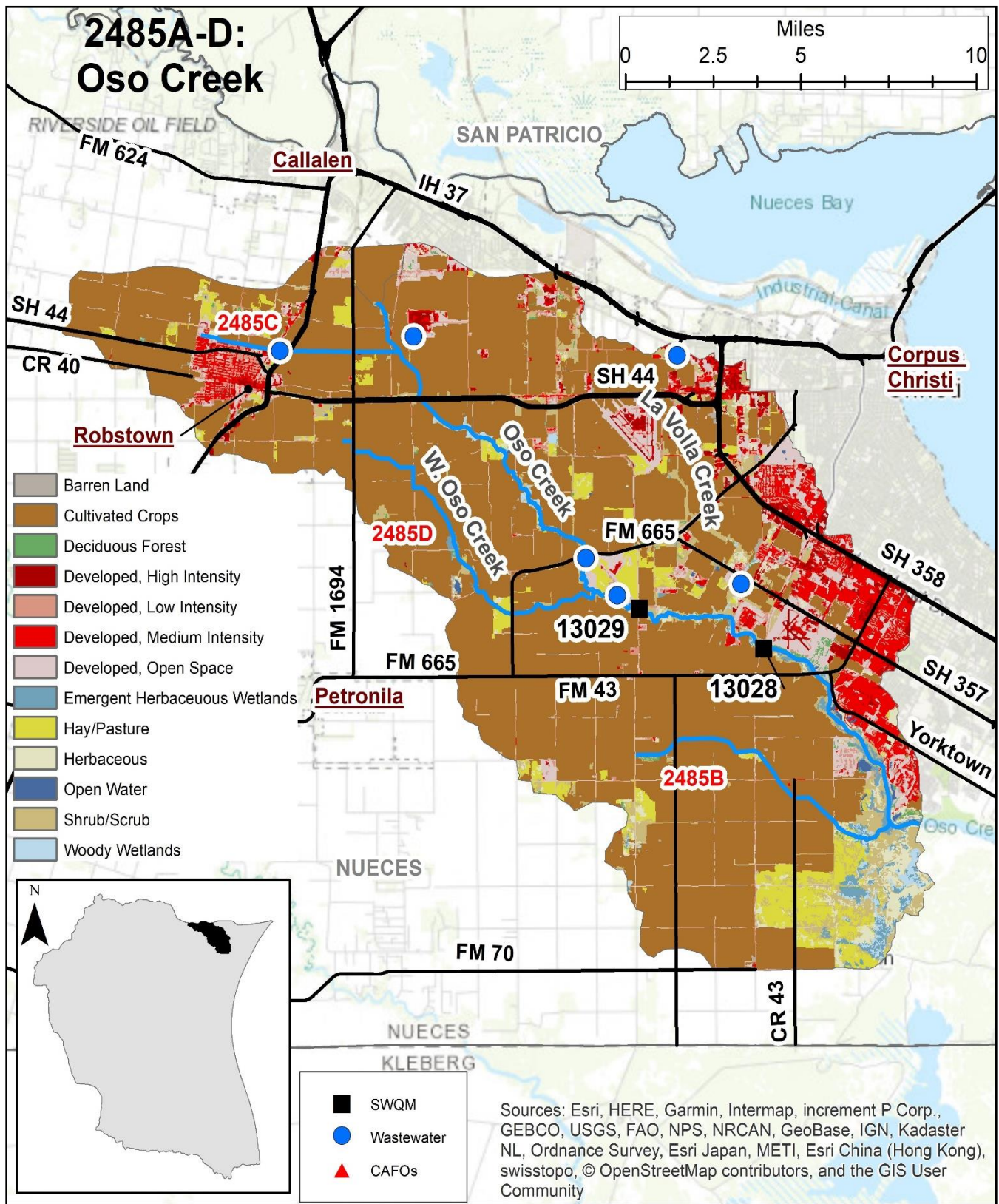
Special Studies – In response to the bacteria impairment, a TMDL for bacteria (Enterococcus) was conducted by the Center for Coastal Studies at TAMU-CC and was completed in 2007. The TMDL concluded that the Blind Oso differs significantly in physical characteristics and uses from the main portion of Oso Bay. It is extremely shallow and has a soft, muddy bottom and wetland areas. Local area stakeholders indicate that the Blind Oso is not used for contact recreation but is used extensively by waterfowl since it provides high quality habitat for waterfowl and shorebirds. TAMU-CC collected additional bacteria samples for a special study in 2013. Most of those samples exceeded the standard. The technical report can be found at:

<https://www.tceq.texas.gov/assets/public/waterquality/tmdl/67osobaybacteria/67-osobaybacteria-tmdl-adopted.pdf>

In 2010, TCEQs TMDL Program assessed dissolved oxygen concentrations and prepared a Use Attainability Analysis (UAA) for the bay. Based on data collected for the TMDL, a revision to the DO criteria is being proposed. The TCEQ recommends changing the 24-Hr average criteria from 5.0 mg/l to 4.5 mg/l. The recommended change for the 24-Hr minimum criteria is from 4.0 mg/l to 2.0 mg/l. If the proposed revisions are approved, the bay would meet the DO standard. The project website is: <https://www.tceq.texas.gov/waterquality/tmdl/24-osobayoxyg.html>



Station 13440 – Oso Bay at SPID Bay Bridge



Segment 2485A-D – Oso Creek

Segments 2485A: Oso Creek

Segment Description - Oso Creek flows 29.5 miles from a point 3 miles upstream of SH 44 west of Corpus Christi (pop. 326,554) to the confluence with Oso Bay in Nueces County. Its watershed is 118,380 acres. The southeastern end of the creek flows through highly developed areas of Corpus Christi. The northwestern end is primarily rural, but development is rapidly encroaching.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Oso Creek	13028	01	At SH 286 south of Corpus Christi	NRA	Routine Quarterly
	13029	01	At FM 763 southwest of Corpus Christi	NRA	Routine Quarterly

Water Quality - The creek has had an **impairment** for **bacteria** (enterococcus) for primary contact recreation since 2002. The creek also has concerns for **nitrate**, **chlorophyll-a**, and **total phosphorus** in the 2020 IR Assessment.

Special Studies – In 2016, NRA completed a report called the Riparian Evaluation of Oso Creek and Tributaries in support of Implementation Plan recommendations. For the study, NRA made maps identifying hindrances and constraints of riparian areas and identified evaluation project areas to establish on-going evaluations. The report can be found at:

<https://www.tceq.texas.gov/assets/public/waterquality/tmdl/67osocreekbacteria/67-2016OsoRiparianEvaluationReport.pdf>

In 2019, a TMDL for bacteria was conducted and completed by the Texas Institute for Applied Environmental Research (TIAER). TIAER developed a load duration curve (LDC) to quantify pollutant loads and specific TMDL for point and nonpoint sources of bacteria. For more information on the project, visit:

<https://www.tceq.texas.gov/waterquality/tmdl/67-osocreekbacteria>



Station 13028 – Oso Creek at SH 286

Segment 2485B: Unnamed Tributary of Oso Creek

Segment Description - The unclassified water body flows from the Oso Creek confluence to a point 3.2 miles west of SH 286. This tributary is a primarily rural area, but development is rapidly encroaching.

Water Quality - There are no active monitoring sites on the segment. Data for the assessment were collected during the TMDL studies. There is a water quality **concern** for **total phosphorus** in the 2020 IR Assessment. The segment was included in NRA's Oso Creek Riparian Evaluation, found here: <https://www.cbbep.org/manager/wp-content/uploads/1907-Final-Report-9.11.19-Reduce.pdf>



Segment 2485B – Unnamed Tributary of Oso Creek during Riparian Evaluation

Segment 2485D: West Oso Creek

Segment Description - The unclassified water body flows from the Oso Creek confluence upstream to a point 0.3 miles west of FM 1694. This tributary is a primarily rural area, but development is rapidly encroaching.

Water Quality - There are no active monitoring sites on the segment. Data for the assessment were collected during the TMDL studies. There is a water quality **concern** for **total phosphorus** in the 2020 IR Assessment. The segment was included in NRA's Oso Creek Riparian Evaluation, found here: <https://www.cbbep.org/manager/wp-content/uploads/1907-Final-Report-9.11.19-Reduce.pdf>



Segment 2485D – West Oso Creek during Riparian Evaluation



Segment 2491 – Laguna Madre

Segment 2491: Laguna Madre

Segment Description - The Laguna Madre runs along the Texas coast from Corpus Christi Bay in Nueces County to the Brownsville Ship Channel in Cameron County. It is divided into three AUs; the upper portion of the bay north of the Arroyo Colorado confluence (AU_01), the area adjacent to the Arroyo Colorado confluence (AU_02), and the lower portion of the bay south of the Arroyo Colorado confluence (AU_03). Its watershed is 4,222,224 acres. The only development is the very northern and very southern ends: Corpus Christi and Port Isabel, respectively. Padre Island National Seashore encompasses most of the barrier island to the east. The land to the west is predominantly large ranches such as the King Ranch. There are numerous WWTPs permitted to discharge to the Laguna Madre via the North Floodway, some of which are as far west as McAllen.

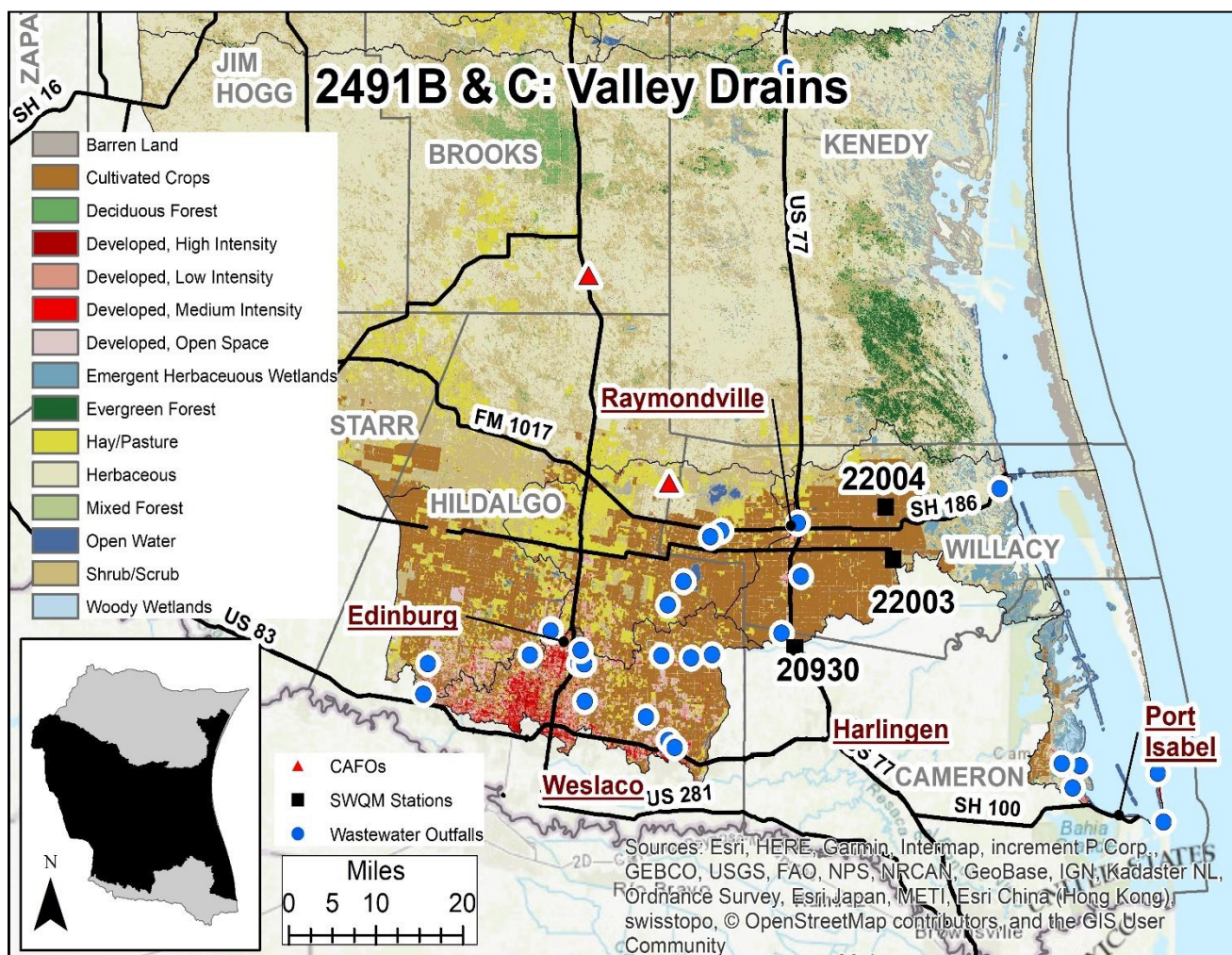
Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Laguna Madre	13445	01	Approx. 1.6 km southwest from southernmost point of South Bird Island	TCEQ Region 14	Quarterly Monitoring
	13449	01	At Channel Marker C-225A North of Port Mansfield	TCEQ Region 15	Bi-annually Monitoring
	13448	01	At intersection of Intracoastal Canal and Port Mansfield Channel	TCEQ Region 15	Bi-annually Monitoring
	13447	02	At intersection of Intracoastal Canal and Arroyo Colorado	TCEQ Region 15	Quarterly Field Only
	14870	03	200 yds off Laguna Vista Shoreline	TCEQ Region 15	Quarterly Monitoring
	13446	03	At Marker 129 East of Port Isabel	TCEQ Region 15	Quarterly Monitoring

Water Quality – AU_01 has a water quality **impairment** for **depressed dissolved oxygen** (24-hour minimum) and a **concern** for **chlorophyll-a** in the 2020 IR Assessment. AU_02 has water quality **impairments** for **depressed dissolved oxygen** (24-hour minimum) and **bacteria** (enterococcus), and **concerns** for **ammonia**, **nitrate**, and **chlorophyll-a**. AU_02 has had an impairment for bacteria for primary contact recreation and oyster waters since 2006 and is being carried forward in the 2020 IR Assessment. Due to the eight-hour holding time and because there are no local labs accredited for enterococci analysis, bacteria sample collection has been suspended. AU_03 has water quality **concerns** for **depressed dissolved oxygen** (grab), and **bacteria** (enterococcus).

Special Studies – To address the dissolved oxygen impairments, water quality standards revisions to the criteria are being proposed: The TCEQ recommends changing the 24-hour average criteria from 5.0 mg/l to 4.5 mg/l, but local stakeholders have requested that they consider 4.0 mg/l. The recommended change for the 24-Hr minimum criteria is from 4.0 mg/l to 2.0 mg/l. If the proposed revisions are approved, the bay would meet the DO standard in all AUs.



Causeway to South Padre Island over the Laguna Madre



Segment 2491B&C – Valley Drains

Segment 2491B: North Floodway

Segment Description – Located in the Lower Rio Grande Valley (LRGV), the North Floodway is used to drain WWTP effluent, return flows from irrigation, and diverted flood water flows from the Arroyo Colorado. It runs from a point 0.04 miles north of Campacuas Lake and 0.32 miles west of FM 491 in Mercedes to the confluence with the Lower Laguna Madre tidal flats.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
North Floodway	20930	01	At intersection of US 77 and FM 2629 in Sebastian	TCEQ Region 15	Routine Quarterly

Water Quality – Data collection on this water body began in November 2011. Although there are no impairments identified in the 2020 IR Assessment, the segment does have water quality **concerns** for **bacteria** (*E. coli*), **nitrate** and **chlorophyll-a**.



Station 20930 – North Floodway at US 77

Segment 2491C: Raymondville Drain

Segment Description – Raymondville Drain flowing into the Lower Laguna Madre.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Raymondville Drain	22004	01	At Willacy CR 445 800 m north of intersection with FM 3142 east of Raymondville	NRA	Routine Quarterly

Water Quality – Data collection began in 2018 and there are not enough data points for an assessment.



Station 22004 – Raymondville Drain at CR 445

Segment 2491C_03: Hidalgo Main Drain

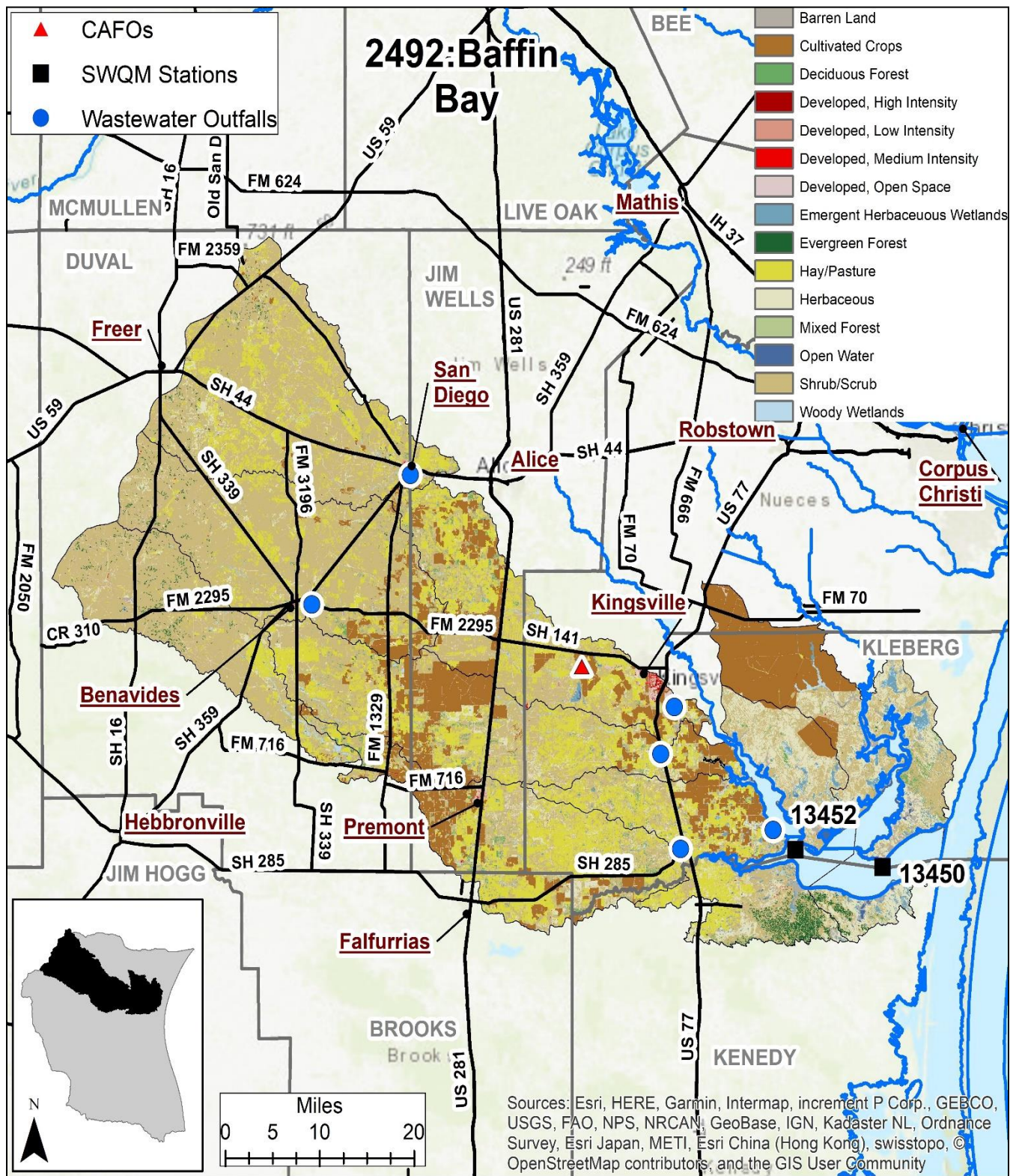
Segment Description – Hidalgo Main Floodwater Channel flowing into the Lower Laguna Madre.

	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Hidalgo Main Drain	22003	01	At FM 1420 1.65 km south of Intersection with FM 490 east of Raymondville	NRA	Routine Quarterly

Water Quality - Data collection began in 2018 and there are not enough data points for an assessment. Elevated bacteria concentrations have been recorded during site visits and will likely be listed in a future assessment.



Station 22003 – Hidalgo Drain at FM 1420



Segment 2492: Baffin Bay / Alazan Bay / Cayo del Grullo / Laguna Salada

Segment Description - Baffin Bay is a hypersaline secondary bay located in Kleberg and Kenedy Counties. Alazan Bay is a tertiary bay located in the northeastern arm of Baffin Bay in Kleberg County, Cayo del Grullo is the northwestern arm in Kleberg County, and Laguna Salada is the western arm in Kleberg and Kenedy Counties. Its watershed is 1,376,310 acres. The City of Kingsville (pop. 25,487) is the only large city in the watershed. Most of the bay is surrounded by large ranches such as the King Ranch. There are only a few public access points.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Baffin Bay	13450	01	Baffin Bay at Channel Marker 14	TCEQ Region 14	Routine Quarterly
	13452	01	Baffin Bay at Channel Marker 36	TCEQ Region 14	Routine Quarterly

Water Quality – Baffin Bay has a water quality **concern** for **chlorophyll-a** listed in the 2020 IR Assessment.

Special Studies – In the last decade, there have been many studies targeting Baffin Bay and its watershed. Although the bay only has a water quality concern for chlorophyll-a, episodes of fish-kills and food web disruptions have caught the attention of a concerned public and researchers alike. The Baffin Bay Stakeholder Group, formed in 2012, is composed of scientists from Harte Research Institute (HRI) at TAMU-CC, CBBEP, United States Department of Agriculture – Natural Resource Conservation Service (USDA-NRCS), TSSWCB, TWRI, TCEQ, Texas Sea Grant, Texas General Land Office (TxGLO), NRA, and a host of concerned citizens, including commercial and recreational fishermen, ranchers, and business owners. In 2013, HRI initiated a volunteer water quality monitoring program. Presently, HRI is assessing nutrient loadings to Baffin Bay, a Coastal Resiliency Master Plan, and serpulid reef studies. For more information, please visit their project page:

[Texas Coastal Resiliency Master Plan | Harte Research Institute](#) Additionally, TWRI received funding for the development of a WPP for Baffin Bay and its tributaries Petronila and San Fernando creeks. The project kicked off in 2020. For more information, please visit their project page:

<https://twri.tamu.edu/our-work/restoring-protecting/petronila-san-fernando-creeks-watershed-planning/>



Segment 2492 – Alazan Bay

Segment 2492A: San Fernando Creek

Segment Description - San Fernando Creek flows 45.6 miles from the confluence with Chiltipin Creek and San Diego Creek in Jim Wells County to the confluence of the Cayo del Grullo arm of Baffin Bay in Kleberg County. Its watershed is 288,572 acres. While primarily rural, the creek flows through the City of Alice (pop. 18,887) and the City of Kingsville (pop. 25,487). There are a number WWTPs that discharge into the creek providing consistent flow. The watershed also has several small communities on septic systems.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
San Fernando Creek	13033	01	At US 77 bridge crossing	NRA	Routine Quarterly

Water Quality – San Fernando Creek is currently listed as **impaired** for **bacteria** (*E. coli*) in the 2020 IR Assessment. The creek was previously listed for enterococci bacteria (marine water), but the sampling location was determined to be upstream of the tidal boundary. The creek also has water quality **concerns** for **chlorophyll-a**, **nitrate**, and **total phosphorus**.

Special Studies - TWRI received funding for the development of a WPP for Baffin Bay and its tributaries Petronila and San Fernando creeks. The project kicked off in 2020 and includes monthly water quality monitoring for bacteria (*E. coli*) and nutrient parameters at San Fernando Creek (Station 13033) and Petronila Creek. For more information or to get involved in the process please visit their project page:

<https://twri.tamu.edu/our-work/restoring-protecting/petronila-san-fernando-creeks-watershed-planning/>

In 2020, NRA conducted a year-long water quality monitoring project funded by TxGLO's Coastal Management Program (CMP). The study included high flow event monitoring on San Fernando, Los Olmos, and Petronila creeks. The final report was posted to the CMP project page in Summer 2021. For more information, please visit the project page: [20-029-000-B736-Final-Report.pdf \(nracleanriversprogram.org\)](#)



Station 13033 – San Fernando Creek at US 77



Segment 2492B: Los Olmos Creek Tidal

Segment Description – Tidal portion of Los Olmos Creek is from the confluence with Laguna Salada upstream 6.8 mi southwest of Riviera.

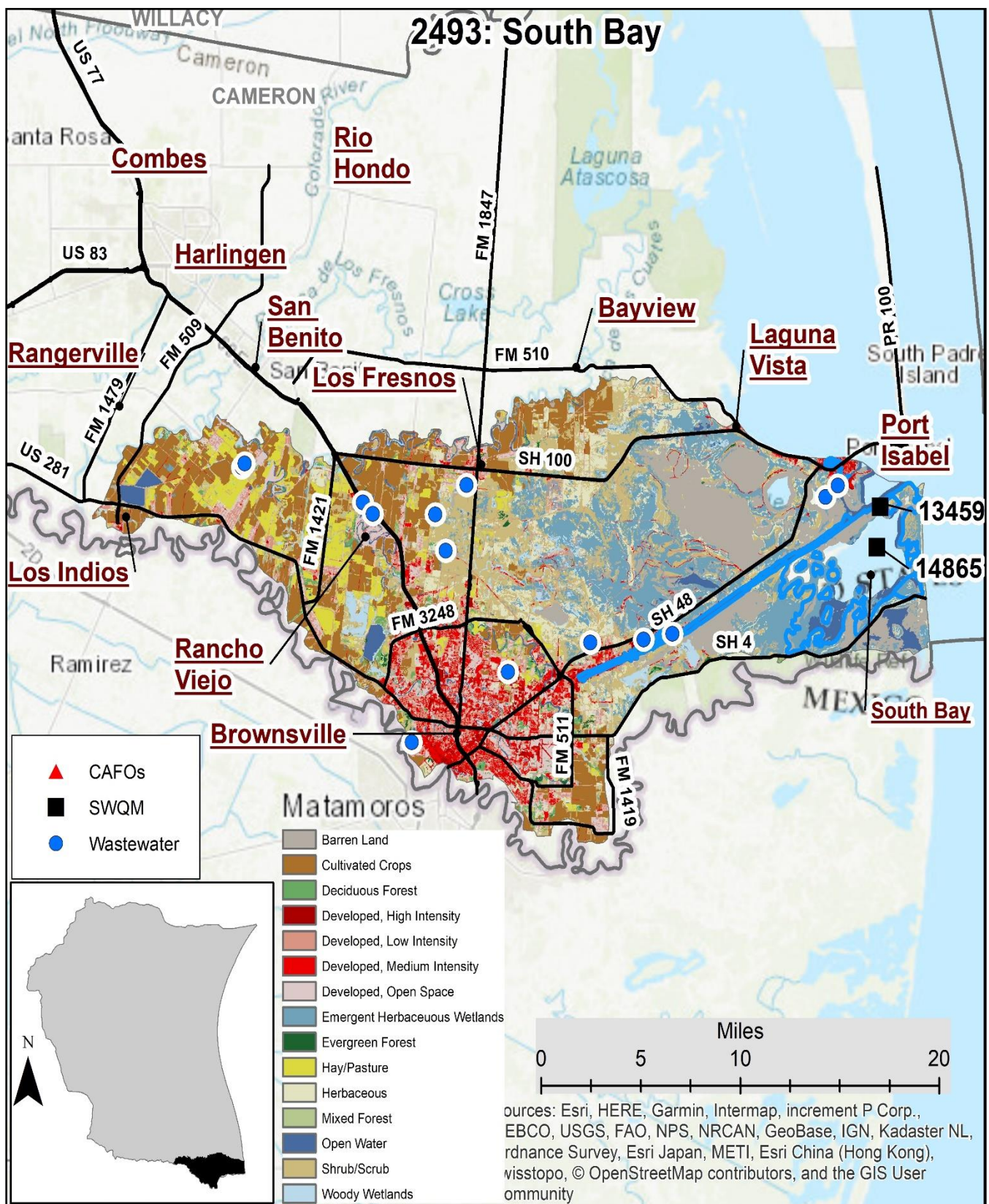
Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Los Olmos Creek	13034	01	At US 77 south of Riviera	NRA	Routine Quarterly

Water Quality – Water quality monitoring began in 2019 and the segment does not have enough data to be assessed in the 2020 IR Assessment. Data collected through 2021 indicate elevated concentrations of bacteria (enterococcus), nitrate nitrogen, total kjeldahl nitrogen, and chlorophyll-a. Possible sources of the nutrients and bacteria include a natural source including bats that reside under the bridge at US 77, and nutrient inputs from the Riviera WWTP. The segment is also known for hyper salinity (>38 ppt) that can be in excess of 70 ppt for extended periods of time.

Special Studies – In 2020, NRA conducted a year-long water quality monitoring project that included collecting data on Los Olmos Creek that was funded by TxGLO's Coastal Management Program (CMP). The purpose of the study was to provide monthly water quality data that TCEQ can use to evaluate the water body and to help researchers determine the contribution of bacteria and nutrient parameters to the creek during rain events. Results of the study indicate concentrations of bacteria (enterococcus), nitrate, and chlorophyll-a were above their criteria and will likely be listed for those parameters in a future IR Assessment. The final report is found on the NRA Clean Rivers Program webpage: <https://nrcleanriversprogram.org/wp-content/uploads/20-029-000-B736-Final-Report.pdf>



Station 13034 – Los Olmos Creek Tidal at US 77



Segment 2493 – South Bay

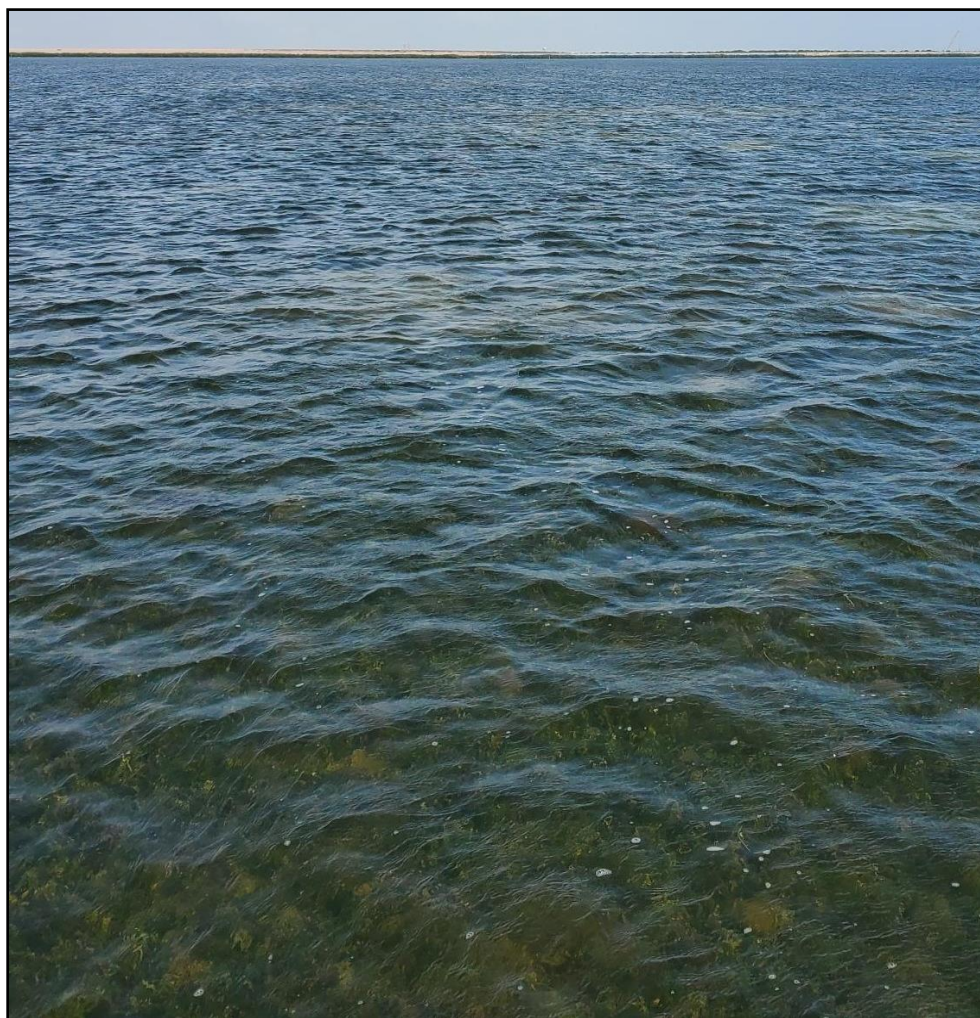
Segment 2493: South Bay

Segment Description - South Bay is located south of the Brownsville Ship Channel in Cameron County. Its watershed, combined with that of the Segment 2493, South Bay, and Segment 2494, the Brownsville Ship Channel is 225,554 acres. South Bay is the southernmost bay in Texas and is part of the South Bay Coastal Preserve. It supports the largest concentration of oysters in the Lower Laguna Madre and is relatively inaccessible.

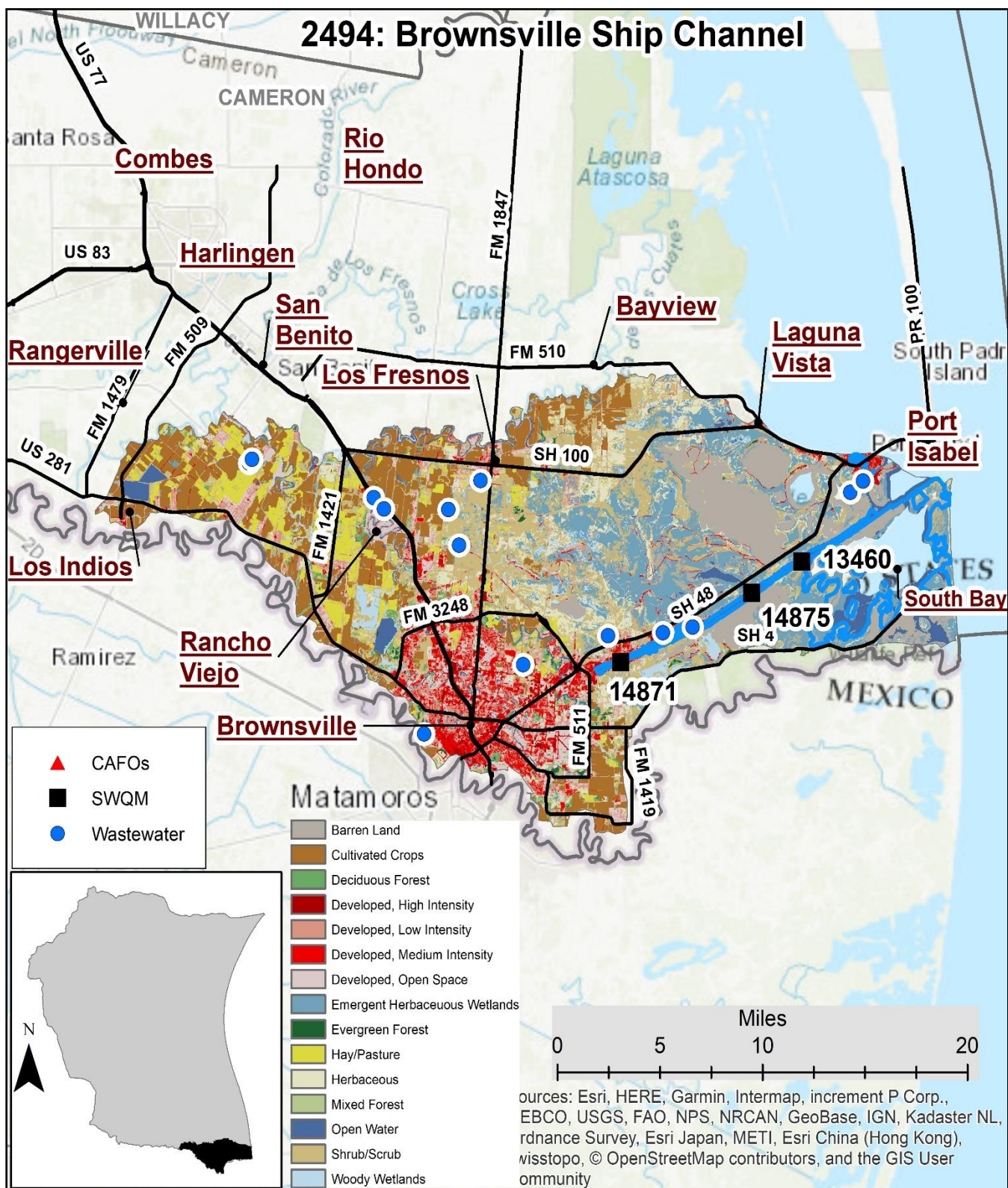
Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
South Bay	13459	01	Approximately 0.1 km west of Clark Island	TCEQ Region 15	Routine Quarterly
	14865	01	Middle of the Bay	TCEQ Region 15	Routine Quarterly

Water Quality - All assessed parameters met the standards in the 2020 IR Assessment.

Special Studies – South Bay was included in the Lower Laguna Madre/Brownsville Ship Channel Watershed Characterization that was conducted by a collaboration of the University of Texas – Rio Grande Valley Brownsville, TWRI, TCEQ, and TIAER in 2018. The report discusses water quality in San Martin Lake, the Brownsville Ship Channel, and the Lower Laguna Madre. The full report can be found at the following website: https://arroyocolorado.org/media/zqjpi1e0/llm_wc_102618_forstakeholderreview.pdf



Segment 2493 - South Bay



Segment 2494 – Brownsville Ship Channel

Segment 2494: Brownsville Ship Channel

Segment Description – The Brownsville Ship Channel (BSC) extends from the Port of Brownsville to the Laguna Madre. Its watershed, combined with that of the Segment 2493, South Bay, and Segment 2494A, the Port Isabel Fishing Harbor is 225,554 acres. The ship channel is part of the Port of Brownsville, a major center of industrial development with over 230 companies doing business there.

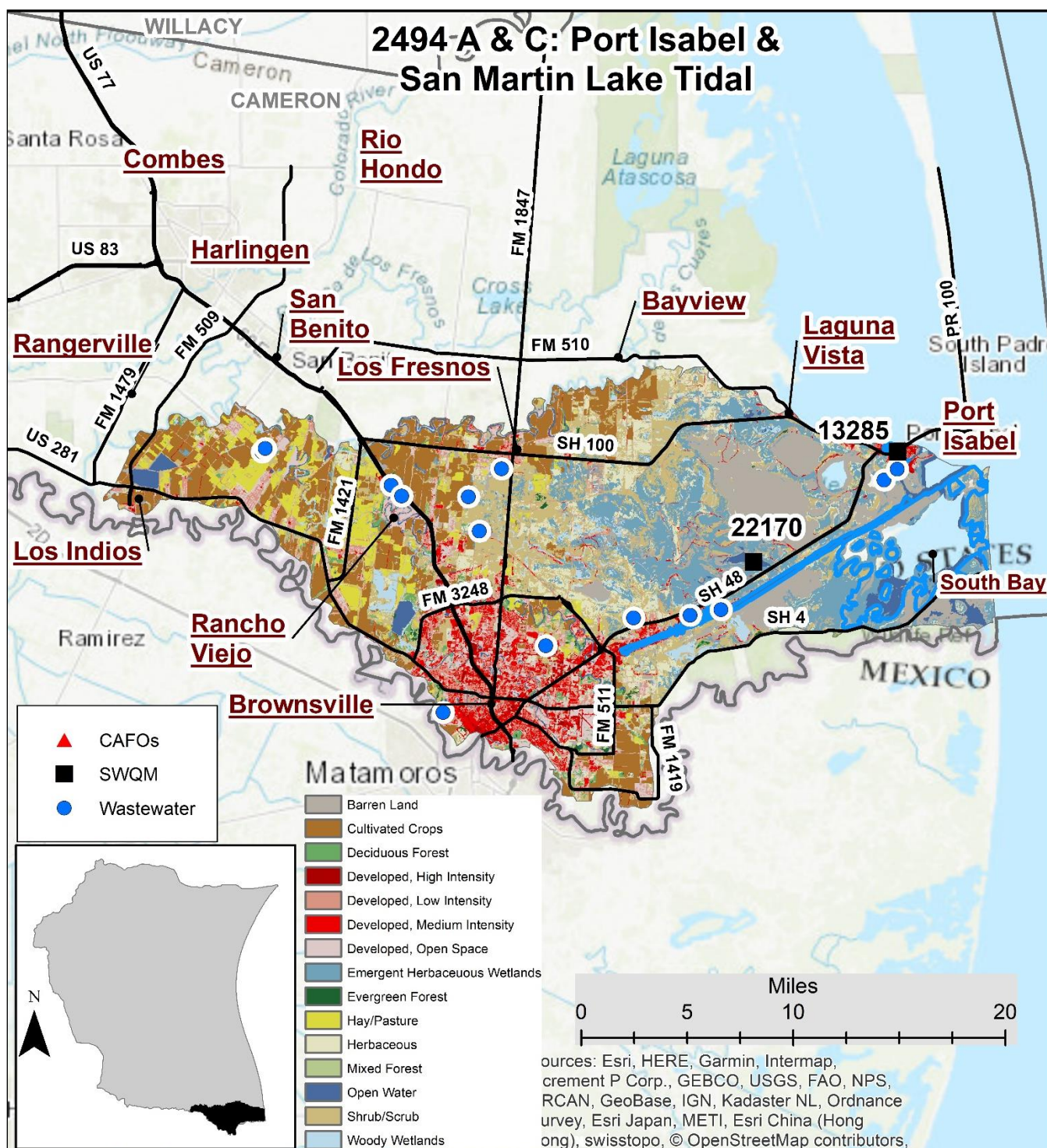
Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Brownsville Ship Channel	13460	01	Near Channel Marker 35/Black Buoy	TCEQ Region 15	Routine Quarterly
	14875	01	At entrance to San Martin Lake	TCEQ Region 15	Routine Quarterly
	14871	01	Mid Channel 595 m east of SH 48 at Foust Road	TCEQ Region 15	Routine Quarterly

Water Quality - The segment is listed as having a water quality **concern** for **depressed dissolved oxygen** (grab) in the 2020 IR Assessment.

Special Studies – The Brownsville Ship Channel was included in the Lower Laguna Madre/Brownsville Ship Channel Watershed Characterization that was conducted by a collaboration of the University of Texas – Rio Grande Valley Brownsville, TWRI, TCEQ, and TIAER in 2018. The report discusses water quality in San Martin Lake, Brownsville Ship Channel, and the Lower Laguna Madre. The full report can be found at the following website: https://arroyocolorado.org/media/zqjpi1e0/llm_wc_102618_forstakeholderreview.pdf



Brownsville Ship Channel



Segment 2494A - Port Isabel and Segment 2494C - San Martin Lake Tidal

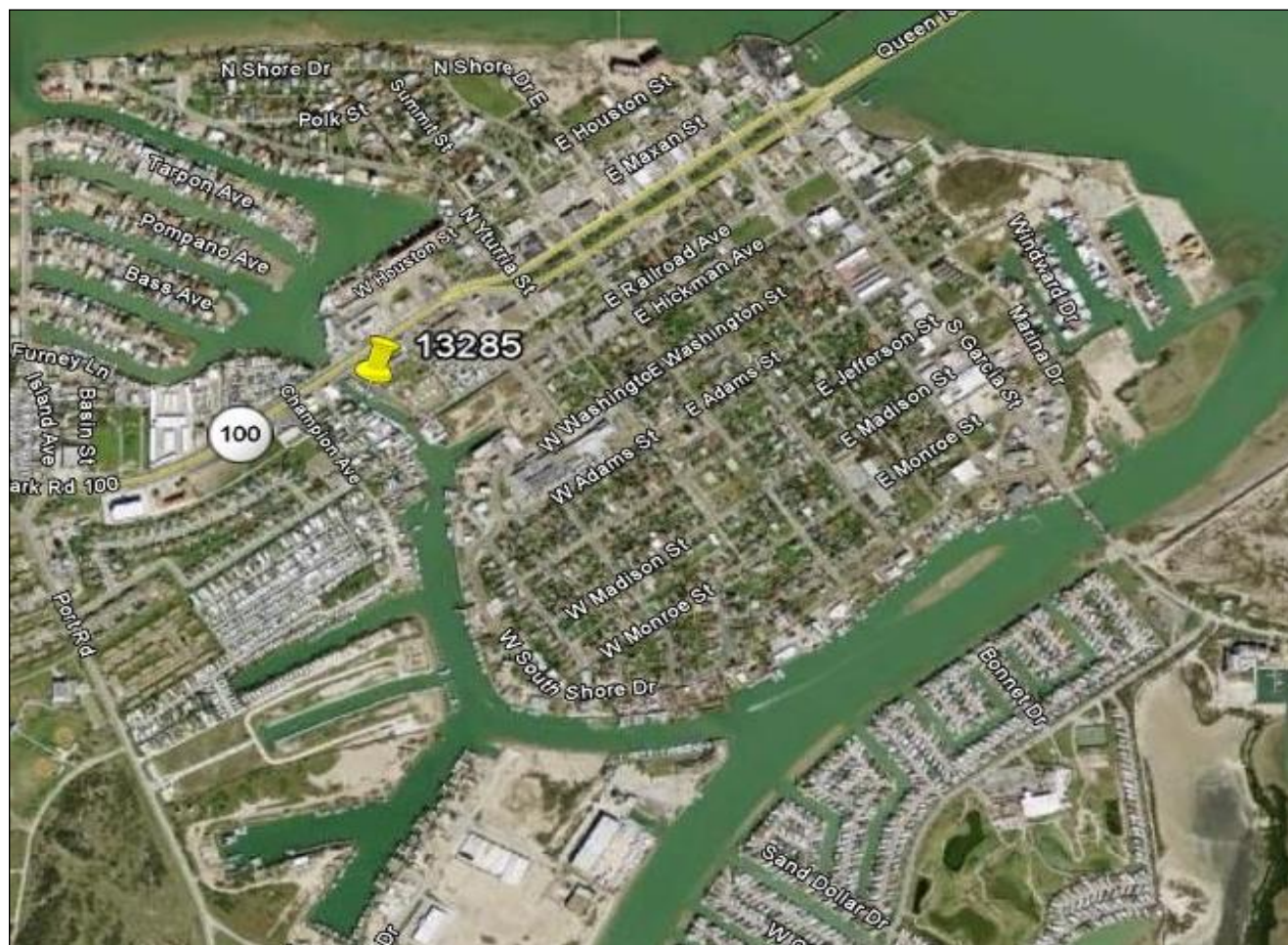
Segment 2494A: Port Isabel Fishing Harbor

Segment Description – The Port Isabel Fishing Harbor is located within the City of Port Isabel in Cameron County. It is connected to the Laguna Madre to the north and to the Brownsville Ship Channel to the south. Its watershed, combined with that of the Segment 2493, South Bay, and Segment 2494, the Brownsville Ship Channel is 225,554 acres. The properties along the canals are a combination of businesses and residential properties.

Segment Name	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Port Isabel Fishing Harbor	13285	01	Approximately 60 m downstream of SH 100 Bridge	TCEQ Region 15	Routine Quarterly

Water Quality – The water body is listed as being **impaired** for **bacteria** (enterococcus) for primary contact recreation since the 2010 IR Assessment; the impairment carries forward in the 2020 IR Assessment. The source of the bacteria is thought to be from nonpoint source runoff since there are no permitted discharges into the harbor. Due to the eight-hour holding time and because there are no local labs accredited for enterococcus analysis, bacteria sample collection has been suspended.

Special Studies – Port Isabel Fishing Harbor was included in the Lower Laguna Madre/Brownsville Ship Channel Watershed Characterization that was conducted by a collaboration of the University of Texas – Rio Grande Valley Brownsville, TWRI, TCEQ, and TIAER in 2018. The report discusses water quality in San Martin Lake, Brownsville Ship Channel, and the Lower Laguna Madre. The full report can be found at the following website: https://arroyocolorado.org/media/zqjpi1e0/llm_wc_102618_forstakeholderreview.pdf



Segment 2494A - Port Isabel Fishing Harbor

Segment 2494B: San Martin Lake Tidal

Segment Description – San Martin Lake is from the confluence with the Brownsville Ship Channel upstream to the confluence with drainage ditches flowing into San Martin Lake System.

	Station ID	AU	Site Description	Monitoring Entity	Sampling Type
Gulf of Mexico	22170	01	2.04 km east and 0.80 km north of the HWY 48 Bridge northeast of Brownsville	NRA	Routine Quarterly

Water Quality – San Martin Lake is a new sampling location for FY 2020 and does not yet have enough data for an assessment.

Special Studies – San Martin Lake was included in the Lower Laguna Madre/Brownsville Ship Channel Watershed Characterization that was conducted by a collaboration of the University of Texas – Rio Grande Valley Brownsville, TWRI, TCEQ, and TIAER in 2018. The report discusses water quality in San Martin Lake System, Brownsville Ship Channel, and the Lower Laguna Madre. The full report can be found at the following website: https://arroyocolorado.org/media/zqjpi1e0/Im_wc_102618_forstakeholderreview.pdf



Station 22170 – San Martin Lake Tidal

List of Impairments and Concerns in the Bays and Estuaries

Segment Name	AU	Description	Impairments	Concerns
2485 Oso Bay	01	Upper Bay (Holly Road to CR 24)	none	Chlorophyll-a
	02	Middle Bay (SH 358 to Holly Road)	DO	Bacteria, Chlorophyll-a, Total Phosphorus
	03	Lower portion of bay (Ocean Drive to State Park Road 22)	Bacteria	Chlorophyll-a, Total Phosphorus
2485A Oso Creek	01	Entire segment	Bacteria	Chlorophyll-a, Nitrate, Total Phosphorus
2485B Tributary of Oso Creek	01	Entire segment	none	Total Phosphorus
2485D West Oso Creek	01	Entire segment	none	Total Phosphorus
2491 Laguna Madre	01	Upper portion north of the Arroyo Colorado confluence	DO	Chlorophyll-a
	02	Area adjacent to the Arroyo Colorado confluence	Bacteria, DO	Chlorophyll-a, Ammonia, Nitrate
	03	Lower portion south of the Arroyo Colorado confluence	none	DO, bacteria
2491B North Floodway	01	Entire Segment	none	Chlorophyll-a, Nitrate, Bacteria
2491C_01 Raymondville Drain	01	Entire Segment	none	none
2491C_03 Hidalgo Drain	01	Entire Segment	none	none
2492 Baffin Bay / Alazan Bay / Cayo Del Grullo / Laguna Salada	01	Entire Segment	none	Chlorophyll-a
2492A San Fernando Creek	01	Entire segment	Bacteria	Chlorophyll-a, Nitrate, Total Phosphorus
2492B Los Olmos Creek Tidal	01	Entire segment	none	none
2493 South Bay	01	Entire segment	none	none
2494 Brownsville Ship Channel	01	Entire segment	none	DO
2494A Port Isabel Fishing Harbor	01	Entire segment	Bacteria	None

Segment 2501: Gulf of Mexico

Segment Description – The Gulf of Mexico consists of 10 assessment units from Sabine Pass on the northern portion of the coast to the southern end of the coast near Port Isabel.

Segment Name	Station Id	Description	Monitoring Entity	Conventional Bacteria, Field	Other
2501 Gulf of Mexico	13468	Gulf of Mexico at Aransas Pass 165 m south and 413 m east of tip of south jetty near marker R-7	TCEQ Region 14	Quarterly	
	13470	Gulf of Mexico at Port Isabel 1.18 km east and 35 m south of Brazos Santiago Pass north jetty	TCEQ Region 15	Quarterly	

Water Quality – The Gulf of Mexico has water quality impairments for **mercury in edible fish tissue**.



Segment 2501 AU_06 – Gulf of Mexico near Port Aransas

List of Impairments and Concerns in the Gulf of Mexico

Segment Name	AU	Description	Impairments	Concerns
2501 Port Aransas Area	06	Port Aransas Area	Mercury in edible tissue	none
2501 Port Isabel Area	10	Port Isabel Area	Mercury in edible tissue	none

STAKEHOLDER PARTICIPATION and PUBLIC OUTREACH

Stakeholder Participation

CRP depends on public involvement and input from stakeholders to assist in understanding the needs of the basins and the areas of concern. The NRA steering committee serves as the focus for public input and assists with:

- Creation of specific achievable water quality objectives and basin priorities
- Review and development of work plans and allocation of resources
- Development and review of major reports
- Establishing monitoring priorities and developing monitoring plans
- Improving awareness of water quality, water resources, and pollutant source issues
- Increasing opportunities for citizens to identify pressing issues, concerns, and contributing ideas to the CRP process
- Expanding the public's role in water quality management issues

The steering committee includes stakeholder volunteers from across NRA's area of responsibility, representing:

- Private citizens
- Fee-payers (identified in Texas Water Code 26.0135(h))
- Political subdivisions (including local, regional, and state officials)
- TSSWCB
- Other appropriate state agencies including: TPWD, Texas Water Development Board, TxGLO, DSHS, Texas Department of Agriculture, RRC, and Texas Department of Transportation
- Other entities interested in water quality matters including: TCEQ regional staff, business and industry, agriculture, environmental and other public interest groups

NRA encourages stakeholder participation to provide suggestions for additional monitoring, special studies, outreach opportunities, and to be a voice for local concerns. For more information about stakeholder participation, the steering committee process, or how to become a steering committee member, visit our web page at [Stakeholder Engagement & Public Outreach - Clean Rivers Program - Nueces River Authority \(nracleanriversprogram.org\)](http://StakeholderEngagement&PublicOutreach-CleanRiversProgram-NuecesRiverAuthority(nracleanriversprogram.org)) or contact NRA using the contact information at the end of this report.

Public Outreach and Education

NRA participates in numerous CRP supported activities to help educate students and adults on pollution sources, the importance of keeping our waters clean, and what they can do to help protect our rivers, lakes, and bays.

Watershed Model Demonstrations

NRA has two watershed models of the Nueces River Basin, and a third model is owned by the City of Corpus Christi. NRA also has a model of the Arroyo Colorado Watershed, which is on loan to the Arroyo Colorado Watershed Protection Partnership, and a second one was completed in summer 2010. In addition, an Oso Creek Watershed Model was built in late 2021. These models are taken to classrooms and outreach events and are used to demonstrate point and nonpoint source pollution. Primarily geared for 5th and 7th graders, participants of all ages enjoy participating in the demonstrations. Food coloring is dripped onto the model to simulate oil leaks, fertilized lawns, illegal dump sites, etc. water is then squirted onto the model using spray bottles to simulate rain. Being an actual scale model of the basin, students locate where they live in the basin, and can see how pollution upstream can reach their communities and how pollution in their communities affect those downstream. This education program reaches about 13,000 students each year.



Other Education Tools

NRA also used an **Aquifer model** in school presentations to show demonstrate how water recharges a sand or karst aquifer, how wells tap an aquifer and how a plume of pollution can move through the ground and impact water quality coming from a water supply well. Students learn about groundwater aquifers, recharge, and personal responsibility.

We have two **Rainfall-Runoff-Recharge models** to illustrate the role of land cover on water quality and quantity. These are delivered mostly at County Ag Fairs and Stock shows and support the 4th grade study of erosion and weathering. Different types of vegetative cover are demonstrated along with bare ground and impervious cover. In the demonstration, Eastern Gama, a native riparian grass, generates 100% clear ground water with no run-off.

Our **Red Rain Barn** is a miniature barn is equipped with gutters and a rain-water collection system calibrated to show how much water can be collected by a simple system. It is an engaging tool delivered at County Fairs and festivals.



Up2U Campaign

NRA, with guidance from local partners, designed and launched print and media components of the Up2U CRP in 2004 in the headwaters of the Nueces River Basin. It was expanded to include the coastal area in 2009. Partners now include the City of Corpus Christi, the City of Port Aransas, the City of Rockport, CBBEP, Friends of the Frio, Nueces County, Port Aransas Chamber of Commerce, and TCEQ. The cornerstone of the campaign is a logo emblazoned mesh litter bag which is both a litter prevention tool and an advertising tool. These bags are now being distributed to beach goers, boaters, students, and litter prevention advocates from the Nueces headwaters to the coast. NRA received the Governor's 2008 Environmental Excellence Award for Education for this project.



Riparian Network

NRA facilitates riparian landowner education focusing on how riparian areas work and what activities can hinder this function. Often misunderstood, the basic riparian dynamics are illustrated via multimedia lessons delivered on www.remarkableriparian.org. This program also resulted in the publication of *Your Remarkable Riparian Field Guide*, a field guide to riparian plants within the Nueces River Basin (now on its third edition), and the companion booklet *Managing Riparian Areas*. NRA works to integrate riparian understanding into all stakeholder processes associated with WPP's, RUAA's, and other special studies. Copies are available for purchase from the website.



CONTACT INFORMATION

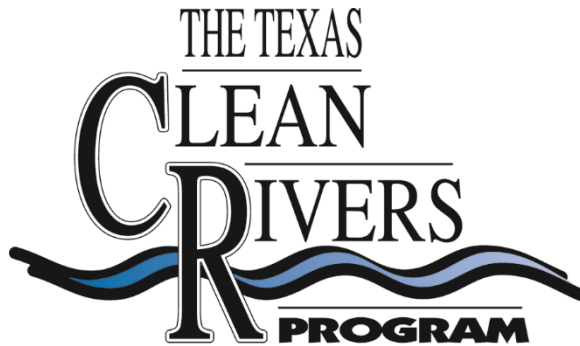
For more information on CRP, other activities of NRA, or to obtain additional copies of this report, contact:

General office
539 HWY S US-83
Uvalde, TX 78802-0349
Tel: (830) 278-6810
Fax: (830) 278-2025

Corpus Christi Office
602 N. Staples Street, Suite 280
Corpus Christi, TX 78401
Tel: (361) 653-2110
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Sam Sugarek, Director of Water Quality Programs, Corpus Christi Office: ssugarek@nueces-ra.org
Julie Lewey, Resource Protection and Education Director, General Office: jlewey@nueces-ra.org

NRA would like to recognize and thank the CRP for their support.



Appendix A
Wastewater Discharge Permit Information

WQ0003596-000 – Taiwan Shrimp Village Association and Arroyo Aquaculture Association: 100,000,000 gpd
 WQ0004792-000 – Military Highway WSC: 1,440,000 gpd via Resaca Del Rancho Viejo
 WQ0005137-000 – La Paloma Energy Center LLC: 1,634,000 gpd
 WQ0005226-000 – Denali Water Solutions, LLC: land application of WWTP and WTP sludge on 909 acres
 WQ0010475-002 – City of Rio Hondo: 400,000 gpd
 WQ0013462-008 – Military Highway WSC Lago: 510,000 gpd via Resaca Del Rancho Viejo
 WQ0014558-001 – East Rio Hondo WSC: 180,000 gpd
 WQ0015265-001 – City of San Benito

2201A Harding Ranch Drainage Ditch Tributary

WQ0005179-000 – Denali Water Solutions LLC: sludge on 1,048 acres

2201B Unnamed Drainage Ditch Tributary in Cameron Co. Drainage District #3

WQ0005025-000 – Military Highway WSC: 1,440,000 gpd of reverse osmosis reject water

2202 Arroyo Colorado Above Tidal

WQ0004051-000 – Frontera Generation Ltd.: 1,400,000 gpd via Main Floodway
 WQ0004257-000 – Watermill Express: 1,000 gpd via subsurface drainfield
 WQ0004754-000 – Military Highway WSC Progreso WTP: 520,000 gpd to Llano Grande Lake
 WQ0004782-000 – North Alamo WSC: 2,000,000 gpd to the North Floodway
 WQ0004789-000 – North Alamo WSC: 2,000,000 gpd to the North Floodway
 WQ0004861-000 – Denali Water: WWTF and WTP sludge
 WQ0004924-000 – Denali Water: WWTF and WTP sludge
 WQ0005186-000 – Denali Water: WWTF and WTP sludge
 WQ0010347-001 – City of Mercedes: 5,000,000 gpd via Arroyo Anacuitas
 WQ0010484-001 – City of Mission: 9,000,000 gpd
 WQ0010490-003 – City of Harlingen Water Works Facility #2: 10,000,000 gpd
 WQ0010504-001 – City of Donna: 2,300,000 gpd to the Llano Grande Lake
 WQ0010596-001 – City of Pharr: 5,000,000 gpd via Main Floodway
 WQ0010619-005 – City of Weslaco South Plant: 2,500,000 gpd via South Donna Drain
 WQ0010633-003 – City of McAllen Facility No. 2: 10,000,000 gpd via unnamed ditch
 WQ0010697-001 – City of La Feria: 500,000 gpd via ditch
 WQ0010697-002 – City of La Feria: 1,250,000 gpd via ditch
 WQ0010972-002 – Palm Valley Estates: 280,000 gpd via irrigation
 WQ0011080-001 – City of Hidalgo: 2,700,000 gpd via Hidalgo County drainage ditch
 WQ0011512-001 – City of San Juan: 4,000,000 gpd via Outfall 001 and 200,000 gpd via Outfall 002 to Main Floodway
 WQ0011628-001 – Winter Garden Park Corporation: 11,000 gpd into Reba Bass Lake
 WQ0013462-001 – Military Highway WSC Progreso: 750,000 gpd
 WQ0013462-002 – Military Highway WSC La Paloma: 210,000 gpd via irrigation
 WQ0013462-003 – Military Highway WSC Santa Maria: 230,000 gpd via irrigation
 WQ0013462-004 – Military Highway WSC San Pedro: 160,000 gpd via irrigation
 WQ0013462-005 – Military Highway WSC Los Indios: 135,000 gpd via irrigation
 WQ0013462-006 – Military Highway WSC South Alamo: 510,000 gpd
 WQ0013523-007 – La Joya ISD: 12,570 gpd via subsurface low pressure dosed drainfields
 WQ0013523-009 – La Joya ISD: 12,500 gpd via subsurface low pressure dosed drainfields
 WQ0013523-010 – La Joya ISD: 20,000 gpd via subsurface low pressure dosed drainfields
 WQ0013523-012 – La Joya ISD: 9,000 gpd via subsurface low pressure dosing drainfields
 WQ0013523-013 – La Joya ISD: 35,000 gpd via subsurface low pressure dosed drainfields
 WQ0013523-016 – La Joya ISD: 12,000 gpd via subsurface low pressure dosing drainfields
 WQ0013633-001 – City of Alamo: 2,000,000 gpd via Hidalgo County drainage ditch
 WQ0013680-002 – Donna ISD Munoz Elementary: 2,500 gpd via subsurface drainfields
 WQ0013680-003 – Donna ISD Garza Elementary: 12,500 gpd via subsurface drainfields
 WQ0014178-001 – US Fish and Wildlife Service Santa Ana National Wildlife Refuge: 1,500 gpd via evaporation
 WQ0014415-001 – Agua Special Utility District: 1,400,000 gpd
 WQ0014415-003 – Agua Special Utility District: 7,550,000 gpd (pending)
 WQ0015265-001 – City of San Benito: 3,750,000 gpd via Arroyo Colorado

2202A Donna Reservoir

WQ0015513-001 – North Alamo WSC: 700,000 gpd (pending)

2204 Petronila Creek Above Tidal

WQ0002888-000 – US Ecology Texas: storm water via Nueces County drainage ditch
WQ0010140-001 – City of Agua Dulce: 160,000 gpd via Agua Dulce Creek
WQ0010592-001 – City of Orange Grove: 200,000 gpd via Agua Dulce Creek
WQ0011541-001 – City of Driscoll: 100,000 gpd
WQ0011583-002 – Nueces County WCID #5: 8,000,000 gpd via Banquete Creek
WQ0011754-001 – Bishop Consolidated ISD: 8,000 gpd via drainage ditch
WQ0014802-001 – Geo Group: 150,000 gpd via drainage ditch
WQ0014981-002 – KB Foundation of Texas: 9,000 gpd

2485 Oso Bay

WQ0001490-000 – AEP Texas Central Barney M. Davis Plant: 540,000,000 gpd
WQ0010401-004 – City of Corpus Christi Oso Facility: 16,200,000 gpd

2485A Oso Creek

WQ0002075-000 – Equistar Chemicals LP – Corpus Christi Plant: storm water (2 outfalls; 1 outfall in 2484)
WQ0010261-001 – City of Robstown: 3,000,000 gpd via unnamed ditch
WQ0010401-003 – City of Corpus Christi – Greenwood Plant: 16,000,000 gpd via La Volla Creek
WQ0011134-002 – Corpus Christi Peoples Baptist Church: 20,000 gpd directly to Oso Creek.
WQ0014228-001 – MPB Properties, Cuddihy Airfield: 60,000 gpd

2491 Laguna Madre

WQ0001752-000 – Rio Grande Valley Sugar Growers: 289,000 gpd via North Floodway Pilot Channel
WQ0002525-000 – Azteca Milling: 300,000 gpd via irrigation
WQ0002803-000 – Value Frozen Foods: 6.9-acre feet/acre/year via irrigation
WQ0003946-000 – Fresh Aquatics, LLC: 8,000,000 gpd via tidal ditch
WQ0004040-000 – Calpine Construction Finance: 1,110,000 gpd via North Floodway Pilot Channel
WQ0004126-000 – Texas Pack, Inc: 150,000 gpd via outfall 001
WQ0004138-000 – Calpine Hidalgo Energy Center: 920,000 gpd via North Floodway Pilot Channel
WQ0004480-000 – North Alamo WSC: 1,000,000 gpd via East Main Drain
WQ0004758-000 – P.E.N. Joint Tenants and North Cameron Regional WSC: 2,000,000 gpd: via North Floodway
WQ0004782-000 – North Alamo WSC: 2,000,000 gpd via Donna Drain
WQ0004789-000 – North Alamo WSC: 2,000,000 gpd via Donna
WQ0004915-000 – North Alamo WSC: 1,000,000 gpd
WQ0005159-000 – Denali Water Solutions LLC: sludge
WQ0010330-001 – City of Santa Rosa: 390,000 gpd via North Floodway
WQ0010365-001 – City of Raymondville: 1,500,000 gpd via Delta Irrigation Ditch
WQ0010401-008 – City of Corpus Christi Laguna Madre: 3,000,000 gpd via pipeline
WQ0010401-009 – City of Corpus Christi Whitecap: 2,500,000 gpd
WQ0010503-002 – City of Edinburg: 5,900,000 gpd via North Floodway
WQ0010619-001 – City of Weslaco: 250,000 gpd via North Floodway
WQ0010619-003 – City of Weslaco: 3,000,000 gpd via North Floodway
WQ0010633-004 – City of McAllen: 15,000,000 gpd via North Floodway
WQ0010682-003 – Willacy Co. Navigation District: 221,000 gpd via Four Mile Slough
WQ0010757-001 – Laguna Madre Water District Isla Blanca Plant: 2,600,000 gpd via irrigation
WQ0010799-001 – Jim Hogg County WCID No. 2 (Hebbronville Plant): 796,000 gpd: via drainage ditch
WQ0010973-002 – County of Hidalgo Delta Lake Park: 5,000 gpd via Willacy WCID Ditch No. 1 (pending)
WQ0011210-001 – City of Lyford: 270,000 gpd via North Floodway
WQ0011510-002 – City of Elsa: 800,000 gpd via North Floodway

2491 Laguna Madre (cont.)

WQ0012321-001 – U.S. Department of Homeland Security Immigration and Customs Enforcement: 160,000 gpd via Cameron County WCID No. 11 Drainage Ditch
WQ0013344-002 – US Department of the Interior: 25,000 gpd via wetland
WQ0013523-014 – La Joya ISD: 13,500 gpd
WQ0013742-001 – Sebastian MUD: 225,000 gpd via North Floodway
WQ0013747-001 – North Alamo WSC: 100,000 gpd via drainage ditches
WQ0013747-002 – North Alamo WSC: 210,000 gpd via surface irrigation
WQ0013747-003 – North Alamo WSC: 122,000 gpd via surface irrigation
WQ0013747-004 – North Alamo WSC: 300,000 gpd via drainage
WQ0013772-001 – Laguna Madre Water District Andy Bowie Park Plant: 1,500,000 gpd via wetland
WQ0013924-001 – Bruni Rural WSC: 62,500 gpd
WQ0014069-001 – Laguna Madre Water District Laguna WWTP: 650,000 gpd via City of Port Isabel Reservoir

WQ0014076-001 – City of San Perlita: 100,000 gpd via evaporation and percolation
WQ0014698-001 – TxDOT: 13,000 gpd via drainage ditches
WQ0014781-002 – City of La Villa: 780,000 gpd via North Floodway
WQ0014919-001 – City of Edcouch: 310,000 gpd via North Floodway Pilot Channel
WQ0014950-001 – Hidalgo County MUD #1: 950,000 gpd
WQ0015163-002 – North Alamo: 500,000 gpd
WQ0015513-001 – North Alamo: 700,000 gpd via North Floodway

2492 Baffin Bay / Alazan Bay / Cayo del Grullo / Laguna Salada

WQ0010067-002 – Duval County Conservation and Reclamation District: 40,000 gpd via Los Olmos Creek
WQ0010084-001 – Utility Board of Falfurrias: 460,000 gpd via surface irrigation
WQ0010253-001 – City of Premont: 350,000 gpd via surface irrigation
WQ0011515-001 – Riviera ISD: 16,000 gpd via surface irrigation
WQ0013361-002 – Kenedy County Sarita Sewer Service and WSC: 44,000 gpd via evaporation
WQ0013374-001 – Kleberg County Kaufer Hubert Memorial Park: 33,000 gpd via Cayo Del Grullo.
WQ0013374-002 – Riviera WCID: 60,000 gpd via Los Olmos Creek
WQ0013374-003 – County of Kleberg Ricardo WWTP: 48,500 gpd via Jaboncillos Creek
WQ0014808-001 – King Ranch Inc.: 25,500 gpd via evaporation

2492A San Fernando Creek

WQ0000579-000 – Ticona Polymers, Inc. (Celanese): storm water
WQ0004819-000 – SNBL USA Ltd.: 35,000 gpd via evaporation
WQ0010067-001 – Duval County Conservation and Reclamation District: 250,000 gpd via Santa Gertrudis Creek
WQ0010270-001 – San Diego MUD: 750,000 gpd via San Diego Creek
WQ0010427-001 – City of Bishop: 320,000 gpd via Carreta Creek
WQ0010536-002 – City of Alice: 2,600,000 gpd via Lattas Creek
WQ0010536-004 – City of Alice: 2,020,000 gpd and irrigation
WQ0010696-001 – City of Kingsville – Plant 1: 3,000,000 gpd via Tranquitas Creek
WQ0010696-004 – City of Kingsville: 1,000,000 gpd via Santa Gertrudis Creek and irrigation
WQ0012035-001 – US Department of the Navy (Kingsville NAS: 400,000 gpd

2494 Brownsville Ship Channel

WQ0002597-000 – Brownsville Navigation District: 100,000 gpd via evaporation
WQ0002817-000 – Brownsville Navigation District Fishing Harbor: 250,000 gpd
WQ0003936-000 – Valley MUD No. 2: 540,000 gpd via San Martin Lake
WQ0004126-000 – Texas Pack, Inc: 150,000 gpd via irrigation
WQ0004541-000 – Southmost Regional Water Authority and Brownsville Public Utilities Board: 4,000,000 gpd via San Martin Lake
WQ0005005-000 – Tenaska Brownsville Partners: storm water
WQ0005209-000 – Maverick Fuel Oil Terminal: storm water (pending)
WQ0010332-001 – Brownsville Navigation District Northside Plant: 98,000 gpd via drainage ditch to BSC
WQ0010350-001 – Laguna Madre Water District Port Isabel Plant: 1,100,000 gpd via Vadia Ancha and monofill sludge on permittee property
WQ0010397-005 – Brownsville Public Utilities N. Robindale Plant: 14,500,000 gpd via San Martin Lake
WQ0010590-002 – City of Los Fresnos: 1,000,000 gpd via San Martin Lake
WQ0015162-001 – East Rio Hondo Water Supply: 100,000 gpd
WQ0011348-001 – Valley MUD No. 2: 400,000 gpd via San Martin Lake
WQ0013817-001 – Olmito WSC (Olmito Plant): 750,000 gpd via San Martin Lake
WQ0014355-001 – Brownsville Navigation District: 100,000 gpd via San Martin Lake

