TRINITY RIVER AUTHORITY

2007 Basin Highlights Report

Introduction

The Clean Rivers Program (CRP) was established in 1991 when the 72nd Texas Legislative Session passed Senate Bill 818. The intent of the CRP is to provide quality assured data to the Texas Commission on Environmental Quality (TCEQ.) The data is then used by TCEQ to make permitting decisions throughout the state. This program is funded, in part, by fees assessed to water and wastewater permits.

In the Trinity River basin, the Clean Rivers Program is managed by the Trinity River Authority under contract with the Texas Commission on Environmental Quality. The TCEQ realized that by partnering with river authorities, program resources could be leveraged to provide significantly more data to the state wide water quality database. In addition, local entities can provide the state additional on-the-ground information that is used for the biannual state wide water quality assessment.

In addition to providing data, CRP partners create an annual Basin Highlights Report designed to provide an overview of the water quality data collected by the program. Every five years, CRP partners produce a Basin Summary Report that looks in-depth at water quality data. In conjunction, these reports provide citizens an explanation of water quality on a basin-wide scale.

In addition, the Basin Highlights provides updates on both completed and in-progress special studies. These special studies are an integral part of the CRP program and allow for resources collected locally to be reinvested in local projects.

Trinity Trivia

- More than 25% of the population of Texas lives within the Trinity River basin and approximately 50% of the population depends on the Trinity basin for drinking water.
- The two largest population centers served by the Trinity basin are the Dallas-Fort Worth Metroplex and the city of Houston.
- The Trinity River is the longest river in Texas to have its entire course within the state boundaries.
- Throughout history, the Trinity River has been called by many names: Arkikosa and Daycoa by the Caddo Indians; River of the Canoes by French explorer Réne Robert Cavelier, Sieur de la Salle in 1687; La Santisima Trinidad by Spanish explorer Alonso De León in 1690; and Encarnación de Verbo by the first governor of the Spanish province of Texas, Domingo Terán de los Rios in 1691.
- Since about 1836, the Trinity River has been used intermittently for cargo navigation. However, navigation has always been hindered by snags, sand bars, and low water. In 1868, Job Boat No. 1 arrived in Dallas with cargo one year and 4 days after leaving Galveston. Railroad construction to Dallas in the early 1870's marked the beginning of the decline of traffic on the Trinity River.

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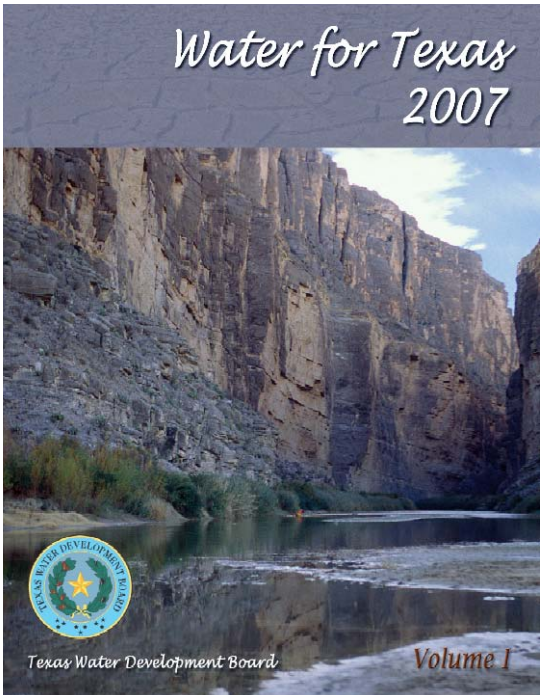
Hurricane Rita Recovery—Lake Livingston Dam

On September 24, 2005, Hurricane Rita struck the Texas/Louisiana coast. The eight southernmost counties within the Trinity River basin were declared disaster areas by FEMA.

During the storm, 70 to 117 mph north winds bore down on Lake Livingston. Huge waves pummeled the dam and washed away the rip-rap protecting the earthen dam. In order to prevent further damage or dam failure, the lake was lowered to 127 feet above mean sea level (4 feet below normal pool level) and emergency repairs were begun immediately with the aid of FEMA. Plans for permanent repairs to the approximately 11,000 feet of damaged rip-rap were made with repair work beginning in January 2006.

As of April 2006, repairs were substantially complete and ahead of schedule. At this time, the lake was allowed to begin refilling. However, due to the ongoing drought conditions in the upstream basin, lake elevation increases were slow until October 2006 when heavy rains fell in the upper basin. Between October 16 and October 22, 2006, runoff from upstream rains increased the level of the lake from 127.36 feet to 131.26 feet above mean sea level.

Lake Livingston dam damage from Hurricane Rita (top) and after repairs were completed (bottom.)



Document available at http://www.twdb.state.tx.us

Texas State Water Plan

The updated state water plan, Water For Texas 2007, which forecasts the planning efforts of each of the 16 regional water planning agencies through 2060, was approved by the Texas Water Development Board on November 14, 2006. 81% of the Trinity River basin falls into either Region C or Region H. The TRA General Manager is a voting member of both of these regional boards.

Region C—Planners estimate water demand to increase to 1,768,464 ac-ft/yr in 2010 and increase 87% by 2060. With no additional supply, the TWDB anticipates a shortage of 245,822 ac-ft/yr in 2010 and 1.92 million ac-ft/yr by 2060. The plan recommends out-of-basin transfers and four new reservoirs. The plan also recommends reuse to provide 5.2% of supply in 2010 and 28% by 2060. In addition, conservation is expected to make up about 11% of the total volume associated with all the recommended strategies.

Region H—Planners estimate that water demands will increase to 2,314,094 ac-ft/yr by 2010 and increase 47% by 2060. If no additional supply projects are developed, estimates are that there will be a shortage of 150,000 ac-ft/yr by 2030 and 849,702 ac-ft/yr by 2060. As subsidence is an issue, groundwater resources are expected to decline by 23%. The plan recommends the construction of 2 reservoirs to make up for this loss. In addition, desalinization and reuse have become a significant part of the plan. Conservation is expected to make up about 9% of the total volume associated with the recommended strategies.

You can find more information for these regions online at *http://www.regioncwater.org/index.cfm* and *http://www.twdb.state.tx.us/rwpg/main-docs/regional-plans-index.htm*.

This Year's Highlights

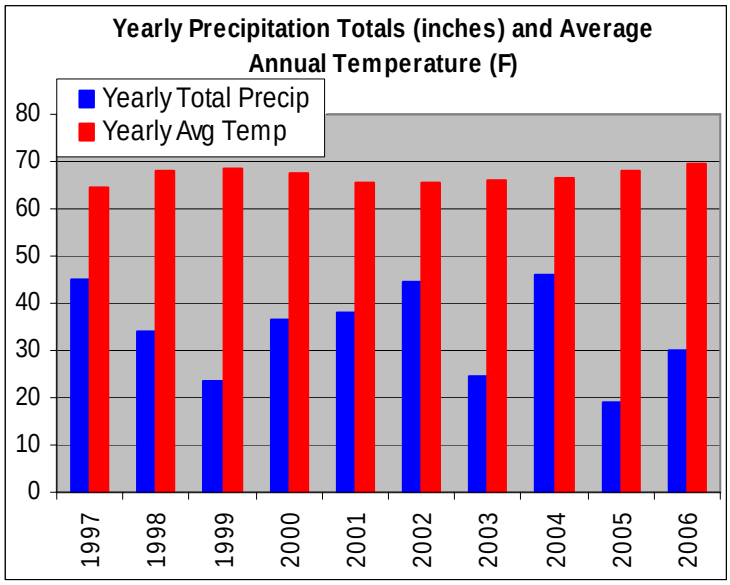
Drought

Drought conditions have persisted in the Trinity River basin as well as within the whole state of Texas for the past several years. Rainfall totals measured in Dallas for the past two years have been well below normal. In 2005, rainfall was approximately 17 inches below the average of 36 inches for the area. In 2006, rainfall measured approximately 30 inches. While this amount was an increase over the previous year, it is important to note that this was due in large part to several large storms in October and December. This pattern is typical of the rainfall in North Texas, with a majority of the yearly total precipitation coming in relatively few heavy rainfall events occurring in the spring and winter. While we have recently seen some minor increases in lake levels, most are still between 1.8 feet and 17.5 feet below conservation pool levels at this writing.

In addition, average annual temperatures have been increasing over the last 5 years, exacerbating the issues associated with lower than normal rainfall. Water use increases as well as increased evaporation potential are depleting the reservoirs at rates not being countered by rainfall and runoff.

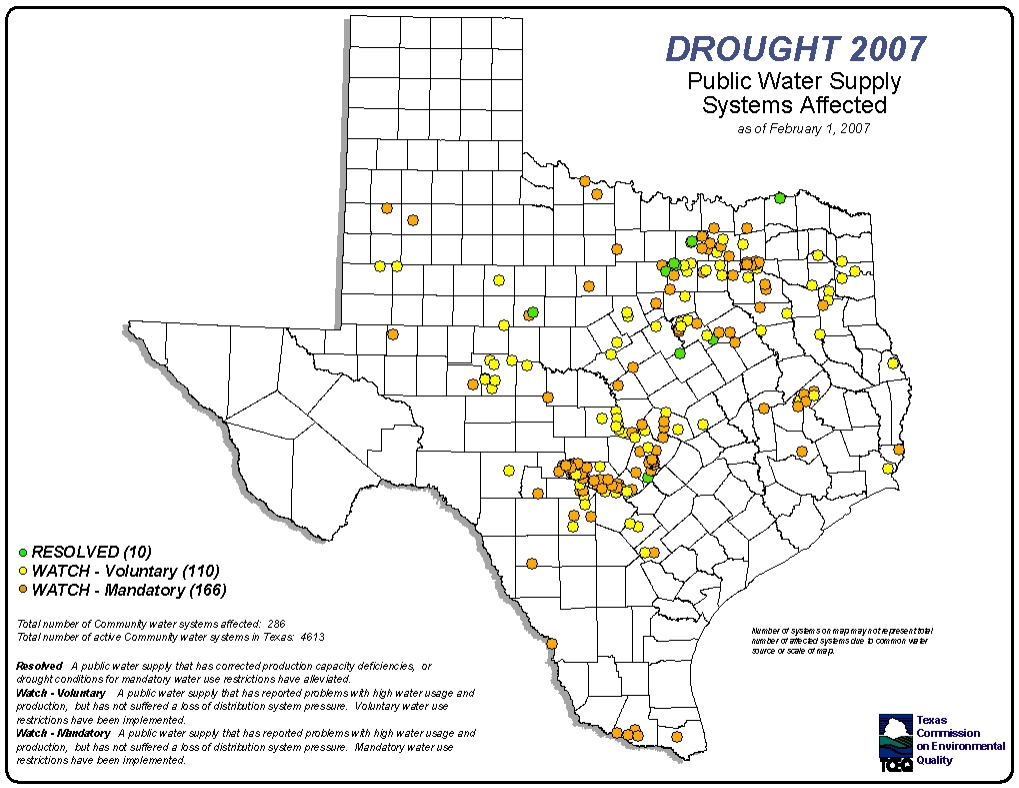
Extended periods of drought can have adverse effects on water quality. Streams with no flow may hold pools of super-heated oxygen-deficient water that can be flushed into lakes during minor rain events causing fish-kills. Minor precipitation may not provide enough additional water volume to dilute pollutants in streams and lakes. In addition, these events can cause taste and odor problems in finished drinking water.

Water conservation measures and restrictions have been put in place in many cities in the Trinity River basin. Within the counties with all or part of their area in the basin, 107 public water supply systems have been affected by the drought as of February 1, 2007. 102 systems are currently on watch for possible water shortages and 5 are not currently experiencing water capacity issues. 41 systems are currently using voluntary rationing in order to avoid further restrictions,



51 are under Stage 1-mild rationing, 4 are in Stage 2-moderate rationing, and 11 are experiencing Stage 3-severe rationing. These levels range from merely suggestions for water conservation to enforcement of restrictions on watering lawns during the day and prohibition of all outdoor water usage except for livestock.

More information on drought and public water supply systems can be found on the Texas Commission on Environmental Quality website at http://www.tceq.state.tx.us/nav/util_water/drought.html.



Water Quality Monitoring

One of the focal points of the Clean Rivers Program is the collection of routine water quality data. By definition, the data are collected in such a way as to prevent bias toward any particular weather conditions or specific events—for example, the data are collected the first full week of every month. In this way, it is possible to have all weather conditions and flow categories reflected in a given data set of 5 to 10 years.

The TCEQ depends on data collected by the river authorities, as well as other CRP participating agencies, in order to conduct biannual assessments of the waterbodies. Each waterbody is assessed to determine if it is meeting its designated use. These uses include drinking water supply, contact recreation, general, protection of aquatic life, and fish consumption. The waterbodies are also evaluated to determine if there are any nutrient or algal growth concerns associated with them.

At the TRA, we have worked to develop a partner network in order to leverage CRP money with programs already in place throughout the basin. Most cities and other local agencies have been conducting sampling programs for one reason or another for many years. Some of these reasons include drinking water supply protection and MS4 permitting. From 1999 to 2002, TRA partnered with cities and local agencies in order to build up the TRA monitoring network. Tarrant Regional Water District, TRA Lake Livingston Project, and the cities of Arlington, Grand Prairie, Irving, Dallas, and Fort Worth have all voluntarily provided their data to the Clean Rivers Program. In addition to these partner agencies, TRA has its own in-house monitoring program. Utilizing this partner network has allowed the TRA CRP to obtain routine monitoring data from approximately 150 sites and a variety of parameters at different frequencies, a feat that would be impossible to accomplish in-house. This network has allowed the TRA CRP obtain nearly $576,000 worth of work at an actual cost to CRP of approximately $133,000 per biennium. As the average biennial budget for the TRA CRP is approximately $832,000, the savings afforded by the partner network has allowed TRA to engage in several special studies and public outreach opportunities discussed later in this report.

In 2006, TRA submitted approximately 2,400 Sample Events and 23,500 Water Quality Measurements to the TCEQ water quality database.

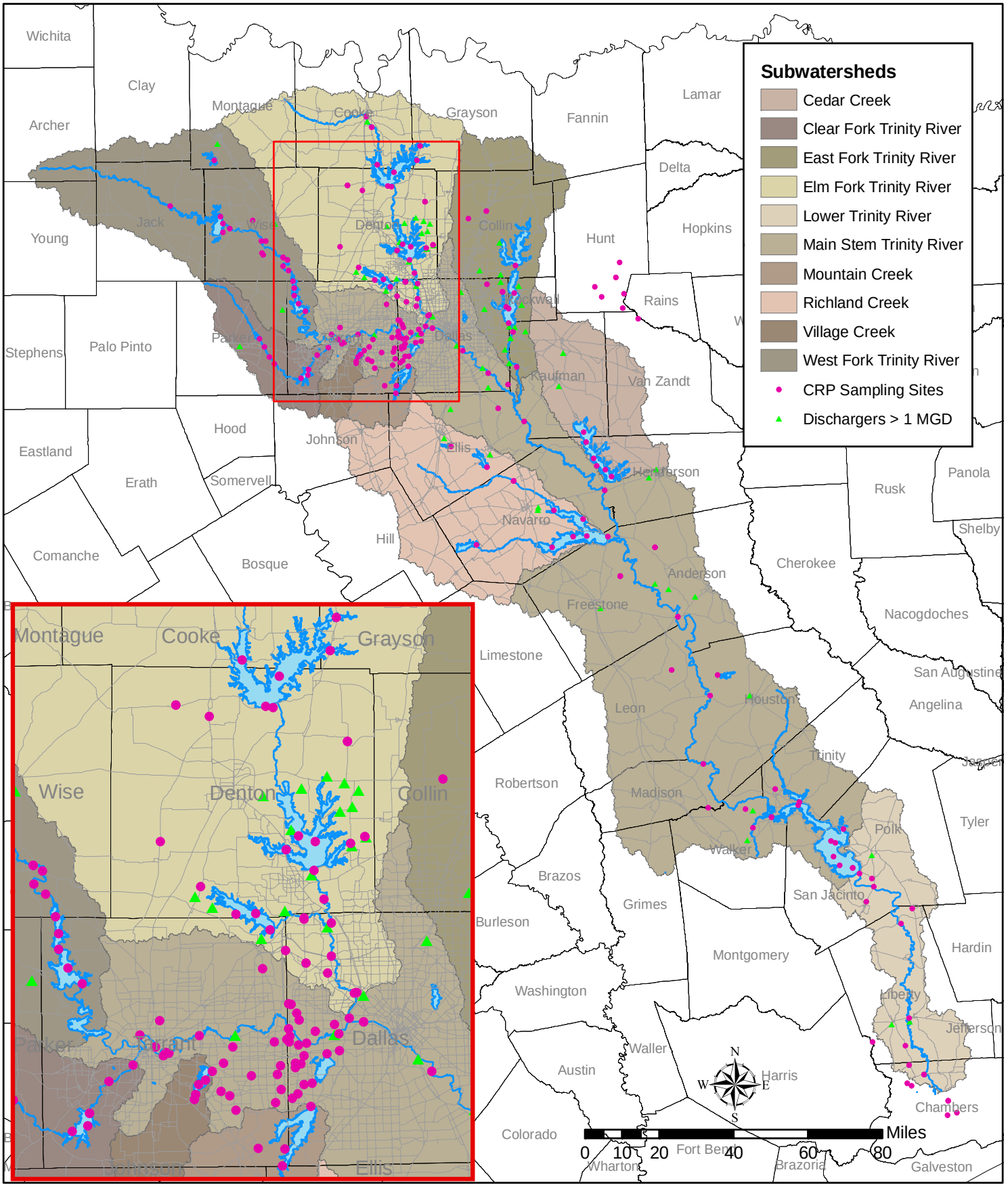
Data that are obtained from the partner agencies are received by TRA CRP staff in various formats. These data are then converted to a single format and quality assured before they are submitted to TCEQ. Once the data are at the state, they undergo additional quality assurance before they are included in the state-wide water quality database and used for waterbody assessment.

TRA maintains a data viewer on the website located at *http://www.trinityra.org/BasinPlan/CRP/viewer/viewer.asp*. Here you can find data for selected sites and parameters that you can view and download as well as photos of sampling sites.

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	Diurnal	7	Diurnal Field
TRA LLP	Intensive	6	Nutrients/Conventionals, Field
TRA LLP	Routine	16	Metals, Nutrients/Conventionals, Bacteria, Field
TRA LLP	Special Study	3	Nutrients/Conventionals, Bacteria, Field
TRWD	Routine	37	Metals, Nutrients/Conventionals, Bacteria, Field
TRWD	Special Study	3	Metals, Nutrients/Conventionals, Toxicity, Bacteria, Field
TRA GO	Routine	10	Nutrients/Conventionals, Bacteria, Field
TRA GO	Special Study	2	Nutrients/Conventionals, Field

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

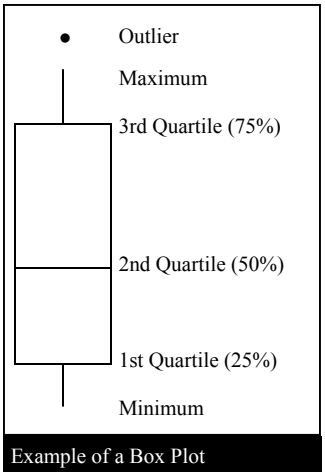
Water Quality Monitoring



Water Quality Conditions

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. 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

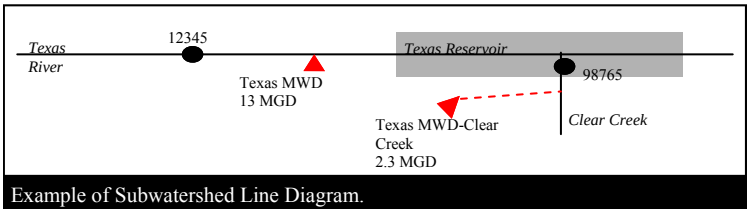


Example of a Box Plot

The red lines located on the graphs represent screening levels or standards 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 site numbers and sample sizes (N) are listed on the x-axis of each graph. Surface samples from December 1, 1999 to November 30, 2004 were used to create the graphs. These data were chosen to be comparable to the 2006 TCEQ Water Quality Inventory. At the time of this writing, the 2006 Inventory was not available. Therefore, the following Water Quality Descriptions reference the 2004 Water Quality Inventory.

West Fork Trinity River near River Legacy Park



Example of Subwatershed Line Diagram.

The diagrams above the box plots are line diagrams of each subwatershed. The horizontal lines represent the main channel of the subwatershed, and the short lines represent tributaries to the main channel or arms of the reservoirs.

Reservoirs are symbolized by gray boxes, and black circles are the stations used in the graphs. The locations of dischargers in the subwatershed are shown by red triangles, and are labeled with the name of the discharger and the volume of permitted discharge. Dotted red lines connecting the red triangles to the line diagram indicate that the discharge flows into an intermediate stream before flowing into the main segment. To the extent possible, all these features are positioned on the line diagram in their approximate locations in the subwatershed.

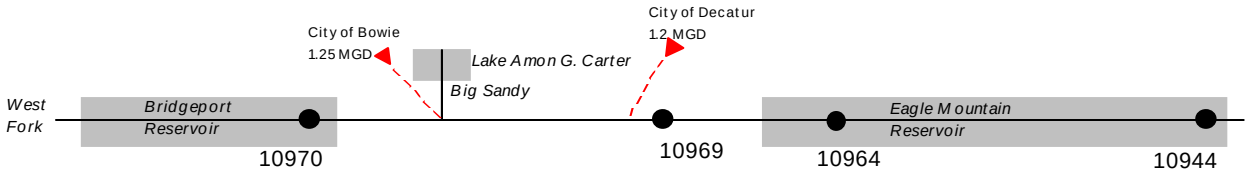
East Fork Trinity River immediately south of Lake Lavon dam

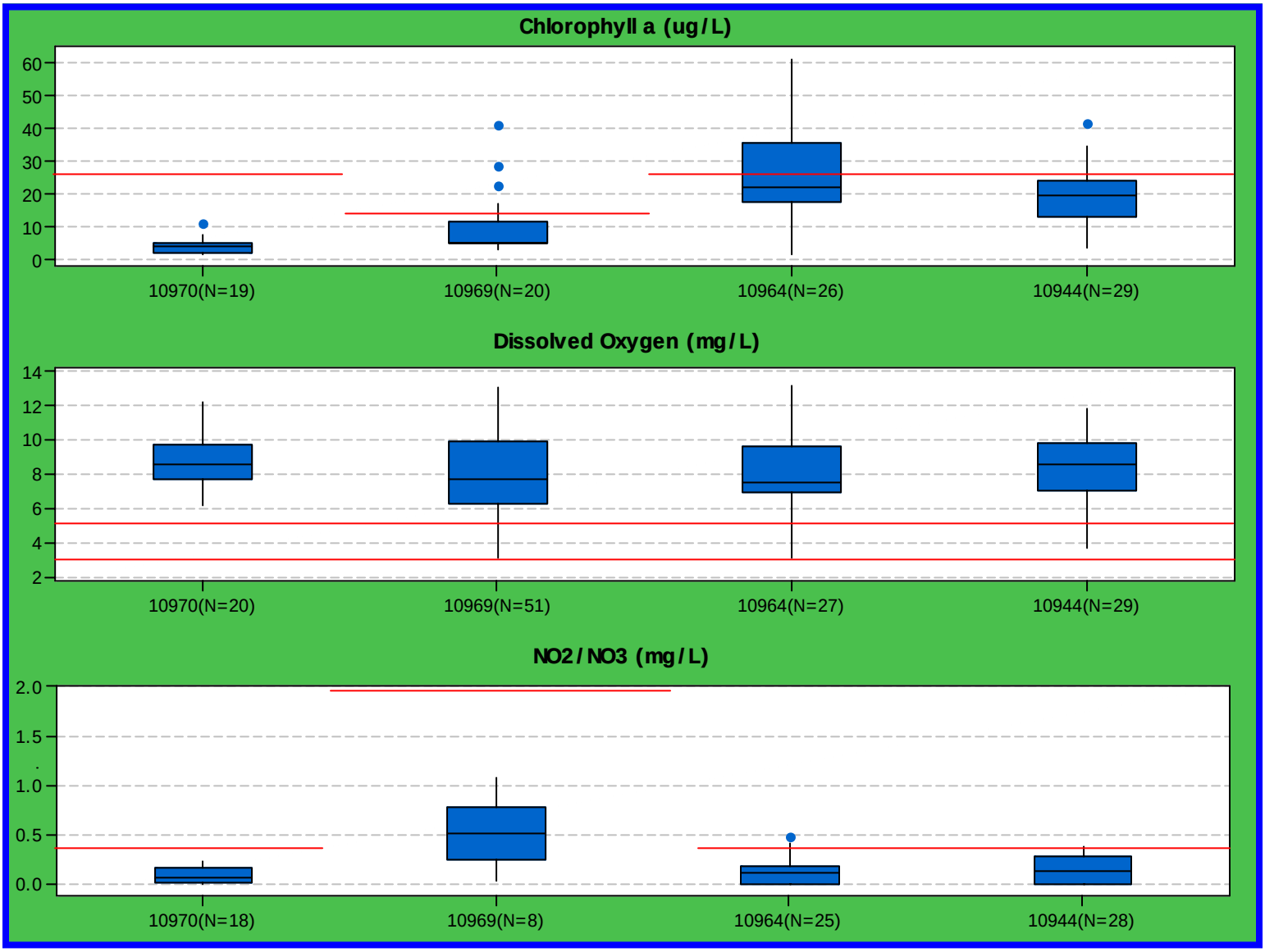
Water Quality Conditions

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 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— Overall water quality for the West Fork Trinity River fully supports contact recreation, public water use, and general use. Nutrients are an area of concern in Eagle Mountain Reservoir. Aquatic life is not supported in the West Fork above Bridgeport Reservoir. There is a fish consumption ban in Lake Worth due to PCBs in fish tissue. There are several areas in the West Fork where there was not enough data to assess every designate use.



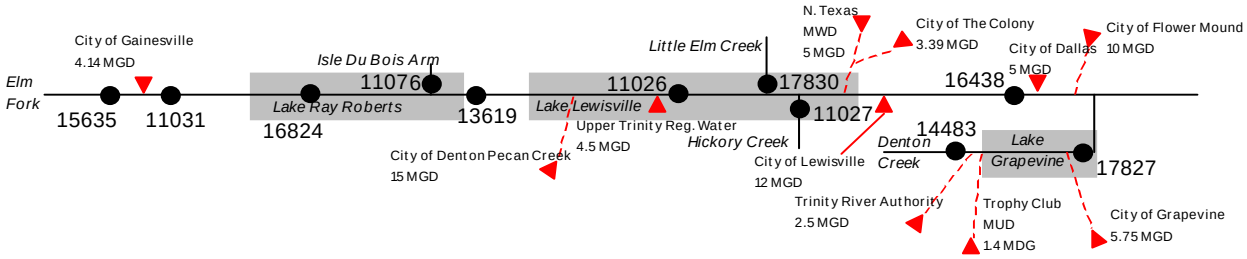


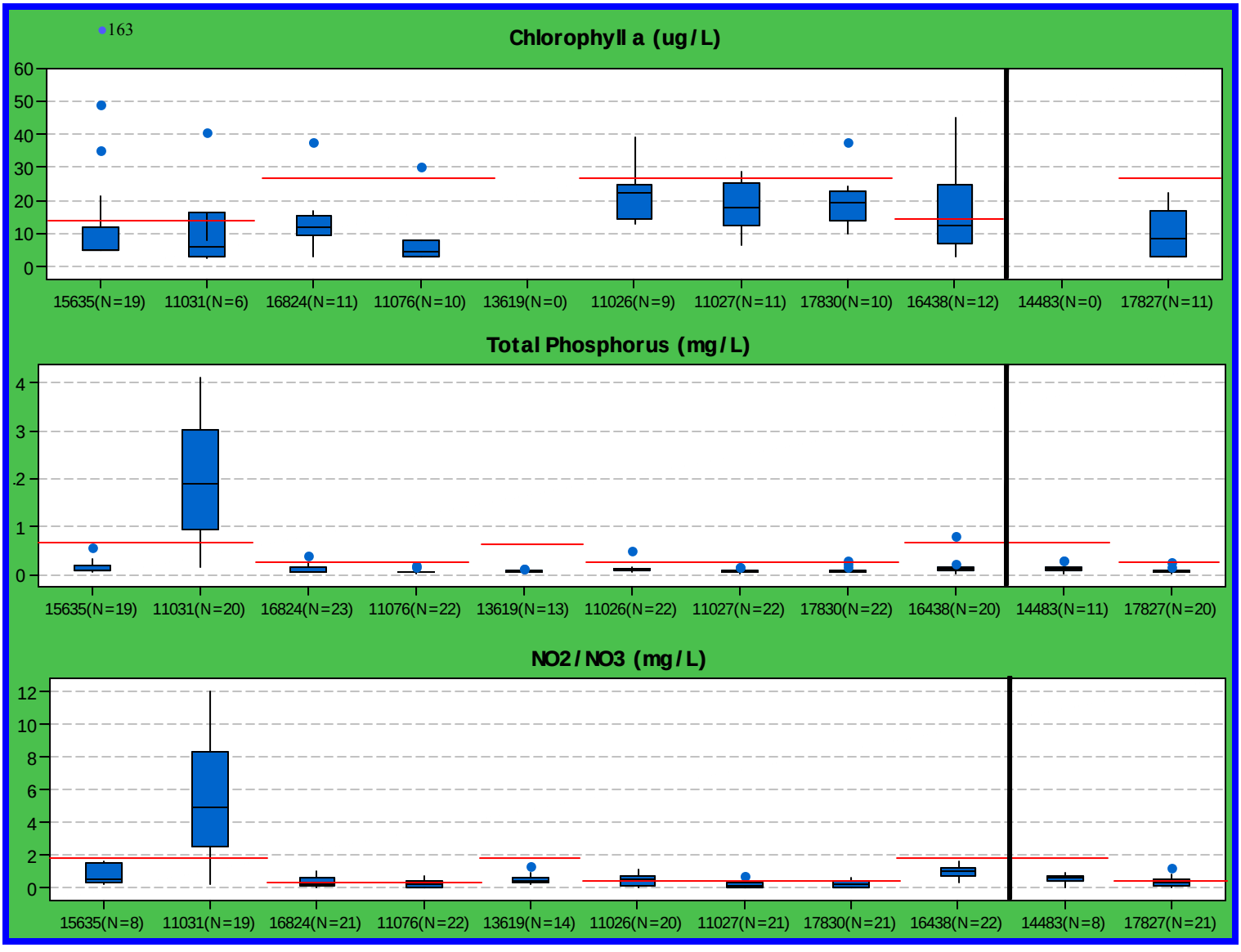
Water Quality Conditions

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—Some issues in the Elm Fork include nutrient concerns throughout most of the subwatershed, as well as bacteria concerns in Clear Creek and Denton Creek. Contact recreation is not supported in Little Elm Creek and Elm Fork above Ray Roberts Lake. Aquatic life, fish consumption, public water supply and general use are fully supported throughout a majority of the subwatershed.





Water Quality Conditions

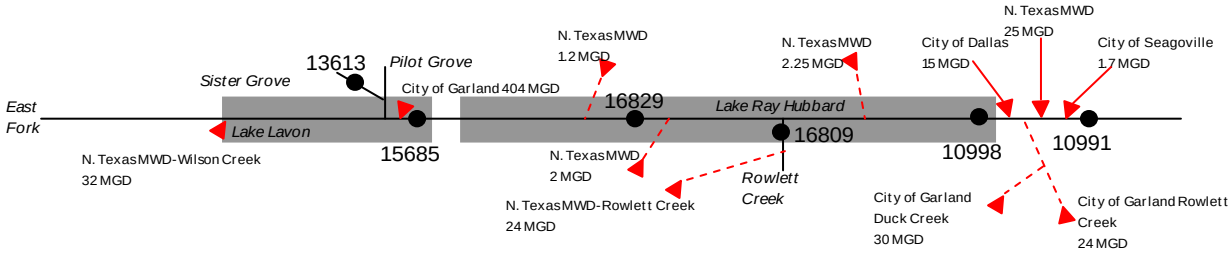
East Fork Trinity River

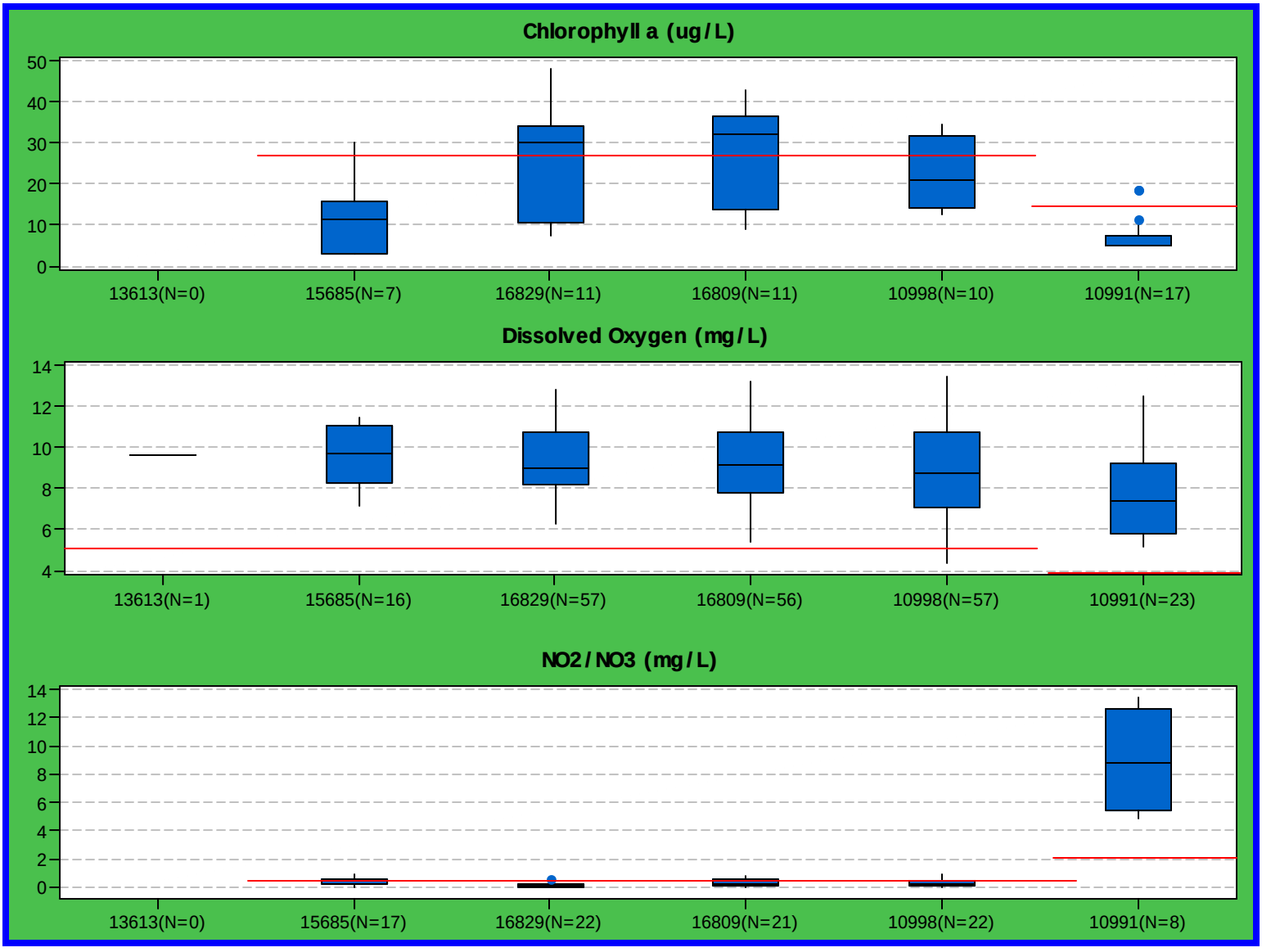
Segments—819, 820, 821

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—There are concerns for nutrients throughout the East Fork Trinity River subwatershed. Contact recreation is not supported in Muddy Creek. Aquatic life, general use, and fish consumption are fully supported when assessed. There are several areas in this subwatershed that were not assessed for contact recreation and fish consumption use due to lack of data.





Water Quality Conditions

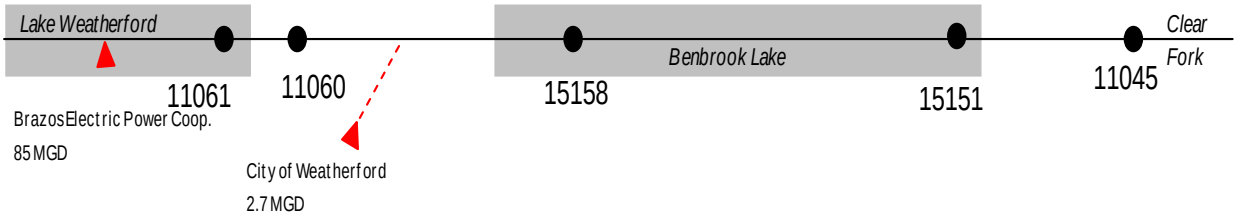
Clear Fork Trinity River

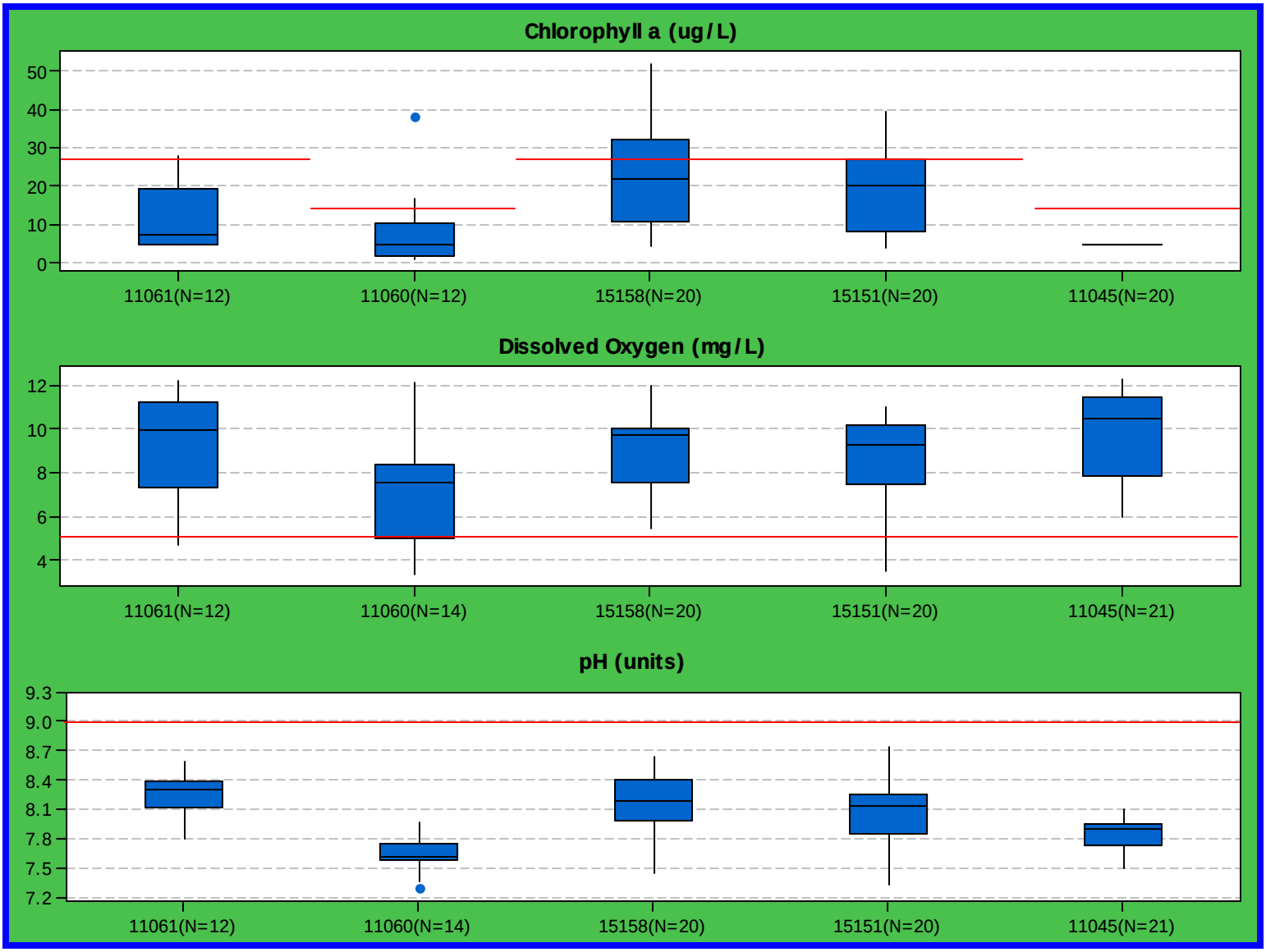
Segments—829, 830, 831, 832, 833

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—Benbrook Lake and Clear Fork below Lake Weatherford show concerns for nutrients. Fish consumption is not supported in Clear Fork below Benbrook Lake but is supported in Benbrook Lake. Contact recreation is fully supported in Clear Fork below Benbrook Lake but not supported in Clear Fork below Lake Weatherford. Aquatic life is partially supported in Clear Fork above and below Lake Weatherford, however is fully supported in Clear Fork below Benbrook Lake and in Benbrook Lake.

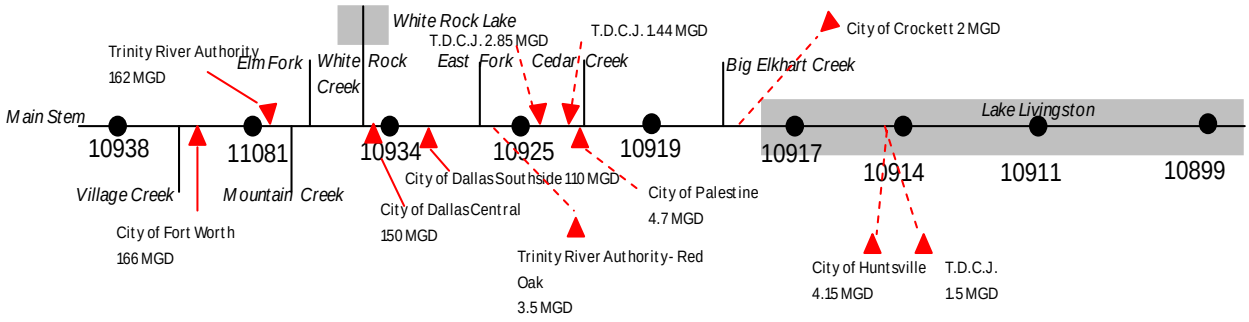


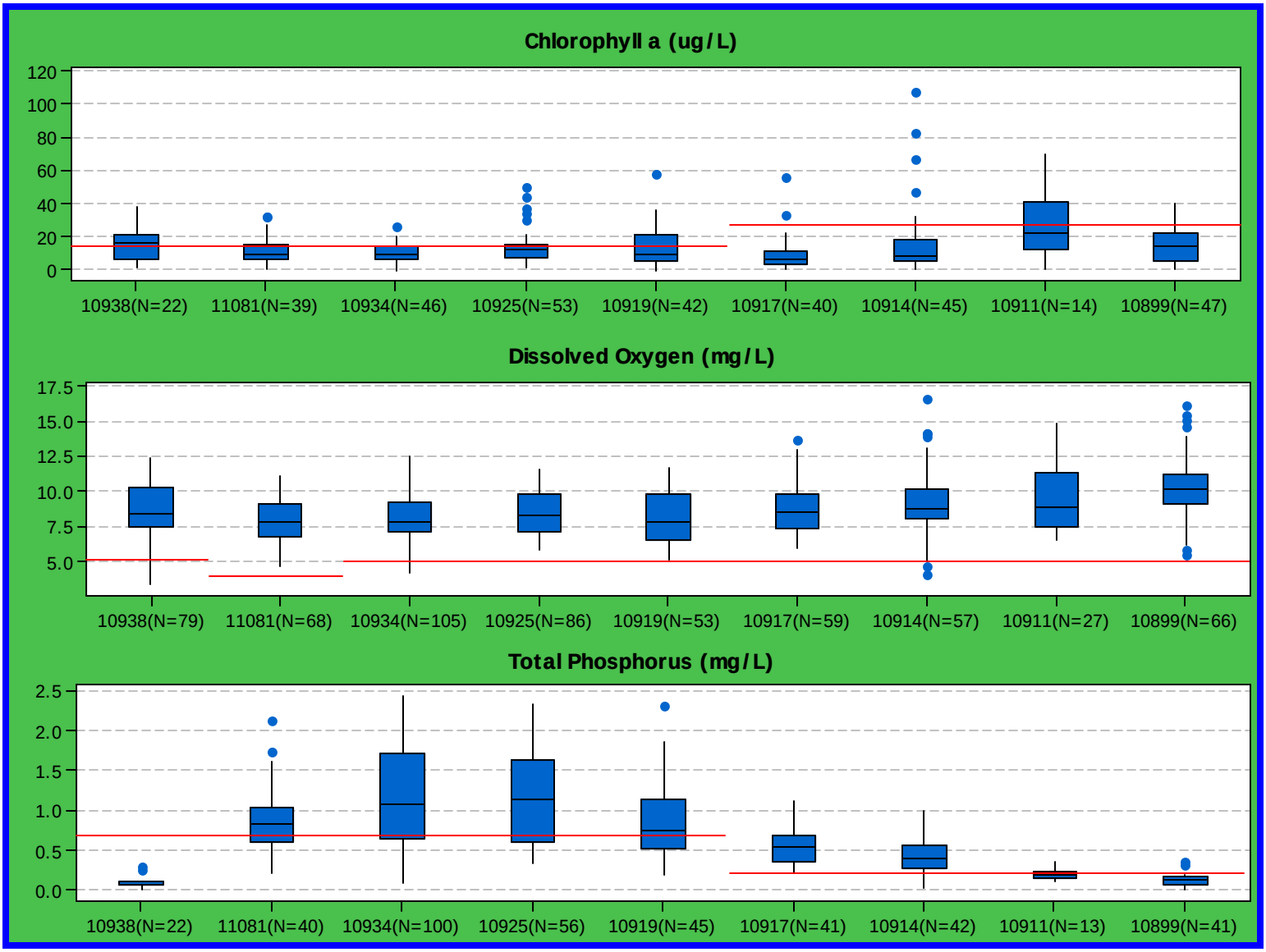


Main Stem Trinity River

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—Contact recreation and fish consumption is not supported in the upper half of the subwatershed. There are also nutrient concerns in this area. The public water supply is fully supported in all areas of the subwatershed when assessed. General use is also fully supported when assessed except for in Lake Livingston, where is it partially supporting due to high pH values in the upper portion of the reservoir.





Water Quality Conditions

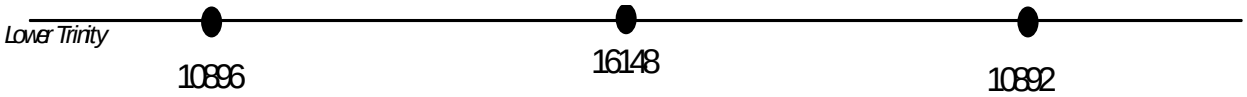
Lower Trinity River

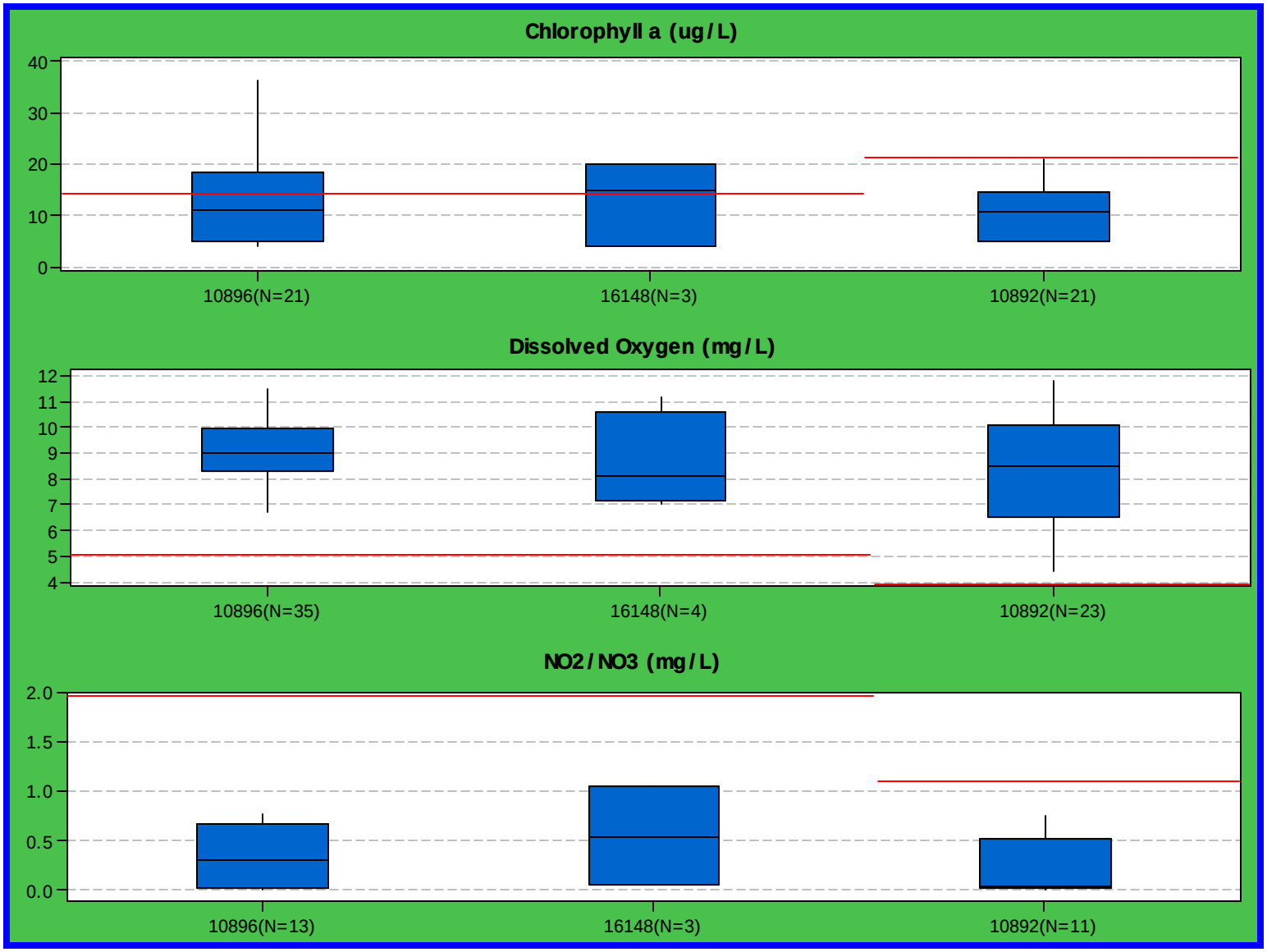
Segments—801, 802

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—Aquatic life, contact recreation, public water supply, fish consumption, and general use are all fully supported in this subwatershed. There are, however, concerns for depressed dissolved oxygen in the river at SH 105 between Romayor and Liberty. The lower portion of this subwatershed is tidally influenced, hence the changes in standards and screening levels between station 16148 and 10892. The overall good water quality supports an abundant local fishery. Diligent water quality sampling is important to protect this resource.





Water Quality Conditions

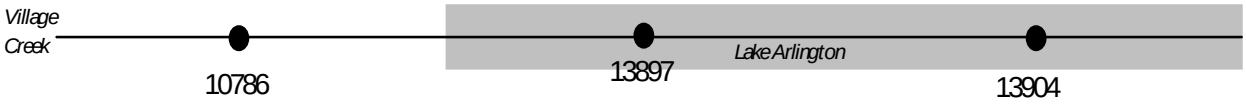
Village Creek

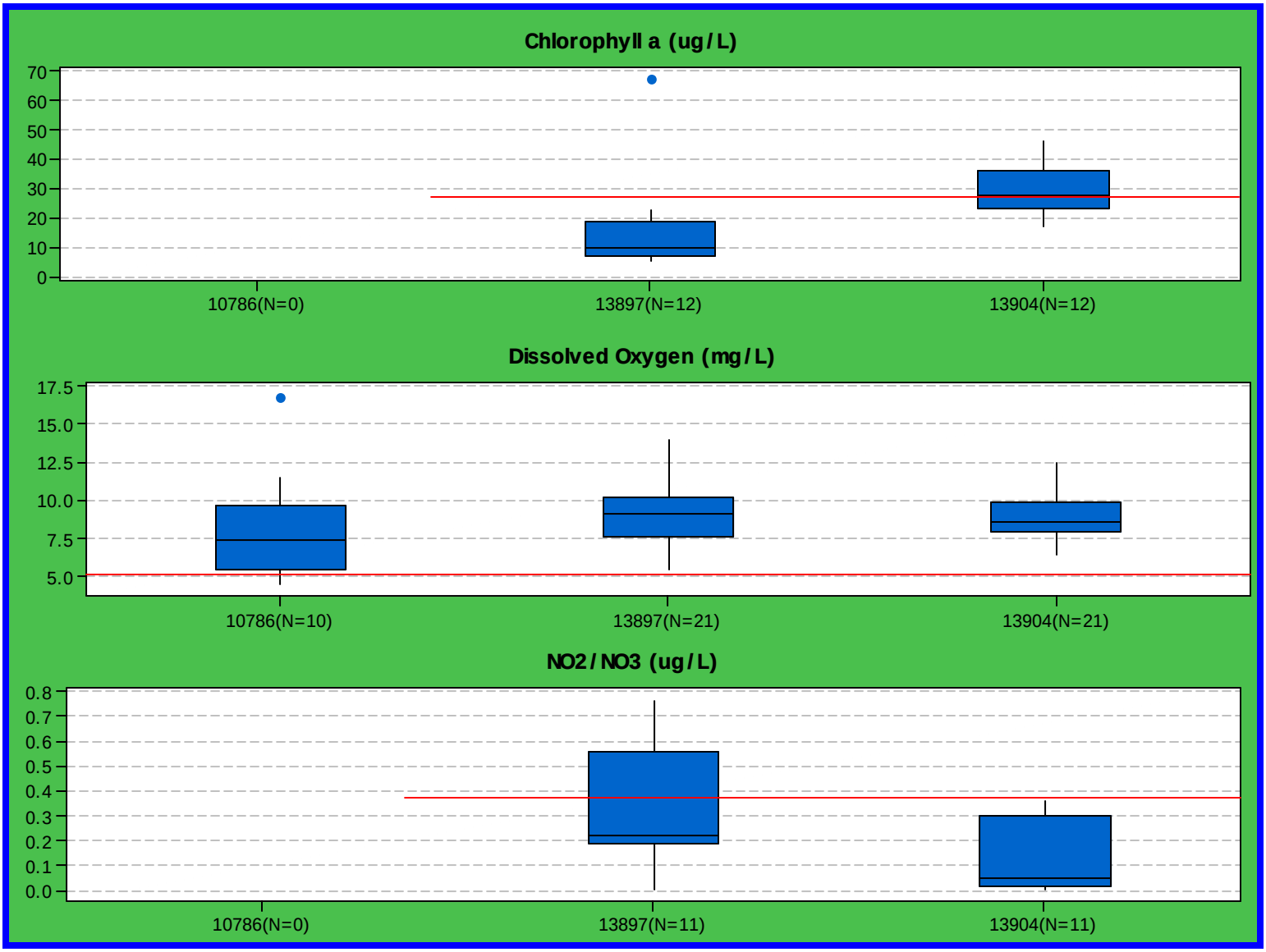
Segments—828

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—Aquatic life, public water supply and general use are all fully supporting when assessed. Fish consumption and contact recreation have not been assessed in this subwatershed. The upper reaches of the Village Creek subwatershed are experiencing tremendous growth and development. The sampling efforts within Lake Arlington will continue to gain importance and provide background data for studying the effects of the development upstream. Additional sampling along Village Creek and its tributaries is needed.





Water Quality Conditions

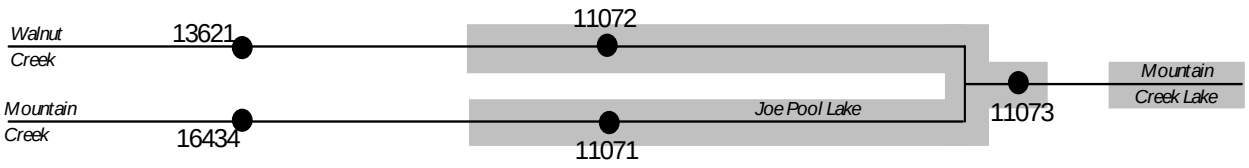
Mountain Creek

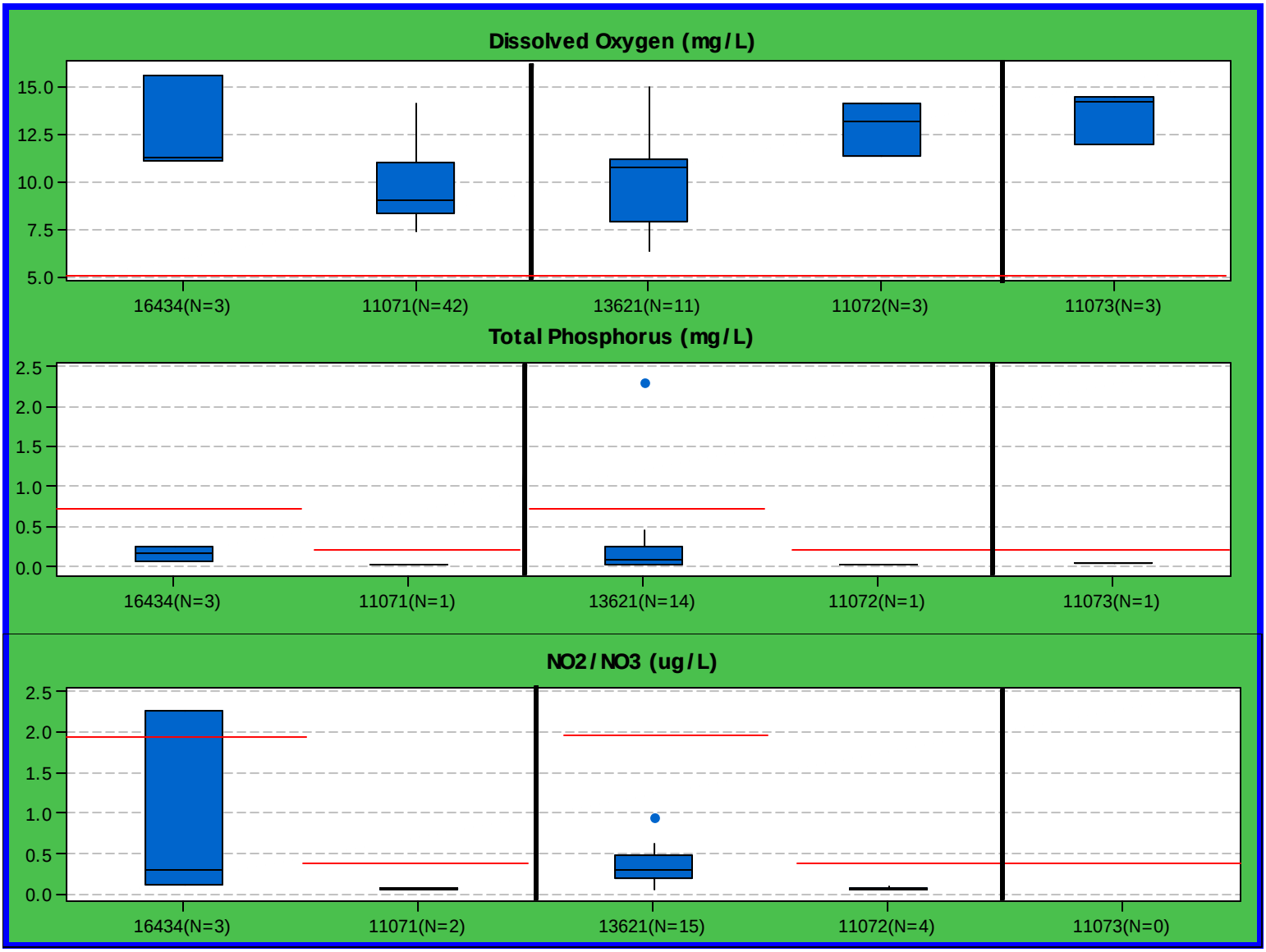
Segments—838

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 all uses assessed. Tremendous urbanization is occurring within the upper reaches of the Mountain Creek subwatershed. As the percentage of impervious surface increases relative to other land cover types, it is imperative to monitor the water quality within Mountain Creek and Walnut Creek. These two tributaries feed Joe Pool Lake which serves as a major water source for the Dallas/Fort Worth Metroplex.

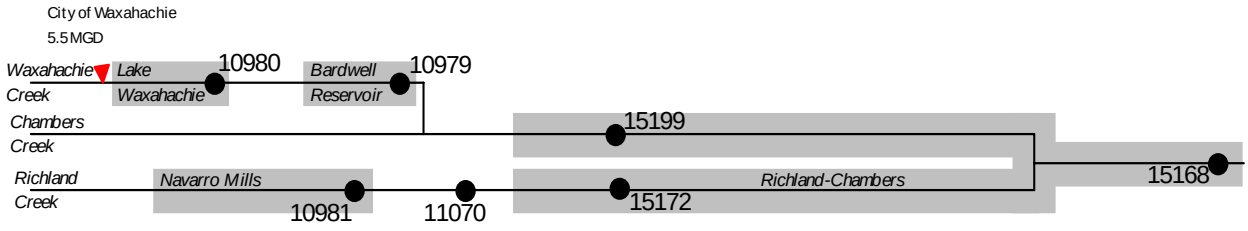


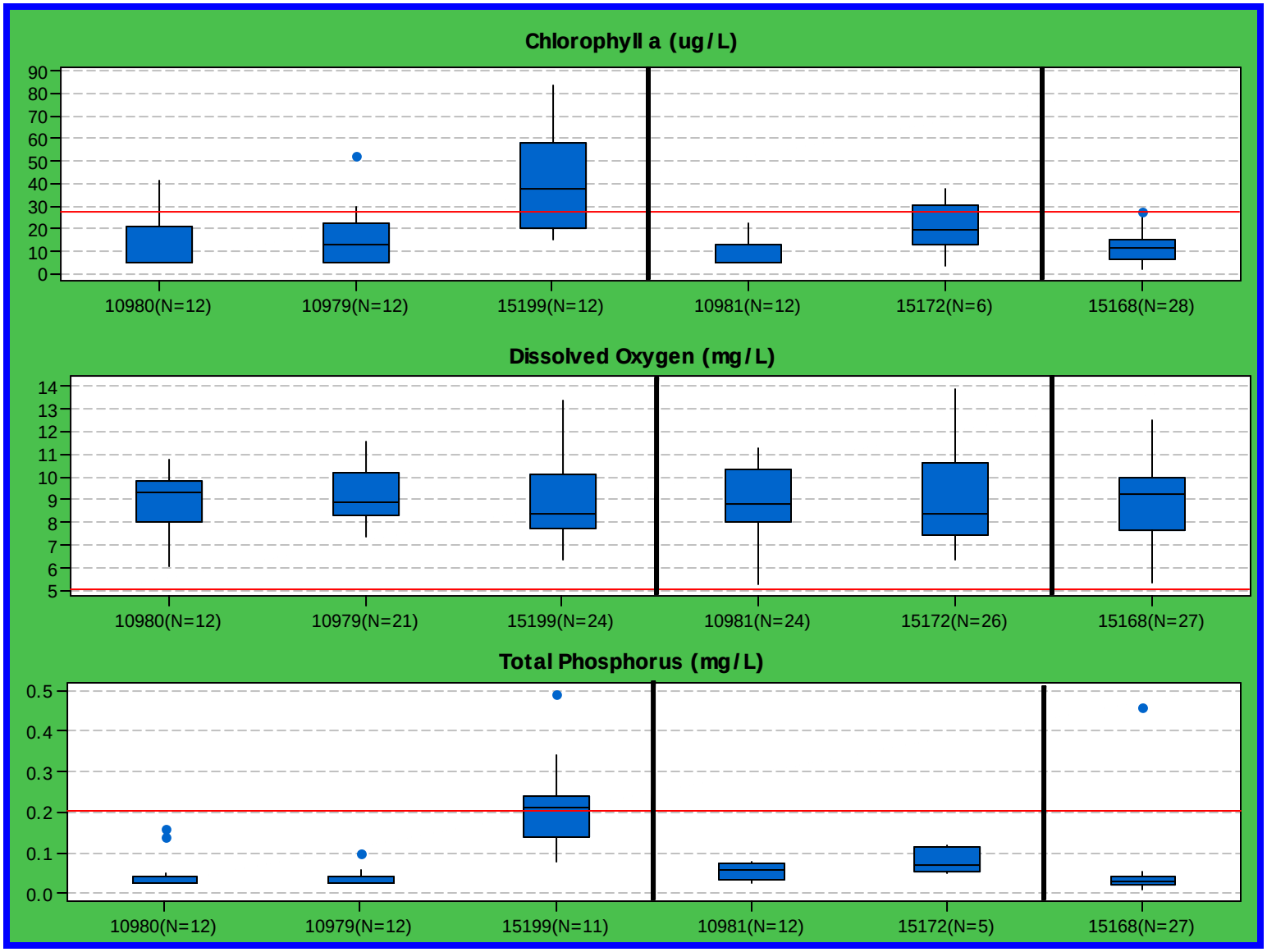


Richland-Chambers

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—Aquatic life is partially supported in Chambers Creek above Richland Chambers Reservoir and fully supported throughout the remainder of the subwatershed assessed. Bardwell Reservoir and Richland Chambers Reservoir show nutrient concerns. General use is partially supported in Richland Chambers Reservoir and fully supported in Bardwell Reservoir. Public water supply is threatened in Navarro Mills Lake and fully supporting in the remainder of the subwatershed.





Water Quality Conditions

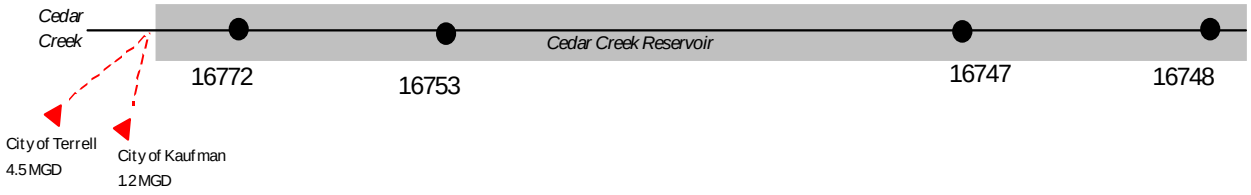
Cedar Creek

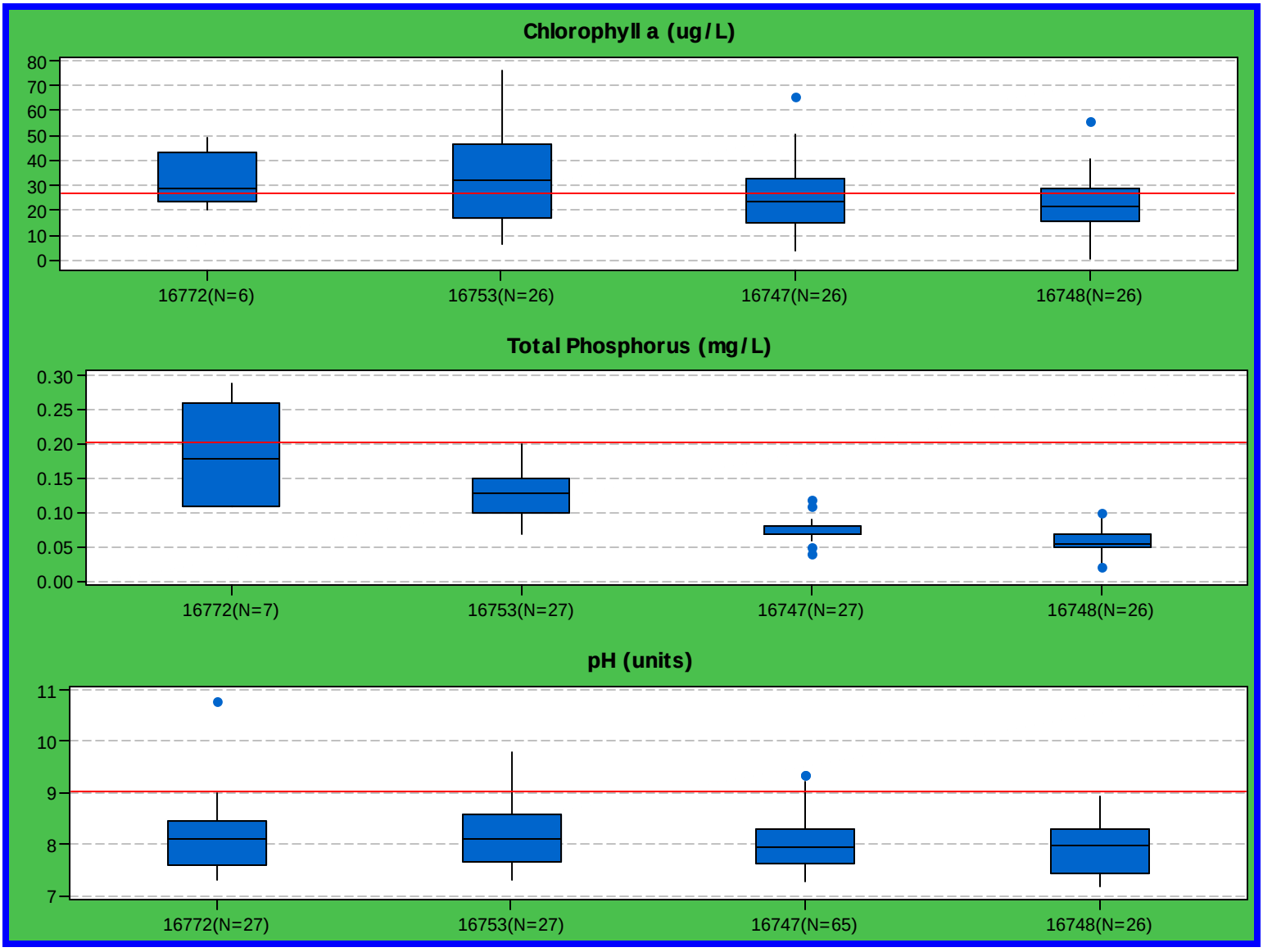
Segments—818

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—There are nutrient concerns in the Cedar Creek Reservoir. General uses are partially and/or non-supporting in various portions of the reservoir due to high pH values. Aquatic life, contact recreation, public water supply is fully supporting, and fish consumption has not been assessed. Cedar Creek Reservoir serves as a major water supply for the Dallas Fort Worth Metroplex and its water quality is monitored closely. Although urbanization is limited in this subwatershed, agriculture BMP's and land use practices are important for this portion of the basin.





Special Studies

Water Quality in Urban Streams

This study was designed in response to questions raised by CRP partner cities. These cities wanted to know the water quality of their urban streams, if there were any significant trends, and if the right parameters were being sampled in the right locations.

Routine water quality data collected by the cities of Irving, Arlington, Grand Prairie, and Fort Worth are being analyzed by Dr. James Grover (UT Arlington) for correlations and trends. The results of his analyses could help focus the cities' sampling programs and make better use of available resources. This study is scheduled for completion in the summer of 2007.

Necessity of Orthophosphate Field Filtration

This study was begun in response to the requirement that all OP samples be filtered in the field immediately after collection. The design of this study should determine if there are any significant differences between samples that are filtered immediately in the field and those filtered up to 48 hours later in the lab.

Two stream sites and two reservoir sites were selected. The streams sites represent high and low turbidity samples and the reservoir sites represent oxic and anoxic samples. Data collection has recently been completed and Dr. James Grover will soon begin the analysis of the data. His analyses will determine if there are significant differences between the two sets of data and it any associated water quality parameters are having any affect on the data.

Preliminary review of the data does not seem to show any significant differences between filtered and unfiltered samples. However, this review is only a side by side comparison of the data sets and no correlation analysis has yet been conducted. The final report for this study is scheduled for completion in the summer of 2007.

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 are currently conducting a use attainability analysis (UAA) to determine the extent and source of the impairments. The UAA will help determine the level of aquatic life use the water bodies can realistically support and if the current standards are appropriate based on the findings.

Old River at FM 1409 upstream of Trinity Bay

The TRA Lake Livingston Project has been collecting water quality and diurnal dissolved oxygen on the West Fork Double Bayou in conjunction with habitat and biological sample collection that is being conducted by the USGS. A data summary is scheduled to be completed by August 2007 with a final report due 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 loading into the bay and the relative contributions from each of the tributaries can be determined.

Trinity River Wasteload Allocation

The Trinity River Compact (Dallas, Fort Worth, TRA, NTMWD) has contracted with consultants to recalculate the wasteload allocation for the Trinity River through the metroplex, specifically segments 841 and 805. The last wasteload allocation was conducted in the 1990s. Increasing development has made it imperative that the wasteload allocation be recalculated.

The model will be updated with additional information related to reuse permits and will also utilize a more real world view of the in-stream flows and discharge from treatment plants. TRA is funding the modeling task of this study to be conducted by Alan Plummer Associates, Inc.

Stakeholder Participation and Public Outreach

Public Outreach

The TRA CRP participates in many public outreach and educational programs. The level of participation ranges from funding for programs and trash clean-ups to participation at various events.

Programs and trash clean-ups funded under the FY2006/2007 contract include the Waterborne Education Center, Texas Watch, Waters to the Sea, River Legacy Park and Living Science Center, Trash Bash, Bridgeport/Eagle Mountain Earth Day, Navarro County Clean-Up, and Walker County Proud.

WEC boat, The Smith Point, gives tours of the tidal and coastal Trinity.

Educational and Outreach Programs

The TRA CRP provides funding for supplies and educational materials and equipment to the Waterborne Education Center which operates out of Anahuac. Two Coast Guard buoy tenders were retrofitted as floating classrooms to teach students about the importance of the tidal and coastal Trinity ecosystems. If you would like more information on the Waterborne Education Center or would like to schedule a tour or field trip, please call (409) 267-3547 or visit *http://www.txwaterborne.org/*.

The TRA CRP also provides funding for Texas Watch for replacement supplies to support sampling kits currently being used as well as funding for a Texas Watch trainer and coordinator. To learn more about Texas Watch, please visit *http://www.texaswatch.geo.txstate.edu/*.

Waters to the Sea is an educational tool currently being developed by Hamline University for the Trinity River. This program is intended to be used to supplement the curriculum for the 4th to 8th grades. This multimedia program teaches students about the environment, history, and water quality using historical figures as a guide through the program. To learn more about this program that has been developed for other river basins, visit *http://cgee.hamline.edu/waters2thesea/Chattahoochee/index.html*.

The River Legacy Park and Living Science Center is located on 1,300 acres in North Arlington. The park includes trails, picnic areas, and playgrounds. The Living Science Center is geared toward educational activities for school age children. The TRA CRP has provided funding for water sampling kits as well as GIS software and computers to teach students about the benefits of GIS. To learn more about the River Legacy Foundation, visit *http://www.riverlegacy.org/*.

Trash Clean-Ups

Funding for supplies and landfill fees are provided to several trash clean-up efforts listed above. These efforts provide an immediate as well as lasting benefits to the watersheds. Several tons of debris are removed from the waterbodies and volunteers are brought into direct contact with their local water resources and are able to see the importance of these resources and the human impacts upon them.

In addition to these programs, TRA CRP staff participate in several outreach events throughout the year. Some of these include Gator Fest in Anahuac (*http://www.texasgatorfest.com/*) and the UT Arlington Celebrating People and Planet event where informational booths are set up to teach visitors about the Trinity River and the Clean Rivers Program. Staff have also participated in local GIS Days held at area colleges to introduce students to GIS and its benefits in the work place.

Stakeholder Participation

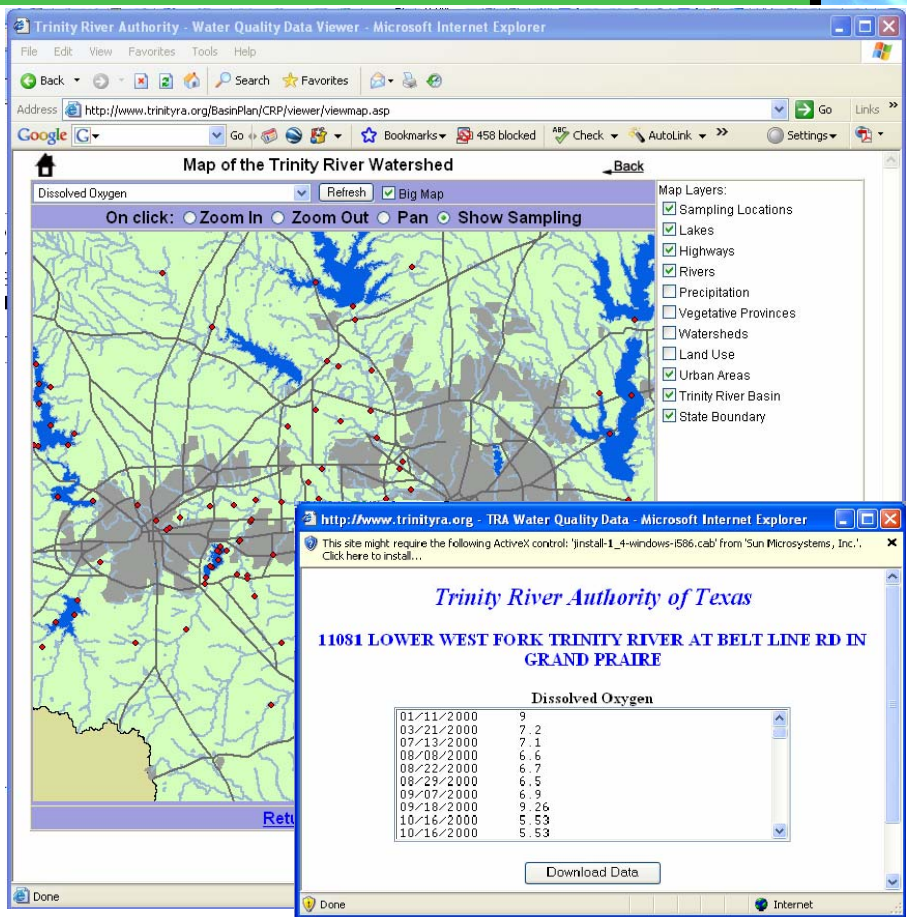
The TRA CRP is guided by a group basin stakeholders. These stakeholders include local sampling agencies, city managers and mayors, as well as volunteer groups and interested citizens. Meetings are held once a year to provide the group with information about the program as well as to solicit ideas for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

Website

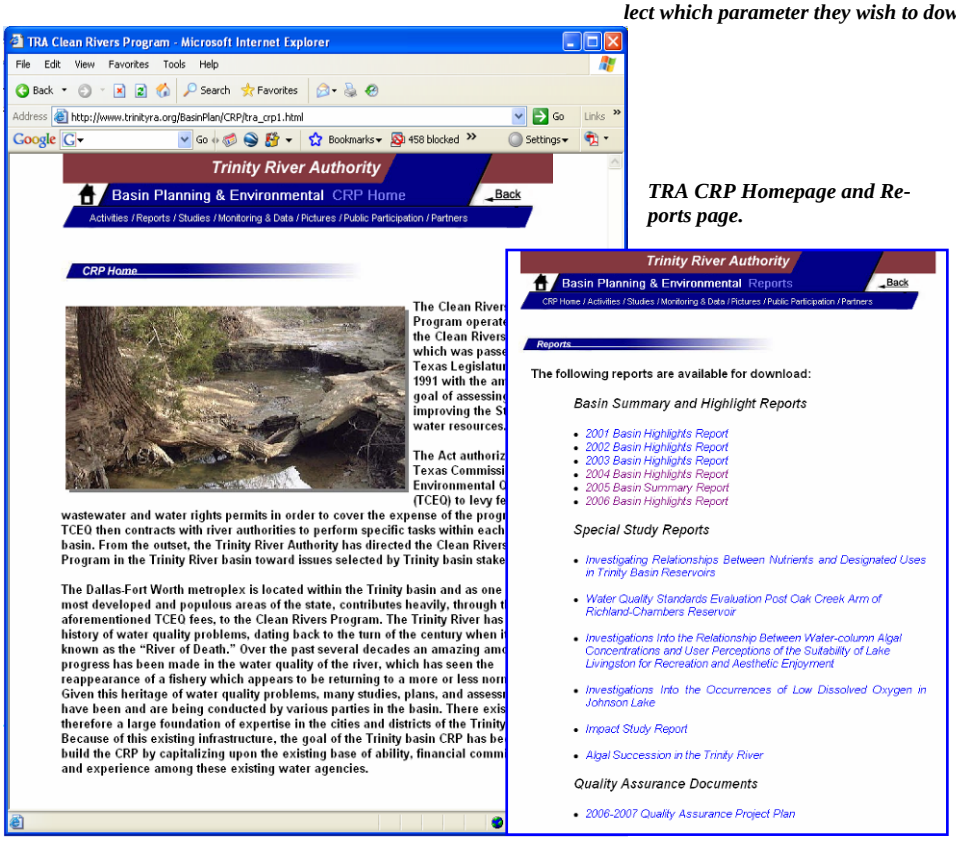
The TRA Clean Rivers Program website can be found at http://www.trinityra.org/BasinPlan/CRP/tra_crp1.html. This website provides information on the program as well as upcoming activities.

Past Basin Highlights and Basin Summary Reports as well as the resultant reports of past special studies and the current Quality Assurance Project Plan can be found on the Reports page at http://www.trinityra.org/BasinPlan/CRP/tra_reports.html. All documents are available as Adobe pdf files which can be viewed online, saved to a personal computer, or printed.

A data viewer for selected sites and parameters throughout the basin can also be found on this website under the Monitoring & Data page at http://www.trinityra.org/BasinPlan/CRP/viewer/viewer.asp. This interactive map allows users to click through the basin selecting sites and parameters to view and download data. Photos of selected station are available to view as well.



TRA CRP data viewer—interactive map and data download pages. The clickable map allows users to pan around the basin to select specific sites to view data. The drop down box allows users to select which parameter they wish to download or view pictures for selected sampling locations.



TRA CRP Homepage and Reports page.

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

The Trinity River Authority of Texas

http://www.trinityra.org

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