

Angelina & Neches River Authority

Providing water resource solutions and protecting the waterways of the Neches River Basin since 1935.



Upper Neches Basin Steering Committee Meeting



ANGELINA & NECHES RIVER AUTHORITY

June 21, 2023

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Agenda

Welcome and Introductions

Jeremiah Poling, Angelina & Neches River Authority

Overview of the Clean Rivers Program

Andrew Henry, Angelina & Neches River Authority

Updates to ANRA's Water Quality Monitoring Program and The 2023 Basin Highlights Report

Andrew Henry, Angelina & Neches River Authority

TMDL and Clean Water Act Project Updates

Kickapoo Watershed Protection Plan – Texas Institute for Applied Environmental Research

La Nana Watershed Protection Plan – Texas Water Resources Institute

Attoyac Watershed Protection Plan – Texas Water Resources Institute

Ayish Bayou Water Quality – Texas Water Resources Institute

Education and Outreach Updates

Kimberly Wagner, Angelina & Neches River Authority

Guest Speaker

Cori Edson, Keep Whitehouse Beautiful

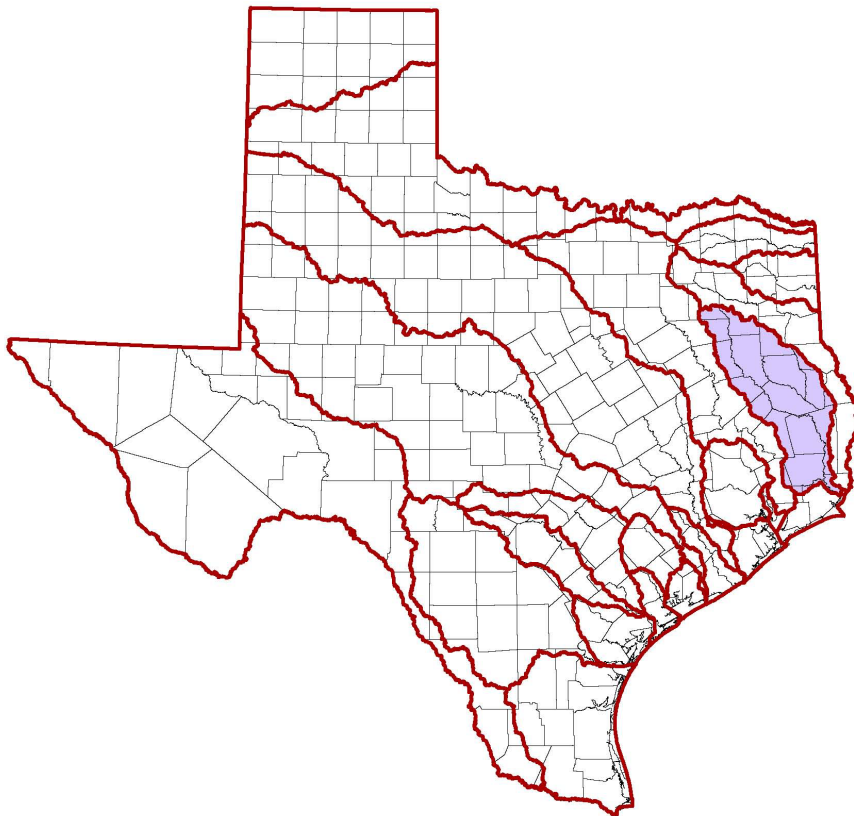
Open Discussion for Steering Committee Member Recommendations and Concerns

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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**

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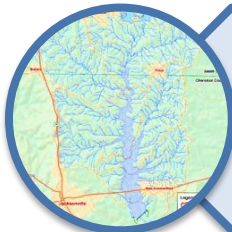
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ANRA's General Administration



**Coordinate with
Governments/Entities**



**Water Resource Planning and
Development**



**Economic Development
Bond Issuance**

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ANRA's Field Operations Division



**Regional Wastewater Treatment Facilities
and Contract Operations**



Drinking Water Utilities



**Biosolids Composting
Neches Compost Facility**



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ANRA's Field 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

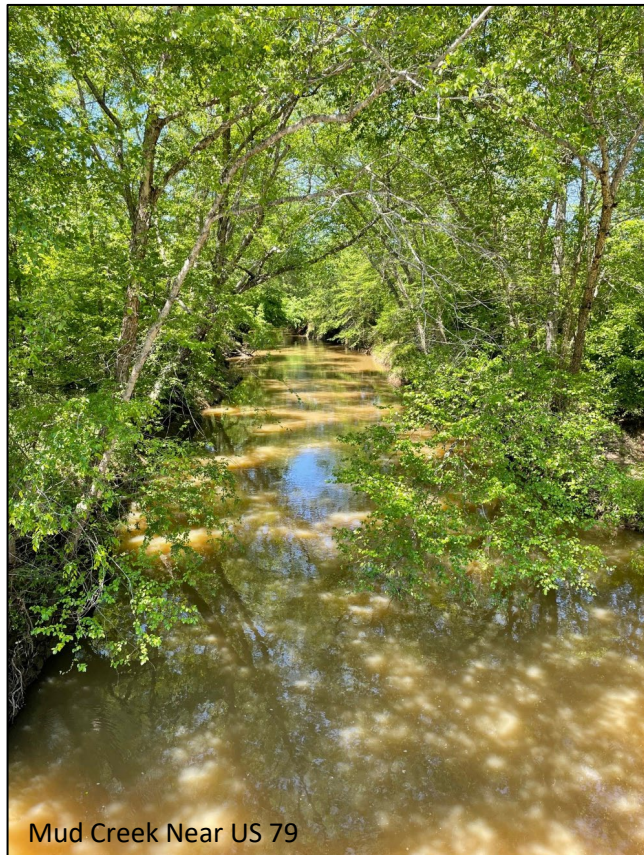


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The Texas Clean Rivers Program (CRP)



Mud Creek Near US 79

- 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
- Emphasis on the collection of water quality data for assessment and regulatory purposes
- Funded by state fees
- Collaboration of the Texas Commission on Environmental Quality (TCEQ) and 15 partner agencies

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



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Budget Allocations for the CRP Program

FY 2024 - 2025 Budget Allocations			
Planning Agency	FY 2024	FY 2025	Total Allocation
Brazos River Authority (12)	\$474,088.00	\$474,088.00	\$948,176.00
Guadalupe-Blanco River Authority (17 & 18)	\$161,195.00	\$161,195.00	\$322,390.00
Houston-Galveston Area Council (9, 10, 11, 13)	\$1,149,758.00	\$1,149,758.00	\$2,299,516.00
International Boundary & Water Commission (23)	\$318,217.00	\$318,217.00	\$636,434.00
Lavaca-Navidad River Authority (16)	\$118,234.00	\$118,234.00	\$236,468.00
Lower Colorado River Authority (14 & 15)	\$454,606.00	\$454,606.00	\$909,212.00
Angelina & Neches River Authority and Lower Neches Valley Authority (6 & 7)	\$392,652.00	\$392,652.00	\$785,304.00
Northeast Texas Municipal Water District (4)	\$118,234.00	\$118,234.00	\$236,468.00
Nueces River Authority (20, 21, & 22)	\$308,279.00	\$308,279.00	\$616,558.00
Red River Authority of Texas (1 & 2)	\$370,448.00	\$370,448.00	\$740,896.00
San Antonio River Authority (19)	\$235,485.00	\$235,485.00	\$470,970.00
Sabine River Authority (5)	\$372,777.00	\$372,777.00	\$745,554.00
Sulphur River Basin Authority (3)	\$118,233.00	\$118,233.00	\$236,466.00
Trinity River Authority (8)	\$468,269.00	\$468,269.00	\$936,538.00
TOTALS	\$5,060,475.00	\$5,060,475.00	\$10,120,950.00

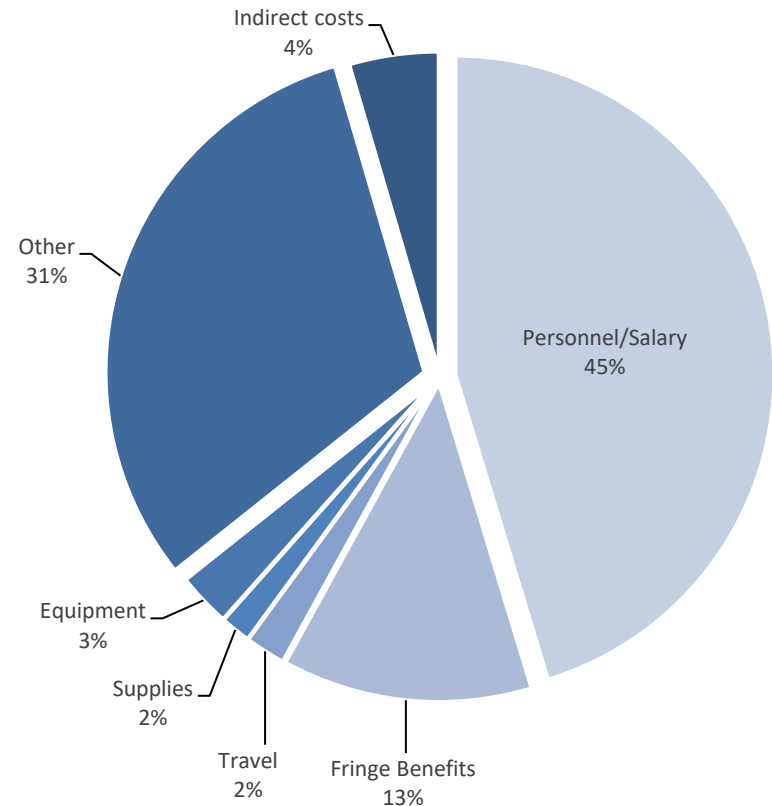
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ANRA's CRP Budget Breakdown

FY 2024 - FY 2025 Clean River Program Budget	
Budget Category	Approved Budget
Personnel/Salary	\$177,903.72
Fringe Benefits	\$49,813.04
Travel	\$8,033.52
Supplies	\$6,035.35
Equipment	\$10,700.00
Contractual	\$0.00
Construction	\$0.00
Other	\$122,376.00
Total Direct Costs	\$374,861.63
Indirect Costs	\$17,790.37
Total Project Costs	\$392,652.00



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FY 2023 Neches Basin Water Quality Monitoring Schedule

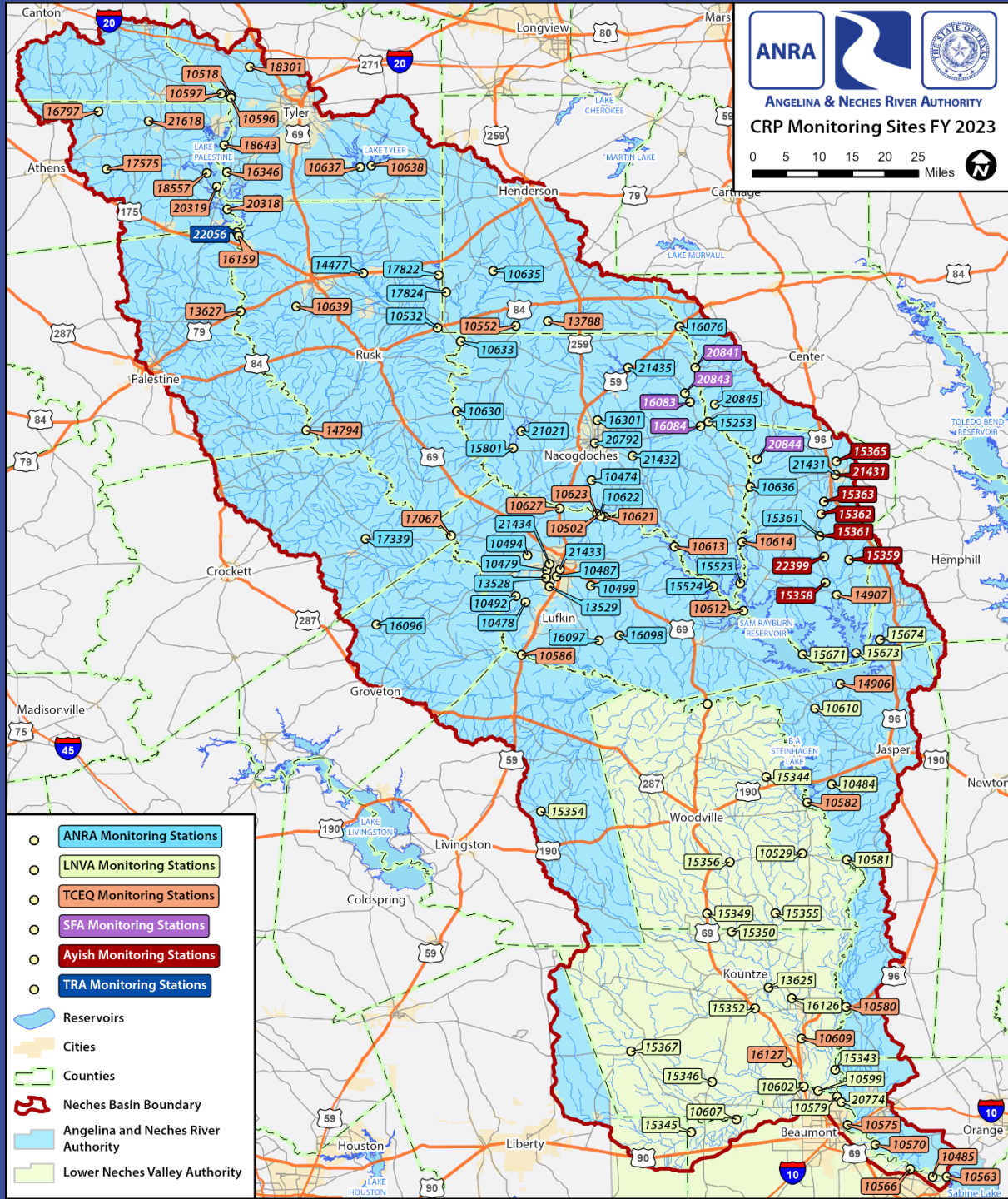
ANRA continues to monitor 37 sites quarterly for field parameters, conventional parameters, and bacteria. Additionally, one 24hr Dissolved Oxygen site on Cedar Creek in Lufkin, Texas.

Changes

- A 24hr DO monitoring site has been re-added at Segment 0615 (Station ID 10622) due to additional monitoring requested by the TCEQ.
- Texas Institute for Applied Environmental Research (TIAER) completed sampling at 9 sites for the Kickapoo WPP in February 2023.
- The Ayish and West Mud project has begun sampling this year on Ayish. Sampling is on a monthly basis at 8 sites, 6 of which are new monitoring sites for ANRA.

FY 2023 Monitoring Stations in the Neches Basin

<i>Sampling Entity</i>	<i>Number of Monitoring Sites</i>
Angelina & Neches River Authority	43 (+2 24hr DO sites)
TCEQ Region 5 (Tyler)	20 (+2 metals in fish tissue)
TCEQ Region 10 (Beaumont)	20
Lower Neches Valley Authority	23
Stephen F. Austin State University	5
Texas Institute for Applied Environmental Research	9 (sampling ended 02/2023)
Tarrant Regional Water District	1



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Water Quality Monitoring in the Neches Basin

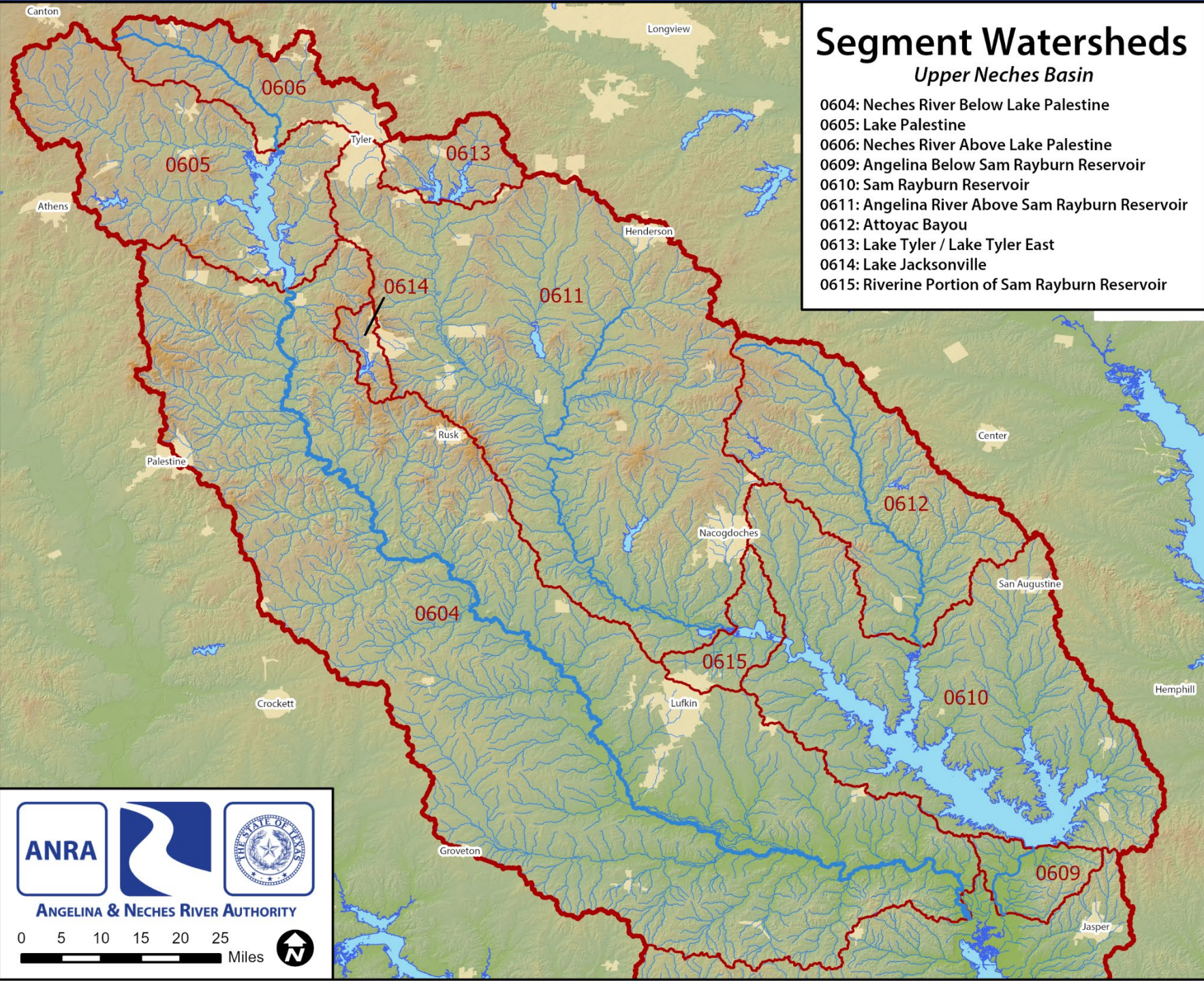
Parameters Collected		
Field	Conventional	Bacteriological
Dissolved Oxygen	Ammonia-N	<i>Escherichia Coli</i> (E.coli)
pH	Nitrate-N	
Conductivity	Nitrite-N	
Instantaneous Stream Flow	Total Kjeldhal Nitrogen	
Water Temperature	Chlorophyll-a	
Secchi Depth (Transparency)	Pheophytin-a	
Total Water Depth	Chloride	
Present Weather	Sulfate	
Days Since Last Significant Rainfall	Total Phosphorus	
Flow Severity	Total Suspended Solids	



Segment Watersheds

Upper Neches Basin

- 0604: Neches River Below Lake Palestine
- 0605: Lake Palestine
- 0606: Neches River Above Lake Palestine
- 0609: Angelina Below Sam Rayburn Reservoir
- 0610: Sam Rayburn Reservoir
- 0611: Angelina River Above Sam Rayburn Reservoir
- 0612: Attoyac Bayou
- 0613: Lake Tyler / Lake Tyler East
- 0614: Lake Jacksonville
- 0615: Riverine Portion of Sam Rayburn Reservoir



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2023 Upper Neches Basin Highlights Report

BASIN HIGHLIGHTS REPORT

2023

For the Upper & Middle Portions of the Neches River Basin
Angelina & Neches River Authority



The Basin Highlights Report is produced annually by ANRA and typically provides an overview of previous years events and ongoing programs in the upper and middle portions of the Neches River Basin that are relevant to the Clean Rivers Program.

Designed to inform and educate stakeholders about water quality monitoring, known issues and efforts to address them. The report provides information on education and outreach activities, and ways that you can get involved in preserving and improving water quality in places that are important to you.



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Upper Neches Basin Sites in the 2022 Texas Integrated Report 303(d) List

SEGMENT ID	SEGMENT NAME	IMPAIRMENTS	CATEGORY (AU ID)
0604	Neches River Below Lake Palestine	Dioxin in edible tissue Mercury in edible tissue	5a (02) 5c (03)
0604A	Cedar Creek	Bacteria in water (Recreation Use) Depressed dissolved oxygen in water	5a (02), 5c (03) 5c (03)
0604B	Hurricane Creek	Bacteria in water (Recreation Use)	5a (01)
0604C	Jack Creek	Bacteria in water (Recreation Use)	5a (01)
0604D	Piney Creek	Bacteria in water (Recreation Use) Depressed dissolved oxygen in water	5b (02) 5b (01)
0604M	Biloxi Creek	Bacteria in water (Recreation Use) Depressed dissolved oxygen in water	5a (03) 5c (03)
0604T	Lake Ratcliff	Mercury in edible tissue	5c (01)
0605	Lake Palestine	pH	5b (02, 03, 09, 10), 5c (01)
0605A	Kickapoo Creek in Henderson County	Bacteria in water (Recreation Use) Depressed dissolved oxygen in water	5c (01, 02) 5c (01)
0606	Neches River Above Lake Palestine	Bacteria in water (Recreation Use) Depressed dissolved oxygen in water	5c (01, 02) 5b (02)
0606A	Prairie Creek	Bacteria in water (Recreation Use)	5b (01, 03)
0606D	Black Fork Creek	Bacteria in water (Recreation Use)	5b (02)
0609	Angelina River Below Sam Rayburn Reservoir	Dioxin in edible tissue Mercury in edible tissue	5a (01) 5c (01)
0610	Sam Rayburn Reservoir	Dioxin in edible tissue Excessive algal growth in water Mercury in edible tissue pH	5a (01 - 10) 5c (01 - 10) 5c (01 - 10) 5c (05)
0610A	Ayish Bayou	Bacteria in water (Recreation Use)	5c (01, 02)
0610P	Bayou Carrizo	Bacteria in water (Recreation Use)	5c (01)
0611	Angelina River Above Sam Rayburn Reservoir	Bacteria in water (Recreation Use)	5c (01, 03, 04)
0611A	East Fork Angelina River	Bacteria in water (Recreation Use)	5c (01, 02)
0611B	La Nana Bayou	Bacteria in water (Recreation Use)	5b (01, 02, 03)
0611C	Mud Creek	Bacteria in water (Recreation Use)	5b (01, 02)
0611D	West Mud Creek	Bacteria in water (Recreation Use)	5c (01)
0612	Attoyac Bayou	Bacteria in water (Recreation Use)	5c (01, 02, 03)
0612F	West Creek	Bacteria in water (Recreation Use)	5c (01)
0613	Lake Tyler/Lake Tyler East	Excessive algal growth in water	5c (03, 04)



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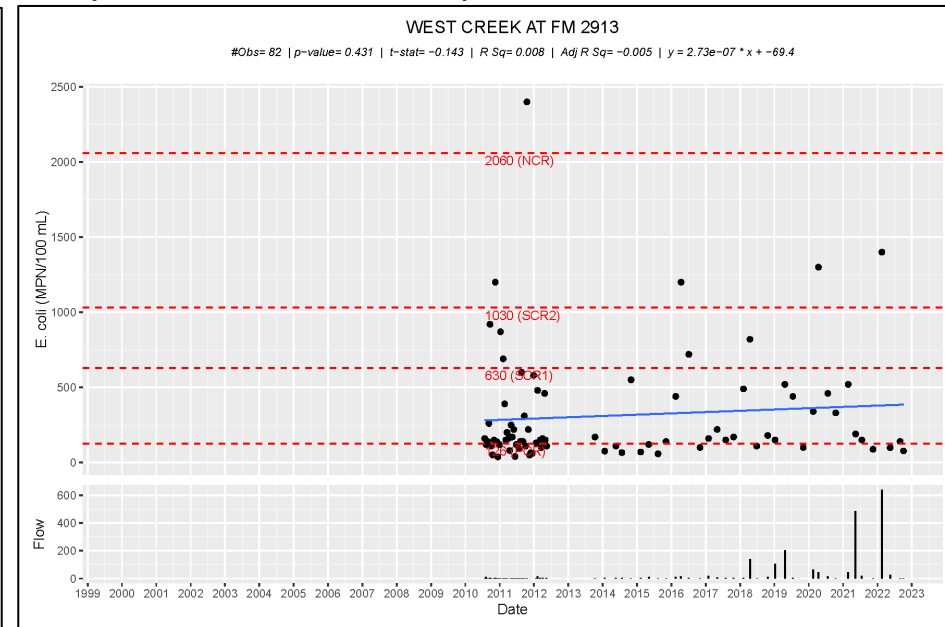
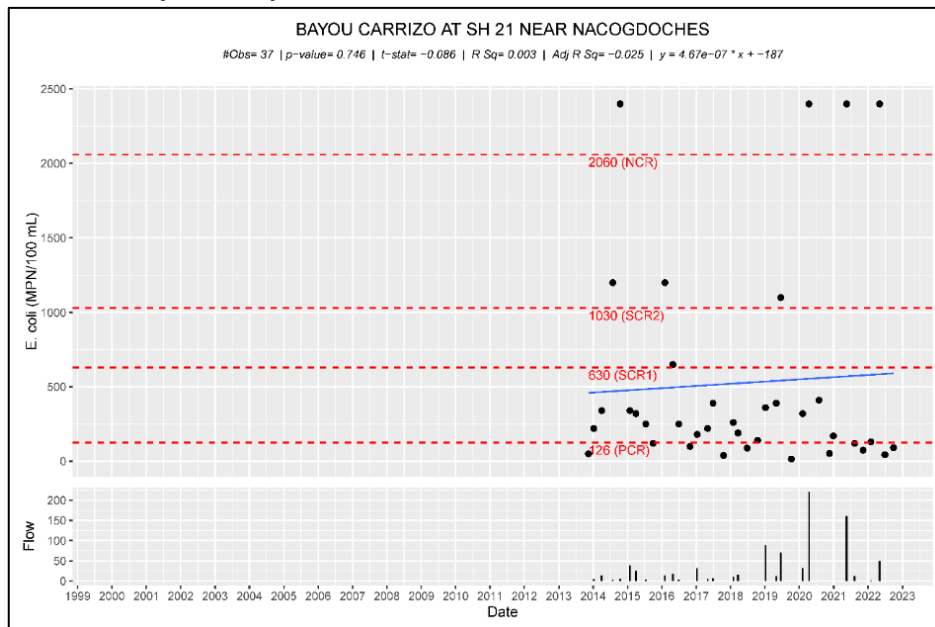


Bayou Carrizo and West Creek – Bacteria in Water

Both of these creeks were newly listed for elevated bacteria in water. This is likely not a new issue, these creeks recently had enough data for them to be assessed by the TCEQ.

The TCEQ uses a 7-year window of data to assess waterbodies. Routine data collection for both of these sites began in late 2013. (West Creek has data from as early as 2010, this was part of the Attoyac Bayou WPP, but this was not routine monitoring.)

Currently, as mentioned before, West Creek is part of the Attoyac Bayou Watershed, so it is being addressed the Attoyac Bayou WPP. More information is needed for Bayou Carrizo before any further action is taken.



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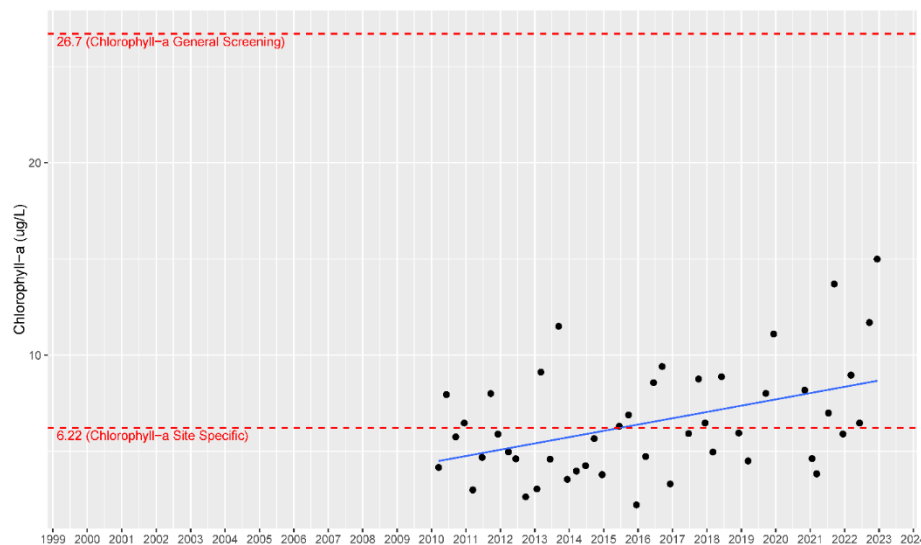


Sam Rayburn Reservoir and Lake Tyler East – Excessive Algal Growth

These reservoirs were newly listed for excessive algal growth, but are likely not new issues as well. The cause is different, however. The TCEQ changed their assessment methodology and adopted new reservoir nutrient criteria (recently approved by the EPA)

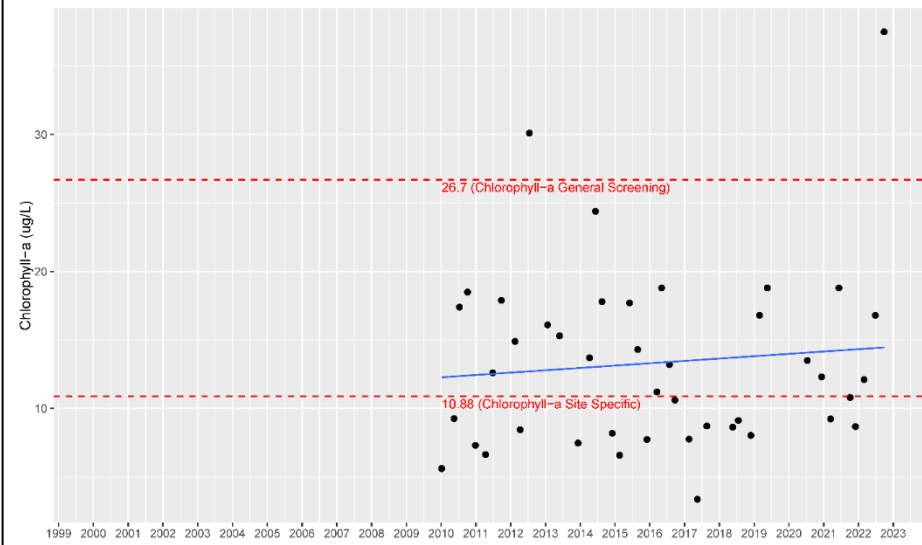
SAM RAYBURN RES AT MAIN POOL

#Obs= 92 | p-value= 0 | t-stat=-2.648 | R Sq= 0.194 | Adj R Sq= 0.185 | $y = 1.04e-08 * x + -8.66$



LAKE TYLER E MIDLAKE NEAR DAM

#Obs= 86 | p-value= 0.357 | t-stat= 0.632 | R Sq= 0.01 | Adj R Sq= -0.002 | $y = 5.43e-09 * x + 5.41$



PARAMETER	CRITERIA	2016 ASSESSED VALUES	2018 ASSESSED VALUES	2020 ASSESSED VALUES	2022 ASSESSED VALUES
CHLOROPHYLL	6.22	4.97	4.85	6.15	7.49
TSI	10.00	NA	NA	NA	48.66
SECCHI DEPTH	1.82	1.55	1.90	1.25	1.1
TOTAL N	0.80	0.44	0.44	0.51	0.48
TOTAL P	0.03	0.03	0.01	0.03	0.03

PARAMETER	CRITERIA	2016 ASSESSED VALUES	2018 ASSESSED VALUES	2020 ASSESSED VALUES	2022 ASSESSED VALUES
CHLOROPHYLL	10.88	12.60	13.45	10.90	10.90
TSI	10.00	NA	NA	NA	53.34
SECCHI DEPTH	1.06	1.20	1.35	1.50	1.50
TOTAL N	0.80	0.57	0.58	0.58	0.57
TOTAL P	0.03	0.03	0.02	0.02	0.02

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Nutrient Assessment Changes and the 5n Category

2001

- TCEQ begins developing nutrient criteria for the TSWQS

2010

- TCEQ adopted nutrient criteria for 75 reservoirs

2013

- EPA approves nutrient criteria for 39 of the 75 reservoirs (Rayburn & Tyler East were among those 39)

2016

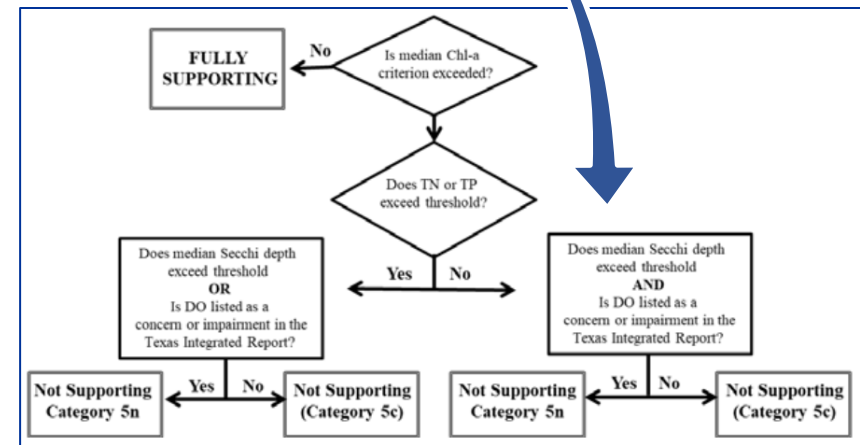
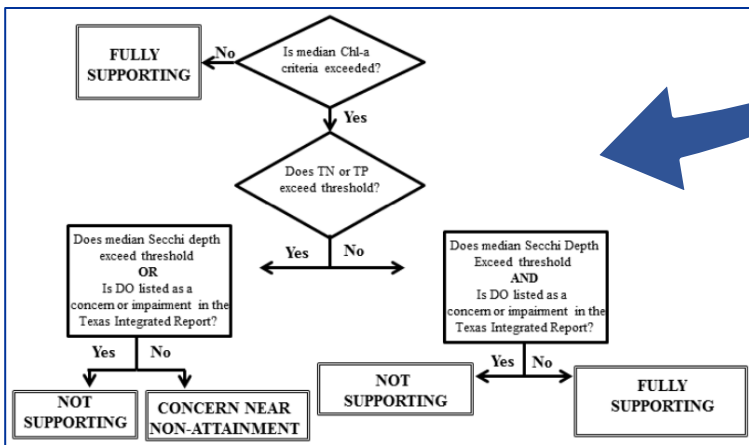
- TCEQ starts assessing the reservoirs with approved criteria with a new line-of-evidence framework

2022

- TCEQ updates their assessment method, leading to a new impairment category, 5n

Also 2022

- Sam Rayburn Reservoir and Lake Tyler East are placed on the 303(d) List



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Sam Rayburn Reservoir – High pH

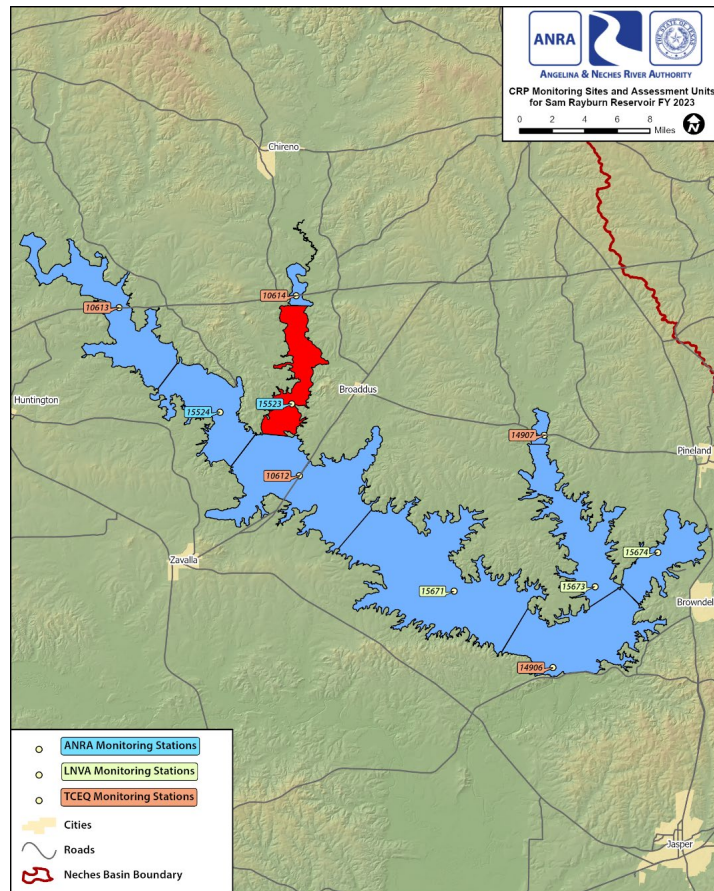
In the 2022 Integrated Report (IR), Assessment Unit 05 of Sam Rayburn Reservoir was listed for pH on the 303(d) List.

The TCEQ's *Potential Sources of Impairments and Concerns* section of the IR lists the source of this impairment as 'unknown'.

There are several organic and inorganic processes which can alter the pH of waterbodies, along with possible differences in sampling methodologies.

Three separate entities currently take part in monitoring on the reservoir: ANRA, LNVA, and TCEQ.

Further information is needed to narrow down the cause(s) of this impairment, a start would be a 24-hour pH study.

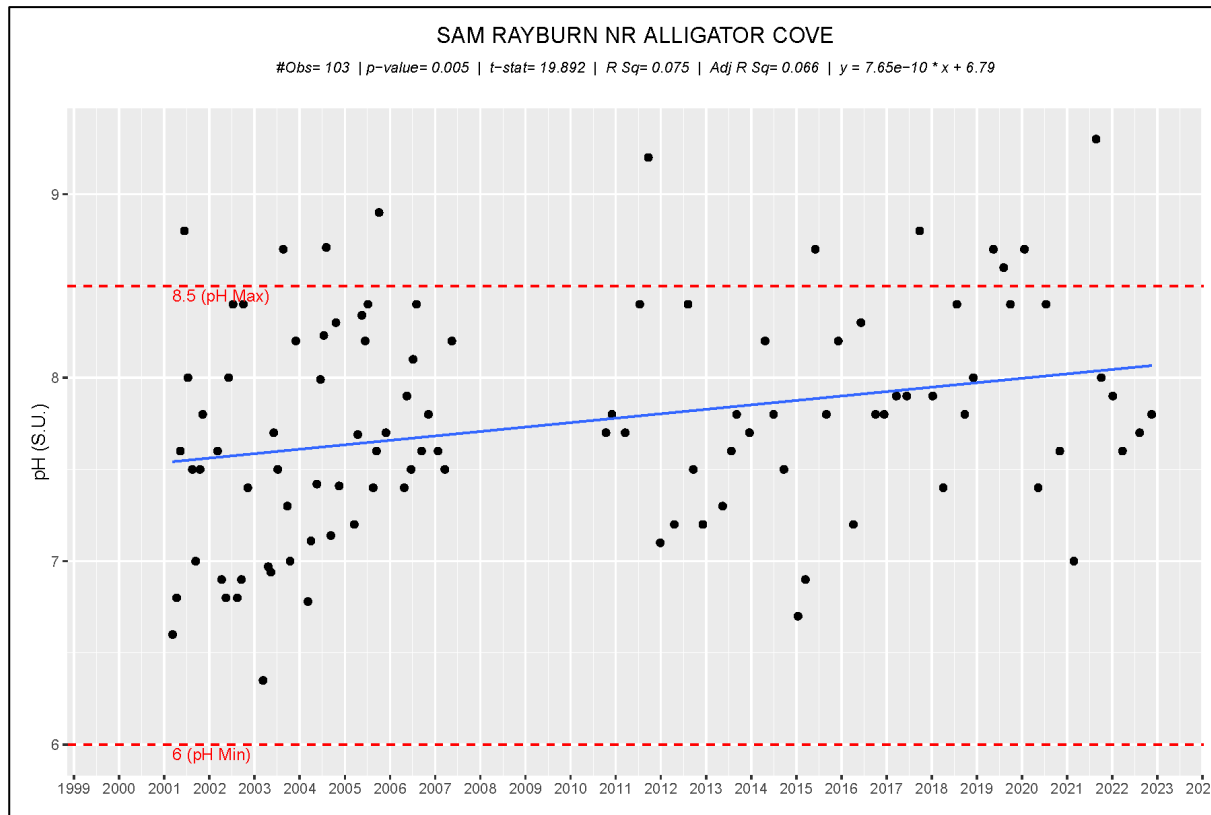


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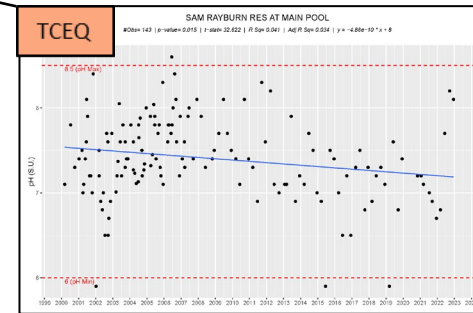
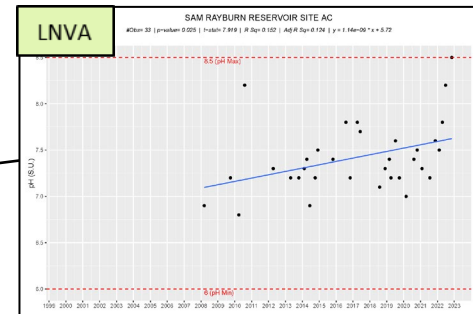
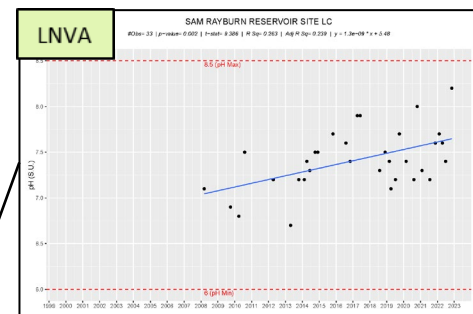
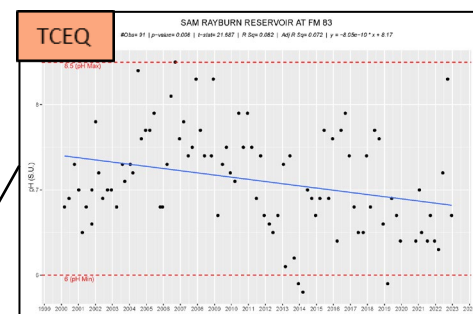
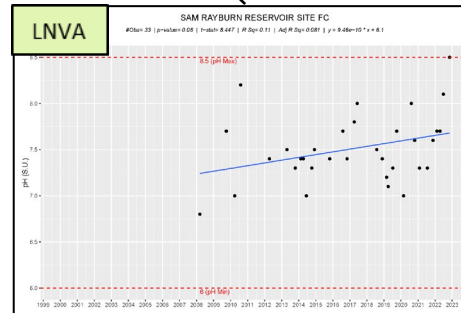
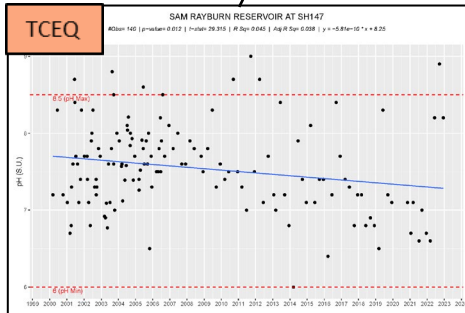
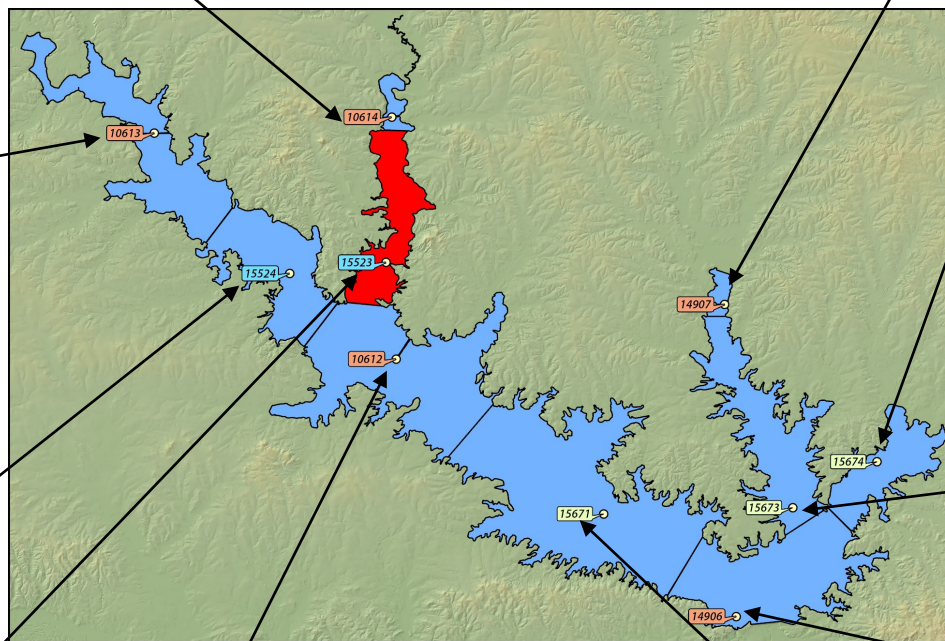
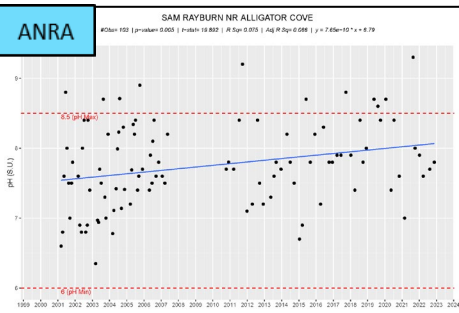
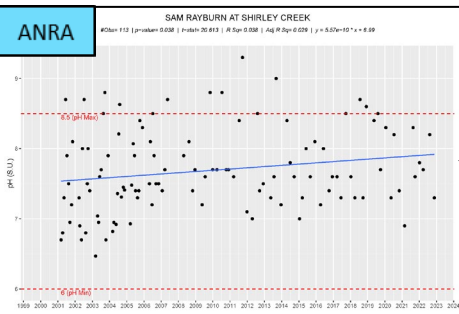
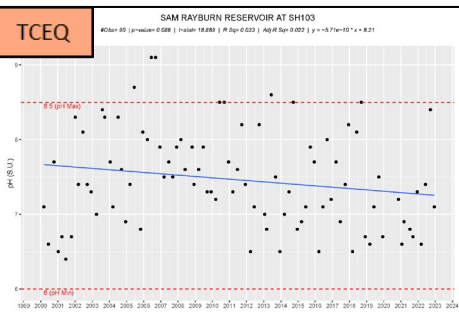
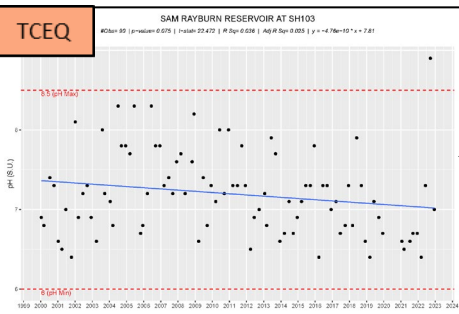
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Sam Rayburn Reservoir – High pH



Datasets from Monitoring at Sam Rayburn: pH



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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/wp-content/uploads/2022/10/ANRA_FY2022_FY2023_CRP_QAPP-1.pdf
- ANRA CRP Monitoring Activities
 - <https://www.anra.org/conservation-recreation/water-quality-activities/clean-rivers-program/monitoring-activities/>
- Coordinated Monitoring Schedule
 - <http://cms.lcra.org>
- ANRA Education and Outreach Materials
 - <https://www.anra.org/conservation-recreation/water-quality-activities/water-quality-education-outreach/>

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Comments or Questions?

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

Andrew Henry

Clean Rivers Program Coordinator

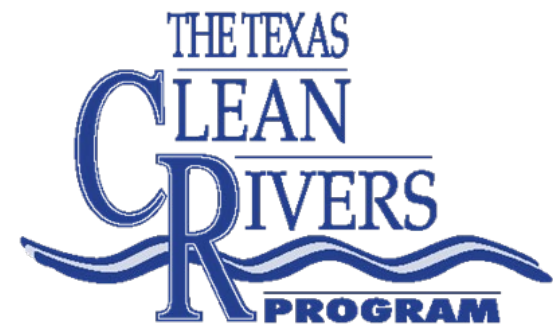
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