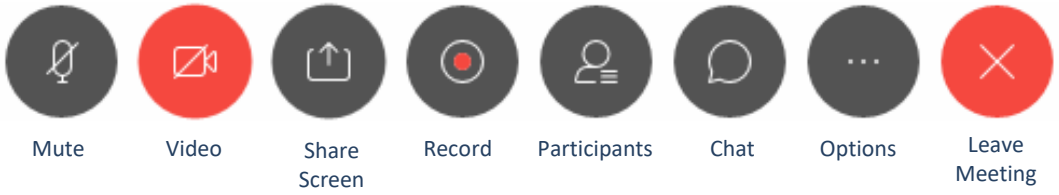
Upper Neches Basin Steering Committee Meeting

July 23, 2020

THE TEXAS CLEAN RIVERS PROGRAM

ANGELINA & NECHES RIVER AUTHORITY

Webex Tools



Chat Box & Raise Hand

For questions, please use the chat box or the “raise hand” feature:

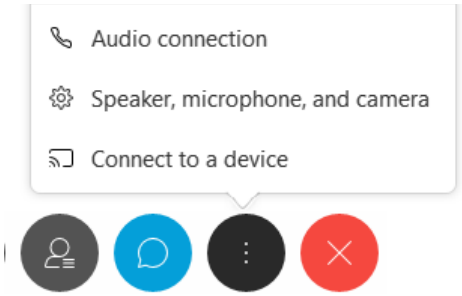
1.) Find your name on the participant list. and hover over your name. A Raise Hand icon will appear.

2.) Click on the Raise Hand button which will place a small hand icon next to your name in the participant list.

3.) Click on the Lower Hand button to withdraw the request.

4.) If you’re calling in via voice only, you can press *3 to raise and lower your hand.

Audio problems?



Dial in: 1-415-655-0001 (US Toll)
Access Code: 126 136 5685

Agenda

- **Welcome and Introductions—**Jeremiah Poling, Angelina & Neches River Authority
- **Overview of the Clean Rivers Program—**Jeremiah Poling, Angelina & Neches River Authority
- **Updates to ANRA's Water Quality Monitoring Program and the 2020 Basin Summary Report—**Carla Ethridge, Angelina & Neches River Authority
- **Special Project Updates:**
  - **Kickapoo Creek in Henderson County—**Leah Taylor, Texas Institute for Applied Environmental Science
  - **Addressing bacterial impairments on tributaries of the Middle Neches (Jack Creek, Cedar Creek, Hurricane Creek, Biloxi Creek)—** Texas Water Resources Institute
  - **Angelina River Watershed Characterization—**Texas Water Resources Institute
  - **Attoyac Bayou watershed On-site Sewage Facility Repair and Replacement—**Texas Water Resources Institute
  - **Attoyac Bayou BMP Effectiveness Monitoring—**Texas Water Resources Institute
  - **La Nana Bayou WPP Development Project Update—**Texas Water Resources Institute
- **Conservation Updates:**
  - **Texas Freshwater Mussels and the Alligator Snapping Turtle—**Allison McElroy, Angelina and Neches River Authority
  - **Western Chicken Turtle Updates—**Mandi Gordon, Environmental Institute of Houston
- **Open Discussion for Steering Committee Member Recommendations and Concerns**

Hurricane Creek below Kiwanis Park

Meet the Presenters:

Jeremiah Poling
Information Resources Manager
Angelina & Neches River Authority

Carla Ethridge
Clean Rivers Program Manager
Angelina & Neches River Authority

Allison McElroy
Wildlife Biologist
Angelina & Neches River Authority

Leah Taylor
Senior Project Director
Tarleton State University

Lucas Gregory
Senior Research Scientist
Texas Water Resources Institute

Anna Gitter
Research Assistant
Texas Water Resources Institute

Emily Monroe
Extension Program Specialist
Texas Water Resources Institute

Mandi Gordon
Senior Biologist
Environmental Institute of Houston-
University of Houston-Clear Lake

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ANRA's Functions in the Neches Basin

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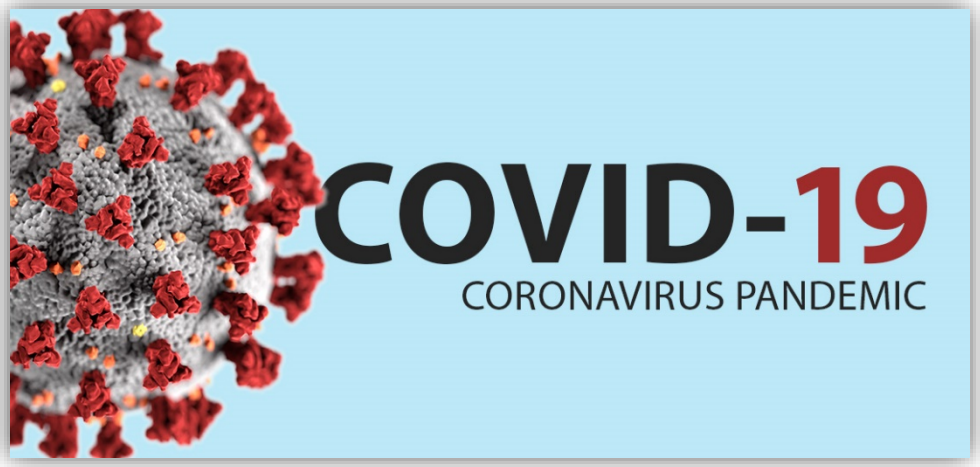
ANRA's Response to COVID-19

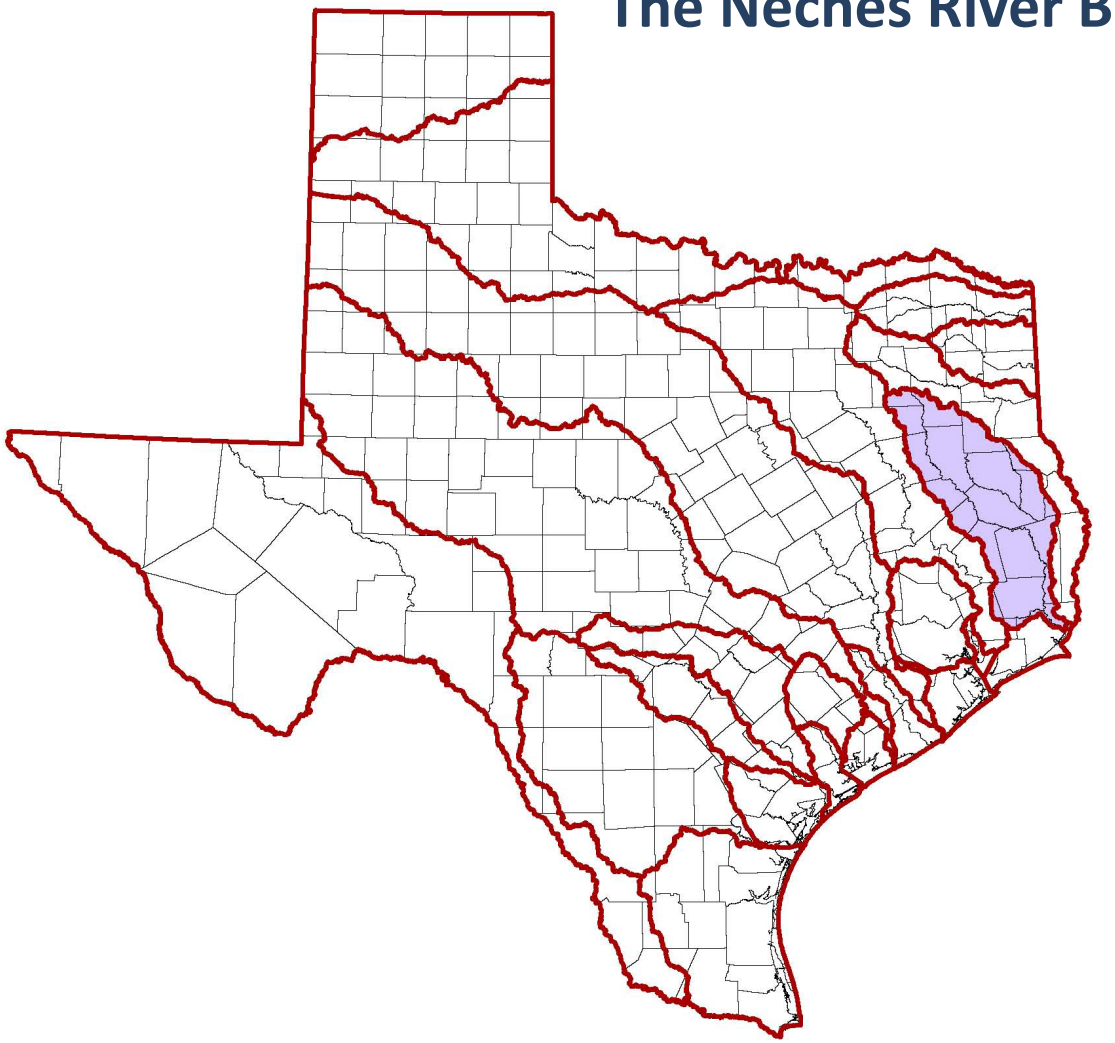
ANRA is closely monitoring the unprecedented situation with COVID-19 as it continues to develop, taking actions as needed and is practicing all recommended precautionary measures to minimize the risk of virus-exposure and spread. These include:

- Employee health pre-screen: measuring employee temperatures, and assessing symptoms prior to entrance into the facility
- Practice social distancing: maintaining a distance of at least 6ft
- Disinfecting and cleaning workspaces routinely
- Providing face coverings for employee use



ANGELINA & NECHES RIVER AUTHORITY

The Neches River Basin



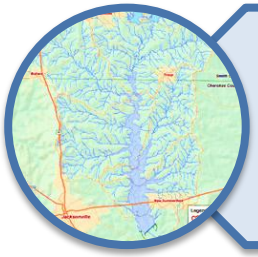
ANRA's Jurisdictional Service Area includes all or a portion of the following 17 counties:

- Van Zandt
- Smith
- Henderson
- Newton
- Cherokee
- Anderson
- Rusk
- Houston
- Nacogdoches
- San Augustine
- Shelby
- Angelina
- Trinity
- Sabine
- Polk
- Jasper
- Orange

ANRA's General Administration

Coordinate with

Governments/Entities



Water Resource Planning and Development

Economic Development

Bond Issuance

ANRA's Field Operations Division

Regional Wastewater Treatment Facilities and Contract Operations

Drinking Water Utilities

Biosolids Composting

Neches Compost Facility

ANRA's Environmental Division

Clean Rivers Program

Water Quality Monitoring

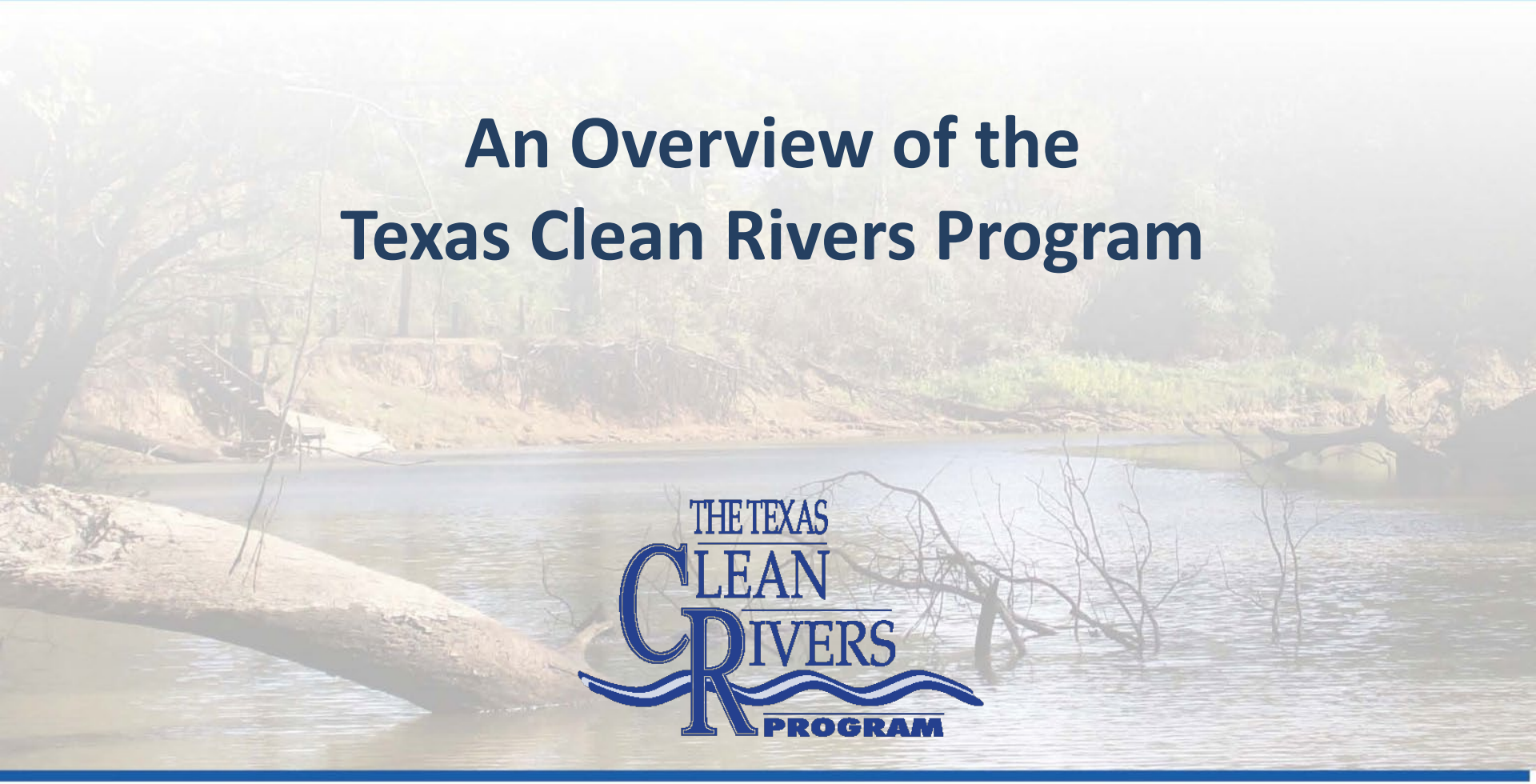
Environmental Laboratory

Drinking Water, Surface Water, and Wastewater Testing

On-Site Sewage Facilities Program

OSSF Permitting & Investigations

An Overview of the Texas Clean Rivers Program



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Ayish at W. Columbia Street In City of San Augustine

The Texas Clean Rivers Program (CRP)

- Established in 1991 by the 72nd Texas Legislative Session (SB 818)
- Purpose is to monitor the waters of the state and maintain and/or improve water quality
- Partially funded by fees on wastewater discharge and water rights permits
- Collaboration of the Texas Commission on Environmental Quality (TCEQ) and 15 partner agencies
- Emphasis on the collection of water quality data for assessment and regulatory purposes

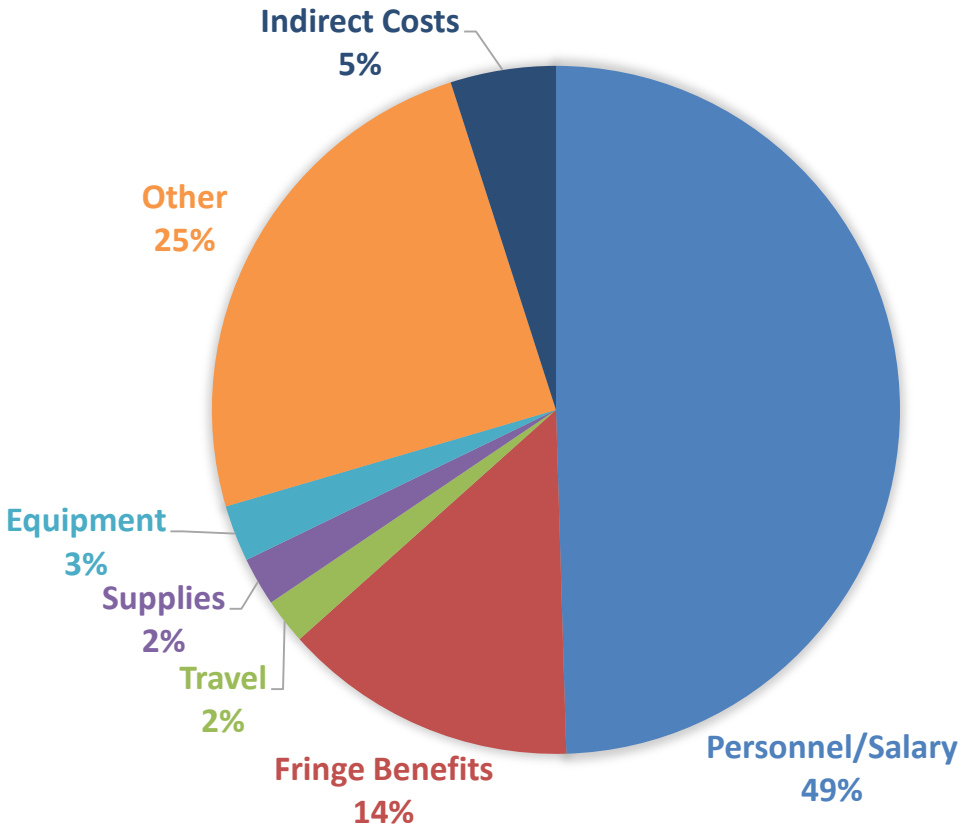
http://www.tceq.texas.gov/waterquality/clean-rivers

FY 2020-2021 Budget Allocations

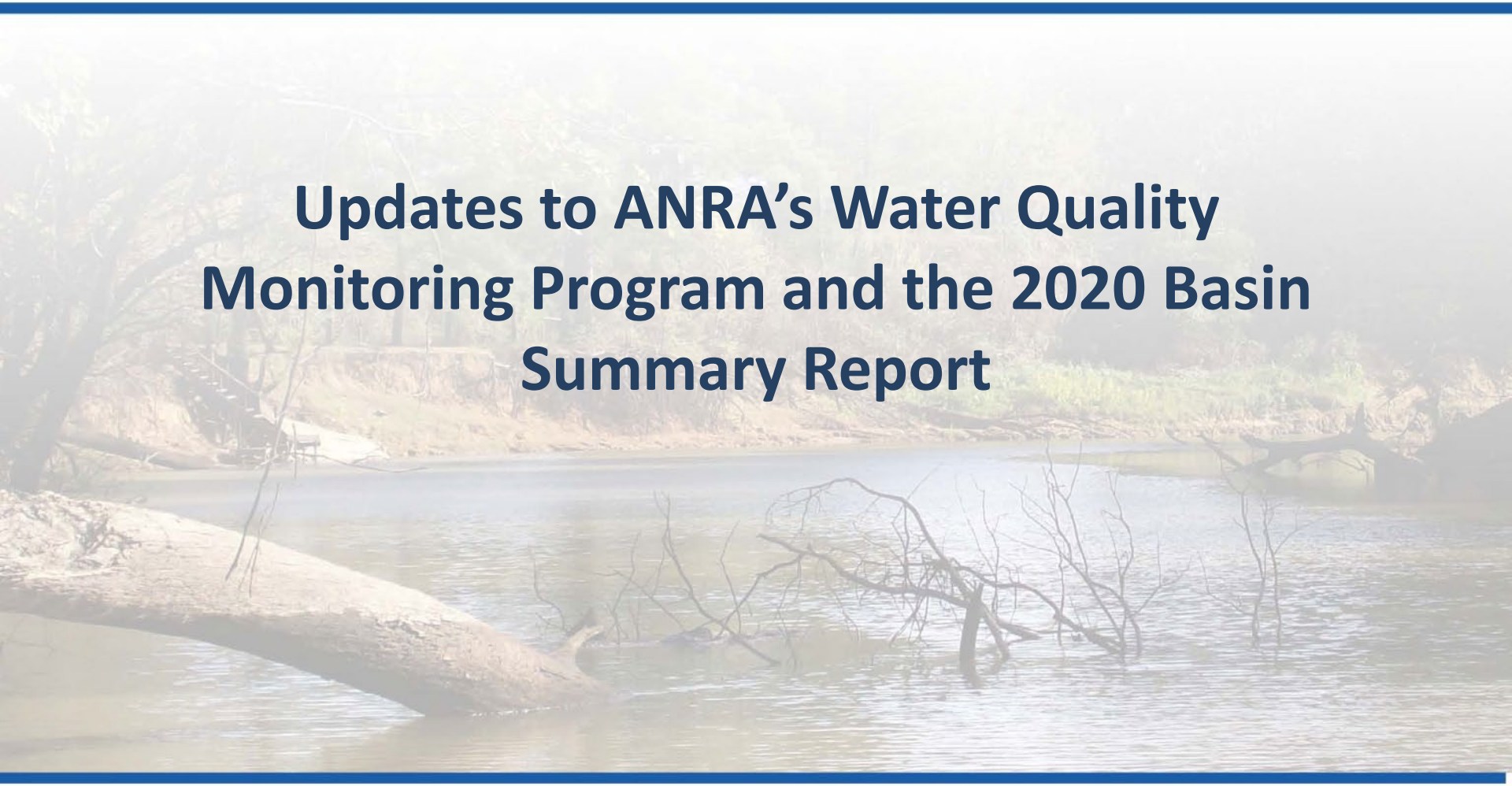
Planning Agency	FY 2020	FY 2021	Total Allocation
BRA (12)	$3,981,590.00	$398,159.00	$796,318.00
GBRA (17 & 18)	$1,353,781.00	$135,378.00	$270,756.00
HGAC (9, 10, 11, 13)	$965,615.00	$965,615.00	$1,931,230.00
IBWC (23)	$267,252.00	$267,252.00	$534,504.00
LNRA (16)	$99,298.00	$99,298.00	$198,596.00
LCRA (14 & 15)	$381,797.00	$381,797.00	$763,594.00
ANRA & LNVA (6 & 7)	$329,766.00	$329,766.00	$659,532.00
NETMWD (4)	$99,298.00	$99,298.00	$198,596.00
NRA (20, 21, & 22)	$258,906.00	$258,906.00	$517,812.00
RRA (1 & 2)	$311,118.00	$311,118.00	$622,236.00
SARA (19)	$197,770.00	$197,770.00	$395,540.00
SRA (5)	$313,074.00	$313,074.00	$626,148.00
SRBA (3)	$99,297.00	$99,297.00	$198,594.00
TRA (8)	$393,272.00	$393,272.00	$786,544.00
TOTALS	$4,250,000.00	$4,250,000.00	$8,500,000.00

ANRA Clean Rivers Program Budget by Category

FY 2018- FY 2021 Clean Rivers Program Budget	
Budget Category	**Approved Budget**
Personnel/Salary	$400,899.26
Fringe Benefits	$112,251.80
Travel	$17,411.87
Supplies	$18,419.13
Equipment	$21,500.00
Contractual	$0.00
Construction	$0.00
Other	$198,960.00
Indirect Costs	$40,089.94
Total Reimbursable Costs	**$809,532.00**



Updates to ANRA's Water Quality Monitoring Program and the 2020 Basin Summary Report



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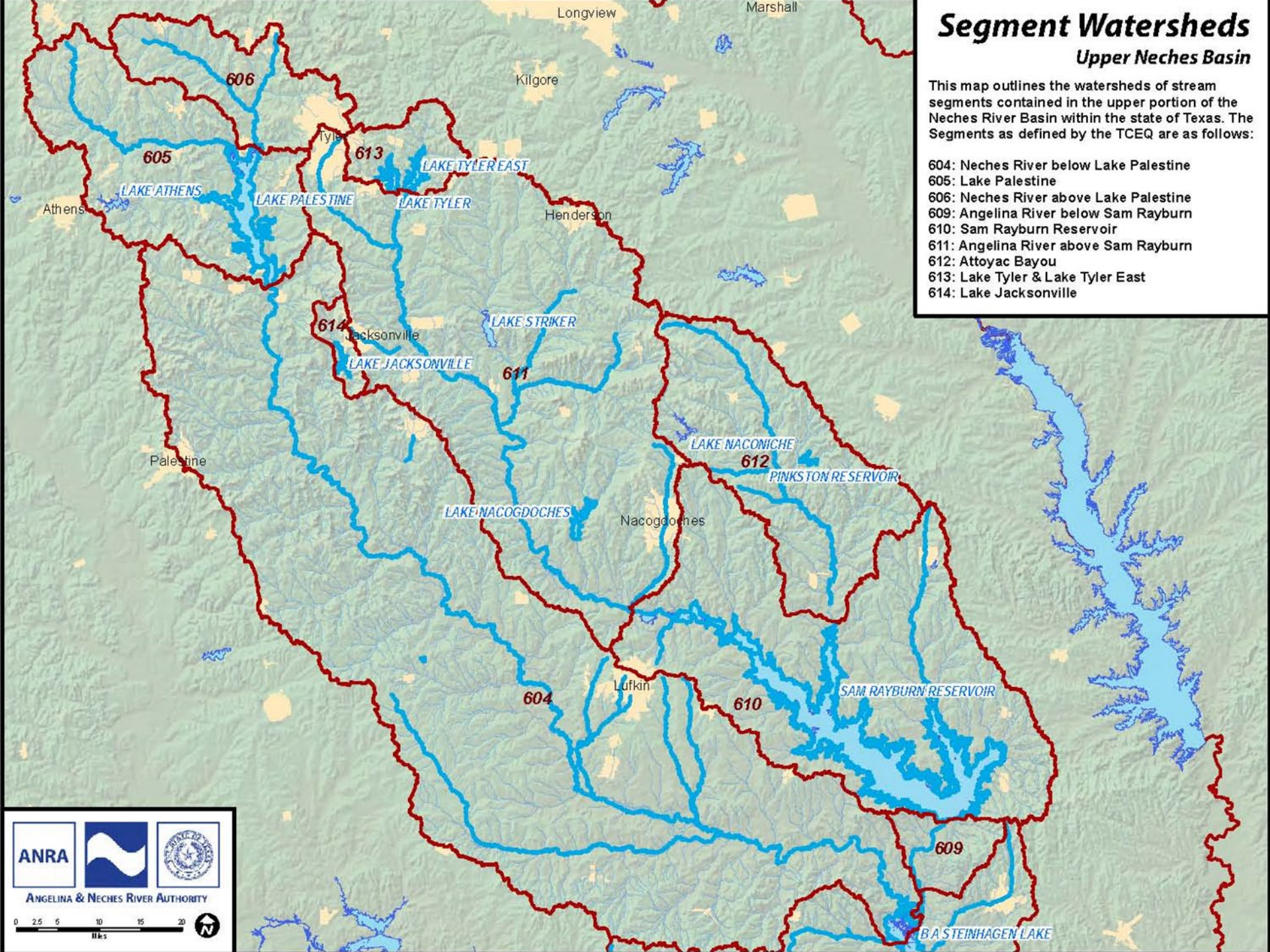

Segment Watersheds
Upper Neches Basin
This map outlines the watersheds of stream segments contained in the upper portion of the Neches River Basin within the state of Texas. The Segments as defined by the TCEQ are as follows:
604: Neches River below Lake Palestine
605: Lake Palestine
606: Neches River above Lake Palestine
609: Angelina River below Sam Rayburn
610: Sam Rayburn Reservoir
611: Angelina River above Sam Rayburn
612: Attoyac Bayou
613: Lake Tyler & Lake Tyler East
614: Lake Jacksonville
Longview
Marshall
Kilgore
Tyler
Athens
Henderson
Jacksonville
Palestine
Nacogdoches
Lufkin
606
605
613
614
611
612
604
610
609
LAKE ATHENS
LAKE PALESTINE
LAKE TYLER EAST
LAKE TYLER
LAKE STRIKER
LAKE JACKSONVILLE
LAKE NACONICHE
PINKSTON RESERVOIR
LAKE NACOGDOCHES
SAM RAYBURN RESERVOIR
B A STEINHAGEN LAKE
ANRA
Angelina & Neches River Authority
0 2.5 5 10 15 20
Miles

FY 2021 Water Quality Monitoring in the Neches Basin

- Currently, ANRA monitors 37 sites quarterly for field parameters, conventional parameters, and bacteria.
- Additional monitoring in the Upper Neches Basin is performed by TCEQ (Region 5 in Tyler and Region 10 in Beaumont), as well as the Lower Neches Valley Authority (LNVA).

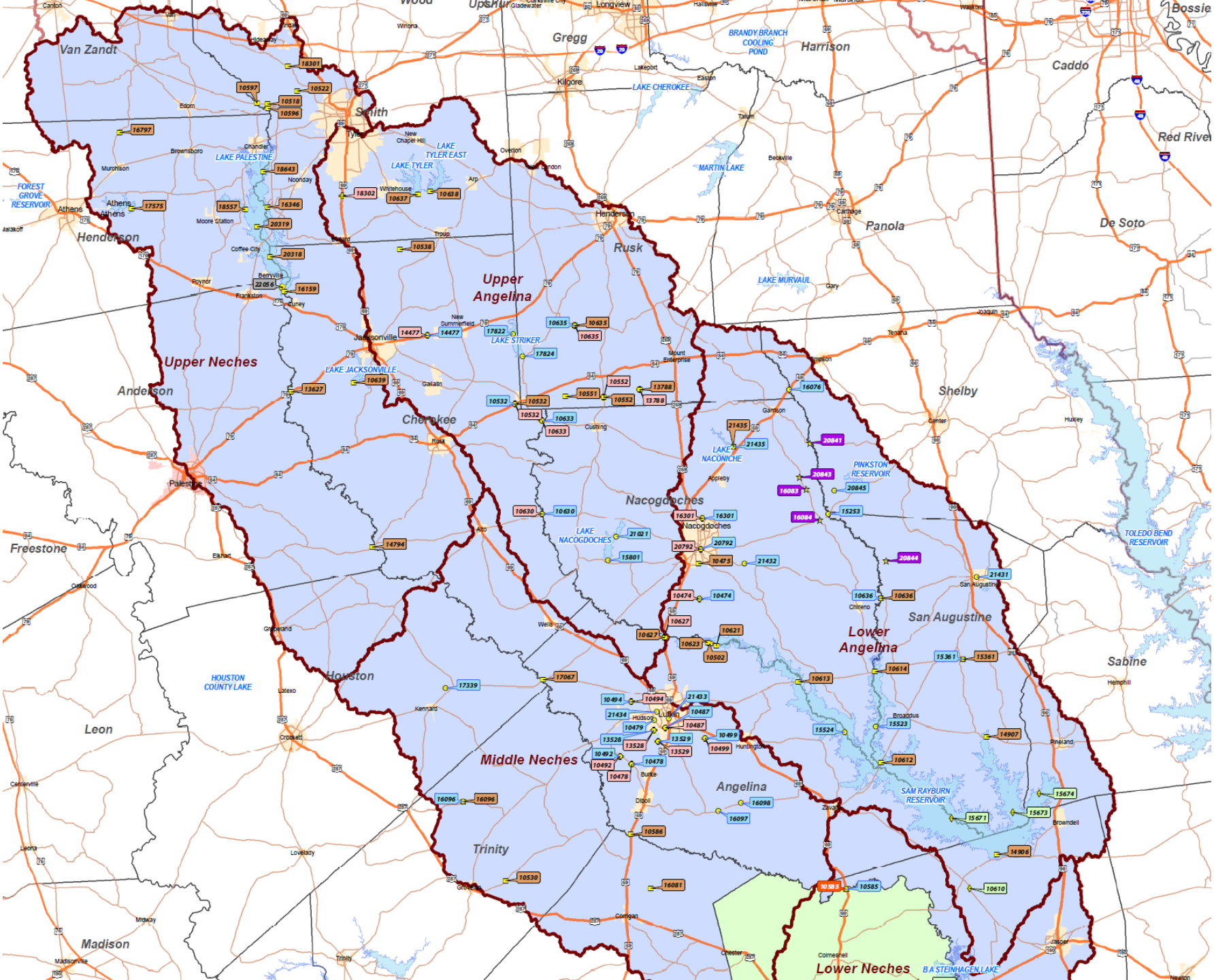
FY 2021 Number of Monitoring Stations in the Neches Basin				
Sampling Entity	Field	Conventional	Bacteria	Flow
ANRA	37	37	37	29
TCEQ-Region 5	21	21	21	10
TCEQ-Region 10	41	41	41	15
LNVA	23	23	23	20

FY 2021 Water Quality Monitoring Changes

- ANRA is now collecting Chlorophyll-a samples at all 37 monitoring stations.
- ANRA began collecting TKN at all 37 monitoring stations.
- ANRA is working on bringing in the Chlorophyll-a and Pheophytin analyses in house to control costs incurred due to outsourcing these analyses.

The Coordinated Monitoring Schedule (CMS) is available online at:

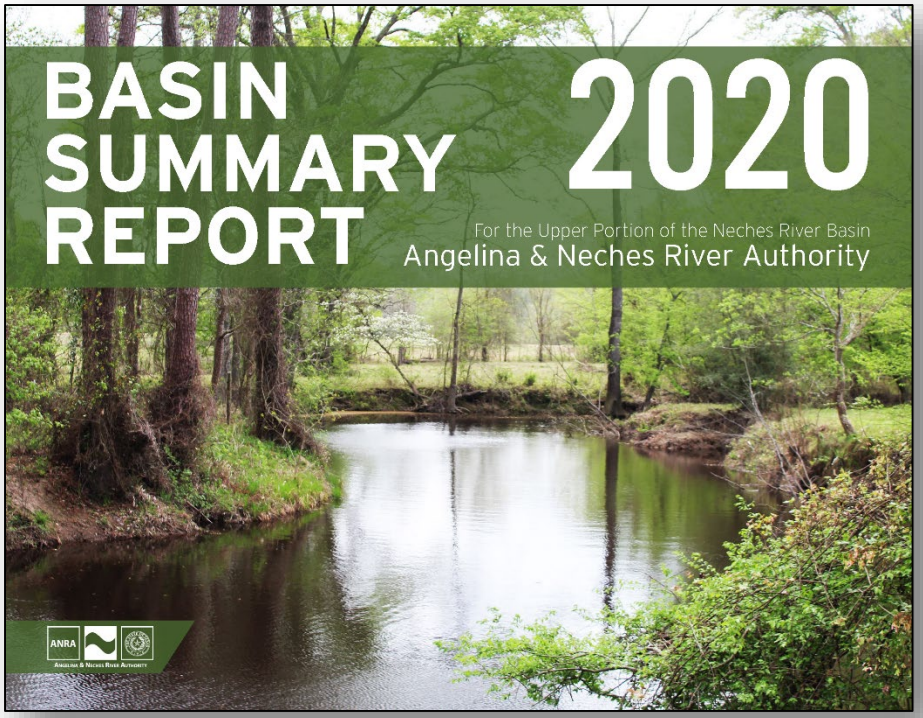
cms.lcra.org

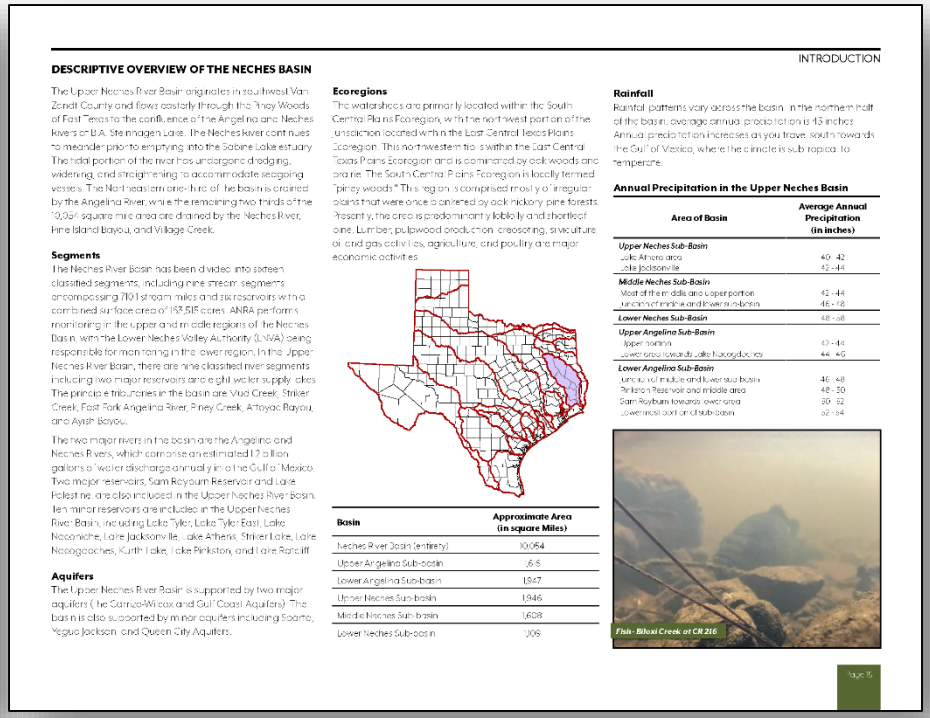

Van Zandt
Gregg
Harrison
Caddo
Bossier
Red River
Smith
Rusk
Panola
De Soto
Henderson
Upper Angelina
Upper Neches
Anderson
Cherokee
Shelby
Nacogdoches
Freestone
Houston
Lower Angelina
San Augustine
Sabine
Leon
Middle Neches
Angelina
Trinity
Madison
Lower Neches
LAKE PALESTINE
LAKE TYLER
LAKE TYLER EAST
LAKE TAWAKONI
LAKE CHEROKEE
BRANDY BRANCH COOLING POND
MARTIN LAKE
LAKE MURVAUL
FOREST GROVE RESERVOIR
LAKE JACKSONVILLE
LAKE STRIKER
LAKE NACONICHE
PINKSTON RESERVOIR
LAKE NACOGDOCHES
TOLEDO BEND RESERVOIR
HOUSTON COUNTY LAKE
SAM RAYBURN RESERVOIR
B A STEINHAGEN LAKE

ANRA's Water Quality Monitoring in the Neches Basin for FY 20

Site Description	AU	Station ID	Comments
Neches at US 69	0604_01	10585	
Cedar at FM 2497	0604A_02	10478	
Cedar at FM 1336	0604A_02	13528	
Cedar at Loop 287	0604A_03	10479	
Cedar at Ellis	0604A_03	21434	
Hurricane at Loop 287	0604B_01	10487	
Hurricane at SH 324	0604B_01	13529	
Hurricane below Kiwanis Park	0604B_02	21433	
Jack at FM 2497	0604C_01	10492	
Jack at FM 3150	0604C_01	10494	
Piney at FM 358	0604D_02	16096	
Biloxi at FM 1818	0604M_02	16097	
Biloxi at CR 216	0604M_03	10499	24 HR Dissolved Oxygen
Buck at FM 1818	0604N_01	16098	
Lake Ratcliff	0604T_01	17339	
Sam Rayburn near Shirley Creek	0610_04	15524	
Sam Rayburn at Alligator Cove	0610_05	15523	
Ayish at SH 103	0610A_01	15361	
Ayish at Columbia St	0610A_02	21431	
Carrizo at SH 21	0610P_01	21432	
Angelina at SH 21	0611_02	10630	
Angelina at SH 204	0611_03	10633	
Angelina at FM 1798	0611_04	10635	
La Nana at CR 526	0611B_01	10474	
La Nana at East Main	0611B_02	20792	
La Nana at Loop 224 North	0611B_03	16301	
Mud at US 84	0611C_01	10532	
Mud at US 79	0611C_02	14477	
Lake Nacogdoches Main Pool	0611Q_01	15801	
Lake Nacogdoches Upper Lake	0611Q_01	21021	
Lake Striker Upper Lake	0611R_01	17822	
Lake Striker Main Pool	0611R_01	17824	
Attoyac at SH 21	0612_01	10636	
Attoyac at SH 7	0612_02	15253	
Attoyac at US 59	0612_03	16076	
West Creek	0612F_01	20845	
Lake Naconiche Main Pool	0612G_01	21435	
Riverine Portion of Sam Rayburn	0615_01	TBD	24 HR Dissolved Oxygen

2020 Upper Neches Basin Summary Report





INTRODUCTION

DESCRIPTIVE OVERVIEW OF THE NECHES BASIN

The Upper Neches River Basin originates in southwest Van Zandt County and flows easterly through the Piney Woods of East Texas to the confluence of the Angelina and Neches Rivers at B.A. Steinhagen Lake. The Neches River continues to meander prior to emptying into the Sabine Lake estuary. The tidal portion of the river has undergone dredging, widening, and straightening to accommodate seagoing vessels. The Northeastern one-third of the basin is drained by the Angelina River, while the remaining two-thirds of the 10,094 square mile area are drained by the Neches River, Pine Island Bayou, and Village Creek.

Segments

The Neches River Basin has been divided into sixteen classified segments, including nine stream segments encompassing 710 stream miles and six reservoirs with a combined surface area of 153,515 acres. ANRA performs monitoring in the upper and middle regions of the Neches Basin, with the Lower Neches Valley Authority (LNVA) being responsible for monitoring in the lower region. In the Upper Neches River Basin, there are nine classified river segments including two major reservoirs and eight water supply sites. The principle tributaries in the basin are Mud Creek, Striker Creek, East Fork Angelina River, Piney Creek, Attoyac Bayou, and Ayish Bayou.

The two major rivers in the basin are the Angelina and Neches Rivers, which comprise an estimated 1.2 billion gallons of water discharge annually into the Gulf of Mexico. Two major reservoirs, Sam Rayburn Reservoir and Lake Palestine, are also included in the Upper Neches River Basin. Ten minor reservoirs are included in the Upper Neches River Basin, including Lake Tyler, Lake Tyler East, Lake Naconiche, Lake Jacksonville, Lake Athens, Striker Lake, Lake Naconiches, Kurth Lake, Lake Pinkston, and Lake Ratcliff.

Aquifers

The Upper Neches River Basin is supported by two major aquifers (the Carrizo-Wilcox and Gulf Coast Aquifers). The basin is also supported by minor aquifers including Sparta, Yegua Jackson, and Queen City Aquifers.

Ecoregions

The watersheds are primarily located within the South Central Plains Ecoregion, with the northwest portion of the jurisdiction located within the East Central Texas Plains Ecoregion. This northwestern portion within the East Central Texas Plains Ecoregion and is dominated by oak woods and prairie. The South Central Plains Ecoregion is locally termed "piney woods." This region is comprised mostly of irregular plains that were once scattered by oak hickory pine forests. Presently, the area is predominantly loblolly and shortleaf pine. Lumber, pulpwood production, creosoting, silviculture, oil and gas activities, agriculture, and poultry are major economic activities.

Basin	Approximate Area (in square Miles)
Neches River Basin (entirety)	10,094
Upper Angelina Sub-basin	6 6
Lower Angelina Sub-basin	1,847
Upper Neches Sub-basin	1,946
Middle Neches Sub-basin	1,608
Lower Neches Sub-basin	109

Rainfall

Rainfall patterns vary across the basin. In the northern half of the basin, average annual precipitation is 43 inches. Annual precipitation increases as you travel south towards the Gulf of Mexico, where the climate is sub-tropical to temperate.

Annual Precipitation in the Upper Neches Basin

Area of Basin	Average Annual Precipitation (in inches)
Upper Neches Sub-Basin	
Lake Athens area	40 - 42
Lake Jacksonville	42 - 44
Middle Neches Sub-Basin	
Most of the middle and Upper portion	42 - 44
Junction of middle and lower sub-basin	46 - 48
Lower Neches Sub-Basin	48 - 48
Upper Angelina Sub-Basin	
Upper portion	42 - 44
Lower area towards Lake Naconiches	44 - 46
Lower Angelina Sub-Basin	
Junction of middle and lower sub-basin	46 - 48
Pertains Reservoir and middle area	48 - 50
Sam Rayburn towards lower area	50 - 52
Lowermost portion of sub-basin	52 - 54

https://www.anra.org/divisions/water_quality/crp/reports.html

2020 Upper Neches Basin Summary Report

The 2020 Upper Neches Basin Summary Report is prepared every six years and provides a comprehensive overview of water quality data and water quality related issues for the Upper Neches River Basin.

- Number of sites assessed: 161
- Number of data points assessed: 212,405

In general, historical and current water quality data of the Neches River Basin include:

- Elevated bacteria levels
- Depressed dissolved oxygen
- Mercury and Dioxin in edible fish tissue
- Concerns for Nutrient levels

Parameter	*Number of Increasing Trends*	*Number of Decreasing Trends*
Bacteria	0	1
Nutrients	3	45
Dissolved Oxygen	1	1

Summary of Impairments and Concerns in the Neches River Basin

Segment ID and Name	Bacteria	Nutrients	Dissolved Oxygen	pH	Mercury & Dioxins in Edible Fish Tissue
0604- Neches River below Lake Palestine		CS			NS
0604A- Cedar Creek	NS	CS	NS		
0604B- Hurricane Creek	NS				
0604C- Jack Creek	NS	CS			
0604D- Piney Creek	NS	CS	NS		
0604M- Biloxi Creek	NS	CS	NS		
0604T- Lake Ratcliff					NS
0605- Lake Palestine				NS	
0605A- Kickapoo Creek	NS		NS		
0606- Neches River above Lake Palestine	NS	CS	NS		
0606A- Prairie Creek	NS	CS			
0606D- Black Fork Creek	NS				
0609- Angelina River below Sam Rayburn Reservoir					NS
0610- Sam Rayburn Reservoir					NS
0610A- Ayish Bayou	NS				
0610P- Bayou Carrizo	CN				
0611- Angelina River above Sam Rayburn	NS	CS			
0611A- East Fork Angelina River	NS				
0611B- La Nana Bayou	NS	CS			
0611C- Mud Creek	NS				
0611D- West Mud Creek	NS	CS			
0611V- Bowles Creek			CS		
0612- Attoyac Bayou	NS				
0612F- West Creek	CS				
0615-Angelina River/Sam Rayburn Reservoir			NS		NS
0615A- Paper Mill Creek	NS				

FS = Fully Supporting, NC = No Concern, CN = Concern for Near Non-Attainment, CS = Concern for Screening Level, NS = Not Supporting, NA = Not Assessed

Trend Analysis

Summary of Statistically Significant Trends in the Upper Neches River Basin

Segment ID	Segment Name	*E. coli*	Temp	DO	pH	Spec Cond	NH3	Cl	SO4	TKN	Total P	TSS	NO3	NO2	NO3/ NO2	Chl-*a*	Pheo
0604	**Neches River below Lake Palestine**				↓			↓		↑	↓				↓	↓↑	↓
0604C	Jack Creek					↓		↓							↓		
0604D	Piney Creek			↓					↓								
0604M	Biloxi Creek	↓			↓						↓						
0604N	Buck Creek										↓						
0604T	Lake Ratcliff					↓			↓			↓					
0605	**Lake Palestine**				↑↓	↑↓		↓	↓	↓	↓					↓	
0605A	Kickapoo Creek				↑												
0606	**Neches River above Lake Palestine**				↑	↓		↓			↓	↓					
0610	**Sam Rayburn Reservoir**			↑	↓↑	↓↑		↓	↓			↓			↓		
0610A	Ayish Bayou				↓						↓						
0611	**Angelina River above Sam Rayburn**				↑			↓			↓				↓	↓	
0611A	East Fork Angelina River				↑	↓		↓							↓		
0611C	Mud Creek							↓	↓		↓				↓		
0611Q	Lake Nacogdoches							↓									
0611R	Lake Striker							↓								↓	
0612	**Attoyac Bayou**								↓		↓				↓		
0612F	West Creek								↓						↓		
0613	**Lake Tyler/Lake Tyler East**					↑		↑				↑					
0614	**Lake Jacksonville**				↓												
0615	**Angelina River/Sam Rayburn Reservoir**				↓		↓	↓	↓	↓							
0615A	Paper Mill Creek				↓	↓		↓	↓	↓	↓				↓		

Additional Resources

- Texas Commission on Environmental Quality Clean Rivers Program
  - http://www.texascleanrivers.org
- Surface Water Quality Monitoring Procedures Manual
  - http://www.tceq.texas.gov/assets/public/comm_exec/pubs/rg/rg415/rg-415.pdf
- Upper Neches Basin Quality Assurance Project Plan (QAPP)
  - https://www.anra.org/divisions/water_quality/crp/pdfs/QAPP/ANRA_FY_2021_CRP_QAPP_FINAL.pdf
- ANRA CRP Monitoring Activities
  - http://www.anra.org/divisions/water_quality/crp/monitoring.html
- Coordinated Monitoring Schedule
  - http://cms.lcra.org

Comments or Questions?

- Please direct inquiries regarding ANRA's Clean Rivers Program to:

Carla Ethridge
Clean Rivers Program Manager
Angelina & Neches River Authority
2109 N John Redditt Dr.
Lufkin, TX 75904
Phone: 936-632-7527
Email: cethridge@anra.org