TRINITY RIVER AUTHORITY

2008 BASIN HIGHLIGHTS REPORT

Introduction

The Texas Clean Rivers Program (CRP) was created by the 72nd Texas Legislature in 1991. This program provides the Texas Commission on Environmental Quality (TCEQ) with quality assured data that is used to make permitting decisions throughout the state. The CRP is funded, in part, by fees assessed to water and wastewater permits.

The TCEQ partners with river authorities to administer the program in each of the river basins in Texas through a biennial contract. This partnership benefits both the TCEQ and the river authorities. The TCEQ leverages funding with the river authorities to greatly extend the capacity of the program and receives significant quantities of data and local knowledge that can be used in decision making processes. The river authorities receive funding that can be used for routine monitoring, special studies, and public outreach. In addition, the TCEQ provides guidance and a programmatic framework that enables each river authority to apply consistent methods for accomplishing Clean Rivers Program goals.

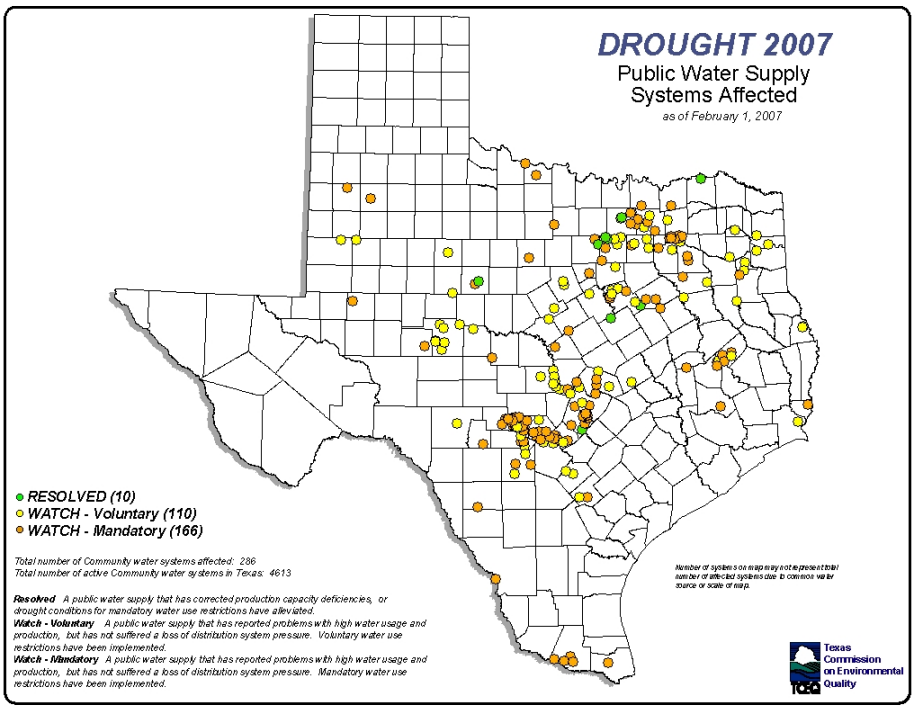
Each year, the CRP partners produce a Basin Highlights Report describing the water quality conditions in each of their basins. Every fifth year, a Basin Summary Report is produced which includes a detailed analysis of water quality data. These reports are made available to the TCEQ as well as citizens to provide them with an explanation of water quality on a basin-wide scale and updates on special study and public outreach activities.

West Fork Trinity River near River Legacy Park in Arlington.

TABLE OF CONTENTS

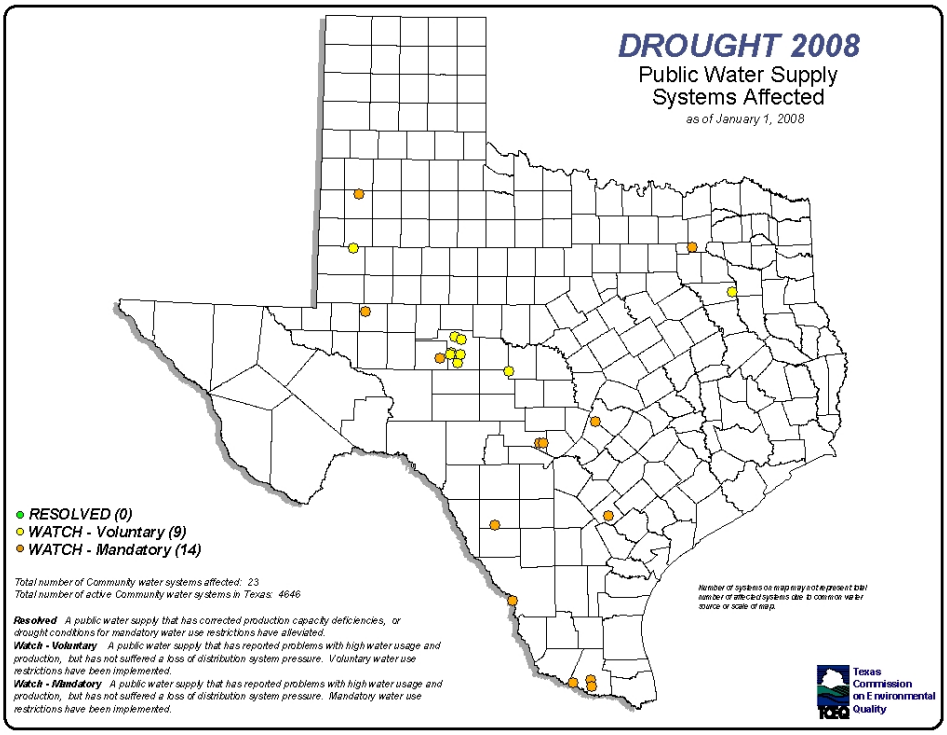
Drought

Extreme drought conditions that plagued the Trinity River basin and the entire state of Texas for several years were alleviated in 2007. Many lake levels throughout the state were approaching critically low levels with some lakes in the Trinity basin more than 17 feet below conservation pool level. Within the counties that are wholly or partially contained by the boundaries of the Trinity River basin, 102 public water supply systems were affected by voluntary or mandatory rationing by February 1, 2007. The Drought 2007 map to the right displays the extent and location of the affected public water supply systems.

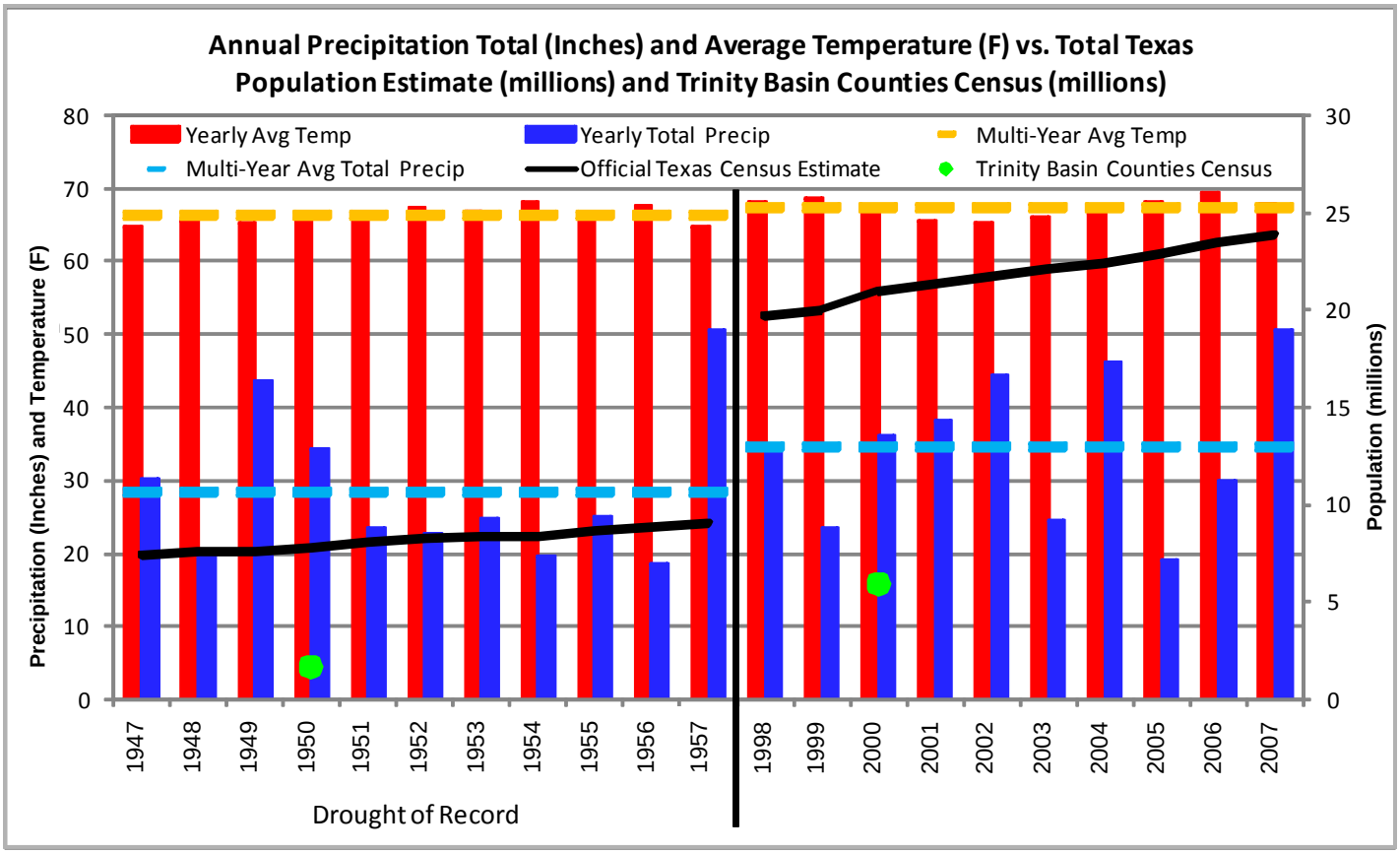


In May and June of 2007, heavy rains swept across Texas and delivered much needed water to the state. However, this water arrived in a series of large rain events that caused heavy flooding in several areas of the state. The Drought 2008 map below shows that as of January 1, 2008, there are no public water supply systems within the Trinity River basin that are affected by restrictions.

Typically in Texas, especially in the Trinity River basin, precipitation occurs in a few heavy events in the fall and spring with a distinct lack of rain throughout the summer months. This leads to increases in water demand during these months triggering increases in water restrictions to help prevent water shortages.



The graph on the following page compares the most recent ten year period to the drought of record from 1947 to 1957. The temperature and precipitation values are taken from a continuous NOAA dataset that has been collecting data from a gage currently located at Dallas/Fort Worth International Airport. During the drought of record, this gage was located at Fort Worth Meacham Airport and later moved to the Greater Southwest International Airport. It is interesting to note that the average total precipitation for the most recent ten year period is approximately six inches greater than during the drought of record.



However, during these same time periods, the population of Texas has drastically increased. According to US Census Bureau estimates, the average population of Texas increased from 8.25 million during the drought of record to 21.8 million during the most recent ten year period, an increase of about 164%. Official US Census counts for counties within the Trinity River basin increased 250% from 1.7 million in 1950 to 5.9 million in 2000. These population measures illustrate the fact that limited water resources in the Trinity Basin and the entire state are being utilized by a significantly larger population than in the past. Therefore, it is important to always practice water conservation measures in order to avoid water shortages and mandatory water restrictions.

More information on drought and public water supply systems can be found on the TCEQ website at http://tceq.state.tx.us/nav/util_water/drought.html. To find more information on water conservation, please visit the Texas Water Development Board website at http://www.twdb.state.tx.us/assistance/conservation/pubs.asp.

Dry marina on Lake Benbrook—August 23, 2006.

Water Quality Assessment

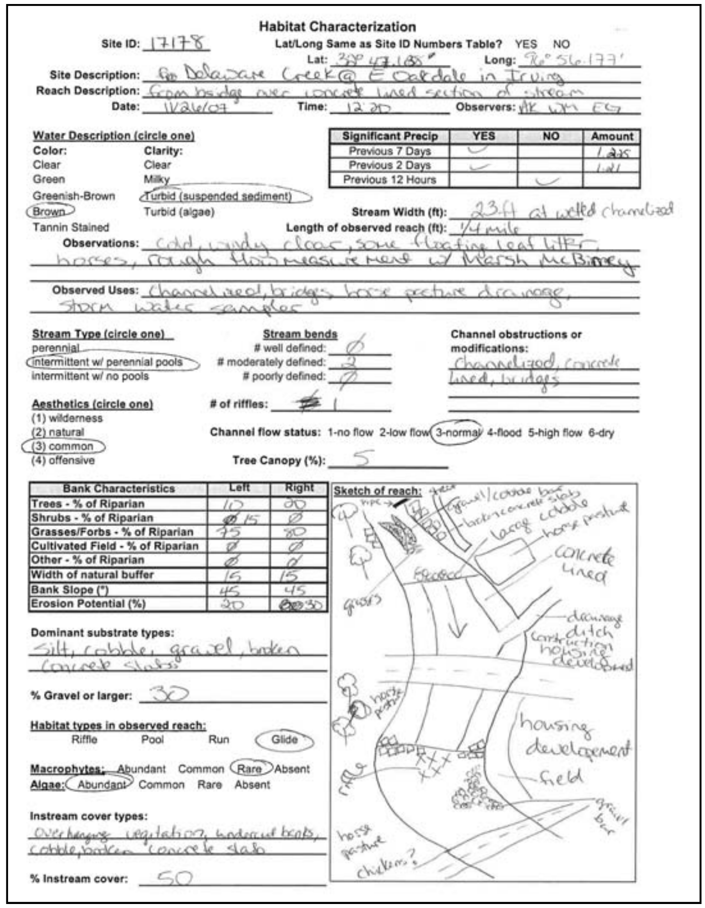
In the summer of 2007, the Texas Commission on Environmental Quality released the 2006 Texas Water Quality Inventory and 303(d) List. The Water Quality Inventory details the results of the water quality assessments conducted by the TCEQ. Waterbodies that are found to be not supporting their designated uses are placed on the 303(d) list where they are prioritized for Total Maximum Daily Load development, standards review, or collection of additional data.

The Water Quality Conditions section of this Basin Highlights Report will outline the results of the 2006 Texas Water Quality Inventory and 303(d) list. This assessment utilizes data collected between December 1, 1999 and November 30, 2004.

TRA CRP Data Management and Integration System

Over the past several years, the TRA CRP has increased the amount of data that is processed and submitted to the TCEQ for use in water quality assessments and permitting decisions. As the amount of data increased, procedures were developed to increase the efficiency with which the data were processed. Data are currently received by CRP staff in a variety of hardcopy and electronic formats which are then converted into a consistent electronic format. After conversion, the data are then quality assured and further processed into a format compatible with TCEQ data management programs. In all, this is a complicated process that involves several discrete steps, both automated and manual.

In 2007, TRA CRP staff initiated a project to integrate these steps into a more streamlined data management system. The goal of this system is to reduce the time spent processing the data into a consistent, quality assured format and begin providing our partners with more useful information in a shorter timeframe. To that end, the TRA CRP purchased a software package called EnviroData from Geotech Computer Systems, Inc. EnviroData is an open source software that



Habitat Characterization

Site ID: 17178 Lat/Long Same as Site ID Numbers Table? YES NO

Lat: 32° 47.185' Long: 96° 56.177'

Site Description: Delaware Creek @ E Oakdale in Irving

Reach Description: from bridge over concrete lined section of stream

Date: 11/26/07 Time: 12:20 Observers: AK WM EG

Water Description (circle one)

Color: Clear, Green, Greenish-Brown, (Brown), Tannin Stained

Clarity: Clear, Milky, (Turbid (suspended sediment)), Turbid (algae)

Significant Precip	YES	NO	Amount
Previous 7 Days	✓		1.225
Previous 2 Days	✓		1.01
Previous 12 Hours		✓	

Stream Width (ft): 23 ft at welded channelized

Length of observed reach (ft): 1/4 mile

Observations: cold, windy clear, some floating leaf litter, horses, rough flow measurement w/ Marsh McBirney

Observed Uses: channelized, bridges, horse pasture drainage, storm water sampler

Stream Type (circle one): perennial, (intermittent w/ perennial pools), intermittent w/ no pools

Stream bends: # well defined: Ø; # moderately defined: 2; # poorly defined: Ø

Channel obstructions or modifications: channelized, concrete lined, bridges

Aesthetics (circle one): (1) wilderness, (2) natural, ((3) common), (4) offensive

# of riffles: 1

Channel flow status: 1-no flow 2-low flow (3-normal) 4-flood 5-high flow 6-dry

Tree Canopy (%): 5

Bank Characteristics	Left	Right
Trees - % of Riparian	10	20
Shrubs - % of Riparian	15	Ø
Grasses/Forbs - % of Riparian	75	80
Cultivated Field - % of Riparian	Ø	Ø
Other - % of Riparian	Ø	Ø
Width of natural buffer	15	15
Bank Slope (°)	45	45
Erosion Potential (%)	20	30

Dominant substrate types: silt, cobble, gravel, broken concrete slabs

% Gravel or larger: 30

Habitat types in observed reach: Riffle Pool Run (Glide)

Macrophytes: Abundant Common (Rare) Absent

Algae: (Abundant) Common Rare Absent

Instream cover types: overhanging vegetation, undercut banks, cobble, broken concrete slab

% Instream cover: 50

Sketch of reach:

Site characterization form used at urban stream stations.

Red Ear Slider observed at Marine Creek in Fort Worth—November 28, 2007.

can be tailored to individual needs and will automate many of the steps that are currently completed manually, thereby increasing the efficiency and accuracy of the data management process.

In 2008, CRP staff will begin working with partner agencies to develop a standard data submittal format as well as a data report package that may include data summaries, graphs, photos, indications of trends, and site characteristics among other things. It is hoped that the generation of the data report packages will serve many purposes such as providing information to be used in partner agency annual reports and increasing the frequency with which water quality data are reviewed.

Flow measurement at Village Creek and IH-30 in Arlington—November 27, 2007.

Urban Stream Site Characterizations

By utilizing routine water quality monitoring data collected by the partner agencies, the TRA CRP has been able to leverage funds provided by the TCEQ in other areas such as special studies and public outreach and education. However, this has prevented TRA CRP staff from becoming intimately familiar with each of the partner agencies sampling sites.

In the fall of 2007, TRA CRP staff conducted a project to gather information about all the urban stream stations in the DFW metroplex. All sites that are sampled by the cities of Arlington, Irving, Grand Prairie, and Fort Worth were visited by CRP staff. At each site latitude and longitude were determined, upstream and downstream photos were taken, a rapid habitat characterization was conducted, and a flow measurement was calculated at all sites that were wadeable and accessible.

The latitude and longitude readings were used to verify each station location against the statewide station list. Photos were taken to document flow status and surrounding conditions. The rapid habitat characterizations consisted of a sketch of the observed stream reach, observations, water and substrate descriptions, bank characteristics, and available habitat types. These habitat characterizations were designed to mimic a full habitat assessment as described in the TCEQ *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data*. However, as this project was designed to only characterize the stream habitat rather than fully assess it. This method allowed CRP staff to visit 46 sites in a short time span to ensure that weather and flow conditions were similar at all sites. In addition, flow measurements were collected at all sites possible. In general, only sites located on the Trinity River or one of its branches were not measured for flow as these sites are not wadeable. All other stream sites were measured either using a Marsh-McBirney electronic flow meter or by calculating a flow estimate when the water level was too low or direct access to the stream was impossible.

The results of this project will be sent to TCEQ to increase the pool of information available to the assessment team. CRP staff intend to conduct these habitat characterizations for each season and potentially select representative sites to conduct more in depth habitat and biological assessments.

WATER QUALITY MONITORING

The TRA Clean Rivers Program has been built upon a volunteer monitoring network that provides for its routine water quality monitoring data. This monitoring network includes the cities of Arlington, Dallas, Fort Worth, Grand Prairie, and Irving as well as the TRA Lake Livingston Project and Tarrant Regional Water District. In addition to these entities, the TRA has its own in-house monitoring program. Approximately 150 sites are monitored on a routine basis by the partner network.

These agencies have been sampling for their own purposes, such as watershed protection and stormwater permitting, for many years. In order to leverage CRP funds, TRA has formed a volunteer partnership with these agencies allowing the TRA CRP to utilize funds for special studies and public outreach activities. Each agency in the partner network has agreed to follow guidelines set forth by the Clean Rivers Program. In return, the TRA CRP financially supports each partner agency's program to various degrees ranging from providing sampling supplies and equipment to compensation for analytical costs. The TRA CRP also provides non-financial support to the partners. This can include training for new staff, additional manpower for sampling, and analysis of data.

A routine water quality monitoring program is defined by its lack of bias to specific conditions such as weather and flow and their effects on water quality. As such, data are collected on a predefined schedule without regard to weather or flow; except in cases where extremely severe weather or flow prevent the safe execution of a scheduled sampling event. It is the goal of this sampling approach to obtain a full range of weather and flow conditions in a dataset of approximately 5 to 10 years.

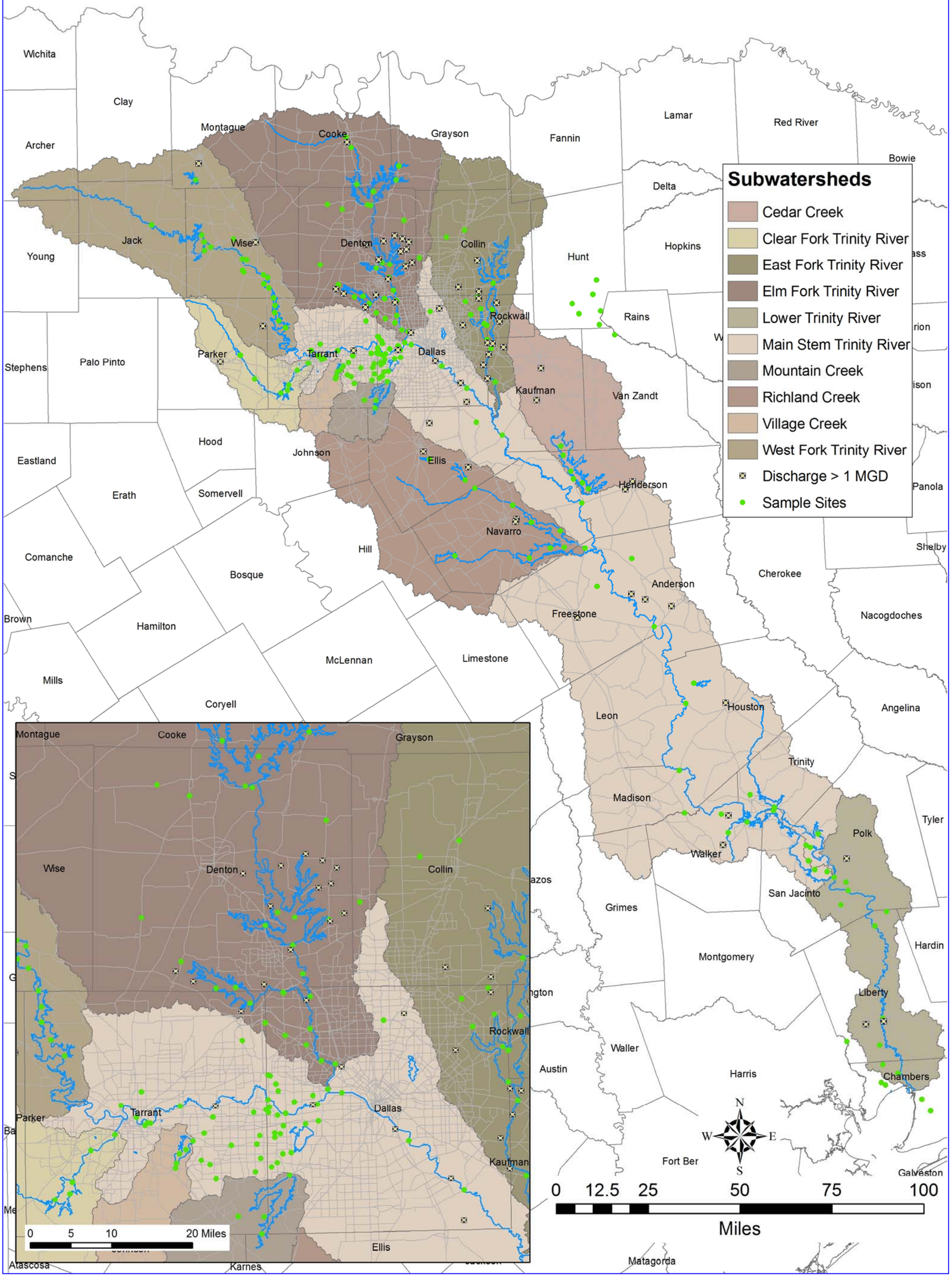
Routine water quality monitoring is also considered to be the long term sampling of individual sites. Routine sampling sites are identified with this in mind. Therefore, these sites are generally located in areas with easy and safe access in order to ensure long term sampling at that location. These locations typically remain static unless situations arise which make the location less desirable to the objectives such as construction, damming, or inaccessibility.

The routine water quality data provided by the partner agencies is used by TCEQ to conduct biannual assessments of waterbodies. The assessments determine if each waterbody is meeting its designated uses such as drinking water supply, contact recreation, protection of aquatic life, and fish consumption. The waterbodies are also assessed to determine if there are any concerns for nutrient levels and algal growth. The results of the assessments are used to make decisions to protect the waterbodies including permitting decisions and studies to determine the sources of impairments and potential corrective actions.

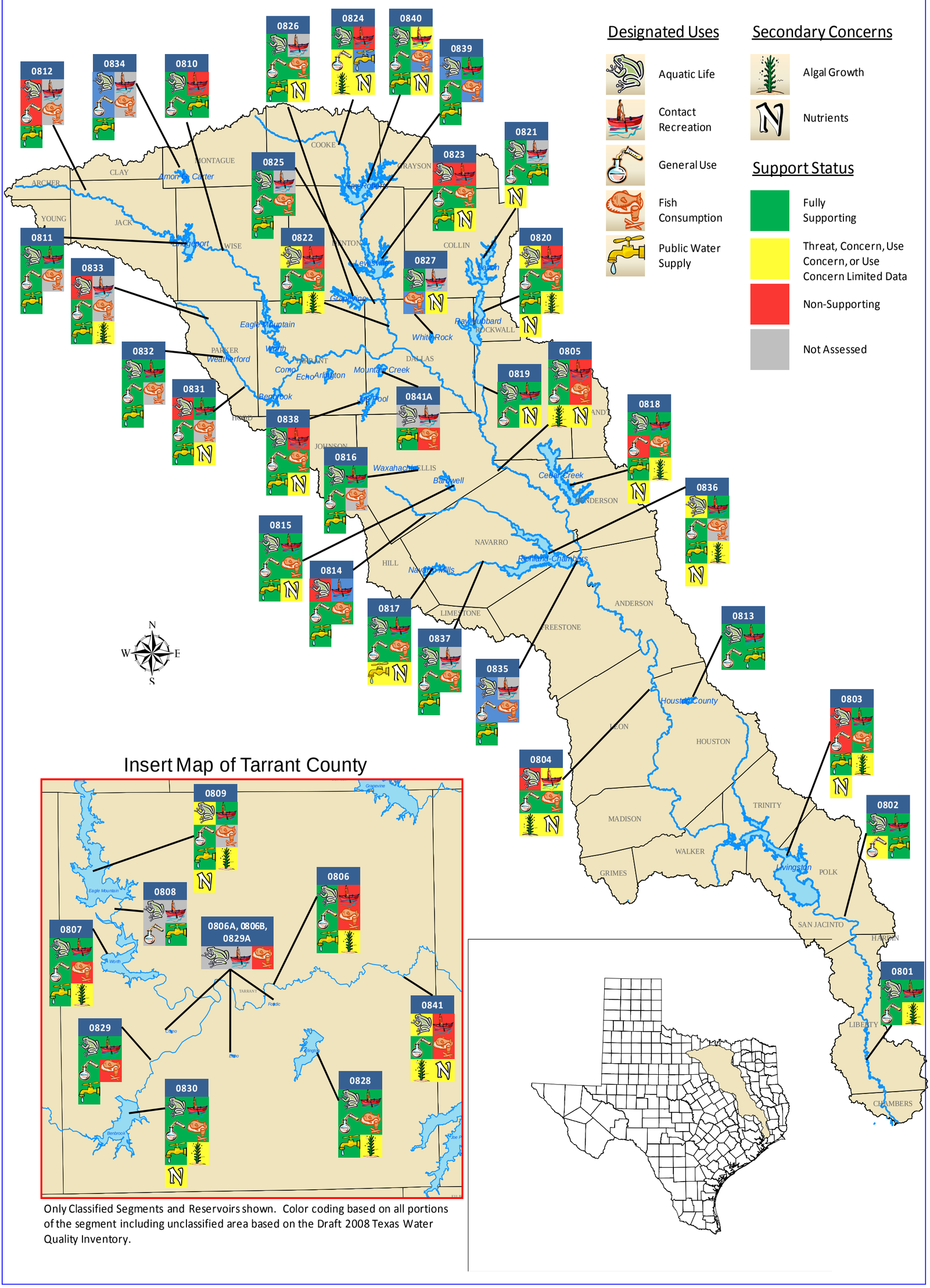
To view the statewide monitoring schedule, please visit http://cms.lcra.org.

Entity	Monitoring Type	Sites	Parameters
City of Arlington	Routine	12	Metals, Nutrients/Conventionals, Bacteria, Field
City of Dallas	Routine	37	Metals, Field
City of Fort Worth	Routine	6	Bacteria, Field
City of Grand Prairie	Routine	22	Metals, Organics, Nutrients/Conventionals, Bacteria, Field
City of Irving	Routine	6	Metals, Nutrients/Conventionals, Bacteria, Field
TRA LLP	Seasonally Biased	6	Diurnal Field
TRA LLP	Routine	22	Metals, Nutrients/Conventionals, Bacteria, Field
TRWD	Seasonally Biased	6	Diurnal Field
TRWD	Routine	39	Metals, Nutrients/Conventionals, Bacteria, Field
TRA GO	Routine	13	Metals, Nutrients/Conventionals, Bacteria, Field

WATER QUALITY MONITORING



WATER QUALITY CONDITIONS

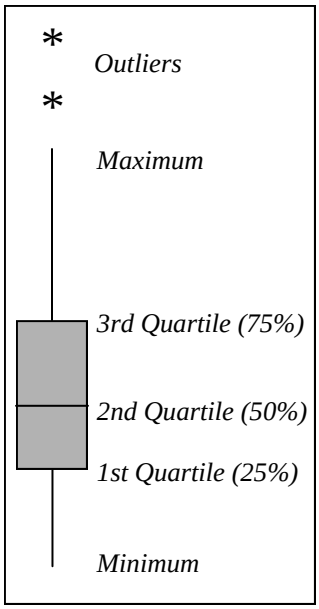


Only Classified Segments and Reservoirs shown. Color coding based on all portions of the segment including unclassified area based on the Draft 2008 Texas Water Quality Inventory.

TRA divides the Trinity River basin into ten subwatersheds. Each subwatershed is bounded by a dam or confluence with the main stem of the river. The map on page 7 displays these subwatersheds including the active sampling stations and dischargers within the Trinity basin.

The map on page 8 displays a summary of the 2006 Texas Water Quality Inventory for the Trinity River basin. The full assessment can be found on the TCEQ webpage at http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/305_303.html#y2006. The map includes color coded icons of each designated use or secondary concern and its corresponding level of support. As this map is intended to provide a summary of the assessment, the icons present an overall representation of the entire segment. For finer detail of each segment, please see the reports available at the website above.

In this section, box plots of selected parameters will be displayed for each subwatershed as well as a brief description of the watershed. A box plot graphically displays data through a five number summary. This consists of a minimum number, maximum number, and three quartiles. The three quartiles that form the box are drawn at 25%, 50% (median), and 75% of an ordered set of data. The difference between the first and third quartile is called the interquartile range. The minimum and maximum endpoints of each whisker are calculated as 1.5 times the interquartile range away from the first and third quartiles. If any data point is greater than this calculated value, it is considered an "outlier". Outliers in this sense are viewed as being numerically distant from the majority of the data; it does not necessarily indicate an erroneous data point. If the actual minimum or maximum values present in the dataset are less than the calculated values, the whiskers terminate at the actual values.



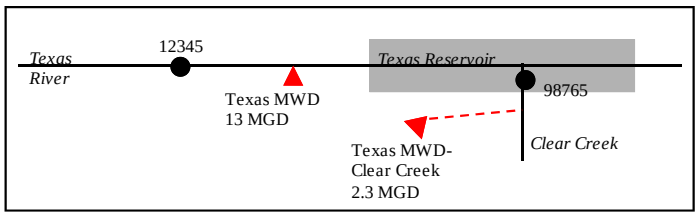
Example of a Box Plot.

The red lines located on the graphs represent screening levels (dashed) or standards (solid) for each water body type. As these levels and standards may vary through segments, streams, or reservoirs, the lines move up and down at the transitions between each of these.

The graphs chosen for each subwatershed are an overall representation of the water quality for that area. The assessment unit numbers and sample sizes (N) are listed on the x-axis of each graph. Assessment units are a grouping of stations defined by TCEQ as being representative of a specific area within a segment. Surface samples from December 1, 1999 to November 30, 2004 were selected for analysis. The data for all stations within an assessment unit were averaged together by date and parameter and the resultant data were used to create the box plots. The accompanying Water Quality Descriptions are based on the 2006 Texas Water Quality Inventory which utilized the same date range as specified above.

The images above the box plots are generalized line diagrams of each subwatershed. Below are descriptions of the elements of each diagram. To the extent possible, all these features are positioned on the line diagram in their approximate locations in the subwatershed.

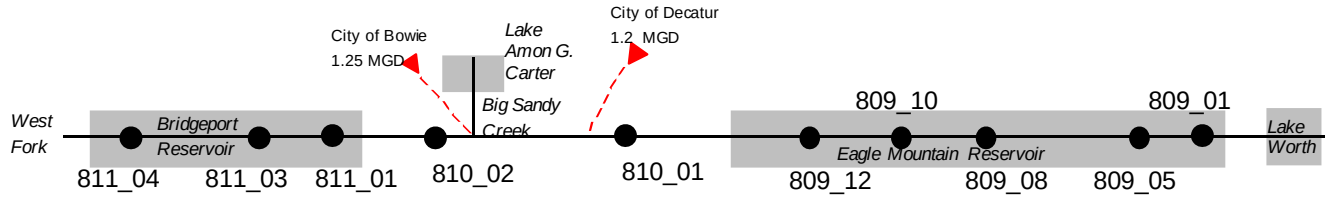
- Main channel(s) of the subwatershed
- Tributaries to the main channel or arms of the reservoirs
- Reservoirs
- Assessment units used in the box plots
- Dischargers—name and permitted flow
- Indicate that the discharge flows into an intermediate stream before flowing into the main segment

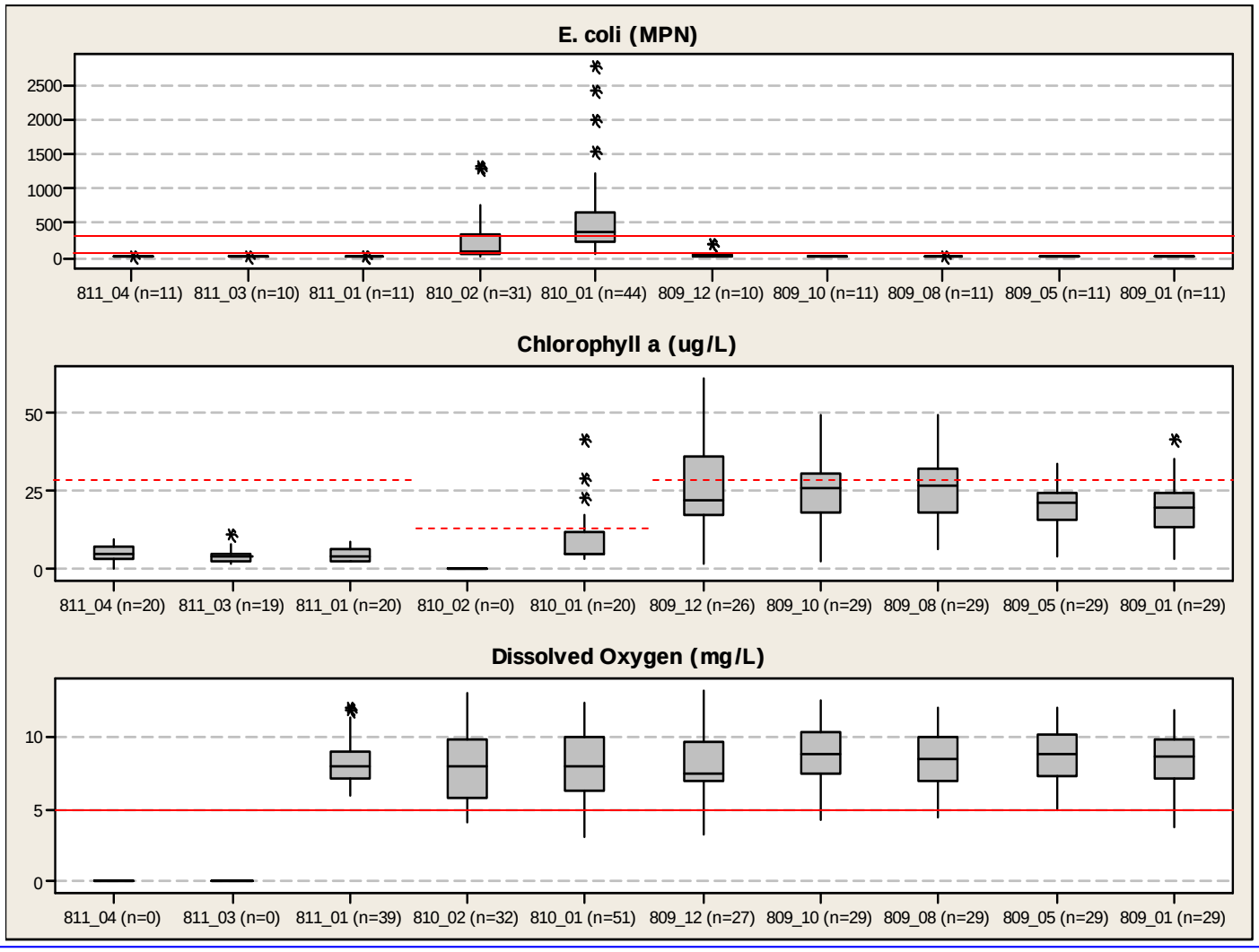


Example of a Subwatershed Line Diagram.

West Fork Trinity River

Segments—807, 808, 809, 810, 811, 812, 834
Boundaries—From Lake Worth dam north into Archer and Montague Counties
Subwatershed Description—Headwaters are considered the start of the Trinity River. Predominant agriculture is cattle grazing with a significant amount of oil and gas drilling. Urbanization increases as the West Fork approaches Fort Worth.
Water Quality Description—The West Fork below Bridgeport Reservoir (Segment 810) was found to be not supporting the contact recreation use due to elevated *E. coli* levels. There are several tributaries that flow into 810 that are similarly impaired. On past assessments, aquatic life and general use in the West Fork above Bridgeport Reservoir (812) was found to be impaired due to depressed Dissolved Oxygen (DO), Chloride, and Total Dissolved Solids (TDS). Due to a lack of more recent sampling in this segment, these impairments have been carried forward to recent assessments. There is a fish consumption ban on Lake Worth (807) due to PCBs in fish tissue. Nutrients and algal growth are of concern in Eagle Mountain Reservoir (809).





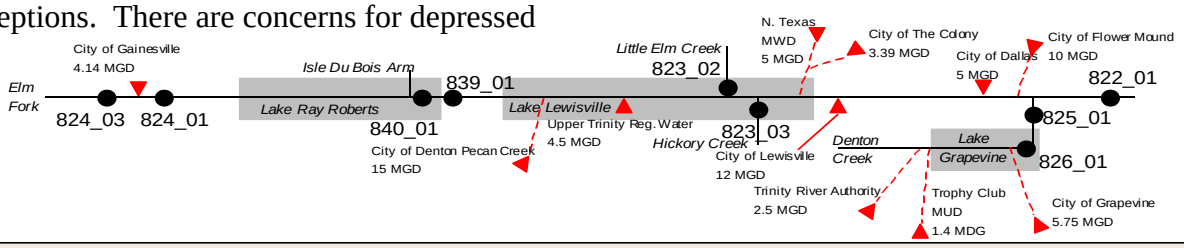
Elm Fork Trinity River

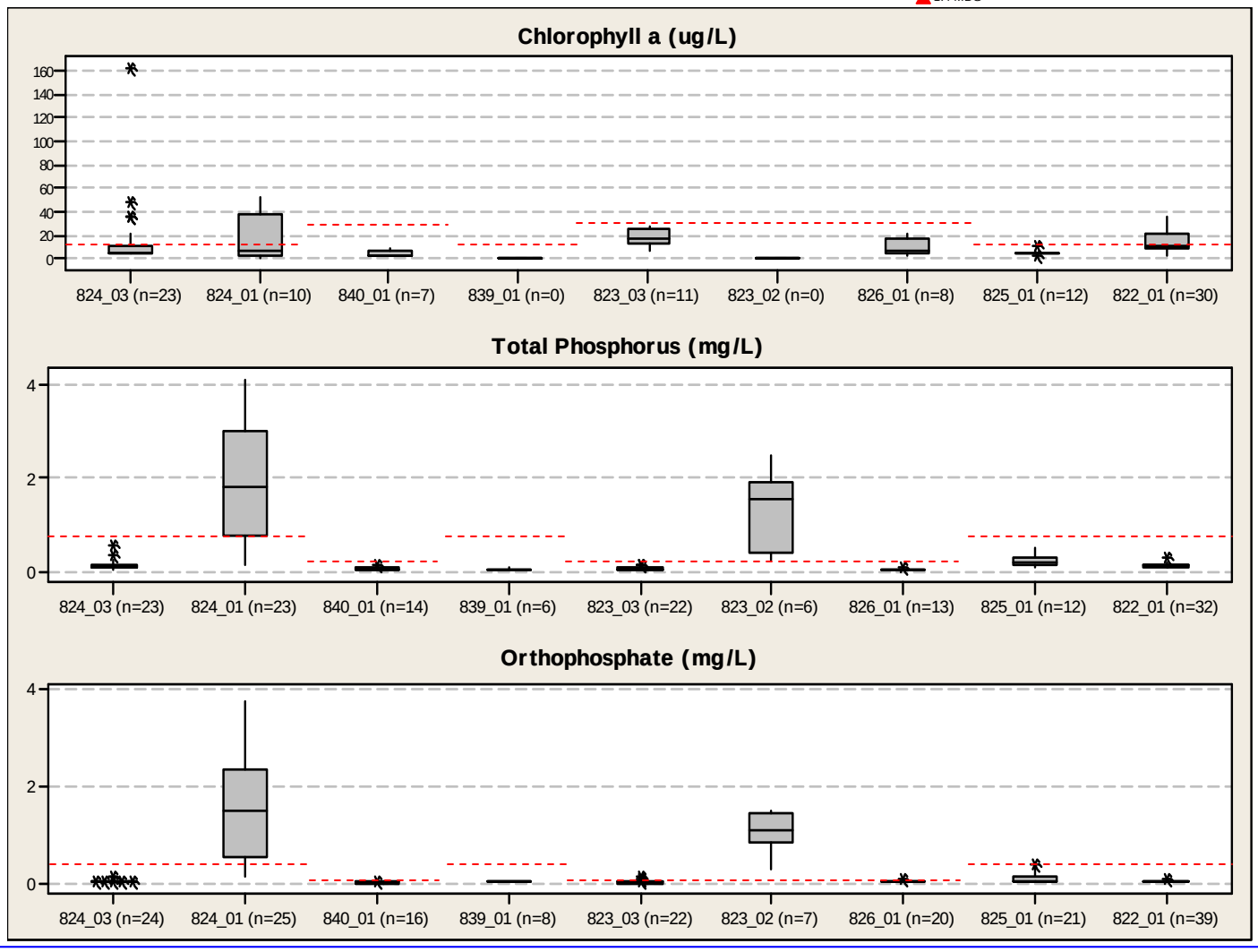
Segments—822, 823, 824, 825, 826, 839, 840

Boundaries—From Frasier dam in Dallas north into Montague County

Subwatershed Description—Gently rolling plains with patches of forest in lowlands. Predominant agriculture is row-crop, cattle grazing, and dairy in the northern portion. Considerable urbanization in the southern half of the watershed.

Water Quality Description—Aquatic life, general, fish consumption, and public water supply uses are fully supported in a majority of the Elm Fork with a few exceptions. There are concerns for depressed DO in Little Elm Creek (823A) and the Elm Fork below Lewisville Lake (822). In addition, Copper in Stewart Creek (823B) was found to not be supporting aquatic life use. There is a concern for low pH in a small portion of the Elm Fork above Ray Roberts Lake (824). The contact recreation use is not supported in several areas of this subwatershed due to elevated *E. coli* or Fecal Coliform levels including the Elm Fork above Ray Roberts Lake and the Elm Fork below Lewisville Lake (822) and its tributaries. Nutrient and algal growth concerns are found throughout most of the subwatershed.





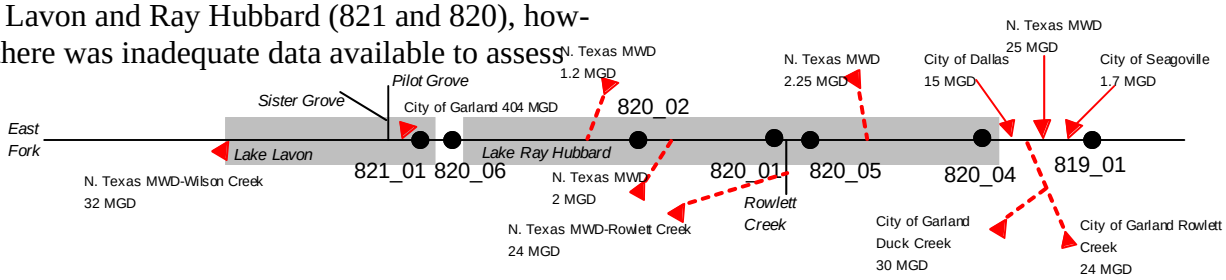
East Fork Trinity River

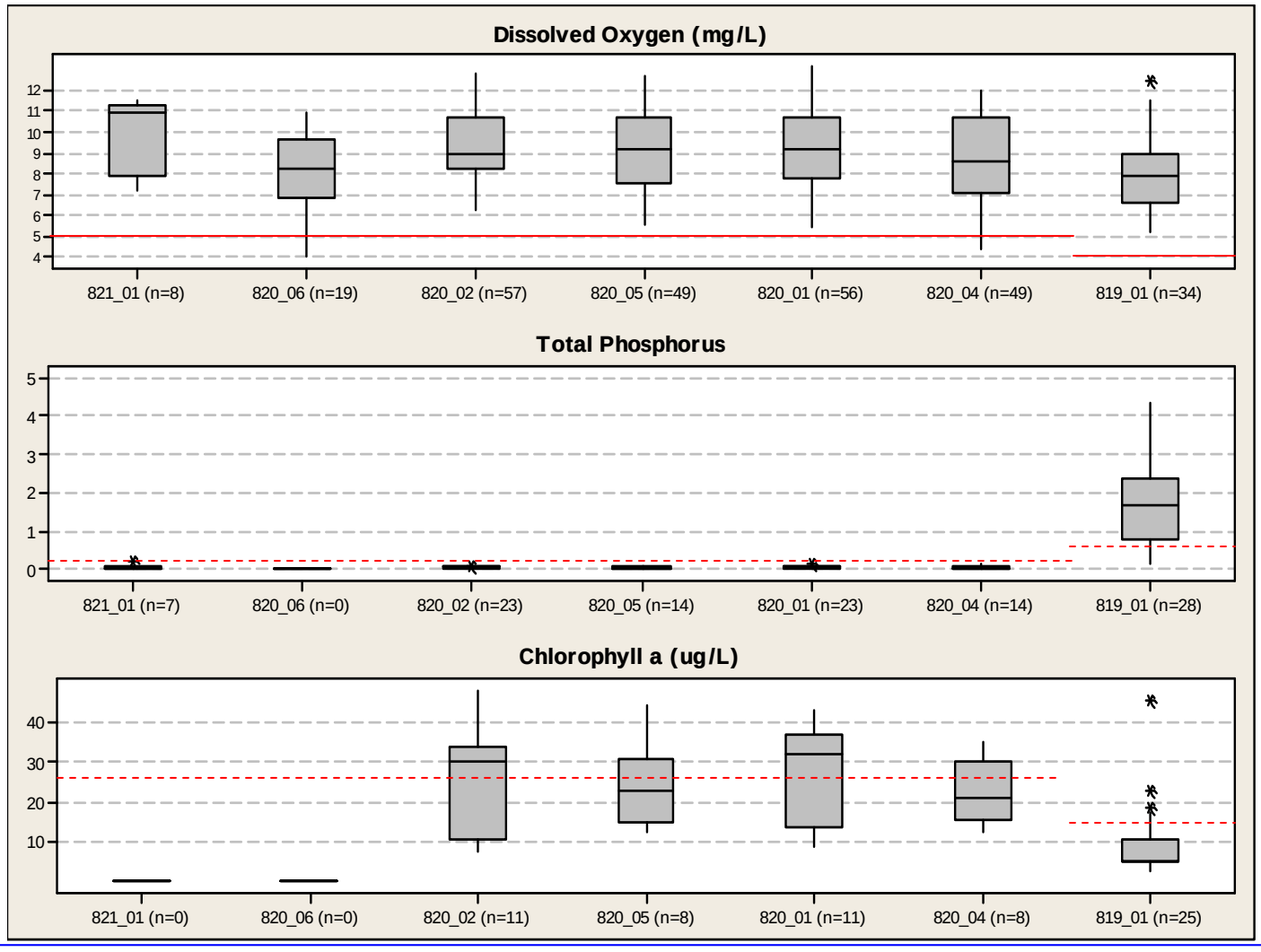
Segments—819, 820, 821

Boundaries—From Lake Ray Hubbard dam northeast into Grayson County

Subwatershed Description—The landscape is mostly flat prairies. Southern portion is heavily urbanized. In addition, the surface waters receive significant effluent. The northern reaches contain significant row-crop farming operations.

Water Quality Description—Aquatic life, general, and public water supply uses were fully supported in Lakes Lavon and Ray Hubbard (821 and 820), however, there was inadequate data available to assess the contact recreation use. Nutrients and algal growth were a concern in both of these reservoirs. Muddy Creek (820C), a tributary to Lake Ray Hubbard, was found to be not support the contact recreation use due to elevated Fecal Coliform levels. In addition, Muddy Creek was also noted as having a concern for depressed DO. The East Fork below Lake Ray Hubbard (819) was fully supporting of the aquatic life, contact recreation, and general uses but had concerns for nutrients.





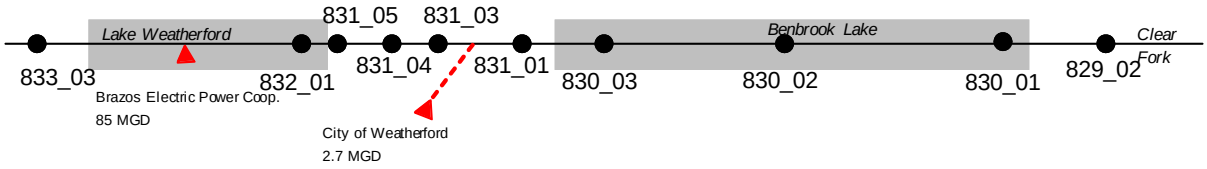
Clear Fork Trinity River

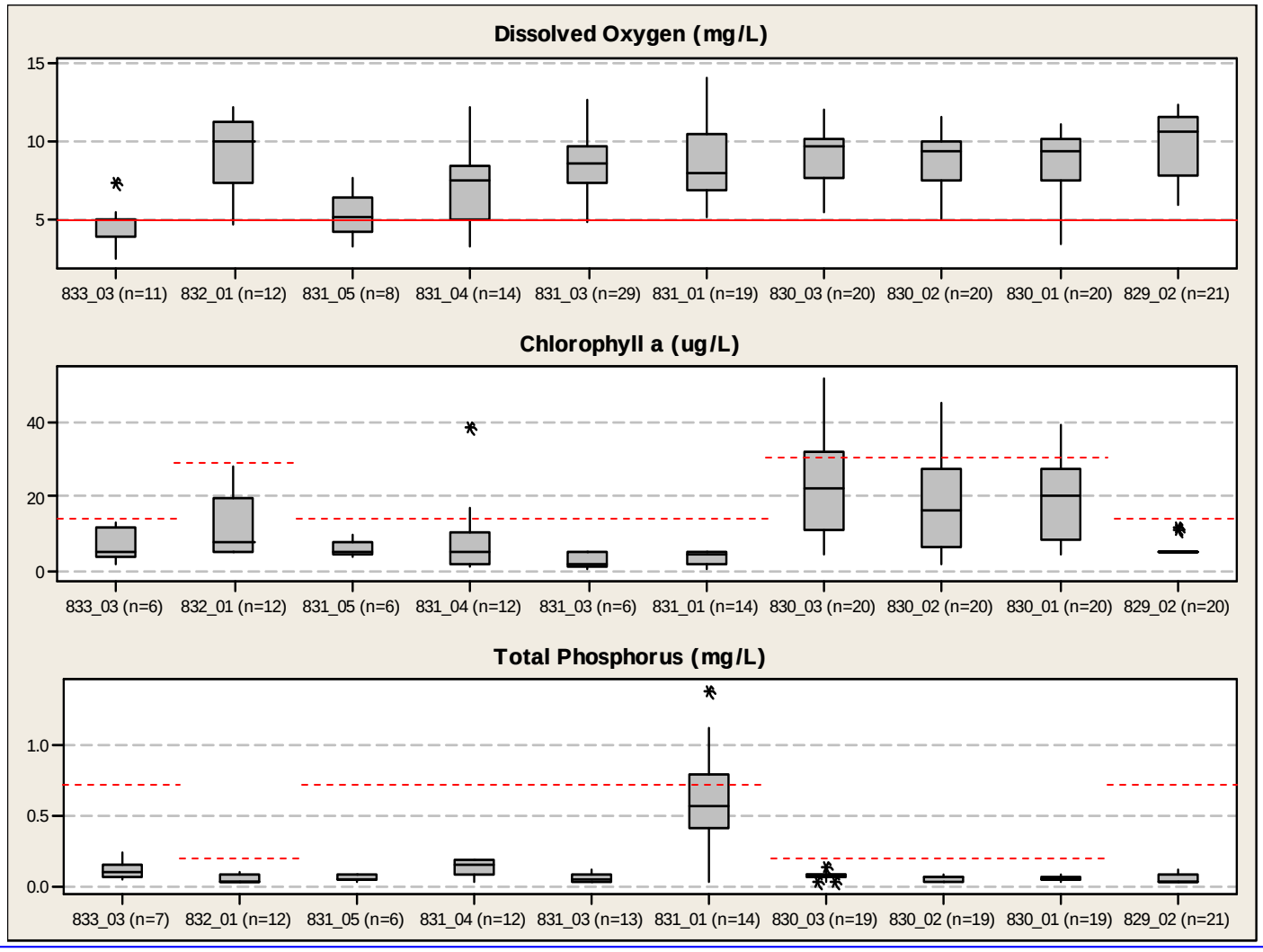
Segments—829, 830, 831, 832, 833

Boundaries—From the confluence with the Lower West Fork Trinity River near SH80 and Vickery in west Fort Worth northwest to Parker County

Subwatershed Description—The terrain here is mostly flat with some gently rolling prairie. The southern reaches are heavily urbanized but, in general, the population is relatively low. Primary agriculture is cattle ranching with some row-crop.

Water Quality Description—The Clear Fork above and below Lake Weatherford (833 and 831) was found to be not supporting the aquatic life use due to depressed DO. These findings are based on limited data due to a lack of sampling in these segments. There are concerns for algal growth and nutrients in these segments. Lake Weatherford and Benbrook Lake (832 and 830) are fully supporting all designated uses with concerns for nutrients and algal growth in Benbrook Lake. There is a fish consumption ban on the lower portion of the Clear Fork below Benbrook Lake (829) and Lake Como (829A), a small urban lake in Fort Worth, due to legacy pollutants, including DDE and PCBs, in fish tissue.





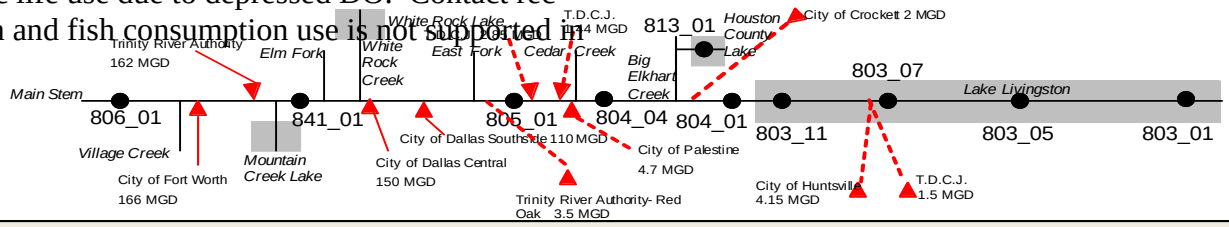
Main Stem Trinity River

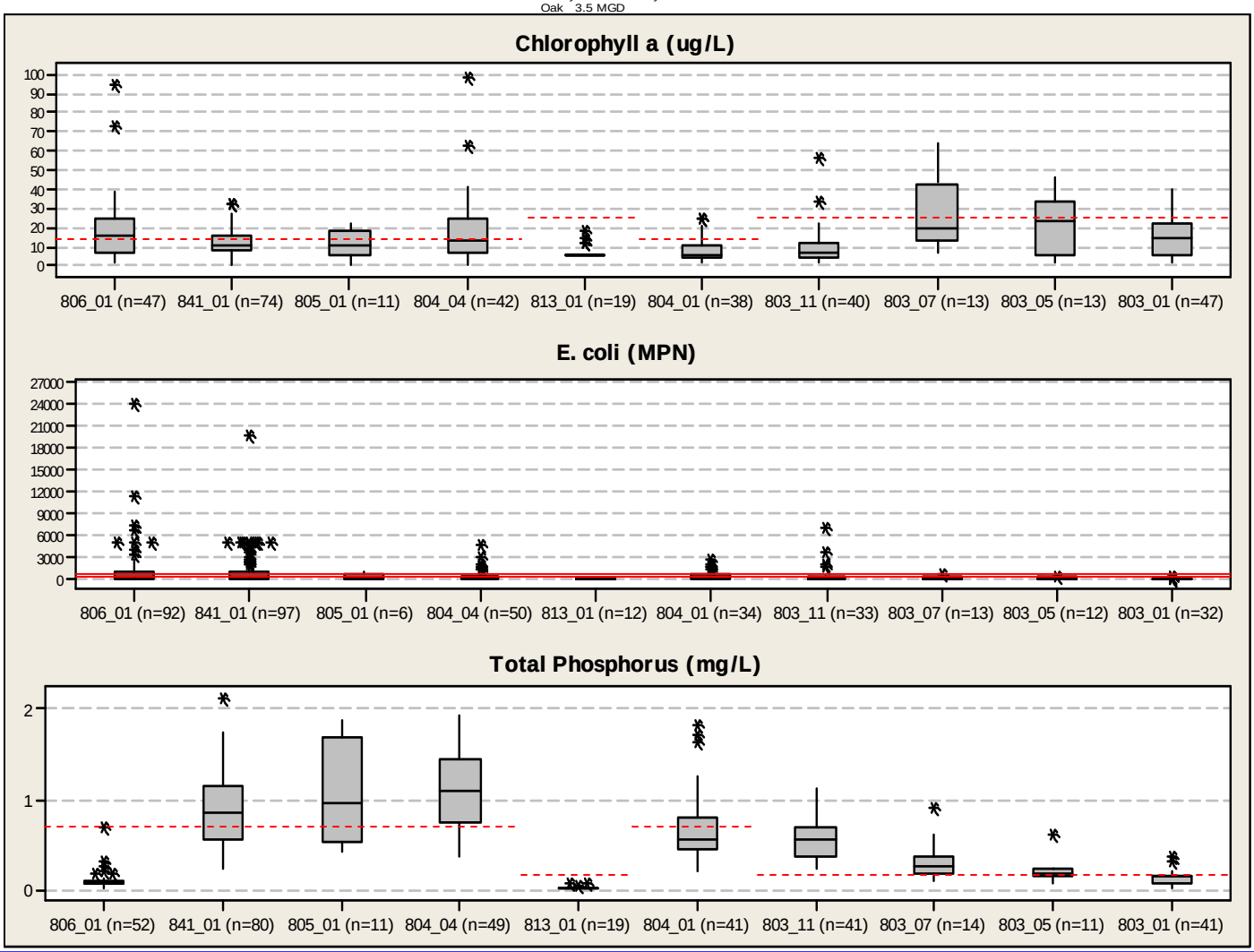
Segments—803, 804, 805, 806, 813, 827, 835, 841

Boundaries—From the Lake Livingston dam north to the Lake Worth dam in Fort Worth

Subwatershed Description—Begins in the densely populated Dallas/Fort Worth Metroplex and meanders 200 miles southeast. Development along the upper northwest portion is extensive.

Water Quality Description—The upper half of the Main Stem Trinity River is fully supporting the aquatic life use. There are two tributaries of the Lower West Fork (841) which have concerns for aquatic life use due to depressed DO. Contact recreation and fish consumption use is not supported in the upper half of this subwatershed. *E. coli* and Fecal Coliform levels were found to be impaired in many of the small urban streams that flow into the Main Stem. A fish consumption ban due to legacy pollutants in fish tissue has been placed on much of the river from Lake Worth dam to FM 85, just south of Rosser. Lake Livingston (803) was found to be not supporting general uses due to Sulfate and several portions of the lake were found to be not supporting aquatic life use due to depressed DO. Concerns for nutrients and algal growth are found throughout this subwatershed.





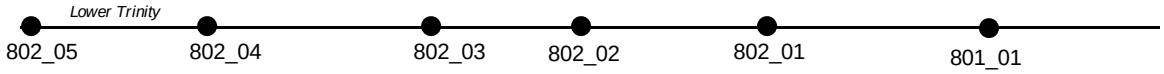
Lower Trinity River

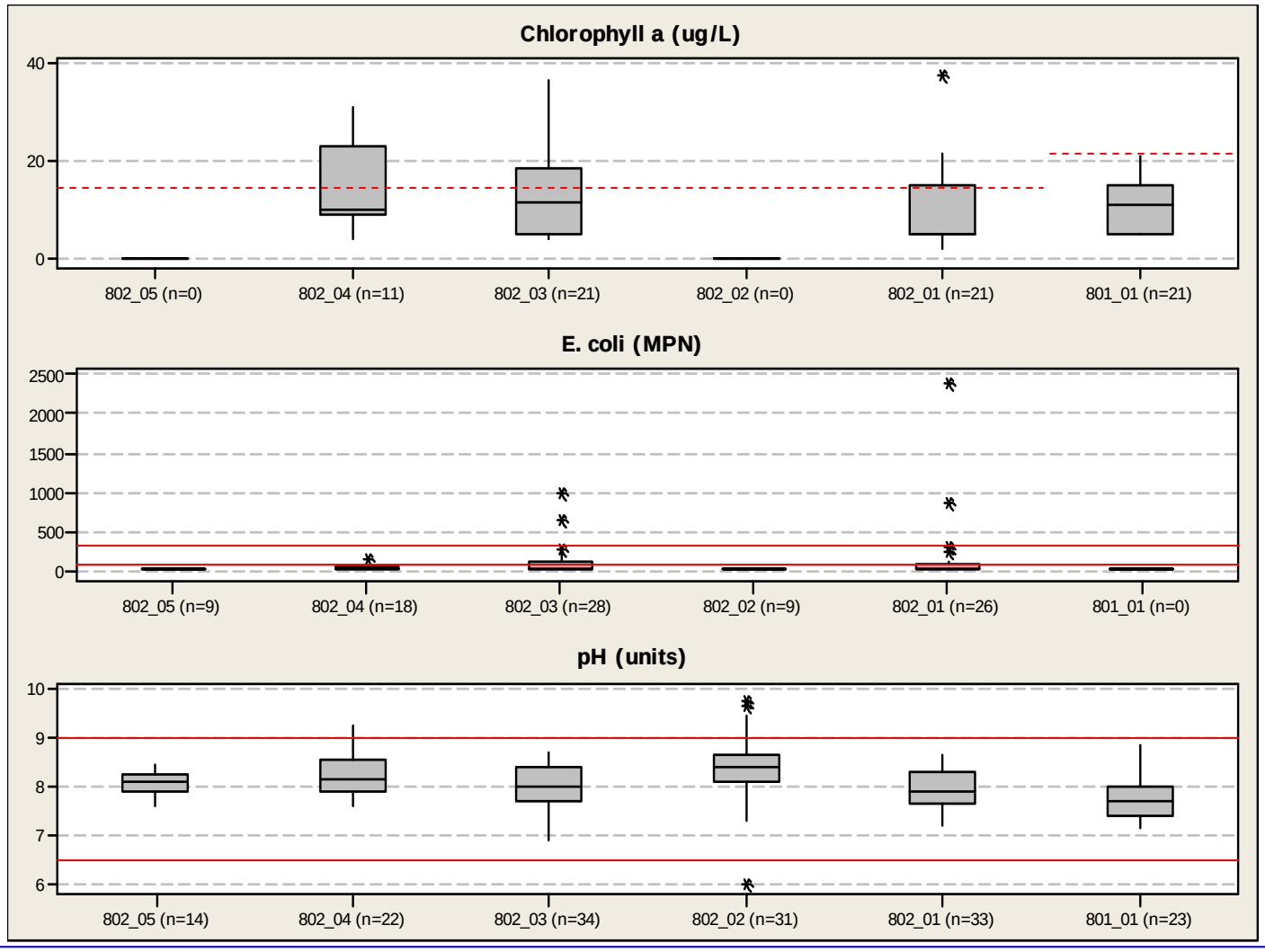
Segments—801, 802

Boundaries—From Trinity Bay north to Lake Livingston dam

Subwatershed Description—South of the Lake Livingston dam, the Lower Trinity gingerly traverses the flat coastal prairie. Near the end of her voyage, Houston taps into this perennial water source before it passes through the Wallisville saltwater barrier and into Trinity Bay.

Water Quality Description—The Lower Trinity River is fully supporting the aquatic life and contact recreation uses. There was no data on this subwatershed for fish consumption use. Portions of the river below Lake Livingston dam (802) were found to have concerns for general use due to elevated pH levels and public water supply use due to Sulfate. The tidally influenced terminus of the Trinity River (801) was found to be fully supporting all uses assessed. A tributary to this segment of the river, Old River (801B) was found to have concerns for algal growth.





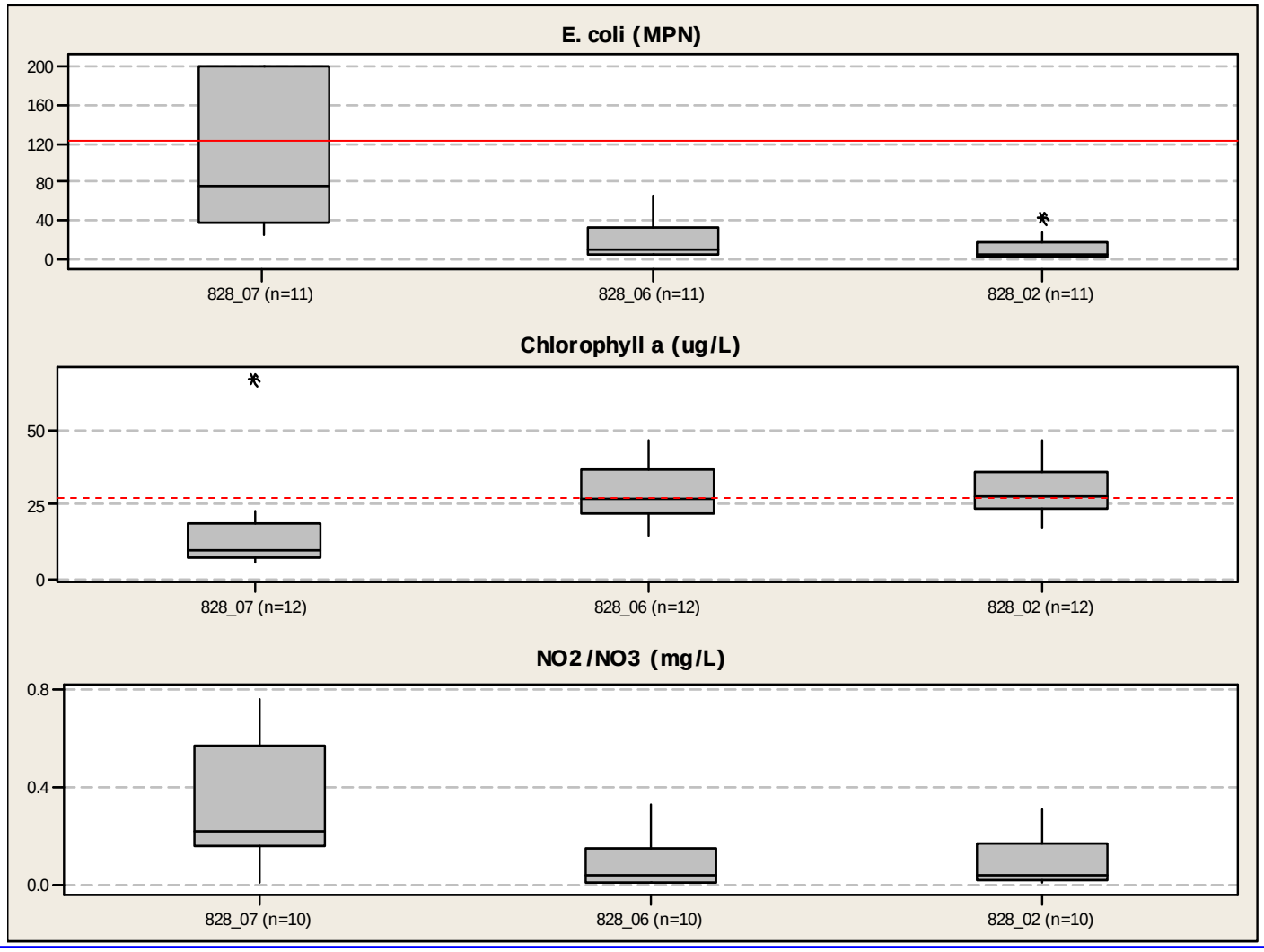
Village Creek

Segments—828

Boundaries—From the Lake Arlington dam southwest into Johnson County

Subwatershed Description—Village Creek is the smallest of the subwatersheds. It begins in the rural sandy soils of the Eastern Cross Timbers and empties into Lake Arlington. The reservoir is an important water source for Arlington and NE Tarrant County.

Water Quality Description—Lake Arlington (828) is fully supporting the aquatic life, contact recreation, general, fish consumption, and public water supply uses. There are concerns for algal growth in some portions of the lake. There has been tremendous growth and development in the upper reaches of the Village Creek subwatershed in recent years and this development is ongoing. This rapid urbanization makes continued water quality monitoring important and provides an opportunity to determine the effects of upstream development.



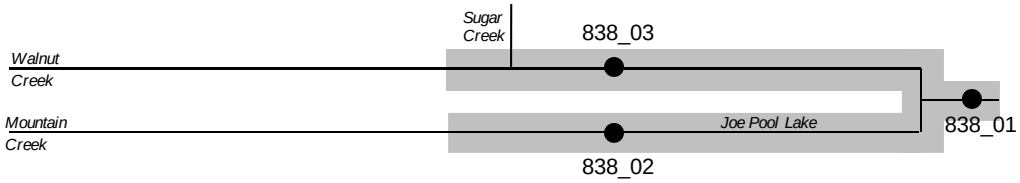
Mountain Creek

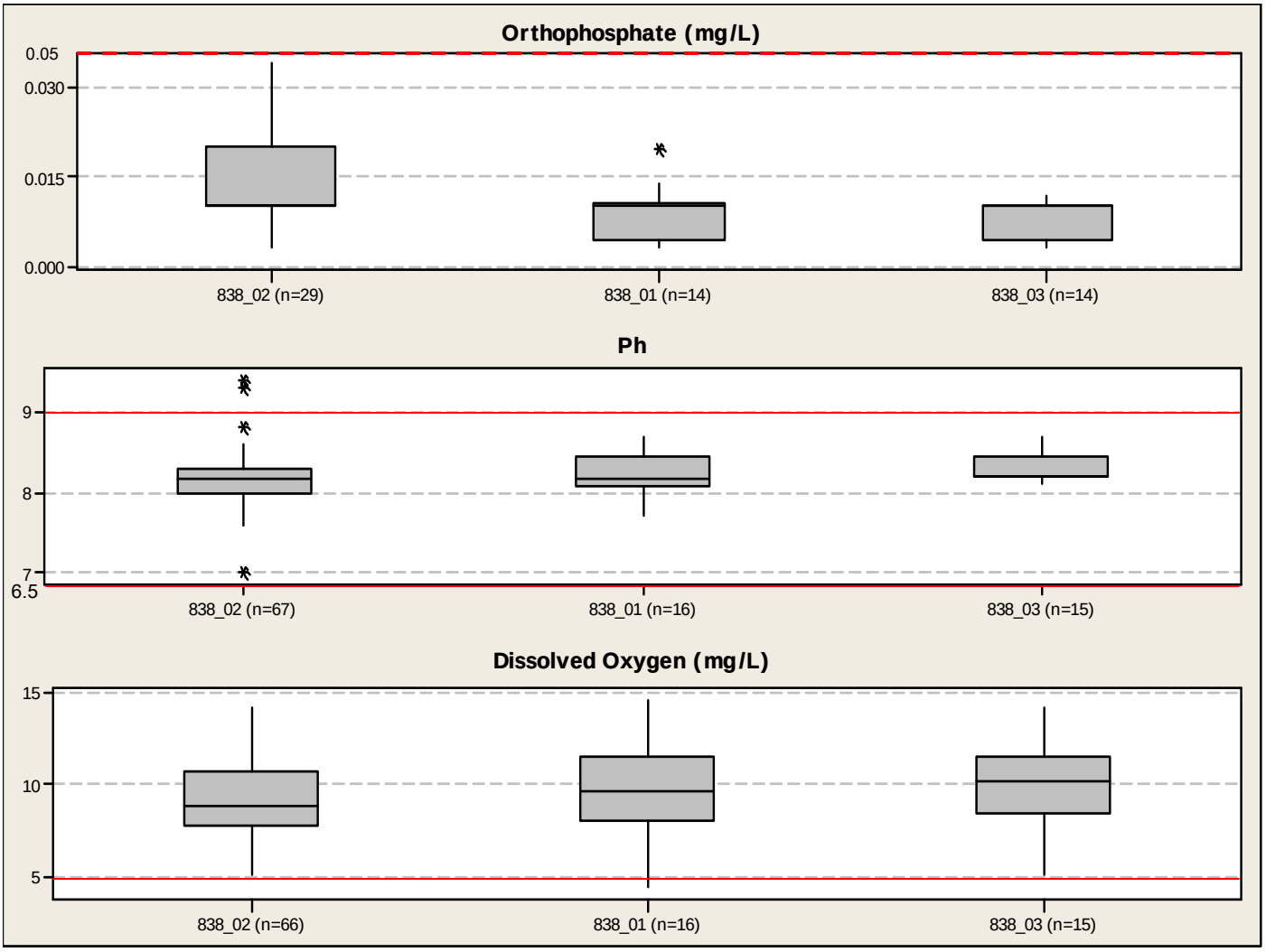
Segments—838

Boundaries—From Mountain Creek Lake dam west to Johnson County

Subwatershed Description—The Blackland Prairie soils support an abundance of row-crop agriculture in this highly rural watershed. It is important to monitor the water quality in Mountain Creek due to increasing urbanization.

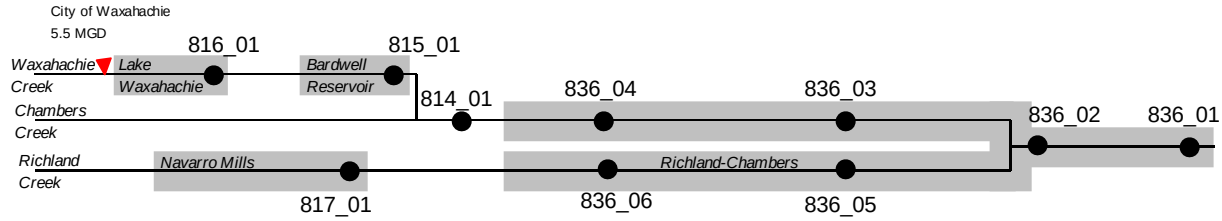
Water Quality Description—The Mountain Creek subwatershed is fully supporting the aquatic life, general, fish consumption, and public water supply uses. There are concerns for nutrients in the Mountain Creek arm of Joe Pool Lake (838). The assessment found issues with *E. coli* in two tributaries to Joe Pool Lake. Sugar Creek has concerns while Walnut Creek did not support the contact recreation use due to elevated *E. coli* levels. Like Village Creek, the Mountain Creek subwatershed is experiencing rapid growth and development. Joe Pool Lake is also an important water source for the Dallas Fort Worth Metroplex, therefore, it is important to continue monitoring the lake and its tributaries.

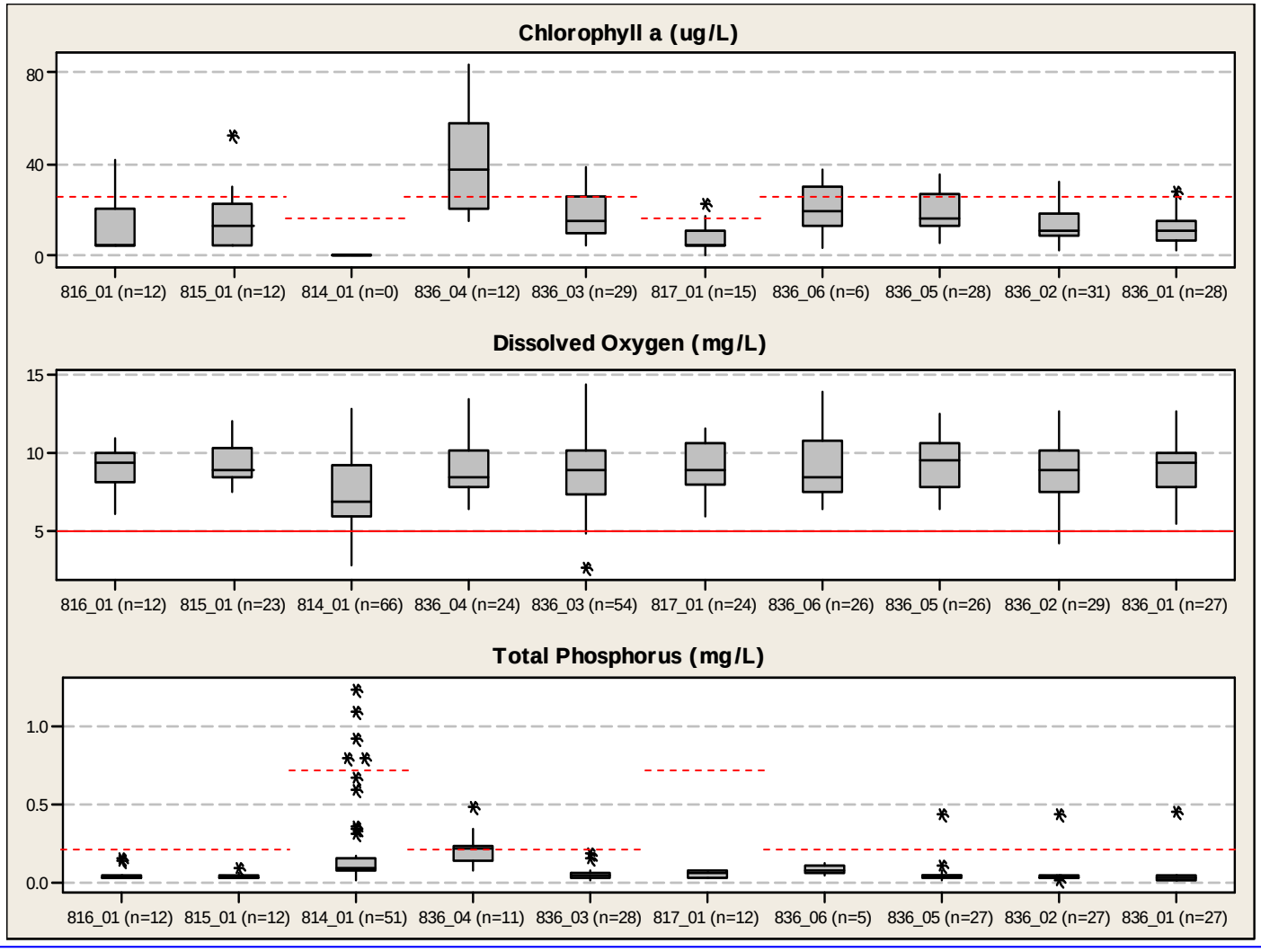




Richland-Chambers

Segments—814, 815, 816, 817, 836, 837
Boundaries—From the Richland-Chambers Reservoir dam northwest into Johnson and Hill Counties
Subwatershed Description—Agriculture is predominant across the flat to gently rolling prairies of the subwatershed. Urbanization has been slow in this area and the population remains low.
Water Quality Description—The contact recreation, general, and fish consumption uses are fully supported in the Richland-Chambers subwatershed. Navarro Mills Lake (817) was found to have concerns for nutrients as well as public water supply use due to Atrazine. The remainder of the subwatershed is fully supporting the public water supply use. A portion of Chambers Creek above Richland-Chambers Reservoir (814) is not supporting the aquatic life use due to depressed DO. Richland-Chambers Reservoir (836) was found to have a concern for aquatic life due to depressed DO in the lower portion of the Chambers Creek arm. In addition, there were concerns for nutrients and algal growth in several portions of the reservoir.





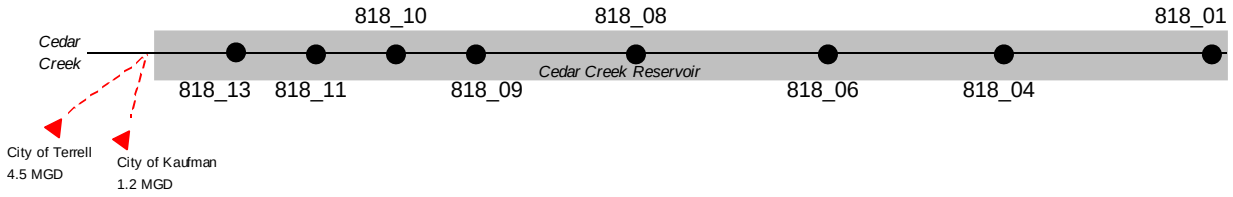
Cedar Creek

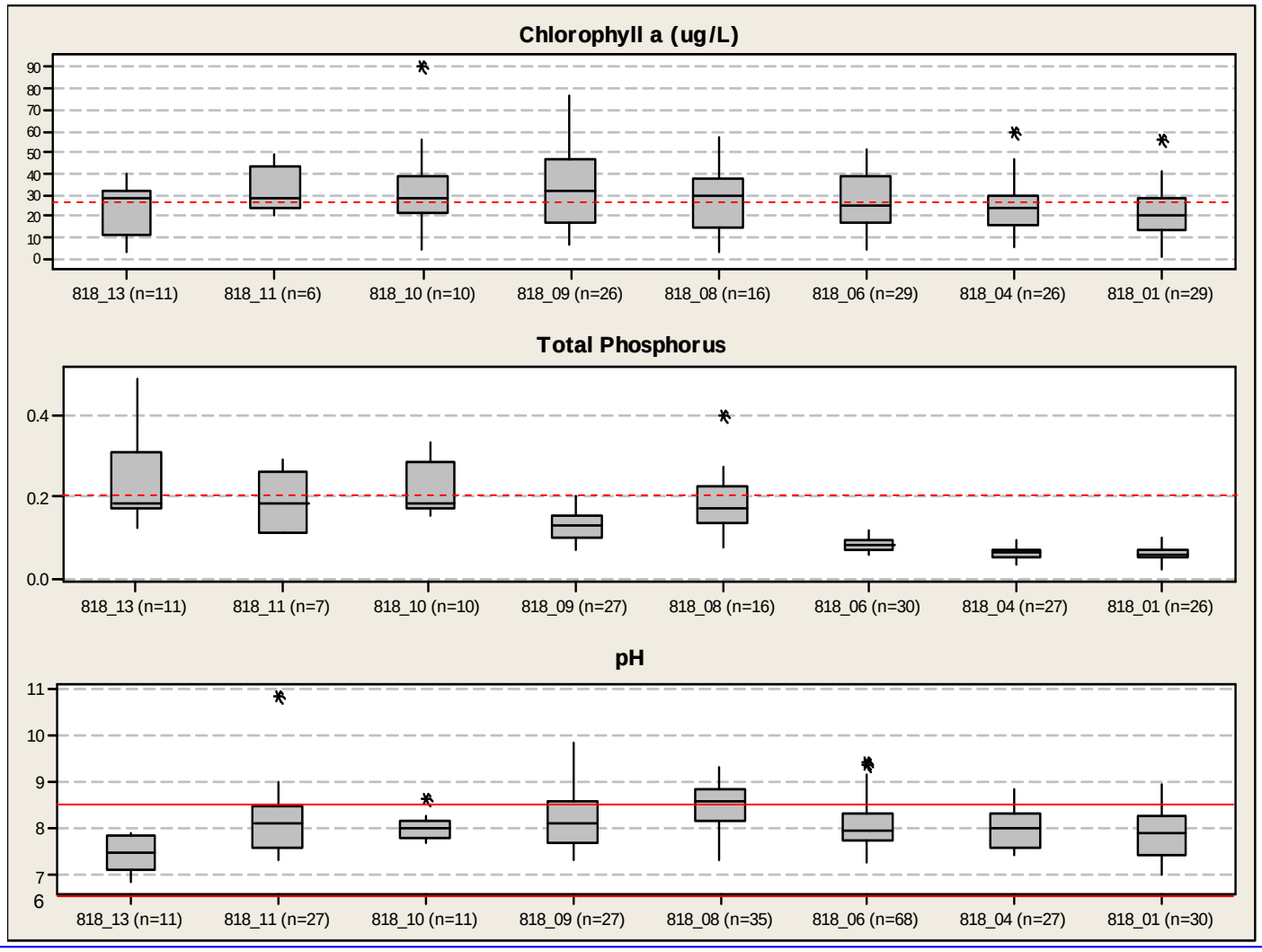
Segments—818

Boundaries—From Cedar Creek Lake dam north into Rockwall County

Subwatershed Description—Cedar Creek Reservoir was created to satisfy the water demands of Fort Worth and Tarrant County. Development has been intensive near the reservoir, but the watershed remains sparsely populated.

Water Quality Description—Cedar Creek Reservoir (818) was found to be fully supporting of the aquatic life, contact recreation, fish consumption, and public water supply uses. A majority of the reservoir, however, is not supporting general use due to elevated pH levels. Additionally, there are concerns for nutrients and algal growth in many portions of the reservoir. Cedar Creek Reservoir serves as a major water supply for the Dallas Fort Worth Metroplex and it's water quality is monitored closely. Although urbanization is limited in this subwatershed, agricultural BMPs and land use practices are important for this portion of the basin to protect the designated uses, specifically the public water supply use.





Water Quality in Urban Streams

In the summer of 2007, an analysis of municipal water quality data was completed by Dr. James Grover of the University of Texas at Arlington. Data collected by the cities of Arlington, Fort Worth, Grand Prairie, and Irving were included in the project. The analyses were focused on determining trends in water quality parameters, similarities between sites, and potential areas of concern.

Data analysis showed exceedances typically occurred under expected conditions. For example, *E. coli* levels tend to be elevated in small to medium sized streams and Chlorophyll a levels are higher in broad channels with open surroundings. Principal components analysis indicated that for some cities, adequate water quality characterization might be possible using fewer sites.

Necessity of Orthophosphate Field Filtration

During the FY2006-2007 contract, the TRA CRP studied the differences between field and lab filtered orthophosphate (OP) samples. Two stream sites and two reservoir sites were selected to represent the range of conditions found in the Trinity River basin. Samples were collected for one year using uniform methods to prevent contamination and reduce variability. Resultant data were then analyzed by Dr. James Grover.

Data analysis showed that there was no significant difference between OP samples filtered at the lab and samples that were filtered in the field. As a result of this study, TCEQ has agreed to accept lab filtered OP samples from the TRA into the statewide database.

West Fork Double Bayou UAA

The West Fork Double Bayou and Cotton Bayou were both found to be impaired for depressed dissolved oxygen on the 2002 Water Quality Inventory. Due to the impairment and increasing development in the area, H-GAC and the USGS conducted a use attainability analysis (UAA) during FY 2007. The goal of this UAA is to determine the extent and source of the impairments, whether natural or anthropogenic. The UAA will also determine the level of aquatic life use the waterbodies can realistically support and if the current standards are appropriate.

The TRA Lake Livingston Project collected water quality samples and diurnal dissolved oxygen on the West Fork Double Bayou . These sampling events coincided with habitat and biological sampling conducted by the USGS.

An interim report for this study is available on the H-GAC website at http://www.h-gac.com/community/water/maps/documents/Cotton_bayou_combined.pdf. The final report for this study is scheduled for completion in FY2008.

Trinity Bay Nutrient Loading

Intensive sampling began on this project in July 2004 and will continue indefinitely. Samples are collected monthly from six sites located on 4 major tributaries to Trinity Bay. This sampling is intended to enhance the fixed monitoring in the lower basin and to acquire data on inflows into the bay. With this data, total loadings into the bay and the relative contributions from each of the tributaries can be determined.

Trinity River Wasteload Allocation

The last wasteload allocation for the Trinity River was conducted in the 1990s and is used to determine the assimilative capacity of the river and the limits of each discharger. Increasing development in the metroplex has made it imperative to recalculate the wasteload allocation. In FY2007, The Trinity River Compact (Dallas, Fort Worth, TRA, NTMWD) contracted with consultants to complete this task.

The model used to generate the wasteload allocaction was updated with information on reuse permits and utililzed a more real world view of in-stream flows and discharges from treatment plants. Initial modeling results indicate that, under current effluent limits, discharge flows in the upper Trinity River and East Fork (segments 841 and 805) can increase by approximately 70% and still meet the dissolved oxygen standards in those segment.

Additional modeling and analysis work is planned for FY2008 as the Compact continues this project.

Continuous monitoring station on the Trinity River at Liberty.

Trinity River Fish Population Summary/Survey

In FY2007, the TRA CRP contracted with the University of Houston-Clear Lake to compile information on all available literature pertaining to fish populations in the Trinity River. After and extensive review of academic, government, and published literature, a total of 89 documents were found.

These documents were scanned into PDF format, where applicable, and used to assemble a database and annotated bibliography. The database contains information on the location and time of collection, equipment used, species collected or observed, unit of effort and catch per unit of effort, numbers of species or taxa, and any other data that was provided in the original report. At this time, no water quality data is included in the database due to inconsistencies in format and coverage.

The TRA CRP will contract with UH-Clear Lake during the FY2008-2009 contract to provide a summary and an analysis of the data. The goal of this project is to determine historical trends in fish communities and populations in the mainstem of the Trinity River. The data will also be used to identify any data gaps and will potentially guide future monitoring and assessments of fish populations.

Trinity River Continuous Monitoring Station

The Texas Agricultural Experiment Station has operated and maintained a continuous water quality monitoring station on the Trinity River at Liberty. This station collects field data as well as conventional parameters.

In order to allow for the continued operation of this station, the TRA CRP provides funding for ancillary materials, supplies, and travel costs.

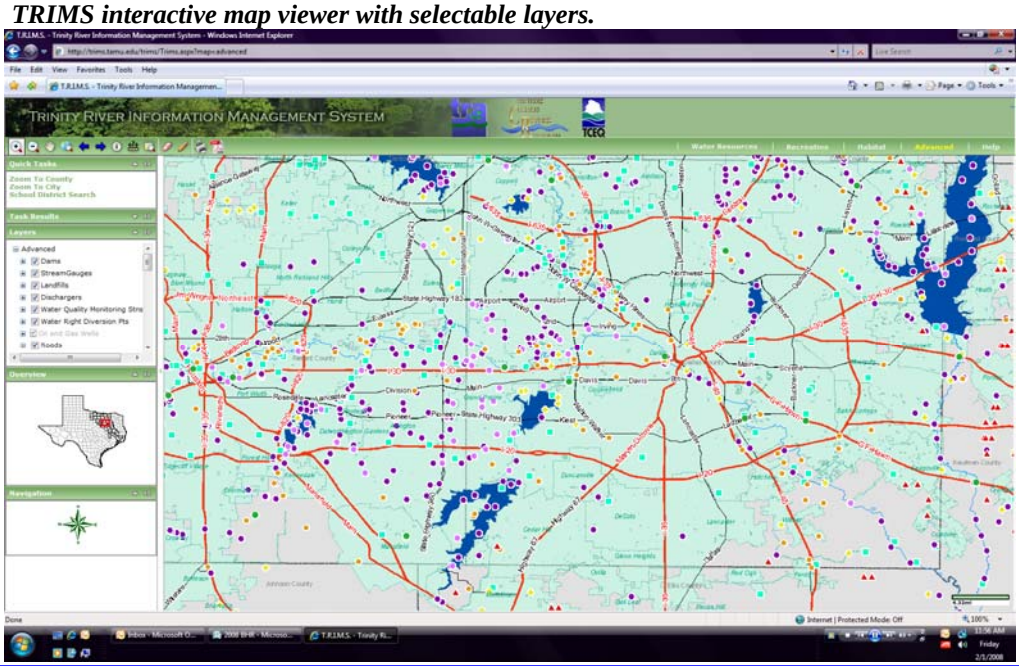
Trinity River Information Management System

In FY2007, as part of Governor Perry's Trinity River Basin Environmental Restoration Initiative, the TRA CRP in cooperation with TCEQ funded the Trinity River Information Management System (TRIMS) through the Texas A&M University Institute of Renewable Natural Resources.

TRIMS is a web-based mapping system that includes data layers for waterbodies, roadways, census tracts, landfills, discharges, and oil and gas wells, just to name a few. Users without specialized geographic information system (GIS) programs and training can easily access this information for making land use decisions in the basin.

To use TRIMS, please visit the website at http://trims.tamu.edu/.

TRIMS interactive map viewer with selectable layers.



Stakeholder Participation

The TRA CRP is guided by a group of basin stakeholders. These stakeholders include basin monitoring agencies, city managers and mayors, volunteer groups, and interested citizens. Each year, meetings are held to provide the group with information about the program and its activities as well as to solicit ideas for special studies that may address specific concerns. To learn more about the program and how to get involved, please visit http://www.trinityra.org/BasinPlan/CRP/tra_crp1.html.

Living Science Center at River Legacy Parks

Educational and Public Outreach Activities

The TRA CRP and staff are involved in various public outreach and educational programs via funding for programs and participation at various events.

CRP staff take part in several educational and outreach events throughout the course of the biennial contract. Some of these events include GIS Day at local colleges, Gator Fest in Anahuac (http://www.texasgatorfest.com/), and Celebrating People and Planet at UT Arlington. At these events, CRP staff set up informational displays and answer questions about the Trinity River basin.

The Waterborne Education Center (WEC) is located in Anahuac, near Trinity Bay. The WEC operates two 45-foot vessels, the *Smith Point* and the *Moss Bluff*, which are used as floating classrooms capable of carrying approximately 25 students. Classes consist of field labs that demonstrate the importance of the Trinity's tidal and coastal ecosystems. The TRA CRP provides funding for the purchase of educational supplies and equipment. If you would like more information on the WEC, please visit http://www.txwaterborne.org/.

The River Legacy Parks and Living Science Center is located in North Arlington on approximately 1,300 acres of donated land. The parks provide paved and natural trails, picnic and play areas, as well as wildlife habitat. The Living Science Center, built using sustainable design, is an educational facility that includes interactive exhibits, classes, and an animal room. The TRA CRP provides funding for the purchase of supplies and equipment used in the Living Science Center. To learn more about the Parks and Center, please visit http://www.riverlegacy.org/.

Texas Watch is a program that monitors the quality of waterbodies in Texas through volunteers activity. This program is administered by Texas State University in cooperation with TCEQ and the U.S. EPA. The TRA CRP supports a trainer for this program as well as many active volunteer via monitoring kits. To learn more about Texas Watch and to view monitoring data, please visit http://texaswatch.rivers.txstate.edu/.

Trash Clean-Ups

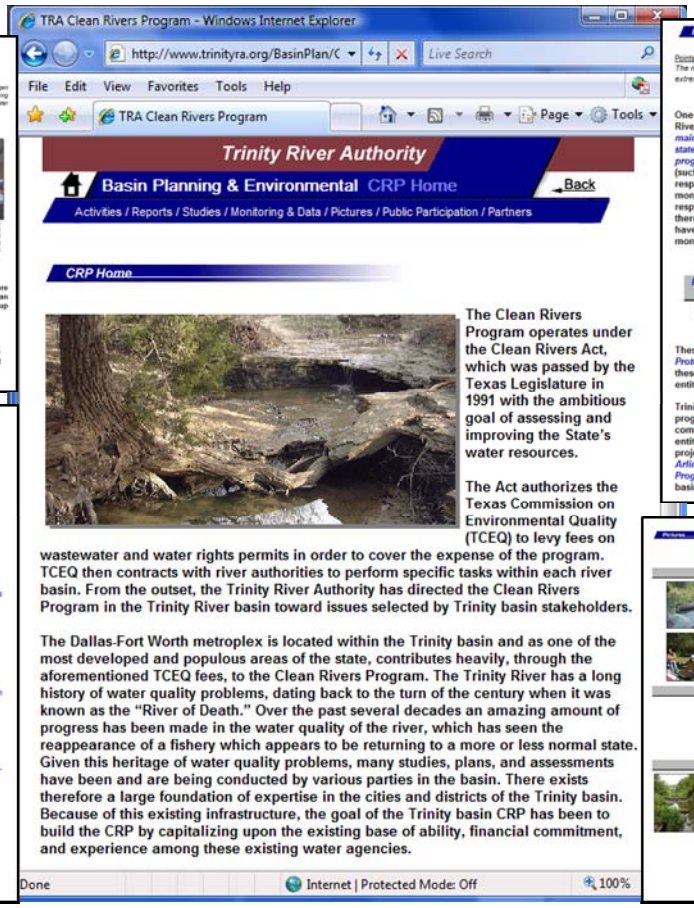
Several trash clean-ups are supported by the TRA CRP including Trash Bash, Navarro County Clean-Up Day, and Walker County Proud. Funding for supplies and landfill fees is provided to the organizers of these beneficial events.

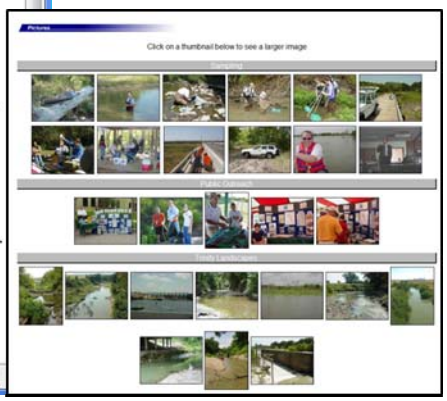
Volunteers at these events remove many tons of debris, tires, and other waste which is then recycled or properly disposed of by event organizers. In addition, volunteers are able to experience the importance of their local water resources and how they are impacted by human activities.

The TRA CRP maintains a website that contains information on the program in general as well as specific information about current activities. The main webpage can be found at http://www.trinityra.org/BasinPlan/CRP/tra_crp1.html.

The Activities page gives a general overview of CRP tasks and links to a page where information for upcoming and past meetings are posted. The Reports page allows users to view and print past Basin Highlights and Summary Reports as well as the final reports for all completed special studies and the most current basin-wide Quality Assurance Project Plan (QAPP). The Studies page briefly describes the special studies planned for the current biennial contract and lists studies conducted in the last contract. The Monitoring & Data page links to the TRA Data Viewer where a user can obtain data via an interactive map. Also found on this page is a link to the Statewide Monitoring Schedule hosted by Lower Colorado River Authority (LCRA). The Pictures page contains images of CRP activities and sampling locations in the Trinity River basin. The Public Participation page discusses some of the educational and outreach programs that the TRA CRP participates in as well as some of the trash clean-ups that are funded. Finally, the Partners page provides links to other agencies in the state that participate in the Clean Rivers Program.

Visit us online at http://www.trinityra.org/BasinPlan/CRP/tra_crp1.html for information on meetings and to view reports, photos, and data.





The Trinity River Authority of Texas

http://www.trinityra.org

PREPARED IN COOPERATION WITH THE
Texas Commission on Environmental Quality
The preparation of this report was financed through grants
from the
Texas Commission on Environmental Quality