

The Rio Grande Basin Highlights Report

April 30, 2005

Clean Rivers Program



The waters of San Felipe Creek upstream of the confluence with the Rio Grande.

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 80 water quality monitoring stations, added 2 new stations, and welcomed 2 new partners. The CRP is in the planning stages to conduct several special studies in the basin in 2005.

In an effort to increase our public outreach programs, the CRP has partnered with Texas Watch this past year by holding their regional meetings and our basin advisory committee meetings together in Laredo and in McAllen. The meetings were such a success for the CRP that we plan to continue this format throughout the Rio Grande basin in the coming years.

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Monitoring

Monitoring types

Routine monitoring – This is the primary monitoring type performed in the basin. 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.

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, pH, conductivity, and dissolved oxygen.



Clean Rivers Program partner heading out to collect samples in the Rio Grande.

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 metals. Since total and dissolved metal values are very low, conductivity primarily measures how much salt is in the water. The state standard for



Biological monitoring with the USGS in the Rio Grande below Big Bend National Park.

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, fluoride, and oil and greases.

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, pesticides and industrial organic compounds 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 bacterial 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 before including the data 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 in identifying the cause of the impairment 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:

<u>Parameter</u>	<u>Criteria</u>
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/l

The secondary parameters for a tidal stream are listed below:

<u>Parameter</u>	<u>Criteria</u>
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 396 CFU for *E. coli* and 400 CFU for fecal coliform.

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 the maximum temperature with the standards falling between 31° and 35° Celsius, or 88° and 95° Fahrenheit.

Assessment and Monitoring Schedule

On the following pages are the assessment of the water quality by sub-basin followed by the monitoring 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.

The monitoring schedule is coordinated with our partners in the basin during our annual coordinated monitoring meetings held in each sub-basin (see the dates of the meetings on page 24).

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 Ciudad 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. The quantity of water from the Rio Conchos is the same as the Rio Grande and sometimes higher. Water from both rivers then flows along Big Bend National Park, where the quality and quantity of the water affects tourism and wildlife in the park.

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, water supply, and steady, continuous flow in the river below the dam as well as fishing and recreation. The



The pristine waters of the Devils River.

dam also contains two hydroelectric plants that can produce electricity for communities on both sides of the border.

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 existing monitoring stations in this segment and a new station has been added this year. 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 United 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 bacterial values exceeding the standards. The exceedance has been linked primarily to overloaded wastewater treatment facilities discharging outside of these standards. Efforts by several agencies and neighborhood groups have led to improvements in these plants that have reduced some of the bacterial impacts in this segment. Continued monitoring will determine if this issue has been resolved or if there are other sources that need addressed. All other 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 and will be replaced in the future. This segment is meeting all of its primary standards, but is listed as having a concern for phosphorous.

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 and three special study sites.

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



The Rio Grande in segment 2314 during non-irrigation season when Elephant Butte dam is not releasing water.

an impairment due to elevated bacteria levels, high chloride concentrations, high sulfate concentrations, and high TDS values.

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 but still exceed the standards.

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 Ranch State Park and Big Bend National Park 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 elevated algal growth throughout

the Big Bend area. 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 four monitoring stations on the lake. Our partners at the Amistad National Park Service are currently collecting data in the marinas to assess potential impacts 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. Due to good rains in the United States and Mexico and to conservation efforts last year, the reservoir is close to full conservancy

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

The report on a special study conducted with the USGS, Big Bend NPS, TCEQ and ourselves to assess the impacts of historical mining is in review and the report should be released this year.

A special study in Big Bend to source track nutrient and salinity contamination between Presidio and Amistad Dam will be conducted this year by Big Bend NPS, the USGS, TCEQ and the CRP. TCEQ is installing two real time monitoring stations in the Rio Grande in Big Bend and the CRP will install three conductivity meters in and around the area as well. The study will also monitor water quality and quantity from several springs along the river to assess their impact on the Rio Grande. 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.

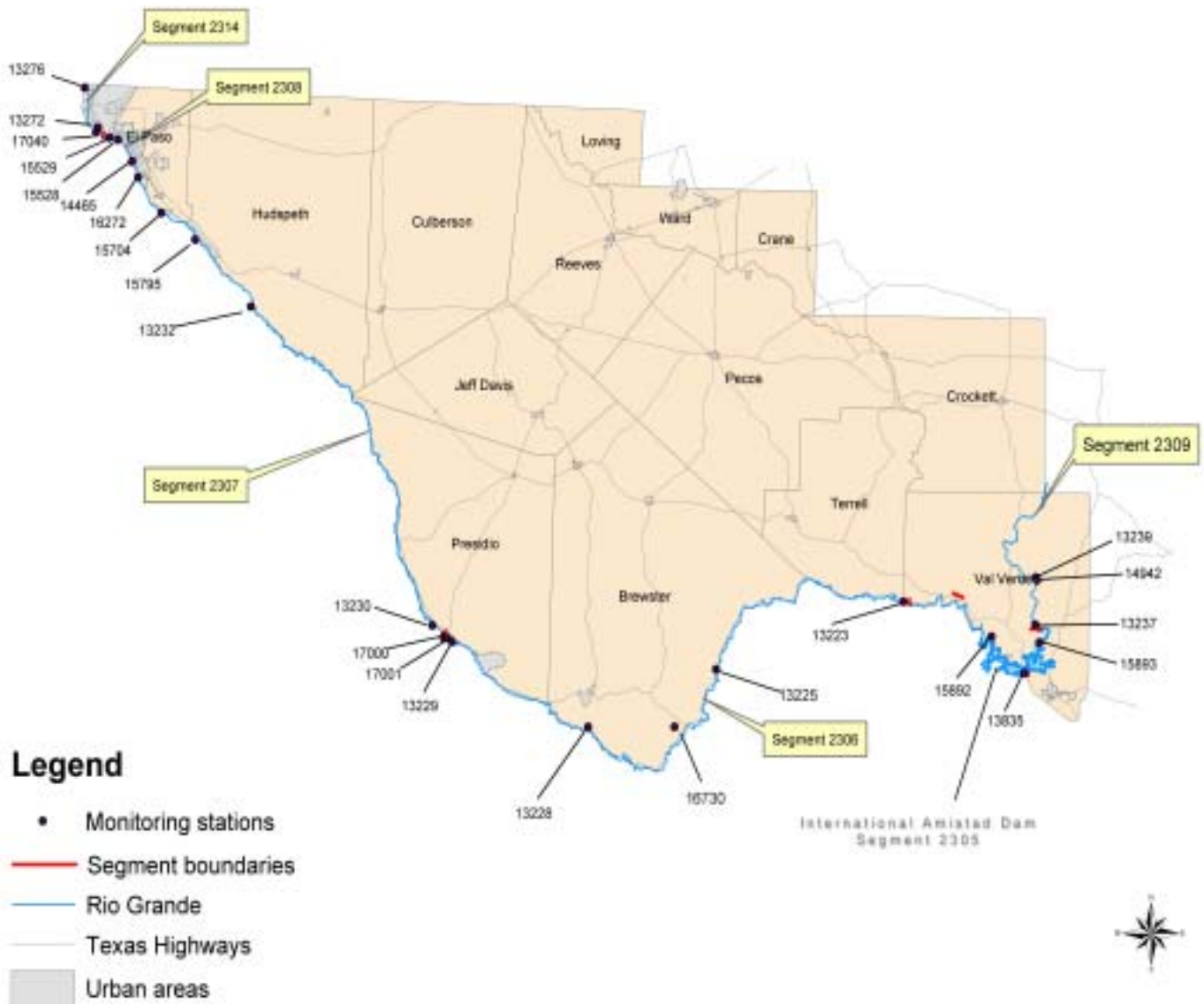
USIBWC Amistad Dam Office – collects water quality samples in the International Amistad Reservoir.

Amistad National Recreation Area National Park Service - collects bacteria samples and conducts special studies in Amistad Lake.

FY2005 Upper Rio Grande Monitoring Stations

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	Metals Water	Org. Water	Metals Sed.	CONV	Tox. Sed.	Bacteria	Fbw	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 90 W	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 NATIONAL 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 OJNAGA 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 QUIMAN	13232	2			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	10	2		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	2	2		8		8	8	8
2307	6	31.587	-106.289	RIO GRANDE AT SAN ELIZARDO, 500M UPSTREAM OF CAPOMO ROAD END OF PAVEMENT AND 10.2 KM DOWNSTREAM OF ZARAGOSA INTERNATIONAL BRIDGE	16272	2	2		8		8	8	8
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. W WTP OUTFALL	15528	12	12		12		12	12	12
2308	6	31.760	-106.470	RIO GRANDE 2.4 KM UPSTREAM FROM HASKELL ST. W WTP 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 Reservoir to just below International Falcon Reservoir and also includes San Felipe Creek. This 303-mile (487-km) stretch of the river flows past five 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.

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 Rio Grande 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 its water needs.

Water Quality Review

Segment 2304 runs from Amistad Dam in Val Verde County to the confluence of the Rio Salado (Mexico) in Zapata 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 bacteria was not met from below Del Rio to the end of the segment indicating a concern for contact recreation. There is a concern for



The Rio Grande below the International Amistad Dam.

phosphorous from Del Rio to Laredo and there is also a concern for ammonia in Laredo. 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 21 monitoring stations in this segment primarily located within the populated areas along the river.

Segment 2303 runs from the confluence of the Rio Salado (Mexico) in Zapata County to Falcon Dam in Starr County, a length of 68 miles (109 km). The reservoir, like Amistad, is used for recreation, water supply, and hydroelectric power generation. The heavy rains in the United States and Mexico have raised the storage in Falcon to 64 percent of conservation capacity.



CRP Basin Advisory Committee meeting and Texas Watch regional meeting in Laredo, TX.

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. There are three monitoring stations in San Felipe Creek.

Partners

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

USIBWC Falcon Field Office - Collects field data and water samples in segment 2303.

City of Laredo Environmental Services Department - collects field data and water samples in Manada Creek in segment 2304.

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

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

TCEQ San Antonio Office – Collects field data and water samples in segment 2304.

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 three monitoring stations in this segment.

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.

FY 2005 Middle Rio Grande Monitoring Stations

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	Metals Water	Org. Water	Metals Sed.	Toxicity	CONV	Bacteria	Fbw	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 DOWNSTR FROM US 883 BRIDGE	15818					2	2	2	
2304	16	27.265	-99.454	RD GRANDE AT WEBB/ZAPATA COUNTY LINE	15817	2		2		12	12	12	12
2304	16	27.404	-99.487	RD GRANDE AT PIPELINE CROSSING, 13.9 KM BELOW LAREDO	13196	8	8	8		8	12	8	8
2304	16	27.330	-99.510	RD GRANDE AT RD BRAVO, 0.5KM DOWNSTR OF THE COMMUNITY OF EL CENIZO	15816						12		
2304	16	27.430	-99.490	RD GRANDE AT MASTERSON RD IN LAREDO, 9.9KM DOWNSTREAM OF INTL BRIDGE #1 (WEST BRIDGE) UPSTR SOUTH SIDE WWTP AND UPSTR NUEVO LAREDO WWTP	15815						12		
2304	16	27.499	-99.507	RD GRANDE AT INTERNATIONAL BRIDGE #2 (EAST BRIDGE) IN LAREDO	15814				2	4	12	4	4
2304	16	27.500	-99.510	RD GRANDE 30 METERS UPSTREAM OF US 81 BRIDGE (CONVENT AVENUE) IN LAREDO	13201						12		
2304	16	27.523	-99.524	RD GRANDE LAREDO WATER TREATMENT PLANT PUMP INTAKE	13202	4		4		4	12	4	4
2304	16	27.570	-99.510	RD 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	RD GRANDE BELOW WORLD TRADE BRIDGE	17410	4		4		4	4	4	4
2304	16	27.702	-99.754	RD 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	RD GRANDE AT APACHE RANCH	17596					4	4	4	4
2304	13	28.346	-100.310	RD GRANDE AT BEWC WEIR DAM 6 MILES SOUTH OF DELRDO, 0.6 MILE DOWNSTREAM OF CUERVO CREEK	15274					2	2	2	2
2304	13	28.663	-100.500	RD GRANDE NEAR IRRIGATION CANAL LATERAL 50 US 277 BRIDGE IN EAGLE PASS	13205			2		12	12	12	12
2304	13	28.681	-100.505	RD GRANDE US 277 AT EAGLE PASS	13206					4	4	4	4
2304	13	29.292	-100.876	RD GRANDE, 4.5 MILE DOWNSTREAM OF DEL RD AT MOODY RANCH	13560	4		2		12	12	12	12
2304	13	29.326	-100.931	RD GRANDE 12.8 MILE BELOW AMESTAD DAM, NEAR GAGE, 340 M UPSTREAM OF US 277 BRIDGE IN DELRD	13208					6	6	6	6
2304	13	29.424	-101.041	RD GRANDE 3.4 KM DOWNSTREAM OF AMESTAD DAM ABOVE WEIR DAM (BWC GAGE #08-4509.00)	15340	6	6	6		8	2	8	8
2313	13	29.331	-100.889	SAN FELIPE CREEK AT GUYLER CONFLUENCE WITH THE RD 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 DELRD (50M DOWNSTR OF US 90)	15821					2	2	2	2
2313	13	29.373	-100.885	SAN FELIPE CREEK AT WEST SPRINGS, NEAR WEST WELLS IN DELRD (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 sub-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, 2301 and 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 sub-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 and high agricultural use. Groundwater in the area is of poor quality and is of little use without expensive desalinization plants.

In 2004, increased rainfall and water deliveries from Mexico have allowed reservoirs to increase storage. Research is also being done on increased storage of the river by construction of a weir around Brownsville and groundwater desalinization in the lower valley.

Invasive aquatic weeds such as hydrilla and water hyacinth were an issue 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. Mechanical removal and biological control, using triploid grass carp, reduced the problem significantly. Heavy rains also helped push the aquatic plants into saline waters where they cannot survive. At present, the problem is not the issue that it was in 2003.

Continued maintenance and control should keep the problem from arising again.



Surveying a monitoring site with our partners 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 13 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 Anhelito 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. Sample collection at station 13180 was recently resumed in order to determine if the impairment still exists.



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

Partners

University of Texas at Brownsville – collects field data and water samples in segments 2301 and 2302

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

USGS – collects field data in segment 2302

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

Sabal Palm Audubon Center & Sanctuary - Collects field data and water samples in segment 2301 at the Sabal Palm Sanctuary.

Preliminary data suggests that there is no impairment at this site but we will collect data every month at this site for two years to determine if this is the case.

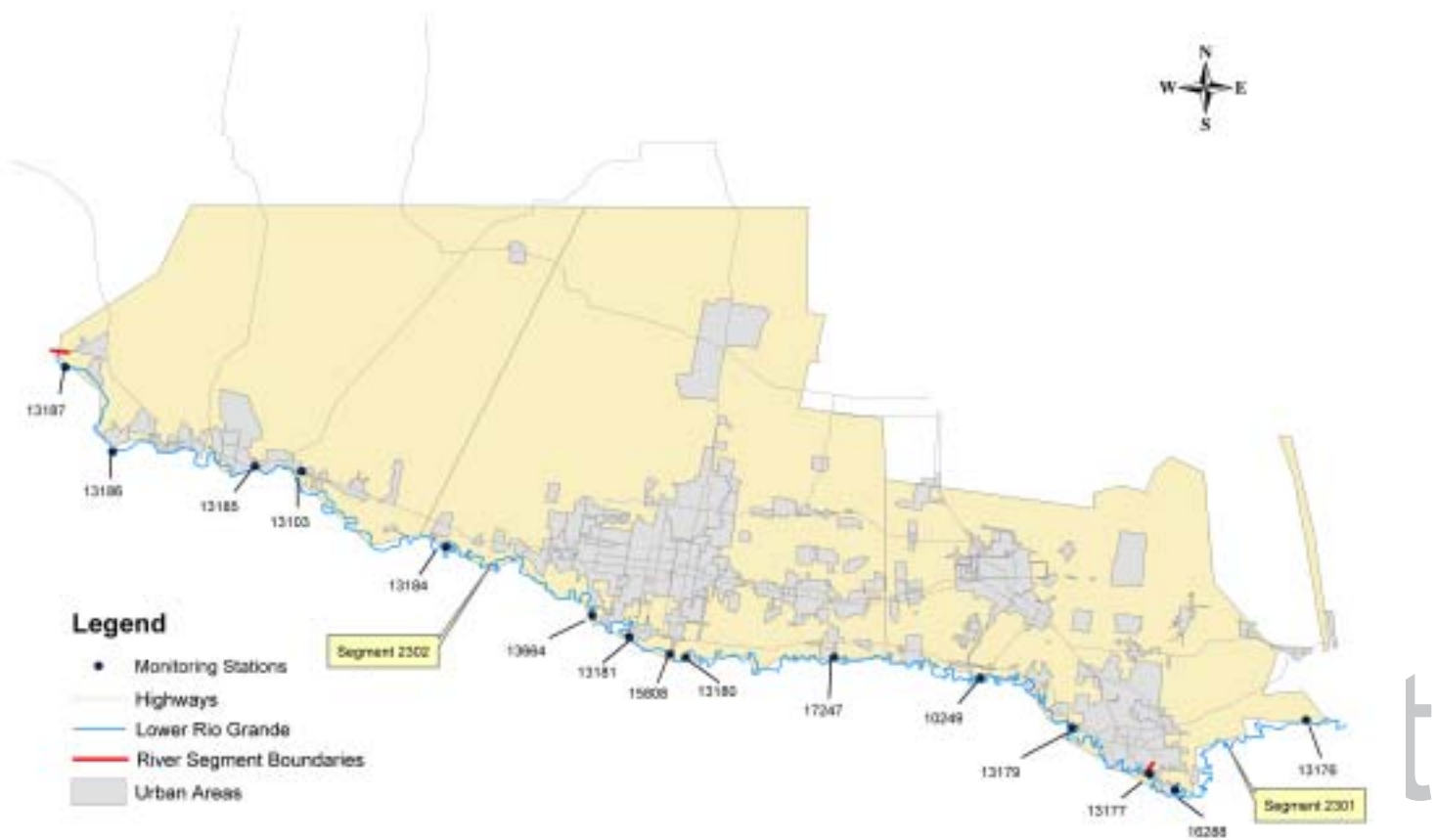
Segment 2301 extends from the confluence of the Rio Grande with the Gulf of Mexico to a point 6.7 miles (10.8 km) downstream of the International Bridge in Cameron County. This 49-mile (73-km) long segment is classified as a tidal stream and is designated for exceptional aquatic life use, contact recreation,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

Segment 2301 has one monitoring station, which will now be collected by our new partners at the University of Texas at Brownsville. The only concern at this station is excessive algal growth as indicated by periodic high chlorophyll-*a* levels. Another station has been added to this segment at the Sabal Palm Sanctuary and is going to be collected by our new partners from the sanctuary.

FY2004 Lower Rio Grande Monitoring Schedule

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	Metab Water	Org. Water	Metab Sed.	CONV	Bacteria	Fbw	FIELD
2301	15	25.962	-97.208	RD GRANDE TIDAL AT SH 4 NEAR BOCA CHICA	13176				4	4		4
2301	15	25.850	-97.414	RD 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	RD 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	RD GRANDE NEAR RIVER BEND BOAT RAMP, 8 KM WEST OF BROWNSVILLE ON US 281	13179				4	4		4
2302	15	26.030	-97.720	RD GRANDE 6.3 KM DOWNSTREAM FROM SAN BENITO PUMPING PLANT	10249				4	4	4	4
2302	15	26.063	-97.950	RD 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	RD GRANDE BELOW EL ANHELO DRAIN SOUTH OF LAS MILPAS	13180					8	8	8
2302	15	26.068	-98.208	RD GRANDE 200M UPSTREAM OF PHARR INTERNATIONAL BRIDGE (US 281)	15808	2		2	10	10	8	10
2302	15	26.096	-98.272	RD GRANDE INTERNATIONAL BRIDGE AT US 281 AT HDALGO	13181			2	10	10	10	10
2302	15	26.130	-98.330	RD GRANDE 0.5 MI BELOW ANZALDUAS DAM, 12.2 MI FROM HDALGO	13664				8	8	8	8
2302	15	26.240	-98.560	RD 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 RD GRANDE CITY	13103				4	4	4	4
2302	15	26.370	-98.860	RD GRANDE AT FORT RINGGOLD 1 MI. DOWNSTREAM FROM RD GRANDE CITY	13185				12	12	12	12
2302	15	26.393	-99.084	RD GRANDE BELOW RD ALAMO NEAR FRONTON	13186				10	10	10	10
2302	15	26.529	-99.158	RD 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 along the Pecos River 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 upstream of the confluence with the Rio Grande in 2002

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. Because of naturally high salt levels, the standards for this segment are also high, therefore, this segment is meeting its standard.

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.



The Pecos River from the US90 bridge upstream of the confluence with the Rio Grande in 2004

TCE, with support from the USIBWC and other agencies, have begun a special study in the Pecos River to determine all possible 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 returns 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.

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 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 installed two TCEQ real-time monitoring stations in the Pecos River. One of those stations was placed at an existing monitoring station near Pecos, Texas. The second was placed at a new site, adding a seventh monitoring station in this segment. The real-time stations have conductivity and pH sensors installed and one of the sites has 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.

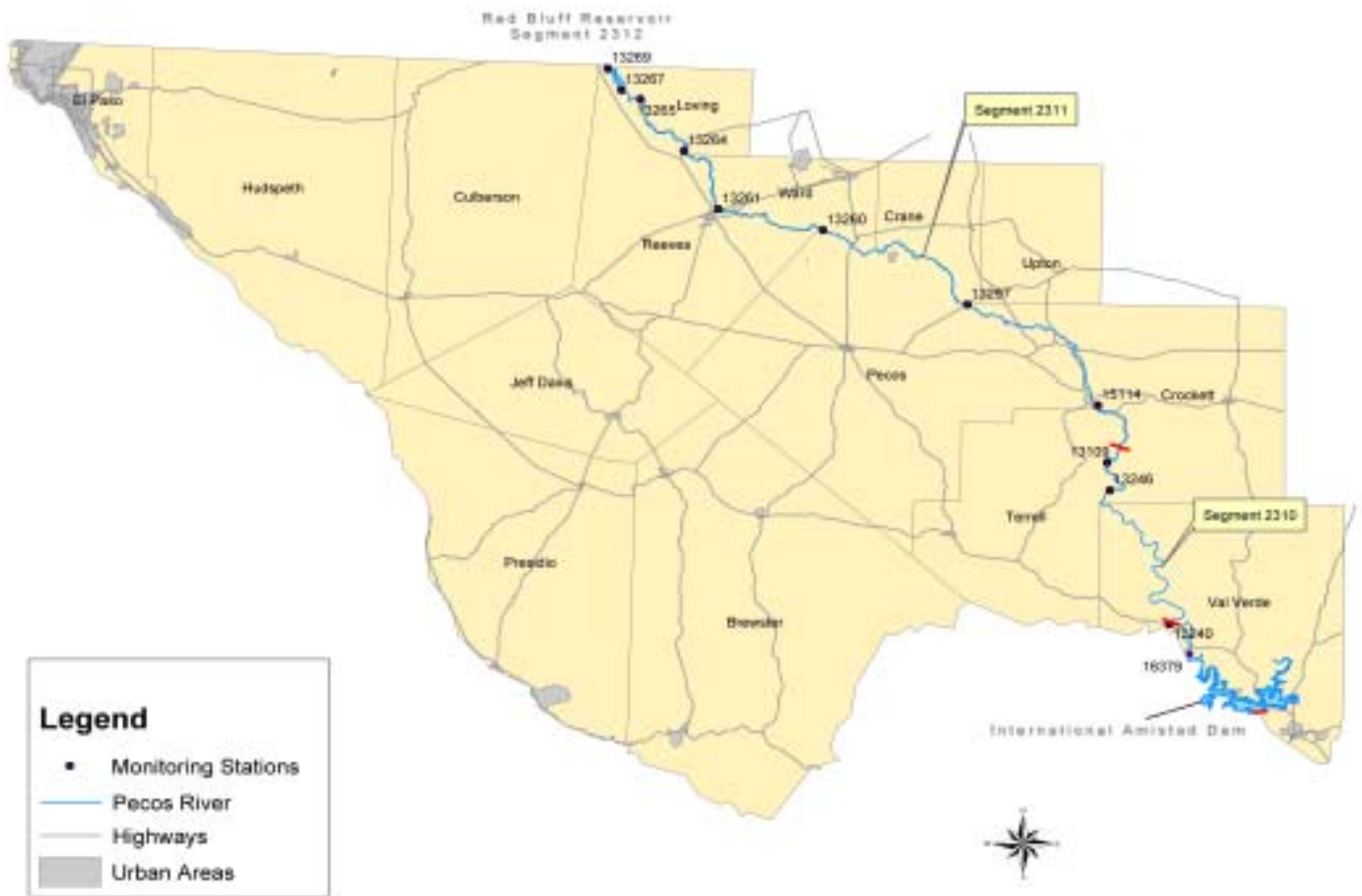
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FY2004 Pecos River Monitoring Schedule

RIVER SEGMENT	Region	LAT	LONG	STATION DESCRIPTION	STATION ID.#	24 HR DO	Metals Water	Org. Water	Metals Sed.	CONV	Bacteria	Fbw	FIELD
2310	13	29.700	-101.360	PECOS RIVER 0.7 MI DOWNSTREAM FROM US 90W IN VALVERDE 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 RD GRANDE	13240		8	8	8	8		8	8
2310	7	30.338	-101.717	PECOS RIVER 7.52 KM UPSTREAM FROM THE VALVERDE/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 GRVN	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	4	4		4

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Pecos River Monitoring Stations



Public Outreach

Basin Advisory Committee

The basin advisory committee (BAC) is a group of private 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

The USIBWC has 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 and plan to continue to expand this program throughout the basin. Texas Watch and the

USIBWC CRP have held meetings together in Laredo and McAllen to pool our resources and reach a larger group of concerned citizens in the basin. These meetings have been a huge success for the CRP. We plan to continue our partnership with Texas Watch in the coming years 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. During the past year, TCEQ and the USIBWC CRP have received over a dozen proposals for assistance with public education and outreach totalling over \$80,000 in requests. Currently, the FORG committee is reviewing the proposals and awarding assistance based on compliance with the FORG mandates, capabilities, and availability of funds.

Any group interested in partnering with the Friends of the Rio Grande can contact USIBWC Clean Rivers Program personnel. For more information, visit the FORG website at www.friendsoftheriogrande.com



The USIBWC CRP website can be found at <http://www.ibwc.state.gov/CRP/Welcome.htm>. Below is a list of the 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.

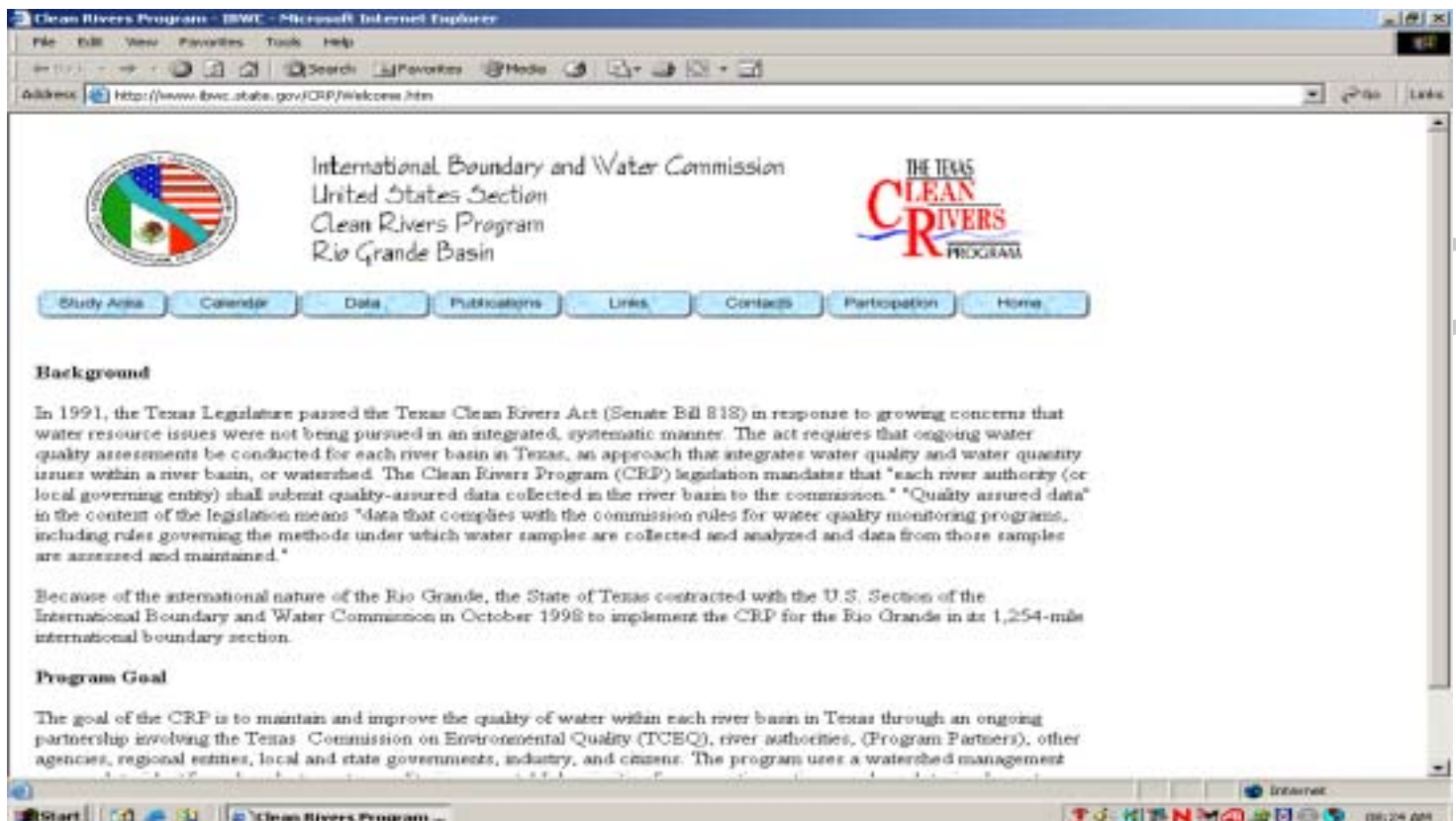
Data – USIBWC CRP Data - will take you to our water quality data page where you can acquire an Excel file of the water quality data by station since 1995. You can also get the monitoring schedule, definition of monitoring parameters, available data on metals analysis in the basin, and the laboratory 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, 2005

Upper Rio Grande basin
El Paso, TX on April 20, 2005

Middle Rio Grande basin
Laredo, TX on April 13, 2005

Lower Rio Grande basin
Harlingen, TX on April 12, 2005

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