

2006 Draft

Upper Neches Basin Highlights Report



The Angelina & Neches River Authority (ANRA) is an independent governmental agency of the State of Texas created by the Texas Legislature in 1977. It is authorized to construct, maintain, and operate any and all works necessary for the purpose of controlling, storing, and preserving the water resources in a 17 county area in the Neches River Basin. ANRA is governed by a nine member Board of Directors appointed by the Governor of Texas to six year terms. ANRA receives no tax revenues from the state nor can it levy any taxes. Revenues are derived solely from the services provided and through customer contracts. Revenue bonds can be issued for the purpose of financing projects in the basin. The current functions of ANRA are water quality management, water resource development, water/wastewater utilities, and water conservation.

Texas Clean Rivers Program

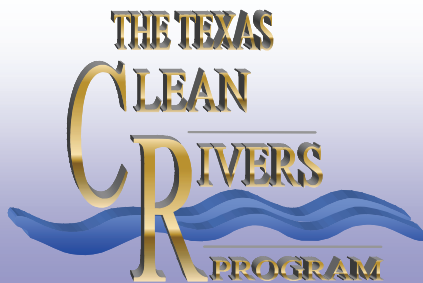
The Texas Clean Rivers Program was created in 1991 by the state legislature to assess, maintain and improve the quality of water resources within each river basin in Texas. Through an ongoing partnership between the Texas Commission on Environmental Quality, river authorities, regional entities, industry, citizens, and other local, state and federal agencies, the Clean Rivers Program (CRP) utilizes a watershed management approach to identify and evaluate water quality issues, establish priorities for corrective action and work to implement those actions. ANRA has served as the CRP regional planning agency in the Upper Neches Basin since the inception of the program. The CRP is funded through fees from water/wastewater permits issued by the state. A Steering Committee consisting of basin stakeholders representing government, industry, and public interests provide input and guidance at regular meetings. These public meetings also provide a forum for citizens to participate with ideas and express any concerns involving water quality issues in the basin.



Canoeists begin their 10 mile trip down the Neches River for the 2005 Neches River Rendezvous.

Upper Neches River Basin

The Upper Neches River Basin originates in southwest Van Zandt county and extends southeasterly through the Piney Woods of East Texas to the confluence of the Angelina and Neches Rivers at B.A. Steinhagen Lake. For Clean Rivers Program assessment purposes, the Neches River Basin is divided into upper and lower study areas. ANRA is responsible for the upper region and the Lower Neches Valley Authority (LNVA) in Beaumont reports on the lower region. The Upper Neches region is primarily located within the South Central Plains eco-region and encompasses approximately 7,451 square miles. There are nine classified river segments consisting of two major reservoirs, eight water supply lakes, and the future Lake Columbia on Mud Creek. The principal tributaries in the basin are Mud Creek, Striker Creek, East Fork Angelina River, Piney Creek, Attoyac Bayou, and Ayish Bayou. The cities of Tyler, Jacksonville, Nacogdoches, and Lufkin are located in the river basin.



Prepared in cooperation with the
Texas Commission on Environmental Quality
under the authorization of the
Texas Clean Rivers Act

Summary of 2005 Highlights

The Basin Highlights Report provides an annual update of the current water quality activities and events in the Upper Neches River Basin. The 2005 highlights included the completion of the Permit Support Monitoring Flow Study, laboratory consultants hired to assess NELAP compliance of the ANRA laboratory, and on-going drought conditions in Texas.

Permit Support Monitoring Flow Study

ANRA completed the 18 month in-stream flow study in August 2005 on five different receiving streams in the basin. The study



ANRA staff collects in-stream flow measurements at Bromley Creek for the Permit Support Monitoring Flow Study.

was based on a priority list of wastewater receiving streams provided by TCEQ which required in-stream flow measurements to determine the seven day, 2 year low flows (7Q2) used in setting permit discharge limits. ANRA performed monthly in-stream flow measurements at six locations in the basin.

The permit holders benefiting from the Permit Support Monitoring flow study included the City of Henderson, City of Whitehouse, International Paper Co. in Camden, and Clemsa Lumber Company in Pollok. The study also included quarterly measurements of the field parameters (pH, Water Temp., Dissolved Oxygen, Conductivity), and digital photos taken at stream locations on each visit. A final Flow Study Summary Report was submitted to the TCEQ in Sept. 2005.

Lab Consultants Hired for NELAP

ANRA hired a Laboratory Consultant in February 2005 to provide an assessment of

the laboratory's quality assurance activities. The assessment included a determination of need requirements and provided guidance for laboratory operations compliant to the National Environmental Laboratory Accreditation Program (NELAP). Over a seven month period, the consultants reviewed quality assurance documents, developed a comprehensive QA/QC Program Document for the laboratory, provided training on quality system activities, and conducted an onsite audit of the laboratory. Routine status reports and an Onsite Audit Report were submitted to ANRA. The ANRA laboratory will continue to work towards NELAP compliance and expects to be ready for application during FY 2007.

Recent Drought Conditions in Texas

After record rainfall in 2004, widespread drought conditions occurred in Texas during 2005. The Palmer Drought Severity Index (PDSI) showed all of East Texas in an extreme drought during December. In early 2006, moderate to severe drought conditions prevailed throughout the entire eastern half of Texas. The statewide precipitation for December 2005 ranks as the 3rd driest on record, and the Sept. to Dec. 2005 period was the 3rd driest on record.

Wildfires threatened populated areas across the state and 199 counties in Texas had outdoor burn bans in effect. The outlook for East Texas by the National Weather Service Climate Prediction Center showed the drought ongoing with some improvement through March 2006. However, recent rainfall in February and March has improved conditions significantly in the region.

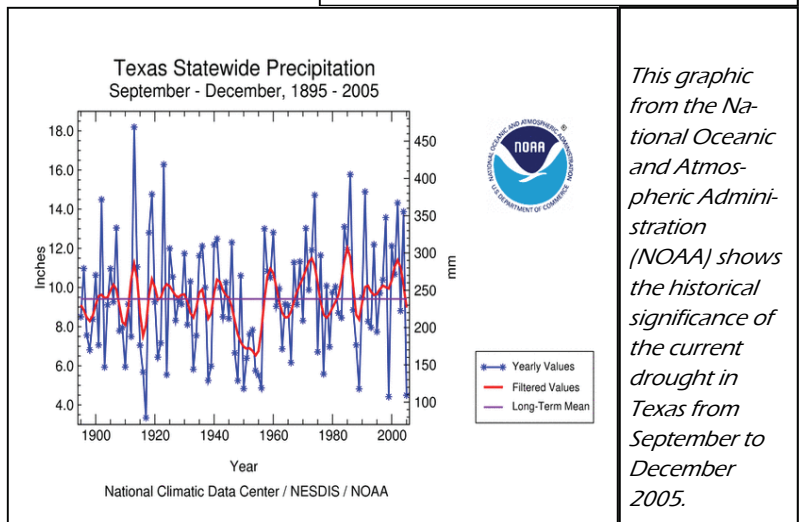
Hurricane Rita Hits East Texas

Hurricane Rita, the most intense hurricane ever recorded in the Gulf of Mexico, made landfall as a Category 3 storm on Sept. 24, 2005. The hurricane caused extensive damage along the southwestern Louisiana and southeastern Texas coasts. The storm moved into East Texas causing major damage in Jasper and areas around the Sam Rayburn Reservoir. Many communities were left without water and electricity.

ANRA played a role after the storm by assisting lake communities with ice, water, food, and supplies. ANRA's water utility near Jasper continued operating with backup generators, and the ANRA laboratory assisted public drinking water systems with increased bacteriological testing services. The majority of the public schools and churches in the Lufkin/Nacogdoches area were used as shelters for evacuees from the Louisiana and Texas coasts.



ANRA staff delivers much needed supplies to the Black Forest Community at Lake Sam Rayburn after Hurricane Rita hit the area.



This graphic from the National Oceanic and Atmospheric Administration (NOAA) shows the historical significance of the current drought in Texas from September to December 2005.

Overview of Water Quality Monitoring Programs

Through the Clean Rivers Program (CRP), ANRA conducts a basin-wide Surface Water Quality Monitoring (SWQM) Program that was established in 1996 to collect scientifically valid water quality data. Annual CRP Coordinated Monitoring Meetings assist ANRA and other agencies like TCEO in developing and finalizing basin-wide monitoring schedules. The current FY 2006 Coordinated Monitoring Schedule and maps of the station locations are available on the following CRP website: <http://cms.lcra.org/>

Types of Monitoring

Routine Monitoring is conducted in order to document long-term water quality conditions and characteristics over a variety of seasonal and flow conditions at fixed stations throughout the basin. ANRA currently performs routine monitoring at 29 stations in the basin. In addition, the City of Tyler is monitoring four stations in the upper basin. All of these monitoring events are coded as **RT** on the CRP monitoring schedule.

Intensive Monitoring is utilized to more thoroughly characterize water quality conditions in the basin and to investigate and detect areas of potential concern. ANRA is currently monitoring four stations which are coded with an **IS** on the CRP monitoring schedule. Two intensive monitoring stations were added in FY 2006 to address historical fecal coliform impairments. The Ayish Bayou and Biloxi Creek will be monitored for *E. coli* bacteria six times per year over the next two years. A systematic monitoring station on Kickapoo Creek at FM 1803 was also added in FY 2006 to address ongoing dissolved oxygen, bacteria and nutrient concerns in the watershed.

24 Hour (Diurnal) Monitoring is designed primarily for the collection of 24-hour dissolved oxygen measurements, although the other field parameters are collected. Coded as **DI** on the CRP monitoring schedule, diurnal measurements are essential for characterizing the aquatic life use of a water body. These measurements allow scientists to analyze the daily variation in an aquatic system that cannot typically be seen with grab samples. ANRA will conduct 24-hour measurements at five monitoring stations during FY 2006.

Permit Support Monitoring is developed in specific areas identified by TCEO staff where additional information on water quality and quantity is needed for the permitting process. These may include studies to develop site-specific criteria, receiving water assessments, and characterization of low flow conditions. ANRA com-



Excessive nutrients in water or eutrophication will cause excessive growth of algae and other aquatic plants like Common Duckweed which is prevalent in Kickapoo Creek above Lake Palestine (above). Eutrophication may cause taste and odor problems in drinking water and can result in fish kills which occurred in the upper Kickapoo Creek arm of Lake Palestine on May 25, 2005 (below).



pleted an 18-month flow study in August 2005, and will not be performing this type of monitoring during FY 2006.

Water Quality Parameters

The following is a brief explanation by category of the various water quality parameters collected and analyzed by ANRA's surface water quality monitoring program.

Field Parameters

The field parameters indicate the general water quality and health of an aquatic system. They include pH, water temperature, dissolved oxygen, and conductivity. Great variations from normal conditions can cause serious health and reproductive problems in aquatic organisms. Dissolved oxygen (DO) is an important measure of the quality of the habitat and overall health of the ecosystem. pH is a measure of the acidity and most aquatic organisms have a preferred pH range, usually pH 6 to 9. Conductivity is a good indicator of the dissolved mineral content in stream ecosystems. Temperature is important

since many aquatic organisms are adapted to survive and prosper within specific temperature ranges.

Bacteria

E. coli is the bacterial indicator used to monitor for the presence of human/animal waste in a waterbody and identify threats for contact recreation use. Elevated levels of these bacteria could lead to sickness in human populations. It also indicates compromised sanitary discharge and septic systems.

Conventional Parameters

Total dissolved solids (TDS) is a direct measurement of the dissolved mineral content in stream ecosystems. High TDS can be harmful to aquatic organisms and can restrict the beneficial use of water. Total suspended solids (TSS) can adversely affect stream ecosystems by filling pools, clogging gills, and limiting the light penetration and transparency critical to aquatic flora. TDS, TSS, sulfate and chloride are common constituents of wastewater and source waters. Their presence in high concentrations may cause unwanted physiological reactions in aquatic organisms, especially aquatic plants.

Total phosphorus includes phosphorus that is bound to sediment particles or inorganic compounds, which can become available in the water column. It is often the limiting nutrient for growth of aquatic vegetation in freshwater systems. Orthophosphate measures the form of phosphorus that is readily available to aquatic systems. Too much phosphorus can often cause excessive aquatic vegetation growth in freshwater systems. Elevated levels of nitrate+nitrite are good indicators of runoff from irrigation, fertilizers, and effluent waste streams. Nitrogen is a limiting factor to algal production in many freshwater systems. Excess ammonia-nitrogen can cause toxicity in fish. The toxicity of ammonia is dependent on pH and temperature. Chlorophyll-a is an indirect measure of algal density. Excess levels may result in harmful swings in DO concentrations, decrease water clarity, and alter the natural food chain of the system.

Excessive nutrients in water leads to eutrophication which is the process of enrichment of a waterbody due to an increase in nutrient loading. Eutrophication causes excessive growth of algae and other aquatic plants which will decrease dissolved oxygen levels and may cause fish kills or other unpleasant effects. Common sources of these pollutants include domestic wastewater, detergents, urban stormwater runoff, and intensive agriculture.

Water Quality Assessments for the Upper Neches Basin

Water Quality Inventory and 303(d) List

The Texas Water Quality Inventory and 303(d) List are generated by the TCEQ every two years (even-numbered years), as required by the federal Clean Water Act, Section 305(b) and 303(d). These reports describe the status of Texas waters based on historical data and identify water bodies that are not meeting standards set for their use. The 303(d) List of impaired water bodies must be approved by the EPA before it is considered final.

The TCEQ is in the process of developing the 2006 Water Quality Inventory and 303(d) List. The surface water quality data used in the 2006 Assessment will include five years of data from March 2000 thru Feb. 2005. ANRA submitted surface water quality data for the 2006 Assessment in March 2005. In the meantime, the Draft 2004 Water Quality Inventory and 303(d) List developed by TCEQ and published on May 13, 2005 is still under review by the EPA. The majority of the data used for both the 2004 and 2006 assessments has been acquired through the Texas Clean Rivers Program. The Draft 2004 Water Quality Inventory and 303(d) List are available at the following web address: <http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/04twqi/twqi04.html>

Surface Water Quality Standards

The Texas Surface Water Quality Standards are developed by the TCEQ and must be approved by the EPA. They are published in Title 30, Chapter 307 of the Texas Administrative Code which was amended to be effective August 17, 2000. The Surface Water Quality Standards serve as the foundation for managing surface water quality in Texas. A standard is a combination of a designated use and the criteria necessary to attain and maintain that use. They are the established goal for a body of water. The uses are the purpose for which the water should be fit, such as contact recreation, support of aquatic life, or drinking water supply. The criteria define the in-stream conditions necessary to support those uses. Criteria are either numeric limits on the amount of a certain pollutant that a water body may contain or narrative conditions on the water's color, odor, or turbidity. Some standards are applied generally to many different water bodies, while some are site-specific. Most water bodies will have multiple uses designated, i.e. a reservoir with a water supply use, contact recreation use, and aquatic life use. Additional information about the Texas Surface Water Quality Standards is available at the following web address: http://www.tceq.state.tx.us/nav/eq/eq_swqs.html

Classified Segments

All major rivers, lakes and estuaries in Texas have been assigned tracking numbers, called classified segments. The classified segments are given numbers that correspond to the major river basin in which they are located. The Neches River has been divided into 15 classified segments and is designated as Basin 6. In the Upper Neches Basin there are nine segments which includes four lakes. All tributaries which are monitored in the basin and are not part of the classified segment system are referred to as unclassified segments. These unclassified segments, both tributaries and lakes, are assigned the number of the classified segment of their watershed and a letter, i.e. 0604A.

ANRA Basin Highlights Report

The annual Basin Highlights Report utilizes the latest Texas Water Quality Inventory and 303(d) List issued by the TCEQ to rank each water body in the basin. The current rankings are based on

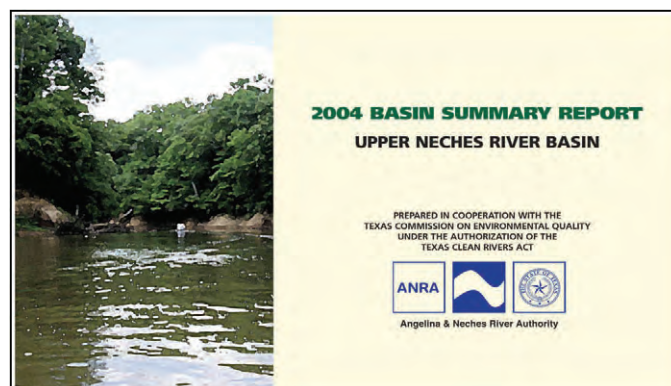
the 2004 Assessment which included the water quality data available from March 1, 1998 to Feb. 28, 2003. TCEQ's *2004 Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data* was followed for this assessment. In 2004, TCEQ conducted a targeted water quality assessment on approximately 27% of the water bodies previously assessed in 2002. In the Upper Neches Basin, only 18 targeted water bodies were re-assessed in the 2004 Water Quality Inventory. The following list of classified and unclassified segments in the basin were re-assessed in 2004:

0604: Neches River Below Lake Palestine
 0604A: Cedar Creek
 0604B: Hurricane Creek
 0604D: Piney Creek
 0604M: Biloxi Creek
 0605: Lake Palestine
 0605A: Kickapoo Creek
 0606: Neches River above Lake Palestine
 0606A: Prairie Creek
 0610: Sam Rayburn Reservoir
 0610A: Ayish Bayou
 0611: Angelina River above Sam Rayburn Reservoir
 0611A: East Fork Angelina River
 0612: Attoyac Bayou
 0612B: Waffelow Creek
 0613: Lake Tyler/Lake Tyler East
 0615: Angelina River/Sam Rayburn Reservoir
 0615A: Papermill Creek

For the 2004 Assessment, the TCEQ identified water bodies with small datasets as partially supporting or not supporting designated uses, without regard for sample size, provided they meet the threshold number of exceedances and are otherwise representative. This change in assessment procedure was implemented due to the certainty that small data sets that already have the threshold number of exceedances will demonstrate partial or non-support of uses once more samples are collected to reach a total sample size of ten.

ANRA Basin Summary Report

ANRA's Basin Summary Report is completed every five years and includes a comprehensive data review. In the 2004 Summary Report, the data review was based on the criteria and assessment procedures from TCEQ's *2002 Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data*. The period of record for the data review was Sept. 1, 1998 to August 31, 2003. In a few cases where the period of record did not meet the minimum number of samples (10), more recent data was used to



Water Quality Assessments for the Upper Neches Basin (continued)

complete the datasets. ANRA's data review included 13 parameters primarily collected during routine monitoring visits by ANRA and TCEQ. This included any available 24-hour (diurnal) dissolved oxygen measurements. Dissolved metals in water and sediment were not included in the assessment. Additional information from TCEQ's Water Quality Inventory and 303(d) List was discussed in the watershed summaries sections. Ambient toxicity data was also obtained from the TCEQ and discussed in the appropriate watershed summaries.

Water Body Rankings

TCEQ's Water Quality Inventory assigns each assessed water body to one of five categories to provide information to the public, EPA, and internal agency programs. The categories indicate the status of the water body, and how the state will approach identified water quality problems. Higher category numbers correspond to higher levels of effort required to manage water quality. Water bodies in Category 5 constitute the 303(d) List and require remedial action by the state to restore water quality. More specifically, Category 5a water bodies require the development of a Total Maximum Daily Load (TMDL). Water bodies in Category 1 are meeting all of their uses and simply require routine monitoring and preventive action.

ANRA developed a water body ranking system based on the Draft 2004 Water Quality Inventory and 303(d) List. ANRA ranked each water body included in the assessment based on the water body meeting the criteria established to support its designated uses as outlined in the *Texas Surface Water Quality Standards*. The designated uses apply to all classified water bodies. The unclassified water bodies normally have to meet the criteria for aquatic life use, contact recreation use, fish consumption and the protection of human health. In addition, many unclassified lakes are designated as public water supplies.

The 2006 Basin Highlights Report includes detailed information for each classified segment in the Upper Neches Basin. Each segment overview includes an update on the planned data collection activities in the watershed, water body assessment rank-

ings, current CRP monitoring schedule, and GIS maps of the coordinated monitoring schedule. Classified segments and corresponding unclassified segments are included in the overviews.

ANRA Water Body Ranking Categories



Exceptional: Attaining all applicable water quality standards and no use is threatened. (Category 1)



Good: Attaining most designated uses, no use is threatened, and insufficient data is available to assess the remaining uses. (Category 2)



Fair: Standard is not supported or is threatened for one or more designated uses, TMDL not required. (Category 4)



Poor: Currently on the 303(d) List, the water body does not meet applicable standards or is threatened for one or more designated uses by one or more pollutants. (Category 5)

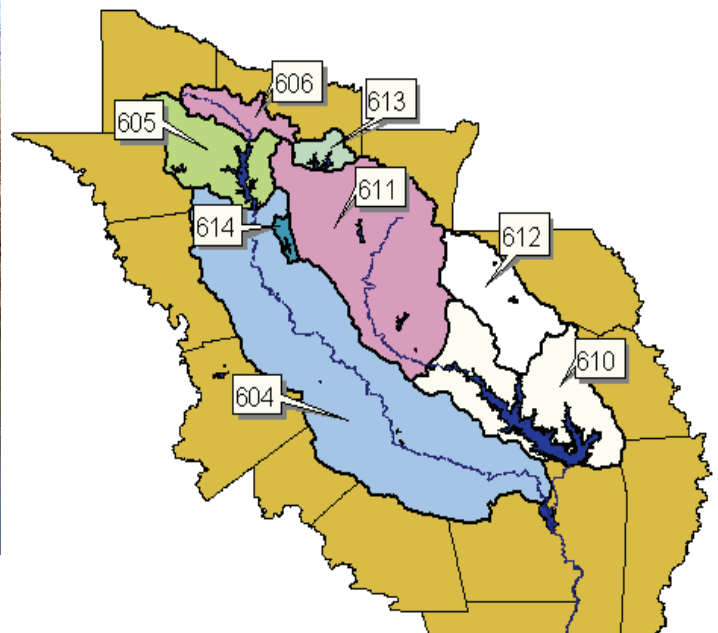


Unknown: Insufficient or no data is available to determine if any designated use is attained. (Category 3)



ANRA staff collects field parameters with a YSI multi-parameter instrument in the Neches River headwaters of Segment 606.

Upper Neches Basin Classified Segments





Segment 604: Neches River Below Lake Palestine


The Neches River below Lake Palestine is by far the longest segment in the Upper Neches River Basin. Beginning in Anderson/Cherokee County at the Lake Palestine Dam and flowing 231 miles to the B.A. Steinhagen Reservoir in Jasper/Tyler County it has a drainage area of over 3,400 square miles. Segment 604 is routinely monitored by ANRA and both TCEQ Regions (5 & 10). TCEQ regions monitor the Neches River while ANRA conducts routine monitoring on both the Neches River and six unclassified segments in the watershed.


During FY 2006, additional monitoring is being conducted in the segment. ANRA is performing intensive monitoring on Biloxi Creek southeast of Lufkin to address the bacteria impairment. Bimonthly bacteria and flow monitoring will be performed over a two-year period. ANRA will also continue diurnal (24 hour) monitoring on Piney Creek and Biloxi Creek. TCEQ regions will conduct routine monitoring on five stations on the Neches River. The FY 2006 CRP monitoring schedule for the segment is available on page 7.

0604—Neches River below Lake Palestine: Due to the length of the segment and the number of monitoring stations, the Neches River is divided into the Upper, Middle, and Lower regions. Each region has two monitoring stations which were included in the assessment. The ranking is assigned to each region as follows:


 Lower Region (Lower boundary to SH 94 crossing West of Lufkin) - Most uses are fully supported, but the Contact Recreation Use was not assessed at the lower monitoring station and the Fish Consumption Use was not assessed at the upper monitoring station. ANRA's 2004 Summary Report indicates a primary concern for *E. coli* at the upper monitoring station.


 Middle Region (SH 94 crossing to US Hwy. 84 East of Palestine) - Most uses are fully supported although the overall Aquatic Life Use is not supported due to chronic metals (lead) in water at the upper monitoring station. The Contact Recreation Use and Fish Consumption Use were not assessed at the lower monitoring station. The 2004 Summary Report shows a primary concern for *E. coli* at the lower monitoring station. This segment is currently a category 5c water body, therefore additional data will be collected before a TMDL or review of the water quality standards is scheduled.


 Upper Region (US Hwy. 84 crossing to headwaters at the Lake Palestine Dam) - All designated uses are fully supported in this region of the segment although the Fish Consumption Use and Nutrient Enrichment were not assessed at the upper monitoring station. The 2004 Summary Report shows a nutrient concern for chlorophyll a at the upper monitoring station.


 0604A—Cedar Creek: Contact Recreation Use is not supported in the lower area downstream of FM 2497 due to the bacteria (*E. coli*) levels. Nutrient Enrichment is a concern for ammonia-nitrogen and total nitrate+nitrite, nitrogen in the same area. The 2004 Summary Report also indicates a concern for total phosphorus and ortho-phosphorus. It is a category 5c water body, and CRP routine/intensive


monitoring will continue.


 0604B—Hurricane Creek: Contact Recreation Use is not supported due to the elevated bacteria (*E. coli*) levels at SH 324 South of Lufkin. There is also a Nutrient Enrichment concern for ammonia-nitrogen at this location. The water body is a category 5c and routine monitoring will continue.


 0604C—Jack Creek: Contact Recreation Use is not supported due to elevated bacteria (fecal coliform) levels. Nutrient Enrichment is a concern for ammonia-nitrogen and nitrate+nitrite nitrogen. The 2004 Summary Report also indicates a concern for total and ortho phosphorus and elevated levels of *E. coli* bacteria. It is a category 5c water body and routine monitoring will continue.

 0604D—Piney Creek: Aquatic Life Use is not supported due to depressed dissolved oxygen (DO) in the lower 25 miles. The Contact Recreation Use is fully supported although a use concern based on limited data for bacteria in the upper 25 miles exists. The 2004 Summary Report indicates a concern for ammonia-nitrogen, partial support for low pH and dissolved oxygen, and a primary concern for 24-hour dissolved oxygen measurements. It is a category 5c water body and routine/diurnal monitoring will continue.

 0604H—One Eye Creek: Aquatic Life Use is fully supported but the Contact Recreation Use and Nutrient Enrichment were not assessed. Limited data is available since the monitoring station was established in order to measure in-stream flows at a location immediately upstream of the City of Rusk WWTP in Cherokee County.

 0604M—Biloxi Creek: Contact Recreation Use is not supported in the upper and lower areas due to high *E. coli* levels. Both an Aquatic Life Use concern based on limited dissolved oxygen data and a Nutrient Enrichment concern for total phosphorus are listed. The 2004 Summary Report also includes a concern for ammonia-nitrogen and a primary concern for 24-hour DO measurements. It is a category 5c water body and routine/diurnal monitoring is ongoing. A two-year intensive survey will be performed by ANRA during FY 2006-07 to address the bacteria impairment.

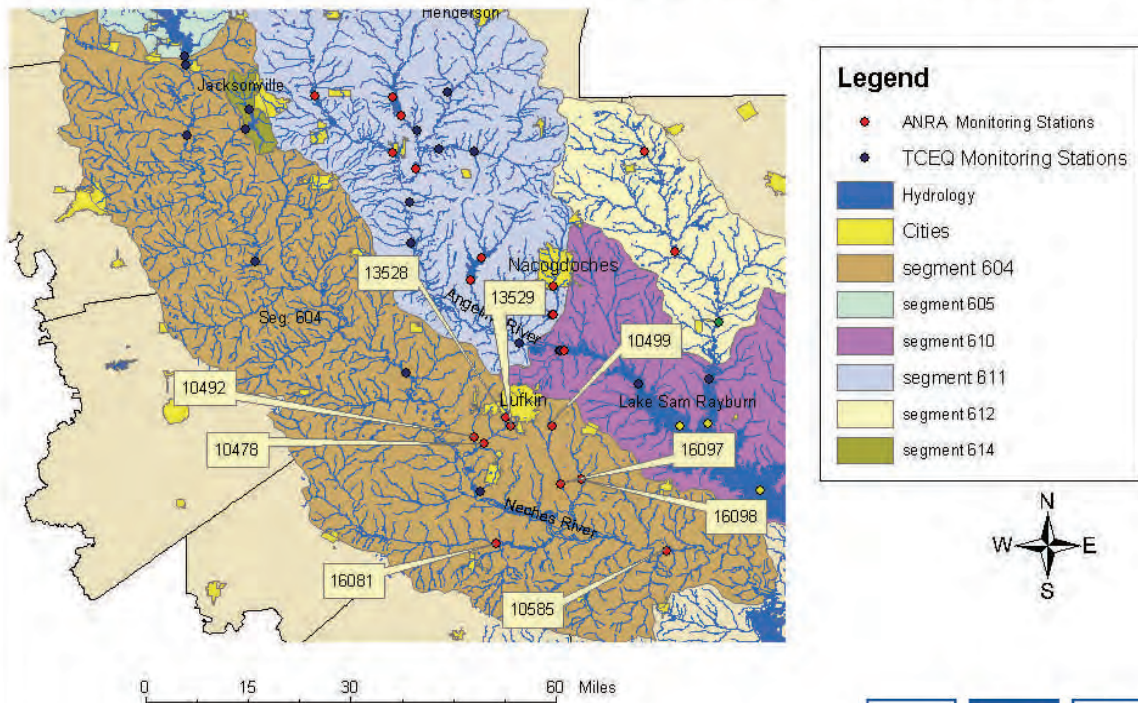
 0604N—Buck Creek: Most uses are fully supported although Fish Consumption Use was not assessed. In addition, Contact Recreation Use was not assessed at the upper monitoring station. ANRA routine monitoring is ongoing.

 0604T—Lake Ratcliff: Fish Consumption Use is partially supported due to mercury in fish tissue. Other uses were not assessed. It is a Category 5a water body which means a TMDL is underway, scheduled, or will be scheduled. A statewide project to address mercury in fish tissue is planned by TCEQ.

Segment 604 - FY 2006 CRP Monitoring Schedule

ANRA Monitoring Stations								
Station ID	Station Description	Prog-Code	Monitoring Parameters					
			24 HR Monitoring	Metals Water	Conven-tionals	Bacteria	Inst. Flow	Field
10478	Cedar Creek at FM 2497	RT			4	4	4	4
10492	Jack Creek at FM 2497	RT			4	4	4	4
10499	Biloxi Creek at Angelina CR 216	IS				6	6	
13528	Cedar Creek at CR 1336	IS			4	4	4	4
13529	Hurricane Creek at FM 324	RT			4	4	4	4
16081	Piney Creek at FM 1987	RT			4	4	4	4
16081	Piney Creek at FM 1987	DI	2				2	
16098	Buck Creek at FM 1818	RT			4	4	4	4
16097	Biloxi Creek at FM 1818	RT			4	4	4	4
16097	Biloxi Creek at FM 1818	DI	2				2	
10585	Neches River at US 69	RT			4	4	4	4


Segment 604 Monitoring Stations FY 2006




Segment 605—Lake Palestine

Lake Palestine impounds the Neches River from the Blackburn Crossing Dam in Anderson/Cherokee County to a point 4.2 miles downstream of FM 279 in Henderson/Smith County, up to a normal pool elevation of 345 feet MSL. Lake Palestine stretches for approximately 21 miles with a surface area of 25,560 acres, and the watershed has a drainage area of 714 square miles.

The major tributaries feeding Lake Palestine are the Neches River, Kickapoo Creek (Segment 605A), and Flat Creek. ANRA conducts routine monitoring on Kickapoo Creek near Brownsboro. During FY 2006, ANRA will perform an intensive survey on Kickapoo Creek to address the water quality issues in the watershed. In addition, TCEQ Region 5 will conduct monthly bacteria and flow sampling on Kickapoo Creek to address the bacteria impairment. TCEQ will perform all routine monitoring on Lake Palestine. A special study to assess eutrophication potential was implemented. Diurnal (24-hour DO) monitoring and field/conventional parameters will be collected at three stations eleven times during the year.

 **0605—Lake Palestine:** All designated uses are fully supported, however some uses were not assessed at a few locations due to limited data. There is a General Use concern based on limited data for high pH at the upper mid-lake/ Big Eddy Bay area, and Nutrient Enrichment Concerns for ammonia-nitrogen and nitrate+nitrite, nitrogen at the headwaters of the Neches River arm. In addition, ANRA's 2004 Basin Summary Report indicates a concern for total and ortho-phosphorus and a non-support of the total dissolved solids (TDS) standard in the upper lake region. It also includes a partial support of the pH standard and a concern for chlorophyll a in the upper mid-lake region. Diurnal monitoring and more frequent routine monitoring will be performed by TCEQ to assess the eutrophication potential of the lake.

 **0605A—Kickapoo Creek:** Contact Recreation Use is not supported downstream of FM 1803 due to elevated bacteria levels. There is a Nutrient Enrichment Concern for ammonia-nitrogen in the same area. In addition, the 2004 Summary Report shows a partial support of the dissolved oxygen (instantaneous) criteria and a primary concern for 24-hour DO measurements. It is a Category 5c water body and routine/intensive monitoring is scheduled for 2006.




Additional monitoring during FY 2006 on Kickapoo Creek and Lake Palestine (pictured above) will address nutrient enrichment concerns.


Segment 606—Neches River Above Lake Palestine

The Neches River above Lake Palestine is from a point 4.2 miles downstream of FM 279 in Henderson/Smith County to Rhines Lake Dam in Van Zandt County. The segment is approximately 27 miles long and has a drainage area of 264 square miles.

During FY 2006, additional monitoring will be conducted by ANRA and TCEQ Region 5. ANRA has added a routine station on the Neches River in Van Zandt County to insure appropriate spatial coverage of the segment. TCEQ will conduct monthly bacteria and flow monitoring on Prairie Creek to address the bacteria impairment. The City of Tyler will continue routine monitoring on Prairie Creek and Black Fork Creek to assess the water quality conditions in the Prairie Creek watershed above Tyler's Westside WWTP.

 **0606—Neches River above Lake Palestine:** The Aquatic Life Use is not supported for depressed dissolved oxygen and is partially supported for zinc (acute) in water from Prairie Creek to river mile 7.0. The zinc (chronic) in water was removed from the 2002 303(d) List. The General Use is partially supported for low pH in the upper area from river mile 7.0 to the headwaters. A Nutrient Enrichment Concern exists for nitrate+nitrite nitrogen in

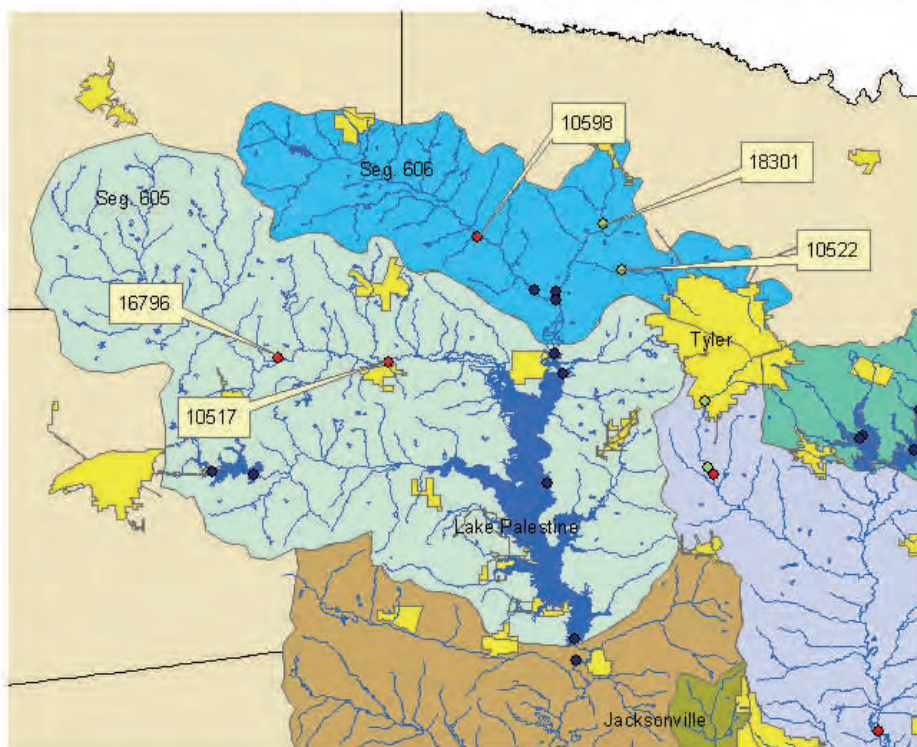
the lower region. There are Aquatic Life Use/General Use concerns for depressed dissolved oxygen, low pH, and an impaired macrobenthos community in the middle region. In addition, ANRA's 2004 Summary Report indicates the lower station is not supporting the *E. coli* standard and the upper station is not supporting the segment specific pH and sulfate standards. A primary concern for 24-hour DO measurements is identified at two stations. It is a Category 5c water body and routine monitoring is scheduled for 2006 by TCEQ and ANRA.

 **0606A—Prairie Creek:** The Contact Recreation Use is not supported due to elevated bacteria levels in the lower 4 miles. There is also an Aquatic Life Use concern for depressed dissolved oxygen in the lower 4 miles and zinc (acute) in water based on limited data in the upper 9 miles. Prairie Creek is a Category 5c water body and monthly bacteria and flow monitoring is scheduled in the lower area while routine monitoring is ongoing in the upper area. However, dissolved metals in water are not being collected at this time. The 2004 Basin Summary Report did not include Prairie Creek in the data review due to insufficient data.

Segment 605/606 - FY 2006 CRP Monitoring Schedule

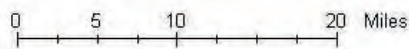
ANRA & City of Tyler Monitoring Stations								
Station ID	Station Description	Prog-Code	Monitoring Parameters					
			24 HR Monitoring	Metals Water	Conven-tionals	Bacteria	Inst. Flow	Field
10517	Kickapoo Creek at FM 314	RT			4	4	4	4
16796	Kickapoo Creek at FM 1803	IS			4	4	4	4
10598	Neches River at Van Zandt CR 420	RT			4	4	4	4
10522	Black Fork Creek upstream of Tyler WWTP (City of Tyler)	RT			4	4	4	4
18301	Prairie Creek at SH 110 (City of Tyler)	RT			4	4	4	4

Segments 605 and 606 Monitoring Stations FY 2006



Legend

- ANRA Monitoring Stations
- ◆ City of Tyler Monitoring Stations
- ◆ TCEQ Monitoring Stations
- Hydrology
- Cities
- segment 605
- segment 606




Angelina & Neches River Authority

Segment 610—Sam Rayburn Reservoir

Sam Rayburn Reservoir is the largest reservoir wholly within the State of Texas. It extends from the Sam Rayburn dam in Jasper County to a point 3.5 miles upstream of Marion's Ferry on the Angelina River arm in Angelina/Nacogdoches County, and to a point 2.4 miles downstream of Curry Creek on the Attoyac Bayou arm in Nacogdoches/San Augustine County. The normal pool elevation is 164.4 feet with a surface area of 114,500 acres and 560 miles of shoreline.

During FY 2006, ANRA will continue to monitor seven routine stations on the Sam Rayburn Reservoir as part of an inter-governmental agreement with the Lower Neches Valley Authority (LNVA). The Sam Rayburn Water Quality Monitoring Program is conducted on a monthly basis from March through November and includes the same parameters as CRP routine monitoring. ANRA will conduct routine and intensive monitoring on the Ayish Bayou. The intensive survey will address the historical bacteria impairment in the upper reaches of Ayish Bayou. The TCEQ Region 10 office will continue routine monitoring at five stations and a special study to collect for metals in sediment at three stations. Diurnal (24-hour DO) monitoring is also scheduled for two stations on the reservoir.


 **0610—Sam Rayburn Reservoir:** The Fish Consumption Use is partially supported in all assessed areas due to mercury in largemouth bass and freshwater drum. The aluminum in water was removed from the 2002 303(d) List. The contact recreation use, public water supply, and general uses are fully supported.

This segment was identified on the 2000 303(d) List as partially supporting the aquatic life use due to depressed dissolved oxygen levels. However, there has been an insufficient number of 24-hour dissolved oxygen values available in 2002 and 2004 to determine if the criterion is supported. This segment will be identified as not meeting the standard for dissolved oxygen until sufficient 24-hour measurements are available to demonstrate support of the criterion. Therefore, the Aquatic Life Use is only partially supported for depressed dissolved oxygen in the following areas: lower Attoyac Bayou arm, upper Ange-



Segment 615—Angelina River/Sam Rayburn Reservoir

This segment was created by the *2000 Texas Surface Water Quality Standards* and it consists of the riverine portion of Sam Rayburn Reservoir from a point 3.5 miles upstream of Marion's Ferry to a point 1.71 miles upstream of the confluence of Paper Mill Creek. It has a surface area of 3,555 acres.

TCEQ Region 10 in Beaumont has historically monitored this area of the lake. During FY 2006, routine monitoring will continue at three stations on the segment. Routine parameters will include color in water samples. Diurnal (24-hour DO) monitoring is scheduled for the downstream station by TCEQ and ANRA. A special study by TCEQ will collect ambient toxicity in water samples for the U.S. EPA.

 **0615—Angelina River/Sam Rayburn Reservoir:** The Aquatic Life Use is not supported due to depressed dissolved oxygen and an impaired fish community downstream of the confluence with Paper Mill Creek. The Fish Consumption Use is partially supported due to mercury in largemouth bass and freshwater drum species in the segment. The Contact Recreation Use, General Use, and Public Water Supply Use are fully supported. There is also an Aquatic Life Use concern based on limited data upstream of Paper Mill Creek for depressed dissolved oxygen and impaired habitat. There are Nutrient Enrich-


ment Concerns for ammonia-nitrogen, nitrate+nitrite, total phosphorus, and ortho-phosphorus downstream and a nitrate+nitrite concern upstream. A Narrative Criteria Concern for color is listed for both the upstream and downstream portions of the segment. The 2004 Summary Report also includes a primary concern for 24-hour DO at both monitoring stations and a primary concern for *E. coli* at the lower station. The water body is a Category 5c and routine, diurnal, and special study monitoring is scheduled for FY 2006.

  **0615A—Paper Mill Creek:** The Aquatic Life, Contact Recreation, and Fish Consumption Uses are fully supported. However, an Aquatic Life Use concern based on limited data for depressed dissolved oxygen and acute toxicity in water to aquatic organisms is listed. A Nutrient Enrichment Concern for ammonia-nitrogen and total phosphorus, and a Narrative Criteria Concern for color are also included in the Draft 2004 Water Quality Inventory. The 2004 Summary Report indicates the DO standard is not supported based on instantaneous measurements, and there is a primary concern for *E. coli* and 24-hour DO measurements. Routine monitoring by the TCEQ will continue in FY 2006. In addition, a special study is planned by TCEQ to collect ambient toxicity in water samples for the EPA.

lina River arm, upper Ayish Bayou arm, and upper mid-Angelina River arm.

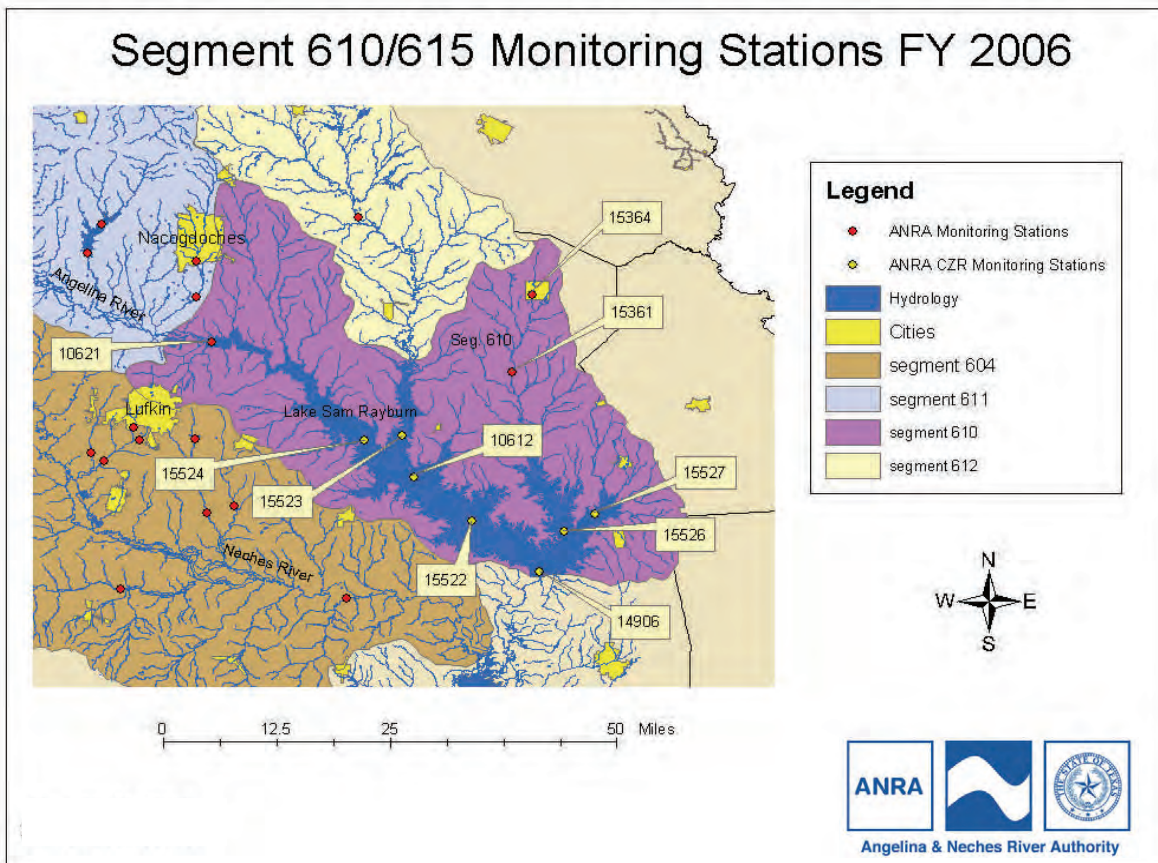
In addition, there is a sediment contaminants concern for arsenic, manganese, and zinc in sediment, and a narrative criteria concern for metals in sediment in many areas of the lake. A nutrient enrichment concern for total phosphorus is listed for the upper Angelina River arm and an aquatic life use concern for depressed dissolved oxygen in the upper Attoyac Bayou arm. The reservoir is listed as a Category 5c water body and routine, diurnal, and special study monitoring by ANRA and TCEQ will continue during FY 2006.

ANRA's 2004 Basin Summary Report indicates that segment 610 is fully supporting the aquatic life use based on instantaneous dissolved oxygen measurements. Since 24-hour data was not available, routinely collected instantaneous measurements (grabs) were compared to the surface water quality standards. Only one DO measurement from ten different monitoring stations on the reservoir was below the 3.0 mg/L grab sample criterion, and only three measurements were below the 24-hour average criterion of 5.0 mg/L. The Summary Report also indicates there is a nutrients concern in many areas of the reservoir. Five stations show a concern for ammonia-nitrogen, eight stations for nitrate+nitrite, and two stations for total phosphorus.

 **0610A—Ayish Bayou:** The Contact Recreation Use is not supported for bacteria in the lower portion downstream of US Hwy. 96. The middle and upper portions were also identified in prior assessments as not supporting the contact recreation use for bacteria. The Aquatic Life Use is fully supported and the Fish Consumption Use was not assessed. The 2004 Summary Report also indicates the Ayish Bayou is not supporting the bacteria standard. The water body is listed as a category 5c and routine/intensive monitoring is scheduled for FY 2006. ANRA will conduct bimonthly bacteria and flow monitoring over a two-year period in the upper Ayish Bayou as part of the intensive monitoring to address historical fecal coliform impairments.

Segment 610/615 - FY 2006 CRP Monitoring Schedule

ANRA Monitoring Stations								
Station ID	Station Description	Prog-Code	Monitoring Parameters					
			24 HR Monitoring	Metals Water	Conventional	Bacteria	Inst. Flow	Field
15361	Ayish Bayou at SH 103	RT			4	4	4	4
15364	Ayish Bayou at SH 147	IS				6	6	
10612	Sam Rayburn Reservoir at SH 147 Bridge	RT			9	9		9
14906	Sam Rayburn Reservoir at Main Pool	RT			9	9		9
15522	Sam Rayburn Reservoir near Veach Basin	RT			9	9		9
15523	Sam Rayburn Reservoir adjacent to Alligator Cove	RT			9	9		9
15524	Sam Rayburn Reservoir near Shirley Creek	RT			9	9		9
15526	Sam Rayburn Reservoir between Needmore Point and Powell Park	RT			9	9		9
15527	Sam Rayburn Reservoir near Mill Creek	RT			9	9		9
10621	Sam Rayburn Res./Angelina River downstream of confluence with Paper Mill Creek	DI	2					





Segment 611-Angelina River above the Sam Rayburn Reservoir


The Angelina River above the Sam Rayburn Reservoir extends from the aqueduct crossing 0.6 miles upstream of the confluence of Paper Mill Creek in Angelina/Nacogdoches County to the confluence of Barnhardt Creek and Mill Creek at FM 255 in Rusk County. Segment 611 is approximately 104 miles in length and has 2,008 square miles of drainage area. The major tributaries in Segment 611 include Mud Creek, West Mud Creek, East Fork Angelina River, and La Nana Bayou. This segment also includes Lake Striker, Lake Nacogdoches, Kurth Lake, and Pinkston Reservoir.

Surface water quality monitoring in Segment 611 is performed by ANRA, City of Tyler and both TCEQ Regions (5 & 10). During FY 2006, ANRA will continue routine monitoring on the Angelina River and five unclassified segments (La Nana Bayou, Mud Creek, West Mud Creek, Lake Nacogdoches, Lake Striker). TCEQ Region 5 will conduct monthly bacteria and flow sampling at five stations to address bacteria impairments. TCEQ Region 10 will conduct a special study on the Angelina River at US Hwy. 59 to collect ambient toxicity in water samples for the U.S. EPA.


0611—Angelina River above Sam Rayburn Reservoir: Due to the length of this segment, it is divided into an upper and a lower region with two monitoring stations per region. The ranking is assigned to each region as follows:



 Upper Region (FM 343 crossing to headwaters in Rusk County) - Contact Recreation Use is not supported due to elevated levels of fecal coliform bacteria at one of the monitoring stations. In prior assessments, there was a Fish Consumption Use concern for lead in water and a General Use concern for low pH based on limited data. However, they are both fully supported in the current (2004) assessment. ANRA's 2004 Basin Summary Report indicates one station in the upper region is not supporting the *E. coli* standard, partially supporting the pH criteria, and has a primary concern for 24-hour DO measurements. The water body is a Category 5c due to the bacteria impairment and routine/diurnal monitoring will continue in 2006. In addition, monthly bacteria and flow monitoring by TCEQ is scheduled for 2006 to address the bacteria impairment.




 Lower Region (Lower boundary to FM 343 in Nacogdoches/Cherokee Co.) - All designated uses are fully supported, however there is an Aquatic Life Use concern for chronic toxicity in water to aquatic organisms based on limited data. The 2004 Summary Report indicates one station in the lower region has a primary concern for *E. coli*. Routine monitoring will continue at both stations during 2006. A special study is planned by TCEQ for the lower station (Hwy. 59) to collect ambient toxicity in water samples for the EPA.




 0611A—East Fork Angelina River: The Contact Recreation Use is not supported in one area based on the fecal coliform geometric mean. The Aquatic Life Use and Fish Consumption Use are not supported due to lead in water from prior assessments.




Additional data has been collected so it should be re-assessed in 2006. It is currently a Category 5c water body and routine monitoring is ongoing at one station. In addition, monthly bacteria and flow monitoring is scheduled by TCEQ in 2006 to address the bacteria impairment.

 0611B—La Nana Bayou: The Contact Recreation Use is not supported due to the elevated bacteria levels in both the mid and lower sections below SH 7. The Aquatic Life Use is fully supported and the Fish Consumption Use was not assessed. There is a Nutrient Enrichment Concern for ammonia-nitrogen in the lower section. The 2004 Summary Report also indicates the water body is not supporting the *E. coli* standard at both stations. Ammonia-nitrogen, total phosphorus and ortho-phosphorus are listed as concerns and the dissolved oxygen criteria was partially supported. The water body is a Category 5c and routine monitoring will continue at both stations. In 2006, monthly bacteria and flow monitoring at two locations will address the bacteria impairment.

  0611C—Mud Creek: The Contact Recreation Use in the lower portion of the water body is not supported due to the fecal coliform levels. Aquatic Life Use is fully supported and the Fish Consumption Use was not assessed. The 2004 Summary Report indicates the *E. coli* standard is not supported at the lower station, and there is a concern for total phosphorus and a primary concern for 24-hour DO measurements at the upper station. However, the upper monitoring station at US Hwy. 79 is fully supporting the bacteria (*E. coli*) standards. The water body is a Category 5c and routine/diurnal monitoring by ANRA will continue at two stations. In addition, monthly bacteria and flow monitoring is scheduled by TCEQ for Mud Creek at Hwy. 84 to address the bacteria impairment.

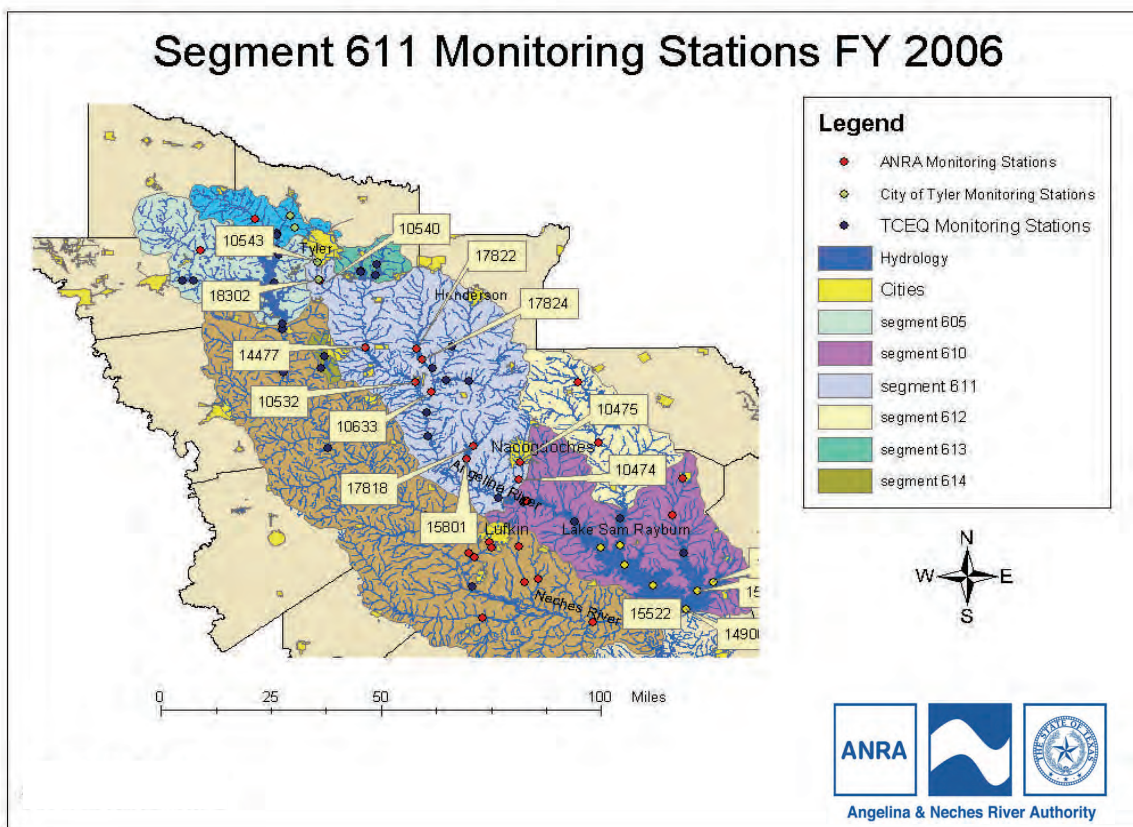
   0611D—West Mud Creek: The Aquatic Life and Contact Recreation Uses are fully supported while the Fish Consumption Use was not assessed. There is a Nutrient Enrichment Concern for nitrate+nitrite nitrogen below US Hwy. 69. The 2004 Summary Report indicates additional concerns for ammonia-nitrogen, total phosphorus and ortho-phosphorus. Routine monitoring will continue during 2006 by both ANRA the City of Tyler.

   0611H—Ragsdale Creek: The Aquatic Life Use is fully supported based on limited dissolved oxygen data. All other uses were not assessed due to limited data. No monitoring is currently scheduled although the City of Jacksonville routinely performs in-stream sampling to support regulatory compliance of their permitted wastewater facilities.

   0611O—Lake Nacogdoches: The Public Water Supply Use is fully supported. No other uses were assessed based on limited data. However, additional data will be available for future assessments. Routine monitoring has been ongoing since 2003 and will continue in 2006 at two stations.

Segment 611 - FY 2006 CRP Monitoring Schedule


ANRA & City of Tyler Monitoring Stations								
Station ID	Station Description	Prog-Code	Monitoring Parameters					
			24 HR Monitoring	Metals Water	Conventionals	Bacteria	Inst. Flow	Field
10633	Angelina River at SH 204	RT			4	4	4	4
10633	Angelina River at SH 204	DI	2				2	
10532	Mud Creek at US 84	RT			4	4	4	4
10540	West Mud Creek at FM 346	RT			4	4	4	4
10474	La Nana Bayou at Nacogdoches CR 526	RT			4	4	4	4
10475	La Nana Bayou at Loop 224 South	RT			4	4	4	4
14477	Mud Creek at US 79	RT			4	4	4	4
14477	Mud Creek at US 79	DI	2				2	
15801	Lake Nacogdoches at Main Pool	RT			4	4		4
17818	Lake Nacogdoches upper lake	RT			4	4		4
17824	Lake Striker near dam	RT			4	4		4
17822	Lake Striker upper lake	RT			4	4		4
18302	West Mud Creek at US 69 (City of Tyler)	RT			4	4	4	4
10543	West Mud Creek above Tyler WWTP (City of Tyler)	RT			4	4	4	4




Segment 612—Attoyac Bayou




The Attoyac Bayou segment is from a point 2.4 miles downstream of Curry Creek in Nacogdoches/San Augustine County to FM 95 in Rusk County. The segment extends for approximately 82 miles until it enters the Sam Rayburn Reservoir, and it has a drainage area of 667 square miles.

During FY 2006, ANRA will continue routine monitoring at two stations on the segment. TCEQ will conduct monthly bacteria and flow monitoring at two stations to address the bacteria impairments.

 **0612—Attoyac Bayou:** The Contract Recreation Use is not supported in the upper and lower portions of the segment. The *E. coli* geometric mean was exceeded at both locations. There is also a Contact Recreation Use concern for fecal coliform in the upper station. All other uses are fully supported. The 2004 Summary Report also indicates the *E. coli* standard is not supported at two stations on the segment. No other concerns were

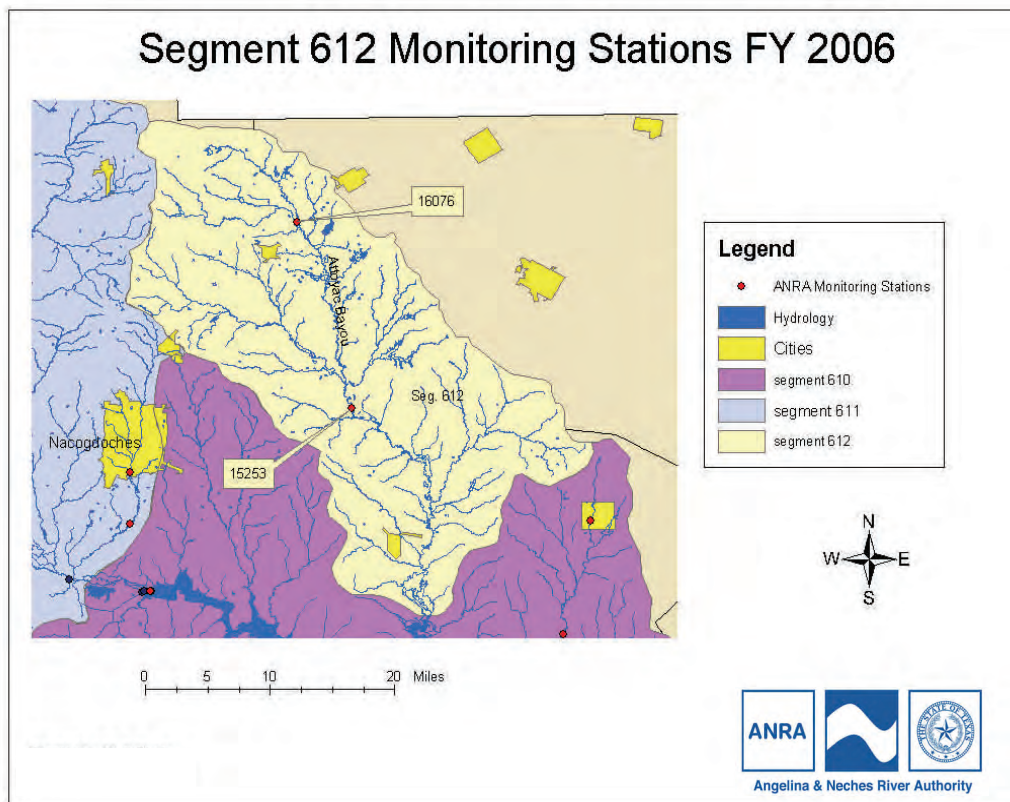
identified. The water body is a Category 5c and routine monitoring by ANRA will continue in 2006. In addition, monthly bacteria and flow monitoring by TCEQ is scheduled in 2006 for the Attoyac Bayou at Hwy. 21 and 59 to address the bacteria impairments.

 **0612B—Waffelow Creek:** The aquatic life, contact recreation, and fish consumption uses were not assessed. The unclassified water body was removed from the 2002 303(d) List for bacteria.

   **0612C—Pinkston Reservoir:** The Public Water Supply Use is fully supported. The aquatic life, contact recreation, and fish consumption uses were not assessed. Monitoring is not scheduled for this water body during 2006.

Segment 612 - FY 2006 CRP Monitoring Schedule

ANRA Monitoring Stations								
Station ID	Station Description	Prog-Code	Monitoring Parameters					
			24 HR Monitoring	Metals Water	Conventional	Bacteria	Inst. Flow	Field
16076	Attoyac Bayou at US 59	RT			4	4	4	4
15253	Attoyac Bayou at SH 7	RT			4	4	4	4



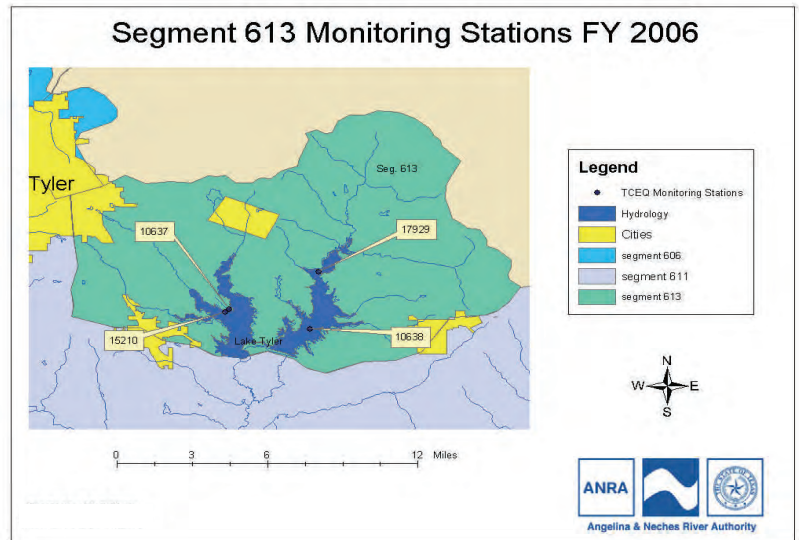
Segment 613 - Lake Tyler & Lake Tyler East

Lake Tyler & Lake Tyler East impound Prairie Creek and Mud Creek from Whitehouse Dam and Mud Creek Dam in Smith County up to the normal pool elevation of 375 feet. They have a combined surface area of 4,880 acres. It is used as a public water supply for the City of Tyler.

The TCEQ regional office in Tyler has continually monitored this segment. During FY 2006, routine monitoring will continue at two stations on Lake Tyler and two stations on Lake Tyler East.



0613—Lake Tyler/Lake Tyler East: All designated uses are fully supported in the segment. In previous assessments, low pH was an issue, however the segment was reassessed using more recent data and it is now fully supporting the general use criteria. The parameter was removed from the 2002 303(d) List. ANRA's 2004 Basin Summary Report indicates all uses are fully supported and there are no additional concerns.



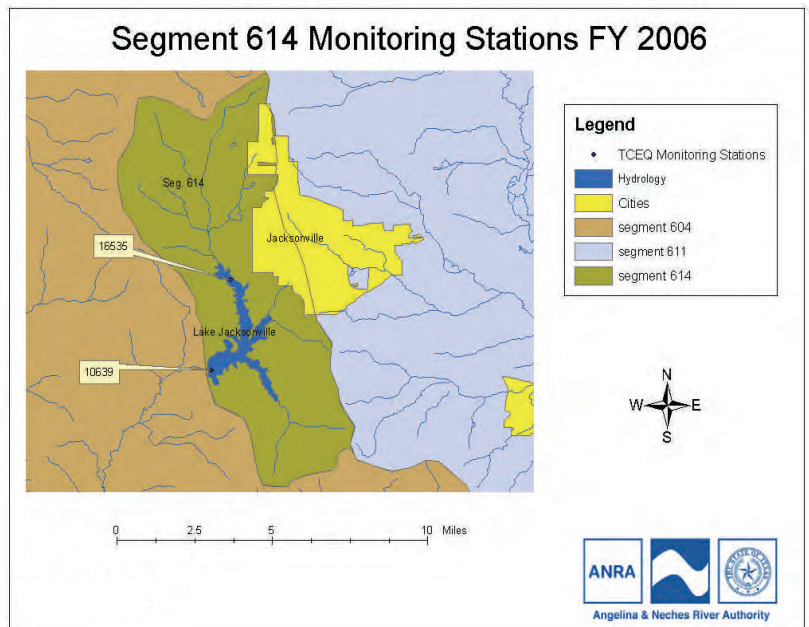
Segment 614 - Lake Jacksonville

Lake Jacksonville impounds Gum Creek from Buckner Dam in Cherokee County up to the normal pool elevation of 422 feet. It has a surface area of 1,320 acres. It is used as a public water supply for the City of Jacksonville.

The TCEQ has routinely collected surface water quality data on Lake Jacksonville. During FY 2006, routine monitoring will continue at two stations on the lake.



0614—Lake Jacksonville: The Public Water Supply and General Uses are fully supported. The Aquatic Life, Contact Recreation, and Fish Consumption Uses were not assessed. Routine monitoring conducted by TCEQ in recent years will provide sufficient data to assess all uses in the future. The 2004 Summary Report shows the segment is fully supporting all uses and there were no additional concerns identified.



Upper Neches Basin Projects

Lake Columbia Water Supply Project Update

The Lake Columbia Water Supply Project is currently in the process of obtaining a 404 Permit from the U.S. Army Corps of Engineers (USACE). The 404 permit application was filed in late 2000 and the permitting process is addressing a number of environmental issues.

An Environmental Impact Statement (EIS) is currently underway by the environmental firm, R.J. Brandes Company in conjunction with Horizon Environmental. This comprehensive study will cost around \$1 million and take approximately 18-24 months to complete. The archeological survey commences in January 2006 to search for prehistoric and historic archeological sites, native and historic cemeteries, historic standing structures, as well as other cultural resources. The cultural resources field work begins in February 2006 to record any cultural sites that occur within the limits of the proposed lake. The field work will last approximately two months and the resulting reports will be submitted as part of the EIS by the Fall of 2006.

The Lake Columbia Downstream Impacts Analysis was completed in Sept. 2005 by Freese & Nichols, Inc. to determine the impacts of the dam's construction and future reservoir operations on the Mud Creek floodplain. The report is available on the ANRA and TWDB website at <http://www.twdb.state.tx.us/>. The results will be incorporated into the Lake Columbia EIS.

On July 28, 2005, the Texas Department of Transportation Commission officially completed the closure of Farm-to-Market Roads 2064 and 2750. ANRA had requested the closures at the point where the roadways enter the proposed Lake Columbia. Closure is conditional on the completion of the reservoir project. The closure of these two lightly traveled roadways will save between \$12 and \$16 million by avoiding the need to build bridges for these two roadways across the lake. Alternate routes are available and the closures will cause very little driver inconvenience.

The next phase of the project includes land appraisals, surveying and the acquisition of land for the reservoir. Additional information about the project is available at: <http://www.lakeeastex.org/>

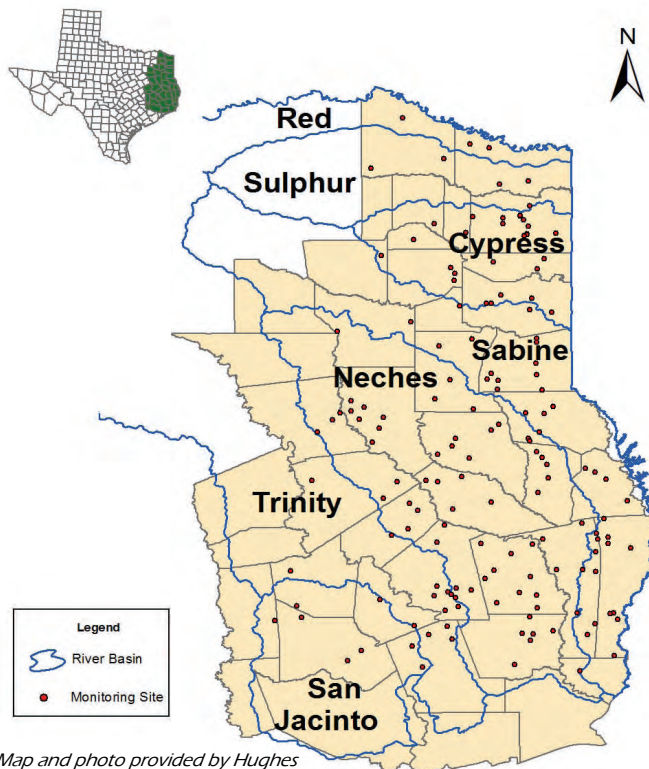
Texas Forest Service BMP Monitoring Program

The Best Management Practices (BMP) Implementation Monitoring Program was started in 1991 by the Texas Forest Service in order to measure the degree of implementation with BMP guidelines by the forestry community and to evaluate the effectiveness of BMPs as applied in the field. Randomly chosen, "normal silvicultural" operations are evaluated for the presence of BMPs and whether or not they are functioning properly, when applicable and only with the landowners consent. Operations that are selected for evaluation include both public and private lands, and this cooperative, non-regulatory program is completely voluntary.

Since 1991, the Texas Forest Service has completed six BMP implementation reports. The last report from 2005 indicates a total of 156 sites were evaluated and are believed to be a representative sample of the forestry activities that occurred in East Texas. These sites were monitored between May 7, 2003 and July 1, 2005. The overall BMP implementation on the sites monitored was 91.7%. In general, implementation was highest on sites under public ownership. The national and state forestland sites had an overall implementation of 98.3%, industry sites had a 95.7% rating, commercial landowners scored 96.0% and family forest owners scored 88.9%.

In the Neches River Basin, there were 62 forestry operations monitored. The combined results of these evaluations showed a 92.8% implementation rate.

BMP Monitoring Site Locations by River Basin



Map and photo provided by Hughes Simpson, Texas Forest Service

The major deficiencies noted during the evaluations were:

- Failure to restore and stabilize stream crossings on temporary roads
- Failure to remove logging debris from streams

Major improvements from the previous rounds were:

- A decrease in the number of significant risks to water quality
- A higher overall BMP implementation on permanent and temporary roads
- An increase in BMP implementation on family forest lands

Additional information about the program including the 2005 BMP implementation report is available on the Texas Forest Service website at the following web address:

<http://texasforestservicetamu.edu/forest/water/default.asp>



Stakeholder Participation and Public Outreach

Stakeholder participation and public outreach are an important aspect of the Texas Clean Rivers Program. The Texas Clean Rivers Act states that, "A truly comprehensive watershed assessment program must allow for the participation of *stakeholders* and other interested parties in the development of water quality objectives and priorities for each river basin". CRP defines a stakeholder as any individual or entity that has a vested interest in the basin's waters, which includes the general public, institutions, government, industry, fee payers, and other interested parties. Stakeholder participation to help determine the direction of each basin's CRP activities is accomplished through the Steering Committee process.

Upper Neches Basin Steering Committee

The CRP Steering Committee for the Upper Neches Basin meets publicly at least once a year in the Lufkin/Nacogdoches area. The Steering Committee provides input to ANRA's Clean Rivers Program and assists in developing water quality objectives, establishing basin priorities, reviewing CRP workplans, allocating resources, reviewing major reports, and identifying water quality issues in addition to other activities.



ANRA's 2005 CRP Steering Committee Meeting

The 2005 Steering Committee Meeting was held on April 8, 2005 in Nacogdoches. Topics discussed included the proposed FY 2006-07 CRP workplan and budget, 2005 Basin Highlights Report, TCEO's Continuous Water Quality Monitoring Program, and the basin-wide coordinated monitoring schedule. The meeting was well attended and the input provided by the committee was very informative. The meeting minutes and presentation handouts are currently available on the ANRA web site. Anyone interested in becoming a member of the CRP Steering Committee may contact ANRA's Project Manager at (936) 633-7541.

Public Outreach Activities

A public outreach program gives the public and concerned citizens an opportunity to stay informed, get involved and make a difference. ANRA's public outreach activities consist of a volunteer environmental monitoring program, environmental education events, water quality presentations, and the ANRA web page.

ANRA utilizes the Texas Watch Volunteer Environmental Monitoring Program to provide educational and hands-on opportunities to perform water quality monitoring in the Upper Neches Basin.

ANRA serves as the Texas Watch regional partner for the river basin and provides training, monitoring kits, and replacement reagents/supplies to the volunteer monitors. There are several volunteer groups in the basin and ANRA continues to provide them with much needed support. The water quality data is reported to ANRA and submitted to Texas Watch where it is available on their website's data viewer. A Texas Watch regional meeting and data analysis workshop was held on April 9, 2005 at Lake Palestine in cooperation with the Greater Lake Palestine Council (GLPC). Additional information about the Texas Watch program is on their website at <http://www.texaswatch.geo.txstate.edu/>.

ANRA Web Page

Another means of reaching the public and providing water quality information is through the ANRA web page. The ANRA website address is <http://www.anra.org/>. The ANRA web page provides general information about the Texas Clean Rivers Program and helpful links are provided to the websites of the TCEO, Texas Watch, and the other CRP program partners. The CRP section of the ANRA website includes information on current activities, CRP steering committee meetings, water quality reports, and the monitoring programs. A surface water quality database for the Upper Neches Basin is available on the website as well as the current monitoring schedules with GIS maps of the monitoring locations. The site is routinely updated to include current CRP activities, water quality data, and upcoming CRP meetings.

Getting Involved

The Angelina & Neches River Authority strives to involve the public in its activities, whether it is through volunteer monitoring programs, public outreach events, or the CRP Steering Committee process. For more information, please contact ANRA at (936) 632-7795 or e-mail info@anra.org.



ANRA sponsors and participates in the annual Neches River Rendezvous event in Angelina County.