

# Basin Highlights Report



## ◆ Nueces River Authority ◆

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May 1999

### Nueces River Authority News

#### Coastal Bend Division Continues to Grow

The Nueces River Authority (NRA) has added two full-time positions to its Coastal Bend Division office in Corpus Christi; an Information Systems Administrator and an Environmental Program Manager.

Rocky Freund is the Information Systems Administrator. She received a Masters of Science degree in Computer Science from Corpus Christi State University. She has worked for the NRA and the Clean Rivers Program (CRP) since 1994 via a contract between the NRA and the Conrad Blucher Institute for Surveying and Science at Texas A&M University-Corpus Christi (TAMU-CC). She is responsible for the database management and the geographic information system portions of the CRP.

Terri Nicolau replaces Meli Sugarek as the Environmental Program Manager. Terri received a Masters of Science degree in Biology from TAMU-CC. Terri is responsible for conducting, coordinating, and administering environmental monitoring, research, and reporting activities for the NRA Coastal Bend Division. In addition to conducting water quality and biological monitoring of rivers, streams, and estuarine waters of the Nueces River Basin, she is involved in tracking of regulatory programs related to water quality, freshwater inflows, and environmental criteria for water resource projects. She will coordinate efforts of the NRA with universities, agencies, and private entities to identify, assess, and resolve water quality concerns of the Nueces River and adjoining coastal basins.

#### Water Quality Monitoring Expertise and Assistance

The recent acquisition of sampling equipment, including a Hydrolab Data Sonde\* 4, and the addition of a biologist to the staff of the Coastal Bend Division enables the NRA to expand and develop available programs and services. In addition to the ability to provide biological and water quality monitoring and analysis, they can offer assistance in other water quality and water resource

related areas including research, planning, conservation, regulatory issues, and public outreach.

The NRA is in the early phase of revising the water quality monitoring plan in the Nueces River Basin and the Nueces Coastal Basins. The NRA is very interested in obtaining monitoring suggestions from residents in the basins. Suggestions are welcome for monitoring efforts to identify water quality problems, or for monitoring efforts to help protect good water quality. For more information, contact Terri Nicolau at 361-980-3193 or [tnicolau@falcon.tamucc.edu](mailto:tnicolau@falcon.tamucc.edu).

A detailed map and information about the active monitoring program in the Nueces River Basin and the Nueces Coastal Basins is available through the NRA web page. Information about frequency of sampling, station locations, parameters analyzed, as well as historical data is available. The information can be retrieved from: <http://www.sci.tamucc.edu/nra/nracrp.html>

#### Web Site Update

The NRA's Web Site (<http://www.sci.tamucc.edu/nra>) has been reorganized and improved. Emphasis has been placed on making the CRP data easier to access. (Follow the links to "CRP," then to "Data Access.") Users can access a list of the surface water quality monitoring stations based on county name, basin name, or segment. From these lists the users can obtain station location, description, and monitoring result information. Additional information includes a description and map of all segments and descriptions of the water quality parameters used by the Texas Natural Resource Conservation Commission (TNRCC). Similar access to the wastewater facility information within the NRA's database is also available.

Links have been added to the Data Access page to the Edwards Aquifer Authority Water Levels and Spring Flows, the Texas Watch Data Viewer, and the United

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*Receiving water assessment: Holly Hardaway, CCS and Chris Caudle, TNRCC.*

States Geological Survey Stream Flow Monitoring Stations pages.

For more information or comments concerning the web site, contact Rocky Freund at 361-980-3193 or rfreund@tamucc.edu.

### **Nueces Coastal Basins CRP Monitoring**

The NRA has been responsible for the CRP in the Nueces River Basin since the program began; in 1997 the NRA assumed responsibility of the Nueces Coastal Basins. Seeking to involve local natural resource entities in the CRP process, the NRA contacted the Center for Coastal Studies (CCS) at Texas TAMU-CC. The benefits of this association are significant cost savings to the NRA and the opportunity for graduate students to obtain funded graduate studies and gain further professional work experience.

In February 1998 Ms. Holly E. Hardaway began routine monitoring at 13 stations in the Nueces Coastal Basins in support of the CRP tasks assigned to the NRA and as her graduate thesis project for TAMU-CC. The monitoring program consists of the collection of water quality samples and biological samples. Water quality samples are either analyzed in the field, or sent to the San Antonio River Authority laboratory for further analyses. Benthic core and net samples collected at each location are returned to the laboratory at CCS for further analysis.

Benthic biota are excellent indicators of long-term water quality trends, and analysis will allow the NRA to establish a better idea of long-term impacts within the basin for each stream reach. Sample analysis by Ms. Hardaway will provide the necessary data for her thesis project.

Comparisons of the faunal assemblages and associated water quality will allow her to determine whether distinct differences or similarities exist at these varied locations within the Nueces Coastal Basin.

### **Bacteria Indicator Study in Oso Bay**

In addition to these targeted monitoring activities, specific concerns are being addressed in Oso Bay for elevated fecal coliform densities. This monitoring effort consists of a twelve month sampling program for various indicator bacteria including fecal coliforms, enterococci, *E. coli* and total coliforms. In June 1998, Ms. Sara Heilman began collecting and analyzing bacteria samples from four locations within Oso Bay as part of her graduate thesis project. The objectives were to determine the levels of these indicator bacteria in Oso Bay and to assess each for performance as an indicator group in an estuarine system.

Weekly samples were collected for the first 15 weeks; and subsequent samples are to be collected twice a month for the remainder of the year. The comparison of the four different indicator bacteria will address the issue of which is the most appropriate indicator for marine recreational waters in this region.

Several criteria will be used to evaluate the indicators, including seasonal fluctuations, levels in relation to standards for contact recreation, and relationship with factors such as salinity and temperature. Comparative information is necessary to determine the best indicator to use when addressing public health issues in contact recreational waters and for making water resource management decisions.

### **RWA for San Fernando Creek**

The NRA contracted with TAMU-CC to perform a receiving water assessment (RWA) of San Fernando Creek. The assessment was completed on 12/17/98 in a cooperative effort with the TNRCC Regional Office - Corpus Christi. RWAs are conducted primarily on unclassified

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streams to determine the appropriate aquatic life use classification. The assessment is based on physical, chemical, and biological characteristics of the stream. The TNRCC has identified San Fernando Creek as a receiving stream that could benefit from additional site-specific water quality information. The information gathered will be used during the next permitting process for the Naval Air Station discharge. Previously the TNRCC had to use default conditions during the permitting process for the Naval Air Station.

The data is still being reviewed by the TNRCC, and an aquatic life use classification has not yet been determined. The data collected on the stream geometry has already been used to update the water quality model of the segment.

### Regional News

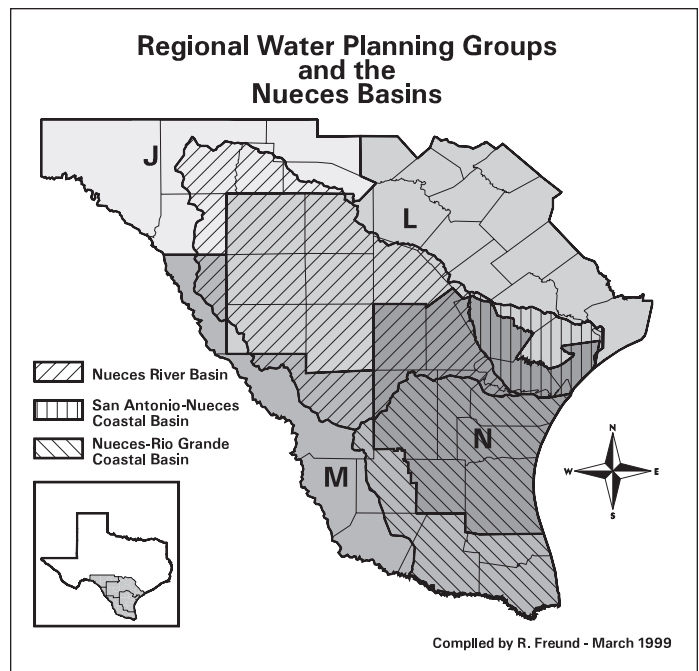
#### Update on SB 1 Regional Water Planning for the Nueces River Basin

The Texas legislature passed Senate Bill (SB 1) in 1997 requiring the development of regional water plans in 16 regions covering all of Texas. The regions boundaries were drawn by the TWDB. Each region has a Regional Water Planning Group (RWPG) charged with the development of a regional water management plan. The watersheds of the Nueces River Basin and the adjoining coastal basins span four different regions for SB 1 water planning purposes (see map). The four regions and RWPG's are: Region J — Edwards Plateau RWPG; Region L — South Central Texas RWPG; Region M — Rio Grande Valley RWPG; and Region N — Coastal Bend RWPG. All four regions have completed the process of developing a scope of work and securing funding from the Texas Water Development Board (TWDB) for the development of the regional water management plan for their region. A draft water management plan for each region must be submitted to TWDB by June 1, 2000.

Because SB 1 recognized that the quantity of water available for these planning regions in the future is, in part, dependent on the quality of the water available, TWDB rules provide that regional water planning programs must coordinate activities with the CRP. In the

Nueces River Basin and the adjoining coastal basins, this coordination is facilitated by the fact that the Coastal Bend Division of the NRA is administering both the CRP and the regional water planning program for the Coastal Bend RWPG. Additional coordination between the CRP and the SB 1 regional water planning is facilitated by the fact that the NRA is well represented on several other RWPG's.

Mr. Con Mims, Executive Director of the NRA, serves as a "River Authority" representative on the South Central Texas RWPG, and Mr. Ariel Garcia, President of the Board of Directors of the NRA, is the "River Authority" representative on the Coastal Bend RWPG. In addition, Mr. Scott Bledsoe, III, a member of the Board of Directors of the NRA and President of the Live Oak Underground Water Conservation District, serves on the Coastal Bend RWPG to represent "Water Districts." Coordination between regions is provided by exchanging liaisons, or non-voting members, between adjacent RWPG's. For example, Mr. Mims is the liaison for the South Central Texas RWPG to the Coastal Bend RWPG, and, in turn, Mr. Bledsoe is the Coastal Bend RWPG liaison to the South Central Texas RWPG.



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### Flow Events on the Nueces River— 1998

Like much of the rest of the state, the Nueces River Basin was in a severe drought for the first nine months of 1998. United States Geological Survey stream flow gages on the Nueces River at Tilden registered no flow for three consecutive months — May through July, 1998. Total inflows to the Choke Canyon/Lake Corpus Christi (CC/LCC) reservoir system for this same period amounted to only 210 acre-feet. Rainfalls associated with several tropical weather systems in August, September and October, 1998 that caused serious flooding in adjoining river basins generated significant flows in the Nueces River Basin but caused little flood damage. These flows provided relief from the drought conditions and increased the CC/LCC reservoir system storage from 36.4% of total system storage capacity at the beginning of August to 58.8% of total capacity by the end of November.

### Water Supply

The City of Corpus Christi sponsored a study to update and analyze streamflow records in the Nueces River Basin to investigate the impact of the 1992-1997 drought on water supplies in the CC/LCC reservoir system. Results indicate that the drought of the 1990's is the new critical period for this reservoir system, surpassing the previous droughts of the 1950's and 1960's both in terms of severity and duration. The use of this new "drought-of-record" in calculating water availability results in a reduction in dependable reservoir system yield of about 2.5 percent.

On the bright side, the Coastal Bend area achieved a major milestone in the development of a dependable, long-term regional water supply with the completion of the 100-mile Mary Rhodes Memorial Pipeline project which conveys water from Lake Texana to the Corpus Christi area. This project stemmed from several recent regional water supply planning efforts designed to identify and develop additional water sources for the region that currently depends on the CC/LCC reservoir system. Recognizing the limitations of water supplies available from within the Nueces River Basin, planners recommended that the region enter into water purchase agreements and acquire water rights from sources outside the Nueces River Basin. The purchase of water from Lake Texana, owned by the Lavaca-Navidad River Authority,

and the construction of the Mary Rhodes Pipeline is the first step, providing up to 41,840 acre-feet of water per year to for the Corpus Christi service area. Construction of the pipeline was accomplished through a partnership of the NRA, the City of Corpus Christi, and the Port of Corpus Christi Authority.

Another step in the process was completed in October, 1998, when the TNRCC granted a permit for the inter-basin transfer of another 35,000 acre-feet per year of water rights in the Colorado River that the City of Corpus Christi purchased from the Garwood Irrigation Company. These two new sources of water are expected to meet municipal and industrial water demands in the Corpus Christi service area for the next 30 to 40 years.

### Coastal Bend Bays and Estuaries Program

The Coastal Bend Bays and Estuaries Program area includes a large portion of the Nueces Coastal Basins and the southeastern portion of the Nueces River Basin. The following are brief summaries of some of the CBBEP's FY '98 and '99 Projects.

#### Oso Creek / Falcon Park Wetland

The City of Corpus Christi has acquired property in Falcon Park along Oso Creek. The CCBEP will facilitate pedestrian access and interaction with created and natural wetlands and uplands by developing low impact trails using recycled materials. Native vegetation will be planted in the currently unvegetated areas surrounding the park to filter urban runoff from the adjacent neighborhood.

#### Atmospheric Deposition Study

The CCBEP collected atmospheric deposition data for a one-year period at two sampling stations on the shores of Corpus Christi and Nueces Bays. Data of selected contaminants will be used to understand the relative atmospheric contributions of trace elements and nutrient inputs to Corpus Christi Bay. Results will be used to render more accurate Event Mean Concentration values used in a Total Loadings model which in turn shall assist in making informed management decisions.

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## Information Clearinghouse

The goal of the Information Clearinghouse is to make regional information accessible and easily searchable for the general public, resources managers, and policy makers. The primary purpose of the present contract is to develop an Internet Map Server. Rocky Freund of the NRA is a member of this workgroup.

## Assistance to Coastal Bend Land Trust

This project is designed to establish a "Land Trust Fund" for the dedicated purpose of habitat protection and to jump start the Land Trust implementation strategy by supporting a series of workshops held throughout the region having the focus of educating landowners, farmers, and developers about the benefits involved in the various Land Trust Mechanisms.

## Recreational Water Quality

The project will establish a contact recreation workgroup to discuss and guide a regional approach to health protection. Additional water quality monitoring will also focus on wet and dry weather conditions in high use areas. Data collected will support development of a predictive model to ensure adequate public health protection during all conditions throughout the region.

## Riparian Corridor Assessment and Habitat

The project will convene a group of experts in wildlife/conservation biology who will determine selection criteria and priorities for habitat protection with a focus on riparian corridors. The group will consider multispecies trophic interactions and the needs of 'species of concern. Riparian corridor habitat will be assessed with finer resolution through a combination of remote sensing, and ground truthing or alternative methods. A final assessment will identify goals, strategies, implementing partners, and a list of habitat protection projects with success potential.

## Small-city Stormwater Planning and Technical Assistance

This project will provide assistance to three counties and four cities in the project area that are subject to TPDES stormwater regulations. The assistance will be in the form of workshops, education, and technical assistance.

## Coordination of Regional Shoreline Management

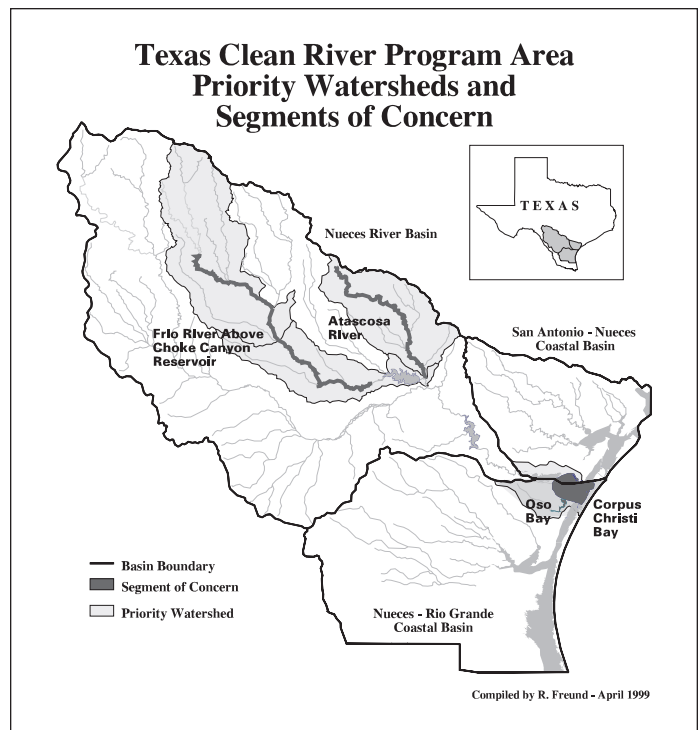
This project will begin to implement Action SM-2 of the Bays Plan, "Assist local governments with shoreline management issues." Workshops will be held to form a Regional Shoreline Advisory Council. The council will oversee the development of a handbook on the subject of "Guidelines for shoreline management for use by local governments."

## Beneficial Uses of Dredged Material

This project will assist in the development of long-term plans for dredged material for the Gulf Intra-coastal Waterway and the Corpus Christi Ship Channel. The intended outcome will be the establishment of guiding principles and potential beneficial uses, and the development and prioritization of a list of site-specific projects (and funding sources) for which consensus can be achieved.

## Assistance to Local Governments on OSSF Programs

This project will assist in the design and implementation of a regional On-Site Sewage Facility program that will seek to identify failing systems, potential funding



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sources, and implement local management plans and improved tracking systems.

### Aransas Causeway Master Public Access Improvement Plan

This project is to develop a master plan for the Aransas Causeway and adjacent environs through a landowner, business owner, and other stakeholder participation process.

For more information on these and other programs sponsored by the CBBEP, contact Jeff Foster at 361-980-3420 or [jfoster@tnrcc.state.tx.us](mailto:jfoster@tnrcc.state.tx.us).

### Impaired Water Bodies and 303(d) List

The TNRCC carries out a regular assessment to identify water bodies that do not meet the water quality standards. The results of this assessment are published in The State of Texas Water Quality Inventory, or Clean Water Act (CWA) Section 305(b) Report. The 305(b) Report and other available data and information on water quality are then used to produce The State of Texas List of Impaired Water Bodies, or CWA Section 303(d) List.

This List identifies:

- ✓ water bodies which do not meet the standards set for their use, or are expected not to meet their use in the near future.
- ✓ pollutants that are responsible for the failure of a water body to meet standards.
- ✓ water bodies that are targeted for clean-up activities within the next two state fiscal years.

The TNRCC expects to finalize the 1999 303(d) list by April. A map of all the segments listed in Nueces River Basin and adjoining coastal basins can be found at [www.sci.tamucc.edu/nra/gifs/segments.gif](http://www.sci.tamucc.edu/nra/gifs/segments.gif). The following paragraphs give a brief justification for each segment on the list. The NRA's priority segments are shown in figure 2.

### Aransas River Above Tidal

The average concentrations of sulfate and total dissolved solids exceed the criteria established to safeguard general water quality uses.

### Petronila Creek Above Tidal

The average concentrations of chloride, sulfate, and total dissolved solids exceed the criteria established to safeguard general water quality uses.

### Choke Canyon Reservoir

In the upper portion of the reservoir, bacteria levels sometimes exceed the criterion established to assure the safety of contact recreation.

### Frio River Above Choke Canyon Reservoir

In 75 miles from FM 1581 in Frio County downstream to the end of the segment, dissolved oxygen concentrations are occasionally lower than the standard established to provide optimum conditions for aquatic life. In a 50-mile portion of the segment from 5 miles east of Fowlerton in LaSalle County to FM 1581 in Frio County, bacteria levels sometimes exceed the criterion established to assure the safety of contact recreation.

### Nueces River Above Frio River

In the lower 25 miles downstream of FM 624 in McMullen County, dissolved oxygen concentrations are occasionally lower than the standard established to provide optimum conditions for aquatic life. Measured pH values occasionally exceed the criterion established safeguard general water quality uses.

### Atascosa River

In the 25 miles downstream of State Highway 16 in Atascosa County, dissolved oxygen concentrations are sometimes lower than the standard established to ensure optimum conditions for aquatic life. In the same 25 miles, bacteria levels sometimes exceed the criterion established to assure the safety of contact recreation.

### Upper Frio River

In the lower half of the segment, dissolved oxygen concentrations are occasionally lower than the standard established to ensure optimum conditions for aquatic life.

### Lower Sabinal River

Bacteria levels sometimes exceed the criterion established to assure the safety of contact recreation.

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### St. Charles Bay

Based on Texas Department of Health shellfish maps, 51.5% of the bay (6.7 sq. mi. of the northern half, tributary and marsh drain) does not support the oyster water use. The remaining 48.5 % of the bay (6.4 sq. mi.) fully supports the oyster water use. Non-supporting areas are restricted or prohibited for the growing and harvesting of shellfish for direct marketing due to potential microbial contamination.

### Corpus Christi Bay

Based on Texas Department of Health shellfish maps, 13.0% of the bay (16 sq. mi. near Corpus Christi) does not support the oyster water use. The remaining 87.0% of the bay (107.1 sq. mi.) fully supports the oyster water use. Non-supporting areas are restricted or prohibited for the growing and harvesting of shellfish for direct marketing due to potential microbial contamination.

### Nueces Bay

Based on Texas Department of Health shellfish maps, 100.0% of the bay (28.9 sq. mi.) does not support the oyster water use. Nueces Bay is restricted for the growing and harvesting of shellfish for direct marketing due to zinc in oyster tissue.

### Oso Bay

Throughout most of the bay, dissolved oxygen concentrations are occasionally lower than the standard established to provide optimum conditions for aquatic life. Based on Texas Department of Health shellfish maps, 100.0% of the bay (7.2 sq. mi.) does not support the oyster water use. Non-supporting areas are restricted or prohibited for the growing and harvesting of shellfish for direct marketing due to potential microbial contamination.

### Aransas Bay

Based on Texas Department of Health shellfish maps, 7.8% of the bay (6.8 sq. mi. along the northern edge of the bay and Rockport) does not support the oyster water use.. The remaining 92.2% of the bay (81.0 sq. mi.) fully supports the oyster water use. Non-supporting areas are restricted or prohibited for the growing and harvesting of shellfish for direct marketing due to potential microbial contamination.

### Copano Bay/Port Bay/Mission Bay

Based on Texas Department of Health shellfish maps, 20.6% of the bay (13.4 sq. mi. near the Intra-coastal Waterway, shoreline, and Aransas/Mission Rivers) does not support the oyster water use. The remaining 79.4% of the bay (51.8 sq. mi.) fully supports the oyster water use. Non-supporting areas are restricted or prohibited for the growing and harvesting of shellfish for direct marketing due to potential microbial contamination.

### Hynes Bay

Based on Texas Department of Health shellfish maps, 8.5% of the bay (10.2 sq. mi. at the north end of the bay near the San Antonio and Guadalupe River confluences and the area adjacent to Seadrift ) does not support and 50.9% of the bay (60.8 sq. mi. of the area south of the non-supporting area, including Hynes Bay up to the Intracoastal Waterway) partially supports the oyster water use (L/NS/PS). The remaining 40.6% of the bay (48.5 sq. mi.) fully supports the oyster water use. Partially supporting areas are conditionally approved for the growing and harvesting of shellfish. Non-supporting areas are restricted or prohibited for the growing and harvesting of shellfish for direct marketing due to potential microbial contamination.

### Conn Brown Harbor (unclassified water body)

In the harbor area, dissolved oxygen concentrations are sometimes lower than the standard established to provide optimum conditions for aquatic life.

### No concern for copper in Corpus Christi Bay

The 1999 draft 303(d) list includes Corpus Christi Bay for elevated levels of dissolved copper. Five measurements collected over a period of five years were available to determine compliance with stream standards. Because of the potential restrictions to port industries discharging to Corpus Christi Bay, the Port Industries of Corpus Christi and the NRA organized a group to address this concern. The group realized that additional data was needed, and was successful in obtaining a large data set of copper data in Corpus Christi Bay from the United States Army Corps of Engineers. The data did not support the TNRCC conclusion, and indicated levels below the criteria. Further review of the data used by the TNRCC revealed quality control problems with the sample for

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which the highest concentration was reported. Based on the USACE data and the quality control problems with the TNRCC data, the Port Industries and the NRA requested that Corpus Christi Bay not be included on the final 303(d) list. The TNRCC has agreed with the conclusion and indicated that it will remove the segment of the list.

### **Project to Assess Oso Creek/Oso Bay (Revised)**

As recommended by the Coastal Coordination Council (CCC) in FY 1998 and in collaboration with the Texas General Land Office (TGLO), the TNRCC is utilizing CZARA 309 Grant dollars through NOAA to fund Total Maximum Daily Load projects in certain coastal watersheds identified in the 1998 303(d) list. 309 Enhancement Grants are federal funds allocated to the TGLO with no state matching funds required. TGLO is responsible for outsourcing the funds and obtaining signed contracts to execute the work. TNRCC will be responsible for contract oversight and approval of deliverables.

The Center for Coastal Studies at Texas A&M University-Corpus Christi has proposed to use CCC approved 309 Grant funds to investigate water quality issues in the Oso Creek/Oso Bay system in the Corpus Christi area. The main objective of this project is to provide an intensive water quality monitoring and biological assessment of the Oso Creek/Oso Bay Watershed. The project objective is in support of the Coastal Bend Bays and Estuary Program's comprehensive conservation and management plan, titled the Coastal Bend Bays Plan.

Oso Bay (Segment 2485) is an enclosed, secondary bay located on the southern shore of Corpus Christi Bay that exchanges water only with Corpus Christi Bay and receives freshwater inflows only from Oso Creek (undesignated). This unique urban watershed is highly productive, yet subject to both natural and anthropogenic stresses that impact water quality. This project will address the conclusions of the June 26, 1998 final 303(d) list and the 1996 TNRCC Regional Assessment of Water Quality in the Nueces Coastal Basins report. Both documents list this segment as an impaired water body with identifiable "concerns" and "possible concerns" for various water quality standards.

The specific focus of this project will be to identify the causes and sources of low dissolved oxygen levels which impair the aquatic life use. Plans provide for eight fixed monitoring stations for routine monthly and storm event sampling, and systematic monitoring for collection and analysis of macroinvertebrate organisms. An eight month monitoring effort is anticipated. This project will provide information necessary for the development of a total maximum daily load (TMDL) for dissolved oxygen.

The TNRCC is currently undertaking the development and implementation of TMDLs for water bodies identified on the 303(d) list. Development and implementation of TMDLs is one means by which the Texas Coastal Management Program will meet the state coastal non-point pollution control requirements of section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

### **Acknowledgment**

This document was prepared in cooperation with the Texas Natural Resource Conservation Commission under Authorization of the Clean Rivers Act.

### **Contact**

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