



Basin Highlights Report 1999

International Boundary and Water Commission Texas Clean Rivers Program in the Rio Grande Basin

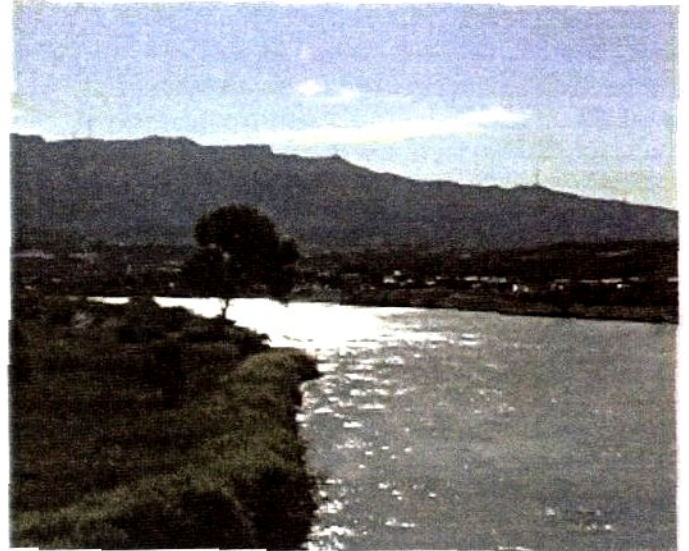
In 1991, the Texas Legislature passed the Texas Clean Rivers Act (Senate Bill 818) to address water resource issues in an integrated, systematic manner. Because the Rio Grande Basin did not have a river authority, the Texas Natural Resource Conservation Commission's (TNRCC) Border Environment Assessment Team (BEAT) administered the Clean Rivers Program (CRP) for the Rio Grande Basin. On August 31, 1998, because of the international nature of the Rio Grande, the State of Texas contracted with the U.S. Section of the International Boundary and Water Commission (USIBWC) to implement the CRP for the Rio Grande in its 1,254 mile international boundary section.

The International Boundary and Water Commission (IBWC) was created more than a century ago by the governments of the United States and Mexico to apply the provisions of various boundary and water treaties, and settle differences arising from such applications through a joint international commission located at the border. The IBWC's jurisdiction extends along the United States - Mexico boundary, and inland into both countries where they may have international boundary and water projects.

THE RIO GRANDE/RIO BRAVO

The Rio Grande, or Rio Bravo as Mexico knows it, begins in the mountains of southern Colorado; flows through New Mexico, forms the international boundary between Texas and Mexico, and finishes its journey 2,000 miles downstream where it empties into the Gulf of Mexico. The river flows through several types of habitat which include deserts, wetlands, mountains, and subtropical coastal regions. A second mountain source in the Mexican Sierra Madre Occidental feeds the Rio Conchos, which provides over three-quarters of the flow into the Rio Grande upstream of the Big Bend National Park area.

The role of the Rio Grande as a water supply and as an international boundary makes it unique, but also poses an environmental challenge in protecting the water quality. The continued development and growth along the border requires a cooperative effort to maintain the water quality in the Rio Grande. The major issues that affect the basin are:



The Rio Grande north of El Paso, Texas.

- *Over 10 million people now live in the Rio Grande Basin. The number of people is expected to grow on both sides of the border, which will result in increased water consumption and increased dependence on the Rio Grande (TNRCC, 1996).*
- *Industrial assembly plants in Mexico, known as maquiladoras, process material from a foreign parent company. "Maquilas" now number over 900 along Texas' and New Mexico's border. Industry brings economic benefit to the area, but also has an impact on the environment through rapid population growth and additional waste streams (TNRCC, 1996).*
- *Agriculture accounts for 80 percent of the surface water demands in the basin and plays an important role in the economy of all the states of the basin (TNRCC, 1996).*

It is the goal of the Texas Clean Rivers Program to maintain and improve the quality of water through an ongoing partnership with Federal, State and local governments, industry and citizens. The program uses a watershed management approach to identify and evaluate water quality issues, establish priorities for corrective action, and implement those actions.

PUBLIC INVOLVEMENT

The Rio Grande Basin Advisory Committees (BAC) play a valuable role in identifying water quality priorities. Input from the BAC provides local information necessary to design water quality projects under the Clean Rivers Program. The basin has three advisory committees: the Upper, Middle, and Lower BAC. Citizens, government agencies, private landowners and other non-governmental agencies can participate and address specific issues as members of the Rio Grande BAC.

The USIBWC CRP staff recently completed a series of coordinated monitoring meetings in El Paso, McAllen and Laredo, Texas. The purpose of these meetings was to inventory ongoing water quality monitoring activities by participating entities. The end result of this effort was to establish and develop a cooperative basin-wide monitoring network for the Rio Grande for Fiscal Year 2000.

The USIBWC provides equipment, training and Quality Assurance/Quality Control (QA/QC) sessions to BAC members who participate in water quality monitoring activities within the basin.



North of American Dam in El Paso, Texas. Water is diverted by the United States and Mexico according to the Treaty of 1906.

INTERNET WEBSITE

<http://www.ibwc.state.gov/CRPPage.htm>

The USIBWC CRP web site provides access to information on the Clean Rivers Program in the Rio Grande Basin. Included in the website are current CRP activities and links to the TNRCC and CRP planning agencies. Future additions to the site will include:

- *Information on parameters sampled, the frequency of sampling events, and the type of station (fixed routine, systematic, or targeted).*
- *Maps showing sampling sites throughout the basin with a table listing each monitoring site location.*

ONGOING ACTIVITIES AND SPECIAL STUDIES

Current activities in the Rio Grande Basin include studies that are addressing areas of concern where additional data is needed.

Binational Study Regarding the Presence of Toxic Substances in the Rio Grande/Rio Bravo- Phase 1 determined that a high potential for toxic chemical impacts existed in two mainstem and six tributary sites along the international reach of the Rio Grande. Phase 2 results indicated potential impairment by toxic substances in areas of the Rio Grande downstream of El Paso/Ciudad Juarez, Laredo/Nuevo Laredo, and upstream and downstream of Presidio/Ojinaga. The Phase 3 effort included more intensive, multi variate monitoring at fewer sites to identify stressors on human health and aquatic life by assessing habitat conditions, land use, physical, chemical, and biological data. The Phase 1 and 2 reports are available through the USIBWC. The Phase 3 report has not been published.

Fish Tissue Study, Rio Grande, Laredo-Segment 2304-This study is being conducted by TNRCC to identify areas with high human health risk from fish consumption. The study is currently underway and a completion date is not available.

Aquatic Resource Impairment of Resacas by Nonpoint Source Pollution from Urban Runoff in Brownsville-Segment 2302- Resacas (oxbow lakes) are being investigated in Brownsville to determine water quality impairments from different land uses. The study is complete and will be available through the TNRCC.

USIBWC MONITORING ACTIVITIES

The USIBWC water quality monitoring program includes stations on the mainstem of the Rio Grande, its subwatersheds, and reservoirs. In addition to the USIBWC Texas Field Offices and appropriate TNRCC Regional Offices, the CRP Basin-wide Monitoring Program (BMP) partners in the Rio Grande Basin Clean Rivers Program include:

- City of Laredo,
- City of Del Rio,
- City of Brownsville,
- Zapata County,
- Big Bend National Park,
- and the Rio Grande International Study Center.

These groups, in coordination with the USIBWC and the TNRCC, will collect samples based on a monitoring schedule. The CRP-BMP will help eliminate duplication by different agencies and standardize the entire process through the development of a Quality Assurance Project Plan (QAPP). Protocols established in the QAPP will help ensure quality data is produced through proper sampling and analytical techniques, approved methodologies, quality control, and training. There are currently 59 monitoring stations that will be sampled by the

BMP partners. The United States Geological Survey (USGS) also conducts water quality monitoring in the Rio Grande Basin as part of the National Stream Quality Accounting Network Program II (NASQAN II).

Fixed routine monitoring stations provide long-term collection of physicochemical, biological and hydrologic data that will be used to establish a baseline for future studies. The number and location of sampling sites were based on accessibility, relative position to point source discharges, proximity to industrialized areas, locations of IBWC and USGS gauging stations, and available personnel. Currently, all of the 59 locations wherein the USIBWC performs, or coordinates, the monitoring of all fixed routine monitoring stations. The data collected will be used to support ongoing and future studies.

The USIBWC will also conduct *systematic monitoring* in the Rio Grande Basin. The different river segments will be evaluated for parameters of interest during sediment, biological and habitat assessments in addition to baseline site parameters on a rotational basis throughout the basin. *Targeted monitoring* will be implemented to work with basin permitted dischargers and the TNRCC to compile the necessary information and gain additional knowledge of water quality and quantity in support of the permitting process. Future monitoring station locations for fixed, systematic, and targeted monitoring will be determined by an analysis of data collected during the various monitoring assessments in the Rio Grande Basin. A single monitoring site is considered to be representative of no more than 25 miles in freshwater and tidal streams.

WATER QUALITY CONCERNS

The participation of the public and efforts to build support for solving water quality problems are documented in the *1996 Regional Assessment of Water Quality in the Rio Grande Basin*. Issues regarding the use of the Rio Grande for recreation, as a drinking water supply, for fish consumption and aquatic life, dissolved oxygen, and nutrient concentrations were studied using data for the past five years.

Contact recreation- Bacterial contamination from treated and partially treated wastewater effluent continues to inhibit 8 segments of the Rio Grande for swimming. The segments downstream of the two international reservoirs, segments 2302 and 2304, present the most serious areas where contact recreation is not supported. Additionally, the effects of non-point source runoff from agricultural land and animal wastes must continue to be studied.

Public Water Supply- Segments that are designated for public water supply meet the Texas Surface Water Quality Standards. Increasing salinity may result in a future increase in the cost of water treatment to public water supply systems.

Fish consumption and Toxic Chemical Impacts- Available data indicates that serious ecological effects due to toxic chemicals are not widespread. Tributary sites show more serious effects from

toxic chemicals than the Rio Grande. Not enough information has been collected to determine human health effects of toxic substances.

Aquatic Life, Dissolved Oxygen, Nutrients, and Nutrient Trends- Nutrient levels do not represent a threat to human health in the basin. Nutrient levels do not cause widespread depressed dissolved oxygen levels, and excessive aquatic plant growth in the basin. (see graph on dissolved oxygen comparisons, page 5).

Salinity and Trends in Chloride- Salinity is a problem identified throughout the basin with serious long-term implications for agriculture, municipalities, and wildlife. Salinity is a result of both human activities and natural conditions: the naturally salty waters of the Pecos River are a major source of salinity in the Rio Grande. Future increases in water treatment may occur.



Border cities continue to experience rapid population growth. The El Paso and Ciudad Juarez area has the largest border population in Texas.

The Clean Rivers Program will address water quality concerns by:

- *Addressing Nonpoint Source Pollution. Nonpoint source assessments of urban and agricultural areas to assess the extent of contamination will be conducted.*
- *Supporting the Binational Rio Grande Toxic Substances Studies. Efforts to gather and document the occurrence, impacts, and possible sources of toxic substances in the basin are on-going.*
- *Monitoring Nutrients. A cooperative effort by the USIBWC, TNRCC and it's cooperating agencies will continue to gather information on nutrients throughout the basin.*

- *Supporting Wastewater Permits. Additional water quality data will be provided to issue permits that are consistent with the receiving stream's water quality.*
- *Educating People. The relationship of every individual and the effects their actions may have on the environment will be stressed for greater understanding throughout the basin.*
- *Evaluating Water Quality. Causes and sources of toxic chemical contamination will be investigated to determine the human health risks from consumption of fish will be supported and the impacts of increasing salinity will be assessed.*
- *Preventing and Controlling Water Quality Degradation. Work to prevent toxic chemical contamination and support ongoing and new efforts to control salinity will be performed.*

Designated Use Impairments

The State of Texas List of Impaired Waters, commonly referred to as the Clean Water Act, Section 303(d) list, contains a list of waters not meeting or at risk of not meeting state water quality standards. The 303(d) list is critical as it establishes priorities for future water quality management efforts including ongoing monitoring, special studies, review and refinement of water quality standards, pollution prevention activities, and establishment of Total Maximum Daily Load (TMDL) priorities. All segments listed on the 303(d) list are designated to support contact recreation (such as swimming), provide a high aquatic life habitat, and are used as a domestic water supply. Stream segments in the Rio Grande Basin listed in the 1999 303(d) list are:

Upper Rio Grande Segments (from New Mexico/Texas state line downstream to the International Amistad Reservoir, including the Pecos and Devils Rivers).

Segment 2307, Rio Grande Below Riverside Diversion Dam. Average concentrations of chloride, sulfate, and total dissolved solids exceed the criteria established to safeguard general water quality uses.

Segment 2306, Rio Grande Above Amistad Reservoir. Due to toxicity in water and sediment, occasionally exceeds the criteria established to provide optimum conditions for aquatic life. Bacteria levels sometimes exceed the criterion established to assure the safety of contact recreation.

Segment 2310, Lower Pecos River. Average concentrations of chloride, sulfate, and total dissolved solids exceed the criteria established to safeguard general water quality uses. Natural contributions of salts from the soil, as well as saline groundwater seeps and springs, contribute to these elevated levels.

Middle Rio Grande Segments (from the International Amistad Dam downstream to International Falcon Reservoir):

Segment 2304, Rio Grande Below Amistad Reservoir. Downstream of Eagle Pass and Laredo, toxicity in water and sediment occasionally exceed the criteria established to assure optimum conditions for aquatic life. Downstream of Del Rio, toxicity in water sometimes exceeds the criterion established to assure optimum conditions for aquatic life. Downstream of Laredo and Del Rio and in a small section near Eagle Pass, bacteria levels occasionally exceed the criterion established to assure the safety of contact recreation. A TMDL project to determine the extent and severity of the impairment due to toxics in fish tissue is underway.

Segment 2303, International Falcon Reservoir. Average concentrations of chloride and total dissolved solids exceed the criteria established to safeguard general water quality uses.

Lower Rio Grande Segment (from International Falcon Reservoir downstream to the Gulf of Mexico):

Segment 2302, Rio Grande Below Falcon Reservoir. Water quality does not meet the designated use due to bacteria levels occasionally exceeding the criteria established to assure safety of contact recreation.



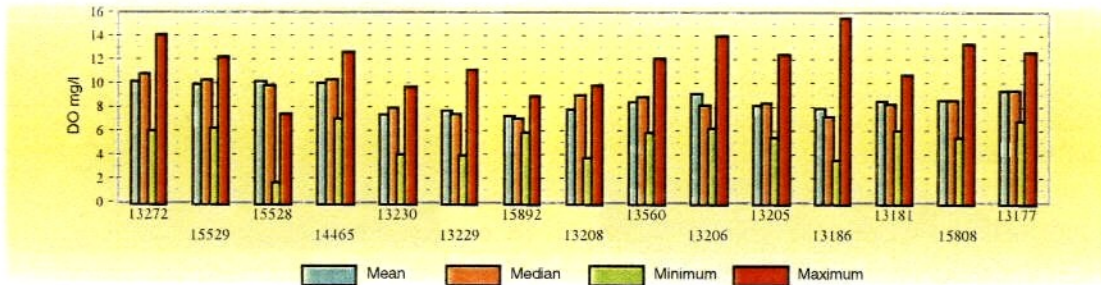
Figure 1. Stream Segments in the Rio Grande Basin. (Segments in red are listed on the 303 (d) list) (TNRCC, CRP homepage, 1999)

Rio Grande Basin Data Comparisons

The three graphs presented below compare parameters for sites on the Rio Grande mainstem (identified by TNRCC station number) sampled by the USIBWC in 1998 and the first quarter 1999. The parameters are only a sample of the data collected by the USIBWC.

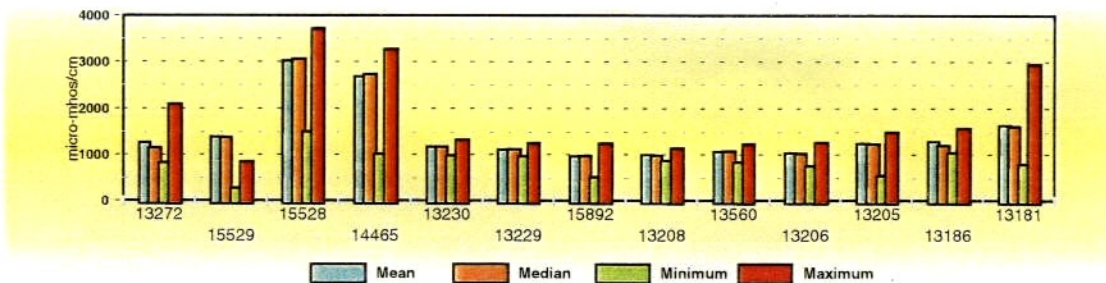
Dissolved Oxygen Comparison

The stream standard for dissolved oxygen (DO) is 3-6 mg/l in the Rio Grande. The DO concentration is an important first indicator of water quality. In general, oxygen levels decline as pollution increases.



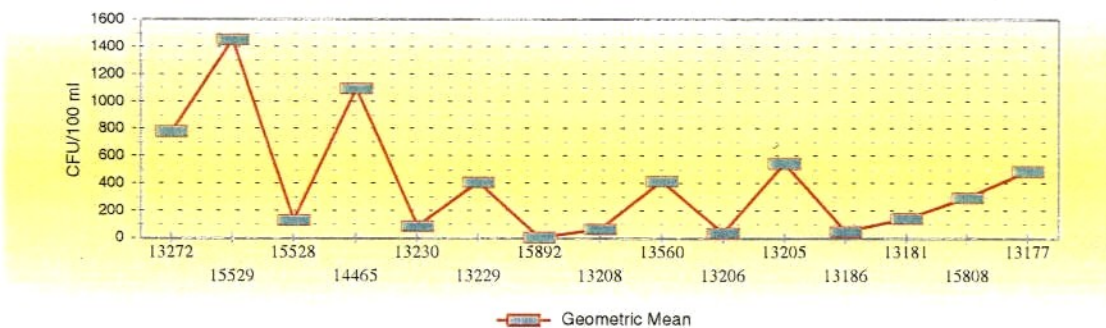
Specific Conductivity Comparison

Conductivity, measured in micro-mhos per centimeter, is closely related to the concentration of total dissolved solids (TDS). Increasing conductivity levels translates to higher TDS and salinity.



Fecal Coliform Comparison

High fecal coliform counts, measured in colony forming units per 100 milliliters, have been seen in areas where there is treated and untreated wastewater discharges. Non-point source runoff from agricultural land and animal wastes need to be studied further.



Monitoring Station ID Number and Name

13272- Rio Grande (RG) at Courchesne Bridge (El Paso)
 15529- RG 2.4 km above Haskell St. WWTP
 15528- RG 1.3 km below Haskell St. WWTP
 14465- RG 16.7 km below Haskell St. WWTP
 13230- RG above Rio Conchos (Presidio)
 13229- RG below Rio Conchos
 15892- RG Arm, Amistad Reservoir at Buoy 28
 13208- RG 7.2 km below Amistad Dam at US277 in Del Rio

13560- RG 7.2 km downstream of Del Rio at Moody Ranch
 13206- RG upstream of Eagle Pass
 13205- RG downstream of Eagle Pass
 13186- RG below Rio Alamo near Fronton
 13181- RG at Hidalgo/Reynosa Bridge
 15808- RG 200m upstream of Pharr Bridge
 13177- RG at El Jardin Pump near Brownsville

BENEFITS

The USIBWC will strive to direct its programs to issues that are important to its CRP partners throughout the basin by:

- *forming Basin Advisory Committees that include all interested parties,*
- *seeking and utilizing the Basin Advisory Committees' suggestions,*
- *providing assistance to programs initiated by cities and counties, and*
- *analyzing key issues on a basin wide basis before implementation by regulatory agencies, including Safe Drinking Water Act and conservation initiatives, and Total Maximum Daily Load projects.*



Downstream of Station 13272, Rio Grande at Courchesne Bridge along the Texas-New Mexico Border.

REFERENCES

Texas Natural Resource Conservation Commission, Border Environment Assessment Team, 1996 Regional Assessment of Water Quality in the Rio Grande Basin. Oct 1996. 74 p.

Texas Natural Resource Conservation Commission, Clean Rivers Program (CRP) Homepage, <http://www.tnrcc.state.tx.us>

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