

**Proposed FY 2010**

**Comprehensive Annual Work Plan**

**Recommended by**

**CBBEP Bays Council**



**August 2009**

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**Project # 1001      Hydrodynamic Model for the Nueces Delta**

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**Performing Organization:**                    **University of Texas**  
**Total Project Funding:**                    **\$295,220** (Grant from City of Corpus Christi and  
USACOE)  
**CBBEP Bays Plan Actions:**                **FW-1, FW-2, FW-3, FW-4**

**Background:**

The purpose of this project is to (1) conduct field research to establish how the principal ecological communities in the Nueces Delta respond to water flow, elevation and salinity, and to establish an empirical basis for predicting ecological responses to upstream changes in water supply, local diversion efforts and/or restoration interventions; and (2) develop a hydrodynamic model necessary to understand the transport of water through the Nueces River Delta located near Corpus Christi, Texas.

This project is part of the U.S. Army Corps of Engineers (USACOE) catchment-to-estuary restoration efforts for the Nueces River and its tributaries. The focus on the present project is in the field research to establish how the principal ecological communities in the Nueces Delta respond to water flow, elevation (i.e., inundation) and salinity, and to establish an empirical basis for predicting ecological responses to upstream changes in water supply, local diversion efforts and/or restoration interventions.

This work will be closely coordinated with a separate project by the Harte Research Institute for the Gulf of Mexico Studies to develop an ecological model of the vegetation community responses to changes in the physical regime.

**Objectives:**

- 1) Perform field work to estimate the distribution of vegetation assemblages in the Rincon Delta by species, cover, and biomass;
- 2) Perform field experiments to determine the response of the predominant species assemblages to pore-water salinity and nutrient inputs;
- 3) Quantify gross photosynthesis, and its seasonal and geographical variation in predominant species.
- 4) Develop computational models of key physical fluxes through the Delta (water levels, salt and temperature).
- 5) Conduct the data collation, collection and analysis necessary to build these foundational models.

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**Project # 1002 Matagorda Island Marsh Restoration – Implementation Phase 3**

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**Performing Organization:** Aransas National Wildlife Refuge - USFWS  
**Total Project Funding:** \$190,000  
(\$116,000 CBBEP + \$74,000 grant from USFWS-Coastal Program)  
**CBBEP Bays Plan Actions:** HLR-2

**Background:**

Matagorda Island National Wildlife Refuge consists of more than 56,000 acres along 38 miles of the Texas coast, between the cities of Port O'Connor and Fulton. Habitat types within the refuge include beaches, sand dunes, grasslands, and tidal marshes. An estimated 15,000 acres of marsh on Matagorda Island were negatively impacted when, from the early 1960s to the late 1970s, large portions of the marsh were sectioned off, blocked with levees, drained, and utilized for cattle production. Since the 1970s, multiple culverts installed throughout the marsh have failed, resulting in the continued degradation of natural flow/circulation patterns, marsh habitat, wildlife abundance and diversity, and water quality.

Over the course of FY 2007, FY 2008, and FY 2009, CBBEP has contributed \$417,000 towards work on Matagorda Island, which has been matched by over \$400,000 cash and \$75,000 in-kind contributions from project partners. These funds allowed for the 1) development and update of an Adaptive Management Plan (AMP), 2) installation of 17 monitoring stations, and 3) removal of obstructions to water circulation and/or installation of water flow structures at 8 sites, enhancing water circulation to approximately 3,000 acres of marsh and adjacent habitat.

This project will implement the third round of restoration actions within Matagorda Island's Western Marsh in accordance with the Matagorda Island Adaptive Management Plan

**Objectives:**

- 1) Remove obstructions to water circulation and/or install water flow structures at a minimum of 3 sites, in accordance with the AMP.
- 2) Maintain, relocate, and install new monitoring stations as needed to assess improvements to water circulation, in accordance with the AMP.

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**Project # 1003      Colonial Waterbird Management**

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**Performing Organization:**            **CBBEP**  
**Total Project Funding:**            **\$175,000**  
**CBBEP Bays Plan Actions:**        **HLR-1, HLR-4**

**Background:**

The Living Resources Characterization Report prepared for the Estuary Program documented the declining populations of certain colonial waterbird populations. Some species of colonial waterbird have experienced a 90% reduction in breeding pairs since the 1960's. Colonial waterbird populations are indicators of the overall health of the estuary. Bird watching, especially viewing colonial waterbirds, is an important and growing component of ecotourism and the local economy.

Building on the efforts of the CBBEP Colonial Waterbird projects in previous years, this project will continue the implementation of specific management actions of the *CBBEP Colonial Waterbird Rookery Island Management Plan*. Management actions will include efforts to reduce human-disturbance, nesting substrate management, vegetation management to enhance rookery island habitat, and predator control where necessary. Outreach will continue to be a crucial component in achieving project objectives.

**Objectives:**

- 1) Continue efforts on enhancement and construction of nesting habitat.
- 2) Continue to promote public programs to protect colonial waterbirds.
- 3) Assist in efforts to note fluctuations of colonial Waterbird populations for management purposes.
- 4) Install signage to reduce impacts of human disturbance on waterbird colonies.
- 5) Implement predator control efforts.

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**Project # 1004 Coastal Bend Environmental Science – Learning on the Edge (LOTE)**

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**Performing Organization: CBBEP**  
**Total Funding: \$ 140,000**  
**CBBEP Bays Plan Actions: PEO-2, PEO-3, PEO-5**

**Background:**

The CBBEP's Environmental Education & Outreach Implementation Team (EEOIT) identified challenges that teachers face as they embark in meeting the Texas Education Agency's (TEA) established Texas Essential Knowledge and Skills (TEKS) state requirements. Teachers teaching science in the primary schools are often ill-equipped to instruct students in the sciences resulting in area students receiving low scores on the Texas Assessment of Knowledge and Skills (TAKS). CBBEP has developed a program to be delivered by the CBBEP Environmental Educator titled "Coastal Bend Environmental Science: *Learning on the Edge*". This program is specifically designed to provide the following:

**Objectives:**

The objective of this project is aid teachers in the community to increase their knowledge, skills and provide resources to more effectively teach science to their students in local schools.

**Summer Teacher Academy**

The CBBEP Environmental Educator will deliver a locally based environmental science curriculum and provide training to area teachers by integrating some of the Program's well-regarded science education programs. The educator will provide training to teachers in the use of the curriculum through interactive sessions, encouraging them to go beyond what conventional textbooks currently provide. The educator will demonstrate the use of the curriculum materials so teachers can observe the actual presentation of the material to real students. This program is designed to target Grades 3-8 to support preparation for the state-mandated TEKS assessment in Grades 5 - 8. The summer workshops may include delivery of the *Kritters 4 Kids* curriculum that teaches school children about the importance of wildlife and habitat, the threat of urbanization, local ecosystems, and food webs. Additionally, the program will provide teachers several teaching tools such as thermometers, magnifying glasses, bug jars for use in their classroom and in the field.

**In-classroom Curriculum and Field Trips to the Nueces Delta Preserve**

This project will address the gap that exists between the delivery and implementation of new curriculum by teachers. Follow-up visits to assist teachers further with implementation of the curriculum in their classrooms would be conducted throughout the school year by the Environmental Educator. Teachers will be invited to participate in CBBEP coordinated field trips to area sites that provide them and their students hands-on experiences in the local environment.

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**Project # 1005      CBBEP Habitat Protection Media Campaign**

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**Performing Organization:**            CBBEP  
**Total Funding:**                    \$ 35,000  
**CBBEP Bays Plan Actions:**        BTR-1, PEO-2, PEO-3, PEO-5

**Background:**

Public outreach continues to be a key element of the CBBEP to educate Coastal Bend residents about the importance of bays and estuaries to their communities. The CBBEP will utilize local and regional media, which includes television, radio, print, and websites, to implement the goals of the CBBEP Public Outreach Strategy. The priority issues for this media campaign as identified in the *Coastal Bend Bays Plan* are:

- Altered Freshwater Inflow Into Bays and Estuaries
- Non-point Source Pollution
- Loss of Wetlands and Estuarine Habitats - Degradation of Water Quality
- Condition of Living Resources
- Altered Estuarine Circulation
- Public Health Issues

Some or all of the priority issues listed above will be considered for public outreach through media.

**Objectives:**

Use the media to provide the public with the environmental science knowledge to make sound decisions regarding the effective management of bay resources and to promote environmental stewardship through increasing awareness of the resources and the issues regarding their use.

**Performing Organization:**            **CBBEP**  
**Total Funding:**                        **\$12,000**  
**CBBEP Bays Plan Actions:**        **BD-1**

**Background:**

Bay debris poses public health risks and reduces the aesthetic appeal of the bay system. It can degrade habitats, snare aquatic and wildlife species. These impacts result in costs: to the shrimper who tears his net by hanging up on debris; to the windsurfer who steps on a broken bottle; to the tourist industry when hotel rooms are unfilled because potential visitors would rather visit cleaner beaches; and to agencies and organizations who devote thousands of hours to cleaning the beaches along the bays.

Debris clean-up along the shoreline is a continual challenge along the Texas Coastal Areas. Every year, numerous clean-up events are coordinated and hundreds of tons of debris are collected and disposed. During certain periods of the year, heavy visitation by tourists results in overflowing garbage receptacles causing debris to be spread over large areas. Additionally, frustrated beach goers leave debris behind, not willing to transport it with them to their lodging site. Since prevention is generally more cost-effective than clean-up, CBBEP will approach this issue by strategically placing large garbage receptacles by request and in areas of high use to prevent debris from being mismanaged and ending up along the bay shorelines.

The CBBEP will also make dumpster service available upon request for Coastal Cleanups. The CBBEP will base the determination of which cleanups to provide dumpsters to on the amount of project funding available.

**Objectives:**

- 1) To reduce the amount of debris along coastal roadsides and shorelines by the placement of large garbage receptacles in strategic locations during the three critical high traffic weekends of 2010 (Memorial Day, Fourth of July, and Labor Day):
  - Lighthouse Lakes Kayak Park
  - Padre Island (exact location TBD)
  - Clem's and Billing's Marina
  - Other locations if necessary
- 2) The CBBEP will also make dumpster service available upon request for Coastal Cleanups. Some examples of possible partners are the City of Corpus Christi Spring Break cleanup, TGLO Adopt a Beach, and other organized coastal clean ups. The CBBEP will determine which cleanups to provide dumpsters to based on the amount of project funding available.
- 3) To work with the City of Aransas Pass to install permanent trash receptacles along the Redfish Bay Causeway in areas where the public historically accesses the water.

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**Project # 1007**

**Nueces County Packery Channel Nature Park Kayak Launch  
& Bird Observation Area**

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**Performing Organization:** Nueces County & CBBEP  
**Total Funding:** \$47,000  
**CBBEP Bays Plan Actions:** BTR-2, PEO-2

**Background:**

Nueces County has developed a master plan for the Packery Channel Nature Preserve Park. This plan, which has been developed in coordination with Texas Parks and Wildlife Department, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Audubon Outdoor Club, Coastal Bend Bays and Estuaries Program, local conservationists, the County, and the public, is a comprehensive park development Master Plan to accomplish and guide the mission, goals, and objectives for this Nature Park. The Master Plan identifies the existing site conditions, current land use, proposed habitat restoration and enhancement opportunities, park improvements, the development of a Habitat Conservation Management Plan, and provides a framework for development and funding of the Nature Park.

Nueces County owns, operates, and manages the 20-acre Packery Channel Nature Preserve Park (Nature Park). The park site is located on Padre Island just off of Park Road (PR) 22 between the JFK Causeway and State Highway 361 in Nueces County, Texas. The County's mission for this 20-acre public Nature Park is to enhance/restore an ecological resource on the North Padre-Mustang Island "barrier island", to provide environmentally conscious stewardship for passive public recreational access, and to provide significant educational outreach opportunities with emphasis on the protection, restoration, enhancement, and preservation of the barrier island natural resources.

The proposed Kayak Launch and Bird Observation Public Access Facilities are consistent with the Packery Channel Nature Preserve Park Master Plan, and is one of Nueces County's first steps to accomplish this new regional program and initiative involving improved public access, education, and preservation of coastal natural resources through restoration, enhancement, and protection of wildlife habitat and aquatic and marine ecosystems occurring on County public lands on North Padre-Mustang Island.

As part of the improvements envisioned in the County Packery Channel Nature Preserve Park Master Plan, the County is requesting CBBEP funds for improved public access facilities including a bird observation deck, designated kayak launch area with bollards, and covered picnic tables. These facilities would be proposed along Packery Channel.

**Objectives:**

- 1) Construct a covered observation deck and walk way out of treated timber.
- 2) Construct a Kayak Launch by improving existing launch area.
- 3) Install covered picnic tables.
- 4) Make improvements to existing access roadway.

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**Project # 1008      Oso Bay/ Mud Bridge Public Access Management - Phase II**

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**Performing Organization:**            **CBBEP**  
**Total Funding:**                    **\$20,000**  
**CBBEP Bays Plan Actions:**        **BTR-2, BD-1, HLR-1**

**Background:**

The Yorktown Boulevard Bridge over Oso Bay, commonly referred to as Mud Bridge, is an access spot for area residents to fish and recreate from the shores of Oso Bay. Anglers often pull off the road and drive on the mud flats to target fisheries at the outfall of the Barney M. Davis Power Plant's cooling reservoir and points beyond. Others use the site as a 4x4 recreation site, damaging mudflats and vegetation common to the area. Illegally dumping of large household garbage (such as old appliances, dilapidated vehicles, etc.) further degrades land around the site.

This area is a common feeding ground for the Reddish Egret and loafing ground for shore birds such as the Snowy Plover. Estimates of greater than 100 acres of state-owned mudflats on the southeast and southwest side of Mud Bridge have been negatively impacted for years. This continued degradation of the marsh habitat affects wildlife abundance, diversity, and water quality.

**Objectives:**

- 1) Continue public access management project to the Flour Bluff side of Mud Bridge.
- 2) Identify and protect priority habitats, natural tidal mud flats, and marsh habitat from vehicular access.
- 3) Create ecologically safe public access opportunities at the site that provides the greatest ecological benefit and still allows access to all users.

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**Project # 1009      Nueces Delta Preserve Facilities Improvements**

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**Performing Organization:**            **CBBEP**  
**Total Funding:**                        **\$45,000**  
**CBBEP Bays Plan Actions:**        **BTR-2, PEO-3**

**Background:**

CBBEP Nueces Delta Preserve Estuary Learning Center is located on a 1432 acre tract of land that is included within the 5400 acre Nueces Delta Preserve. Over the past three years the CBBEP has been developing the Estuary Learning Center. At this Center the CBBEP hosts students from around the coastal bend and also various other outdoor groups. While at the NDP student groups have a set curriculum and the out door groups participate in activities in which they have a special interest. A portion of the activities take place at the existing pavilion and educational classroom. These two structures were built specifically to host the CBBEP's educational program and groups who use the NDP. While these two facilities are very user friendly there are simple improvements that can help increase the educational and outdoor experience of students and groups while on trips at the NDP.

The CBBEP would like to construct a concrete walk way between the two structures, build a deck off the existing educational classroom, and erect an observation tower off of the deck. These three improvements will exponentially increase groups experience while at the NDP.

The concrete walk will allow safe and all season passage between the two buildings. The deck will act as an outdoor seating area allowing field trip leaders to "corral" the students before activities at the NDP. The observation tower will give students and wildlife watchers a bird's eye view of the entire NDP. The towers base will also be used as a kiosk area.

**Objectives:**

- 1) Implement construction of the concrete walk, deck, and observation tower using the developed "NDP Conceptual Master Plan".
- 2) Install educational signage around the base of the tower creating a kiosk.

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**Project # 1010      Bacteria Monitoring and Source Tracking in Corpus Christi Bay  
at Cole and Ropes Parks**

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**Performing Organization:**            Texas A&M University – Corpus Christi  
**Total Project Funding:**            \$50,000  
**CBBEP Bays Plan Actions:**        WSQ-1, WSQ-5, PH-1

**Background:**

The purpose of this project is to better characterize bacteria levels at Cole and Ropes Park for public safety by adding additional sampling days to the existing Texas Beach Watch Program and implementing bacteria source tracking to try and identify the source of high bacteria levels at these sites.

On July 17, 2008 EPA published a notice in the Federal Register providing the public the opportunity to review its decision to add Corpus Christi Bay to the Texas 2008 section 303(d) list as required by the Environmental Protection Agency's (EPA) public participation regulations. Based on its review of public comments received in response to this public notice, EPA has decided to maintain the listing of Corpus Christi Bay on the State's 303(d) list but has amended the scope of the listing to geographically define the impairment as restricted to only the Ropes Park and Cole Park Beach portions of Corpus Christi Bay as presently delineated by the Texas Beach Watch Program. The Texas Beach Watch Program collects water quality samples and tests for *Enterococcus* bacteria and compared to EPA's recommended Single Sample Maximum Density (SSMD) criteria of 104 colony forming units (cfu)/100 ml. Upon receipt of reliable data, the Texas Beach Watch Program recommends advisories when sample results for *Enterococcus* exceed EPA's recommended criteria. EPA has re-categorized the listing of the Ropes Park and Cole Park Beach portions of Corpus Christi Bay in category 5c of the State's integrated report.

CBBEP will work with the TAMUCC, City of Corpus Christi, TCEQ, and the TGLO to develop a sampling design that will create not only a better characterization of bacteria levels but also try and identify the sources at Cole and Ropes Parks to ensure improved public safety. This is a first step attempt in solving the Corpus Christi Bay bacteria issue.

**Objectives:**

- 1) Better characterize bacteria levels at Cole and Ropes Park by adding additional sampling to the existing Texas Beach Watch Program.
- 2) Identify the high bacteria level source(s) at Cole Park and Ropes Park.

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**Project # 1011      Construction of Two Permanent Dissolved Oxygen (DO)  
Monitoring Stations in Corpus Christi Bay**

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**Performing Organization:** TAMUCC – Conrad Blucher Institute  
**Total Project Funding:** \$30,000  
**CBBEP Bays Plan Actions:** WSQ-3, WSQ-4, WSQ-5

**Background:**

The purpose of this project is to construct two permanent structures in Corpus Christi Bay that will support the Harte Research Institute in collecting continuous real time DO data which is being funded under a \$390,000 grant from NOAA and partnering with CBI. This project would help support a larger ongoing effort to understand the DO problem in the bay.

Hypoxia (low dissolved oxygen concentration) is known to occur in the southeast corner of Corpus Christi Bay each summer. Long thought to be a temporary summer occurrence, it is now known that hypoxia has a greater temporal extent than previously thought. However, because of a lack of long-term, continuous measurements, it is not known how often hypoxia occurs in Corpus Christi Bay.

Since 1994, hypoxia monitoring has been confined to July and August and limited to bi-weekly sampling trips or deployment of continuous recorders over periods of one week. This proposal is aimed at expanding the monitoring program to have permanent continuous recorders inside and outside of the hypoxic zone and within Corpus Christi Bay. This project is possible because TAMUCC has recently been awarded \$390,000 to purchase six sets of water quality sondes and current meters. The plan is to partner with CBI, build a new platform and refurbish an existing platform in the bay, purchase radio telemetry equipment, and establish permanent moorings within the bay.

This project is unique in two ways. For the first time, continuous measurements will be in the hypoxic layer of bottom water for long periods of time. In addition, nearly all CBI sites (except in the MANERR) are adjacent to shorelines, and these two stations will be in the open of waters of the bay. The project will enable us to determine the extent of the hypoxia problem, and the mid-bay data will allow us to build models of water quality across Corpus Christi Bay because the mid-bay station will provide a point for interpolation.

Hypoxia has been monitored since 1988, and it was discovered in 2006 that hypoxia likely occurs in spring and fall as well. Thus the scale of the grab-sample monitoring program has to be increased to a continuous sampling scheme. Two long-term stations will be established in the epi-center of the hypoxic zone and in the middle of the bay outside the zone.

**Objectives:**

- 1) Construct one new platform and refurbish an existing platform.
- 2) Install instrumentation.
- 3) Install software systems for telemetry.

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**Project # 1012      Screening Investigation of Contaminants in Fish Tissue**

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**Performing Organization:** TAMUCC – Harte Research Institute  
**Total Project Funding:** \$44,000  
**CBBEP Bays Plan Actions:** WSQ-4, WSQ-5, PH-2

**Background:**

The purpose of this screening project is to quantify the contaminants (e.g., mercury, dioxins, and PCBs) found in fish tissues from the upper Laguna Madre, Corpus Christi, and Aransas Bays. Recently in July 2008, the Texas Department of State Health Services (TDSHS) issued a fish consumption advisory in Galveston Bay, Texas due to elevated levels of dioxins and polychlorinated biphenyls (PCBs) found in spotted seatrout and catfish. In 2002, TDSHS conducted a study in Nueces Bay on oysters and selected fin fish and found elevated zinc in oysters and one out of three spotted seatrout collected had elevated PCB levels that exceeded TDSHS guidelines for human health. In 2005, TDSHS conducted another study in Nueces Bay looking at PCBs in spotted seatrout, red drum and southern flounder. Out of 24 seatrout collected, all had PCBs but were below the TDSHS guidelines for human health. In 2004, the Center for Coastal Studies collected croaker, catfish and pinfish throughout the Coastal Bend and measured a variety of contaminants in fish tissue. They found only one sampling site to contain detectable PCB concentrations and it was below TDSHS guidelines for human health. However, these samples were collected via trawls, and did not specifically target legal-size recreational fishes that are commonly consumed.

Thus, the **goal** of this study is to quantify the contaminants (e.g., mercury, dioxins, and PCBs) found in black drum (*Pogonias cromis*) and spotted seatrout (*Cynoscion nebulosus*) tissues from the upper Laguna Madre, Corpus Christi, and Aransas Bays (Redfish Bay). This screening project was designed with conversations among TDSHS staff so that the data from this project may be recognized as valid if contaminate levels exceed unsafe thresholds. TDSHS would then consider completing a comprehensive project in order to notify the public of health issues.

Five black drum and five spotted seatrout will be collected of legal size from each bay system. The five similar-sized fish will be combined into a composite sample from each bay (i.e., 1 composite sample for each species per bay), for a total of 6 composite samples to be analyzed for contaminants for this project.

**Objectives:**

- 1) Collect legal-size black drum and spotted seatrout from Aransas Bay, Corpus Christi Bay, and the upper Laguna Madre;
- 2) Determine total mercury, dioxin, and PCB concentrations found in the composite muscle tissue samples of the fishes collected, and determine differences among species and bays.

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**Project # 1013      Lower Nueces River Cleanup**

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**Performing Organization:**                      **To Be Determined (via a Request for Bids)**  
**Total Project Funding:**                      **\$25,000**  
**CBBEP Bays Plan Actions:**                      **WSQ-5, FW-1, HLR-1, PH-1, BD-1**

**Background:**

The purpose of this project is to provide support to an ongoing cleanup effort with Nueces County (lead agency), Nueces River Authority, City of Corpus Christi, TCEQ, Texas A&M University – Corpus Christi, Beautify Corpus Christi, and San Patricio County to clean up large anthropogenic debris from the lower portions of the Nueces River where the City of Corpus Christ gets its drinking water.

In 2003 there were a number of reports of oil sheens on the Nueces River. The Texas Commission on Environmental Quality (TCEQ) hired a diver to determine the cause of the sheen. The culprit was a tar bucket that periodically released blobs of tar. The diver removed the bucket from the river bottom, and commented on the numerous other items he'd seen including boats, cars, and refrigerators.

County Road 73 runs parallel to this portion of the river located upstream from the saltwater barrier dam. The houses are in various states of disrepair. There are no public water supply nor wastewater services in the areas. From both the river and road perspectives, there appears to be water wells that either draw directly out of the river or from the adjoining alluvium. Outhouses within a few yards from the river bank and flowing discharge pipes have also been observed. Many of the yards contain trash and debris that will be washed downstream with the next flood. At one location, a school bus is on the verge of falling into the river.

This portion of the river is the conduit for raw water from Lake Corpus Christi to the City of Corpus Christi's O. N. Stevens Water Treatment Plant – the drinking water source for much of the area.

This project is being coordinated by Nueces County. Precinct 1 County Commissioner Peggy Bañales initiated the effort and it will be continued by her successor, Mike Pusley. The City of Corpus Christi is planning to hire a firm to conduct an underwater survey to identify and provide GPS coordinates for objects on the bottom of the river. Representatives from Nueces County (lead agency), Nueces River Authority, City of Corpus Christi, TCEQ, Texas A&M University – Corpus Christi, Beautify Corpus Christi, San Patricio County, and the Coastal Bend Bays and Estuaries Program have been working together since early 2008 to develop a plan to address the problem.

**Objectives:**

- 1) Provide support to an ongoing cleanup effort in the Lower Nueces River from which multiple cities, including Corpus Christi, get their drinking water.

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**Project # 1014      Nueces Bay Causeway Marsh Restoration – Construction**

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**Performing Organization:**                    **To Be Determined (via a Request for Bids)**  
**Total Project Funding:**                    **\$585,000** (\$130,000 CBBEP + \$455,000 USFWS Grant)  
**CBBEP Bays Plan Actions:**                **HRL-1, HLR-2**

**Background:**

This will expand the size of the construction component of the Nueces Bay Causeway Marsh Restoration project (Project #0929). A significant portion of #0929 funds must go towards contractor mobilization/de-mobilization. These new funds will go almost entirely towards earth-moving activities, greatly reducing the overall construction cost per acre.

Nueces Bay Causeway supports the section of U.S. Highway 181 that crosses the mouth of Nueces Bay between Corpus Christi and Portland. Historically, this area consisted of significant amounts of crucial marsh habitat. Approximately 180 acres of marsh habitat was lost to dredging and construction of the causeway in the late 1940s, and approximately 160 acres of marsh has been lost to subsequent erosion. This assessment does not include impacts caused by the construction of the roadway or railroad that existed prior to the 1940s.

Based on a habitat assessment conducted in 2006, the general health of the remaining marsh complex is good, supporting a variety of fisheries (including crucial nursery habitat) and providing foraging and loafing opportunities for migratory colonial waterbirds. Low-marsh communities, dominated by smooth cordgrass (*Spartina alterniflora*), are much more ecologically productive than mid-marsh communities and adjacent uplands. Unfortunately, it is the low-marsh communities that have suffered the greatest loss – to the point where they are no longer the dominant community type in the area.

The marsh complex and adjacent uplands also serve as a buffer, protecting U.S. Highway 181 from erosion. As stated earlier, approximately 160 acres of this protective buffer has been lost since the 1940s. The causeway also provides public access for bird watchers, wade-fishers and light watercraft. Currently, public access along the Nueces Bay side of the Nueces Bay Causeway is largely unmanaged, increasing the vulnerability of crucial habitat and adding to the effects of natural erosion.

Marsh restoration will consist of adjusting bottom elevation to support low-marsh communities, designing channels for adequate circulation through the raised areas, and planting appropriate vegetation. The marsh complex and causeway will be protected by an earthen or stone berm.

**Objectives:**

- 1) Restore crucial habitat, resulting in an increase to ecological productivity and diversity
- 2) Protect crucial infrastructure (Highway 181) by providing an increased buffer from wave energy
- 3) Provide appropriate managed public access to Nueces Bay.

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**Project # 1015      Nueces Bay Causeway Marsh Restoration – Engineering and Construction Management**

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**Performing Organization:**           HDR Engineering  
**Total Project Funding:**           \$70,000  
**CBBEP Bays Plan Actions:**       HRL-1, HLR-2

*This project will complete the Engineering Design, Bidding Assistance, and Construction Administration components associated with Nueces Bay Causeway Marsh Restoration.*

Nueces Bay Causeway supports the section of U.S. Highway 181 that crosses the mouth of Nueces Bay between Corpus Christi and Portland. Historically, this area consisted of significant amounts of crucial marsh habitat. Approximately 180 acres of marsh habitat was lost to dredging and construction of the causeway in the late 1940s, and approximately 160 acres of marsh has been lost to subsequent erosion. This assessment does not include impacts caused by the construction of the roadway or railroad that existed prior to the 1940s.

Based on a habitat assessment conducted in 2006, the general health of the remaining marsh complex is good, supporting a variety of fisheries (including crucial nursery habitat) and providing foraging and loafing opportunities for migratory colonial waterbirds. Low-marsh communities, dominated by smooth cordgrass (*Spartina alterniflora*), are much more ecologically productive than mid-marsh communities and adjacent uplands. Unfortunately, it is the low-marsh communities that have suffered the greatest loss – to the point where they are no longer the dominant community type in the area.

The marsh complex and adjacent uplands also serve as a buffer, protecting U.S. Highway 181 from erosion. As stated earlier, approximately 160 acres of this protective buffer has been lost since the 1940s. The causeway also provides public access for bird watchers, wade-fishers and light watercraft. Currently, public access along the Nueces Bay side of the Nueces Bay Causeway is largely unmanaged, increasing the vulnerability of crucial habitat and adding to the effects of natural erosion.

Marsh restoration will consist of adjusting bottom elevation to support low-marsh communities, designing channels for adequate circulation through the raised areas, and planting appropriate vegetation. The marsh complex and causeway will be protected by an earthen or stone berm.

**Project Objectives:**

1. Provided needed Engineering and construction oversight for the construction phase of projects # 0929 and 1014.

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**Project # 1016      Community Partnerships for Habitat Restoration**

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**Performing Organization:**            **CBBEP**  
**Total Project Funding:**            **\$17,500**  
**CBBEP Bays Plan Actions:**        **HRL-2, HLR-10, PEO-5**

**Background:**

In accordance with the Coastal Bend Bays Plan, CBBEP continually seeks opportunities to promote public partnerships and recognition programs that will protect the bay system and its resources. CBBEP has identified several partnership opportunities to leverage small contributions to allow for the implementation of small- or demonstration scale projects that will protect or restore crucial habitats or living resources.

The project will implement the following tasks.

2. Partner with the Animal Rehabilitation Keep at University of Texas Marine Science Institute to provide 1 or more tanks and the associated water quality equipment needed for the rehabilitation and release of endangered sea turtles.
3. Partner with Corpus Christi Botanical Gardens to provide equipment that will enhance water flow to an 80-acre prairie wetland demonstration site.
4. Partner with Texas A&M University-Kingsville to provide materials for the construction of a demonstration-scale artificial wetland.
5. Partner with Texas Parks and Wildlife Department and/or local governments to implement vegetation management projects.

**Objectives:**

- 1) Implement small- or demonstration scale projects that will protect or restore important habitats or living resources.
- 2) Promote public partnerships and recognition programs to protect the bay system and its resources.

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**Project # 1017      Nueces Bay Tide Gauge Relocation**

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**Performing Organization:**            Texas A&M University-Corpus Christi - CBI  
**Total Project Funding:**            \$16,000  
**CBBEP Bays Plan Actions:**        FW-1

**Background:**

There is currently a tide gauge located at White Point along the northern shore of Nueces Bay. The tide gauge was installed in 1983 on a dock structure which is in disrepair. The station is operated with old equipment and the location creates a maintenance problem due to large amounts of silt that accumulate around the gauge.

A unique opportunity has come up to utilize slightly used equipment from a dismantled station in the Viola Turning Basin. A new platform would be constructed on the southern side of Nueces Bay near the Fulton Corridor, allowing for easy access, good water depth for operation and maintenance, and still in range to be productive for future research projects being conducted in and around Nueces Bay.

This project will allow researchers to utilize a consistent and reliable source of tide gauge data, since the only other tide gauge in Nueces Bay is being taken down due to outdated equipment and poor infrastructure.

**Objectives:**

- 1) Dismantle the Viola Turning Basin tide gauge
- 2) Use Viola Turning Basin equipment to install a new station in Nueces Bay.
- 3) Maintain new tide gauge station for 1 year.

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**Project # 1018      Comprehensive Habitat Management Plan for the Corpus Christi Bay Area – Phase II: Plan Development**

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**Performing Organization:**            **Harte Research Institute for Gulf of Mexico Studies**  
**Total Project Funding:**            **\$60,000**  
**CBBEP Bays Plan Actions:**        **D-2, D-3, HLR-1, HLR-2, HLR-4**

**Background:**

The purpose of this project is to develop a consensus based comprehensive management plan that identifies habitat enhancement, creation and conversion opportunities in the Corpus Christi area.

This project is Phase II of a two phase project in an effort to develop an ecosystem based management plan for the Corpus Christi Bay area. Phase I (to be completed by August 2009) concluded the planning portion of the project which included meeting with over 50 different groups of stakeholders and holding a workshop to build a consensus of what the major needs are for the Corpus Christi Bay system. Phase II will consist of conducting a needs assessment, hosting several workshops with stakeholders, writing a plan, and developing a map.

An analysis and consensus from resource agencies, the scientific community and others to identify and characterize ecological needs (e.g. bird rookeries, reef structures, emergent saltwater marsh, seagrass habitat, riparian habitat, etc.) will be used to identify and direct the use of financial resources and other assets associated with development when they become available.

This plan would be available for use by CBBEP, regulatory agencies, development interests, industrial users and citizen interests alike in planning for maintenance, growth and sustainable economic development within the Coastal Bend area.

**Objectives:**

- 1) Conduct an ecosystem services based needs assessment
- 2) Host several workshops with stakeholders
- 3) Write a plan
- 4) Develop a map that ties in with the plan

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**Project # 1019      “Mud between the Toes” - Educational Field Trips to the  
Nueces Delta Preserve for Grades K - 12**

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**Performing Organization:    CBBEP**  
**Total Funding:                \$ 10,000**  
**CBBEP Bays Plan Actions: PEO-2, PEO-3, PEO-5**

**Background/Need**

The need to instill a sense of personnel stewardship of natural resources and enrich the youth experiences in science has been a focus of CBBEP. Over the existence of the CBBEP, outreach and educational efforts to youth have been targeted by various activities and projects supported by the Program. Efforts include facilitating school visits, providing educational materials and facilitating field experiences for schools within the CBBEP Project Area. Recently, increased attention to efforts by the area educational system to improve science and math knowledge in the local youth has concerned area leaders.

The EEOIT has voiced their interest and support for continued involvement of CBBEP in helping the educators with the challenges of inspiring youth to take an interest in science and the outdoors.

**Objectives:**

- 1) Utilize the Nueces Delta Preserve as the destination of Educational Day Trips throughout the school year. CBBEP Staff will coordinate and conduct 30+ trips to the NDP. Funds for this project will be used to provide for supplies, bus cost reimbursement, and funds to reimburse the campus for a substitute, should one be needed.

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**Project # 1020      Partnering for Teacher Workshops**

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**Performing Organization:** Various Education Partners & CBBEP  
**Total Funding:** \$ 10,000  
**CBBEP Bays Plan Actions:** PEO-3, PEO-5

**Background:**

*Learning on the Edge* is an exceptional partnership that focuses on equipping teachers with the skills, curriculum, support and materials to strengthen science teaching as it relates to the environmental treasures of Texas Coastal Bend. The Coastal Bend Bays & Estuaries Program Educator has noticed that some teachers would like continuing education in Environmental Science. Partnering throughout the year would allow quarterly workshops to introduce environmental issues to teachers who may not be able to spend a full week in the summer at a workshop. It will also allow those teachers who may need more instruction in a specific area of science to continue their education.

**Objectives:**

The Coastal Bend Bays & Estuaries Environmental Educator will facilitate quarterly workshops designed for teachers (grades 3-8) to address local environmental science topics by collaborating with well-regarded science education programs of the Coastal Bend. Participants will enhance their science knowledge through direct instruction, hands-on learning, field excursions, and TEKS-aligned lesson presentations. As a State Board for Educator Certification (SBEC) continuing professional education (CPE) provider, teachers will receive 2-4 hours of CPE credits. In addition to continuing education, this project will address the gap that exists between teachers learning about environmental science and the delivery and implementation of environmental science in the classroom. The purpose is to help teachers recognize their strengths and weaknesses in science, while allowing the Environmental Educator to assist with requested help from the teacher.

**Specific Tasks and Deliverables:**

Coastal Bend Bays & Estuaries Program partners will perform a portion of teaching during the teacher workshop. The teachers will receive a copy of classroom activities from the Coastal Bend Bays & Estuaries Program, and equipment for the classroom. The workshops will be small scale educational seminars with equipment provided.

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**Project # 1021    Educational Signage and Identification Keys for the Nueces Delta Preserve**

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**Performing Organization:**            **CBBEP**  
**Total Funding:**                        **\$ 5,000**  
**CBBEP Bays Plan Actions:**        **PEO-3, PEO-5**

**Background:**

Interest in utilizing the Nueces Delta Preserve continues to grow. In order to improve the educational activities at the Nueces Delta Preserve, certain improvements need to be made. The trails and educational areas are in need of kiosks and educational signage.

**Objectives:**

- 1) Kiosks will be placed by the educational building and Rincon Bayou.
- 2) Trail head signs will be placed at the head of each trail.
- 3) Identification Keys should be created for common species of flora and fauna at the Nueces Delta Preserve.

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**Project # 1022      Up 2 U Clean Rivers-Clean Bays Education Program**

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**Performing Organization:**            **Nueces River Authority**  
**Total Funding:**                        **\$ 20,000**  
**CBBEP Bays Plan Actions:**        **PEO-3, PEO-5**

**Background:**

This project will bring the highly effective, award winning education and outreach program currently being delivered in 11 other Nueces basin counties to San Patricio and Kleberg Counties. The education portion of the project will target 5th and 6th grade students with hands on interactive lessons delivered in the classroom in compliment to their regular curriculum. The outreach portion of the program will target the general public as well as students using the Nueces River Watershed Model and Wetland on Wheels. Outreach efforts will be delivered at Ag Fairs and festivals. This project will also allow for the creation of another custom watershed model to accommodate the expanded audience. The outreach/education message is simple: the resources (watersheds, bays, estuaries and the ocean) are special, their health is connected to each other, and human behavior and personal responsibility (awareness, consideration and behavioral change) represents the solution to resource protection

**Objectives:**

With funding from the Coastal Bend Bays and Estuaries Program the Nueces River Authority education staff will bring watershed model presentations to 5th and 6th grade classrooms in San Patricio (est. 1,900 students, 87 classroom presentations) during the 2009- 2010 school-year. The lesson will be delivered using our custom watershed model of the Nueces River basin and associated coastal basins. The topographically correct model shows how surface water flows in the basins, where the groundwater aquifers are located and how non-point source pollution can enter waterways. Students participate by “polluting” the land and waterways with food coloring; making it “rain” using water bottles; and watch how the pollution is carried downstream to the bays and into the Gulf of Mexico. This tool provides students with a visual/interactive connection between watershed health and bay and estuary health and aims to cultivate personal responsibility delivered in the classroom. These demonstrations will accentuate the value of coastal wetlands and incorporate the successful “Clean Rivers - Up To You” litter prevention campaign with our trash bags given to students (made of mesh material similar to potato bags, trash goes in but water and sand will fall through the mesh). The lesson supports the 5th and 6th grade Texas Essential Knowledge and Skills (TEKS) for Science including the following concepts: water cycle, erosion and weathering, non-renewable resources, limitations of models, sources of water in a watershed, the relationships between ground and surface water, conservation of resources, and cause and effect relationships in natural resources. Another education tool, The Wetland on Wheels, will be used for outreach at two school and two non-school related events in San Patricio County. The simulated wetland is a model of habitats from fresh water rivers to the bays and into the Gulf of Mexico. Local animals prepared by a taxidermist are placed around the trailer to show examples of the many animals in our area that depend on these special environments. It shows the importance of habitats and water quality for animals and discusses additional 5th/6th grade TEEKS including; adaptations, conservation and use of natural resources.

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**Project # 1023      CBBEP Public Outreach Events and Activities**

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**Performing Organization:**            CBBEP  
**Total Funding:**                    \$ 30,000  
**CBBEP Bays Plan Actions:**        PEO-1, PEO-2, PEO-3, PEO-4, PEO-5, BTR-1

**Background:**

One of the most important goals of the *Bays Plan* is to educate citizens about the ecology of the bay system, its many environmental and economic values, and how an individual can make a positive difference to ensure its long-term health. To accomplish this, the Public Education and Outreach Action Plan is designed to: raise the public's environmental awareness; foster community stewardship of bay resources; and increase individual involvement in bay resource management issues.

Helping residents and visitors to understand the complex issues concerning bay resource management will be a priority. In addition to understanding how the bay system functions, it is important that citizens develop a sound appreciation for the significant value and economic impact derived from the renewable resources of the bays. As a result of the need for the Public Outreach Events and Activities, the CBBEP will participate in the following:

- Community Events and Festivals
- CBBEP Educational Materials
- CBBEP Website
- CBBEP E-Newsletter
- Other Outreach Opportunities
- National Ocean Sciences Bowl and other educational events

**Objectives:**

- 1) To provide the general public with the environmental science knowledge to make sound decisions regarding the effective management of bay resources and to promote environmental stewardship through increasing awareness of the resources and the issues regarding their use.

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**Project # 1024      CBBEP/CBBF Community Outreach Partnership**

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**Performing Organization:**            **Coastal Bend Bays Foundation**  
**Total Funding:**                    **\$ 50,000**  
**CBBEP Bays Plan Actions:**        **PEO-1, PEO-2, PEO-3, PEO-4, PEO-5**

**Background:**

The CBBEP is constantly working to promote public/private partnerships as stated in the *Coastal Bend Bays Plan* to help achieve its educational goals. One of the benefits of the partnership between the CBBEP and Coastal Bend Bays Foundation (CBBF) is addressing the need for continued dialogue between competing user groups and the need for an engaging, public forum to allow for individual input into the public policy debate. The *Bays Plan* calls for continued involvement from CBBF, as the region prepares itself for ever-increasing numbers of people wanting to make use of the bays and estuaries. Minimizing conflict through informed discussion will help achieve the overall objective of ensuring the public's safety, health, and enjoyment of our bays and estuaries.

The CBBEP will work closely with the CBBF on the project objectives outlined below but will not be limited to only those listed. The environmental education and outreach activities will include: monthly Coastal Issues Forums, bay-resource/related workshops, the Adopt-A-Beach program, the continuation of the Earth Day celebration held in April, and the coordination of the annual CBBF Conservation and Environmental Stewardship Awards. The CBBEP will be acknowledged as one of the major funding partners at the various events and activities.

CBBEP is the most important funding partner for CBBF programs. The CBBF is a public interest organization (non-profit 501(c)(3)) dedicated to the conservation of freshwater and coastal natural resources through communication, advocacy, research and education.

**Objectives:**

- 1) Host, organize and coordinate turnkey operation of Earth Day festival.
- 2) Host, organize and coordinate turnkey operation of Adventure Bay at Bayfest.
- 3) Host, organize and coordinate CBBF Conservation and Environmental Stewardship Annual Awards Banquet.
- 4) Conduct monthly Coastal Issues Forums to increase communication between resource managers, users and general public.
- 5) Organize and coordinate Adopt-A-Beach beach clean ups.
- 6) Organize and coordinate bay-resource/related workshops.
- 7) Continue to seek matching funds.

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**Project # 1025      CBBEP Property Management (Nueces Delta, Oso, Padre Island, etc.)**

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**Performing Organization:            CBBEP**  
**Total Project Funding:            \$30,000**  
**CBBEP Bays Plan Actions:        HLR-1**

**Background:**

CBBEP is responsible for several properties including over 5,400 acres along the Nueces River and Nueces River Delta, 70 acres along Oso Bay, 35 acres along Nueces Bay (HWY 181) and 53 acres on Mustang Island.

The CBBEP Nueces Delta Preserve is located 3 miles from the City of Odem and 20 miles from downtown Corpus Christi. The CBBEP Nueces Delta Preserve consists of approximately 5,400 acres in San Patricio and Nueces Counties that are owned and managed by the CBBEP as a conservation site for the purpose preserving natural habitat, function and species diversity in the Nueces River delta. The preserve is rich in diversity that can be characterized by Tamaulipan thorn scrub, grasslands, lomas, freshwater wetlands, riparian habitat, brackish wetlands, coastal wetlands mud flats and shoreline. The CBBEP's secondary goal for the preserve is for the property to be used for a variety of educational and research opportunities.

The funds provided by the project support the necessary management and routine maintenance of the properties, including but not limited to road maintenance; fencing maintenance, gates, brush control, habitat and predator management (as appropriate necessary), and property taxes.

Past project accomplishments include dike repair to a 50 acre created wetland, construction of black bellied whistling duck, barn, and screech owl nest boxes, aerial application of herbicide to invasive huisache, road repairs post high volume rain events, construction of a parking area for school buses, creation of a wildlife observation area and water sampling station, establishing routine mowing of common areas, portable toilet, and trash collection service.

**Objectives:**

- 1) Provide for the ongoing maintenance and management of the Nueces Delta Preserve and other CBBEP Properties.

**CBBEP FY 2010 Proposed Projects sorted by Implementation Team**

<b>Human Uses Implementation Team</b>		
Project #		
1006	Debris Management at Public Access Sites	12,000
1007	Nueces County Packery Channel Park Kayak Launch & Bird Observation	47,000
1008	Oso Bay/Mud Bridge Public Access Management - Phase II	20,000
1009	Nueces Delta Preserve Facilities Improvements	45,000
<b>Water &amp; Sediment Quality Implementation Team</b>		
1001	Hydrodynamic Model for the Nueces Delta	295,220
1010	Bacteria Monitoring & Source Tracking in CC Bay-Cole & Ropes Parks	50,000
1011	Construction of Two Dissolved Oxygen Monitoring Stations in CC Bay	30,000
1012	Screening Investigation of Contaminants in Fish Tissue	44,000
1013	Lower Nueces River Cleanup Project	25,000
<b>Habitat &amp; Living Resources Implementation Team</b>		
1003	Colonial Waterbird Management Program	175,000
1002	Matagorda Island Marsh Restoration - Implementation Phase 3	190,000
1014	Nueces Bay Causeway Marsh Restoration - Construction	585,000
1015	Nueces Bay Causeway Marsh Restoration - Engineering & Management	70,000
1016	Community Partnerships for Habitat Restoration	17,500
1017	Nueces Bay Tide Gauge Relocation	16,000
<b>Maritime Commerce and Dredging Implementation Team</b>		
1018	Comprehensive Habitat Management Plan - Phase II: Plan Development	60,000
<b>Environmental Education Implementation Team*</b>		
1004	Coastal Bend Environmental Science - Learning on the Edge (LOTE)	115,000
1019	"Mud between the Toes" Field Trips to the Nueces Delta Preserve	10,000
1020	CBBEP Partnering for Teacher Workshops	10,000
1021	Educational Signage and I.D. Keys for the Nueces Delta Preserve	5,000
1022	Up 2 U Clean Rivers - Clean Bays Education Program	20,000
<b>Public Outreach Implementation Team*</b>		
1023	CBBEP Public Outreach Events and Activities	30,000
1005	CBBEP Habitat Protection Media Campaign	35,000
1024	CBBEP/CBBF Community Outreach Partnership	50,000
<b>CBBEP Program Activities</b>		
1025	CBBEP Property Management	30,000
		<b>Subtotal \$1,986,720</b>
<b>Late Edition to Proposed Work Plan</b>		
1026	Socioeconomic Dimensions of Hypoxia	100,000

Ded. Funds

Ded. Funds

Ded. Funds

Pending \$\$

**Total \$2,086,720**