The Rio Grande Basin Highlights Report

April 30, 2004

Clean Rivers personnel assisted the USGS in a fish survey of the Rio Grande in the Big Bend National Park area.

Clean Rivers Program

The United States Section of the International Boundary and Water Commission (USIBWC) supports and administers the Clean Rivers Program (CRP) in the Rio Grande basin under the guidance of the Texas Commission on Environmental Quality (TCEQ), providing expert insight into the needs and water quality issues that are unique to an international water boundary.

CRP partners throughout the basin have been a valuable asset in water quality monitoring, advice and suggestions on improving the program and the basin, developing and assisting in special studies, and communicating and educating the general public.

During the past year, the CRP continued to maintain its large network of 78 water quality monitoring and even added 2 new stations. The CRP assisted in several proposals for special studies in the basin and looks forward to working on these studies.

In an effort to increase our public outreach programs, the CRP has partnered with Texas Watch this past year in Laredo. The CRP plans to continue improving our public outreach throughout the entire basin. The CRP also joined our Basin Advisory Committee meetings with the USIBWC's citizen forums so that both programs can benefit from the information, focus, and reach of the other.

Monitoring

Monitoring types

Routine monitoring – This is the primary monitoring done along the river. Routine monitoring is performed at fixed locations at regular intervals throughout the year for specific parameters. This data is used to establish a baseline and provide information about ambient water quality conditions in the water body. It is through routine monitoring that positive or negative trends in water quality can be determined and concerns or impairments in the water body can be identified.

Intensive monitoring – This type of monitoring is performed at a routine monitoring site to provide more detailed information by using a more intensive schedule or additional parameters not performed during the routine analysis. This type of monitoring is usually initiated after the routine monitoring has identified a problem with water quality that needs to be further isolated by source in order to find a solution to the water quality issue.

Special studies – This type of monitoring is performed in a river segment to address concerns identified by other agencies, local communities, or academia to determine unique impacts in that area. These studies are usually short term and very intensive, utilizing the efforts of several different organizations to produce data on a single aspect of the water body. The CRP submitted several special study proposals last year and will begin participation on two special studies in 2004 and 2005.

Clean Rivers Program personnel training and monitoring with the Rio Grande basin partners.

Parameters monitored

Field

When samples are collected for laboratory analysis, the sample collector gathers several parameters in the field. These are: weather conditions at the time of collection, recent rain events in the area, the water and air temperature, water depth, stream width, flow and how that flow compares to the normal flow for that water body, secchi disk or how murky the water is, and three of the most important water quality parameters in a water body. Those are:

pH - is a measure of how acidic or basic the water is. The range goes from 0 to 14, with 7 being neutral. pH values less than 7 indicate acidity, whereas a pH greater than 7 indicates a base. State water quality standards require the pH to be between 6.5 and 9.0. If the pH falls outside of this range, aquatic plants and animals can no longer survive and the water is harmful to humans who come into contact with it as well.

Conductivity – is an indicator of how well the water conducts electricity. Pure water does not conduct electricity; the impurities in water are what allow electricity to pass through the water. These impurities are salts and metal. Since total and dissolved metal values are very low, conductivity primarily measures

Clean Rivers Program personnel seining in the Rio Grande near Candelaria while performing a special study.

how much salt is in the water. The state standard for conductivity depends on the designated use of the water body.
Dissolved oxygen (DO) – easily the most important water quality parameter of them all. Low DO values can lead to reduced numbers of aquatic plants and animals in the water body and increase harmful bacteria levels. State standards for DO vary depending on the designated use of the water body but nowhere in the Rio Grande basin is the standard less than 5.0 mg/L.

Conventional

These parameters are collected in the field and analyzed by a laboratory. All of the sites monitored are analyzed for conventional parameters, which include:
Solids – total and dissolved material of any kind. High solids lead to murky water and lower available oxygen for plants and animals. High dissolved solids can render the water unusable as a drinking water source.
Nutrients – such as nitrogen compounds, ammonia, and phosphorous. High nutrient levels can cause excessive plant growth, which can lead to reduced dissolved oxygen, reduced stream flow and reduced navigability of the waters.
Salts – sodium, potassium, magnesium, calcium, chlorides, and sulfates. These parameters combine to produce salts in the water, which can make the water undrinkable, reduce aquatic plant and animal survival, and make agricultural lands unusable.
Chlorophyll-a – an indicator of excessive plant and algal growth in the water body.
Alkalinity – measures the acid neutralizing ability of the water due to the amount of carbonates, bicarbonates, and hydroxides in the water. Alkaline water is detrimental to agriculture and plant growth.
Other parameters that are periodically tested are silica, organic carbon, and fluoride.

Metals

Metals are tested less frequently than field and conventional parameters and are not tested at all of the monitoring stations because of the high costs to analyze for these parameters and previous sampling has ruled out the need for continued testing. Metals can be tested as total or dissolved metals in water and can be tested in the sediment to determine long-term accumulation of metals. Metals typically analyzed are aluminum, arsenic, barium, chromium, copper, lead, mercury, nickel, silver, and zinc

Organics

These parameters are tested less frequently than metals, also because of the cost and because of no historical presence in the water. Organic compounds analyzed are herbicides and pesticides in the water and the sediment.

Bacteria

The CRP analyzes fecal coliform and *E. coli* as indicators of bacterial contamination of the water body. The state of Texas is switching from fecal coliform to *E. coli* as the preferred indicator bacteria, but is collecting both at present so that there is ample *E. coli* data to use in assessing trends and patterns in bacterial contamination.

Screening Criteria

Data collected for the above mentioned parameters are then checked by the CRP for accuracy, quality, and adherence to approved methods. The data are then submitted to TCEQ, which also runs quality assurance checks on the data, for inclusion in the state database. Data from the past five years that contain at least 10

data collections is then assessed against the Texas Surface Water Quality Standards (TSWQS) that are assigned to each stream segment to create a summary of the water quality. This summary is used to create the Texas Water Quality Inventory. Any section of a water body that does not meet the standards is then placed on the 303(d) report, which lists concerns and impairments in the water bodies of the state. Sections of a water body listed on the 303(d) are looked at to determine the course of action to take to identify the cause of the concern and possible solutions to remove that listing.

Impairments are determined when a section does not meet the primary standards assigned the segment. Primary concerns are chlorides, sulfates, total dissolved solids (TDS), dissolved oxygen, pH, temperature, and bacteria. The designated use of the stream segment determines what value will be set for the standard.

Concerns are determined when a section does not meet the secondary standards. Secondary criteria are determined based on the water body type. The entire Rio Grande basin except segment 2301 is listed as a freshwater stream. Segment 2301 is listed as a tidal stream. The secondary parameters for a freshwater stream are listed below:

Parameter	Criteria
Ammonia	0.17 mg/l
Nitrate + nitrite	2.76 mg/l
Total phosphorous	0.80 mg/l
Ortho phosphorous	0.50 mg/l
Chlorophyll-a	11.6 ug/Ll

The secondary parameters for a tidal stream are listed below:

Parameter	Criteria
Ammonia	0.58 mg/l
Nitrate + nitrite	0.26 mg/l
Total phosphorous	0.71 mg/l
Ortho phosphorous	0.55 mg/l
Chlorophyll-a	19.2 ug/l

A section is listed as having a concern if more than 25% of the data fail to meet the above criteria.

Designated Uses

Contact Recreation – fishing, swimming, wading, boating, etc. The primary parameter of concern for this use is bacteria. The standard for the geometric mean for *E. coli* is 126 Coliform Forming Units/100 ml (CFU). For fecal coliform it is 200 CFU. The standard for a single grab sample is 400 CFU for fecal coliform and 396 CFU for *E. coli*.

Domestic water supply - as a drinking water source, the primary concern is TDS. The standard is 1,000 mg/l.

Aquatic life use – this designated use has four levels depending on how much aquatic life is usually found in the stream in the form of fish, benthics (aquatic insects), and plants. The primary criterion for this use is DO. For exceptional the standard is 6.0 mg/l, for high the standard is 5.0 mg/l, for intermediate the standard is 4.0 mg/l, and for low the standard is 3.0 mg/l.

Fish consumption - this applies to stream segments where citizens may collect and consume fish from the river.

The standard for pH in all uses in the Rio Grande basin is between 6.5 and 9.0. The last primary concern is temperature with the standards falling between 31^{o} and 35^{o} Celsius, or 88^{o} and 95^{o} Fahrenheit.

Assessment and Monitoring Schedule

On the following pages are the assessment of the water quality by sub-basin followed by the montiroing schedule and a map of the sub basin and station locations. The monitoring schedule lists the TCEQ designated segment and TCEQ region that the station is located in, the latitude and longitude of the station, the station description and I.D. number, and the number of times per year that the specified parameter is collected at each station by one of our partners.

Upper Rio Grande Basin

Introduction

The upper Rio Grande sub-basin extends from the Texas – New Mexico state line downstream to the International Amistad Dam, a length of 650 miles (1045 km). The river flows through 8 counties in the United States and consists of five river segments; 2314, 2308, 2317, 2306, and 2305. In segment 2314, the river meanders in and out of Texas and New Mexico and in some parts forms the boundary between the two states. After segment 2314, the Rio Grande forms the boundary between the United States and Mexico.

During irrigation season, the water in the river is used for agriculture by New Mexico, Texas, and Mexico. The City of El Paso, TX also uses the river to provide half of its drinking water supply. The sister cities of El Paso and Juarez, Chihuahua have a combined population of over 2 million and lands surrounding the cities are used primarily for agriculture. This impact reduces the quantity and the quality in the river significantly. Water in the river downstream of these cities is primarily composed of agricultural runoff, wastewater effluent, and raw or partially treated sewage. Because of this, the upper Rio Grande downstream of El Paso/Juarez is very high in salts and bacteria.

As the river flows by the sister cities of Presidio, TX and Ojinaga, Chihuahua, the Rio Conchos combines with the Rio Grande improving the water quality slightly. In the past, the quantity of water from the Rio Conchos and the Rio Grande was about the same. Recently, however, the Rio Grande is receiving less water from the Rio Conchos. Because of reduced flows in both rivers, the Rio Grande along Big Bend National Park saw water levels so low that the river was discontinuous for the first time in over 40 years.

Prior to the river entering Amistad Dam, the Pecos River enters the Rio Grande improving the water quality again. The river is then impounded by the International Amistad Dam, operated by the International Boundary and Water Commission. Benefits created by the dam include flood prevention for downstream communities, improved water quality, and steady, continuous flow in the river below the dam as well as fishing and recreation. The dam also contains two hydroelectric plants that can produce electricity for communities on both sides of the border.

The Rio Grande as it flows through the Big Bend Bational Park.

Water Quality Review

Segment 2314 extends from the New Mexico – Texas state line downstream to the International Dam in El Paso County, a length of 21 miles (33 km). Designated uses for this segment are high aquatic life use, public water supply, fish consumption, and contact recreation. There are two monitoring stations in this segment. Primary impactors in this segment are irrigated agriculture, some industry, and municipal wastewater treatment effluent. The persistent drought in this region has also had a large impact on water quality in the Rio Grande. Treaty allotments of water for the United States are diverted at the American Dam. A short distance downstream, Mexico's treaty

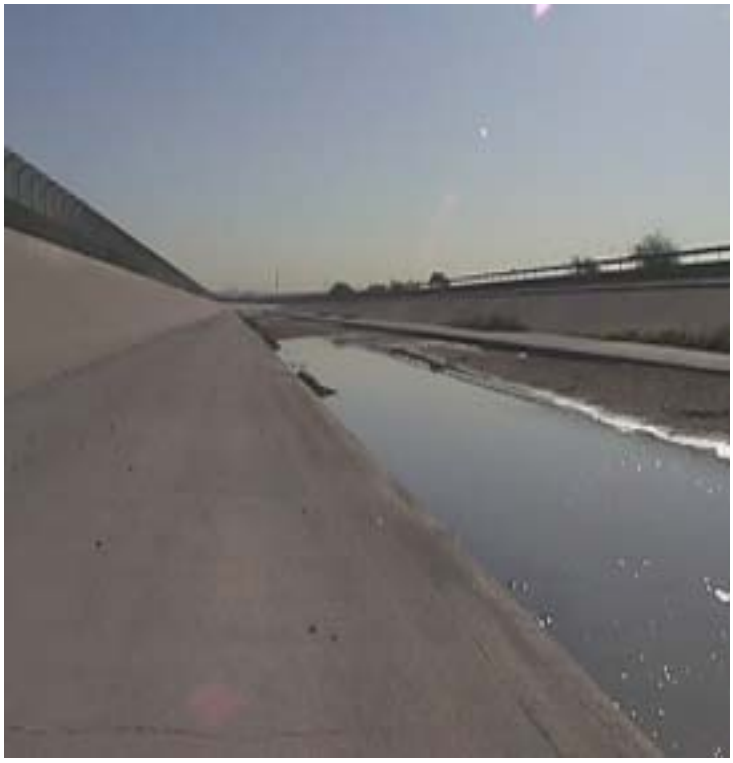
allotment is diverted at the International Dam. Water diverted for the United States is sent along a canal system, the Rio Grande American Canal Extension (RGACE), for use by El Paso as a drinking water source and for irrigation by Unites States farmers. Water diverted into Mexico is used by Mexican farmers for irrigation purposes.

This segment is listed as having a contact recreation impairment due to fecal coliform values exceeding the standards. The exceedance has been linked primarily to overloaded wastewater treatment facilities discharging outside of these standards. Efforts are underway by several agencies to ensure that this issue will be resolved and improve the water quality in this segment. In November 2001, the State of New Mexico lowered the standard for fecal coliform from 1,000 CFU to 200 CFU for the stretch of river from Percha Dam to the International Dam in El Paso. All other designated uses are fully supported in this segment.

Segment 2308 is the region below International Dam in El Paso County downstream to the Riverside Diversion Dam in El Paso County, a length of 15 miles (24 km). The designated uses for this segment are low aquatic life use, non-contact recreation, fish consumption, and public water supply. There are three monitoring stations along this segment. The upper portion of this segment was concrete lined to prevent meandering of the international boundary. Since the creation of the RGACE canal, this segment contains very little water. The failed Riverside Diversion Dam was removed this past year because of its poor condition. This segment is meeting all of its primary and secondary standards.

Segment 2307 runs from the Riverside Diversion Dam in El Paso County to the confluence with the Rio Conchos in Presidio County, a length of 222 miles (357 km). The designated uses for segment 2307 are contact recreation, public water supply, high aquatic life use, and fish consumption. There are five monitoring stations in this segment.

The upper portion of this segment receives flow from irrigated agriculture and wastewater treatment plant effluent from both countries and also receives poorly treated sewage as well. Because of this, this segment has an impairment due to elevated bacteria levels, high chloride concentrations, high sulfate concentrations, and high TDS values.



The Rio Grande through the channelized section of Segment 2308.

Below these points, there are no impactors on the river as it meanders through rough terrain and sparse ranch land. Bacteria and salt concentrations decline slightly as the river reaches the end of the segment.

Segment 2306 flows from the confluence with the Rio Conchos in Presidio County to the confluence with Ramsey Canyon in Val Verde County, a length of 313 miles (503 km). The designated uses are high aquatic life use, contact recreation, fish consumption, and public water supply. There are seven monitoring stations along this segment. Presidio, TX and Ojinaga, Chihuahua are the primary impactors in this segment. The river then flows through Big Bend State and National Parks and then meets with the Pecos River. High TDS levels from segment 2307 still plague this segment causing an impairment for drinking water use, while elevated bacteria levels create an impairment for contact recreation use. There is also a concern for high total phosphorous levels below Presidio. Bacteria levels drop below the standard as the river reaches the end of

the segment and standards for drinking water use are met after the confluence with the Pecos River.

Segment 2305 runs from the confluence with Ramsey Canyon in Val Verde County to the International Amistad Dam along the Rio Grande and from the confluence of Little Satan Creek in Val Verde County to the Dam along the Devils River, a total length of 75 miles (120 km). The designated uses are contact recreation, high aquatic life use, fish consumption, and public water supply. This segment has three monitoring stations on the lake. All of the designated uses are being met, but there is a total phosphorous concern in the reservoir at international buoy #1.

Segment 2309 is the Devils River, which is 67 miles (108 km) long, from its origin in Sutton County to the confluence of Little Satan Creek. The designated uses for the Devils River are exceptional aquatic life, contact recreation, fish consumption, and public water supply. All uses are fully supported, as water quality is very high. Typical TDS values are below 500 mg/L and there are few impactors along this river. There are three monitoring stations in this segment.

Special Studies

There are several ongoing special studies that are being performed for academic research in the Upper Rio Grande. Last year a special study in the Big Bend region to assess the impacts of historical mining concluded and the report is in the final phases. The report should be released this year.

Another special study is being proposed in Big Bend to source track nutrient and salinity contamination between Presidio and Amistad Dam. High bacteria, salt, and nutrient levels threaten the ecosystem and recreational activities along the Rio Grande in Big Bend. The purpose of the study will be to characterize the flows and nutrient loading in this stretch of the river.

Partners

USIBWC American Dam Office – collects water quality samples at five sites in segments 2314, 2308, and 2307 around El Paso.

El Paso Water Utilities – provides laboratory analysis of water quality samples collected by the USIBWC American Dam Office and special samples collected in the El Paso area.

El Paso Community College – conducting special studies on bacteria in the El Paso area.

University of Texas at El Paso – collects water quality samples at Fabens and San Elizario, Texas and conducts special studies on riparian habitat in the El Paso area.

TCEQ El Paso office – collects water quality samples throughout the upper Rio Grande from El Paso to Big Bend.

USIBWC Presidio Office – collects water quality samples around Presidio.

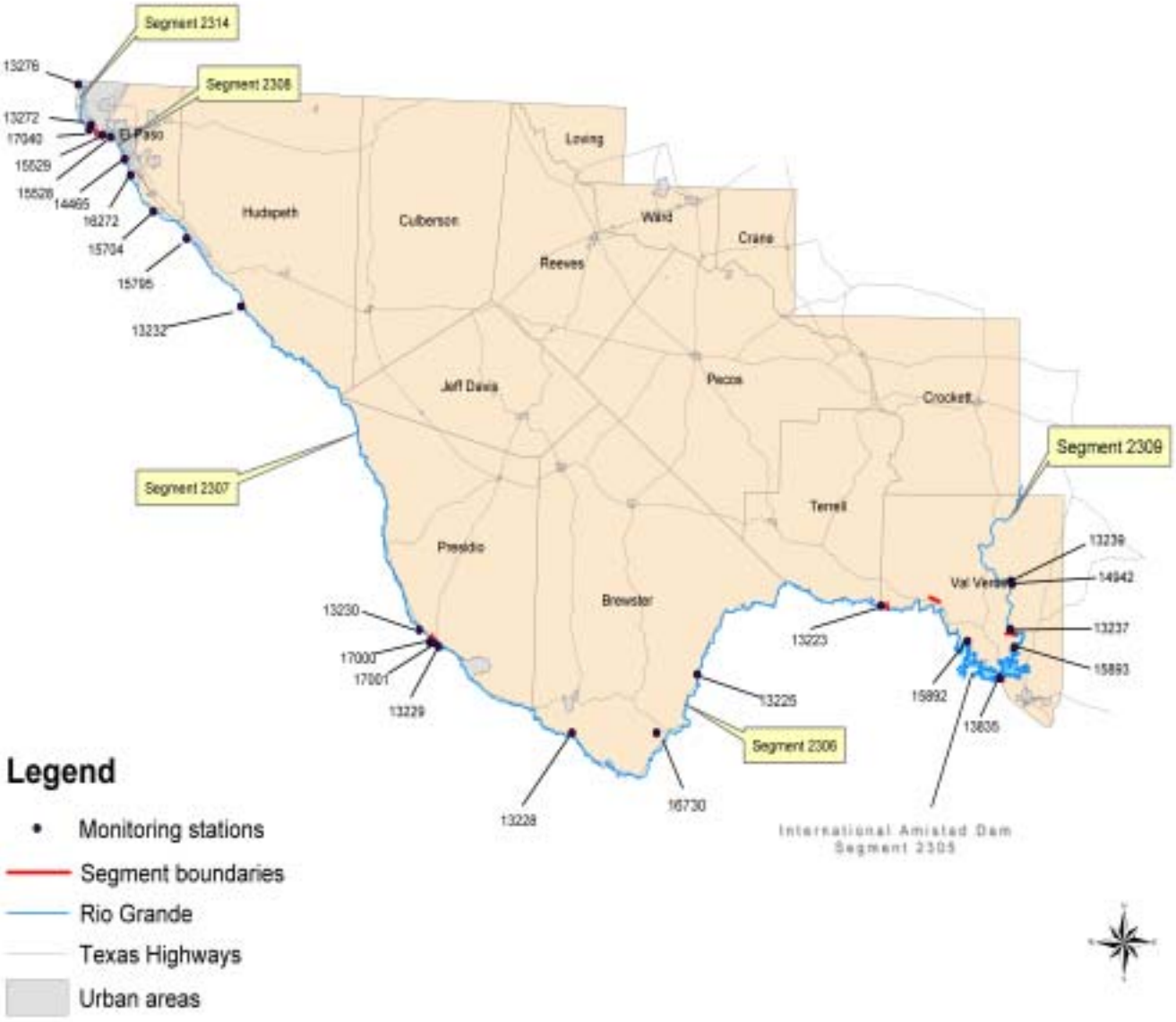
Big Bend National Park Service – collects water quality samples in the Big Bend area and conducts special studies in the Big Bend area.

USIBWC Amistad Dam Office – collects water quality samples in the International Amistad Reservoir.

FY2004 Upper Rio Grande Monitoring Stations

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	Metals Water	Org. Water	Metals Sed.	CONV	Tox. Sed.	Bacteria	Flow	FIELD
2305	13	29.460	-101.060	AMISTAD RESERVOIR AT BUOY #1	13835				4		4		4
2305	13	29.625	-101.251	AMISTAD RESERVOIR RIO GRANDE ARM AT BUOY #28	15892			2	4		4		4
2305	13	29.601	-100.976	AMISTAD RESERVOIR DEVILS RIVER ARM AT BUOY DRP	15893			2	4		4		4
2306	13	29.780	-101.760	RIO GRANDE AT FOSTER RANCH WEST OF LANGTRY OFF HWY 90W	13223	8	8	10	10		2	10	10
2306	6	29.450	-102.830	RIO GRANDE AT FM 2627 (GERSTACKER BRIDGE) BELOW BIG BEND	13225				4		4	4	4
2306	6	29.180	-103.060	RIO GRANDE AT RIO GRANDE VILLAGE IN BIG BEND NATONAL PARK	16730				8		8	8	8
2306	6	29.167	-103.554	RIO GRANDE AT THE MOUTH OF SANTA ELENA CANYON	13228				12		12	12	12
2306	6	29.533	-104.350	RIO GRANDE BELOW RIO CONCHOS CONFLUENCE NEAR PRESIDIO	13229				12		12	12	12
2306	6	29.533	-104.350	RIO GRANDE BELOW RIO CONCHOS CONFLUENCE NEAR PRESIDIO	13229	8	8	8	8			8	8
2306	6	29.543	-104.377	RIO GRANDE AT PRESIDIO RAILROAD BRIDGE	17000						8	8	8
2306	6	29.557	-104.384	RIO GRANDE AT PRESIDIO OJINAGA VEHICLE BRIDGE	17001						8	8	8
2307	6	29.604	-104.467	RIO GRANDE 2.4 MI.UPSTREAM FROM RIO CONCHOS CONFLUENCE	13230				12		12	12	12
2307	6	31.025	-105.594	RIO GRANDE AT NEELY CANYON, SOUTH OF FORT QUITMAN	13232				4		4	4	4
2307	6	31.317	-105.936	RIO GRANDE AT ALAMO CONTROL STRUCTURE, 9.7 KM UPSTREAM OF FORT HANCOCK PORT OF ENTRY	15795	4	1		12	2	12	12	12
2307	6	31.430	-106.142	RIO GRANDE AT GUADALUPE POINT OF ENTRY BRIDGE AT FM 1109 WEST OF TORNILLO	15704				6		6	6	6
2307	6	31.587	-106.289	RIO GRANDE AT SAN ELIZARIO, 500M UPSTREAM OF CAPOMO ROAD END OF PAVEMENT AND 10.2 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE	16272				6		6	6	6
2308	6	31.658	-106.329	RIO GRANDE AT RIVERSIDE CANAL 1.8 KM DOWNSTREAM OF ZARAGOSA INTL BRIDGE	14465	12	12		12		12		12
2308	6	31.753	-106.419	RIO GRANDE 1.3 KM DOWNSTREAM FROM HASKELL ST. WWTP OUTFALL	15528	12	12		12		12	12	12
2308	6	31.760	-106.470	RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST. WWTP OUTFALL, SOUTH OF BOWIE HIGH SCHOOL FOOTBALL STADIUM IN EL PASO	15529	12	12		12		12	12	12
2309	13	29.683	-101.000	DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK	13237				4		4	4	4
2309	13	29.900	-100.998	DEVILS RIVER ON DEVILS RIVER STATE NATURAL AREA 1.7 KM UPSTREAM OF DOLAN CREEK	13239				4		4	4	4
2309	13	29.886	-100.992	DOLAN SPRINGS 100 YDS. UPSTREAM OF CONFLUENCE WITH DEVILS RIVER IMMEDIATELY UPSTREAM OF ROAD CROSSING	14942				4		4	4	4
2314	6	31.803	-106.540	RIO GRANDE AT COURCHESNE BRIDGE, 1.7 MI UPSTREAM FROM AMERICAN DAM	13272	12	12		12		12	12	12
2314	6	31.780	-106.550	RIO GRANDE AT ANAPRA BRIDGE	17040						12		12
2314	6	31.981	-106.631	RIO GRANDE UPSTREAM OF EAST DRAIN	13276				4		4	4	4

Upper Rio Grande Monitoring Stations



Middle Rio Grande Basin

Introduction

The middle Rio Grande sub-basin consists of that portion of the river flowing from just below International Amistad Resivoir to just below International Falcon Reservoir and also includes San Felipe Creek. This 303-mile (487-km) stretch of the river flows through ValVerde, Kinney, Maverick, Webb, and Zapata Counties in Texas and the Mexican states of Coahuila, Nuevo Leon, and Tamaulipas. Del Rio, Eagle Pass and Laredo along with Mexican sister cities Ciudad Acuña, Piedras Negras, and Nuevo Laredo comprise the bulk of the populations living along the Rio Grande in this sub basin. Laredo, in particular, is one of the fastest growing cities in the country. Increased trade with Mexico, manufacturing growth, and tourism have contributed to population increases in the area.

Water sampling in the Rio Grande in Laredo, Texas during the Nuevo Laredo special study.

Overall water quality in the middle Rio Grande sub-basin has been stable or has shown improvement over the last few years. Water impounded behind Amistad Dam slows in velocity and much of the suspended solids carried from the Upper Rio Grande sub basin settles. Water in the middle sub-basin is used for irrigation and increasingly for municipal use. Most municipalities along the river are dependent on surface water for domestic and industrial use. Del Rio, TX is the only major city that relies on groundwater for it's water needs. The middle Rio Grande sub-basin has been further subdivided into three segments and contain a total of 23 sampling stations.

Water Quality Review

Segment 2304 runs from the confluence of the Rio Salado (Mexico) in Zapata County to Amistad Dam in Val Verde County, a length of 226 miles (364 km). The water body uses for this segment are high aquatic life use, contact recreation, general uses, fish consumption, and public water supply use. The public water supply, fish consumption, and general uses are fully supported.

The standard for fecal coliform was not met in different parts of the segment indicating a concern for contact recreation. In the future, *E coli* will replace fecal coliform as the primary indicator of fecal contamination. Until enough data is collected, fecal coliform will continue to be collected and used to assess this segment and all of the sites collected for treaty purposes will continue to test for both species. Ambient toxicity, whether indicator aquatic insects and fish can survive in the water, was noted as failing in previous years downstream of Del Rio, TX. This part of the river will continue to be identified as not meeting aquatic life use due to this issue until additional data can be collected to demonstrate otherwise. There are 18 monitoring stations in this segment primarily located within the populated areas along the river.

Segment 2303 runs from Falcon Dam in Starr County to the confluence of the Rio Salado (Mexico) in Zapata County, a length of 68 miles (109 km). The reservoir,

The pristine water of San Felipe Creek in Del Rio, TX near the source waters from Blue Hole Spring.

like Amistad, is used for recreation, water supply, and hydroelectric power generation. The extended drought along with below average flow from tributaries has resulted in less water in the reservoir and reduced allocations for downstream users, primary irrigated agriculture.

The designated uses for the reservoir include contact recreation, high aquatic life use, fish consumption, and public water supply use. The public water supply and general uses are fully supported. The high aquatic life use, contact recreation and fish consumption uses were not assessed. Previously listed as exceeding the surface water quality standards for chloride and TDS, these parameters were removed from the 303(d) list in 2000 as recent data showed the segment was attaining the standards. There are two monitoring stations in Segment 2303.

Segment 2313, San Felipe Creek, is a 9-mile (15-km) long stretch of high quality stream originating in the Del Rio area. Two springs, located within the city limits, make up the San Felipe Creek providing the city with a high quality water supply for drinking, fishing, and swimming. Recently, the City of Del Rio, TX constructed a reverse osmosis water treatment facility to protect the spring from high turbidity values during heavy rain events.

The segment is designated for high aquatic life use, contact recreation, general use, fish consumption, and for public water supply use. All uses were fully supported except for fish consumption, which was not assessed due to lack of fish tissue data. This creek has a positive effect on the Rio Grande. Water quality is very high and reduces some of the loading in the Rio Grande as it travels downstream to other communities.

Partners

USIBWC Amistad Field Office – Collects field data, flow and water samples in Segment 2304.

USIBWC Falcon Field Office - Collects field data, flow and water samples in Segment 2303.

City of Laredo County Health and Environmental Engineering Department – Collects bacteriological samples at eight sites around Laredo, TX.

Rio Grande International Study Center – Collects field data and water samples in segment 2304.

Texas Commission on Environmental Quality – Collects field data and water samples in segment 2304.

FY 2004 Middle Rio Grande monitoring stations

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	24 HR DO	Metals Water	Org. Water	Metals Sed.	CONV	Bacteria	Flow	FIELD
2303	16	26.8644	-99.308	FALCON LAKE AT INTERNATIONAL BOUNDARY MONUMENT #1	13189					4	4		4
2303	16	27.043	-99.444	FALCON RESERVOIR AT SAN YGNACIO WTP INTAKE, 350M DWNSTR FROM US 83 BRIDGE	15818					2	2		2
2304	16	27.265	-99.454	RIO GRANDE AT WEBB/ZAPATA COUNTY LINE	15817					12	12	12	12
2304	16	27.404	-99.487	RIO GRANDE AT PIPELINE CROSSING, 13.9 KM BELOW LAREDO	13196		8	8	8	8	12	8	8
2304	16	27.330	-99.510	RIO GRANDE AT RIO BRAVO, 0.5KM DWNSTR OF THE COMMUNITY OF EL CENIZO	15816						12		
2304	16	27.430	-99.490	RIO GRANDE AT MASTERSON RD IN LAREDO, 9.9KM DOWNSTREAM OF INTL BRIDGE#1(WEST BRIDGE) UPSTR SOUTHSIDE WWTP AND UPSTR NUEVO LAREDO WWTP	15815						12		
2304	16	27.499	-99.507	RIO GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO	15814					4	12	4	4
2304	16	27.500	-99.510	RIO GRANDE 30 METERS UPSTREAM OF US 81 BRIDGE (CONVENT AVENUE) IN LAREDO	13201						12		
2304	16	27.523	-99.524	RIO GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE	13202					4	12	4	4
2304	16	27.570	-99.510	RIO GRANDE AT CP&L POWER PLANT INTAKE	15813						12		
2304	16	27.580	-99.500	MANADAS CREEK AT FM 1472 NORTH OF LAREDO	13116		4		4	4	4	4	4
2304	16	27.597	-99.533	RIO GRANDE BELOW WORLD TRADE BRIDGE	17410					4	4	4	4
2304	16	27.702	-99.754	RIO GRANDE AT THE COLOMBIA BRIDGE, 2.7 KM UPSTREAM OF THE DOLORES PUMP STATION, 45.1 KM UPSTREAM OF THE LAREDO WTP INTAKE	15839					4	12	4	4
2304	13	27.933	-99.924	RIO GRANDE AT APACHE RANCH	17596					4	4	4	4
2304	13	28.346	-100.310	RIO GRANDE AT IBWC WEIR DAM 6 MI. SOUTH OF EL INDIO, 0.6 MI. DOWNSTREAM OF CUERVO CREEK	15274					2	2	2	2
2304	13	28.663	-100.500	RIO GRANDE NEAR IRRIGATION CANAL LATERAL 50 US 277 BRIDGE IN EAGLE PASS	13205				2	12	12	12	12
2304	13	28.681	-100.505	RIO GRANDE US 277 AT EAGLE PASS	13206					4	4	4	4
2304	13	29.292	-100.876	RIO GRANDE, 4.5 MI. DOWNSTREAM OF DEL RIO AT MOODY RANCH	13560		4		2	12	12	12	12
2304	13	29.326	-100.931	RIO GRANDE 12.8 MI. BELOW AMISTAD DAM, NEAR GAGE, 340 M UPSTREAM OF US 277 BRIDGE IN DEL RIO	13208					6	6	6	6
2304	13	29.424	-101.041	RIO GRANDE 3.4 KM DOWNSTREAM OF AMISTAD DAM ABOVE WEIR DAM (IBWC GAGE #08-4509.00)	15340	2	6	6	6	8	2	8	8
2313	13	29.331	-100.889	SAN FELIPE CREEK AT GUYLER CONFLUENCE WITH THE RIO GRANDE	13270					2	2	2	2
2313	13	29.369	-100.884	SAN FELIPE CREEK AT BLUE HOLE FLOOD GATES, IN PARK BETWEEN US 90 BRIDGE AND SOUTHERN PACIFIC RR BRIDGE IN DEL RIO (50M DWNSTR OF US 90)	15821					2	2	2	2
2313	13	29.373	-100.885	SAN FELIPE CREEK AT WEST SPRINGS, NEAR WEST WELLS IN DEL RIO (IN WEST CHANNEL OF CREEK, 0.5 KM UPSTREAM FROM US 90 BRIDGE)	15820					2	2	2	

Middle Rio Grande Monitoring Stations

Lower Rio Grande Basin

Introduction

The lower Rio Grande su- basin stretches from just below Falcon Dam to the mouth of the Rio Grande at its confluence with the Gulf of Mexico. This portion of the river is divided into two segments, 2301and 2302. This 280-mile (451-km) stretch of the Rio Grande runs through Starr, Hidalgo , and Cameron Counties of Texas and forms the border between those counties and the Mexican State of Tamaulipas. Major cities in the su- basin include McAllen, Harlingen, and Brownsville on the United States side of the river and Matamoros and Reynosa on the Mexican side. The largest portion of water used in the area is consumed by agriculture. However, the 2000 census shows the lower Rio Grande Valley has the fourth largest increase in population in the country. Increased municipal and industrial demands will only further tax a limited resource already taxed by previous drought conditions. Groundwater in the area is of poor quality and is of little use in supplementing current water needs.

Current topics of interest in the lower Rio Grande sub-basin include the water debt owed to the United States by Mexico, as Mexico has failed to deliver water amounts from six of its tributaries required by treaty. In 2003, rainfall increased slightly and water deliveries from Mexico increased. The USIBWC is urging Mexico to increase deliveries in 2004 as well.

Invasive aquatic weeds such as hydrilla and water hyacinth are another issue of interest in the lower Rio Grande. These aquatic plants choke portions of the river preventing boat traffic, impeding water flow and increase water loss through consumption and evapotranspiration. Methods of control have ranged from mechanical removal to biological control. Currently, Texas Parks and Wildlife, in conjunction with various local entities, have started a program of control using triploid grass carp. These large fish, rendered sterile to prevent reproduction, feed upon aquatic vegetation including hydrilla. Between May and August of 2003, over 26,000 carp were released in the lower Rio Grande.

The Rio Grande impounded by Anzalduas Dam in the Lower Rio Grande.

Water Quality Review

Segment 2302 is classified as a freshwater stream with a length of 231 miles (371 km) and contains 12 monitoring stations. Its designated uses are high aquatic life use, contact recreation, general use, fish consumption, and public water supply. A portion of this segment (from Pharr International Bridge to downstream of Santa Ana National Wildlife Refuge) contains an impairment for contact recreation use due to high bacteria levels. The high bacteria levels were primarily reported from sampling station 13180 (Rio Grande below El Anhelo Drain). This station has limited data and has not had any data collected for several years. Stations upstream and downstream of this site contain recent data and do not exhibit this same impairment.

The Rio Grande as it flows below Brownsville, Texas prior to entering the Gulf of Mexico.

Partners

City of Brownsville – collects field data and water samples in segment 2301 and 2302

TCEQ Harlingen Field Office – collects field data and water samples in segment 2301 and 2302

USGS – collects field data in segment 2302

USIBWC Mercedes Office – collects field data and water samples in segment 2301 and 2302

Sample collection at station 13180 was recently resumed in order to determine if the impairment still exists.

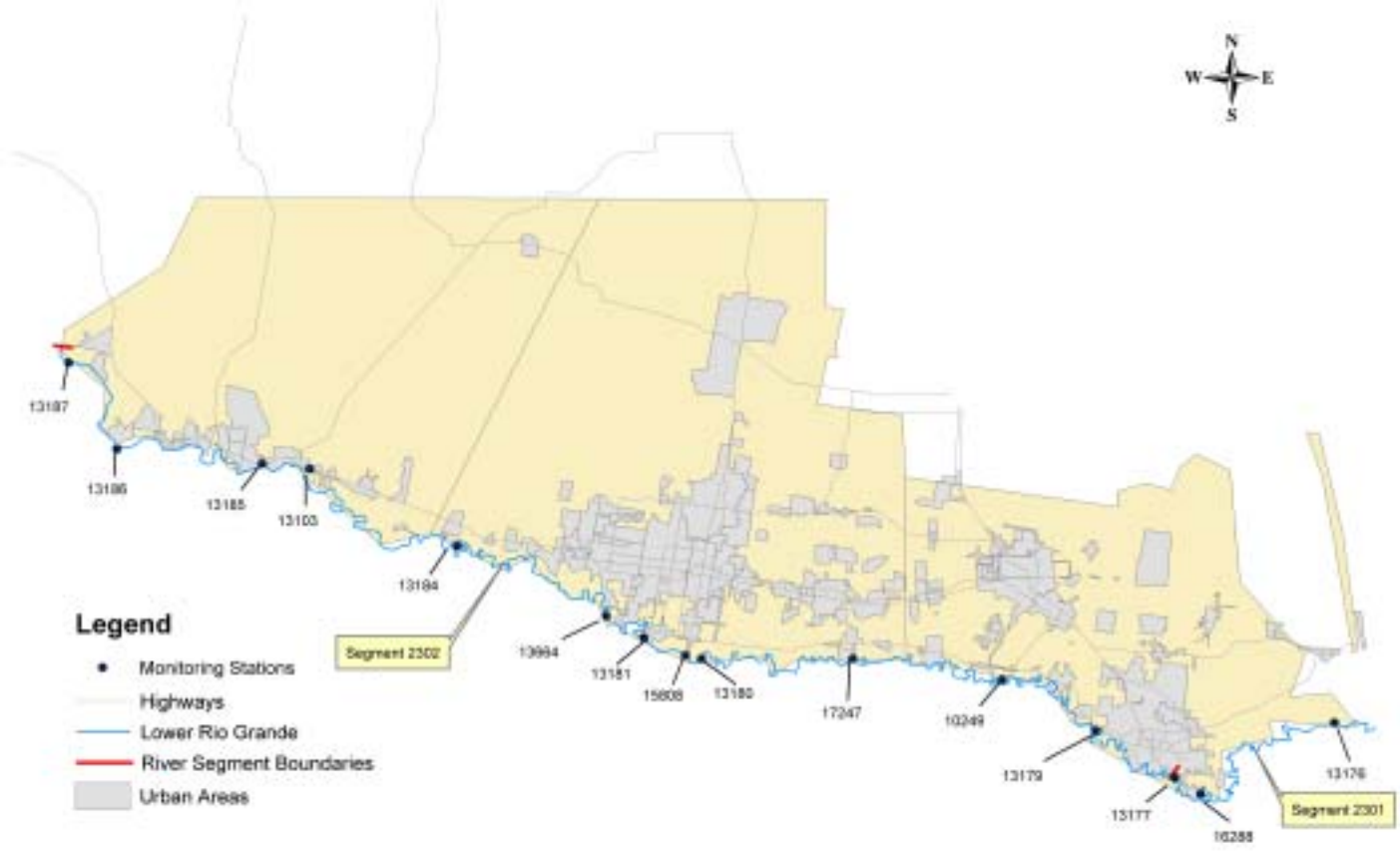
Segment 2301 extends from the confluence of the Rio Grande with the Gulf of Mexico to a point 6.7 miles (10.8 km) downstream of the International Bridge in Cameron County. This 49-mile (73-km) long segment is classified as a tidal stream and is designated for exceptional aquatic life use, contact recreation, general use, and fish consumption. All uses are supported, except fish consumption, which has not been assessed.

Segment 2301 has one monitoring station. The only concern at this station is excessive algal growth as indicated by periodic high chlorophyll-*a* levels. Severe drought in the Rio Grande had caused the mouth of the Rio Grande to close in 2002. Since then, the mouth has reopened but is still in danger of closing again if water flows in the Rio Grande continue to remain low.

FY2004 Lower Rio Grande Monitoring Schedule

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	Metals Water	Org. Water	Metals Sed.	CONV	Bacteria	Flow	FIELD
2301	15	25.962	-97.208	RIO GRANDE TIDAL AT SH 4 NEAR BOCA CHICA	13176				4	4		4
2301	15	25.850	-97.414	RIO GRANDE AT SABAL PALM SANCTUARY AT NORTHEAST BOUNDARY OFF PARK ROAD 1 MI. SOUTH OF FM 1419 NEAR PALM GROVE	16288				4	4		4
2302	15	25.876	-97.454	RIO GRANDE EL JARDIN PUMP STATION, AT LOW WATER DAM 300 FT. BELOW INTAKE	13177	10	10	8	10	10	10	10
2302	15	25.950	-97.576	RIO GRANDE NEAR RIVER BEND BOAT RAMP, 8 KM WEST OF BROWNSVILLE ON US 281	13179				4	4		4
2302	15	26.030	-97.720	RIO GRANDE 6.3 KM DOWNSTREAM FROM SAN BENITO PUMPING PLANT	10249				4	4	4	4
2302	15	26.063	-97.950	RIO GRANDE 100 METERS UPSTREAM FROM THE FM 1015 BRIDGE THAT CROSSES INTO MEXICO AT PROGRESSO	17247				4	4		4
2302	15	26.063	-98.183	RIO GRANDE BELOW EL ANHELO DRAIN SOUTH OF LAS MILPAS	13180					8	8	8
2302	15	26.068	-98.208	RIO GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE (US 281)	15808	2		2	10	10	8	10
2302	15	26.096	-98.272	RIO GRANDE INTERNATIONAL BRIDGE AT US 281 AT HIDALGO	13181			2	10	10	10	10
2302	15	26.130	-98.330	RIO GRANDE 0.5 MI. BELOW ANZALDUAS DAM, 12.2 MI. FROM HIDALGO	13664				8	8	8	8
2302	15	26.240	-98.560	RIO GRANDE AT SH 886 NEAR LOS EBANOS	13184				7	7	7	7
2302	15	26.362	-98.787	ARROYO LOS OLMOS BRIDGE ON US 83 SOUTH OF RIO GRANDE CITY	13103				4	4	4	4
2302	15	26.370	-98.860	RIO GRANDE AT FORT RINGGOLD 1 MI. DOWNSTREAM FROM RIO GRANDE CITY	13185				12	12	12	12
2302	15	26.393	-99.084	RIO GRANDE BELOW RIO ALAMO NEAR FRONTON	13186				10	10	10	10
2302	15	26.529	-99.158	RIO GRANDE 2.5 MI. BELOW FALCON DAM AT DIVERSION STRUCTURE	13187	6	6	6	6		6	6

Lower Rio Grande Monitoring Stations



Pecos River Basin

Introduction

The Pecos River in Texas begins at the Texas – New Mexico state line and is then impounded by Red Bluff Reservoir. Releases from Red Bluff are made in accordance with the Pecos River Compact for distribution to irrigation districts in the basin. The river then flows southeast until it empties into the Rio Grande upstream of International Amistad Dam, a journey of 409 miles (658 km). The Pecos River is divided into three segments: 2312, 2311, and 2310 upstream to downstream.

The heavy drought conditions in the southwest have caused the Pecos River to see episodes of discontinuity. Invasive saltcedar plants have also been linked to reduced water levels and increased salinity in the Pecos River basin. Since 1999, Texas A&M Cooperative Extension (TCE) has been successfully eradicating the species in the Upper Pecos under a research grant and has received national recognition for their project. Plans are underway to continue the eradication of saltcedar along the entire Pecos River. Due to the success of TCE, other river basins with the same problem have begun similar programs.

The Pecos River from the US90 bridge prior to the confluence with the Rio Grande.

Water Quality Review

Segment 2312 is the Red Bluff Reservoir from the Texas – New Mexico state line to the end of the dam, a distance of 11 miles (18 km). Designated uses for this segment are high aquatic life use, fish consumption, and contact recreation. There are two monitoring stations in this segment. Salinity levels in the reservoir are typically over 6,000 mg/l, preventing use as a public water supply and agriculture is restricted to salt tolerant crops. This segment is listed as having a nitrate concern in the middle of the lake.

Segment 2311 is located directly below the Red Bluff Reservoir to the confluence of Independence Creek in Crockett/Terrell County, a length of 349 miles (561 km). The designated uses for this segment are high aquatic life use, contact recreation, and fish consumption. There are six monitoring stations along this segment. The salinity continues to increase in the Pecos River in this segment, climbing to as high as 22,000 mg/l.

Segment 2310 runs from the confluence of Independence Creek in Crockett/Terrell County down to the confluence with the Rio Grande in Painted Canyon in Val Verde County, a length of 49 miles (79 km). The designated uses for this segment are contact recreation, public water supply, high aquatic life use, and fish consumption. There are four monitoring stations in this segment.

Independence Creek is a high quality stream that provides freshwater input into the Pecos River, bringing salinity values down to drinking water levels. Recent abnormally high

The invasive plant species Tamarisk, otherwise known as saltcedar, just after Arsenal Application. After the application, the plant fails to bloom the following season.

salinity levels in the Pecos, however, have caused this segment to have a drinking water impairment due to elevated levels of chloride, sulfate, and TDS.

Special Studies

TCEQ and USIBWC have been working on setting two TCEQ real-time monitoring stations in the Pecos River. One of those stations will be placed at an existing monitoring station. The second will be placed at a new site, adding a seventh monitoring station in this segment. The real-time stations will have conductivity and pH sensors installed and one of the sites will have flow data as well. Data from these sites will be taken at regular intervals and made available on the TCEQ website.

Salinity in the Pecos River enters the state above 5,000 mg/L and climbs to over 18,000 mg/l as the water flows downstream. TCE, with support from the USIBWC and other agencies, will begin a special study in the Pecos River to determine all sources contributing to the increasing salinity. This study will last about two years and will look at salinity inputs from geological sources, vegetation contributions, non point source contamination, tributary input, and agricultural return to determine the causes and potential solutions to the increasing salinity values in the Pecos River.

Partners

Upper Pecos Soil and Water Conservation District #213 and the Natural Resource Conservation Service – collect water quality samples in the Upper Pecos.

TCEQ Midland Office – collects water quality samples at Red Bluff and along the entire Pecos River.

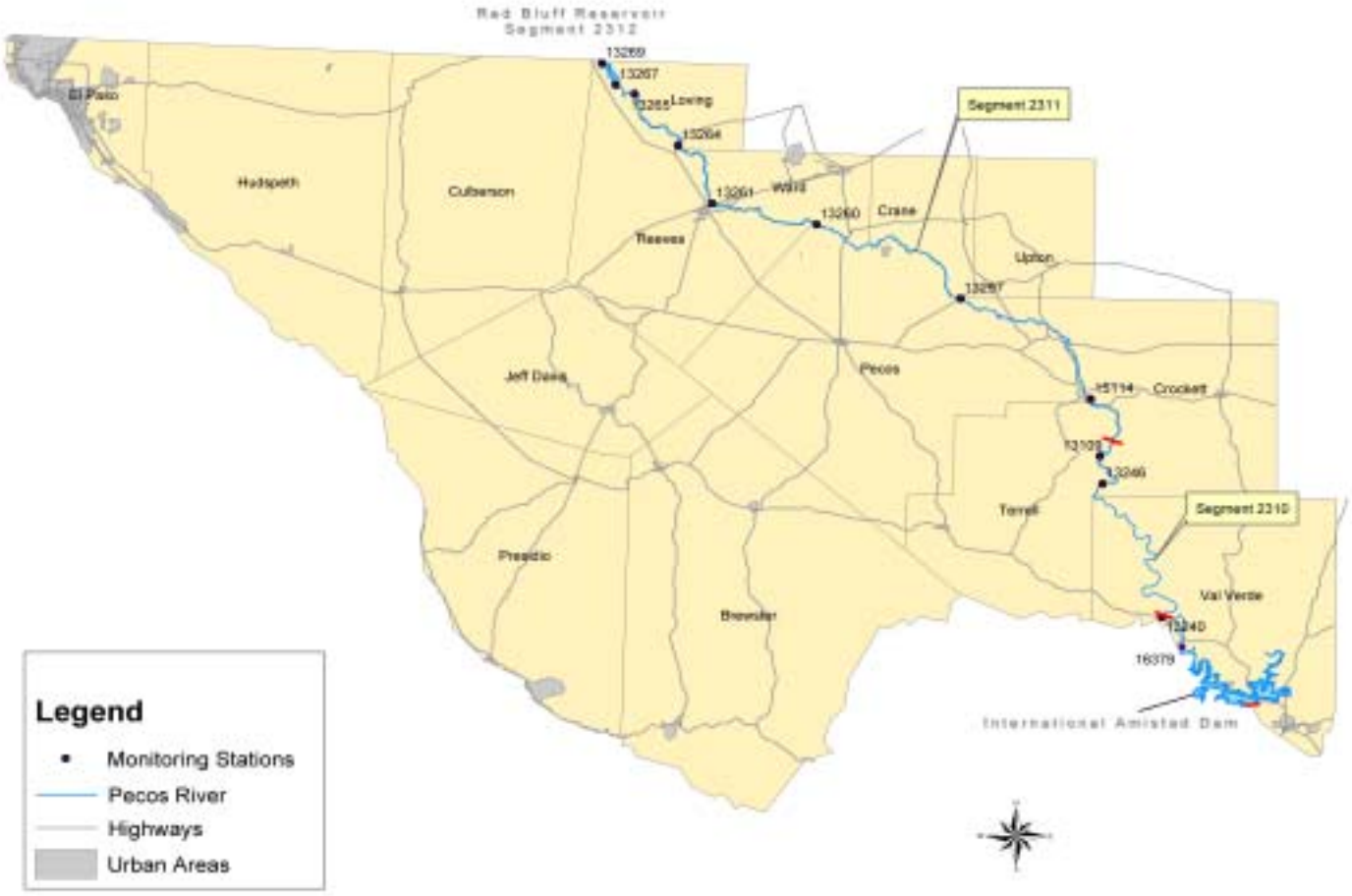
USIBWC Amistad Dam Office – collects water quality samples on the Pecos River as it enters the International Amistad Dam.

Texas A&M University Cooperative Extension – conducts research in the Pecos River sub-basin.

FY2004 Pecos River Monitoring Schedule

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	24 HR DO	Metals Water	Org. Water	Metals Sed.	CONV	Bacteria	Flow	FIELD
2310	13	29.700	-101.360	PECOS RIVER 0.7 MI. DOWNSTREAM FROM US 90W IN VAL VERDE COUNTY	16379					2	2	2	2
2310	13	29.800	-101.450	PECOS RIVER AT GAGING STATION 7.4 MI. EAST OF LANGTRY, 15.0 MI. UPSTREAM FROM CONFLUENCE WITH RIO GRANDE	13240		8	8	8	8		8	8
2310	7	30.338	-101.717	PECOS RIVER 7.52 KM UPSTREAM FROM THE VAL VERDE/TERRELL/CROCKETT COUNTY LINE CONVERGENCE	13246		4			4	4	4	4
2310	7	30.450	-101.732	INDEPENDENCE CREEK 0.5 MI. DOWNSTREAM FROM JOHN CHANDLER RANCH HEADQUARTERS	13109		4			4	4	4	4
2311	7	30.681	-101.776	PECOS RIVER 1.6 MI UPSTREAM OF US 290 BRIDGE, SE OF SHEFFIELD	15114					4	4	4	4
2311	7	31.079	-102.359	PECOS RIVER AT US 67 NE OF GIRVIN	13257	2				4	4	4	4
2311	7	31.366	-103.004	PECOS RIVER AT FM 1776 SW OF MONAHANS	13260	2				4	4	4	4
2311	7	31.440	-103.470	PECOS RIVER NEAR PECOS, TEXAS	13261					4	4	4	4
2311	7	31.670	-103.630	PECOS RIVER NEAR MENTONE, TEXAS	13264					4	4	4	4
2311	7	31.872	-103.831	PECOS RIVER AT FM 652 BRIDGE NE OF ORLA	13265					4	4	4	4
2312	7	31.908	-103.917	RED BLUFF RESERVOIR ABOVE DAM, NORTH OF ORLA	13267				2	2	2		2
2312	7	31.994	-103.983	RED BLUFF RESERVOIR 1/2 MI. SOUTH OF TEXAS -NEW MEXICO BORDER	13269				2	2	2		2

Pecos River Monitoring Stations



Public Outreach

Basin Advisory Committee

The basin advisory committee (BAC) is a group of iprivate citizens, government agency representatives, citizen groups, and academia who provide input and guidance for the program to ensure issues and concerns in the community are addressed. Input from the BAC assists the CRP in determining what direction the program should take, changes to the monitoring schedule, new monitoring sites, special studies, and dissemination of information. People who are interested in providing input on environmental issues and who would like to be a member of the Rio Grande Basin BAC can contact anyone in the CRP. (see page 24 for contacts)

BAC meetings are held once a year around July and August in El Paso, Laredo, and the Lower Rio Grande Valley. These meetings provide the USIBWC CRP with an opportunity to update the committee on recent activities and future plans. The meetings also provide a forum for other agencies and academia to present their programs and research and for everyone at the meeting to provide input into the program.

Texas Watch

This past year, the USIBWC partnered with Texas Watch in the Rio Grande Basin. Texas Watch is a network of trained volunteers and partners who gather information about the natural resources of Texas and ensure the information is available to the general public. Volunteers are trained to collect quality-assured information that can be used to make environmentally sound decisions. Currently, over 400 Texas Watch volunteers collect water quality data on lakes, rivers, streams, wetlands, bays, bayous, and estuaries in Texas. Texas Watch also provides training curriculum and continuing education credits to teachers so they can, in turn, provide future generations with the information necessary to protect our environment.
We began our partnership with great success in Laredo, Texas. Texas Watch has held teacher workshops and community outreach and held a regional meeting there on February 21, 2004 so that we could present the program and recruit more participation throughout the Middle Rio Grande basin. We plan to continue our partnership with Texas Watch in the coming year and expand the program into the Upper and Lower Rio Grande in cities like El Paso, Brownsville, and McAllen and expand our current program in the Middle Rio Grande in cities like Del Rio and Eagle Pass.

Friends of the Rio Grande

A recent initiative created as a sunset recommendation from the Texas State Legislature mandated TCEQ to create and fund a team called the Friends of the Rio Grande (FORG). The objective of FORG is to promote environmental awareness along the Rio Grande through public outreach and education, organizing volunteer cleanups along the river, water quality monitoring, and recognition of exemplary environmental efforts.

In partnership with TCEQ, the USIBWC CRP administers the FORG program. Public outreach and education efforts are coordinated with Texas Watch, taking advantage of their years of education expertise and curriculum production. Texas Watch trains and recruits individuals to participate in their volunteer monitoring programs, as well.

USIBWC and TCEQ personnel are actively seeking other agencies, groups, and individuals to join the initiative to expand the program into their communities. Any group or municipality interested in partnering with the Friends of the Rio Grande can contact USIBWC Clean Rivers Program personnel.

Presentations

Clean Rivers Program personnel give presentations on the program efforts and water quality along the Rio Grande to schools, public forums, and local, state and federal forums.

Website

During the past year, the USIBWC CRP website underwent major revisions, creating a new, easy to use website that provides a wealth of information. Below is a list of website pages and the information provided.

Study Area – This page contains an interactive map of the Rio Grande Basin. By clicking on one of the sub-basins, a detailed map of the area will be displayed, containing information about our monitoring sites.

Calendar – We will post meetings that we will be attending or have attended and updates on current activities in the basin on this page.

Data – TCEQ Data Link – will get you to the TCEQ water quality database for the State of Texas.

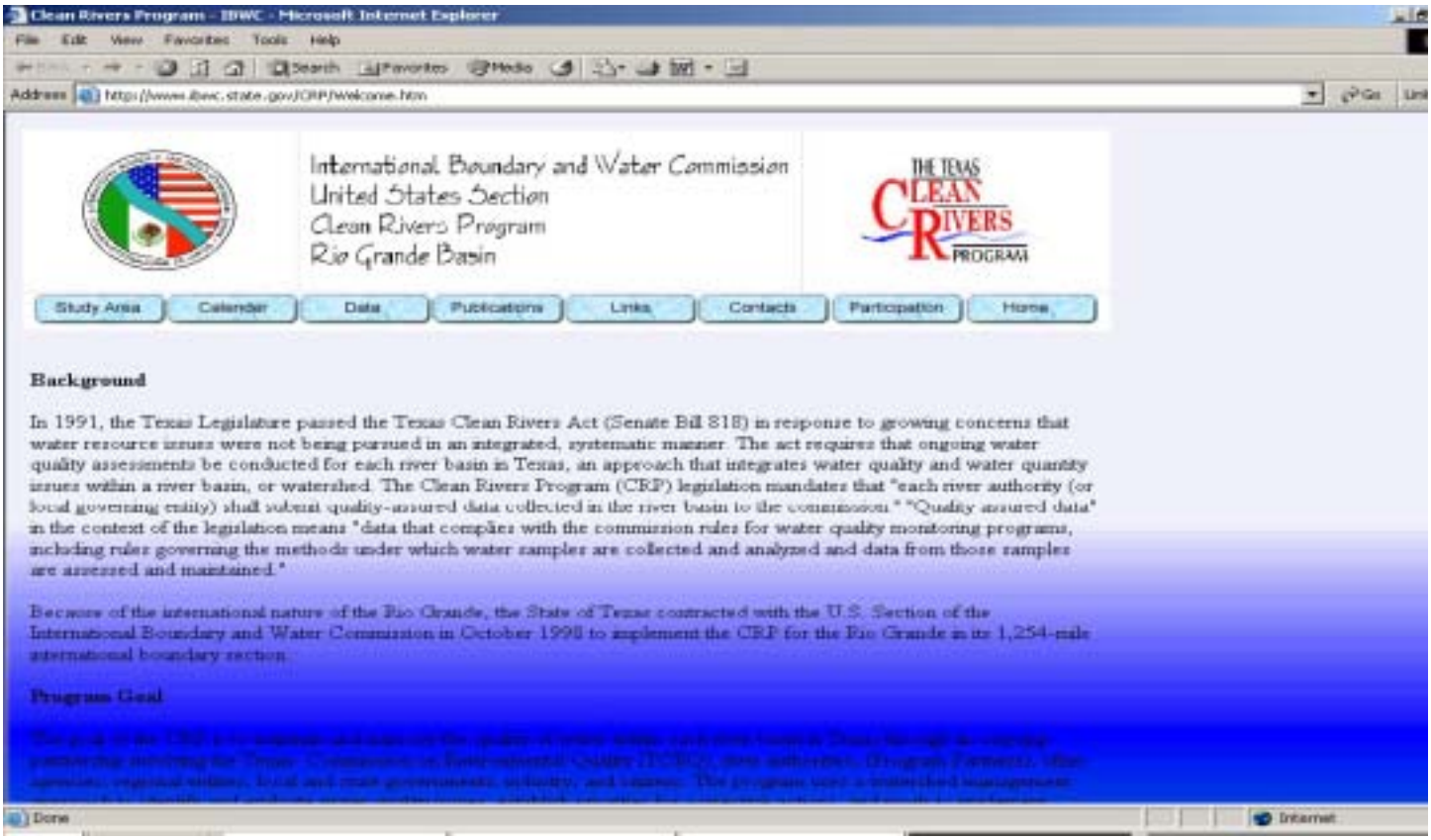
Data – USIBWC CRP Data - will take you to our water quality data page where you can acquire an Excel file of the water quality data by station since 1995. You can also get the monitoring schedule, definition of monitoring parameters, available data on metals analysis in the basin, and the laboratory specifications.

Publications – contains our Basin Highlights Reports and our five-year Basin Summary Report in PDF format.

Links – contains links to other planning agencies in Texas, the Rio Grande basin partners, and other related links.

Contacts – contains contact information for the USIBWC CRP personnel.

Participation – contains information on participating in the Clean Rivers Program and/or Texas Watch.



Contacts

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Coordinated Monitoring Meetings

Pecos River basin
Midland, TX on March 30, 2004

Upper Rio Grande basin
El Paso, TX on April 20, 2004

Middle Rio Grande basin
Laredo, TX on April 13, 2004

Lower Rio Grande basin
Harlingen, TX on April 12, 2004

International Boundary and Water Commission, United States Section
4171 N. Mesa, Suite C-100
El Paso, TX 79902
Tel: 915 832 4703 Fax: 915 832 4166
www.ibwc.state.gov/CRP/Welcome.htm