

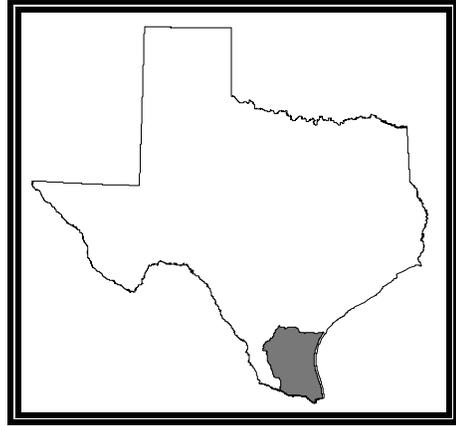
Below is an Electronic Version of an Out-of-Print Publication

You can scroll to view or print this publication here, or you can borrow a paper copy from the Texas State Library, 512/463-5455. You can also view a copy at the TCEQ Library, 512/239-0020, or borrow one through your branch library using interlibrary loan.

The TCEQ's current print publications are listed in our catalog at www.tnrcc.state.tx.us/admin/topdoc/index.html.

Basin 22

Nueces–Rio Grande Coastal



Nueces–Rio Grande Coastal Basin Narrative Summary

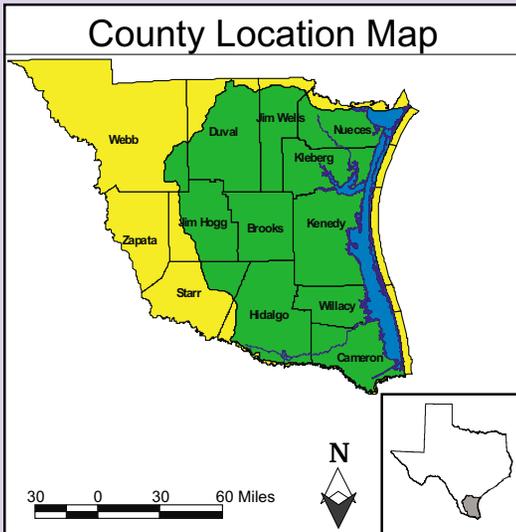
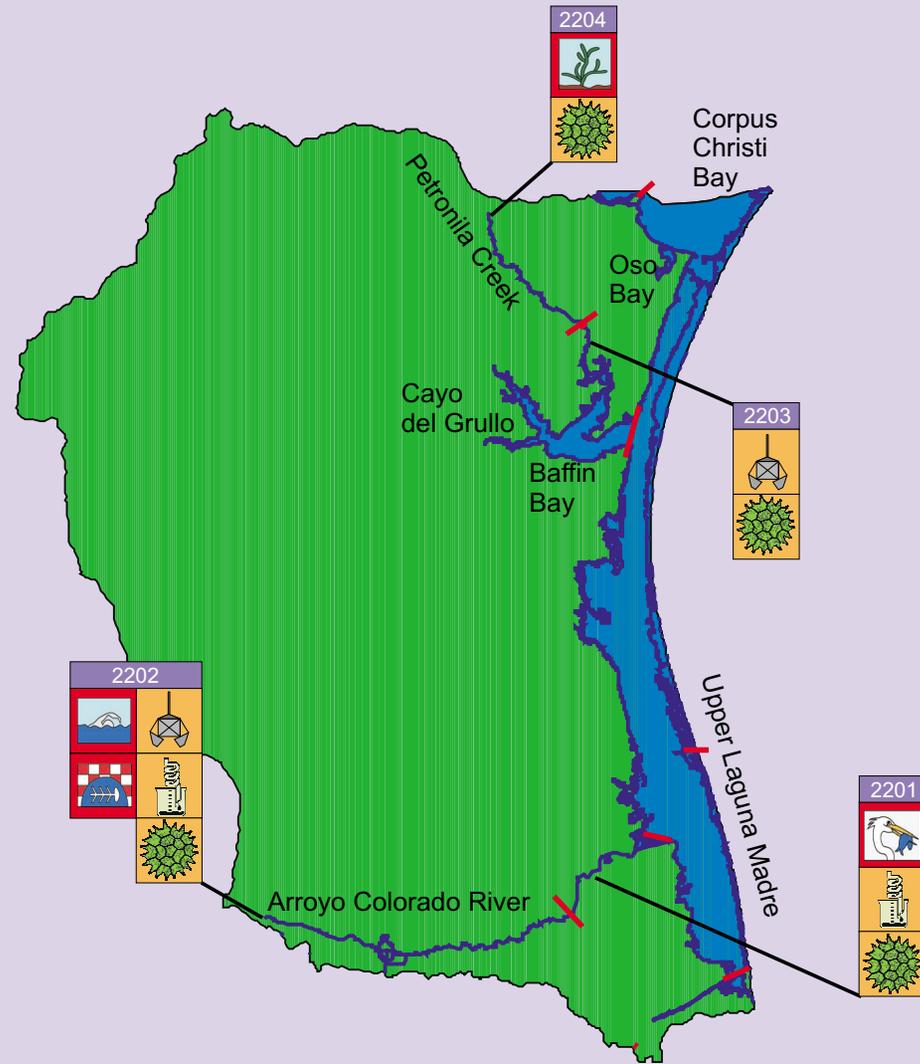
The Nueces–Rio Grande Coastal Basin lies on the coastal plain between the Nueces River and the Rio Grande, and drains into the Laguna Madre, Baffin Bay, and Oso Bay. The total drainage area is 10,442 square miles. The economy is based primarily on agriculture, oil and gas production, and tourism. Irrigated production of fruit and vegetables is a prominent industry.

The basin has been divided into four classified stream segments which encompass 147 stream miles, consisting of tidal and above-tidal reaches of the Arroyo Colorado and Petronila Creek. In addition, one unclassified reservoir encompassing 333 acres was evaluated for the year 2000 assessment. There are 55 active monitoring stations in the basin.

The Arroyo Colorado provides most of the drainage in the Lower Rio Grande Valley and receives much of the municipal, industrial, and agricultural wastewater generated in the area. Flow in the Arroyo normally is sustained by irrigation return flows and municipal wastewater discharges.

Low dissolved oxygen concentrations and ambient sediment toxicity occur in the Arroyo Colorado tidal (2201). Fecal coliform densities are elevated in the Arroyo Colorado above tidal (2202). General uses are not supported in Petronila Creek above tidal (2204) due to elevated chloride, sulfate, and total dissolved solids concentrations. The Texas Department of Health has issued fish consumption advisories for the Arroyo Colorado above tidal (2202) due to elevated toxaphene, DDE, and chlordane concentrations in fish tissue, and for Donna Reservoir (2202A) due to elevated concentrations of PCBs in fish tissue. Concerns exist for nutrients in all four classified segments, for toxic substances in sediment in the Arroyo Colorado above tidal (2202) and Petronila Creek tidal (2203), and for sulfate in Donna Reservoir (2202A) (public water supply use).

Nueces-Rio Grande Coastal Basin Identified Water Quality Issues



Nueces–Rio Grande Coastal Basin Graphical Summary

Basin Map	Water Bodies									
	Segment 2201 Arroyo Colorado Tidal	Segment 2202 Arroyo Colorado Above Tidal	Segment 2202A Donna Reservoir	Segment 2203 Petronila Creek Tidal	Segment 2204 Petronila Creek Above Tidal					
DESIGNATED USE SUPPORT										
Contact Recreation	S	N	NA	S	S					
Noncontact Recreation	NA	X	X	X	X					
Public Water Supply	X	X	S	X	X					
Fish Consumption										
Human Health	NA	NA	NA	NA	NA					
Advisories/Closures	S	N	N	NA	NA					
Aquatic Life										
Dissolved Oxygen (Grab)	N	S	NA	S	S					
Dissolved Oxygen (24-Hour)	NA	NA	NA	NA	NA					
Metals in Water	S	S	NA	NA	NA					
Organics in Water	S	S	NA	NA	NA					
Water Toxicity Tests	S	NA	NA	NA	NA					
Sediment Toxicity Tests	N	NA	NA	NA	NA					
Macrobenthos	NA	NA	NA	NA	NA					
Fish	NA	NA	NA	NA	NA					
GENERAL USE SUPPORT										
Water Temperature	S	S	X	S	S					
pH	S	S	X	S	S					
Chloride	X	S	X	X	N					
Sulfate	X	S	X	X	N					
Total Dissolved Solids	X	S	X	X	N					

S = Support; P = Partial Support; N = Nonsupport; T = Threatened; NC = No Concern; C = Concern;
 NA = Not Assessed; X = Not Applicable

Nueces–Rio Grande Coastal Basin Graphical Summary (Continued)

Basin Map	Water Bodies									
	Segment 2201 Arroyo Colorado Tidal	Segment 2202 Arroyo Colorado Above Tidal	Segment 2202A Domna Reservoir	Segment 2203 Petronila Creek Tidal	Segment 2204 Petronila Creek Above Tidal					
WATER QUALITY CONCERNS										
Contact Recreation	X	X	NA	X	X					
Noncontact Recreation	X	X	X	X	X					
Fish Tissue	NA	NA	NA	NA	NA					
Sediment	NC	C	NA	C	NA					
Narrative	NC	NC	NC	NC	NC					
Nutrient Enrichment										
Ammonia Nitrogen	C	C	NA	NC	NC					
Nitrite + Nitrate Nitrogen	C	C	NA	NC	NC					
Orthophosphorus	NC	NC	NA	NC	NC					
Total Phosphorus	NC	NC	NA	NC	NC					
Chlorophyll <i>a</i>	C	C	NA	C	C					
Public Water Supply										
Finished Water Chloride	X	X	NC	X	X					
Finished Water Sulfate	X	X	C	X	X					
Finished Water TDS	X	X	NC	X	X					
Surface Water Chloride	X	X	NA	X	X					
Surface Water Sulfate	X	X	NA	X	X					
Surface Water TDS	X	X	NA	X	X					
Aquatic Life										
Dissolved Oxygen	X	X	NA	X	X					
Metals in Water	NA	NA	NA	NA	NA					
Organics in Water	NA	NA	NA	NA	NA					
Water Toxicity Tests	NA	NA	NA	NA	NA					
Sediment Toxicity Tests	NA	NA	NA	NA	NA					

Nueces–Rio Grande Coastal Basin

Segment 2201 - Arroyo Colorado Tidal

Water body description: From confluence with Laguna Madre in Cameron/Willacy County to a point 100 meters (110 yards) downstream of Cemetery Road south of Port Harlingen in Cameron County

Water body classification: Classified

Water body type: Tidal Stream

Water body length / area: 26.00 Miles

Use support summary: The aquatic life use is not supported due to depressed dissolved oxygen concentrations in the upper 7.1 miles. The aquatic life use is also not supported due to significant effects in ambient sediment toxicity tests throughout the segment. The fish consumption, contact recreation, and general uses are supported.

Water quality concerns summary: Ammonia nitrogen is a concern in the upper 11.5 miles. Nitrite + nitrate nitrogen is a concern in the upper 6 miles. Chlorophyll *a* is a concern through the entire segment.

Additional summary: A wasteload evaluation (WLE) for dissolved oxygen was approved in 1989 and has been incorporated into the state Water Quality Management Plan. Advanced waste treatment is required for one or more dischargers.

Projects are underway for dissolved oxygen and ambient toxicity in sediment to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program. For more information on specific TMDL projects, visit the TNRCC Web site at www.tnrcc.state.tx.us/water/quality/tmdl/.

Monitoring sites used in the assessment

Station	Station Description
13071	Arroyo Colorado Tidal at mile 10 (marker 22)
13072	Arroyo Colorado Tidal FM 106 Bridge at Rio Hondo
13073	Arroyo Colorado Tidal at Camp Perry north of Rio Hondo
13559	Arroyo Colorado Tidal at marker 27 (mile 15) 0.8km N of the point where channel becomes boundary between Willacy and Cameron Co.
13782	Arroyo Colorado Tidal near CM 16 at Arroyo City, km 10.9
14849	Arroyo Colorado Tidal at the junction of Cayo Atascoso
14850	Arroyo Colorado Tidal 2.4 km SW of junction of Cayo Atascoso and 5.63 km upstream from GIWW
14851	Arroyo Colorado Tidal at CM 36
14852	Arroyo Colorado Tidal at CM 54 at the first horseshoe bend
14853	Arroyo Colorado at CM 73 at second horseshoe bend
15547	Arroyo Colorado Tidal 2.1 km upstream from GIWW
15548	Arroyo Colorado Tidal 200 m upstream from confluence with Cayo Atascoso, 3.8 km upstream from GIWW
15551	Arroyo Colorado tidal 1.45 km downstream from CH 18 and 8.1 km upstream from GIWW
15552	Arroyo Colorado tidal at western boundary of Laguna Atascosa National Wildlife Refuge, 8.6 km upstream from GIWW
15553	Arroyo Colorado Tidal 0.6 km upstream from CM 18, 10.2 km upstream from GIWW
15554	Arroyo Colorado Tidal at CM 16, 10.4 km upstream from GIWW
15555	Arroyo Colorado Tidal at Paul Bergh's Boat Dock in Arroyo City, 0.7 km upstream from CM 16 and 11.2 km upstream from GIWW
15556	Arroyo Colorado Tidal at confluence with common channel from Hung and Taiwan Shrimp Farms, 11.4 km upstream from GIWW
15557	Arroyo Colorado Tidal 1.6 km upstream from CM 36 and 13.1 km upstream from GIWW
15558	Arroyo Colorado Tidal at Hung's Shrimp Farm intake, 2.3 km upstream from CM 36 and 13.8 km upstream from GIWW
15559	Arroyo Colorado Tidal 0.4 km upstream from CM 54 and 16.0 km upstream from GIWW
15560	Arroyo Colorado Tidal 0.5 km upstream from CM 54 and 16.1 km upstream from GIWW
15561	Arroyo Colorado Tidal 1.4 km upstream from CM 54 and 17.0 km upstream from GIWW
15562	Arroyo Colorado Tidal 0.8 km upstream from CM 73, east of Paso Real and 21.1 km upstream from GIWW

Monitoring sites, continued

Station	Station Description
15563	Arroyo Colorado Tidal 2.6 km upstream from CM 73, south of Paso Real and 22.9 km upstream from GIWW
15564	Arroyo Colorado Tidal 300 m upstream from CM 27 and 24.5 km upstream from GIWW
15565	Arroyo Colorado Tidal 2.5 km upstream from CM 27 and 26.7 km upstream from GIWW
15566	Arroyo Colorado Tidal 4.4 km upstream from CM 27 and 28.6 km upstream from GIWW
15567	Arroyo Colorado Tidal 3.4 km downstream from Camp Perry and 30.8 km upstream from GIWW
15568	Arroyo Colorado Tidal 1.5 km downstream from Camp Perry and 32.7 km upstream from GIWW
15569	Arroyo Colorado Tidal 0.5 km upstream from Camp Perry and 34.7 km upstream from GIWW
15570	Arroyo Colorado Tidal adjacent to Rio Hondo WWTP discharge, 0.8 km downstream from FM 106 and 36.5 km upstream from GIWW
15571	Arroyo Colorado Tidal adjacent to Rio Hondo and Harlingen City boundary, 0.9 km upstream from FM 106 and 38.2 km upstream from GIWW
15572	Arroyo Colorado Tidal 2.5 km downstream from low water bridge at Port Harlingen and 39.9 km upstream from GIWW
15576	Arroyo Colorado Tidal 400m upstream from CM 16 and 10.94 km upstream from GIWW
15579	Arroyo Colorado Tidal at Arroyo Aquaculture Association Intake, 400 m upstream from CM 36 and 11.9 km upstream from GIWW at midchannel
15582	Arroyo Colorado Tidal 3.4 km upstream from CM 54 and 19.0 km upstream from GIWW
16142	Arroyo Colorado Tidal 1.3km downstream from Cemetery Road, NE of Port of Harlingen
16143	Arroyo Colorado Tidal 0.8km upstream from FM106, SW of Rio Hondo
16144	Arroyo Colorado Tidal 1.0km downstream from Camp Perry
16145	Arroyo Colorado Tidal 8.0km upstream from Arroyo City
16146	Arroyo Colorado Tidal 4.0km upstream from Arroyo City
16147	Arroyo Colorado Tidal 3.0km downstream from Arroyo City
16151	Arroyo Colorado Tidal, 311km downstream from Camp Perry and 31.1km upstream from GIWW
16152	Arroyo Colorado Tidal, 3.4km upstream from CM 27 and 27.6km upstream from GIWW
16153	Arroyo Colorado Tidal, 2.65km upstream from CM 73 and 22.95km upstream from GIWW

Monitoring sites, continued

Station	Station Description
16154	Arroyo Colorado Tidal, 1.2km upstream from CM 36 and 12.7km upstream from GIWW
16155	Arroyo Colorado Tidal, 0.8 km upstream from confluence with Cayo Atascoso and 4.5km upstream from GIWW

Published studies

Publication	Date	Author
AS 69 Arroyo Colorado	Feb. 1994	Davis/KleinSasser/Cantu
IMS 72 Arroyo Colorado	Aug. 1976	Twidwell, S.
IS 49 Arroyo Colorado	Aug. 1982	Davis, J.
IS 61 Arroyo Colorado	March 1981	Davis, J.
IS 69 Arroyo Colorado	Aug. 1983	Davis, J.
LP 86-05 Arroyo Colorado	July 1986	Bowles, R. (Region 15)
LP 89-07 Arroyo Colorado	Dec. 1987	Davis, J.

Wastewater dischargers

Permit type	Number of outfalls
Agriculture	1
Domestic	3
Industrial	20

Historical fish kills

Start date	Location	Fish killed	Suspected cause
07/06/1994	Canal 5 miles north of US 83 on Bass Blvd. in Harlingen	100	Low Dissolved Oxygen
10/13/1994	Arroyo Colorado, intake canal at shrimp farm, back part of canal on private property	500	Low Dissolved Oxygen
09/16/1995	Arroyo Colorado turning basin east of Harlingen	2,000,000	Low Dissolved Oxygen
11/04/1996	Arroyo Colorado, from water tower in Arroyo City, upstream to Circle X	1,000	Disease
06/18/1997	Arroyo Colorado, Port Harlingen to Camp Perry	1,000,000	Low Dissolved Oxygen
08/04/1997	In Arroyo Colorado at Rio Hondo near Pt of Harlingen	1,000,000	Low Dissolved Oxygen

Historical fish kills, continued

Start date	Location	Fish killed	Suspected cause
09/13/1997	Irrigation canal off FM 803	300	Low Dissolved Oxygen
07/13/1998	On the west bank of the Arroyo Colorado from the port of Harlingen to N of the Rio Hondo swing bridge.	100,000	Low Dissolved Oxygen
07/30/1998	Arroyo Colorado at the Rio Hondo bridge	100,000	Low Dissolved Oxygen
08/17/1998	Arroyo Colorado approximately 0.5 miles N of Rio Hondo bridge	2,000,000	Low Dissolved Oxygen

Nueces–Rio Grande Coastal Basin

Segment 2202 - Arroyo Colorado Above Tidal

Water body description: From a point 100 meters (110 yards) downstream of Cemetery Road south of Port Harlingen in Cameron County to FM 2062 in Hidalgo County

Water body classification: Classified

Water body type: Freshwater Stream

Water body length / area: 63.00 Miles

Use support summary: The contact recreation use is not supported due to elevated fecal coliform densities in the lower 40 miles. The fish consumption use is not supported due to a no-consumption advisory issued by the Texas Department of Health in September 1980 due to elevated concentrations of chlordane, toxaphene, and DDE in fish tissue. The aquatic life and general uses are supported in the lower 40 miles.

Water quality concerns summary:

Ammonia nitrogen, nitrite + nitrate nitrogen, and Chlorophyll *a* are concerns in the lower 40 miles. Arsenic, barium, chromium, copper, manganese, mercury, nickel, selenium, zinc, toluene, and DDE in sediment are concerns in the lower 25 miles.

Additional summary:

A wasteload evaluation (WLE) for dissolved oxygen was approved in 1989 and has been incorporated into the state Water Quality Management Plan. Advanced waste treatment is required for one or more dischargers.

Total maximum daily loads (TMDLs) to evaluate the causes and sources of chlordane, DDE, and toxaphene in fish tissue and allocate the allowable loading have been completed and approved by the Commission.

A project is scheduled for fecal coliform bacteria to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program.

**Additional information,
continued:**

For more information on specific TMDL projects, visit the TNRCC Web site at www.tnrcc.state.tx.us/water/quality/tmdl/.

Monitoring sites used in the assessment

Station	Station Description
13074	Arroyo Colorado at low water bridge at Port Harlingen
13079	Arroyo Colorado at US 77 in SW Harlingen
13081	Arroyo Colorado main floodway in Llano Grande at FM 1015 south of Weslaco

Published studies

Publication	Date	Author
AS 161 Donna Reservoir	1993-94	Webster, C (Region 15)

Wastewater dischargers

Permit type	Number of outfalls
Domestic	86
Industrial	6

Historical fish kills

Start date	Location	Fish killed	Suspected cause
07/18/1994	Drain ditch near intersect. US 83/77 & FM 486, San Benito	95	Temperature
07/14/1995	3 Miles downstream from Rio Hondo Bridge in Arroyo Colorado	5,000,000	Low Dissolved Oxygen

Nueces–Rio Grande Coastal Basin

Segment 2202A - Donna Reservoir (unclassified water body)

Water body description: Off-channel irrigation reservoir pumped from Rio Grande near the City of Donna in Hidalgo county

Water body classification: Unclassified

Water body type: Reservoir

Water body length / area: 333 Acres

Use support summary: The fish consumption use is not supported throughout the entire reservoir and connecting canals to the Rio Grande due to an aquatic life closure issued in February 1994 by the Texas Department of Health due to elevated concentrations of PCBs in fish tissue. Other uses were not assessed due to insufficient data.

Water quality concerns summary: The average sulfate concentration in finished drinking water is a concern.

Additional summary: A total maximum daily load (TMDL) to evaluate the causes and sources of PCBs and allocate the allowable loading has been completed and approved by the Commission. For more information on specific TMDL projects, visit the TNRCC Web site at www.tnrcc.state.tx.us/water/quality/tmdl/.

Nueces–Rio Grande Coastal Basin

Segment 2203 - Petronila Creek Tidal

Water body description: From the confluence of Chiltipin Creek in Kleberg County to a point 1 km (0.6 miles) upstream of private road crossing near Laureles Ranch in Kleberg county.

Water body classification: Classified

Water body type: Tidal Stream

Water body length / area: 14.00 Miles

Use support summary: The aquatic life, contact recreation, and general uses are supported. The fish consumption use was not assessed due to insufficient data.

Water quality concerns summary: Barium in sediment and chlorophyll *a* are concerns.

Monitoring sites used in the assessment

Station	Station Description
13090	Petronila Creek 1.2 km upstream of the confluence with Tunas Creek

Nueces–Rio Grande Coastal Basin

Segment 2204 - Petronila Creek Above Tidal

Water body description: From a point 1 km (0.6 miles) upstream of private road crossing near Laureles Ranch in Kleberg county to the confluence of Agua Dulce and Banquete Creeks in Nueces County

Water body classification: Classified

Water body type: Freshwater Stream

Water body length / area: 44.00 Miles

Use support summary: General uses are not supported due to elevated average chloride, sulfate, and total dissolved solids concentrations. The aquatic life and contact recreation uses are supported. The fish consumption use was not assessed due to insufficient data.

Water quality concerns summary: Chlorophyll *a* is a concern.

Additional summary: A project is underway for chloride, sulfate, and total dissolved solids to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program. For more information on specific TMDL projects, visit the TNRCC Web site at www.tnrcc.state.tx.us/water/quality/tmdl/.

Monitoring sites used in the assessment

Station	Station Description
13094	Petronila Creek at FM 892 SE of Driscoll
13096	Petronila Creek at FM 665 east of Driscoll
13099	Petronila Creek at FM 2826 north of Driscoll

Wastewater dischargers

Permit type	Number of outfalls
Domestic	6

Historical fish kills

Start date	Location	Fish killed	Suspected cause
05/29/1996	Bishop City Lake, off highway 77	211	Low Dissolved Oxygen
02/03/1997	Petronilla Creek at FM 70	30	Temperature
02/13/1998	City of Bishop at Carreta Creek	6	Pollutant

