

SABINE RIVER BASIN Highlights

THE TEXAS CLEAN RIVERS PROGRAM

January 2003

SABINE RIVER WATERSHED MANAGEMENT PROGRAM

The Sabine River Authority (SRA) is using an integrated approach to address water quality issues. This comprehensive program includes the following components:

- ★ Public Participation and the Basin Steering Committee;
- ★ Data Collection, Management, and Analysis, including
- ★ Systematic Monitoring and
- ★ Special Studies;
- ★ Subwatershed Inventory;
- ★ Quality Assurance Project Plan (QAPP);
- ★ Geographic Information System (GIS); and
- ★ the World Wide Web Project.

This integrated approach to water quality management provides for the best use of limited resources. The subwatershed inventory, data analysis, and screening studies supplement the routine monitoring and are used to help identify areas of water quality concerns or possible concerns and allow the focus of additional monitoring resources on problem areas. The coordination of state, regional, and local entities reduces duplication of effort in addressing water quality issues. Encouraging public participation increases the awareness of the impact of human activities on water quality.

PUBLIC PARTICIPATION AND BASIN STEERING COMMITTEE

The Sabine Basin Steering Committee allows stakeholders to have an active role in addressing water quality issues in the Sabine Basin. The Basin Steering Committee meetings are held in three locations to encourage participation from all of the stakeholders in the Basin. With an emphasis on stakeholder involvement, the SRA invites water supply corporations, permitted dischargers, councils of government, city, and county officials to become Steering Committee members. Private citizens and environmental organizations are also urged to join the Committee. Interested parties should contact the SRA to be added to the contact list. Membership in the Committee has grown from 65 to 143 members since 1991.

The Comprehensive Sabine Watershed Management Study, completed in 1999, addressed water supply as well as water quality in the Sabine Basin. Performed in conjunction with the Texas Water Development Board (TWDB), the study updated the 1985 *Update of the Master Plan for the Sabine River*. Significant changes have taken place since 1985 that necessitated an update of SRA's overall plan for the Basin. This plan takes an overall look at Basin development including such issues as water need, water supply, the environment, conservation, economic development, and natural resources among others. The goal of this planning is to implement a program to satisfy the water needs of the Sabine Basin in a timely and cost-effective manner. The combination of this study with the Texas Clean Rivers Program (TCRP) represents a holistic approach to water management.

TEXAS WATCH CITIZEN MONITORING

The SRA continues to provide Texas Watch program training and support in both the Upper and Lower Sabine Basin. In the Upper Sabine Basin, the SRA supports Jarvis Christian College students monitoring ten sites in the Hawkins area, Kilgore College students monitoring a site near their campus, City of Longview employees monitoring several sites in the Longview area, a Hallsville High School teacher monitoring two sites, an Emory science teacher monitoring a site, and a Spring Hill Middle School teacher monitoring one site. Texas Watch data from watersheds in the Longview area was utilized with other professional data collected by the SRA in a special study of Grace Creek and its major tributaries. SRA made a Texas Watch presentation at the Jarvis Christian College career day for seventy-five high school 10th and 11th graders visiting the school. SRA staff has attended the statewide Texas Watch Meeting of the Monitors (MOMS) each year. In the Lower Sabine Basin, training and support has also continued with the help of area schools. Students at Little Cypress-Mauriceville High School monitor two sites near their school. Also, a Texas Watch volunteer monitor is actively monitoring one site on the South Prong of Big Sandy Creek in Reach 4. Students in the Orange area also learn about monitoring from the West Orange Cove Independent School District Nature Classroom on Adams Bayou. Groups or individuals interested in citizen monitoring should contact the SRA for additional details. Information on citizen monitoring can also be found at the Texas Watch website. The site is hosted by Southwest Texas State University and can be found at www.texaswatch.geo.swt.edu/.

DATA COLLECTION BY OTHER ENTITIES

All entities collecting water quality data in the Sabine Basin are encouraged to coordinate their efforts with SRA and participate under the SRA QAPP. Collection of water quality data under a qualified QAPP ensures that data is collected and analyzed according to TCEQ specifications. Only water data collected under a qualified QAPP can be used by the TCEQ in updating wastewater permits and Texas Surface Water Quality Standards. Water quality data collected by the City of Longview and Eastman Chemical has been included in the SRA QAPP. Eastman Chemical Corporation collects quarterly samples at six Sabine River sites and at their point of discharge to provide additional metals data for Stream Segment 0505. The City of Longview monitors two sites on Lake Cherokee under the SRA QAPP as a part of their drinking water supply monitoring program. Information on the SRA QAPP can be found in the Quality Assurance Project Plan section of this document.

DATA COLLECTION, MANAGEMENT AND ANALYSIS

The collection, management, and analysis of water quality data is accomplished through an integrated program that includes a data management plan, a comprehensive monitoring program, and statistical analyses of historical and current data. The SRA's Data Management Plan was updated in September 1999 and is reviewed on an annual basis. The data collection program is discussed below. Data analyses are conducted according to guidelines set forth by the Clean Rivers Program.

TEXAS WATER QUALITY INVENTORY AND 303(D) LIST OF THE CLEAN WATER ACT

The Clean Water Act in Section 303(d) requires that water bodies not meeting established water quality standards be listed as impaired and reported to the Environmental Protection Agency (EPA). The Program Guidance for the Texas Clean Rivers Program requires the Planning Partners to analyze the results of the data screening in conjunction with other factors affecting water quality to identify and describe the reason for the concern. The SRA provided comments to the TCEQ on the Draft 2002 303(d) List (http://www.tnrcc.state.tx.us/water/quality/02_twqmar/02_summaries/); however, EPA has not approved the final list at this time. Water bodies of concern are addressed in the Summary of Sabine Basin Water Quality section of this report.

THE SRA WATER QUALITY MONITORING PROGRAM

The SRA Water Quality Monitoring Program (WQMP) for 2002 included 39 stations on the main stem and in the reservoirs sampled monthly. Active stations for WQMP were selected on the basis of relative position (upstream or downstream) to point source discharges, water supply intakes, proximity to industrialized areas of the Basin, representative coverage of reservoirs, and other land use activities that have the potential to impact water quality.

SRA TCRP SUBWATERSHED SCREENING PROGRAM

The SRA TCRP Subwatershed Screening Program utilizes biological screening studies in combination with routine physical and chemical parameters to provide data on the health of aquatic life and long-range water quality protection. The screening studies provide information on the health of aquatic life and provide toxics information to protect human health. The focus of these tests is in subwatershed areas where this information is lacking. The biological tests include ambient toxicity tests (AT) and rapid bioassessments (RBA's) with macroinvertebrate and fish collection. Water quality samples are also collected for physicochemical parameters to aid in determining long-term trends in water quality for the routine water quality parameters. This additional monitoring program complements the existing WQMP by providing information on the many subwatersheds not covered by WQMP. The Subwatershed Screening Program also includes field investigations to provide data on subwatersheds that have never been sampled.

Sampling site locations and monitoring parameters are reviewed each year at coordinated monitoring meetings with all of the entities conducting water quality monitoring in the Sabine Basin. Adjustments are made in the various programs to reduce duplication of effort and ensure that all areas are appropriately monitored. The Subwatershed Screening studies in 2002 focused on Reach 2 in the Lower Basin, with additional monitoring in problem areas identified by screening in previous years. Subwatershed sampling locations were selected using a

subwatershed ranking system that included previous biological screening results, historical data, and the subwatershed inventory of all known factors that could influence water quality.

SPECIAL STUDIES

The herbicide atrazine has recently come under increased scrutiny in the Lake Tawakoni watershed after the reservoir was placed on the 303(d) List citing atrazine as a possible threat to future water use. Although atrazine levels found have not exceeded allowable limits in water supply samples, the SRA began conducting monthly sampling for atrazine at three sites in Lake Tawakoni in April 2000. This sampling is in cooperation with the Texas Commission on Environmental Quality (TCEQ, www.tceq.state.tx.us) in an effort to resolve the atrazine concerns. Sampling is scheduled to continue through August 2003 at which time the data will be analyzed and the future needs of the sampling program adjusted accordingly. The SRA participates in periodic meetings of the Surface Water Protection Committee, which is composed of state and local parties associated with atrazine monitoring and education.

Upper Basin special studies have concentrated sampling efforts in some areas where routine screening indicated the need for more information. Subwatersheds 7.07 (1998/1999), 5.18 (2000), 5.19 (2001), and 5.20 (2002) have received intensive monitoring in special studies designed to provide more information on the cause for non-attainment of stream standards for certain parameters in these subwatersheds.

A Lower Basin special study was begun in September 2001 in Reach 2 and will continue until September 2003. The Caney Creek Subwatershed is being sampled in this special study.

SUMMARY OF SABINE BASIN WATER QUALITY

The data analysis program developed by SRA was produced following guidance from the TCEQ. The TCEQ developed the Texas Surface Water Quality Standards (TSWQS) to protect the designated use of surface waters for the state. The TSWQS has established 15 classified segments in the Sabine Basin with segment specific criteria. The remainder of the Basin falls under the general criteria, which are applicable to all surface waters throughout the state. To determine whether the designated uses were supported, water quality parameters were examined and compared to screening levels based on criteria in the TSWQS. Data from the past five years of water quality monitoring was compared to screening criteria to assess use support of the surface waters in the Sabine Basin. Full support of the designated use was indicated when no more than 10% of the values exceeded the screening levels. Partial support was indicated when the screening levels were exceeded between 11 and 25% of the time. Nonsupport was indicated when more than 25% of the values exceeded the screening criteria.

Data analyses were also conducted to determine impacts due to pollution. Although the TSWQS does not currently have established numerical criteria for nutrients and chlorophyll α , the same data analysis process was used to determine whether there were no concerns or concerns for impacts due to pollution from nutrient enrichment. Screening levels for these parameters were statistically developed by TCEQ from long-term monitoring data.

Additional analyses were performed on parameters that reflect general water quality rather than specific use support. Some of the criteria for these parameters are based on annual averages rather than individual values. In these instances, the averages were compared to the criteria and support was indicated when less than 25% of the averages exceeded the criteria. Partial support was not assessed.

Metals data were analyzed using average hardness values for the Subwatershed or Reach where appropriate. The screening values for metals toxicity used the most stringent criteria of either the acute, chronic, or human health criteria. Metals included for the analysis were aluminum, arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, silver, and zinc. All values were for dissolved metals except selenium and mercury, which is in accordance with TSWQS.

The following tables contain the criteria for the data analysis used:

Use Support Criteria Table

Use	Parameter/Criteria or Screening Levels	Fully Supporting	Partially Supporting	Not Supporting
Overall Use Support		All uses are fully supported if:	One or more uses are partially supported and remaining uses are fully supported if:	One or more uses are not supported if:
Aquatic Life Support	Dissolved Oxygen	0-10% does not meet screening level.	11-25% do not meet screening level.	>25% do not meet screening level.
	Toxicants	For any individual parameter, 0-10% exceed acute criterion, and/or the mean does not exceed the chronic criterion.	For any individual parameter, 11-25% exceed acute criterion.	For any individual parameter, >25% exceed the acute criterion, and/or the mean exceeds the chronic criterion.
	Ambient Water Toxicity	0-10% have acute or chronic toxicity	11-25% have acute or chronic toxicity	>25% have acute or chronic toxicity
Contact Recreation	Fecal Coliform 400 colonies/100 mL	0-25% exceed screening level.	Partial support is not assessed.	>25% exceed screening level.

Water Quality Concerns Due To Pollution Impacts

Category	Parameter	Screening Levels	No Concern	Concern
Freshwater Streams	NH ₃ -N	0.3 mg/L	For any one parameter, 0-25% of values exceeds the screening level.	For any one parameter, more than 25% of values exceed the screening level.
	NO ₂ -N + NO ₃ -N	3.1 mg/L		
	OP	1.4 mg/L		
	Chlorophyll a	16.5 µg/L		
Reservoirs	NH ₃ -N	0.13 mg/L		
	NO ₂ -N + NO ₃ -N	0.41 mg/L		
	OP	0.1 mg/L		
	Chlorophyll a	20.0 µg/L		
Saltwater Tidal Streams	NH ₃ -N	0.72 mg/L		
	NO ₂ -N + NO ₃ -N	1.86 mg/L		
	OP	1.25 mg/L		
	Chlorophyll a	23.0 µg/L		

General Use Support

Parameter	Units/Criteria	Fully Supporting	Partially Supporting	Not Supporting
Water Temperature	°C, segment-specific	0-10% exceed criterion	11-25% exceed criterion	>25% exceed criterion
pH	Standard units,	0-10% do not meet criteria	11-25% do not meet criteria	>25% do not meet criteria
Chloride	mg/L, segment-specific	Segment average less than criterion	Partial support is not assessed	Segment average exceeds criterion
Sulfate	mg/L, segment-specific	Segment average less than criterion	Partial support is not assessed	Segment average exceeds criterion
Total Dissolved Solids (Conductivity)	mg/L (µmhos/cm), segment-specific	Segment average less than criterion	Partial support is not assessed	Segment average exceeds criterion

REACH 1

Description: Reach 1 consists of the Sabine River and its drainage from the Sabine River confluence into Sabine Lake (river mile 0) to Morgan Bluff (river mile 25.1) in Orange County. Reach 1 is divided into fourteen subwatersheds and covers 348.48 square miles. Most of Reach 1 (86%) is in Texas and 14% is in Louisiana. This reach includes Segments 0501 (Sabine River Tidal), 0508 (Adams Bayou Tidal), and 0511 (Cow Bayou Tidal). Although some areas are quite rural, much of this reach is dominated by two cities with populations greater than 5,000.

Water Quality: Data analyses have indicated water quality problems in three subwatersheds. The Adams Bayou Subwatershed and the Cow Bayou Subwatershed are impaired due to low dissolved oxygen, high fecal coliforms, and high nutrients. Previous special studies on these two subwatersheds indicated the impairments were due to both point and non-point sources. The non-point sources include large populated areas using inadequate on-site sewage treatment systems. A total maximum daily load (TMDL) project, the Orange County TMDL Project, has been initiated to address the water quality issues in these subwatersheds. The SRA will lead the public participation of the Orange County TMDL. The consulting engineering firm of Parsons Inc., will lead all other aspects of the project development, such as the historical data review, sampling plans, and model development.

Results from the Little Cypress Bayou Subwatershed Special Study (1999 – 2001) showed impairment due to low dissolved oxygen, high fecal coliforms, and high nutrients. Little Cypress Bayou's impairments are further compounded due to little or no flow except at periods of high rainfall.

Monitoring: The SRA 2002 WQMP includes monthly monitoring at five sites in Reach 1. TCRP monitoring for this reach includes two sites in the Adams Bayou Subwatershed and two sites in the Cow Bayou Subwatershed as a follow up to special studies conducted from 1998 to 1999. This sampling is also being done to bridge the gap between the special studies and the Orange County TMDL Project. Measurement of 24-hour dissolved oxygen was performed two times per year in each of these subwatersheds.

REACH 2

Description: Reach 2 includes the Sabine River and its drainage from Morgan Bluff (river mile 25.1) to a point that includes Caney Creek (river mile 95.24) in Newton County. Reach 2 is divided into nine subwatersheds and covers 1,103.15 square miles. Most of Reach 2 (75%) is in Texas and 25% is in Louisiana. Reach 2 includes the lower portion of Segment 0503 (the Sabine River below Toledo Bend) and Segment 0513 (Big Cow Creek). This is largely a rural area with no major industries or cities.

Water Quality: Data analyses have shown water quality problems in two subwatersheds in Reach 2. The Nichols Creek Subwatershed was added to the 303(d) List due to low dissolved oxygen and high fecal coliform bacteria levels. The conditions in Nichols Creek appear to be due to ambient conditions and no biological impairments have been observed. There are no permitted discharges in this sparsely populated subwatershed. The 303(d) List originally included the Big Cow Creek Subwatershed (Segment 0513) due to elevated levels of fecal coliform bacteria, but it has since been removed. Recent data indicate the levels of fecal coliform bacteria are within acceptable limits. The Big Cow Creek Subwatershed contains only one municipal wastewater discharge and no other densely populated areas. Non-point sources include large areas of pastureland.

Monitoring: The SRA is monitoring three sites in Reach 2 for 2002 in the WQMP, including one site located in the SRA main canal. The SRA is monitoring two sites in a special study in the Caney Creek Subwatershed for the TCRP. The monitoring of these sites should continue until September 2003. Other parameters, including ambient toxicity, were also sampled on Big Cow Creek in addition to the routine WQMP parameters.

REACH 3

Description: Reach 3 consists of the Sabine River and its drainage from above the Caney Creek confluence (river mile 95.24) to Toledo Bend Dam (river mile 156.45). This reach is divided into eight subwatersheds and covers 364.28 square miles. Most of Reach 3 (77%) is in Texas and 23% is in Louisiana. Reach 3 is largely a rural area with no major cities or industries and includes the upper portion of Segment 0503 (the Sabine River below Toledo Bend).

Water Quality: The data analyses indicate water quality problems in only one subwatershed in Reach 3. The Bayou Anacoco Subwatershed, located in Louisiana, has elevated levels of fecal coliforms, chlorides and sulfates.

Monitoring: The SRA WQMP in Reach 3 includes five monitoring sites including one site in the Bayou Anacoco Subwatershed.

REACH 4

Description: Reach 4 includes the Sabine River from Toledo Bend Dam (river mile 156.45) in Newton County to a point that includes the Murvaul Creek confluence (river mile 291.2) in Panola County. This Reach is divided into 21 subwatersheds and covers 2,932.82 square miles. Most of Reach 4 (68%) is located in Texas with 32% being located in Louisiana. Reach 4 includes Segment 0504 (Toledo Bend Reservoir) and Segment 0509 (Lake Murvaul) both of which are classified for water supply. This reach is dominated by Toledo Bend Reservoir and has no major cities or industries.

Water Quality: Concerns have been identified in Toledo Bend Reservoir associated with two subwatersheds in this Reach. Water quality problems in the San Miguel Bayou Subwatershed, located in Louisiana, include low dissolved oxygen, high fecal coliform levels, and high levels of nutrients. In the Tenaha Creek Arm of the reservoir, low dissolved oxygen levels were observed in the summer months, but the low values appear to be due to ambient conditions and no biological impairments were observed. Toledo Bend Reservoir was included on the 303(d) List for pH, dissolved oxygen, and mercury in fish tissue. The pH in some areas of Toledo Bend Reservoir was occasionally outside the range established in stream standards, however the exceedances were observed in less than 10% of the samples. The Texas Department of Health fish consumption advisory is still in effect for largemouth bass at Toledo Bend Reservoir due to elevated levels of mercury (www.tdh.state.tx.us/bfds/ssd/images/etexas-fish.jpg). Toxicity tests in the Palo Gaucho Bayou indicated possible water quality problems, but RBA's showed no impairments.

Monitoring: The SRA WQMP includes ten sites in Reach 4, including four sites on the Louisiana side of Toledo Bend.

REACH 5

Description: Reach 5 includes the Sabine River and its drainage from above the Murvaul Creek confluence (river mile 291.2) in Panola County to a point that includes the Glade Creek confluence (river mile 397.95) in Gregg County. This reach is divided into 24 subwatersheds and covers 1,629.18 square miles. Segment 0510 (Lake Cherokee, a water supply reservoir) is included in Reach 5. Also included is Segment 0505 (main-stem of the Sabine River), which is used extensively for water supply. Reach 5 has the highest concentration of population in the Sabine Basin. There are numerous industries in this reach as well as six cities with populations above 5,000.

Water Quality: Water quality concerns were identified in five subwatersheds in this reach during prior analyses. Additional data collected since that time has removed the concerns and possible concerns. The concerns and possible concerns in Reach 5 included biological impairments, low dissolved oxygen, and high fecal coliform bacteria. Low dissolved oxygen levels were occasionally observed in Hatley Creek. Ambient toxicity tests in the Mason Creek Subwatershed showed lethality in about 18% of the samples, but the rapid bioassessments (RBA's) showed no impairments. High nutrients were observed in both the Grace Creek Subwatershed and the Rabbit Creek Subwatershed. High levels of fecal coliform bacteria were also found in Grace Creek. RBA's performed in the Grace Creek Subwatershed in 2000 indicated non-impaired or slight impairment in twelve assessments at six sites. Fish samples indicated intermediate or high aquatic life use in ten assessments at six sites and limited/intermediate life use in two assessments. RBA's performed in 2001 in the Rabbit Creek subwatershed indicated no impairment or slight impairment in fifteen assessments at eight sites and moderate impairment in one assessment. Fish samples at these sites indicated intermediate to high aquatic life. In the Hawkins Creek Subwatershed biomonitoring toxicity was detected in about 30% of the samples. Benthic samples indicated non-impairment or slight impairment and fish samples indicated high water quality at most sites.

Monitoring: The SRA WQMP includes six main-stem river sites in Reach 5. A non-point study was conducted in the Grace Creek Subwatershed in 2000 to delineate concerns identified in the 1999 assessment. SRA participated in a Texas Parks & Wildlife Department (TPWD, www.tpwd.state.tx.us) biological and habitat assessment on one site on Grace Creek for an urban streams impact study during 2000. Grace Creek was one of many urban sites in Texas assessed during the TPWD study. The Rabbit Creek Subwatershed received a special study by the SRA in 2001 and the Hawkins Creek Subwatershed was studied in 2002. Eastman Chemical personnel are monitoring six sites in Reach 5. SRA has trained Eastman Chemical field personnel in the TCEQ metals sampling protocol and Eastman has been collecting additional samples for several metals under the umbrella of the SRA QAPP since 1998. Personnel from TCEQ and the City of Longview are sampling two sites in Lake Cherokee. The Longview sampling program is also under the SRA QAPP.

REACH 6

Description: Reach 6 encompasses the Sabine River below Lake Tawakoni from above the Glade Creek confluence (river mile 397.95) in Gregg County to Iron Bridge Dam (river mile 514.5). This reach is divided into 27 subwatersheds and covers 1,977.13 square miles. Reach 6 includes Lake Fork Reservoir (Segment 0512), which is a public water supply reservoir. This reach also includes Segments 0506, 0514, and 0515. Reach 6 is largely a rural area, but Segment 0512 has numerous dairies.

Water Quality: Water quality concerns and possible concerns have been identified in five subwatersheds in Reach 6. Ambient toxicity tests in the Little White Oak Creek Subwatershed showed lethality in about 20% of the samples, but no impairments were seen in the rapid bioassessment. Observations in the Harris Creek Subwatershed included low dissolved oxygen levels, high levels of nutrients, and 20% lethality in biomonitoring samples. High sulfate levels were recorded at a single site located in a tributary to Lake Fork Reservoir, but no elevated levels were observed in the main body of the reservoir. In the Running Creek Subwatershed, elevated levels of fecal coliform bacteria and nutrients were detected. Elevated levels of nutrients were also observed in the Elm Creek Subwatershed as well as elevated levels of chlorides and sulfates.

Monitoring: The SRA WQMP includes eight sites in Reach 6, including three sites in Lake Fork Reservoir.

REACH 7

Description: Reach 7 stretches from Iron Bridge Dam (Lake Tawakoni, river mile 514.5) to the Sabine River (Cowleech Fork, river mile 579.4) watershed divide near the City of Celeste (headwaters of the Sabine River). This reach is divided into seven subwatersheds and covers 774.72 square miles. All of Reach 7 subwatersheds drain into Lake Tawakoni (Segment 0507), a public water supply reservoir. Although much of this Reach 7 is rural, it contains one of the four largest cities in the Sabine Basin.

Water Quality: In Subwatershed 7.07, elevated levels of fecal coliform and nutrients were detected. A study performed during 1998-99 indicated impairments that were not as severe as initially indicated and appear to have originated from non-point sources in the mostly-rural watershed. The SRA has recommended the development of a source water protection plan for Lake Tawakoni and its watershed. The 1998 draft 303(d) List of water bodies not meeting their designated use has included Lake Tawakoni as threatened due to atrazine in finished water supplies. Lake Tawakoni has also been included on the Draft 2002 Water Quality Inventory Summary for concerns with high pH levels and low dissolved oxygen. The pH levels are due to ambient conditions and the revisions to the standards included a change to the pH range for Lake Tawakoni. The low dissolved oxygen levels were observed at one location in the summer months and appear to be due to ambient conditions.

Monitoring: The SRA 2002 WQMP includes three sites monitored monthly in Reach 7. The SRA is conducting a joint study with the TCEQ to examine atrazine levels on a monthly basis at three sites in Lake Tawakoni. Preliminary results indicate levels are well below the maximum contamination level of 3 parts per trillion established by EPA.

SUBWATERSHED INVENTORY

Inventories are being maintained by the SRA of all factors that can impact water quality for the Sabine Basin and are being placed into the SRA's GIS as layers. Subwatersheds can then be analyzed based on the specific factors within the subwatershed. Data sets for the inventories have been received from a number of sources including municipalities, government agencies (local, state, and federal), and universities. Data sets that include water quality analyses must first be reviewed to determine if the quality assurance associated with the data meets the criteria stated in the SRA QAPP. Other data sets are also reviewed in accordance with the SRA Data Management Plan. In addition to layers for hydrology and highways, the data sets include:

- ★ Water Quality Data;
- ★ Population;
- ★ Septic Tanks;
- ★ Solid Waste Sites;
- ★ Land Use;
- ★ Permitted Discharges;
- ★ Storm Water Permits;
- ★ USGS Flow Stations;
- ★ Superfund Sites; and
- ★ Oil and Gas Wells.

As other data sets become available to the SRA they will be assimilated into the Subwatershed Inventory as well.

QUALITY ASSURANCE PROJECT PLAN

The Quality Assurance Project Plan (QAPP) was updated in December 2001. This document includes all of the details about the SRA monitoring programs, the project definition and background, and all of the quality assurance requirements to ensure the data collected are accurate. The QAPP also ensures that the data collected are representative of the water body being sampled.

GEOGRAPHIC INFORMATION SYSTEM

The SRA Geographic Information System (GIS) is a tool used to examine all of the factors that influence water quality. The SRA GIS provides analysis and spatial representation of this data, thus allowing the relationships of several data sets to be analyzed or viewed in this format. Many layers of information are available through the Internet for use by stakeholders and other interested entities. The following summarizes the recent developments in the SRA GIS.

Existing datasets in the SRA library are continually updated with many additional datasets being downloaded from the Internet. The datasets downloaded include National Wetland Inventories, USGS Quads 100K and 250K, 1999 TIGER Line Files, Census Data, Louisiana DOQs, and Louisiana base map data.

The SRA has received Certificate of Convenience and Necessity (CCN) data as GIS coverages from TCEQ. CCN areas are regions that can be served by various water and wastewater service providers. The SRA received this information for all counties that intersect the Sabine Basin. While this is work in progress, it promises to be important in future analyses.

SRA has recently received, from the Railroad Commission, oil well and pipeline data that can help SRA analyze their effects on subwatersheds.

Other activities include maintaining and developing relationships with GIS user groups as well as other agencies and universities such as the Stephen F. Austin Forest Research Institute (SFA FRI), Texas Natural Resources Information System (TNRIS), and Texas Department of Information Resources (DIR). TNRIS is currently working on a base mapping initiative which will provide Texas with highly accurate and attributed base maps layers. These base map layers will be a great improvement over current data.

SRA received Soil Survey Geographic Database (SSURGO) soil data for several counties, and receipt of contour data is pending.

WORLD WIDE WEB PROJECT

SRA's World Wide Website, www.sra.dst.tx.us, provides TCRP stakeholders with access to information and data regarding water resource issues within the Sabine River Basin. Information and data services provided include the following:

The TCRP home page, www.sra.dst.tx.us/srwmp/tcrp/, provides information regarding Senate Bill 818, a current events calendar, and links to the TCEQ and other TCRP Planning Partner websites.

The State of the Basin page, www.sra.dst.tx.us/srwmp/tcrp/state_of_the_basin/, provides access to the latest water quality and supply information for the Sabine River Basin, Texas. Contents include Reach and Subwatershed Inventories, Monthly Water Quality Monitoring Program Reports, Basin Highlights Reports, and Summary Reports.

The Water Quality Information Clearinghouse page, www.sra.dst.tx.us/data/wq/, provides access to the entire Sabine Basin portion of the TCEQ Surface Water Quality Monitoring Program (SWQM) database (which includes the SRA WQMP data) and the Subwatershed Inventory

The Sabine Basin GIS Clearinghouse page, www.sra.dst.tx.us/data/gis/, allows users to view and download water-related GIS data sets.

The Quality Assurance Project Plan is available at www.sra.dst.tx.us/srwmp/tcrp/state_of_the_basin/qapp/.

The Lake and River Conditions page, www.sra.dst.tx.us/basin/lake_and_river_conditions.asp, provides links to near-real-time lake level data for the Sabine River Basin at the U.S. Geological Survey, as well as historical values back to January 1995. Additional links connect to National Weather Service flood statements, flood warnings, and hydrologic readings (river and reservoir levels and precipitation).

The Orange County TMDL Project page, www.sra.dst.tx.us/srwmp/octmdl/, provides information regarding public meetings, a project overview, and a link to the TCEQ *Improving Water Quality in Adams and Cow Bayou: A TMDL Project for Bacteria, Dissolved Oxygen and pH* Fact Sheet.