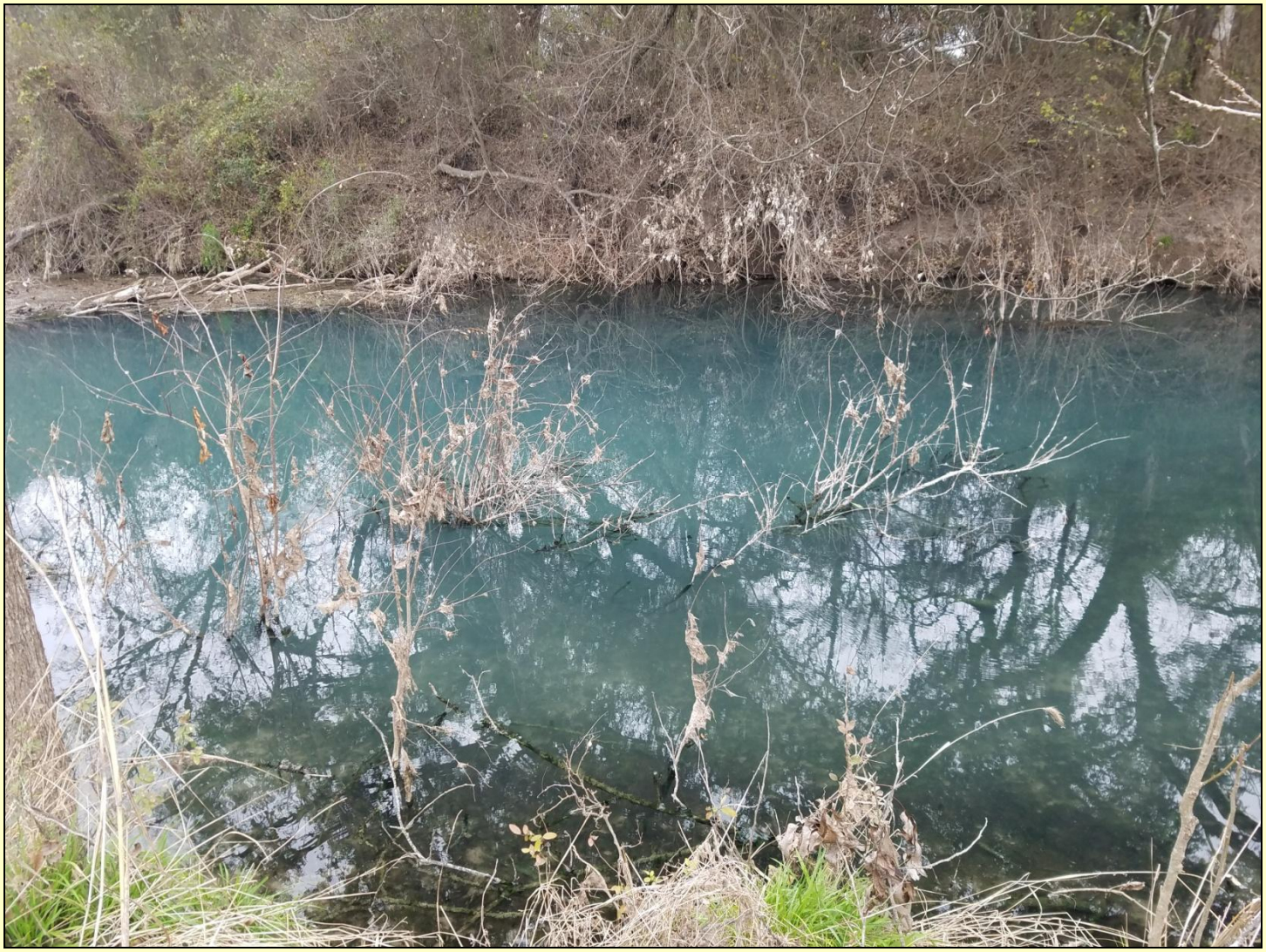
Nueces River Authority

Steering Committee and Stakeholder Update #2
(2nd Quarter of FY 2018-2019)
December 2017 - February 2018

March 9th, 2018

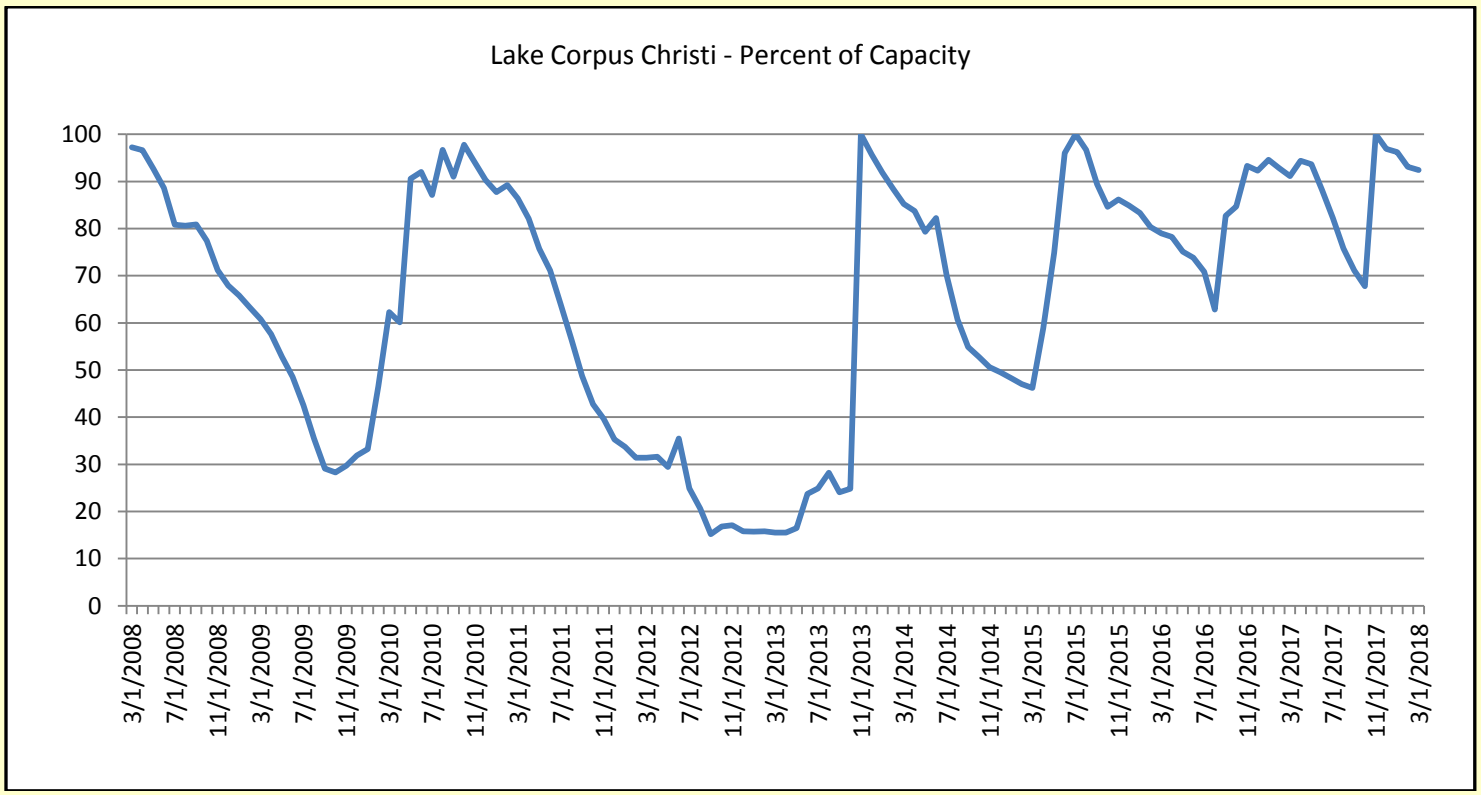
Routine Clean Rivers Program Monitoring

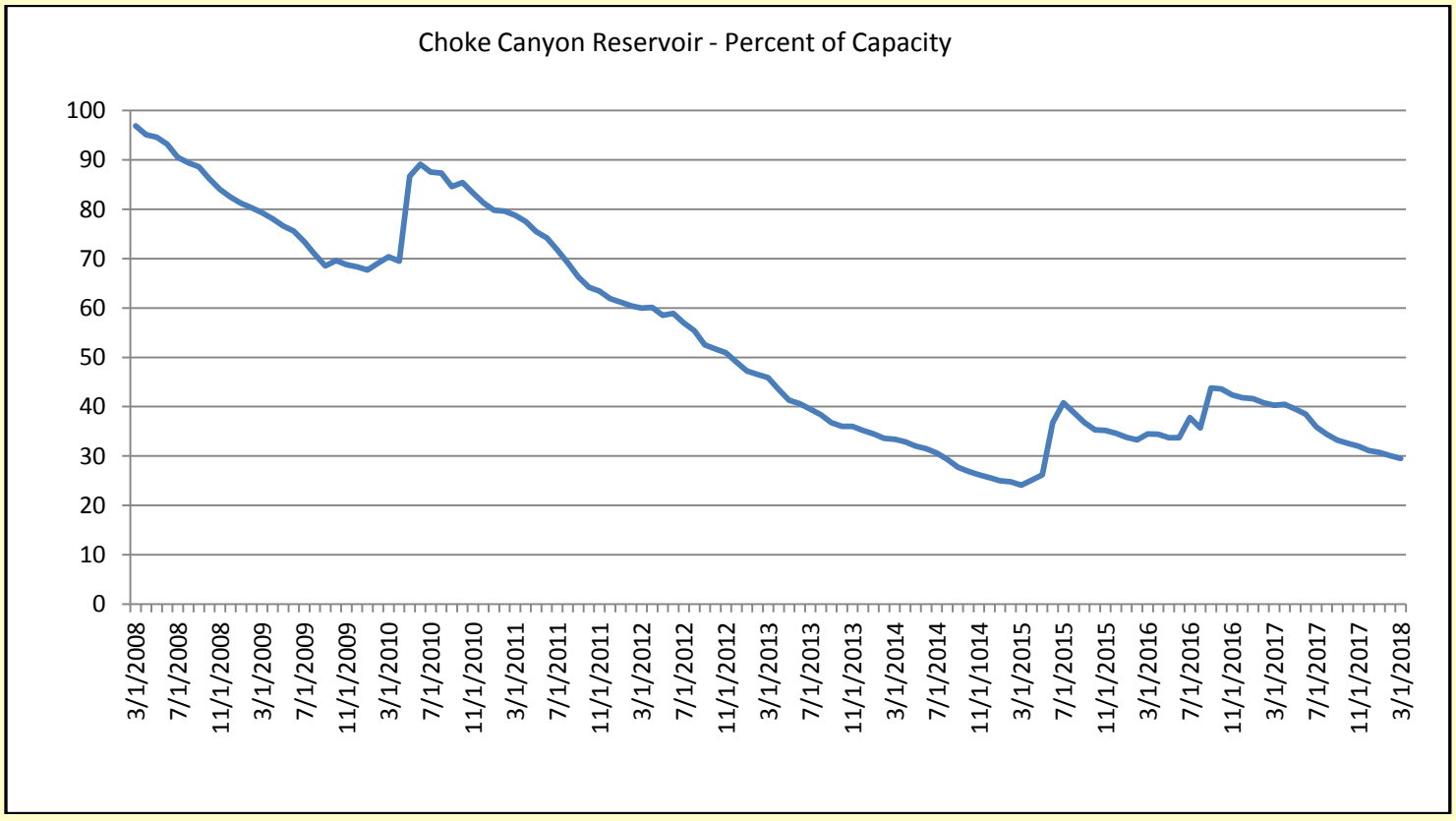
Field staff from the Nueces River Authority conducted routine quarterly water quality sampling at all 35 river/reservoir stations and 8 coastal stations in the second quarter. The Leona River, which had an approximate 10 year hiatus from flowing spring water, is looking good lately. The milky blue water was 73° F (air temp was 45°F) on the quarterly site visit in mid-February. One 24-hour dissolved oxygen monitoring event occurred on the Atascosa River in Pleasanton; the oxygen levels were all in the normal range.



Lake Levels

Percent capacity of the Reservoir System (Choke Canyon + Lake Corpus Christi) dropped from 49.4% to 47.1% of capacity during the 2nd quarter. For the Daily Reservoir System and Pass-Thru Status Report, please visit the website https://www.nueces-ra.org/CP/CITY/passthru/index.php.





Submerged Biota

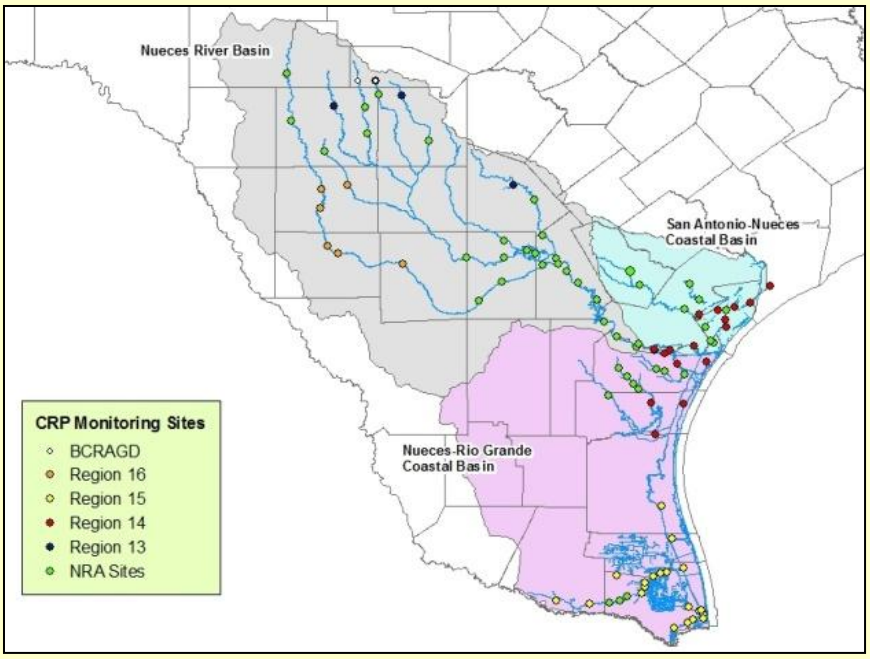
During routine quarterly Clean Rivers Program monitoring, field staff observed an abundance of submerged species. Top left is a type of submerged species that resembles golden 70's era shag carpet. It could be a type of algae, filamentous bacteria or filamentous diatom. It was observed growing on some submerged wood just downstream of the boat ramp off Airport Road on the Nueces River near George West. Top right is a picture of some filamentous algae (likely *Spirogyra*) that was growing in long tresses in the Mission River at Refugio. Rapid growth of algae is associated with nutrient enrichment and light availability.

Floating Algae

Mosquito fern or Azolla (*Azolla filiculoides*) was observed in the Nueces River at SH-16 south of Tilden during NRA's quarterly monitoring trip. According to Wikipedia, *Azolla* forms a symbiotic relationship with cynaobacterium *Anabaena azollae*, which fixes atmospheric nitrogen. This has led the plant being dubbed a "super plant", as it can readily colonize areas of freshwater, and grow at high speed – doubling its biomass every two to three days. The only known limiting factor on its growth is phosphorus, another essential mineral.

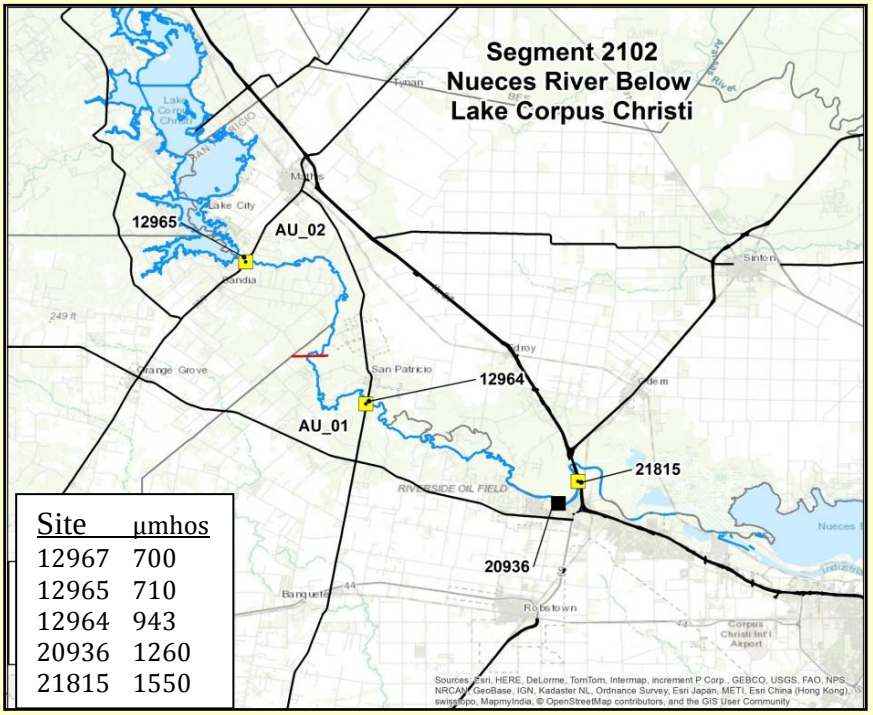
Coordinated Monitoring Meeting

The annual Clean Rivers Program (CRP) Coordinated Monitoring Meeting, hosted by the Nueces River Authority, will be held on March 21th from 1:00 -4:30 pm in room 210 at the Regional Transport Authority building located at 602 N. Staples Street in Corpus Christi. In addition to coordinating CRP monitoring activities for FY 2019, the meeting also provides an overview of water quality concerns and impairments in the Nueces River Basin, Nueces-Rio Grande Coastal Basin and the San Antonio Coastal Basin. All stakeholders and interested parties are welcome to attend.



Pass the Salt

Nueces River Authority field staff recently made some changes to the CRP funded sampling schedule to conduct quarterly monitoring at all of the Lower Nueces River sites (Segment 2102) in the same day. Part of the reason for the change is to document the changes in water quality in the 35.0-mile reach from Lake Corpus Christi to the Calallen Dam. NRA monitoring began at Lake Corpus Christi at the Dam (Station 12967) by boat. Four river sites were monitored below the dam: La Fruta Bridge at FM 359 (station 12965), Bluntzer Bridge at FM 666 (station 12964), Hazel Bazemore (station20936), and upstream of the saltwater barrier at Labonte Park (station 21815).



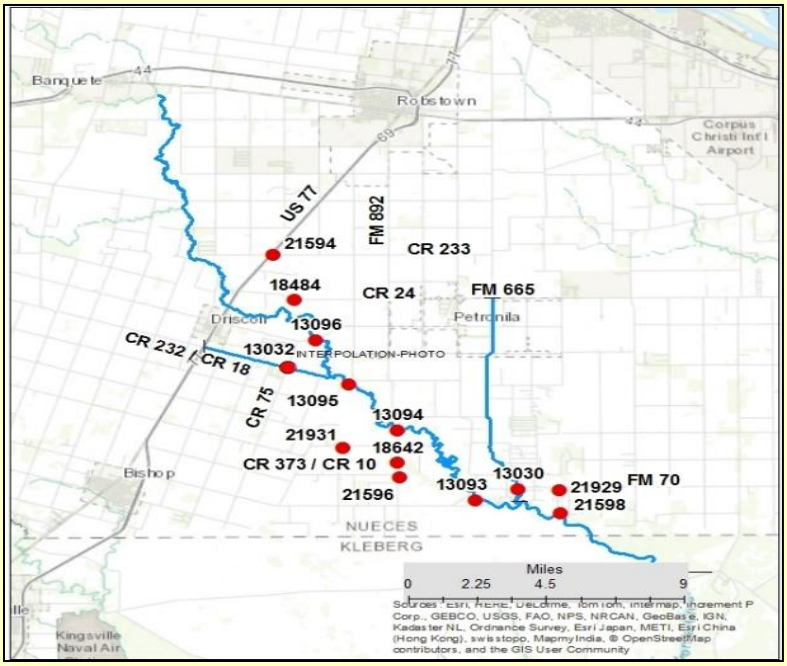
Outreach and Education

It was another busy quarter for NRA's Education and Outreach Program. The program saw 2,541 people at 19 events using tools such as the custom made watershed model as well as the rain catchment, and groundwater models. For more information about outreach and education, contact slewey@nueces-ra.org.

Petronila Creek Tributary Study

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 2018-2019, NRA is conducting monthly monitoring at 13 sites. Four sites are located on the main stem of Petronila Creek (13096, 13095, 13094, and 13093 – data is in bold on the graph) and show an increasing specific conductance trend as it flows downstream.

Site #	Dec (µmhos)	Jan (µmhos)	Feb (µmhos)
21594	9,750	10,900	8,010
18484	32,700	36,100	36,400
13032	34,500	41,500	39,000
13096	**19,400**	**21,500**	**20,600**
13095	**19,400**	**21,500**	**20,200**
21931	26,600	36,400	43,500
13094	**19,600**	**23,000**	**21,400**
18642	31,200	40,800	42,500
21596	16,900	dry	dry
13093	**20,700**	**24,200**	**24,500**
13030	30,600	37,300	37,600
21929	21,400	47,000	44,900
21598	21,100	44,200	44,000



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 TSSWCB have conducted numerous studies of bacteria sources and quantities in the Oso Creek watershed. Based on the results of those studies, a Total Maximum Daily Load (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 is disseminating information to the public.

Meetings take place once a quarter and are held at the South Texas Botanical Gardens in Corpus Christi. You can learn more about the Oso Bay TMDL and/or the Oso Creek Watershed Public Outreach at the TCEQ project page: http://www.tceq.texas.gov/waterquality/tmdl/67-osobaybacteria.html;

Urbanization and Water Quality

There has been a long history of human settlement near rivers. But as our cities grow and develop over time, the natural riverine systems that once functioned to absorb pollutants and decrease stream velocities become replaced by networks of drainage systems that have the sole focus of removing water as fast as possible to prevent flooding. Although necessary, the strategies used to prevent loss of human life and property come with a great expense to sensitive riverine habitat. Urbanization, as it is called, impacts surface water quality by several mechanisms:

- Impervious surfaces reduce the amount of rainfall infiltrating into the soil, thereby increasing the amount of stormwater runoff.
- As water runs over land, it picks up pollutants and transports them to the nearest waterway. This polluted runoff, also know as nonpoint source (NPS) pollution, is one of the leading causes of water pollution.
- Drainage improvements decrease the travel time of stormwater to the receiving water body resulting in higher peak runoff (and subsequently lower baseflow during dry periods).
- Changes in hydrology resulting in erosion and increased bed load of sediment.
- Impacts on water quality caused by pollutants (increases in nutrient, bacteria, oxygen demanding substances).
  https://www.des.nh.gov/organization/divisions/water/wmb/.../stormwater_chapt1.pdf

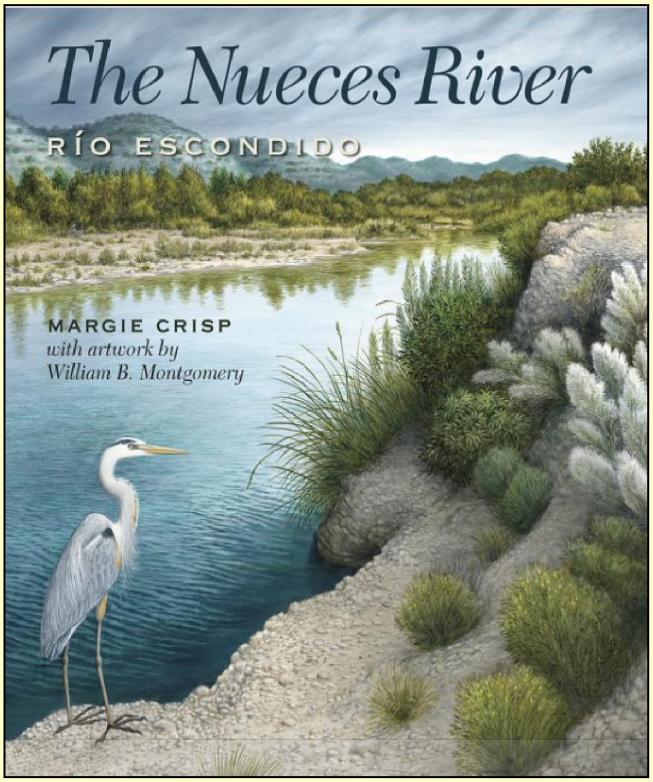
In an attempt to reduce the impact of urbanization, residents are urged to adopt best management practices. A list of proven strategies are found on the EPA's website: https://www.epa.gov/nps/nonpoint-source-what-you-can-do

Up2U

There was an alarming amount of trash observed under the bridge at the crossing of FM 99 on the Atascosa River in Live Oak County (Station 12980).

The Nueces River – Río Escondido

The Nueces River – Río Escondido is one of the latest books in the River Book series, a publishing partnership of Texas A&M University Press and The Meadows Center for Water and the Environment at Texas State University. Author Margie Crisp takes readers on a literary journey from the river's pristine headwaters in the Edwards Plateau, through the thorny brush country of the South Texas Plains, to the river's end in Nueces Bay near Corpus Christi. William Montgomery captures the beauty of this magical place with his accompanying artwork.



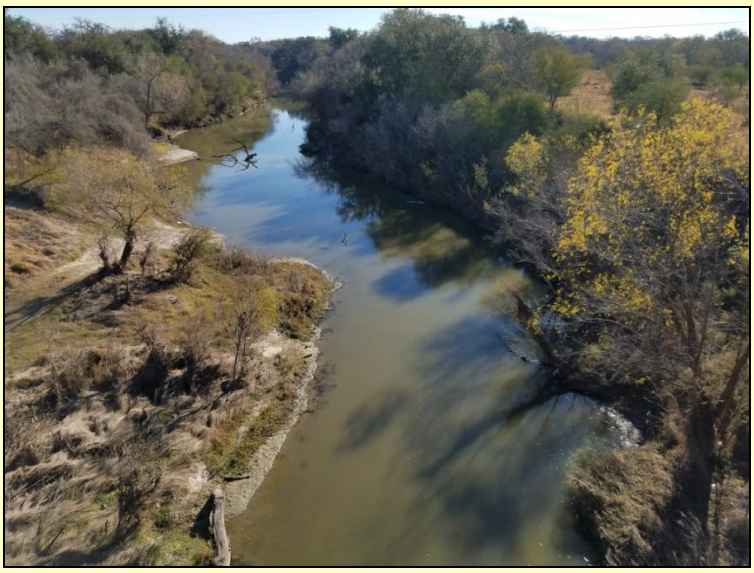
"Capturing the river's subtle beauty, abundant wildlife, diverse culture, and unique history of exploration and conflict, and settlement, they reveal the untold story of this enigmatic river with passion, humor, and reverence." – Andrew Sansom, General Editor, The Meadows Center. http://www.meadowscenter.txstate.edu/Publications.html

Valley Monitoring

NRA currently monitors five sites down in the Rio Grande Basin (see page 10 for the map of stations). Three sites (16445, 13079, and 13080) are located on the above tidal portion of the Arroyo Colorado (Segment 2202) and two are tributaries of the Laguna Madre (Segment 2491). These two tributary sites are new stations in the newly designated Segment 2491C; the Hidalgo Main Floodway (CRP site 22003) and the Raymondville Drain (CRP site 22004). All five sites were visited in mid December under cloudy skies and cool conditions (upper 50s).

Site	E. coli	Ammonia	TKN	Total Phos	Nitrate/Nitrite	Chlorophyll a
13079	110 cfu	0.088 mg/L	2.11 mg/L	1.02 mg/L	6.10 mg/L	14.5 µg/L
16445	140 cfu	0.104 mg/L	2.30 mg/L	1.15 mg/L	6.29 mg/L	141.0 µg/L
13080	110 cfu	0.088 mg/L	2.47 mg/L	1.04 mg/L	5.93 mg/L	14.9 µg/L
22003	10 cfu	0.260 mg/L	2.85 mg/L	0.847 mg/L	3.87 mg/L	13.5 µg/L
22004	150 cfu	0.101 mg/L	0.415 mg/L	0.198 mg/L	1.52 mg/L	18.0 µg/L

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



Funding for the NRA, as watershed coordinator to seek funding for and initiate implementation of the WPP, is provided by the TSSWCB through a §319(h) grant from EPA. Following is a brief update on the status of the implementation of some of the management measures identified in the WPP that are currently underway or have been recently completed.

OSSF Repair and Replacement

As of February 2018, 40 OSSFs within the watershed have been pumped out and inspected. Thirteen were found to be in good working order. Of the remaining 27 systems, 17 need to be completely replaced and ten need some repair work. Six replacements and seven repairs have been completed. The program, funded by the TCEQ through a §319(h) grant from EPA, will continue through February 2020 or until the budgeted funds are spent.

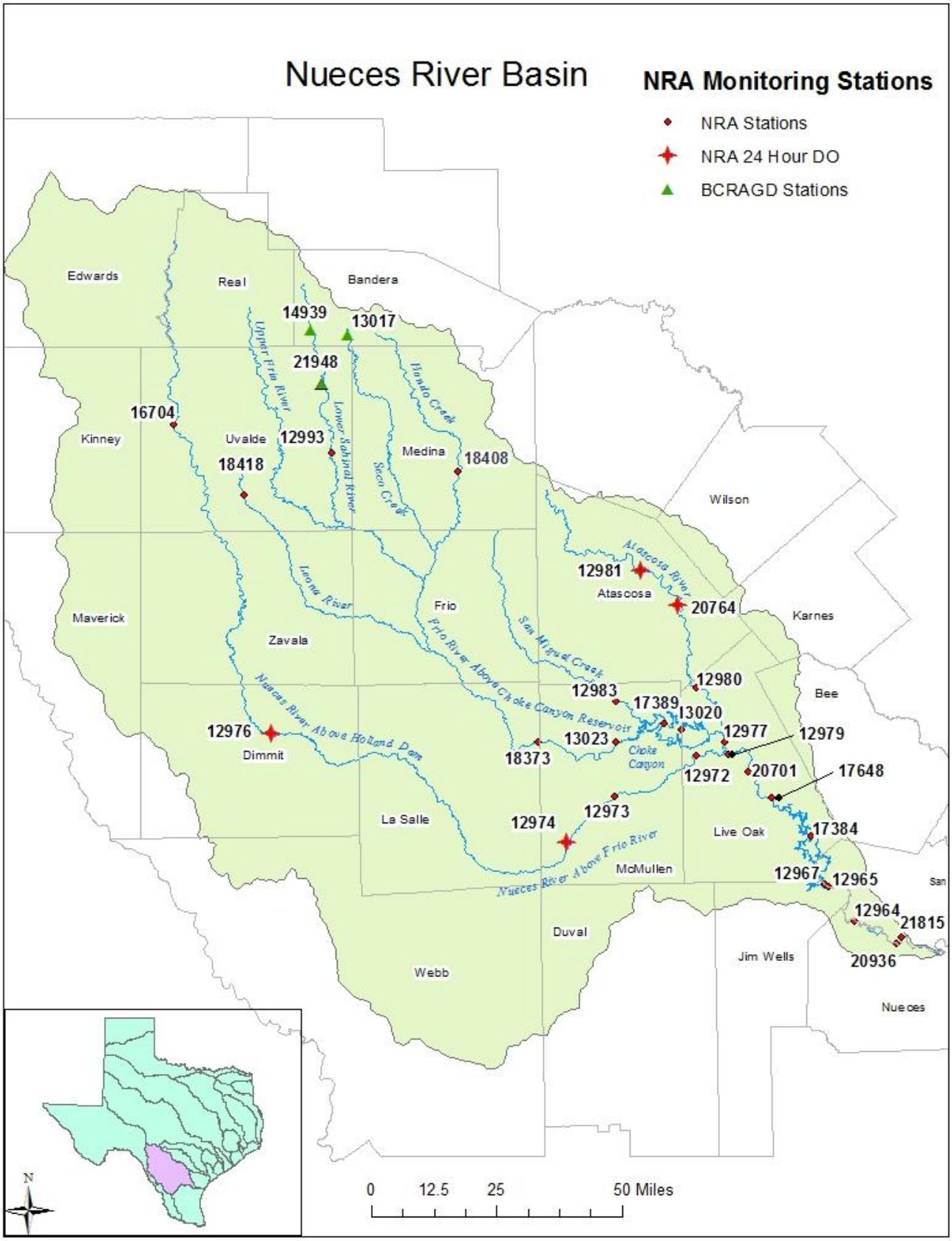
OSSF Conversion

This project will result in a detailed plan and cost estimate to connect some existing homes with OSSFs to the City of Corpus Christi's existing infrastructure. This project is also funded by the TCEQ through a §319(h) grant from EPA. The design work has begun and the City expects to have a draft report by the end of March 2018. A stakeholder meeting will be planned for Summer 2018 to inform the residents of the project.

Lone Star Healthy Streams Workshop

A workshop, conducted by the Texas AgriLife Extension Service, is scheduled for April 10, 2018 from 1pm – 5pm at the Johnny Calderon County Building in Robstown. The goal of this program is the protection of Texas waterways from bacterial contamination originating from livestock operations and feral hogs that may pose a serious health risk to Texas citizens. To achieve this important goal, the program's objective is the education of Texas farmers, ranchers, and landowners about proper grazing, feral hog management, and riparian area protection to reduce the levels of bacterial contamination in streams and rivers. Dairy Outreach Program Area (DOPA) credits will be available to dairy farmers and three Continuing Education Units (CEUs) will be available for pesticide applicators. NRA will also demonstrate their Nueces Basin Watershed Model. A link to the online registration will be posted on NRA's website as soon as it is available.

The next stakeholder meeting will be scheduled for some time in April or May 2018. For more information about the Partnership and the WPP, visit http://www.nuecesriverpartnership.org or contact Rocky Freund at (361) 653-2110 or rfreund@nueces-ra.org.


Nueces River Basin
NRA Monitoring Stations
NRA Stations
NRA 24 Hour DO
BCRAGD Stations
Edwards
Real
Bandera
Kinney
Uvalde
Medina
Wilson
Maverick
Zavala
Frio
Atascosa
Karnes
Bee
Dimmit
La Salle
Live Oak
McMullen
Duval
Webb
Jim Wells
Nueces
San
14939
13017
21948
16704
12993
18418
18408
12981
20764
12980
12983
17389
13020
12977
12979
12976
13023
18373
12972
20701
17648
12973
12974
17384
12967
12965
12964
21815
20936
Upper Frio River
Lower Sabinal River
Hondo Creek
Seco Creek
Atascosa River
Leona River
San Miguel Creek
Frio River Above Choke Canyon Reservoir
Choke Canyon
Nueces River Above Holland Dam
Nueces River Above Frio River
N
0
12.5
25
50 Miles


San Antonio-Nueces Coastal Basin
NRA Stations
NRA 24 Hour DO
Goliad
Bee
San Patricio
Aransas
Refugio
SARCO CREEK
BLANCO CREEK
POSTH CR.
MEDIO CREEK
COPANO CREEK
W ARANSAS CR.
ARANSAS RIVER
PAPALOTE CREEK
CHILIPITIN CR.
12937
12952
12941
12944
12943
12947
13405
18848
13426
San Antonio Bay
St. Charles Bay
Mesquite Bay
Copano Bay
Aransas Bay
Nueces Bay
Corpus Christi Bay
Redfish Bay
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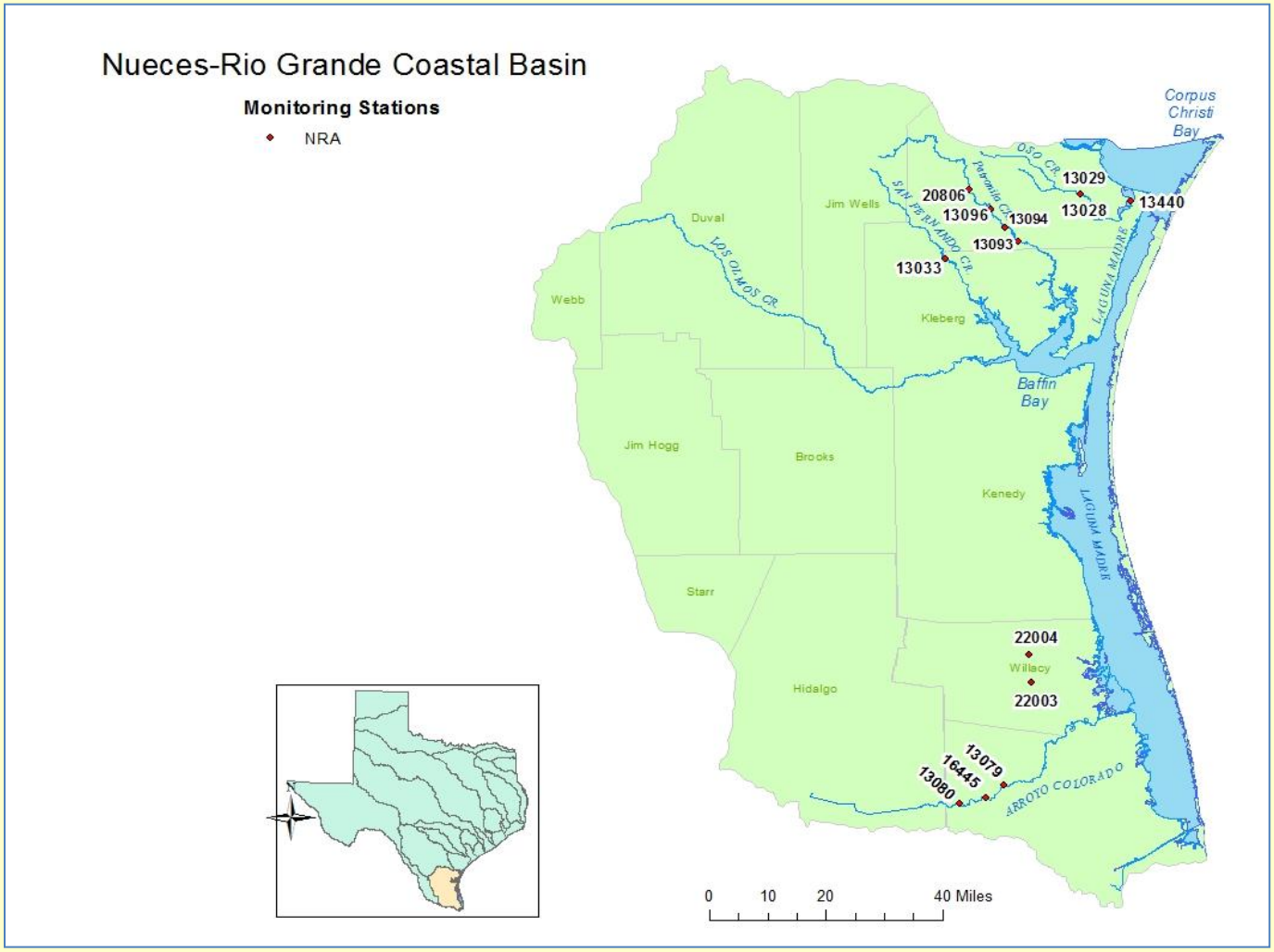
Nueces-Rio Grande Coastal Basin
Monitoring Stations
NRA
Corpus Christi Bay
Jim Wells
Duval
Webb
Kleberg
Jim Hogg
Brooks
Kenedy
Starr
Hidalgo
Willacy
Baffin Bay
LAGUNA MADRE
OSO CR.
SAN FERNANDO CR.
LOS OLMOS CR.
ARROYO COLORADO
20806
13029
13028
13440
13096
13094
13093
13033
22004
22003
13079
16445
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