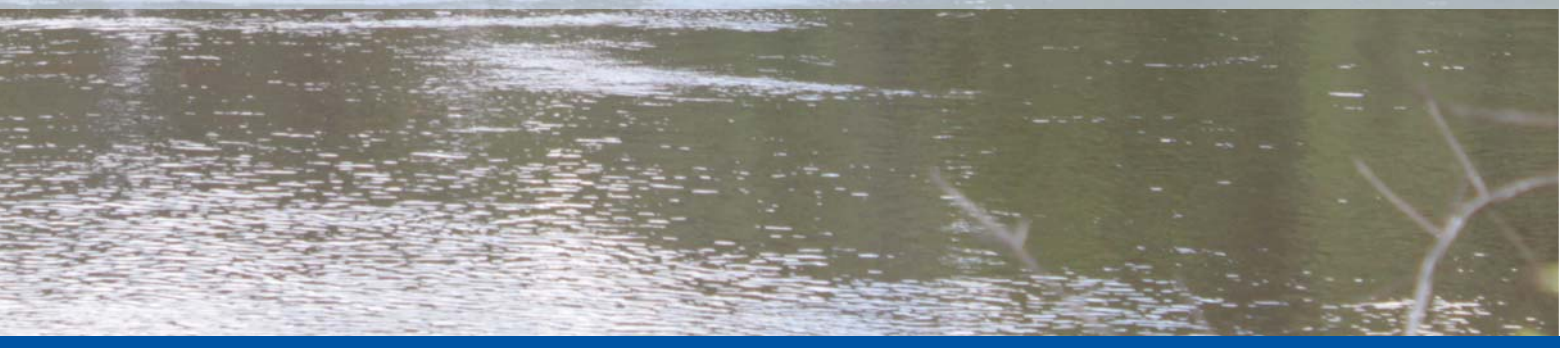
Angelina & Neches River Authority

THE TEXAS CLEAN RIVERS PROGRAM

2016 Basin Highlights Report

For the Upper Portion of the Neches River Basin



Neches River at US 59, June 2016

Angelina & Neches River Authority
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About the Basin Highlights Report

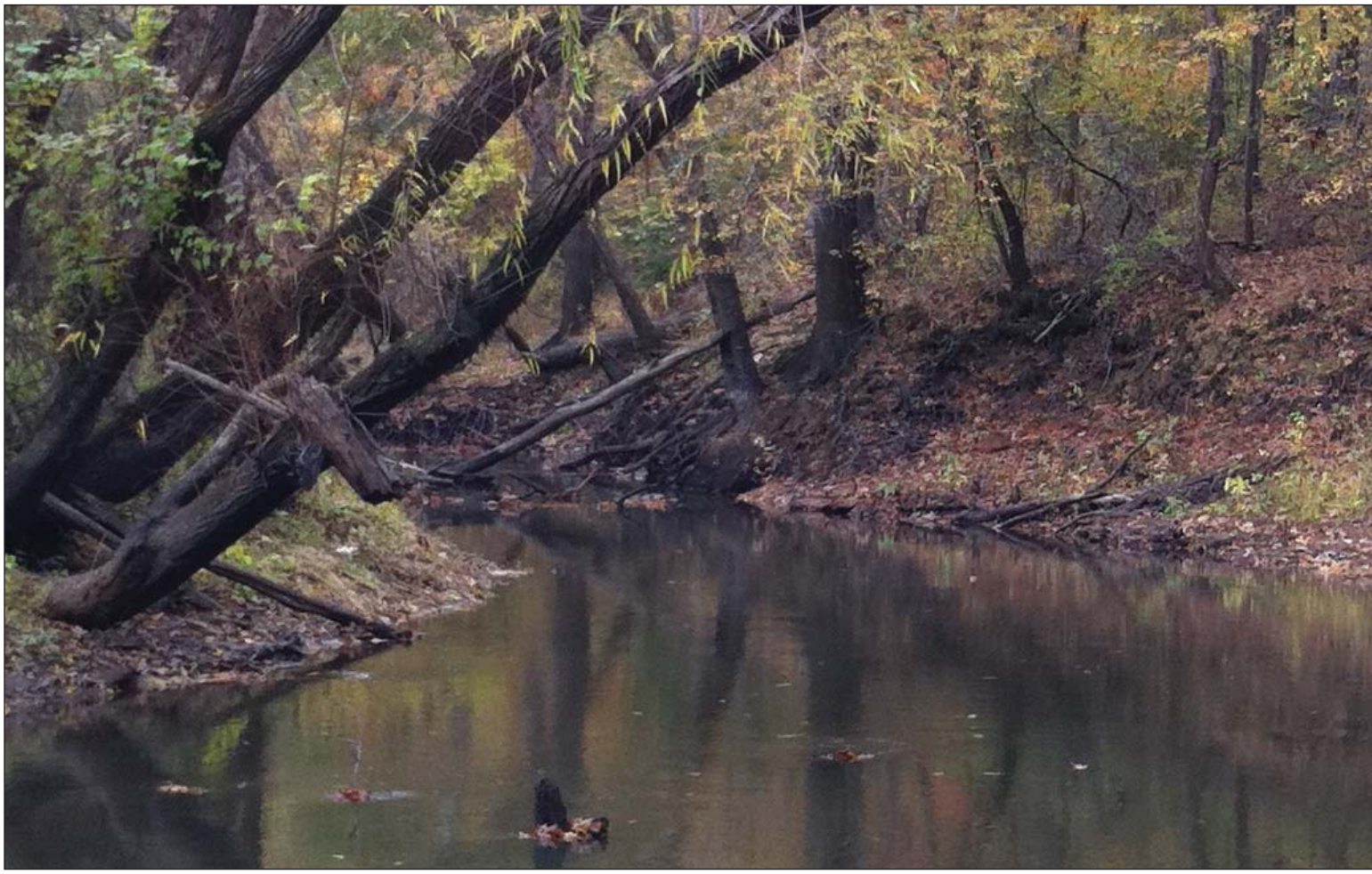
The **2016 Basin Highlights Report** is intended to provide a brief overview of the previous year's events and ongoing programs in the upper and middle portions of the Neches River Basin that are relevant to the Clean Rivers Program (CRP). Activities described in this report include the surface water quality monitoring activities of the Angelina & Neches River Authority (ANRA), events that could effect water quality, and special projects in the basin. Additionally, the report identifies impaired water bodies in the basin, as well as public outreach efforts.

For a more comprehensive look at the basin, please refer to the **2015 Basin Summary Report**. The report is available for download from ANRA's website at www.anra.org.

About The Clean Rivers Program

The Texas Clean Rivers Act, enacted in 1991 by the Texas legislature, requires that each Texas River Basin conduct ongoing water quality assessments, integrating water quality issues using a watershed management approach. The Clean Rivers Program implements the Clean Rivers Act through water quality monitoring, assessment, and public outreach. Currently, monitoring in the state of Texas includes over 1800 sites and regional water quality assessments within the 23 major river and coastal basins and their sub-watersheds.

The mission of the CRP is to maintain and improve the quality of water within each river basin in Texas through an ongoing partnership involving the Texas Commission on Environmental Quality (TCEQ), river authorities, other agencies, regional entities, local governments, industry, and citizens. The program's watershed management approach will identify and evaluate water quality issues, establish priorities for corrective action, work to implement those actions, and adapt to changing priorities.



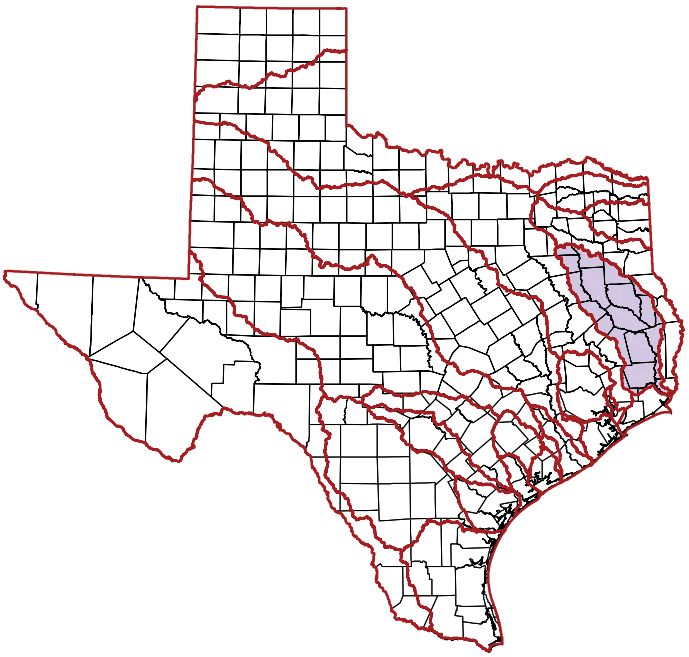
Angelina River at SH 204

About The Angelina & Neches River Authority

The Angelina & Neches River Authority (ANRA) was created in 1935 by the Texas legislature as a conservation and reclamation district. ANRA's office is located in Lufkin, Texas. ANRA's territorial jurisdiction consists of 8,500 square miles that lie wholly or in part of the following counties: Van Zandt, Smith, Henderson, Newton, Cherokee, Anderson, Rusk, Houston, Nacogdoches, San Augustine, Shelby, Angelina, Trinity, Sabine, Polk, Jasper, and Orange.

The Angelina & Neches River Authority has the responsibility for monitoring, protecting, and enhancing water resources in the Neches River Basin.

ANRA's functions in the basin include: water quality monitoring, drinking water and wastewater analysis, on-site sewage facility permitting, water and wastewater utilities, water resources development, regional wastewater/composting facilities, and other regional planning efforts.



This Year's Highlights

New Field Monitoring Equipment

The TCEQ, through a long-term equipment loan program, has provided ANRA with a new multiprobe sonde and display unit for use in Clean Rivers Program monitoring activities. The new YSI EXO-1 sonde is capable of measuring pH, conductivity, temperature, and dissolved oxygen. This multiprobe replaces a YSI 600XLM that was purchased in 2007.

The new mulitprobe and handheld display is a welcome addition to ANRA's water quality monitoring program. Although the previous instrument had been very reliable for a long time, it was reaching the end of its useful life. The new equipment allows for reduced ongoing maintenance costs, better data storage/transfer/management capabilities, and faster response times.

In the near future, ANRA hopes to replace its flow measurement instrumentation as well, either as part of another equipment loan from TCEQ or through direct purchase.

Calibration of the multiprobe sonde

ANRA Environmental Laboratory

For water samples collected by ANRA, analysis of conventional and bacteriological parameters is performed by the ANRA Environmental Laboratory. The ANRA Environmental Laboratory is certified by the National Environmental Laboratory Accreditation Program (NELAP) for the chemical and microbiological analysis of potable and non-potable water. The laboratory performs analysis of drinking water, wastewater, and surface water samples for numerous entities and private individuals in the basin, including the Clean Rivers Program.

Beginning in FY 2014, ANRA increased the number of stations it monitors from 25 to 40 stations per quarter. We were able to do this even while other agencies statewide were reducing the number and/or frequency of monitoring due to budget cuts. ANRA was able to achieve this increase in monitoring activities due to a long-term goal to modernize and invest in the ANRA Environmental Laboratory. ANRA began the process of investing in the laboratory operations by implementing a Laboratory Information Management System in 2009. Since that time, ANRA has made significant changes to the laboratory in the form of automated analytical instrumentation, including a flow-injection analysis system and an ion chromatograph. This instrumentation has allowed ANRA to significantly increase sample throughput, reduce labor and supply costs, increase reproducibility, and lower analytical detection limits.

In November 2015, the ANRA Environmental Laboratory was assessed by TCEQ to evaluate the laboratory's quality systems, capabilities, and qualifications and to determine the extent of conformance to the NELAP standards and the rules enacted by the State of Texas for accreditation of environmental laboratories. These assessments occur every two years. The ANRA Environmental Laboratory successfully completed the assessment, with TCEQ concurring with ANRA's corrective action responses and closing out the assessment.

For more information regarding the ANRA Environmental Laboratory, including services offered by the Laboratory, please contact:

Trey Reeves
Laboratory Manager
Angelina & Neches River Authority
210 E. Lufkin Ave.
Lufkin, TX 75901
Phone: (936) 633-7542
Email: treeves@anra.org

2016 Neches River Basin Coordinated Monitoring Meeting

The 2016 Coordinated Monitoring Meeting (CMM) for the Neches and Neches/Trinity River Basins was held on March 24, 2016 in Brookeland, TX. This meeting was attended by representatives from the Angelina & Neches River Authority (ANRA), Lower Neches Valley Authority (LNVA), Texas Parks and Wildlife Department (TPWD), and the Texas Commission on Environmental Quality (TCEQ). The purpose of the CMM is to allow the various agencies conducting surface water quality monitoring in the basin to coordinate schedules, frequency, and coverage. A coordinated monitoring schedule reduces the duplication of effort, as well as improving the spatial coverage of monitoring stations.

This meeting was to set the monitoring schedule for FY 2017, which begins September 1, 2016. Based upon the discussions at the meeting, neither ANRA nor LNVA proposed any changes to their monitoring schedules for FY 2017. The Tyler regional office of TCEQ will discontinue monitoring of Station 20828 (Neches at Van Zandt CR 4511). This station is located at the headwaters of the Neches River, and due to its intermittent nature during times of drought, it has not been possible to collect routine monitoring samples at that location. Station 10597 (Neches at SH 64) will represent that portion of the segment, as it is located within the same assessment unit. This change allows for more consistency in monitoring activities while still maintaining spatial representation in monitoring locations.

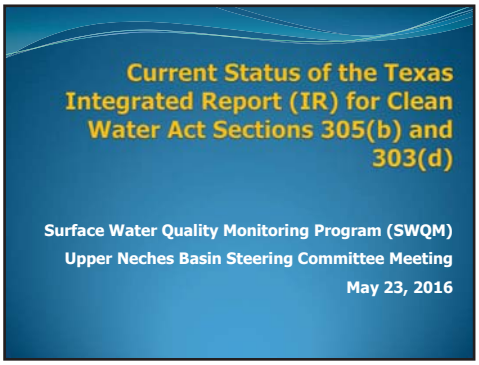
2016 Upper Neches Basin Clean Rivers Program Steering Committee Meeting

ANRA's Clean Rivers Program Steering Committee met on May 23, 2016 at ANRA's Central Office in Lufkin. The meeting had an excellent turnout, and was attended by representatives of ANRA, TCEQ, TPWD, the Texas Railroad Commission, the Texas Water Resources Institute, Castilaw Environmental, Stephen F. Austin State University, Nacogdoches County Environmental Health and Safety, Pineywoods Resource Conservation & Development, the Sentinels, and private individuals.

Presentations at the meeting included a discussion on ANRA's water quality monitoring activities, an update on the Attoyac Bayou watershed (including current and future projects to address nonpoint source pollution in the wastershed), and an update on the current status of the development of the latest Integrated Report.

More information about the Clean Rivers Program Steering Committee, including how to join, is presented later in the Basin Highlights Report.

2016 Neches River Basin Steering Committee Meeting



Flooding in the Neches River Basin

One thing that is consistent about the weather in East Texas is that it is never consistent. Although the Neches Basin has fared better than our neighbors in Houston or to the east in the Sabine Basin, we have still had to deal with flooding issues. This is in stark contrast to periods of drought we have been dealing with in recent years.

Both the Neches and Angelina Rivers have been above flood stage in the past few months, making water quality monitoring much more challenging.

Flooding on the Neches River at US 59 in Diboll, June 10, 2016

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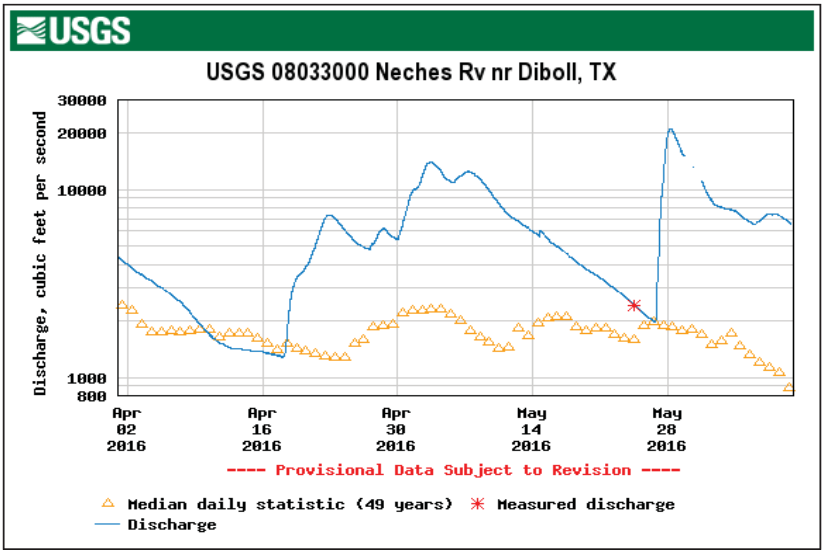
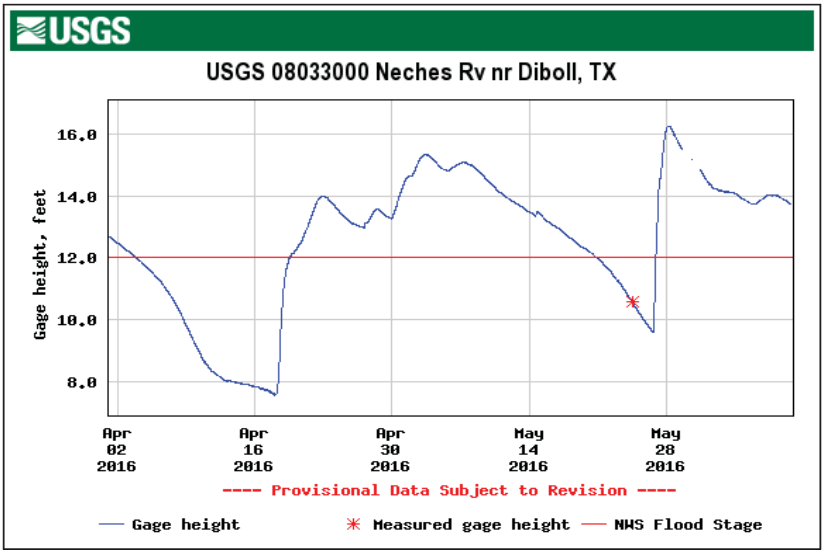
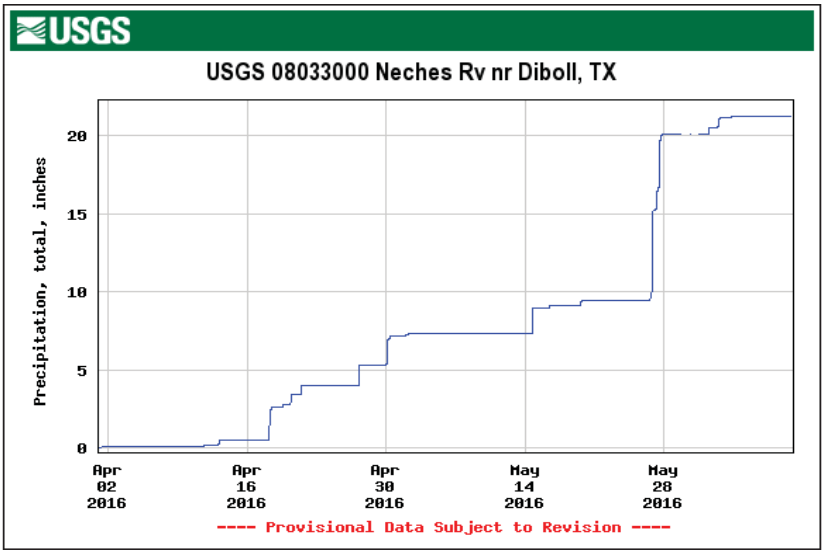

USGS
USGS 08033000 Neches Rv nr Diboll, TX
Discharge, cubic feet per second
30000
20000
10000
1000
800
Apr 02 2016
Apr 16 2016
Apr 30 2016
May 14 2016
May 28 2016
---- Provisional Data Subject to Revision ----
Median daily statistic (49 years)
Measured discharge
Discharge

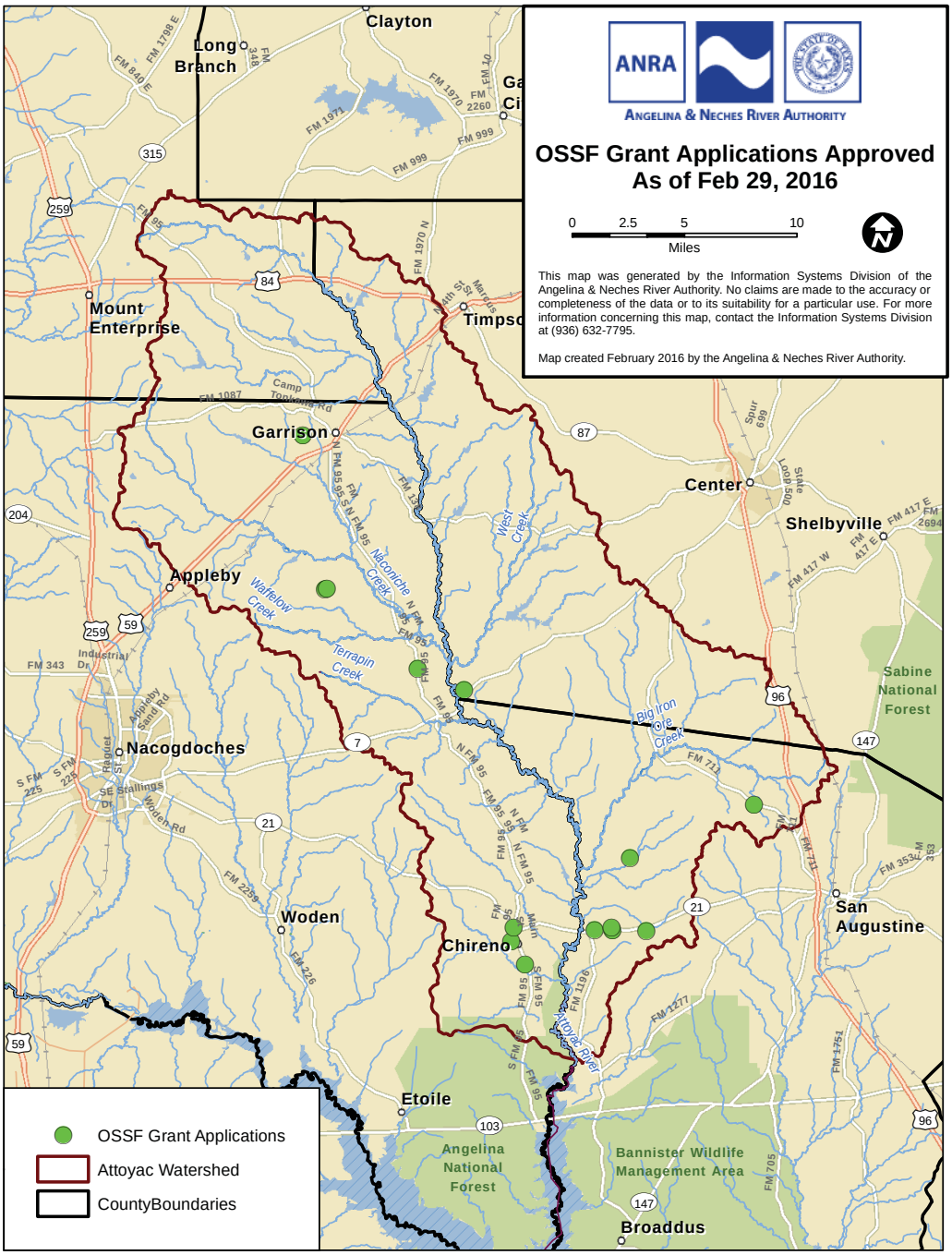

USGS
USGS 08033000 Neches Rv nr Diboll, TX
Gage height, feet
16.0
14.0
12.0
10.0
8.0
Apr 02 2016
Apr 16 2016
Apr 30 2016
May 14 2016
May 28 2016
---- Provisional Data Subject to Revision ----
Gage height
Measured gage height
NWS Flood Stage


USGS
USGS 08033000 Neches Rv nr Diboll, TX
Precipitation, total, inches
20
15
10
5
0
Apr 02 2016
Apr 16 2016
Apr 30 2016
May 14 2016
May 28 2016
---- Provisional Data Subject to Revision ----

Lake Sam Rayburn OSSF Program Support and Attoyac Bayou OSSF Remediation

Through this project, ANRA developed a database of On-Site Sewage Facilities (OSSFs) in the Control Zone Rayburn (CZR), the 2000-ft buffer zone around Sam Rayburn Reservoir, as well as the unincorporated portion of San Augustine County. The database is being used to track and map all permitted systems in the project area, which includes a portion of the Attoyac Bayou watershed, a 303(d) listed waterbody impaired for bacteria.

Failing or non-existent OSSFs in the Attoyac Bayou watershed have been identified through a combination of database tracking of complaints and violations, field reconnaissance and inspections, and consultations with local officials. Funds from the project are being used to install aerobic OSSFs in the portions of Nacogdoches, San Augustine, Shelby, and Rusk Counties that lie within the Attoyac Bayou watershed. Replacement or installation of OSSFs will reduce potential sources of nonpoint source (NPS) pollution that may be contributing to the bacteria impairments in the watershed. Failing septic systems were listed in the *Attoyac Bayou Watershed Protection Plan* as one of the leading potential sources of the bacterial impairments.



Map of Attoyac Bayou OSSF Project Area

Project Partners

Funding for the project is provided by the Texas Commission on Environmental Quality (TCEQ) through a Clean Water Act, Section 319(h) grant from the U.S. Environmental Protection Agency (EPA).

Failing OSSF systems in the Attoyac Bayou Watershed

Aerobic OSSF systems installed in the Attoyac Bayou Watershed

Water Quality in the Upper Neches River Basin

Impairments and Concerns

Bacterial impairments are the most common reason for water bodies in the upper and middle portions of the Neches River Basin to be listed on the 303(d) List. Three classified segments (Neches River Above Lake Palestine, Angelina River Above Sam Rayburn Reservoir, and Attoyac Bayou) have a bacterial impairment listed in the 2014 Integrated Report. Additionally, thirteen unclassified segments have impairments or concerns for *E. coli* bacteria. Generally, most bacterial impairments are due to nonpoint sources of pollution.

Numerous segments had concerns for nutrients, particularly Ammonia-Nitrogen and Total Phosphorus.

Depressed Dissolved Oxygen levels were common in the basin. These impairments and concerns are most likely due to a combination of low flows and elevated nutrient levels.

2015 Basin Summary Report

For more information on the water quality in the Neches Basin, please refer to the **2015 Basin Summary Report** for the Upper Portion of the Neches River Basin. The report is available for download on ANRA's website at www.anra.org.

A print version of the report can be requested by contacting the Angelina & Neches River Authority at 936-632-7795 or by emailing a request to info@anra.org.

Impairments and Concerns in the Upper Neches Basin (as listed in the 2014 Texas Integrated Report)			
Segment ID	**Segment Name**	**Impairment(s)**	**Concern(s)**
0604	Neches River Below Lake Palestine	Mercury in Edible Tissue Dioxin in Edible Tissue	Chlorophyll-*a*
0604A	Cedar Creek	*E. coli*	Ammonia-Nitrogen Nitrate-Nitrogen Total Phosphorus
0604B	Hurricane Creek	*E. coli*	Ammonia-Nitrogen
0604C	Jack Creek	No Impairments	Depressed Dissolved Oxygen Ammonia-Nitrogen Total Phosphorus
0604D	Piney Creek	Depressed Dissolved Oxygen	Depressed Dissolved Oxygen Ammonia-Nitrogen
0604M	Biloxi Creek	*E. coli*, Depressed Dissolved Oxygen	Depressed Dissolved Oxygen Ammonia-Nitrogen Total Phosphorus
0604N	Buck Creek	No Impairments	Ammonia-Nitrogen
0604T	Lake Ratcliff	Mercury In Edible Tissue	No Concerns
0605	Lake Palestine	pH	Depressed Dissolved Oxygen Chlorophyll-*a* pH (High)
0605A	Kickapoo Creek	*E. coli*, Depressed Dissolved Oxygen	Depressed Dissolved Oxygen Ammonia-Nitrogen
0606	Neches River Above Lake Palestine	*E. coli* Depressed Dissolved Oxygen pH (Low)	*E. coli* Depressed Dissolved Oxygen Nitrate-Nitrogen Total Phosphorus Zinc in Water
0606A	Prairie Creek	*E. coli*	No Concerns
0606D	Black Fork Creek	*E. coli*	Ammonia-Nitrogen
0609	Angelina River Below Sam Rayburn Reservoir	Mercury in Edible Tissue Dioxin in Edible Tissue	No Concerns
0610	Sam Rayburn Reservoir	Mercury in Edible Tissue Dioxin in Edible Tissue	Depressed Dissolved Oxygen Ammonia-Nitrogen pH Iron in Sediment Manganese in Sediment Mercury in Edible Tissue
0610A	Ayish Bayou	*E. coli*	No Concerns
0611	Angelina River Above Sam Rayburn Reservoir	*E. coli* Aluminum in Water	Lead in Water
0611A	East Fork Angelina River	*E. coli*	*E. coli*
0611B	La Nana Bayou	*E. coli*	*E. coli* Ammonia-Nitrogen Nitrate-Nitrogen Total Phosphorus
0611C	Mud Creek	*E. coli* Aluminum in Water	*E. coli* Depressed Dissolved Oxygen
0611D	West Mud Creek	*E. coli*	Ammonia-Nitrogen Nitrate-Nitrogen
0611Q	Lake Nacogdoches	No Impairments	Ammonia-Nitrogen
0611R	Lake Striker	No Impairments	Ammonia-Nitrogen
0612	Attoyac Bayou	*E. coli*	Depressed Dissolved Oxygen Ammonia-Nitrogen
0615	Angelina River/Sam Rayburn Reservoir	Depressed Dissolved Oxygen Impaired Fish Community Mercury in Edible Tissue Dioxin in Edible Tissue	Nitrate-Nitrogen Total Phosphorus
0615A	Paper Mill Creek	*E. coli* Aluminum in Water	No Concerns

Water Quality Monitoring in the Upper Portion of the Neches Basin

In FY 2016, the Angelina & Neches River Authority monitors 40 sites quarterly for field, conventional parameters and bacteria, with an additional site being monitored for bacteria and field parameters. The Texas Commission on Environmental Quality (TCEQ) also has a robust sampling program in the basin, with monitoring being conducted by both Region 5 (Tyler) and Region 10 (Beaumont) staff. The Lower Neches Valley Authority (LNVA), which monitors primarily in the lower portion of the basin, also monitors Sam Rayburn Reservoir in the upper portion of the basin.

Number of Monitoring Stations in the Upper Neches Basin for FY 2016

Sampling Entity	*Field*	*Conventional*	*Bacteria*	*Flow*	*Metals in Water*	*Metals in Sediment*
ANRA	40	40	41	32	0	0
TCEQ - Region 5	23	23	23	9	0	0
TCEQ - Region 10	20	20	20	5	0	6
LNVA	6	6	6	1	0	0

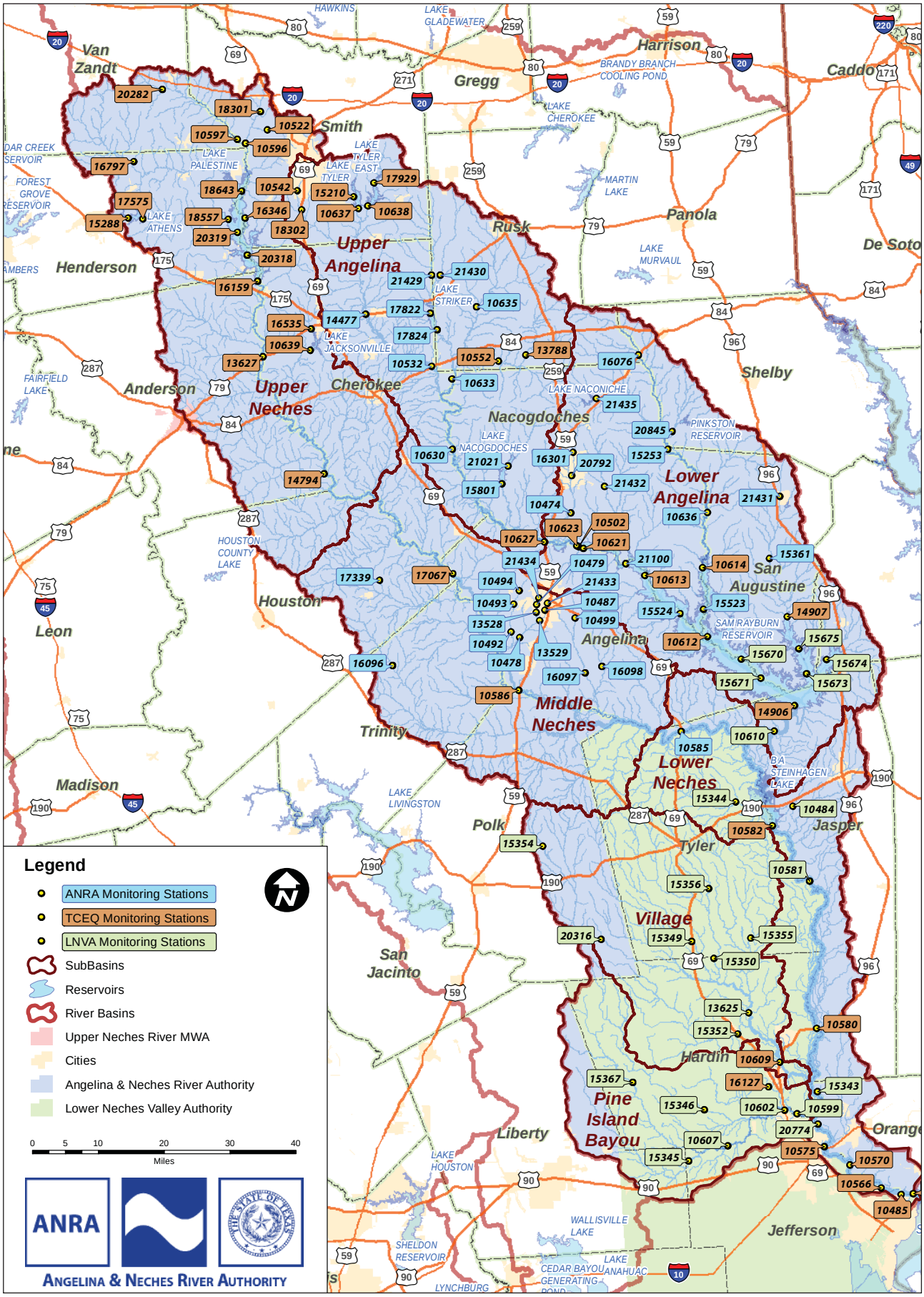
ANRA monitoring personnel collect both field and conventional parameters at monitoring stations, with stations being monitored on a quarterly basis. The following table lists the parameters that ANRA collects and monitors.

Parameters for Quarterly Monitoring

Field Parameters	*Conventional Parameters*	*Bacterial Parameters*
Dissolved Oxygen Days Since Last Significant Rainfall Flow Severity Instantaneous Stream Flow pH Present Weather Secchi Transparency Specific Conductance Total Water Depth Water Temperature	Ammonia-Nitrogen Chloride Chlorophyll-*a* Pheophytin-*a* Sulfate Nitrate-Nitrogen Nitrite-Nitrogen Total Phosphorus Total Suspended Solids (TSS)	*E. coli*

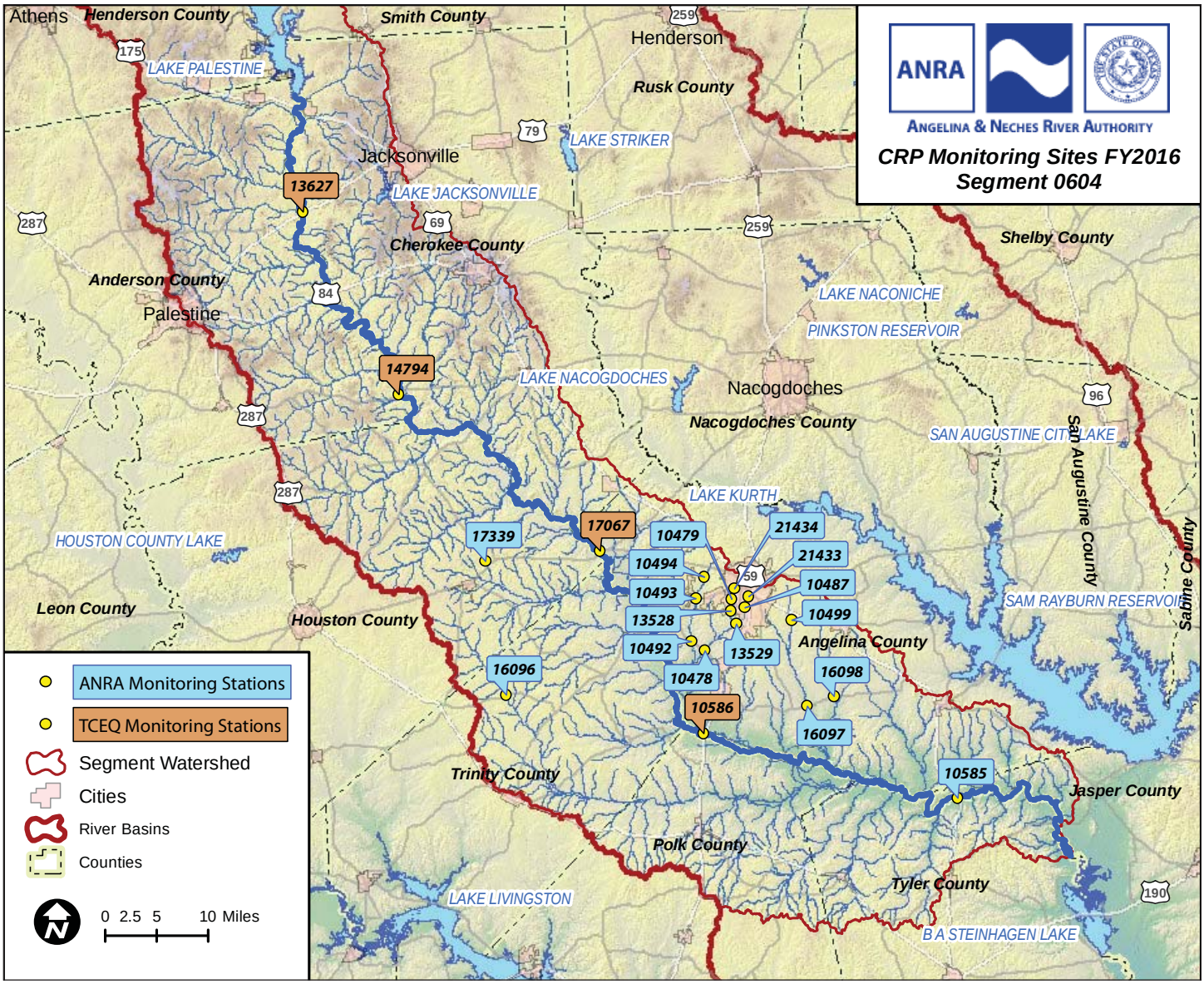
A map of monitoring stations in the Neches Basin is located on the next page. Detailed maps and listings of monitoring stations, including monitoring frequencies, are presented on the following pages.

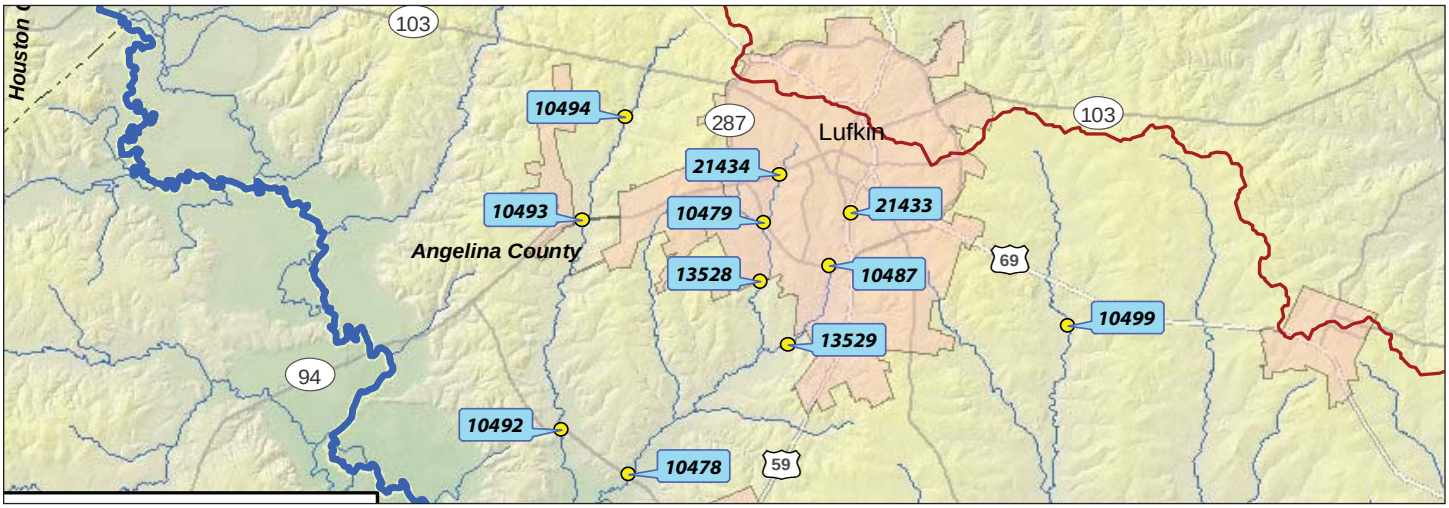
La Nana Creek at CR 526 (Monitoring Station 10474)



Map of Monitoring Stations in the Neches Basin

Segment 0604 - Neches River Below Lake Palestine



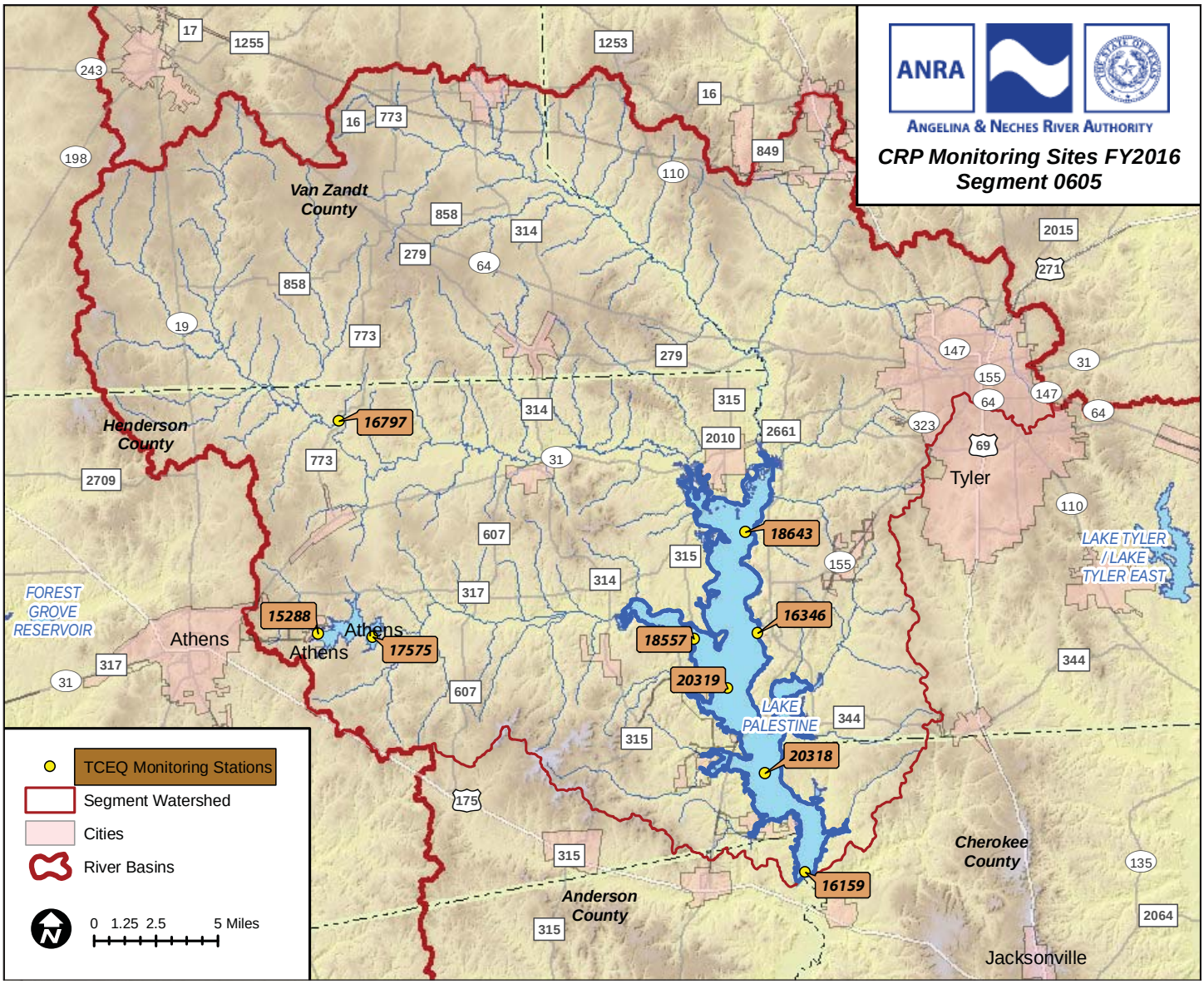


Detail of monitoring stations in Lufkin

Monitoring Stations in Segment 0604 - Neches River Below Lake Palestine								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0604 - Neches River Above Lake Palestine								
10585	NECHES RIVER AT US 69	4	4	4	4			ANRA
10586	NECHES RIVER AT US 59	4	4	4	4			TCEQ-10
17067	NECHES RIVER AT SH 7	4	4	4				TCEQ-10
14794	NECHES RIVER AT SH 294 23.12 KM SOUTHWEST OF RUSK IN ANDERSON COUNTY	4	4	4	4			TCEQ-5
13627	NECHES RIVER DOWNSTREAM LAKE PALESTINE AT US 79 4.4 MI NORTH OF NECHES 0.67 MI DOWNSTREAM FROM RAILROAD BRIDGE	4	4	4	4			TCEQ-5
Segment 0604A - Cedar Creek								
13528	CEDAR CREEK AT FM 1336	4	4	4	4			ANRA
10478	CEDAR CREEK AT FM 2497	4	4	4	4			ANRA
21434	CEDAR CREEK AT ELLIS AVE IN LUFKIN	4	4	4	4			ANRA
10479	CEDAR CREEK AT LOOP 287	4	4	4	4			ANRA
Segment 0604B - Hurricane Creek								
13529	HURRICANE CREEK AT FM 324	4	4	4	4			ANRA
21433	HURRICANE CREEK 38 METERS DOWNSTREAM OF KIWANIS PARK DRIVE	4	4	4	4			ANRA
10487	HURRICANE CREEK AT LOOP 287	4	4	4	4			ANRA
Segment 0604C - Jack Creek								
10492	JACK CREEK AT FM 2497	4	4	4	4			ANRA
10493	JACK CREEK AT SH 94	4	4	4	4			ANRA
10494	JACK CREEK AT FM 3150	4	4	4	4			ANRA
Segment 0604D - Piney Creek								
16096	PINEY CREEK AT FM 358 EAST OF PENNINGTON	4	4	4	4			ANRA
Segment 0604M - Biloxi Creek								
16097	BILOXI CREEK AT FM 1818	4	4	4	4			ANRA
10499	BILOXI CREEK AT ANGELINA CR 216	6		6	6			ANRA
Segment 0604N - Buck Creek								
16098	BUCK CREEK AT FM 1818	4	4	4	4			ANRA
Segment 0604T - Lake Ratcliff								
17339	LAKE RATCLIFF NORTHWEST ARM	4	4	4	4			ANRA

Neches River at US 69 (Monitoring Station 10585)

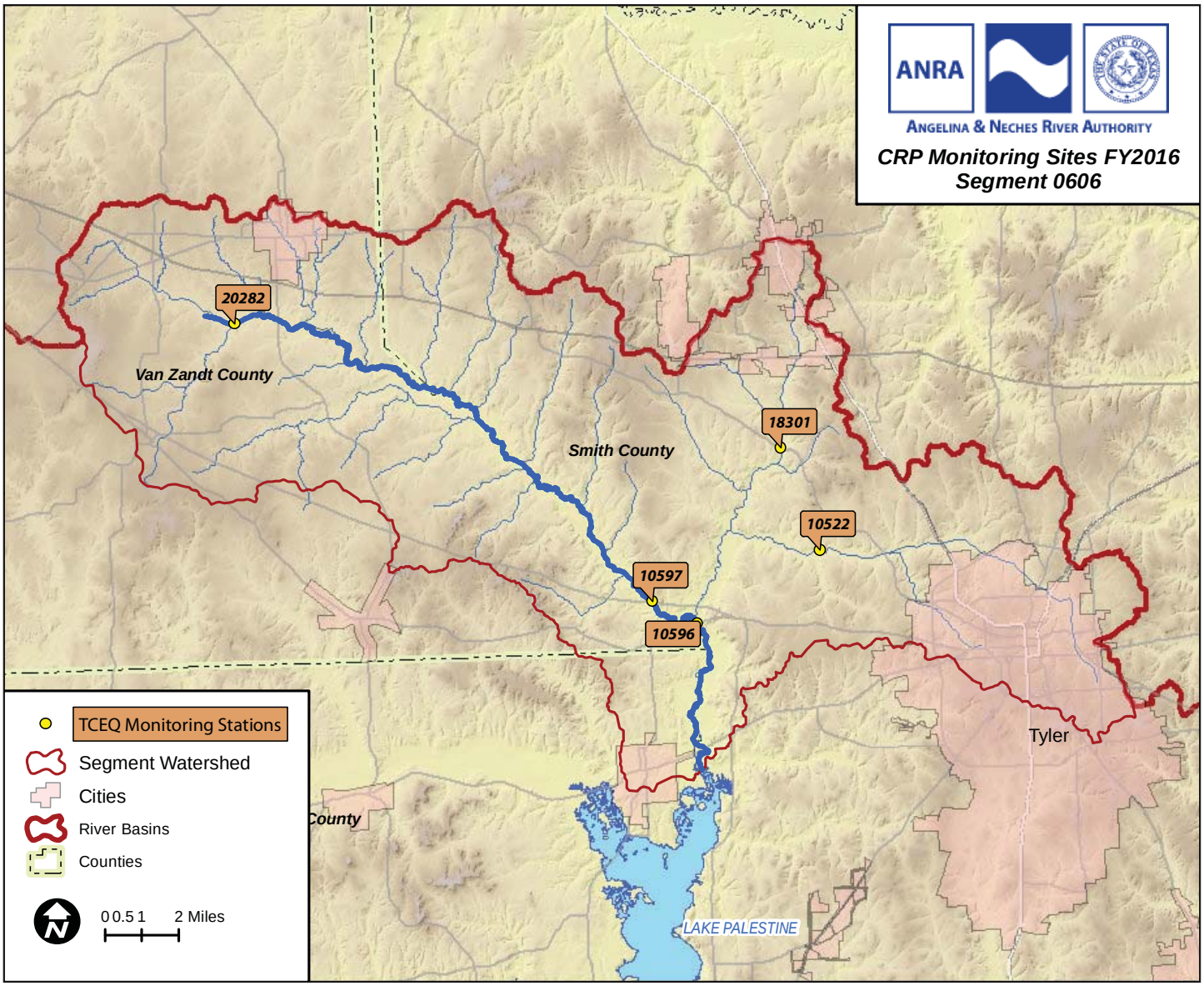
Segment 0605 - Lake Palestine



Lake Palestine at SH 315 bridge

Monitoring Stations in Segment 0605 - Lake Palestine								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0605 - Lake Palestine								
16159	LAKE PALESTINE AT DAM	4	4	4				TCEQ-5
20318	LAKE PALESTINE, MIDLAKE, APPROXIMATELY 2.35 MILES DUE SOUTH OF THE NORTH END OF THE SH155 BRIDGE	4	4	4				TCEQ-5
16346	LAKE PALESTINE AT TYLER INTAKE	4	4	4				TCEQ-5
18557	LAKE PALESTINE IN FLAT BAY	4	4	4				TCEQ-5
18643	UPPER LAKE PALESTINE NE	4	4	4				TCEQ-5
20319	LAKE PALESTINE CWQMN SITE, MID-LAKE, 1.13 KM EAST TO THE END OF CAPE TRANQUILITY DRIVE AND 1.35 KM WEST TO THE END OF REGAL ROW	4	4	4				TCEQ-5
Segment 0605A - Kickapoo Creek								
16797	KICKAPOO CREEK AT FM 773	4	4	4	4			TCEQ-5
Segment 0605F - Lake Athens								
15288	LAKE ATHENS DOWNSTREAM OF WATER TREATMENT PLANT INFLOW WEST ARM OF LAKE 0.6 MI EAST NORTHEAST OF INTERSECTION OF FM 2495/FM 2892	4	4	4				TCEQ-5
17575	LAKE ATHENS NEAR NORTHEAST END OF DAM 375 M WEST OF SPILLWAY	4	4	4				TCEQ-5

Segment 0606 - Neches River Above Lake Palestine

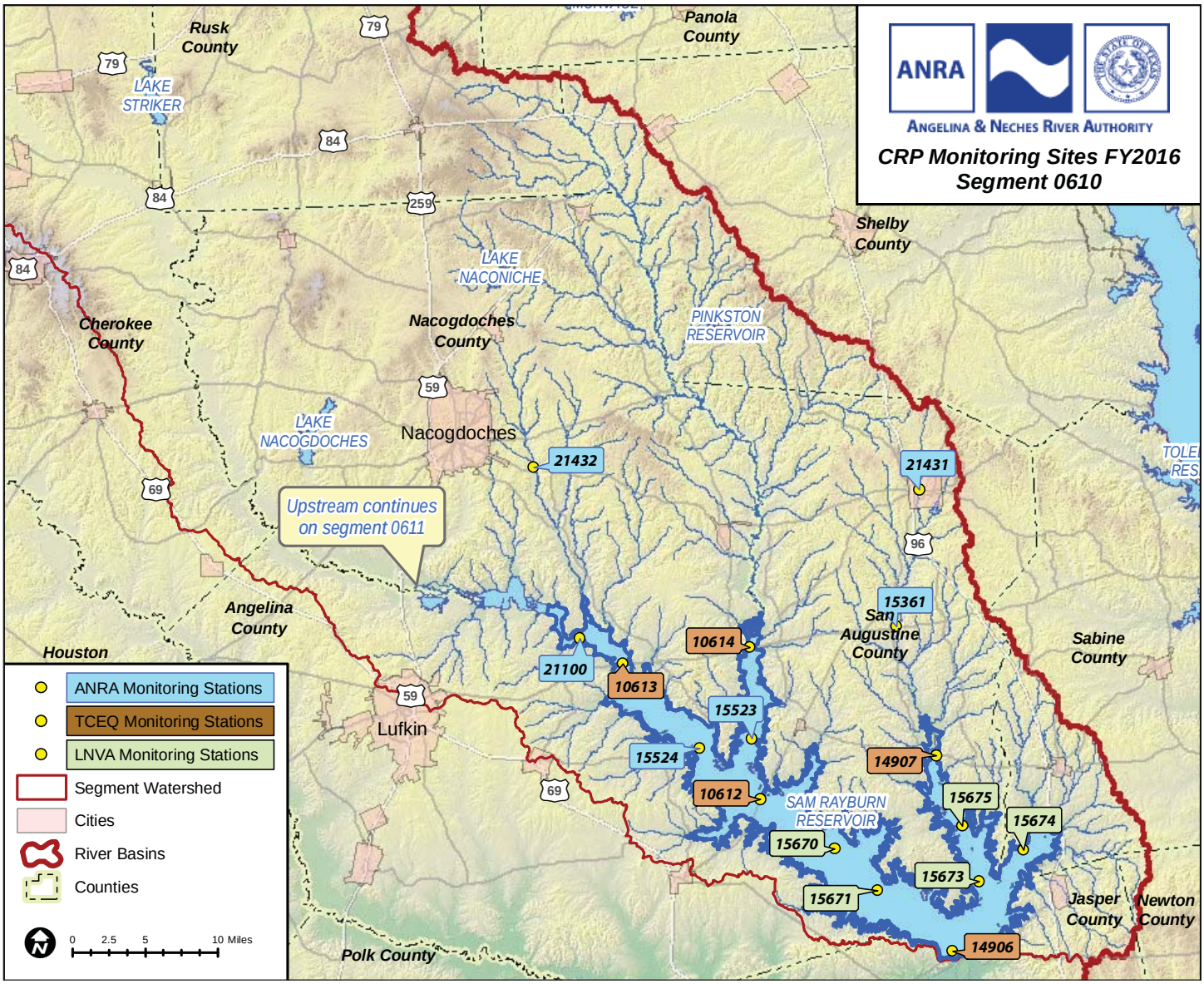


Monitoring Stations in Segment 0606 - Neches River Above Lake Palestine								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0606- Neches River Above Lake Palestine								
10596	NECHES RIVER AT FM 279 WEST OF TYLER AND NE OF CHANDLER	4	4	4	4			TCEQ-5
10597	NECHES RIVER UPSTREAM LAKE PALESTINE AT SH 64 WEST OF TYLER	4	4	4	4	5		TCEQ-5
Segment 0606A - Prairie Creek								
18301	PRAIRIE CREEK AT SH 110 6.5 MI NORTHWEST OF TYLER AND 3.5 MI SOUTHWEST OF LINDALE	4	4	4	4			TCEQ-5
Segment 0606D - Black Fork Creek								
10522	BLACK FORK CREEK AT SMITH CR 46 2.3 KM UPSTREAM OF TYLER-WESTSIDE WWTP 4.5 KM DOWNSTREAM OF PRAIRIE CREEK	4	4	4	4			TCEQ-5

Neches River Above Lake Palestine (image courtesy of the Texas Institute for Applied Environmental Research)

Neches River Above Lake Palestine (image courtesy of the Texas Institute for Applied Environmental Research)

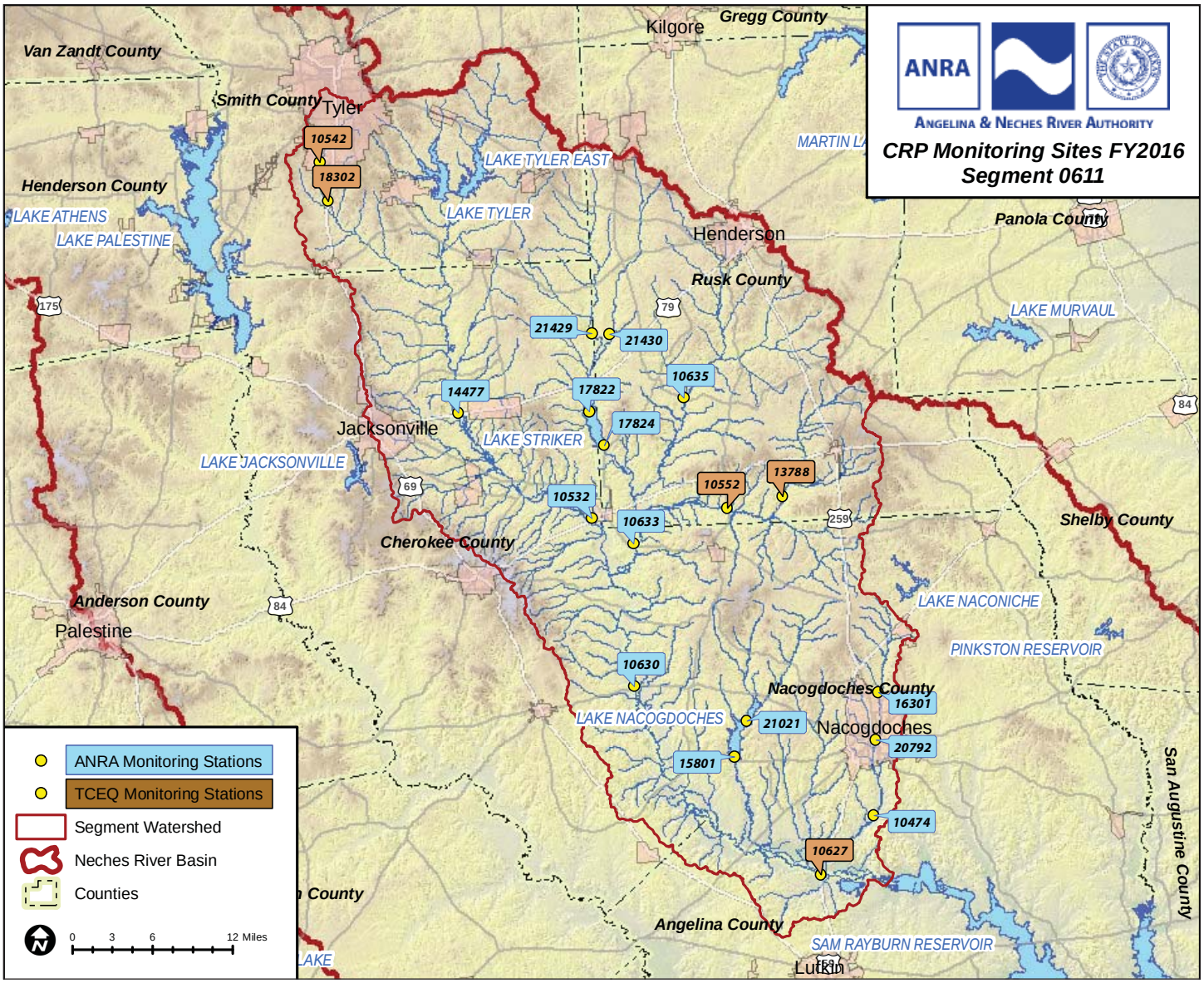
Segment 0610 - Sam Rayburn Reservoir



Sam Rayburn Reservoir near Shirley Creek Marina (Monitoring Station 15524)

Monitoring Stations in Segment 0610 - Sam Rayburn Reservoir								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0610 - Sam Rayburn Reservoir								
14906	SAM RAYBURN RESERVOIR AT MAIN POOL APPROXIMATELY 0.70 KM NORTH OF THE POWER PLANT INTAKE AT REC RD 255/ANGELINA RIVER	4	4	4			4	TCEQ-10
15671	SAM RAYBURN RESERVOIR USGS SITE FC 7.21 KM SOUTHWEST OF FM 3173/FM 705 INTERSECTION	4	4	4				LNVA
15670	SAM RAYBURN RESERVOIR USGS SITE GC 9.84 KM SOUTHEAST OF SH 147 6.56 KM NORTHEAST OF FM 2743/ FM 3373 INTERSECTION	4	4	4				LNVA
10612	SAM RAYBURN RESERVOIR AT SH 147 BRIDGE 9.75 KM SOUTHWEST OF BROADDUS AND 12.4 KM NORTHEAST OF ZAVALLA	4	4	4			4	TCEQ-10
15524	SAM RAYBURN RESERVOIR NEAR SHIRLEY CREEK IN THE ANGELINA RIVER CHANNEL 5.13 KM NE OF FM 2109/ FM 2801 INTERSECTION	4	4	4				ANRA
15523	SAM RAYBURN RESERVOIR ADJACENT TO ALLIGATOR COVE IN THE ATTOYAC RIVER CHANNEL 3.94 KM NORTHWEST OF FM 3185/ SH 147 INTERSECTION	4	4	4				ANRA
10614	SAM RAYBURN RESERVOIR WEST SHORE AT SH 103 6.6 MILES EAST OF ETOILE	4	4	4				TCEQ-10
21100	SAM RAYBURN RESERVOIR ON ANGELINA RIVER CHANNEL 0.75 KM DOWNSTREAM OF MARIONS FERRY BOAT RAMP 4.2 KM NORTH AND 2.2 KM EAST OF FM 1669/ SH 103 INTERSECTION NEAR LUFKIN	4	4	4				ANRA
10613	SAM RAYBURN RESERVOIR AT SH 103 3.73 KM WEST-SOUTHWEST OF ETOILE	4	4	4				TCEQ-10
15674	SAM RAYBURN RESERVOIR USGS SITE LC 1.7 KM NORTHWEST OF MILL CREEK PARK SWIMMING AREA 3.96 KM NW OF ST LOOP 149/ US 96 INTERSECTION	4	4	4				LNVA
15673	SAM RAYBURN RESERVOIR USGS SITE AC 2.5 KM EAST NORTHEAST OF FM 705/FM 3127 INTERSECTION	4	4	4				LNVA
15675	SAM RAYBURN RESERVOIR USGS SITE MC 4.86 KM EAST NORTHEAST OF FM 3173/FM 705 INTERSECTION 8.8 KM DOWNSTREAM OF FM 83	4	4	4				LNVA
14907	SAM RAYBURN RESERVOIR AT FM 83 BRIDGE CROSSING 13.5 KM WEST OF PINELAND	4	4	4				TCEQ-10
Segment 0610A - Ayish Bayou								
15361	AYISH BAYOU AT SH 103 0.8 KM EAST OF FM 705	4	4	4	4			ANRA
21431	AYISH BAYOU AT WEST COLUMBIA STREET IN CITY OF SAN AUGUSTINE	4	4	4	4			ANRA
Segment 0610P - Bayou Carrizo								
21432	BAYOU CARRIZO AT SH 21 NEAR NACOGDOCHES	4	4	4	4			ANRA

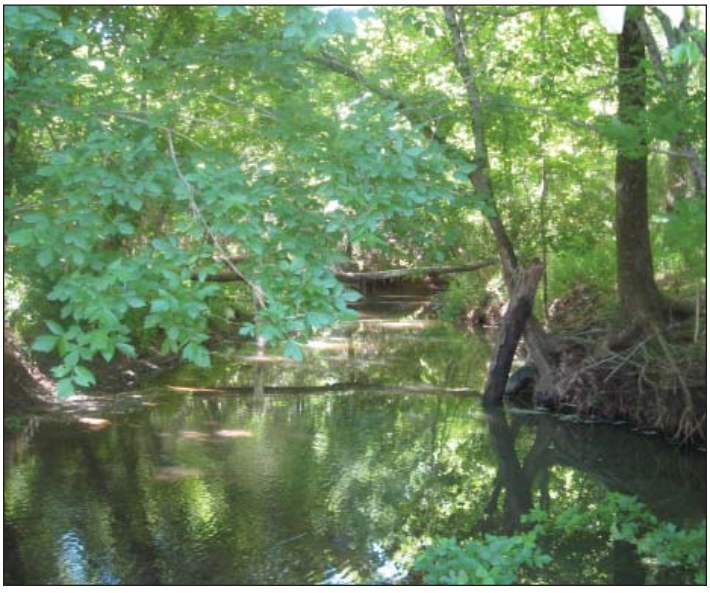
Segment 0611 - Angelina River Above Sam Rayburn Reservoir



Angelina River at SH 21 (Monitoring Station 10630)

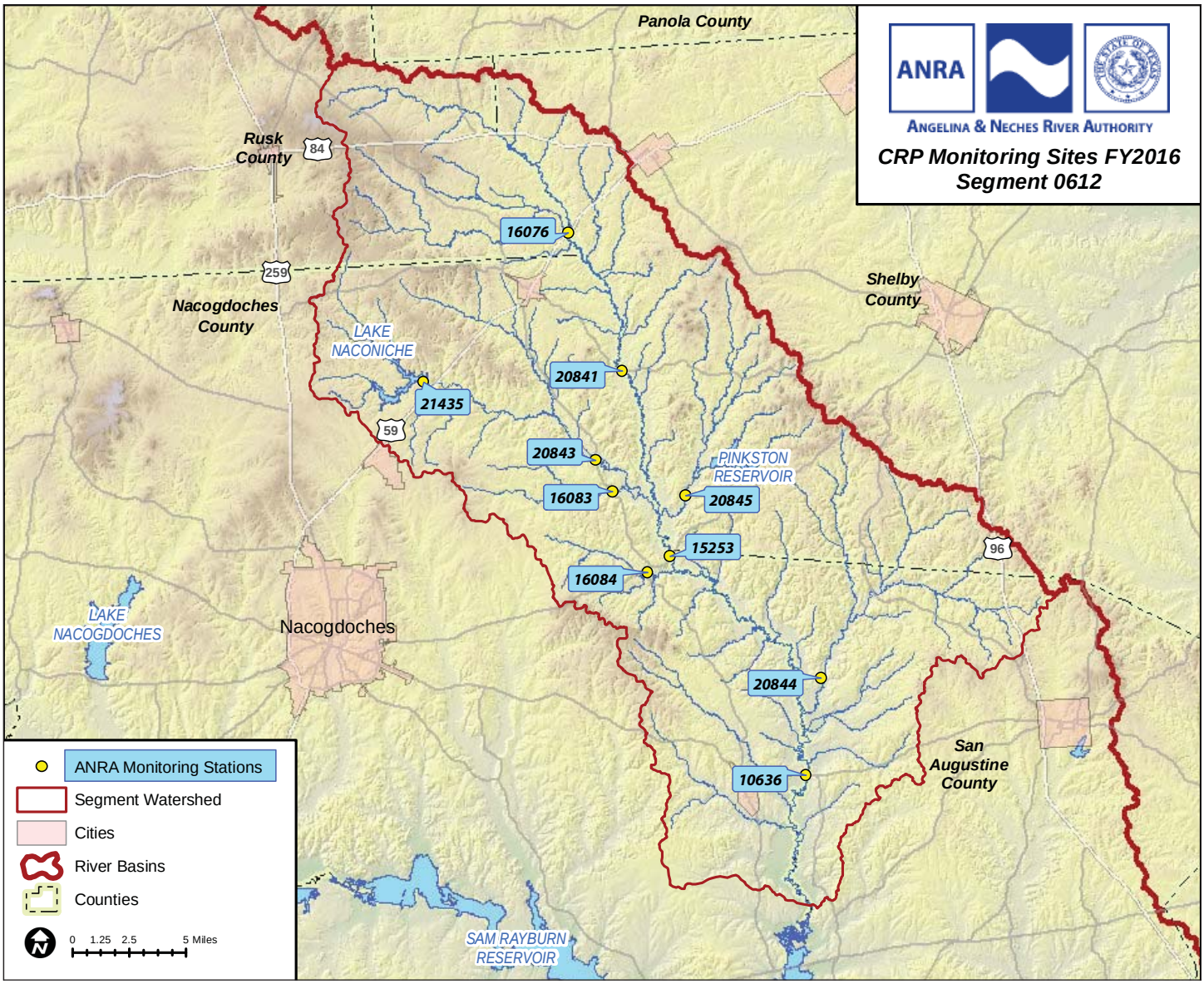
Monitoring Stations in Segment 0611 - Angelina River Above Sam Rayburn Reservoir								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0611 - Angelina River Above Sam Rayburn Reservoir								
10627	ANGELINA RIVER AT US 59	4	4	4	4			TCEQ-10
10630	ANGELINA RIVER AT SH 21	4	4	4	4			ANRA
10633	ANGELINA RIVER 340 METERS UPSTREAM OF SH 204	4	4	4	4			ANRA
10635	ANGELINA RIVER AT FM 1798	4	4	4	4			ANRA
Segment 0611A - East Fork Angelina River								
13788	EAST FORK ANGELINA RIVER AT RUSK CR 3218	4	4	4	5			TCEQ-5
10552	EAST FORK ANGELINA RIVER AT FM 225	4	4	4	4			TCEQ-5
Segment 0611B - La Nana Bayou								
10474	LA NANA BAYOU AT NACOGDOCHES CR 526 6.9 MI SOUTH OF NACOGDOCHES BETWEEN FM 2863 AND FM 3228	4	4	4	4			ANRA
20792	LA NANA BAYOU IMMEDIATELY UPSTREAM OF EAST MAIN STREET/STATE HIGHWAY 7/ STATE HIGHWAY 21 IN NACOGDOCHES	4	4	4	4			ANRA
16301	LA NANA BAYOU AT LOOP 224 NORTH IN THE CITY OF NACOGDOCHES 1.2 KM EAST OF THE INTERSECTION OF US BUS 59F/ST LOOP 224 NORTH	4	4	4	4			ANRA
Segment 0611C - Mud Creek								
14477	MUD CREEK AT US 79	4	4	4	4			ANRA
10532	MUD CREEK AT US 84	4	4	4	4			ANRA
Segment 0611D- West Mud Creek								
18302	WEST MUD CREEK AT US 69	4	4	4	4			TCEQ-5
Segment 0611Q - Lake Nacogdoches								
15801	LAKE NACOGDOCHES AT DAM	4	4	4				ANRA
21021	LAKE NACOGDOCHES NEAR ISLAND IN UPPER LAKE	4	4	4				ANRA
Segment 0611R - Lake Striker								
17822	LAKE STRIKER UPPER LAKE	4	4	4				ANRA
17824	LAKE STRIKER SE OF POWERPLANT	4	4	4				ANRA
Segment 0611V - Bowles Creek								
21429	BOWLES CREEK AT CHEROKEE CR 4608/RUSK CR 4194	4	4	4	4			ANRA
Segment 0611 W - Johnson Creek								
21430	JOHNSON CREEK AT RUSK CR 476	4	4	4	4			ANRA

Mud Creek at US 79 (Monitoring Station 14477)



La Nana Creek at Loop 224 N (Monitoring Station 16301)

Segment 0612 - Attoyac Bayou



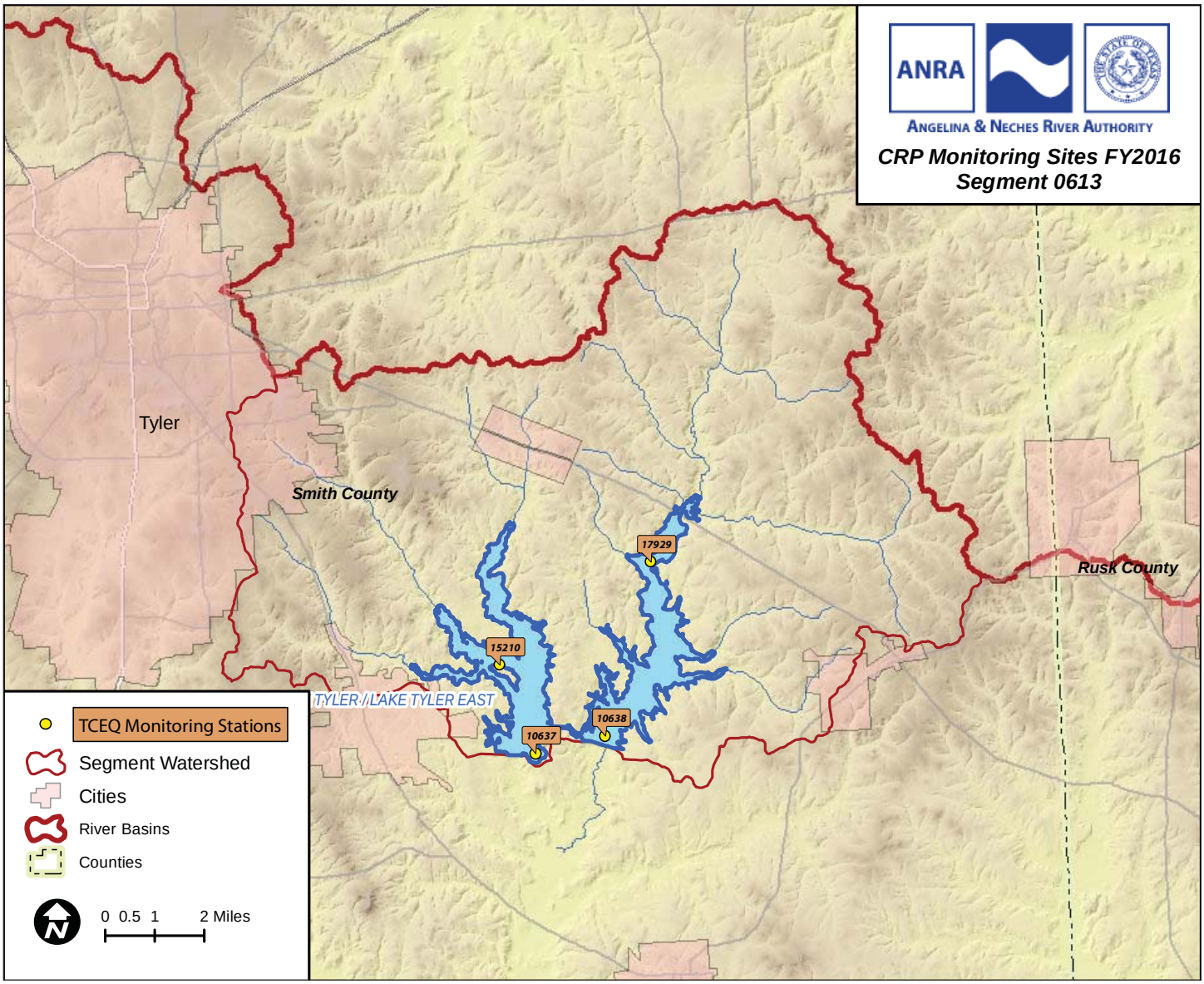
Big Iron Ore Creek at FM 354 (Monitoring Station (20844)

Boat ramp at Lake Naconiche

Monitoring Stations in Segment 0612 - Attoyac Bayou								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0612 - Attoyac Bayou								
10636	ATTOYAC BAYOU AT SH 21 0.71 KM WEST OF INTERSECTION OF SH 21/ FM 1196 4.77 KM EAST OF CHIRENO	4	4	4	4			ANRA
15253	ATTOYAC BAYOU AT SH 7 1.75 KM NORTHEAST OF MARTINSVILLE	4	4	4	4			ANRA
16076	ATTOYAC BAYOU AT US 59 4.12 KM NORTHEAST OF GARRISON	4	4	4	4			ANRA
20841	ATTOYAC BAYOU AT FM 138 9.65 KM SOUTHEAST OF US 59 IN GARRISON	12	12	12	12			ANRA
Segment 0612A- Terrapin Creek								
16084	TERRAPIN CREEK AT SH 95 1 MI SOUTH OF MARTINSVILLE	12	12	12	12			ANRA
Segment 0612B - Waffelow Creek								
16083	WAFFELOW CREEK AT FM 95 3.65 MI NORTH NORTHWEST OF MARTINSVILLE	12	12	12	12			ANRA
Segment 0612D - Naconiche Creek								
20843	NACONICHE CREEK AT FM 95 APPROXIMATELY 9 KM N OF INTERSECTION WITH SH 7 IN MARTINSVILLE	12	12	12	12			ANRA
Segment 0612E - Big Iron Ore Creek								
20844	BIG IRON ORE CREEK AT FM 354 APPROXIMATELY 9.65 KM N OF INTERSECTION WITH SH 21 AND NE OF SAN AUGUSTINE	12	12	12	12			ANRA
Segment 0612F - West Creek								
20845	WEST CREEK AT FM 2913 2.57 KM N OF INTERSECTION WITH SH 7	4	4	4	4			ANRA
Segment 0612G - Lake Naconiche								
21435	NACONICHE LAKE NEAR THE DAM 226 METERS NORTH AND 715 METERS WEST OF INTERSECTION OF FM 2435 AND US 59 NORTHEAST OF CITY OF NACOGDOCHES	4	4	4				ANRA

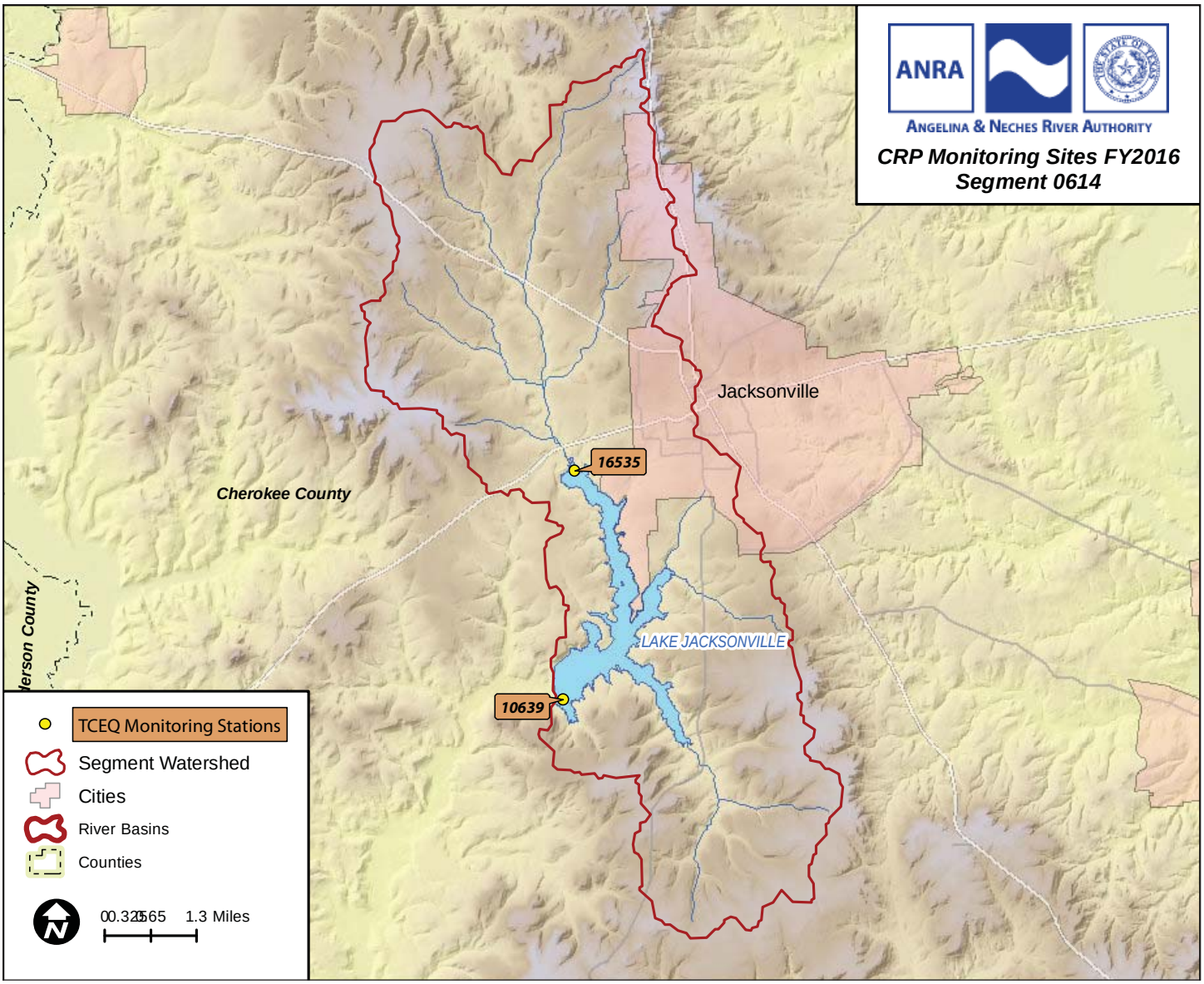
Attoyac Bayou at US 59 (Monitoring Station 16076)

Segment 0613 - Lake Tyler/Lake Tyler East



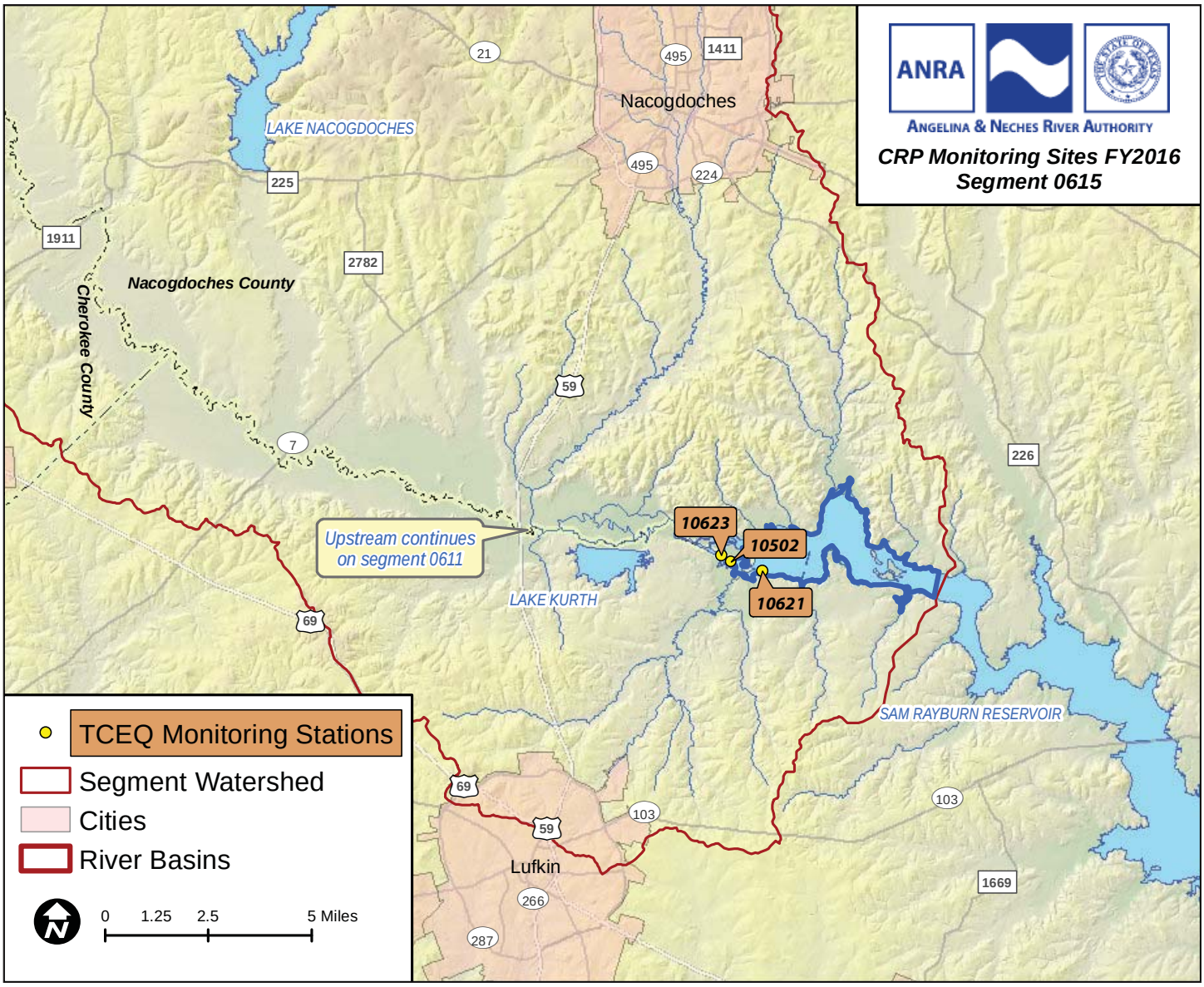
Monitoring Stations in Segment 0613 - Lake Tyler/Lake Tyler East								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0613 - Lake Tyler/Lake Tyler East								
10637	LAKE TYLER MIDLAKE AT DAM	4	4	4				TCEQ-5
15210	LAKE TYLER AT LANGLEY ISLAND	4	4	4				TCEQ-5
10638	LAKE TYLER EAST NEAR DAM	4	4	4				TCEQ-5
17929	LAKE TYLER EAST UPPER MID LAKE	4	4	4				TCEQ-5

Segment 0614 - Lake Jacksonville



Monitoring Stations in Segment 0614 - Lake Jacksonville								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0614 - Lake Jacksonville								
10639	SOUTHWEST CORNER OF LAKE JACKSONVILLE APPROX 100M UPSTREAM OF DAM AND EQUIDISTANT FROM BOTH SHORELINES	4	4	4				TCEQ-5
16535	LAKE JACKSONVILLE UPPER LAKE NEAR RAW WATER INTAKE STRUCTURE 760 M SOUTHEAST OF INTERSECTION OF FM 747/US79	4	4	4				TCEQ-5

Segment 0615 - Angelina River/Sam Rayburn Reservoir



Monitoring Stations in Segment 0615 - Angelina River/Sam Rayburn Reservoir								
Monitoring Station ID	Description	Annual Frequency						Monitoring Entity
		Field	Conv	Bacteria	Flow	Metals in Water	Metals in Sediment	
Segment 0615 - Angelina River/Sam Rayburn Reservoir								
10623	SAM RAYBURN RESERVOIR AT CONFLUENCE OF ANGELINA RIVER 0.75 KM NORTHWEST OF PAPER MILL CREEK	4	4	4				TCEQ-10
10621	SAM RAYBURN RESERVOIR NEAR ANGELINA RIVER 0.7 KM DOWNSTREAM OF CONFLUENCE WITH PAPER MILL CREEK LOWER CHANNEL	4	4	4				TCEQ-10
Segment 0615A - Paper Mill Creek								
10502	PAPER MILL CREEK UPPER BIFURCATION CHANNEL IMMEDIATELY UPSTREAM OF ANGELINA RIVER CONFLUENCE NW CORNER OF SAM RAYBURN RESERVOIR	4	4	4				TCEQ-10

Angelina River Above Sam Rayburn

Angelina River Above Sam Rayburn near Rivercrest

Stakeholder Participation and Public Outreach

ANRA Operations

The Angelina & Neches River Authority (ANRA) promotes public involvement in the Upper Neches Basin through numerous operations and departments. In addition to monitoring water quality through the Clean Rivers Program (CRP), ANRA operates and maintains numerous public drinking water and municipal wastewater facilities and maintains the on-site septic system program for Sam Rayburn Reservoir, Angelina County, and the unincorporated portion of San Augustine County. ANRA also operates an Environmental Laboratory offering services to the public. Additionally, ANRA produces and sells biosolids compost through our Neches Compost Facility.

Informational Literature

Numerous pamphlets, brochures, and other educational and informational literature on such topics as water quality, conservation, and on-site septic facilities are available to the public at ANRA's offices. ANRA supports the TPWD invasive species awareness campaign "Hello Giant Salvinia, Goodbye Texas Lakes" by making informational pamphlets available to the public.

Basin Steering Committee

The steering committee's role is advisory in nature and involves assistance with the review of local issues and creation of priorities for the Upper Neches river basin. Committee members assist with the review and development of work plans, reports, basin monitoring plans, allocation of resources, and basin action plans. CRP steering committee meetings are held annually each Spring. The committee is made up from a diverse group of stakeholders. One of the objectives of the CRP Long-Term Plan is to engage and inform stakeholders. The Steering Committee process gives stakeholders an opportunity to contribute their ideas and concerns through steering committee meetings, public meetings, and other forums. The process also allows for the communication of issues related to water quality so that priorities may be set which consider local, regional, state, and federal needs. The Steering Committee aids in increasing opportunities for citizens to identify pressing issues and concerns, contribute ideas to the CRP process, and functions to expand the public's role in water quality management issues.

Texas Stream Team

ANRA serves as the Texas Stream Team regional partner for the Upper Neches Basin and provides training, monitoring kits, and replacement reagents to the volunteer monitors in the basin. ANRA supports a number of water quality monitors in the basin. The largest and most active group is comprised of members of the Greater Lake Palestine Council (GLPC). GLPC consists of a group of representatives from each Property Owner's Association surrounding Lake Palestine. The GLPC is concerned about protecting water quality in Lake Palestine and making other improvements in the area.

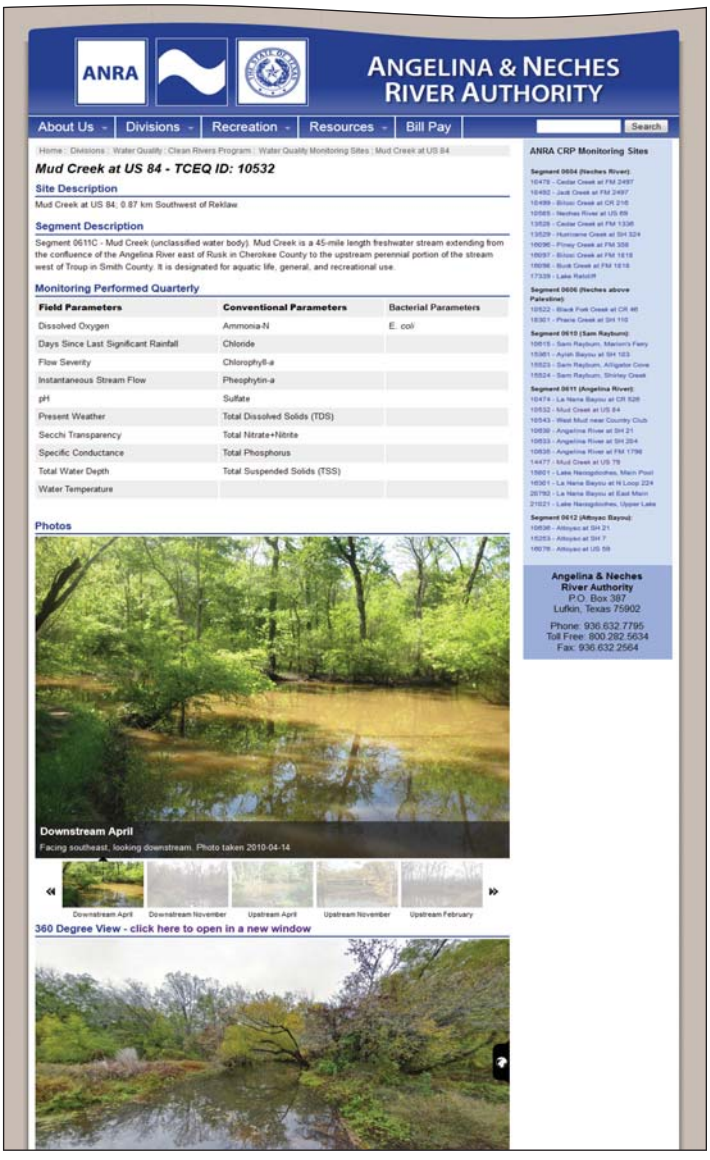
ANRA Publications

Every year, ANRA's Clean Rivers Program produces either a Basin Highlights Report or Basin Summary Report (every five years) that discusses water quality in the Neches River Basin. These reports are distributed to our Steering Committee members, interested stakeholders, and other interested parties.

ANRA Website

The Angelina & Neches River Authority provides the public with information concerning water quality issues on our website, which is updated frequently. The ANRA website provides public access to information on the Clean Rivers Program, current and historical Basin Summary and Basin Highlights reports, meeting agendas and minutes, maps, and water quality data.

Please visit us online at www.anra.org.



ANRA Website (www.anra.org)

Additional Online Resources

The Texas Commission on Environmental Quality - www.tceq.texas.gov

The Texas Clean Rivers Program - www.texascleanrivers.org

Clean Rivers Program Guidance - www.tceq.texas.gov/waterquality/clean-rivers/guidance/index.html

Coordinated Monitoring Schedule - cms.lcra.org

2014 Texas Integrated Report - www.tceq.texas.gov/waterquality/assessment/14twqi/14txir

Texas Surface Water Quality Standards - www.tceq.texas.gov/waterquality/standards/eq_swqs.html

Clean Rivers Program Map Tool - www80.tceq.texas.gov/SwqmisWeb/public/crpmap.html

Clean Rivers Program Data Tool - www80.tceq.texas.gov/SwqmisWeb/public/crpweb.faces

Surface Water Quality Monitoring Procedures - www.tceq.texas.gov/waterquality/monitoring/swqm_guides.html

Attoyac Bayou Watershed Protection Plan - attoyac.tamu.edu

Texas Stream Team - txstreamteam.rivers.txstate.edu

Texas Invasives - www.texasinvasives.org

Texas Department of State Health Services Fish Consumption Advisories - www.dshs.state.tx.us/seafood/survey.shtm

The Surface Water Quality Monitor Newsletter - www.tceq.texas.gov/compliance/monitoring/water/newsletter.html

EPA's Surf Your Watershed - cfpub.epa.gov/surf/locate/index.cfm

USGS The National Map Streamer - nationalmap.gov/streamer

US Drought Monitor - droughtmonitor.unl.edu/

THE TEXAS CLEAN RIVERS PROGRAM

Contact Information

For more information on ANRA's Clean Rivers Program, or to join the Steering Committee, please contact:

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2016 Upper Neches Basin Highlights Report

The 2016 Basin Highlights Report was prepared by the Angelina & Neches River Authority
in cooperation with the Texas Commission on Environmental Quality (TCEQ)
under the authorization of the Texas Clean Rivers Act.

Angelina & Neches River Authority
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