

2019 Program Update

San Antonio-Nueces Coastal Basin

Nueces River Basin Nueces-Rio Grande Coastal Basin Bays and Estuaries



This document was prepaired in cooperation with the Texas Commission on Environmental Quality under authorization of the Clean Rivers Act

Nueces River Authority

Introduction

In 1991, the Texas Legislature passed the Texas Clean Rivers Act (Senate Bill 818) requiring basin-wide water quality assessments to be conducted for each river basin in Texas. The Texas Commission on Environmental Quality (TCEQ) implements the Clean Rivers Program (CRP) by contracting with fifteen partner agencies to collect data from over 1,800 water monitoring sites in the 25 river and coastal basins throughout the state. Each river or coastal basin is assigned to one of the partner agencies.

The Program Goal of the CRP is to maintain and improve the quality of water within each river basin in Texas through an ongoing partnership involving the TCEQ, river authorities, other agencies, regional entities, local governments, industry and citizens. Nueces River Authority (NRA), working closely with TCEQ, conducts surface water quality monitoring to identify and evaluate surface water quality issues, establish priorities for corrective action, works to implement those actions, and adapts to changing priorities. Surface water quality data are used in the development of Texas Surface Water Quality Standards, for modeling water quality trends, providing baseline data for water quality projects, and to help establish wastewater permit limits. Objectives are to:

- Provide quality assured data to TCEQ for use in water quality decision-making
- Identify and evaluate water quality issues
- Promote cooperative watershed planning
- Inform and engage stakeholders
- Maintain efficient use of public funds
- Adapt to emerging water quality issues

Under CRP, the 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 30,500 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.

In 2018, NRA conducted routine quarterly water quality monitoring at 33 river and 10 coastal stations on a quarterly basis for conventional, bacteria, flow (where applicable), and field parameters. NRA also conducted 24-hour dissolved oxygen (DO) monitoring at five sites. All monitoring procedures and methods followed the guidelines prescribed in the NRA QAPP, the TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods (RG-415) and the TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416).

Water quality data collected under approved QAPPs and included in the Surface Water Quality Monitoring Information Systems (SWQMIS) database are used for water quality assessments. The *Texas Integrated Report of Surface Water Quality* is prepared and submitted to the U.S. Environmental Protection Agency (EPA) every two years in even numbered years, as required by law.

NRA provides access to quality assured surface water quality data on NRA's website. Information on all parameters tested for is available using the 5-digit Station Identification (Station ID) numbers provided in this document. <u>https://www.nueces-ra.org/CP/CRP/SWQM/index.php</u>

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Basin 20 – San Antonio-Nueces Coastal Basin

The San Antonio-Nueces Coastal Basin covers approximately 3,100 square miles, draining to Copano and St. Charles Bays. The basin is largely rural, with the dominant industries being crop farming and cattle rearing. Monitoring sites in Basin 20 are located on the tidal and above tidal portions of the Mission and Aransas rivers and for Aransas and Poesta creeks.



Station ID	Sampling location	Sampling Type
12943	Mission River Tidal at FM 2678	Quarterly
12944	Mission River at US 77	Quarterly
12947	Aransas River Tidal at FM 629	Quarterly
12948	Aransas River Tidal at US 77	Quarterly
12952	Aransas River East of Skidmore	Quarterly
12937	Poesta Creek at FM 202	Quarterly

Basin 20 - Concerns and Impairments

Waterbody	Concerns	Impairments
Mission River Tidal	None	Bacteria
Mission River Above Tidal	None	None
Aransas River Tidal	None	Bacteria
Aransas River Above Tidal	Nitrate, Total Phosphorus	Bacteria
Aransas Creek	None	Bacteria
Poesta Creek	Low Dissolved Oxygen (DO)	Bacteria

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Two Total Maximum Daily Loads (TMDLs) for Indicator Bacteria in Aransas River Above Tidal (Segment 2004) and Poesta Creek (Segment 2004B)

High concentrations of bacteria are often found in the tidal portions of the Mission and Aransas rivers and Poesta Creek. Elevated concentrations of bacteria may indicate a health risk to people who swim or wade in the rivers - activities called "contact recreation". A TMDL titled *Two Total Maximum Daily Loads for Indicator Bacteria in the Tidal Segments of the Mission and Aransas Rivers: Segments 2001 and 2003* and the associated Implementation Plan (IP) was approved by the EPA in 2017. An addendum to the study was conducted on the Aransas River Above Tidal and Poesta Creek (Segments 2004 and 2004B). The Technical Report, which was completed by Texas Water Resources Institute (TWRI), is available online at:

https://www.tceq.texas.gov/assets/public/waterquality/tmdl/76copano/76-aransas-poesta-tsd.pdf



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Basin 21 - Nueces River Basin

The Nueces River winds 315 miles from its source in the Edwards Plateau near Rock Springs (elevation 2,402) through the thorny brush country of the South Texas Plains to the river's end in Nueces Bay, located near Corpus Christi. The total drainage area covers approximately 17,000 square miles, encompassing all or part of 23 counties in South-Central Texas and includes the Frio River and its tributaries and the Atascosa River.



Dissolved Oxygen Monitoring

NRA routinely collects DO data on waterbodies during routine monitoring events. In some cases, waterbodies are found to have low DO concentrations due to reasons including nutrient enrichment, insufficient circulation, and seasonal influences (warm water holds less oxygen). In segments where there are impairments for DO, NRA conducts diel monitoring where DO is measured every 30 minutes in a 24 hour period. NRA conducts diel monitoring at 4 sites in Basin 21. Two sites are located on the Atascosa River (In Pleasanton and FM-541 in McCoy) and the other two sites are located on the Nueces River at FM-624 and FM-190 in Asherton.

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Station ID	Sampling location	Sampling Type
21815	Nueces River at Saltwater Barrier	Quarterly
20936	Nueces River at Hazel Bazemore Park	Quarterly
12964	Nueces River at FM 666	Quarterly
12965	Nueces River at FM 359	Quarterly
12967	Lake Corpus Christi near Dam	Quarterly
17384	Lake Corpus Christi near Hideaway Hill	Quarterly
17648	Lake Corpus Christi at CR 151	Quarterly
12972	Nueces River at FM 1042	Quarterly
12973	Nueces River at SH 16	Quarterly
12974	Nueces River at FM 624	24-hour DO
12976	Nueces River at FM 190 in Asherton	24-hour DO
12977	Frio River at SH 72 in Three Rivers	Quarterly
12979	Nueces River at US 281	Quarterly
20701	Nueces River at Airport Road Boat Ramp	Quarterly
12980	Atascosa River at FM 99	Quarterly+metals
12981	Atascosa River at RR crossing in Pleasanton	24-hour DO
20764	Atascosa River at FM 541 in McCoy	Quarterly+24-hour DO
12983	San Miguel Creek at SH 16	Quarterly
18418	Leona River at FM 140	Quarterly
12993	Sabinal River at US 90	Quarterly
16704	Nueces River at SH 55	Quarterly
18408	Hondo Creek at SH 173	Quarterly
13019	Choke Canyon Reservoir near Dam	Quarterly
13020	Choke Canyon Reservoir Mid-Lake	Quarterly
17389	Choke Canyon Reservoir at FM 99	Quarterly+metals
13023	Frio River at SH 16 in Tilden	Quarterly
18373	Frio River at SH 97 near Fowlerton	Quarterly

Basin 21 - Concerns and Impairments

Waterbody	Concerns	Impairments
Nueces River Tidal	Chlorophyll-a	None
Nueces River Below Lake Corpus Christi	Chlorophyll-a	Total Dissolved Solids (TDS)
Lake Corpus Christi	None	TDS
Nueces River Above Frio River	Low DO, Chlorophyll- <i>a,</i> Nitrate, Total Phosphorus, Impaired Fish Community, Impaired Macrobenthic Community	None
Nueces River Above Holland Dam	Low DO, Chlorophyll-a	Low DO
Nueces River / Lower Frio River	Chlorophyll-a	TDS, bacteria
Atascosa River	Chlorophyll- <i>a,</i> Nitrate, Total Phosphorus, Impaired Habitat	Low DO, bacteria, impaired macrobenthic community, impaired fish community

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Waterbody	Concerns	Impairment
San Miguel Creek	Low DO	Bacteria
Leona River	Nitrate	Bacteria
Lower Sabinal River	Nitrate	None
Upper Sabinal River	None	None
Upper Nueces River	None	None
Upper Frio River	Impaired habitat, Impaired Fish Community	Impaired Macrobenthic Community, Impaired Fish Community
Hondo Creek	Nitrate	Chloride
Seco Creek	None	None
Choke Canyon Reservoir	Nutrients – excessive algal growth	None
Frio River Above Choke Canyon Reservoir	Low DO, Chlorophyll- <i>a,</i> Nitrate	Bacteria, Chloride, TDS



Nueces River Watershed Partnership – Implementation of the Lower Nueces River Watershed Protection Plan (WPP)

The Lower Nueces River (Segment 2102) below Lake Corpus Christi flows 39 miles from Wesley Seale Dam at Lake Corpus Christi to the saltwater barrier dam in Calallen. The segment was the focus of a WPP due to an impairment for TDS. The segment also has a water quality concern for chlorophyll-*a*. The WPP was approved in 2016 and is now in the implementation phase. One of the implementation plan strategies identified is the On-site Sewage Facility (OSSF) Repair and Replacement Assistance Program. As of March 2019, 47 pump outs and inspections were completed. Fourteen were found to be in good working order; 11 repairs have been made; and 16 systems have been replaced.

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Aquatic Life Monitoring

Aquatic Life Monitoring (ALM) is an interagency bioassessment study between TCEQ and Texas Parks and Wildlife Department (TPWD) used to determine if aquatic assemblages (fish and benthic macroinvertebrates) and physical habitat in wadeable freshwater streams in Texas meets the aquatic life use criteria as established in the Texas Surface Water Quality Standards. ALM monitoring occurred in the Nueces River Basin in the Upper Frio River (Segment 2113) and the Nueces River Above Frio River (Segment 2104) in the Spring of 2017. Data from the first bioassessment indicated that aquatic assemblages reflect Exceptional Aquatic Life which would lead to a de-listing of the sites on the segments during future assessments. The second monitoring trip is tentatively scheduled for Summer 2019.



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Basin 22 – Nueces-Rio Grande Coastal Basin

The Nueces-Rio Grande Coastal Basin covers approximately 10,400 square miles in South Texas and includes streams such as the Arroyo Colorado Tidal (Segment 2201) and above tidal (Segment 2202) in the Rio Grande Valley and Petronila Creek Tidal (Segment 2203) and above tidal (Segment 2204), which is a tributary to Alazan Bay located on the northern arm of Baffin Bay.



Station ID	Sampling location	Sampling Type
13079	Arroyo Colorado at US 77	Quarterly
13080	Arroyo Colorado at FM 506	Quarterly
16445	Arroyo Colorado at Dilworth Road	Quarterly
13093	Petronila Creek at FM 70	Quarterly
13094	Petronila Creek at FM 892	Quarterly
13096	Petronila Creek at FM 665	Quarterly
20806	Petronila Creek at Alice Road	Quarterly

Basin 22 - Concerns and Impairments

Waterbody	Concerns	Impairments
Arroyo Colorado Tidal	Low DO, Chlorophyll- <i>a,</i> Nitrate	Low DO, Bacteria, Mercury in edible tissue, Polychorinated Byphenyls (PCBs) in edible tissue
Arroyo Colorado Above Tidal	Chlorophyll- <i>a,</i> Nitrate, Total Phosphorus	Bacteria, Mercury in longnose gar, PCBs in edible tissue
Petronila Creek Tidal	Chlorophyll-a, pH	Bacteria
Petronila Creek Above Tidal	Chlorophyll-a	Bacteria, Chloride, Sulfate, TDS

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Petronila Creek Above Tidal Tributary Study (Segment 2204)

Petronila Creek, located in Kleberg and Nueces counties, flows forty-four miles to its confluence in Alazan Bay. In 2000, water quality testing found that elevated levels of chloride, sulfate, and TDS in the creek exist downstream of US Hwy 77 in an area where man-made nonpoint sources such as produced water, brine pits, and brine injection wells are known to exist. To address the impairments TCEQ adopted three TMDLs for the creek in 2007. Since FY 2013-2014, the TCEQ has contracted with NRA to conduct monthly water quality monitoring to identify chloride, sulfate, and TDS contributions from tributaries of Petronila Creek, including drainage ditches. For FY 2018, NRA conducted monthly monitoring at 13 sites. Four sites are located on the main stem of Petronila Creek (13093, 13094, 13095, and 13096) and show an increasing specific conductance trend as it flows downstream.



Station ID	Sampling location	Sampling Type
21598	Tributary to Petronila Creek near FM 70	Monthly
21929	Tributary to Petronila Creek at FM 70	Monthly
13030	Tributary to Petronila Creek at FM 70	Monthly
21596	Tributary to Petronila Creek at FM 892	Monthly
18642	Tributary to Petronila Creek at FM 892	Monthly
21931	Tributary to Petronila Creek at FM 3354	Monthly
13093	Petronila Creek at FM 70	Monthly
13094	Petronila Creek at FM 892	Monthly
13095	Petronila Creek at County Road 18	Monthly
13096	Petronila Creek at FM 665	Monthly
13032	Tributary to Petronila Creek at CR 18/75	Monthly
18484	Tributary to Petronila Creek at CR 24	Monthly
21594	Tributary to Petronila Creek at CR 233	Monthly

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Basin 24 – Bays and Estuaries

The Bays and Estuaries region of Texas covers approximately 2,002 square miles along the entire Texas Coast. There are 48 classified estuarine segments that are monitored by several river authorities and TCEQ regional offices. NRA monitors water quality in 5 of the coastal segments including: Copano/Port/Mission Bay (Segment 2472), Redfish Bay (Segment 2483), Oso Bay (Segment 2485), Laguna Madre (Segment 2491), and Baffin Bay/Alazan Bay/Cayo del Grullo/Laguna Salada (Segment 2492).



Station ID	Sampling location	Sampling Type
13405	Port Bay at SH 188	Quarterly+metals
13426	Redfish Bay at SH 361	Quarterly
18848	Conn Brown Harbor	Quarterly+metals
13440	Oso Bay at SH 358	Quarterly
13028	Oso Creek at SH 286	Quarterly
13029	Oso Creek at FM 763	Quarterly
22003	Hidalgo Main Floodwater Channel at FM 1420	Quarterly
22004	Raymondville Drain at CR 445	Quarterly
13033	San Fernando Creek at US 77	Quarterly
13034	Los Olmos Creek at US 77	Quarterly

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Basin 24 - Concerns and Impairments

Waterbody	Concerns	Impairments
San Antonio Bay / Hynes Bay	Chlorophyll-a	Bacteria in oyster waters
Mesquite Bay	None	None
Aransas Bay	None	None
Little Bay	Chlorophyll-a	None
Copano Bay & Port Bay	None	Bacteria in oyster waters
St. Charles Bay	Low DO	None
Corpus Christi Bay	None	Bacteria at recreational beaches
Nueces Bay	Chlorophyll-a	Zinc in edible tissue, copper in water
Redfish Bay	None	None
Conn Brown Harbor	Copper in water	None
Corpus Christi Inner Harbor	Ammonia, Nitrate	Copper in water
Oso Bay	Chlorophyll-a, Total	Low DO, Bacteria, Bacteria
	Phosphorus	in oyster waters
Oso Creek	Chlorophyll-a, Nitrate,	Bacteria
	Total Phosphorus	Bacteria
Laguna Madre	Low DO, Bacteria,	Low DO, Bacteria, Bacteria
	Chlorophyll-a, Nitrate	in oyster waters
North Floodway	Chlorophyll-a, Nitrate	None
Baffin Bay / Alazan Bay / Cayo Del Grullo / Laguna Salada	Chlorophyll-a	None
San Fernando Creek	Chlorophyll- <i>a,</i> Nitrate, Total Phosphorus	Bacteria
South Bay	None	None
Brownsville Ship Channel	Low DO	Bacteria
Port Isabel Fishing Harbor	None	Bacteria

Oso Bay & Oso Creek TMDL and IP

Since 2002, Oso Creek (Segment 2485A), which flows 28 miles to the confluence of Oso Bay in Nueces County has been identified as being impaired for having bacteria concentrations that exceed state water quality standards. Since 2003, the TCEQ and the Texas State Soil and Water Conservation Board (TSSWCB) have conducted numerous studies of bacteria sources and quantities in the Oso Creek watershed. Based on the results of those studies, a TMDL and an Implementation Plan (IP) for Oso Creek is being developed to address the contact recreation impairment. Staff from the Center for Coastal Studies at Texas A&M University – Corpus Christi and the Coastal Bend Bays Foundation (CBBF) is disseminating information to the public at http://www.tceq.texas.gov/waterquality/tmdl/67-osobaybacteria.html

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Baffin Bay/Alazan Bay/Cayo del Grullo/Laguna Salada (Segment 2492)

Baffin Bay has been on the TCEQ 303(d) list for a water quality concern for chlorophyll-*a*. Major tributaries to the bay including Petronila and San Fernando creeks, have water quality concerns and/or impairments listed on the TCEQ 303(d) list. Although the bay is not officially impaired for any parameter, widespread brown tide events, episodic low dissolved oxygen related fish kills, a dwarf clam mortality event, and an emaciated black drum (*Mulinia lateralis*) event in 2010 prompted researchers from Texas A&M University-CC Harte Research Ititute (HRI) to form the Baffin Bay Stakeholder Group to address water quality concerns. The group is composed of stakeholders from USDA-NRCS, TSSWCB, TWRI, TCEQ, Texas Sea Grant, Texas General Land Office (TxGLO), TPWD, Coastal Bend Bays and Estuaries Program (CBBEP) and private landowners.



Lower Laguna Madre/Brownsville Ship Channel WPP

The Lower Laguna Madre/Brownsville Ship Channel (LLM/BSC) Watershed, located between the Arroyo Colorado and the Rio Grande Rivers' watersheds, drains much of the Lower Rio Grande Valley through the Brownsville Ship Channel. The segment was the focus of a WPP due to an impairment for bacteria and a water quality concern for dissolved oxygen. Details of the WPP, which is ongoing can be found at: <u>https://www.tceq.texas.gov/waterquality/nonpoint-source/projects/lower-laguna-madre-watershed-protection-plan</u>

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Basin 25 - Concerns and Impairments

Waterbody	Concerns	Impairments
Gulf of Mexico	None	Mercury in offshore sport fishes

Steering Committee Membership

Steering Committees are made up of representatives from the public, government, industry, business, agriculture, and environmental groups. They are created to help guide CRP efforts by providing input on local water quality concerns and setting priorities within its basins. NRA provides a quarterly update to stakeholders that summarizes CRP funded activities including water quality monitoring, updates on various water quality studies, and education/outreach. Steering Committee Meetings are held every other year. To receive an update in your e-mail inbox, please contact Sam Sugarek at: ssugarek@nueces-ra.org. or visit the Clean Rivers Program section of our website at: https://www.nueces-ra.org/CP/CRP/

Public Outreach and Educational Activities

In late 2018, NRA launched a new Facebook Page titled *Nueces River Authority – Clean Rivers Program* that will post content related to CRP funded Surface Water Quality Monitoring. The page also promotes stewardship activities such as litter clean up events and educational activities that include the use of the custom-made watershed model of the Nueces River Basin, a groundwater model, and various rainfall runoff models that are used in classrooms, County Agriculture Fairs, and community events such as Earth-Day Bay-Day in Corpus Christi.



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