COASTAL BEND BAYS & ESTUARIES PROGRAM

Protecting Our Bays & Estuaries

FY 2017 Comprehensive Annual Work Plan

Coastal Bend Bays & Estuaries Program, Inc.
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I. Introduction

History

In its 1987 reauthorization of the Water Quality Act, the U.S. Congress established the National Estuary Program (NEP) to promote long-term planning and management of nationally significant estuaries threatened by pollution, development, or overuse. The Administrator of the Environmental Protection Agency (EPA) was given authority to convene Management Conferences and to award Federal financial assistance grants to approved state programs for the purpose of developing and implementing a Comprehensive Conservation and Management Plan (CCMP). The Act defines criteria by which Management Conferees are charged with balancing the conflicting uses in target estuaries, while restoring or maintaining their natural character.

The Coastal Bend Bays & Estuaries Program (formerly the Corpus Christi Bay National Estuary Program) was formally established in October 1993 with committee meetings beginning in late 1993. The CBBEP was one of the first NEPs to use a streamlined approach to the development of a CCMP. The goal of the CBBEP to complete a Preliminary CCMP within 12 to 18 months (from 09/01/94) and a final CCMP (*Coastal Bend Bays Plan)* in approximately four years (by September 1998) was achieved.

A State-EPA Management Conference Agreement detailing this and other specific outputs of the four-year program was signed in May 1994 by the Regional Administrator of the EPA and the Chairman of the State-lead agency for the Program, the Texas Natural Resource Conservation Commission (now the Texas Commission on Environmental Quality – TCEQ). The CBBEP had been established since December 1993 as a program of the TCEQ. In 1999, CBBEP became a non-profit organization to lead implementation.

CBBEP Operations

The project area encompasses the estuarine environment of 75 miles of the south-central Texas coastline, and includes the 12 counties of the region known as the Coastal Bend. This 514 square mile area of water includes all bays, estuaries, and bayous in the Copano, Aransas, Corpus Christi, Nueces, Baffin, and upper Laguna Madre bay systems, which together represent three of the seven major Texas estuaries.

The priority Issues for the CBBEP are:

- Alteration of Freshwater Inflow into Bays and Estuaries
- Condition of Living Resources
- Loss of Wetlands and Estuarine Habitats
- Degradation of Water Quality
- Altered Estuarine Circulation
- Bay Debris
- Selected Public Health Issues

The *Coastal Bend Bays Plan* has been developed to address each of these priority issues under the following categories of action plans: Human Uses; Maritime Commerce and Dredging; Habitat and Living Resources; Water and Sediment Quality; Freshwater Resources; and Public Education and Outreach. The projects selected for implementation under this Cooperative

Agreement reflect a combination of priority and readiness or feasibility for implementation. Implementing Partners for other actions of the *Bays Plan* will likewise be called upon to begin and continue to implement their own portions of the Plan. The role of Program staff is multi-faceted, but will include at a minimum the following tasks: (1) acquire, manage, and disperse funds to implement the *Bays Plan*; (2) develop and implement partnership projects with local governments, state and federal agencies, and private organizations; (3) monitor, track, and report on implementation performance by implementing partners, and work to maintain implementation commitments; and (4) coordinate the environmental monitoring and assessment of *Bays Plan* implementation effectiveness.

Work Plan Development

The FY 2017 Comprehensive Work Plan will allow the CBBEP to continue the implementation of the *Coastal Bend Bays Plan.* This Work Plan describes implementation projects and administrative support that will be undertaken pending approval and receipt of funds by the funding entities.

All data and information produced under the auspices of the CBBEP will adhere to standardized formats and be made publicly accessible. A public participation strategy, refined under the "public education and outreach" chapter of the *Bays Plan*, will continue to guide public participation efforts in the *Bays Plan* implementation. The list of Priority Issues, refined through public input and characterization projects will continue to serve as the focus for implementation.

II. Starting Date

The starting date for this FY 2017 Comprehensive Work Plan will be September 1, 2016.

III. Federal and State Program Coordinators and Project Officers

Federal
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Corpus Christi, TX 78412

IV. Accomplishments To Date

CBBEP regularly assesses administrative program activities in order to improve its success. CBBEP has continuously had favorable annual financial audits, as well as the quality system audits conducted by the Texas Commission on Environmental Quality (TCEQ). CBBEP has identified the need for more project documentation in a timely manner. Specifically, project progress needs to be better documented in the CBBEP project database on a more regular basis – not just when reporting deadlines are due. In addition, CBBEP recognizes the need to make draw-downs on EPA funds on a timelier basis.

The CBBEP achieved its primary project-related goal for FY 2016, which was to continue the successful initiation and completion of projects developed to implement the *Coastal Bend Bays Plan*. To date, CBBEP and its partners have achieved programmatic progress on 94 percent of *Bays Plan* actions. The Program's success in leveraging funds for CBBEP projects has also been noteworthy. Broad support for CBBEP's activities continues to be evidenced by the range of contributors, including local governments, industries, NGOs, and state and federal agencies. The CBBEP Bays Council continues to support the priorities as listed in the *Bays Plan*.

In 2016 the CBBEP implemented numerous projects aligned with the goals and objectives of EPA's *Strategic Plan and Government Performance and Results Act*. These projects include well-defined outputs and outcomes.

All project deliverables identified prior to CBBEP FY 2012 implementation years have been completed. CBBEP will prepare a draft Revised Comprehensive Work Plan that reallocates funds not identified with projects for FY 2013, FY 2014, FY 2015 and FY 2016.

The project implementation teams continue to identify, initiate and select project ideas for inclusion in the Program work plans. The teams are: Habitat & Living Resources Team, Human Uses Team; Maritime Commerce & Dredging Team; Water & Sediment Quality Team; and Environmental Education & Outreach Team. The *Bays Plan* Coordination Team, consisting of all the chairs of the Implementation Teams and key members of the Bays Council, coordinates the annual work plan recommendations to the CBBEP Bays Council, and reviews and proposes update recommendations to the *Bays Plan*.

V. Goals for FY 2017

The overarching goal for FY 2017 is to continue the successful implementation of the *Coastal Bend Bays Plan.* CBBEP Implementation Teams continue to identify, initiate and select project ideas for inclusion in the Program work plans. The teams are: Habitat & Living Resources, Human Uses Team; Maritime Commerce and Dredging Team; Water & Sediment Quality Team; and Environmental Education & Outreach Team. The CBBEP Coordination Team, consisting of all the chairs of the Implementation Teams and key members of the Conference, coordinates the annual work plan recommendations to the CBBEP Board of Directors, and reviews and proposes update recommendations to the *Bays Plan.*

VI. Statement of Competency

CBBEP is committed to the development and implementation of procedures and policies in order to assure that activities that acquire, generate, compile, or use environmental data and technology that are of the appropriate type and quality for their intended use. CBBEP operates under, and maintains an annually approved Quality Management Plan to continually assure that

quality of the data generated is sufficient to meet the objectives of the project. To this end, CBBEP's activities meet all the requirements that have been set forth to receive and utilize funds from the Agency and can demonstrate this through the following commitment:

"Competency for generating environmental measurement data under USEPA funded assistance is demonstrated at the CBBEP through the maintenance of quality assurance project plans for data collection activities that involve water quality monitoring and other environmental measurements, and through the approved Quality Management Plan that provides descriptions of the quality policies, including all requirements described in EPA QA/R-2."

VII. Implementation of Projects

Project activities for FY 2017 have been selected for their contribution towards implementation of the *Coastal Bend Bays Plan*. Thirty projects will be implemented in FY 2017. A comprehensive list of projects outlining project numbers, titles, action items, performing party(s), and budget can be found in Table 1: FY 2017 Comprehensive Annual Work Plan Outline. This list represents the combined efforts of the many volunteers who have donated their time and expertise to help assure the successful implementation of the *Coastal Bend Bays Plan.*

VIII. Project Deliverables/Schedule

Specific project deliverables and schedules for completion are to be negotiated with the sub-contractor of the project and will be included in the scope of work of the project contract. The project contract and any amendments will be subject to review by funding entities and are incorporated into this annual work plan by reference.

Project 1701 CBBEP Coastal Bird Management

Performing Organization: **CBBEP**
Total Project Funding: **$144,616**
CBBEP *Bays Plan* Actions: **HLR-1, HLR-4**

Background:

Coastal birds are important components of estuarine ecosystems and serve as indicators of ecosystem health. In addition, recreational bird viewing is a significant and growing component of ecotourism, a major facet of the local economy. The 2010 Environmental Indicators Report prepared by CBBEP documented the declining populations of many colonial waterbird species in Texas, with some species experiencing up to a 90% reduction in breeding pairs since the 1960's. Research continually provides evidence of the importance of the Texas coast to many other non-breeding coastal bird species, many of which are also experiencing major population declines.

Years of experience working with coastal bird species in the Coastal Bend makes the CBBEP uniquely qualified to provide expertise and assistance to partners and stakeholders working to conserve coastal birds. The CBBEP will assist resource agencies, universities, and other stakeholders in joint efforts to monitor changes in coastal bird populations at a large scale. These monitoring efforts will take place primarily in December and May and provide information that helps direct waterbird management priorities for CBBEP for the coming years. In addition, the CBBEP will meet with partners and stakeholders throughout the year to provide updated information on coastal bird species ecology and management in the Coastal Bend area.

Building on the efforts of the CBBEP Colonial Waterbird projects from previous years, this project will continue the implementation of specific management actions of the *CBBEP Colonial Waterbird Rookery Island Management Plan*. Additionally, these efforts will extend to activities that support the conservation of non-breeding coastal bird species and their habitat. Management actions will include efforts to reduce anthropogenic impacts, habitat management and protection, and predator control when necessary. Public education and outreach will continue to be a major component in achieving project objectives.

Objectives:

This project will:

- Continue the restoration efforts of coastal bird populations through management of colonial waterbird nesting sites, including habitat enhancement, protection, and predator control, and by reducing anthropogenic impacts to coastal birds.
- Develop and implement public education and outreach programs that promote awareness and stewardship of coastal birds and their habitats.
- Assist partners in efforts to monitor changes in coastal bird populations for management purposes.
- Provide resource agencies, researchers, and other stakeholders with expertise on coastal bird ecology, habitats, and conservation needs.

Project 1702 Delta Discovery

Performing Organization: **CBBEP**
Total Project Funding: **$209,806**
CBBEP *Bays Plan* Actions: **BTR-1, PEO-2, PEO-3, PEO-5**

Background:

Delta Discovery embraces our entire environmental education program. The educational program costs consist of the following:

- Salary of CBBEP environmental educators, temporary part-time staff, and interns.
- Supplies and needed for the Nueces Delta Learning Preserve
- Supplies and food for Teacher workshops

Field trips: Many of the students that are being exposed to scientific concepts for the first time have never spent much time outdoors. There is a need to bring classroom concepts alive in the proper setting through field trips. Getting students out of the classroom and into the outdoors adds greatly to the students understanding of natural processes. CBBEP Environmental Educators provide field trip opportunities for teachers and students to visit the Nueces Delta Preserve. The cross-curricular trip may to be organized by the teacher, with assistance from the Environmental Educator, to create an educational TEKS-aligned agenda for outdoor education. This program sees over 8000 students a year. The goal is to plant seeds of appreciation and passion for a new generation of naturalists, biologists, and nature lovers to protect and preserve the Coastal Bend through educating school children about preserving our environment and protecting our animal and plant life.

Bus Reimbursement Funding: CBBEP will conduct environmental education learning experiences for students and their teachers. The funding is intended to support the education trip in its entirety, including associated educational materials, substitutes if needed for middle school trips, and the necessary and reasonable costs associated with transporting the teacher and students from the school to the destination.

Fall/Spring Workshops: CBBEP Environmental Educators will facilitate workshops throughout the school year. These workshops will address local environmental science topics and will align to the TEKS objectives. Hands-on learning in the field will dominate and field work correlation to the classroom will follow the outdoor learning experience. Participating teachers will receive SBEC credits. The workshops focus 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. Partnering throughout the year would allow the CBBEP to introduce environmental issues to teachers who may not be able dedicate time in the summer to workshops. It will also allow those teachers who may need more instruction in a specific area of science to continue their education. The funding provides all fees for partnering, curriculum, and substitute teachers in order for these workshops to occur on weekdays.

Summer Workshops: CBBEP partners with already successful educational programs. By combining all of these resources into one program, Coastal Bend Environmental Science seeks to provide teachers the tools needed to successfully teach science and promote student awareness of local ecology and environmental issues affecting the bays and estuaries.

During the Summer and Fall/Spring Workshops, CBBEP will provide light refreshments throughout the day, such as snacks, bottled water, soft drinks and sandwiches. The Nueces Delta Preserve is about 21 miles away from nearby restaurants and transporting the teachers to/from any restaurants will delay the workshops considerably. CBBEP has made arrangements for sandwich delivery to the NDP. Teachers can continue with the workshop with little downtime. Workshops are held during the hottest part of the summer, with little or no shelter available at times.

Nueces Delta Learning Preserve Facilities Upkeep: Upkeep of the Nueces Delta Learning Preserve Facilities consists of electricity costs, phone and internet costs, restroom cleaning, trash pick-up, equipment for programming, staff accreditation and educational training, and mileage, etc.

Objective:

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

Project 1703 Quantifying Plastic Debris Loading and Accumulation in Corpus Christi Bay to Improve Stakeholder Awareness

Performing Organization: **Texas A & M University – Corpus Christi**
Total Project Funding: **$49,705**
CBBEP Bays Plan Actions: **WSQ-3, BD-1**

Background:

Corpus Christi is nicknamed the "Texas Riviera" or the "Sparkling City by the Sea," with Corpus Christi Bay being the centerpiece of this city. Unfortunately, Corpus Christi Bay is beginning to develop a reputation for it ubiquitous trash/plastic debris and littered shorelines. (See "All the Cups" on YouTube: https://www.youtube.com/watch?v=LhlBSOlTYdQ.) Not only can this "reputation" have economic consequences in the broader region, with $1.5 billion and $5.4 million in local revenues tied to nature tourism and fisheries, but it has been documented that plastics in marine environment are harmful to fisheries, sea turtles, birds and marine mammals. Unfortunately, this problem is not unique to Corpus Christi, with plastic debris estimates in the ocean at ~268,000 tons and 4.8-12.7 million tons loaded annually. The fate of plastic debris is also largely unknown, as estimates for total annual plastic loading do not match observed concentrations. The first step in understanding the problem locally is quantifying its scale and studying sources. This project will determine types, sources, and sizes of plastic loading and accumulation within Corpus Christi Bay.

This project will provide the City of Corpus Christi with the baseline data needed to justify funding requests and grants that will tackle the problem through education, outreach and mitigation. Additionally, the data collected will assist researchers locally and globally in assessing the impact of aquatic plastic debris on ecosystem function and health.

This research will address the CBBEP Water and Sediment Quality and Bay Debris Action Plans by pursuing the following objectives:

1) Quantification of source loading of plastic debris to Corpus Christi Bay
2) Quantification plastic debris accumulation in Corpus Christi Bay sediment
3) Improved stakeholder awareness of plastic debris in Corpus Christi Bay

The two major sources of plastic (stormwater runoff and wastewater effluent) will be sampled to quantify loading to Corpus Christi Bay. Four to eight rainfall events, depending on their frequency, will be collected during this project. To help determine the fate of plastic debris, sediment cores will also be taken and analyzed.

Project Objective:

The primary objective of this project is to produce baseline data that is vital to understanding our ongoing plastic pollution problems in the coastal bend by quantifying source loading and fate in Corpus Christi Bay.

Project 1704 Lower Nueces River Pet Waste Collection Stations

Performing Organization: **Nueces River Authority**
Total Project Funding: **$3,525**
CBBEP Bays Plan Actions: **WSQ-1**

Background:

The Lower Nueces River, Segment 2102, between Lake Corpus Christi and the saltwater barrier dam, is the primary drinking water source for about 500,000 residents in the Coastal Bend region. It is on the State's 303d list of impaired water bodies for elevated total dissolved solids (TDS). An increasing trend in TDS levels was first noted in the Nueces River Authority's (NRA) 2008 Basin Summary Report for the Texas Commission on Environmental Quality's Clean Rivers Program. The average of the measured TDS values has exceeded the water quality criteria of 500 mg/l as of the 2012 Texas Integrated Report.

Increasing trends in chlorophyll-a levels were first noted in NRA's 2008 Basin Summary Report at stations 12965 and 12964. There has been a concern for this parameter at station 12964 since the 2008 Texas Water Quality Inventory and at station 12965 since the 2012 Texas Integrated Report.

Although *E. coli* levels are currently meeting the water quality criteria, an increasing trend in bacteria levels was identified at station 12964 in NRA's 2013 Basin Summary Report.

The Lower Nueces River Watershed Protection Plan was developed to protect and restore this critical water source. It is the drinking water source for nearly half a million people and supplies industries. The WPP includes management measures, identified by the local stakeholder group, to address the TDS impairment, chlorophyll-a concerns, increasing bacteria levels in this segment of the river, and all potential pollutant sources in the watershed.

The installation of pet waste collection stations is one of the management measures identified to address bacteria loading. NRA will coordinate with Nueces County (Hazel Bazemore Park), San Patricio County (La Fruta Park), Texas Parks and Wildlife (Lake Corpus Christi State Park), and the Wilderness Lakes RV Resort (at SH 359) to identify up to five locations for the stations. It is intended that this grant would supply the stations and a year's worth of supplies. The entities in charge of the location areas will need to commit to maintaining the stations before one is installed. The WPP implementation schedule is for the stations to be installed within three years.

Project Objective:

The primary project objective will be to install pet waste collection stations in up to five locations along the Lower Nueces River to help address bacteria loading.

Project 1705 A Bacterial Source Tracking Project to Identify Sources of Fecal Pollution at Cole and Ropes Parks

Performing Organization: **Texas A&M University-Corpus Christi**
Total Project Funding: **$59,892**
CBBEP Bays Plan Actions: **PH-1, WSQ-1, WSQ-3**

Background:

The purpose of the proposed project is the identification of fecal pollution sources at Cole and Ropes Parks in Corpus Christi Bay. Beaches in these two recreational parks (Beach IDs TX259473 and TX821303) have a history of elevated fecal indicator bacteria concentrations. Water quality at both parks was classified as impaired by the Texas Commission of Environmental Quality (TCEQ) and both beaches have been added to the Texas 303(d) list. In response to these impairments in water quality, the Cole and Ropes Parks Coordination Committee drafted an implementation plan for one total maximum daily load (TMDL) for bacteria. The TMDL implementation plan has identified bacterial source tracking as the first priority for implementation (Management Measure 3.2: Bacterial Source Tracking) and states that source tracking be completed before any Management Measures or Control Actions are implemented. Therefore, the completion of this bacterial source tracking project will get the implementation plan "off the ground" and facilitate effective and timely water quality remediation.

Impairment of water quality is thought to stem from unknown point and nonpoint sources of fecal pollution. In 2010, a preliminary source tracking study (Cole and Ropes Parks Study), funded by the General Land Office and Coastal Bend Bays & Estuaries Program, reported elevated levels of fecal indicator bacteria. That study recommended future studies use library independent host-associated markers to identify sources of fecal pollution. More recently, the exhaustive Source Identification Protocol Project (SIPP) analyzed 41 bacterial source tracking methods and confirmed that library-independent detection of host-associated genetic markers (e.g. humans, seagull, cow, horse and dog) is the preferred method to identify sources of fecal pollution (Boehm *et al.* 2013; Harwood *et al.* 2013; Stewart *et al.* 2013). Unlike library dependent methods, the use of host-associated genetic markers negates the need to create a library and yields rapid (less than 4 hours per sample) and quantitative results.

For a period of one year, monthly surface water samples will be collected at six Texas Beach Watch stations at Cole and Ropes Parks. Attempts will be made to collect samples that represent periods of dry and wet loading (the latter is a sample type missing from the previous preliminary study due to prolonged drought). In total, six sites sampled twelve times, plus six rainfall events, conducted in triplicate, will generate 324 samples (6 sites X 18 sampling events X 3 replicates). Fecal pollution sources will be identified using genetic markers targeting Bacteroidales strains associated with human, seagull and dog feces using quantitative real-time PCR (QPCR) (Seurinck *et al.* 2005; Lu *et al.* 2008). This method will quantify the abundance of source-associated human, seagull and dog fecal pollution. The data will be used to determine if either of these animals are a significant source of fecal loading.

Project Objective:

The objective of this project is to identify fecal pollution sources at Cole and Ropes Park in Corpus Christi Bay.

Project 1706 Outdoor Classrooms

Performing Organization: **CBBEP & USFWS**
Total Project Funding: **$10,000**
CBBEP *Bays Plan* Actions: **PEO-3, PEO-5**

Background:

In several discussions with teachers and principals, it has been determined that moving students to learning opportunities (field trips) is becoming more difficult. Buses are expensive and finding personnel to supervise, as well as scheduling, has become challenging. Field trips at the middle school and junior high level are almost non-existent.

One way to solve this problem would be to bring learning opportunities to schools in the form of an outdoor classroom. Outdoor classroom is defined as an outdoor area on campus set aside for student investigation and learning. Components are varied but often include benches or picnic tables adjacent to a study or natural area where students can gain field experience.

Objective:

To provide public schools with the option of an outdoor classroom that will promote interest in science, include community experts, support parent involvement, provide field experience to students, and help to improve scores.

Project 1707 Corpus Christi Bay Marine Debris Prevention and Assessment

Performing Organization: **City of Corpus Christi**
Total Project Funding: **$20,000**
CBBEP Bays Plan Actions: **BD-1**

Background:

The purpose of this project is to purchase and install 20 catch basin inserts at the highest priority areas where trash accumulates in the Cole Park drainage basin and allow the City to assess effectiveness through observations and regular maintenance.

The City of Corpus Christi (City) recently completed an assessment in late 2015 of debris/trash in the Cole Park drainage basin to try and assess the areas with the highest accumulation rates of trash getting into the stormwater system and eventually making it to Corpus Christi Bay. A map of the Cole Park areas with high amounts of trash was produced based on data gathered during the 2015 study. Other maps were produced to show specific strategies for implementation, including that show locations for placing catch basin inserts at high priority areas. The City will be observing the amount of trash accumulated in the catch basin inserts to ensure effectiveness of devices and for prevention of bay debris reaching the bay. The City installed 20 catch basin inserts in January 2015 and has begun collecting information on their effectiveness. This project would double the amount of catch basin inserts in place to help support the City's efforts to reduce trash and debris from reaching Corpus Christi Bay.

This project would leverage the City's existing 20 catch basin inserts that are currently collecting debris and the City's operation and maintenance costs associated with the devices.

Project Objective:

The primary project objective will be to purchase and install 20 catch basin inserts to help gather information on effectiveness of the devices and to prevent bay debris from reaching Corpus Christi Bay.

Project 1708 CBBEP Community Outreach Partnerships

Performing Organization: **Coastal Bend Bays Foundation**
Total Project Funding: **$30,000**
CBBEP Bays Plan Actions: **PEO-1, PEO-2, PEO-3, PEO-4 and PEO-5**

Background:

As stated in the *Coastal Bend Bays Plan,* CBBEP is constantly working to promote public/private partnerships to help achieve its educational goals.

The CBBEP partnership with the Coastal Bend Bays Foundation (CBBF) addresses our educational goals set forth in the *Bays Plan*. One of the benefits of the partnership between the CBBEP and 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 in the public policy debate. The *Bays Plan* calls for continued involvement from CBBF, as the region prepares itself for ever-increasing number 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.

This project will result in increase in the community's awareness of local environmental issues through Earth Day, forums and an awards banquet. An estimated 12,000 people are expected to attend these events.

Project Objectives:

- Host, organize and coordinate turnkey operation of Earth Day festival.
- Host, organize and coordinate CBBF Conservation and Environmental Stewardship Annual Awards Banquet.
- Conduct Coastal Issues Forums to increase communications between resource managers, users and general public.
- Organize and coordinate bay-resource/related workshops with CBBEP's approval.
- Continue to seek matching and/or leveraging funds.

Project 1709 CBBEP Property Management

Performing Organization: **CBBEP**
Total Project Funding: **$35,000**
CBBEP *Bays Plan* Actions: **HLR-1**

Background:

CBBEP is responsible for several properties including over 8,500 acres along the Nueces River and Nueces River Delta, 35 acres along Nueces Bay (HWY 181) and 160 acres on Mustang Island, and 180 acres on the Lamar Peninsula.

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 10,500 acres in San Patricio and Nueces Counties that are owned and managed by CBBEP as a conservation site for the purpose of 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, tidal mud flats and estuarine shoreline. 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 CBBEP owned properties, including but not limited to road maintenance, fencing maintenance, gates, brush control, equipment purchases, habitat and predator management (as appropriate and necessary), and property taxes.

Past project accomplishments include dike repair to a 50 acre created wetland, management equipment purchases, nest box construction, building maintenance, volunteer projects, aerial application of herbicide to invasive *huisache*, road repairs, preparation for prescribed fire, construction of a parking area for school buses, creation of a wildlife observation area and water sampling station, establishing routine mowing of common areas, trash collection service and (when needed) portable toilet services.

Objective:

To provide the ongoing maintenance and management of the Nueces Delta Preserve and other CBBEP properties.

Project 1710 Black Skimmer Migratory Patterns and Identification of Wintering Sites

Performing Organization: **CBBEP**
Total Project Funding: **$40,000**
CBBEP *Bays Plan* Actions: **HLR-1, HLR-4**

Background:

Populations of some coastal birds such as Black Skimmers have declined over 50% in the past 40 years according to the Texas Colonial Waterbird Society, which conducts an annual census throughout the coastal bays. In recent decades, the immediate coastal environment has undergone major changes due to development and increases in bay use by the public, and from broader changes to climate which may be affecting sea levels and storm frequency and intensity. Surveys conducted by Coastal Bend Bays and Estuaries Program and the U.S. Fish and Wildlife Service in some areas of the Texas coast have indicated that Black Skimmers are suffering from unusually low breeding success, including multiple years of virtually no birds fledging from nesting sites. Known causes of nest and colony loss include tidal overwash – often associated with storm events or abnormally high seasonal tides – and human disturbance. Skimmers are among the most sensitive of all coastal-breeding bird species, taking flight from nests when a potential predator is a long distance from the colony. This leaves the unprotected eggs and chicks vulnerable to heat stress as well as predation by opportunistic Laughing Gulls and other birds. Other factors that potentially contribute to declines in Black Skimmer populations include prey availability and quality, and survival throughout the long nonbreeding phase of the year.

At present, very little is known about the nonbreeding phases of Black Skimmers that breed on the Texas coast, though it is suspected that roughly half of the population probably leaves Texas for six or more months of the year. This information is critical for evaluating causes of population declines and determining where future conservation investments can be most effective.

Objectives:

This project will:

- Identify important migratory patterns and wintering sites by deploying tracking devices (solar PTTs) on up to 9 Black Skimmers programmed to transmit location data during the nonbreeding season to determine patterns of dispersal, migratory route, wintering area, and habitat usage.
- Raise public awareness of the plight of the species and of relevant new scientific findings through presentation to stakeholders at the end of each nesting season during a workshop, where strategies will be developed by the collaborative stakeholders and make recommendations on future projects.
- Facilitate public interest in skimmer conservation through updates on social media and links from the websites of project partners.

Project 1711 Nueces Delta Environmental Monitoring Project

Performing Organization: **Conrad Blucher Institute**
Total Project Funding: **$55,305**
CBBEP Bays Plan Actions: **FW-1, FW-2, FW-3, FW-4**

Background:

The purpose of this project is for the Conrad Blucher Institute for Surveying and Science (CBI) at Texas A&M University - Corpus Christi (TAMUCC) to continue maintenance of three current real-time salinity monitoring stations, add a new salinity station, and maintenance of one meteorological monitoring station along the Rincon Bayou, as well as maintenance of a tide gauge in west Nueces Bay. Data from all monitoring stations will assist in characterization of freshwater inflows into the Nueces Delta. Salinity sensors along the Nueces Delta will be used to trace freshwater inflows from freshwater pumping events via the Rincon Bayou Pipeline (RBP) from the Nueces River and will report water temperature, conductivity and salinity every 30 minutes. Data from these salinity stations are used by the Nueces Inflow Pipeline Advisory Committee (IPAC) to help determine when to recommend the schedule of pass-throughs of "banked" water to the City of Corpus Christi and by the Nueces Estuary Advisory Council (NEAC) to create freshwater inflow recommendations. The Center for Coastal Studies (CCS) at TAMUCC uses the salinity data provided from the salinity stations to support various projects involving sampling in the Nueces Delta. Data from these salinity stations are also utilized by the University of Texas Marine Science Institute (UTMSI) to support various modeling projects which will investigate the interaction between salinity of pore-water in the sediment and salinity of tidal creeks in the Nueces Delta.

Additionally, the data is intended for use in the calibration and validation of the Nueces Delta Hydrodynamic Model. A weather station will also be maintained in the Nueces Delta and will provide air temperature, wind, precipitation, barometric pressure, relative humidity, and solar radiation data. A tide gauge will be maintained to the National Oceanic and Atmospheric Administration's standards and will report water level, water temperature, wind speed, wind direction, and barometric pressure. All data will be available to the public at CBI's webpage (**http://cbi.tamucc.edu**).

Normally, a river flows through a delta area prior to making its confluence with its receiving water body. The Nueces River is different in that it flows into Nueces Bay at a point along the south shore of the bay, 2 ½ to 3 miles from the delta-bay interface, completely bypassing the delta. Only during times of severe flooding, causing over-banking of the river, or locally heavy rain, did much freshwater make it into the delta proper. To provide more freshwater diversions during normal flow conditions, the City of Corpus Christi built a pipeline and pump station to divert up to the first 3,000 acre-feet of pass-throughs per month from above the saltwater barrier dam directly into the upper Rincon Bayou.

The primary project objectives will be to continue monitoring the freshwater inflows coming into the delta via the pipeline by recording salinities within the water column at various stations along the Rincon Bayou, as well as to maintain a real-time weather station and a tide gauge in Nueces Bay for the period of one year. These instruments will be used to calculate spatial and temporal environmental effects as well as the amount of freshwater needed to manage a healthier estuary.

Objective:

Maintain real-time water quality, tide gauge, and meteorological monitoring stations in the Nueces Delta and Bay to measure effects of Rincon Pipeline freshwater inflows.

Project 1712 Comprehensive Management Plan - Nueces Delta Preserve

Performing Organization: **CBBEP**
Total Project Funding: **$35,000**
CBBEP Bays Plan Actions: **HLR-1, PEO-1, FW-1**

Background:

In December of 2015 with the purchase of a 1970 acre tract from The Conservation Fund the Nueces Delta Preserve became to a contiguous 10,500 acres. CBBEP has decided that a Comprehensive Management Plan to help with guidance and operations of the Nueces Delta Preserve is needed to best serve the property. Current and future managers of the Nueces Delta Preserve will benefit from the goals and objectives set out in the plan.

Not unlike any other conservation property there are numerous ongoing uses of the Nueces Delta Preserve. Ensuring the current uses are compatible and can coexist while continuing to preserve the core conservation values of habitat conservation and enhancement will be the guiding principles of the plan.

Objectives:

- Establish an advisory team to help develop the Comprehensive Management Plan
- Identify and document all activities at the Nueces Delta Preserve
- Obtain current and historical aerial imagery of the Nueces River Delta
- Obtain all boundary surveys in an electronic form
- Obtain all pipeline owner and operator information on CBBEP owned lands
- Develop a framework for the Comprehensive Management Plan
- Draft the Comprehensive Management Plan

Project 1713 Volunteer Water Quality Monitoring Program in Baffin Bay

Performing Organization: **Texas A&M University-Corpus Christi**
Total Project Funding: **$50,000**
CBBEP Bays Plan Actions: **WSQ-3**

Background:

The purpose of this project is to help maintain a volunteer water quality monitoring program in Baffin Bay that will be gathering water samples and identifying potential sources of water quality degradation in the system. Baffin Bay is also undergoing significant eutrophication, as exemplified by a long-term increase in nitrogen and phosphorus loads and chlorophyll *a* concentrations that have exceeded state criteria for nearly the past decade (Montagna and Palmer 2012). Additional symptoms include blooms of potential HAB species (*A. lagunensis*, *Pyrodinium bahamense*), episodic hypoxia and fish kills.

In response to concerns over water quality changes in Baffin Bay, Texas A&M University-Corpus Christi (TAMU-CC) recently initiated a spatially-temporally intensive volunteer water quality monitoring program to: 1) generate data for construction of nutrient budgets and to identify potential sources of nutrient/organic matter loadings that are contributing to water quality degradation in the system, and 2) characterize the ecosystem response to loading events, including from episodic storm events.

As part of the volunteer program and a TAMU-CC Ph.D. student project, samples will be collected from 8 sites in Baffin Bay on a monthly basis, as well as at higher frequencies in response to episodic storm events or fish kills (Figure 1). Two of the sites overlap with TCEQ quarterly monitoring stations, allowing for comparison with longer-term trends within Baffin Bay. At each site, vertical profiles will be performed and discrete surface samples collected. Additionally, a YSI Ecomapper Autonomous Underwater Vehicle (AUV), equipped with water quality sensors (temperature, salinity, D.O., pH, chlorophyll fluorescence) will be regularly deployed to identify water quality "hot spots" and to characterize environmental conditions pre- and post-storm.

Objective:

Support and maintain a volunteer water quality monitoring program through TAMU-CC and collect monthly data, and rain event data, to identify nutrient concentrations and loading throughout the bay system.

Project 1714 CBBEP Public Outreach Events and Activities

Performing Organization: **CBBEP**
Total Project Funding: **$25,000**
CBBEP *Bays Plan* Actions: **PEO-1, PEO-2, PEO-3, PEO-4 and PEO-5 and BTR-1**

Background:

One of the most important goals of the *Coastal Bend 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 understand the complex issues concerning bay resource management is 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. CBBEP is constantly working to promote public/private partnerships as stated in the *Coastal Bend Bays Plan* to help achieve its educational goals.

Objective:

CBBEP will raise awareness of environmental issues by connecting with the Coastal Bend public through our websites and at community events and festivals. We will spread the CBBEP brand through promotional and educational materials, such as posters, reusable bags and other items. We expect to reach thousands at various community events.

In addition, CBBEP may participate in:

- Community events and festivals
- CBBEP may produce or purchase educational and promotional materials
- CBBEP will maintain a web site(s)
- CBBEP develop and provide electronic updates
- Other outreach opportunities

Project 1715 Interpretative Signage CBBEP Project Area

Performing Organization: **CBBEP**
Total Project Funding: **$25,000**
CBBEP Bays Plan Actions: **HRL-1, PEO-1, BD-1, FW-1**

Background:

Packery Flats is a dynamic area made up of diverse ecological communities. This property is owned by the Texas General Land Office, and managed by a group of natural resource entities. The property is heavily used by the public for wade fishing, bird watching, and nature viewing and has limited interpretive signage. Additional interpretative signs at different points of access to the property will help inform the public about the importance of the habitat communities found within the property and the need to conserve/protect them.

The Nueces Delta Preserve is CBBEP's 10,500 acre property in the Nueces River Delta. CBBEP will develop signage for the property that will help students and visitors better understand the function of the Nueces River Delta. Research and restoration efforts along with habitat types will be highlighted in the signage. Currently, there are no interpretative signs located on the property. The signs will help CBBEP guests and field trip participants better understand the 'big picture' of the Nueces River Delta.

The development of identifiable interpretative signs within in the coastal bend is imperative to promoting the conservation of coastal resources. A signage template for the Coastal Bend area has been developed through previous efforts.

The purpose of this project is to design, manufacture and install interpretative signage at the Kate's Hole Public Access Area within Packery Flats Coastal Habitat Community and also at the CBBEP Nueces Delta Preserve.

Objectives:

- To provide additional interpretative signs at Packery Flats different access points that will inform the public of the importance of the Packery Flats Coastal Habitat Community.
- To provide interpretative signs at the Nueces Delta Preserve to be viewed by the many students and visitors to the Nueces Delta Preserve that participate in the CBBEP environmental education program.

Project 1716 Animal Rehabilitation Keep Public Access and Education Project

Performing Organization: **Mission-Aransas NERR**
Total Project Funding: **$38,500**
CBBEP Bays Plan Actions: **BTR-1, BTR-2, PEO-5**

Background:

The purpose of this project is to create public access and educational trails and signage to portions of the Animal Rehabilitation Keep (ARK) located on the campus of the University of Texas Marine Science Institute in Port Aransas, Texas. The ARK will provide walking paths and interpretive signage to educate the public.

The UTMSI and the Mission Aransas National Estuarine Research Reserve (Reserve) strive to enhance public understanding of the value and function of estuaries and to encourage protection of the coastal environment. The ARK was established in 1983 and has been the areas primary facilitator of rehabilitating endangered sea turtles and marine birds. The ARK has always had restricted access to its facilities due to permit restrictions on the animals that will be released after being rehabilitated. Unfortunately, some of the animals will never be released due to their injuries, but this creates a perfect opportunity to educate the public about these species and their habitats.

This project includes extending the Wetlands Education Center trails to include the ARK that sits directly adjacent. Several existing structures will be modified to include non-releasable sea turtles, sea birds, and raptors. The inclusion of trails and educational exhibits focusing on the importance of the animals and their habitats for protection will be installed throughout the pathway. The walkways will be constructed of crushed granite, and provide access to each of the following areas:

- Raptor muse
- Pelican enclosure
- Turtle viewing pool

Objectives:

- To provide a public access to the ARK that enhances the educational programs and improves the overall learning experience of Coastal Bend visitors.
- To modify/enhance existing structures for public viewing of animals at the ARK.
- To showcase the benefits and importance of ARK animals and habitats (i.e., sea turtles, sea birds, raptors, barrier islands, etc.)

Project 1717 Goose Island Circulation Enhancement

Performing Organization: **CBBEP/EPA Gulf of Mexico Program**
Total Project Funding: **$235,901**
CBBEP Bays Plan Actions: **HRL-1, FW-1**

Background:

The purpose of this project is to design, permit, and construct a replacement culvert system at a water body known as Goose Lake to restore hydraulic circulation and exchange to the area. Goose Lake is located in San Patricio County, TX and is within the boundaries of the CBBEP Nueces Delta Preserve. This portion of the Nueces River Delta was impacted in the 1950's when a road was constructed across the marsh by a previous land owner. The construction of the road reduced water exchange and the loss of function of the existing culvert system has resulted in a reduction of tidal exchange. By replacing the non-functioning culvert systems with a functioning culvert system, circulation will be restored to the 147 acre area known as Goose Lake.

Objectives:

- Enhancement and restoration of 147 acres of wetland complex and tidal flats to ensure ecological productivity and diversity.
- Improved and expanded marsh vegetation due to lower salinities and increased inundation and circulation.
- Improved habitat and nesting areas for important coastal bird species, such as stilts, egrets, and mottled ducks and wintering shorebirds, such as sandpipers and dunlin.
- Increased public awareness and appreciation of wetlands, specifically the Nueces River Delta.

Project 1718 Nueces Delta Imagery Acquisition

Performing Organization: **University of Texas Marine Science Institute**
Total Project Funding: **$18,500** (leverage TWDB $40,000)
CBBEP Bays Plan Actions: **HLR-1, FW-1**

Background:

The purpose of this project is to acquire high resolution, true-color and color infrared imagery of the Nueces Delta marsh complex for the University of Texas Marine Science Institute (UTMSI) so they can utilize it to determine if patterns of vegetation have changed since the last acquisition of imagery on 1 November 2005. New, current high resolution imagery (pixel resolution of one foot) is needed to reproduce the 2005 imagery to ensure an accurate change analysis. Freely available moderate resolution imagery (50 cm resolution from TNRS, MODIS, LANDSAT, etc.) does not provide sufficient detail to accurately calculate change between 2005 and 2016 to allow UTMSI to perform precise orthorectification consistent with the 2005 imagery.

The Texas Water Development Board (TWDB) has executed contracts State-wide in an effort to implement adaptive management plans that were developed through the Senate Bill 3 process for establishing environmental flows for the State of Texas. UTMSI will enter into contract with the TWDB to look at changes in marsh vegetation along the Rincon Bayou in the Nueces Delta in response to the Rincon Bayou Pipeline freshwater inflows (Fig. 1). The contract between the TWDB and UTMSI covers data analysis and ground truthing, but does not however, include the costs of imagery acquisition that is needed for a comprehensive assessment of vegetation change.

This project would quantify the loss of internal deltaic marsh over time in response to increases in open water areas. It has been well documented that the outer edges of the Nueces Delta are eroding rapidly, but the last assessment of change was completed more than a decade ago. These data will provide information that will contribute to a broader understanding of the potential roles of decreased freshwater inflows, sediment loading, subsidence, and erosion. UTMSI will leverage the existing TWDB contract funds of $40,000 to acquire the needed imagery to complete a full assessment of the vegetation changes in the lower Nueces Delta, and especially along the lower Rincon Bayou. The image acquisition would occur in November 2016, nearly exactly eleven years after the last acquisition and the subsequent vegetation classification completed by Rasser (2009).

Project Objective:

The primary project objective will be to acquire true-color and color infrared orthogonal imagery using nearly identical procedures employed in 2005 to determine patterns of vegetation changes in the lower Nueces Marsh.

Project 1719 Causeway Island Habitat Protection, Nueces Bay Texas – Design and Engineering

Performing Organization: **CBBEP**
Total Project Funding: **$230,000**
CBBEP Bays Plan Actions: **HLR-1, HLR-2**

Background:

In 2016 CBBEP received notification of funding from CEPRA and CMP to address habitat loss at Causeway Island. The match requirement for CEPRA is 60/40, with CBBEP needing to fund 40% of the total project cost. The match requirement for CMP is 75/25 with CBBEP needing to fund 25% of the project cost.

This project will address actions needed to protect important rookery island habitat at Causeway Island. Causeway Rookery Island is located in Nueces County on the north side of US Highway 181, between the cities of Corpus Christi and Portland, Texas. Causeway Island is currently 7 acres and serves as roosting and nesting habitat. The Island supports approximately 3,070 pairs of breeding colonial waterbirds per year. The Island harbors numerous threatened and priority Texas avian species including the Reddish Egret, Little Blue Heron, Black Skimmer, and Gull-billed Tern. Native Texas thorn scrub located on the higher elevation portion of the Island is utilized by the birds for nesting and foraging.

In 2003, the Coastal Bend Bays & Estuaries Program (CBBEP) installed geotextile tubes on the north side to protect the Island from erosion. The protection on the north side is especially important during the winter months when strong fronts come across the bay and waves erode the shoreline. Sometime in early 2014, the middle section of the geotextile tube began to fail. By November 2014, approximately 230 feet of the tube had failed causing the shoreline to be exposed to wave energy and resulting in approximately 45 feet of shoreline eroded in less than a year. Protecting the further loss of this important habitat will help thousands of colonial waterbirds.

The CBBEP has also invested funding in the dredge placement events from the Port of Corpus Christi. The CBBEP has also constructed and installed several platforms for birds to nest on and has planted native vegetation for the birds to forage on. The shoreline protection will be implemented in phases, depending on the availability of funding.

Objectives:

The CBBEP will contract with a local engineering firm who will complete preliminary engineering, obtain aerial imagery, prepare an alternatives analysis, and 70% construction design for protection of Causeway Island and provide permitting support for a USACE permit. The final engineering and design will include a structure designed to protect the Causeway Island from wind and wave erosion and will also trap and secure sediment from future dredge placement events.

Project 1720 Identifying Nesting Habitat for Texas Diamondback Terrapin in the Mission-Aransas Estuary

Performing Organization: **TAMU-CC**
Total Project Funding: **$19,957**
CBBEP Bays Plan Actions: **HLR-1, HLR-4**

Background:

The purpose of this project is to identify nesting habitats for Texas diamondback terrapin. Aside from two recent studies, there is virtually nothing known regarding terrapin nesting in Texas. In order to ensure the longtime survival of this species, it is imperative to identify and preserve the habitats utilized for nesting. Terrapins are known to exhibit nest site fidelity, meaning they return to the same nesting beaches year after year. Bulk heading and other shoreline alterations can prevent terrapins from accessing nesting beaches. Until these areas are identified, there is no hope of preserving them as functional nesting habitats. This project aims to identify specific nesting sites in the Mission-Aransas Estuary, Texas using a nesting habitat characterization created during a similar study in the Nueces Estuary.

Previous research, funded by CBBEP, has suggested methods for reducing mortality in juvenile and adult terrapins through the use of bycatch reduction devices. Attention should also be paid to the earliest life stages to ensure healthy recruitment into terrapin populations. In order to do this, nesting habitats must first be identified so that they can be preserved.

Walking surveys will serve to collect descriptive data, including percent vegetation cover, substrate type, and elevation, if nesting sites are identified. Raided nests, as well as aborted nesting attempts, will be marked on a GPS and sampled for the abovementioned parameters. Motion activated digital cameras will be deployed in areas that meet the criteria for nesting found in a previous study conducted in the Nueces Estuary. These cameras will allow for the monitoring of potential nesting sites. Digital trail cameras were highly successful in documenting overland travel by mature female terrapins in the Nueces Estuary and should provide similar results in the Mission-Aransas Estuary. By combining these two methods, chances of discovering nesting habitats will be increased. A final report describing the findings of this project will be made available.

Objective:

The project objective is to identify diamondback terrapin nesting sites. The nesting habitat sites identified will then be marked for preservation efforts.

Project 1721 Relative Sea Level Rise Habitat Assessment in the Nueces Delta Preserve

Performing Organization: **Mission-Aransas NERR and UTMSI**
Total Project Funding: **$30,000**
CBBEP Bays Plan Actions: **HLR-1**

Background:

The proposed project will help determine the impacts of sea level rise on marsh habitats in the Nueces Delta Preserve by gathering data on both vegetative communities and elevation change. Funding for the proposed project will be used (1) to continue a long-term marsh vegetation monitoring program at the Nueces Delta and (2) to supplement the existing marsh monitoring program with elevation data gathered using Surface Elevation Tables (SETs). This is a two-year project that will provide CBBEP and resource agencies with the information they need for planning for sea level rise in the future. More specifically, the results of this project can be used to help answer questions related to the management and restoration of the Nueces Delta Preserve, which is owned by CBBEP.

This scope includes the installation of a group of three Surface Elevation Tables (SETs) at two sites within the CBBEP Nueces Delta Preserve (total of 6 SETs). Using the elevation data gathered from SETs, we can compile a more complete picture of habitat changes due to relative sea level rise within the Nueces Delta. This proposal builds upon other efforts along the Texas coast to maintain and monitor SETs. The Mission-Aransas NERR has worked with UTMSI researchers to install, maintain, and survey four groups of SETs since 2012, with a fifth group being installed later this spring (2016). These existing Mission-Aransas NERR SETs are located in the NERR boundary within Aransas and Copano bays, which are situated just north of Nueces Bay.

SETs help researchers acquire the fundamental data and information needed to understand the effects of changing local sea level and inundation patterns on the response of vegetative communities. Knowledge about other factors such as changes in vegetative communities, precipitation, temperature, water chemistry, and invasive species is helpful in segregating the impacts of changing land and water levels from other environmental influences. Previous, on-going, and planned research projects at the Nueces Delta will be invaluable in identifying the key indicators that are environmentally important and will complement the data gathered through this proposed project.

In particular, the SET data will greatly benefit a long-term vegetation monitoring program that has been maintained and monitored by UTMSI for many years at the Nueces Delta. Measurements at vegetation transects have been made continuously for over 15 years (since 1999) and have included: percent cover, species composition, sediment ammonium, pore water salinity, and sediment moisture. By placing SETs in close proximity to these transects, researchers will have a much more complete picture of habitat changes due to relative sea level rise and inundation changes. Since funding is no longer available for UTMSI to monitor these vegetation transects on a regular basis, the current proposal also includes funds to allow UTMSI to continue monitoring vegetation transects within the Nueces Delta.

Objectives:

- Purchase supplies and install a group of three SETs at two different sites (6 total SETs) within the Nueces Delta for gathering elevation data.
- Monitor elevation at installed SETs twice a year for two-year period.
- Monitor percent cover, species composition, sediment ammonia, pore water salinity, and sediment moisture at existing vegetation transects within the Nueces Delta twice per year for a two-year period.

Project 1722 Brazilian Peppertree Treatments for the Texas Gulf Region Cooperative Weed Management Area

Performing Organization: **Mission-Aransas NERR**
Total Project Funding: **$40,000**
CBBEP Bays Plan Actions: **HLR-1, HLR-2, HLR-10**

Background:

The purpose of this project is to continue Brazilian peppertree (*Schinus terebinthifolius*) control treatments on land within the Texas Gulf Region Cooperative Weed Management Area (CWMA). Brazilian peppertree is a non-native, invasive woody plant with the ability to completely dominate and change the landscape. Brazilian peppertree dominated landscapes have been shown to be poor habitat for native wildlife and may negatively impact grassland bird populations. In 2015, it is estimated that Brazilian Pepper occupies approximately 133 acres within the city limits of Port Aransas. The species is easily spread by some birds, which consume the fruit and seeds. This negative environmental impact of the species is so extreme that the Texas Department of Parks and Wildlife lists the species as a Prohibited Aquatic Species, making it illegal to release the species into waters of the state (Texas Administrative Code, Title 31, part 2, Chapter 57, Subchapter A). Additionally, the Texas Department of Agriculture lists the species as a noxious species, in which a person commits an offense under Texas Agricultural Code §71.151 if the person sells, distributes or imports the plant listed in any live form without permit.

The Texas Gulf Coast CWMA was established in 2014 and its mission is to address invasive Brazilian peppertree from Port O'Connor to Packery Channel on barrier islands of the Texas Gulf Coast. All together the Texas Gulf Region CWMA is approximately 151.3 square miles (391.9 km^2) or 96,832 acres. Currently the CWMA contains nine partners, and over 30 members.

Funding from CBBEP will be used specifically for Brazilian Pepper control within the CWMA boundary. Areas of focus include Charlie's Pasture, University of Texas Marine Science Institute and I.B. Magee property, along with additional follow-up treatments at Charlie's Pasture. The CWMA is also planning on conducting another replanting event this fall, which could occur following a contractor treatment. Funding from CBBEP could potentially enhance more than 50 gross acres of coastal grasslands and native plant communities through Brazilian peppertree removal.

Objective:

The primary project objective will be Brazilian Pepper control within the CWMA boundary which will enhance more than 50 gross acres of coastal grasslands and native plant communities.

Project 1723 Enhancing Nesting Success of Priority Bird Species in South Texas

Performing Organization: **CBBEP**
Total Project Funding: **$40,903**
CBBEP *Bays Plan* Actions: **HLR-1, HLR-4**

Background:

Many of the colonial waterbird species in Texas have seen dramatic population declines, partly because of the loss and degradation of vital nesting habitat. Currently, in the Coastal Bend of Texas, most waterbird species nest on small, isolated islands in the bays and waterways along the coast. The majority of these islands are composed of dredge material and often lack the vegetation that many waterbirds prefer for nesting, therefore, the planting of native vegetation is critical to provide suitable nest structure and prevent the establishment of invasive/exotic vegetation.

The Coastal Bird Program at CBBEP has, over the last decade, developed successful techniques for managing habitat in the harsh, salty, and dry conditions that exist on rookery islands. Using new materials and planting techniques such as tree tubes, weed mat, and site-specific fertilizer, the Coastal Bird Program has seen vastly improved seedling survival and growth rates; as much as 80% or more first year survival over previous seedling establishment techniques. This project will provide materials and personnel to effectively plant 1,500 native brush seedlings on area rookery islands, greatly improving existing habitat for colonial nesting waterbirds.

Another factor affecting reproductive success for colonial waterbirds is chronic human disturbance. CBBEP efforts in recent years have looked at ways of minimizing disturbance and educating the public of the ramifications of disturbance to nesting birds. Installing signage around rookery islands is one way of warning and informing bay users to stay off active nesting sites. Many of the signs that have been in place for several years are too small, faded, and hard to read. New, larger signs that can be seen and read from further away are needed to inform bay users to avoid critical nesting areas before they are close enough to disturb nesting birds. This project provides materials to install and/or replace 50 signs at key rookery islands.

Objectives:

This project will:

- Improve valuable rookery island habitat through the planting and establishment of 1,500 native brush seedlings on key colonial waterbird nesting sites.
- Reduce human disturbance of rookery islands by replacing and installing new, larger signs that warn bay users of active rookeries and can be seen from a considerable distance, preventing and minimizing human disturbance of waterbird colonies.

Project 1724 Lower Laguna Madre Bird Conservation

Performing Organization: **CBBEP**
Total Project Funding: **$106,836**
CBBEP *Bays Plan* Actions: **HLR-1, HLR-4**

Background:

The Laguna Madre is one of the most important coastal wetland complexes for birds in the Western Hemisphere. Much of the value of this system for birds is based on the diversity of tidal flats and seagrass beds spread over a very large geography – extending from the Corpus Christi area down to La Pesca, in Tamaulipas, Mexico.

While CBBEP's Coastal Bird Program has conducted extensive management efforts focused on the Upper Laguna Madre within the CBBEP program area, virtually no management activity has been directed towards important sites in the Lower Laguna Madre which is nearly the same size.

The Coastal Bird Program has conducted some management activity in that area in the past, and is well acquainted with the area and the management needs of the islands. There are substantial opportunities to successfully manage these sites for the benefit of colonial nesting species.

This project will allow the Coastal Bird Program to initiate a slate of management actions at island sites throughout the Lower Laguna Madre, and establish a more permanent presence in the lagoon system and the surrounding communities. This will be accomplished by hiring one additional staff person who will work in conjunction with the current Bird Program staff. This expansion will allow the smooth transfer of knowledge and management methods that have been developed over years of the program's activities in the central coast.

The expansion will also allow the Coastal Bird Program to engage more directly with partners in coastal conservation on the Mexican portion of the Laguna Madre by offering training and assistance with management planning and implementation.

Objectives:

This project will:

- Improve colonial nesting waterbird populations in the Lower Laguna Madre by addressing proximate causes of nest failure such as predation, lack of suitable nesting substrate, and human disturbance.
- Implement monitoring efforts on shorebird populations to identify potential conservation actions.
- Engage volunteers and communities in coastal bird conservation efforts through the coastal portion of the Rio Grande Valley.

Project 1725 Waters for Wildlife: Enhancing Freshwater Sources for Whooping Cranes

Performing Organization: **San Antonio Bay Partnership**
Total Project Funding: **$23,000**
CBBEP Bays Plan Actions: **HLR-2**

Background:

In 2014, the San Antonio Bay Partnership received funding from the US Fish and Wildlife Service (USFWS) and the Coastal Bend Bays & Estuaries Program (CBBEP) to collaborate with the International Crane Foundation (ICF) on a project to develop a "Water Well Suitability Index." The project used a GIS-based conservation planning software called NatureServe Vista to develop a suitability index that characterized locations within the Whooping Crane wintering territory based on their potential for successful use by cranes following water well installation/repair. The index was designed to help ensure that resources are utilized wisely by investing in water wells that are more likely to provide the greatest benefit to Whooping Cranes.

The San Antonio Bay Partnership is currently using funds from CBBEP and USFWS to install a water well at a priority site identified in the "Water Well Suitability Index" project. There are many more sites, however, where additional water wells are needed, and the list of priority sites in the "Water Well Suitability Index" provides the opportunity to target financial resources towards the installation of water wells that will have great benefits for Whooping Cranes. The San Antonio Bay Partnership is requesting funds to install an additional water well at one priority site in the Whooping Crane wintering territory – the site will be chosen from the high priority locations identified in the "Water Well Suitability Index."
In order to evaluate the effectiveness of the "Water Well Suitability Index" and gather additional data that can be used to refine future iterations of the index, it is important to monitor the presence and absence of Whooping Cranes and other wildlife at the freshwater ponds created by newly installed water wells.

Therefore, SABP is also requesting funds to work with ICF to monitor usage by Whooping Cranes (and other wildlife) at the freshwater ponds created near the newly installed water wells, as well as other additional nearby freshwater ponds. This monitoring project will build upon recent and on-going efforts by ICF/SABP to use game cameras to monitor usage by Whooping Cranes at freshwater ponds. ICF and SABP received funding in 2015 from the Texas State Aquarium Wildlife Care, Conservation, and Research Fund to purchase cameras and equipment to monitor several ponds on the Aransas National Wildlife Refuge and nearby Lamar Peninsula. Additional funds, however, will be needed in the future to monitor new sites and repair broken and damaged equipment. The funds requested as part of this project will be used to purchase the supplies needed to supplement and repair existing equipment and to support future travel to monitoring sites.

Objectives:

- Install one new water well at a priority site identified in the "Water Well Suitability Index."
- Purchase, install, and maintain game cameras at freshwater ponds in order to monitor usage by Whooping Cranes and other wildlife.

Project 1726 An Ecosystem-based Approach to Assess Baffin Bay's Black Drum in Different Hydrological Conditions

Performing Organization: **Harte Research Institute**
Total Project Funding: **$30,000**
CBBEP Bays Plan Actions: **HLR-1, HLR-4**

Background:

The purpose of this project is to examine resource use (food, habitat) of black drum in Baffin Bay. In 2013, TPWD published the "Emaciated Black Drum Event" report, highlighting the need for information on benthic food resources and Black Drum feeding dynamics throughout the BBC. The TPWD report, in part, provided the motivation to initiate a comprehensive, multi-trophic level study to determine linkages between water quality, benthic food resources, and Black Drum.

The results of the comprehensive study can be summarized as follows:

- Benthic food resources are available throughout Baffin Bay Complex and prey communities are similar across space and time.
- Benthic food resources (Macrofauna communities) change with observed dissolved oxygen concentrations and salinity.
- Black Drum are opportunistic and are generally consuming benthic food resources proportional to their availability.
- Black Drum show fidelity to the Baffin Bay Complex, indicating that this species is vulnerable to estuary-scale disturbances

However, a caveat to the comprehensive study is that it was conducted when hydrological conditions were fairly stable, and since the end of the study, conditions have changed considerably. Water quality in the BBC has changed recently from this stable condition due to large volumes of rainfall in the Baffin catchment and other meteorological phenomena. Because Black Drum are feed on the benthos, and benthic food resources are dependent on the overlying water column (indirectly changes in salinity and dissolved oxygen), it is important to determine what effect these changes in water quality will have on Black Drum diets. This is especially important in the near future because we have just entered an El Niño period, which is linked with wetter than normal weather in South Texas.

Following the design of previous work (mostly funded by CBBEP and Sea Grant), the team will resume a standardized benthic sampling program to understand the spatial and temporal patterns in the abundance of potential Black Drum prey (i.e., benthic invertebrates) across Baffin Bay (*Objective 1*). To examine Black Drum reliance on these potential resources and spatial variability in trophic role, the group will continue to conduct diet analyses from specimens collected from Baffin Bay (*Objective 2*). These diet analyses will include stable isotope analyses of Black Drum tissues, prey items (in stomachs and in sediments) and in the water column.

Objective:

To obtain a comprehensive scientific understanding of how to best manage the Black Drum fishery in Baffin Bay.

Project 1727 Update of the "Bays Plan" and "Implementation Strategy for the Bays Plan" (Phase 2)

Performing Organization: **TBD**
Total Project Funding: **$31,262**
CBBEP Bays Plan Actions: **HLR-4, HLR-10**

Background:

The "Bays Plan" is a comprehensive conservation and management plan (CCMP) intended as a living document. EPA recommends that each National Estuary Program review its CCMP every three-to-five years to determine whether a revision or update is needed to keep the CCMP relevant. EPA also expects that all CCMPs revised by the end of FY 2020 will take into account a broad, risk-based climate change vulnerability assessment. Climate change has never been addressed in the CBBEP "Bays Plan".

The "Bays Plan" (CBBEP's CCMP) was completed in 1998 and even though the majority of the plan is still pertinent to our needs here in the Coastal Bend, it is in dire need of a thorough review and an update. The update is necessary to review each of the goals, objectives and actions to determine what revisions are needed to address various changes that have occurred in the Coastal Bend area over the last 15 years. The review and update of the plan will also take into consideration new scientific findings that affect the actions needed to continue to protect the quality of the natural resources and the watershed in the Coastal Bend area.

Recently, in an effort to develop more information on local effects climate change may have in the Coastal Bend area, CBBEP initiated a project to conduct a Climate Change Vulnerability Assessment. This project was submitted as part of the FY15 Work Plan to EPA and the TCEQ and the information resulting from the vulnerability assessment report will be used to develop only the section in the Bays Plan needed to address climate change.

CBBEP initiated the effort of reviewing and revising the CCMP, "Bays Plan" and "Implementation Strategy for the Coastal Bend Bays Plan" through a project 1627 using CBBEP staff and a contractor. Meetings/workshops to solicit stakeholder input were coordinated, facilitated and conducted by CBBEP staff and the contractor. Although the project deliverable was a draft of the updated, revised plan, this project will take the "Draft Revised Plan" finalize it and make it accessible to the public.

Objective:

To complete the thorough review of the CBBEP "Bays Plan" and to revise the plan with current Goals, Objectives and Actions for every section in the existing plan and to add a section on Climate Change/Sea Level Rise, and other needs that may have developed over the past 15 years and to "complete the graphics and layout" of the plan to make it accessible to the public via print (a condensed version) and web site.

Project 1728 Gulf Coast Conservation Initiative (Phase 4)

Performing Organization: **CBBEP**
Total Project Funding: **$341,000**
CBBEP Bays Plan Actions: **BTR-3, SM-3, HLR-1, HLR-2**

Background:

The Gulf Coast Conservation Initiative (GCCI)'s purpose is to protect, enhance, and/or restore habitat for whooping cranes, northern Aplomado falcons, Attwater's prairie chickens, Sprague's pipit and associated species.

The Aplomado Falcon, Attwater's Prairie Chicken, and Whooping Crane are endangered species that occur in coastal Texas, and whose ranges overlap to varying degrees with one another, as well as with many migratory birds which have experienced long-term, broad-scale declines across much of their ranges. These species can neither recover nor be sustained unless habitat sufficient to support viable populations is conserved. Habitat for these species has been degraded by the production of food and fiber, and is being lost to development and rising sea-levels. Protecting, enhancing, and restoring habitat for these species from development will in this area reduce or avoid impacts from recreational uses, protect and preserve functional sensitive natural habitat types, preserve open space, and restore degraded habitats in the GCCI priority area.

Since 2002, CBBEP has worked to acquire either fee simple title or conservation easements for more than 7,200 acres of freshwater marsh, forested wetlands, mudflats, riparian corridors, and native upland habitat for conservation management. CBBEP has coordinated with U.S. Fish & Wildlife Service, Natural Resources Conservation Services, and The Nature Conservancy to develop and implement management plans and restoration actions throughout this protected habitat. CBBEP has also coordinated worked with other property owners (such as Aransas National Wildlife Refuge, Texas Parks and Wildlife Department, City of Corpus Christi, South Texas Botanical Gardens and Nature Center, and private property owners) to develop and implement restoration actions on their property.

CBBEP will coordinate with USFWS, USDA-NRCS, and other conservation organizations to identify and implement restoration actions that benefit a minimum of 220 acres of habitat for Aplomado Falcons, Attwater's Prairie Chickens, and/or Whooping Cranes, as well as associated focal migratory birds' habitats. For projects on private lands CBBEP or a designated project partner will develop written 10-year long agreements with landowners.

Objective:

Identify and implement restoration actions that benefit a minimum of 220 acres of habitat for Aplomado Falcons, Attwater's Prairie Chickens, and Whooping Cranes.

Project 1729 Mechanistic Modeling of Bottom Water Dissolved Oxygen Dynamics in Baffin Bay

Performing Organization: **Texas A & M University – Corpus Christi**
Total Project Funding: **$50,110**
CBBEP Bays Plan Actions: **WSQ-1**

Background:

Baffin Bay has been the subject of intensive water quality studies since 2013, largely in response to concerns over persistent algal blooms, fish kills and hypoxic events. As part of those studies, various relevant water quality parameters (including dissolved oxygen, D.O.) have been measured on a monthly basis, with higher frequency (every 15 minutes, continuously) D.O. measurements commencing in January 2015 and continuing to present. This project will support the development of a mechanistic dissolved oxygen model for Baffin Bay that ties together all existing datasets in order to understand the main drivers of D.O. dynamics and hypoxia formation in Baffin Bay. The benefit of this work is that it will provide a science-based tool for management agencies and stakeholders for hypoxia mitigation purposes.

In order to quantify the D.O. sources and sinks, we propose to build a mechanistic D.O. model. This model is based upon previously published studies for shallow stratified lake and coastal waters (Fennel et al., 2013; Fennel et al., 2001; Stefan and Fang, 1994). We will divide the water column in Baffin Bay into two layers when there is stratification. We assume each layer is horizontally well-mixed. Our preliminary application of this model to another local bay system (Oso Bay) suggests that this method appropriately simulated D.O. dynamics during the entirety of 2012 as assessed from field data (Hu and Wetz, unpubl. data). In short, the model will be parameterized from data collected by TCEQ quarterly monitoring, the aforementioned monthly sample collections, higher frequency continuous collections, and experimental rate measurements determined through Sea Grant-funded to Wetz and Hu.

The model outputs will generate contributions of different processes to D.O. production and consumption. We will use this information to unravel the dominant mechanisms involved in D.O. variability and hypoxia formation. Through scenario modeling (i.e., simulating reductions in nutrient load, long-term water temperature changes), we expect to propose mitigation strategies for reducing the area of hypoxia in the Baffin Bay.

Objective:

The primary objective of this project is to build a mechanistic D.O. model that will provide a science-based tool for management agencies and stakeholders to use for hypoxia mitigation purposes.

Project 1730 Caring for Our Coast - Delta Discovery and Habitat Protection/Enhancement Activities

Performing Organization: **CBBEP**
Total Project Funding: **$25,000**
CBBEP Bays Plan Actions: **PEO-3, HLR-1, HLR-2**

Background:

This project, sponsored by CITGO is designed to support the activities and habitats at the Nueces River Delta Preserve. 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 10,500 acres in San Patricio and Nueces Counties that are owned and managed by CBBEP as a conservation site for the purpose of 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, tidal mud flats and estuarine shoreline. 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 Delta Discovery Program and necessary management of habitat and routine maintenance of the CBBEP the delta, including but not limited to road maintenance, fencing maintenance, gates, brush control, fireguard work, equipment purchases, habitat and predator management (as appropriate and necessary).

Objective:

The primary objective of this project is to support the Delta Discovery Program - to include assisting in the implementation of field trips for schools in the Coastal Bend and to implement habitat restoration and management in the Nueces River Delta - to include maintenance and installation of fire guards for controlled burns, invasive brush management, and vegetation management in created fresh water wetlands.

IX. Program Administration

CBBEP administrative staff (5 FTE's) will provide organizational and logistical support for Estuary Council and subcommittee meetings, and coordinate/communicate as necessary with appropriate groups, including stakeholder groups, state and federal agencies, local governments, and professional groups relevant to CCMP implementation. Staff will:

1. Acquire, manage, and disperse funds to implement the *Bays Plan*;
2. Monitor, track, and report on implementation performance by implementing partners, and work to maintain implementation commitments;
3. Develop a prioritized biennial work plan and budget for Estuary Council review and approval;
4. Coordinate the periodic update of the *Bays Plan*, the *State of the Bay* report, the *Implementation Strategy*, and other key documents of the program;
5. Provide logistical support for all meetings, workshops, symposia, and special events related to program mission;
6. Provide outreach to the public through local and regional media;
7. Develop strategies for seeking funding sources;
8. Provide for overall program coordination with EPA Region 6 and TCEQ.
9. Participate in regional, state, and national conferences and meetings relevant to estuarine management.
10. Develop and implement policies and procedures for an emergency contingency plan which will include: protecting financial records, office equipment, computers, and other vital records and equipment; employee responsibilities; backup and storage of data; and recovery actions.
11. Continued implementation of a management system to track and assess Quality Assurance Project Plans (QAPPs) and determine required corrective actions and follow-up to be completed on date determined by TCEQ.

X. Project Management and Implementation

CBBEP Project Management staff (9 FTE's) will coordinate/communicate as necessary with appropriate groups, including stakeholder groups, state and federal agencies, local governments, and professional groups relevant to *Bays Plan* implementation. Staff will:

1. Develop and implement partnership projects with local governments, state, and federal agencies, and private organizations;
2. Monitor, track, and report on implementation performance by implementing partners, and work to maintain implementation commitments;
3. Provide communication and coordination with the Texas Coastal Management Program and the Coastal Coordination Council, the Gulf of Mexico Program, the Texas Commission for Environmental Quality (TCEQ), and other relevant coastal/watershed programs;
4. Coordinate the review of proposed actions of federal, state, and local projects in an open process for consistency with the *Bays Plan;*
5. Develop a prioritized biennial work plan and budget for Estuary Council review and approval;
6. Provide for overall program coordination, including quality control/quality assurance procedures with EPA Region 6 and TCEQ.
7. Participate in regional, state, and national conferences and meetings relevant to estuarine management.

XI. Program Expenses

CBBEP funds will be used to support continued program implementation, evaluation, and reporting. Funds are also necessary to provide logistical support for the Bays Council and subcommittee meetings. Expense categories are as follows:

1. Travel – allows Program staff to attend state, regional and national meetings, workshops, and conferences;
2. Supplies – as needed, for the day-to-day operations of the Program;
3. Equipment – purchase of items over $1,000, i.e. computers;
4. Other – copier rental, temporary staff, postage, communication services, accounting services, printing, etc.

XII. Working Capital

The CBBEP Board of Directors has established working capital out of local funding. The funds will be set aside for possible future projects, matching funds and/or emergency funding.

XIII. Summary

On September 1, 2016, the Coastal Bend Bays & Estuaries Program will begin Year 19 of implementing the *Coastal Bend Bays Plan*. This FY 2017 Work Plan describes the proposed work to be initiated during FY 2017. Of the total funds identified in the Work Plan budget, $602,000 are new (FY 2017) EPA federal funds; $741,740 are new (FY 2017) TCEQ funds; $876,000 are new (FY 2017) project-specific funds; and $765,373 are new (FY 2017) local partner/federal court interest funds; and $100,000 are from local reserve funds. The total budget for this FY 2017 Work Plan is $3,085,113.

TABLE 1: FY 2017 COMPREHENSIVE ANNUAL WORK PLAN OUTLINE

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY17 CWA 320	TCEQ FY17 & 604b	LOCAL/ COURT INTEREST	TGLO	MISC GRANTS	GOMP	USFWS	FY16 CF	TOTAL CBBEP FUNDING
1701	Coastal Waterbird Management	HLR-1, HLR-4	CBBEP	113,766				24,850		6,000		$144,616
1702	Delta Discovery	BTR-1, PEO-2, PEO-3, PEO-5	CBBEP	153,277		32,296		24,233				$209,806
1703	Quantifying Plastic Debris Loading and Accumulation in Corpus Christi Bay to Improve Stakeholder Awareness	WSQ-3, BD-1	Texas A&M Corpus Christi		49,705							$49,705
1704	Lower Nueces River Pet Waste Collection Stations	WSQ-1	Nueces River Authority			3,525						$3,525
1705	A Bacterial Source Tracking Project to Identify Sources of Fecal Pollution at Cole and Ropes Parks	PH-1, WSQ-1, WSQ-3	Texas A&M Corpus Christi		59,892							$59,892
1706	Outdoor Classrooms	PEO-3, PEO-5	CBBEP & USFWS							10,000		$10,000
1707	Corpus Christi Bay Marine Debris Prevention and Assessment	BD-1	City of Corpus Christi		20,000							$20,000
1708	CBBEP Community Outreach Partnerships	PEO-1, PEO-2, PEO-3, PEO-4 PEO-5	Coastal Bend Bays Foundation		7,000	23,000						$30,000
1709	CBBEP Property Management	HLR-1	CBBEP			35,000						$35,000

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY17 CWA 320	TCEQ FY17 & 604b	LOCAL/ COURT/ DELTA	TGLO	MISC GRANTS	GOMP	USFWS	FY16 CF	TOTAL CBBEP FUNDING
1710	Black Skimmer Migratory Patterns & Identification of Wintering Sites	HLR-1, HLR-4	CBBEP							40,000		$40,000
1711	Nueces Delta Environmental Monitoring	FW-1, FW-2, FW-3, FW-4	Conrad Blucher Institute		55,305							$55,305
1712	Comprehensive Management Plan – Nueces Delta Preserve	HLR-1, PEO-1, FW-1	CBBEP			35,000						$35,000
1713	Volunteer Water Quality Monitoring Program in Baffin Bay	WSQ-3	Texas A&M University-Corpus Christi					50,000				$50,000
1714	CBBEP Public Outreach Events & Activities	PEO-1, PEO-2, PEO-3, PEO-4, PEO-5, BTR-1	CBBEP			25,000						$25,000
1715	Interpretative Signage in CBBEP Project Area	HLR-1, PEO-1, BD-1, FW-1	CBBEP		10,890	14,110						$25,000
1716	Animal Rehabilitation Keep (ARK) Public Access and Education Project	BTR-1, BTR-2, PEO-5	Mission-Aransas NERR			7,350					31,150	$38,500
1717	Goose Island Circulation Enhancement	HLR-1, FW-1	CBBEP/GOMP						235,901			$235,901
1718	Nueces Delta Imagery Acquisition	HLR-1, FW-1	University of Texas Marine Science Institute			18,500						$18,500

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY17 CWA 320	TCEQ FY17 & 604b	LOCAL/ COURT/ DELTA	TGLO	MISC GRANTS	GOMP	USFWS	FY16 CF	TOTAL CBBEP FUNDING
1719	Causeway Island Habitat Protection, Nueces Bay TX – Design & Engineering	HLR-1, HLR-2,	CBBEP				174,000			56,000		$230,000
1720	Identifying Nesting Habitat for Texas Diamondback Terrapin in the Mission-Aransas Estuary	HLR-1, HLR-4	Texas A&M University Corpus Christi	19,957								$19,957
1721	Relative Sea Level Rise Habitat Assessment in Nueces Delta Preserve	HLR-1,	Mission-Aransas NERR & UTMSI			30,000						$30,000
1722	Brazilian Peppertree Treatments for the TX Gulf Region Cooperative Weed Management Area	HLR-1, HLR-2, HLR-10	Mission-Aransas NERR	2,543		7,457				30,000		$40,000
1723	Enhancing Nesting Success of Priority Bird Species in South Texas	HLR-1, HLR-4	CBBEP					30,000			10,903	$40,903
1724	Lower Laguna Madre Bird Conservation	HLR-1, HLR-4	CBBEP					100,000			6,836	$106,836
1725	Waters for Wildlife: Enhancing Freshwater Sources for Whooping Cranes	HLR-2	San Antonio Bay Partnership			5,000				18,000		$23,000
1726	An Ecosystem-based Approach to Assess Baffin Bay's Black Drum in Different Hydrological Conditions	HLR-1, HLR-4	Harte Research Institute		30,000							$30,000

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY17 CWA 320	TCEQ FY17 & 604b	LOCAL/ COURT/ DELTA	TGLO	MISC GRANTS	GOMP	USFWS	FY16 CF	TOTAL CBBEP FUNDING
1727	Update of the "Bays Plan" and "Implementation Strategy for the Bays Plan" Phase 2	HLR-4, HLR-10	TBD	18,500		12,762						$31,262
1728	Gulf Coast Conservation Initiative Phase 4	BTR-3, SM-3, HLR-1, HLR-2	CBBEP							341,000		$341,000
1729	Mechanistic Modeling of Bottom Water Dissolved Oxygen Dynamics in Baffin Bay	WSQ-1	Texas A&M University Corpus Christi		50,110							$50,110
17630	Caring for Our Coast – Delta Discovery and Habitat Protection/ Enhancement Activities	PEO-3, HLR-1, HLR-2	CBBEP					25,000				$25,000
	TOTAL PROJECT FUNDS			**308,043**	**282,902**	**249,000**	**174,000**	**254,083**	**235,901**	**501,000**	**48,889**	**2,053,818**
	Administrative / Travel		CBBEP	293,957	458,838	258,248						$1,031,295
	TOTAL FUNDING			**$602,000**	**$741,740**	**$527,500**	**$174,000**	**$254,803**	**$235,901**	**$501,000**	**$48,889**	**$3,085,113**