FISCAL 2019 ANNUAL WORK PLAN



A PROGRAM OF THE TCEQ

May 2018

TABLE OF CONTENTS (CTRL+CLICK TO FOLLOW LINK)

LIST OF ABBREVIATIONS	iii
SECTION 1: PROGRAM OVERVIEW	1
SECTION 2: INTRODUCTION	3
SECTION 2.1: ORGANIZATIONAL STRUCTURE	4
SECTION 2.2: FISCAL 2018 GOALS AND ACCOMPLISHMENTS	11
SECTION 2.3: STRATEGIC ACTION PLAN GOALS TO FOCUS ON IN FISCAL 2019	20
SECTION 3: FISCAL 2019 PROJECTS	23
SECTION 3.1: FISCAL 2019 FEDERAL PROJECTS - SUMMARY	23
SECTION 3.2: FISCAL 2019 FEDERAL PROJECT - DETAIL	24
SECTION 3.3: FISCAL 2019 GRANT BUDGET SPREADSHEETS	34
SECTION 4: ONGOING PROJECTS	37
SECTION 4.1: ONGOING FEDERAL PROJECTS - SUMMARY	37
SECTION 4.2: ONGOING FEDERAL PROJECTS - DETAIL	
SECTION 5: COMPLETED PROJECTS	41
SECTION 5.1: PROJECTS COMPLETED IN FISCAL 2018 - SUMMARY	41
SECTION 5.2: PROJECTS COMPLETED IN FISCAL 2018 - DETAIL	42

Table 1. Abbreviations List

Name	Abbreviation
Bacteria Implementation Group	BIG
Best Management Practice	BMP
Clean Water Act	CWA
Coastal Impact Assistance Program	CIAP
Comprehensive Conservation and Management Plan	ССМР
Conservation Assistance Program	САР
Environmental Institute of Houston	EIH
Fats, Oils, and Grease	FOG
Freshwater Inflows Action Plan	FW
Galveston Bay Bacteria Reduction Plan	GBBRP
Galveston Bay Council	GBC
Galveston Bay Estuary Program	GBEP
Galveston Bay Foundation	GBF
Galveston Bay Plan	GBP
Galveston Bay Public Awareness and Education Campaign	Back the Bay
Geographic Information System	GIS
GeoTechnology Research Institute	GTRI
Green Infrastructure for Texas	GIFT
Habitat Protection Action Plan	HP
Houston Advanced Research Center	HARC
Houston-Galveston Area Council	H-GAC
Implementation Plan	I-Plan
Low Impact Development	LID
Municipal Separate Storm Sewer System	MS4
Monitoring and Research	M&R
National Estuary Program	NEP
Natural Resource Uses	NRU
Nonpoint Source	NPS
North American Wetlands Conservation Act	NAWCA
Point Sources of Pollution Action Plan	PS
Public Participation and Education	PPE
Quality Assurance Project Plan	QAPP
Research Action Plan	RSC
River, Lakes, Bays N' Bayous Trash Bash	Trash Bash

Name	Abbreviation
Shoreline Management Action Plan	SM
Species Population Protection Action Plan	SP
Spills and Dumping Action Plan	SD
Submerged Aquatic Vegetation	SAV
Surface Water Quality Monitoring	SWQM
Technical Advisory Committee	TAC
Texas A&M University Galveston	TAMUG
Texas Commission on Environmental Quality	TCEQ
Texas Department of State Health Services	DSHS
Texas Estuarine Resource Network	TERN
Texas General Land Office	GLO
Texas Parks and Wildlife Department	TPWD
Texas Water Resources Institute	TWRI
Unmanned aerial vehicles	UAV
U.S. Army Corps of Engineers	USACE
U.S. Environmental Protection Agency	EPA
U.S. Fish and Wildlife Service	USFWS
United States Geological Survey	USGS
Water Quality Improvement Project	WQIP
Water and Sediment Quality	WSQ
Watershed Protection Plan	WPP

SECTION 1: PROGRAM OVERVIEW

The initial application of grant #CE-00655006 was for three years of time and one year of funding with the intent to request another year of time and funding each year for the next two years. The fiscal 2019 work plan is the third request of funding for this grant. The Texas Commission on Environmental Quality (TCEQ) has found this method is most effective for successful operation and coordination of the Galveston Bay Estuary Program (GBEP).

Galveston Bay is the largest and one of the most productive estuaries in Texas. It sits adjacent to one of the most heavily industrialized areas in the nation. The GBEP service area encompasses 5,000 square miles and 232 miles of estuarine shoreline along the upper Texas Coast and incorporates the five-county area bordering Galveston Bay: Liberty, Chambers, Harris, Galveston, and Brazoria counties.

The GBEP was established in 1989 to provide comprehensive management of this vital resource. In 1990, the GBEP began working with a diverse group of stakeholders to develop a comprehensive plan that would receive broad based support from and involvement by federal and state agencies with jurisdiction in Galveston Bay, industries and businesses, local government officials, commercial and recreational fisherman, conservation organizations, and citizens. In 1994, the Galveston Bay Plan (GBP), the comprehensive conservation and management plan (CCMP), was completed, and in 1995 it was approved by the Governor of Texas and the U.S. Environmental Protection Agency (EPA) Administrator. The initial effort was jointly funded by the EPA, the Texas General Land Office (GLO), and the TCEQ.

The GBP identifies 82 action items to protect and restore the health and productivity of the estuary while supporting continued economic growth and public use of the Galveston Bay. The GBEP received a grant from the EPA to begin implementing the GBP in 1995. This grant ran from fiscal 1995 – 1999 and is now closed. Subsequent grants have run from fiscal 2000 – 2003, fiscal 2004 – 2007, fiscal 2008 – 2010, and fiscal 2011 – 2015. Currently grant #CE-00655005 (fiscal 2014 – 2018) is open but is no longer receiving allocations. The most recent grant #CE00655006 (fiscal 2017-2021) is open and is receiving allocations. Over 200 implementation projects have been initiated under these grants.

The GBEP and its partners have received 17 national awards for their partnerships and progress in implementing the GBP and preserving Galveston Bay.

Pre-2008 AWARDS

- Four awards from Coastal America: one in 1999, Clear Creek Habitat Restoration project, for the beneficial use of dredge material, one in 2002 for Galveston Island State Park habitat restoration, one in 2003 for habitat restoration at Jumbile Cove, and one in 2005 for San Jacinto State Park for beneficial use of dredge material.
- Recognition award from the National Aeronautics and Space Administration for Galveston Bay estuary restoration and five years of implementation of the GBP.
- National Wetland Conservation Award for the Delehide Cove Protection and Restoration project from the U.S. Fish and Wildlife Service (USFWS) in 2006.
- The EPA Gulf of Mexico Program Gulf Guardian Partnership Award for the Brays Bayou Urban Wetlands project.
- The Fisheries and Habitat Conservation Partnership award for the cumulative habitat conservation work on the part of the Natural Resource Uses (NRU) subcommittee.
- Two EPA Gulf of Mexico Program Gulf Guardian Awards to the GBEP partners, including an award in the non-profit category to SCENIC GALVESTON for the Virginia Point Coastal Preserve; in which the GBEP played an instrumental role, and an award in the individual category to Dick Benoit, a highly active local citizen.

2008-PRESENT AWARDS

- The EPA Gulf of Mexico Program awarded the First Place Gulf Guardian Award in the Partnership category for the East Bay Shoreline Protection project.
- Department of Interior's Collaborative Conservation award for the East Bay Shoreline Protection project.
- The EPA's Gulf of Mexico Program Gulf Guardian Partnership Award for the North Deer Island Protection project.
- The Coastal America Partnership Award for the North Deer Island Protection project.
- The Coastal America Partnership Award for the Savannah Oaks Conservation project.

- The TCEQ Texas Environmental Excellence Awards 2014 Finalist: Civic/Community for the Sheldon Lake Restoration project in 2014.
- The Keep Houston Beautiful Mayors Proud Partner Award for the Sheldon Lake Restoration project in 2015.
- The Houston-Galveston Area Council's (H-GAC) Our Great Region Diligence Award for Double Bayou Watershed Protection Plan (WPP) in 2016.
- USFWS' Southwest Region Annual "Partnership of the Year" Award for 2016 for Oyster Lake Shoreline Protection and Marsh Restoration Project.
- The Houston-Galveston Area Council Our Great Region Award for the Double Bayou Watershed Protection Plan in 2017.
- The EPA's Gulf of Mexico Program Gulf Guardian Partnership Award for the Plastic Pollution Prevention Partnership in 2017.
- The EPA's Gulf of Mexico Program Gulf Guardian Partnership Award for River, Lakes, Bays N' Bayous Trash Bash (Trash Bash) in 2017.
- The TCEQ Texas Environmental Excellence Awards 2018 Winner: Civic/Community for Trash Bash.

SECTION 2: INTRODUCTION

The GBEP, a special non-regulatory program of the TCEQ, is a partnership of local governments, business and industry, conservation organizations, bay user groups, and resources agencies. The GBEP is charged with implementing the GBP, the CCMP for Galveston Bay. The GBEP is part of the TCEQ's Office of Water, Water Quality Planning Division. A program manager and staff of seven located in the Houston-Galveston area directly oversee implementation of the GBP. Program staff responsibilities are as follows:

- acquire, manage, and disperse funds to implement specific actions in the GBP;
- provide for coordination and communication among state and federal resource agencies for the many cross jurisdictional issues;
- coordinate, monitor and track implementation activities of the Galveston Bay Council (GBC) partners;
- identify and communicate bay improvements to agencies, stakeholders, and the public;
- conduct public outreach and education to increase awareness of Galveston Bay;
- advocate conservation of the estuary (see Figure 1); and
- maintain stakeholder involvement in the decision-making process through the GBC and its subcommittees.



Figure 1. Stakeholders interact with GBEP staff at a workshop during the revision of *The Galveston Bay Plan, 2nd Edition* hosted by the GBEP in partnership with Houston-Galveston Area Council.

SECTION 2.1: ORGANIZATIONAL STRUCTURE

The GBEP has the primary responsibility for coordinating and administering the work plan. Program staff and job descriptions are provided below.

Sarah P. Bernhardt, M.S., Ph.D., Program Manager, is responsible for overall implementation of the GBP, including: securing and managing funds to support operations, staff, and projects; fostering stakeholder involvement to facilitate GBP implementation; managing program staff and operations to ensure efficient use of resources; and representing the GBEP on national, state, and local boards and committees and at national and state conferences/events to garner federal and state support. Dr. Bernhardt also coordinates the GBC and the Budget and Priorities subcommittee.

Lindsey Lippert, NRU Coordinator, is responsible for coordinating implementation of habitat protection (HP), species population protection (SP), freshwater inflows (FW), shoreline management (SM), and spills and dumping (SD) actions in the GBP; coordination of invasive species workgroup and the NRU subcommittee of the GBC; implementing specific projects to protect, restore and enhance coastal habitat and native species populations, and manage and control invasive species; maintaining Government Performance and Report Act and EPA reporting; serving as back-up budget liaison for the GBEP office.

Lisa M. Marshall, M.S., Monitoring and Research (M&R) Coordinator and Water and Sediment Quality (WSQ) Coordinator, is responsible for coordinating implementation of stormwater, wastewater, septic systems, point sources of pollution (PS), seafood safety, and research (RSC) actions in the GBP; coordinating the regional monitoring program, including data management/reporting, and development and application of environmental indicators; facilitating the M&R and WSQ subcommittees of the GBC; and researching, evaluating and reporting findings concerning scientific and technical issues impacting GBP implementation.

Cynthia Clevenger, Public Participation and Education (PPE) Coordinator and Community Relations Specialist, is responsible for building relationships and developing communication channels and dialogue with local government officials, private sector, and other outside organizations key to implementing the GBP. This position facilitates cross-sectoral learning of public relations and marketing activities for the Galveston Bay watershed; organizes and manages community relations events and the State of the Bay symposium; tracks emerging stakeholder community concerns/issues. Ms. Clevenger also coordinates the PPE subcommittee; provides information to stakeholders, the public and media; oversees the Galveston Bay Public Awareness campaign; promotes special events and projects; and website oversight.

Bryan Eastham, Technical Programs Coordinator, is responsible for serving as the quality assurance officer, contracts specialist, budget liaison, and grants coordinator for the GBEP. Mr. Eastham also coordinates development and submission of federal reports, identifies and tracks the evolution of issues affecting bay management, and researches policy, technical, and management results that pertain to Galveston Bay in collaboration with the NRU and WSQ coordinators.

Mary Stiles, PPE Assistant, handles the GBEP exhibiting events, maintains the GBEP contacts database, handles timekeeping, conducts K – 12 presentations, and supports general activities of the PPE team and PPE subcommittee. Ms. Stiles manages the annual Trash Bash contract and Spanish language community outreach.

Doretta G. Thomas, Administrative Assistant, is responsible for travel coordination, vehicle and equipment maintenance and repairs, mail, correspondence, office safety, and general administrative support for the GBEP.

Cassidy Kempf, Implementation Assistant, is responsible for CCMP implementation tracking, technical writing and editing, supporting program website maintenance, workshop and symposia planning and execution, and supporting overall project management in NRU, WSQ, M&R, and PPE program areas.

PROGRAM COMPETENCY DEMONSTRATION

The following statements demonstrate the GBEP's competency as a Continuing Environmental Program:

- Competency is demonstrated by the TCEQ Quality Systems Audit conducted biennially by Sharon Coleman, the TCEQ quality assurance manager.
- Competency is demonstrated through the EPA Quality Project and Program Management training taken by Sarah Bernhardt and Lisa Marshall on 4/8/14 – 4/10/14 and by Bryan Eastham, and Cassidy Kempf on 1/9/18 – 1/11/18. Lindsey Lippert completed the EPA Quality Assurance Management training on 3/21/07. Certificates are available upon request.
- Competency is demonstrated through the EPA approved TCEQ Quality Management Plan (Revision 23 approved January 2018) that the GBEP operates under, which provides descriptions of the quality policies, including all the requirements described in the EPA document QA/R-2.
- The program manager and staff take many professional development training classes annually which are also available upon request.

FISCAL 2018 LEVERAGING, TRAVEL, AND TECH TRANSFER AMOUNTS

Figures reported in Table 2 provide a mid-year estimate of leveraged funding reported by partners and grantees from September 2017 – August 2018. The number is subject to change as additional funding may be reported for the period.

Table 2. Fiscal 2018 Leveraging

EPA Funds to Program (Section 320)	Other Federal Funds	State Funds	Local Government Funds and In-Kind	Private funds & In-kind
\$600,000	\$1,545,400	\$1,723,363	\$0	\$1,891,000

Figures reported in Table 3 depict the travel expenses and tech transfer descriptions from the last year.

Table 3. Fiscal 2018 Travel and Tech Transfer

EVENT, LOCATION, & PURPOSE	STAFF PERSON	EPA SECTION 320 FUNDS	TCEQ 100% STATE FUNDS
Galveston Bay Foundation (GBF) Conservation Committee Meetings Houston, Texas – Bimonthly (every two months) The GBF and partners meet to discuss conservation projects, management needs, and funding strategies for lands held by the GBF. The committee also reviews bylaws and requirements needed to maintain the GBF's Land Trust Alliance (LTA) Accreditation.	Lindsey Lippert	\$0	\$0

EVENT, LOCATION, & PURPOSE	STAFF PERSON	EPA SECTION 320 FUNDS	TCEQ 100% STATE FUNDS
Interagency Group meetings for the U.S. Army Corps of Engineers (USACE) Coastal Texas Protection and Restoration Feasibility Study Galveston, Texas (and via teleconference)- Monthly -The USACE Galveston District meets with state and federal agency partners to consult on the progress of the study which will identify critical data needs and recommend a comprehensive strategy for reducing coastal storm flood risk through structural and nonstructural measures that take advantage of natural features like barrier islands.	Sarah Bernhardt	\$0	\$0
General Membership Meetings, GBF, Houston, Texas - Semiannual - Updates on the GBF's initiatives.	Sarah Bernhardt	\$0	\$0
Houston-Galveston Area Council's Natural Resources Advisory Committee Houston, Texas – Quarterly -These meetings provided information on issues related to the natural resource management of the region. Presenters during fiscal 2017 covered topics including trees, wastewater, superfund sites, <i>The</i> <i>Galveston Bay Plan</i> revision, among others. Sarah is a non-voting member.	Sarah Bernhardt Cassidy Kempf	\$0	\$0
Environmental Institute of Houston (EIH), University of Houston Clear Lake (UHCL), Science Advisory Board Houston, Texas – Triannual - The meetings provide research updates from the EIH staff and faculty on their research and educational initiatives. Sarah is a non-voting member.	Sarah Bernhardt Lisa Marshall	\$0	\$0
Trash Summit Meetings Houston, Texas (and teleconference) – Monthly - Watershed-wide coordinating initiative to research, track, and quantify litter. This stakeholder-led effort also aims to identify prevention and removal strategies. Other efforts include identifying funding strategies, partnership opportunities, and communication approaches. Initial steps were taken to develop a regional action plan—like other water based plans— focused on litter and marine debris prevention.	Cynthia Clevenger Lisa Marshall	\$0	\$0

EVENT, LOCATION, & PURPOSE	STAFF PERSON	EPA SECTION 320 FUNDS	TCEQ 100% STATE FUNDS
Plastic Pollution Prevention Partnership (P3P) Meetings Houston, Texas – Quarterly -Region-wide collaborative of several organizations and agencies to address plastic debris affecting wildlife and water quality. The group organizes cleanups, wildlife entanglement rescues, and outreach and education efforts. This group is an outcome of regional efforts to address the EPA's Trash Free Waters initiative.	Cynthia Clevenger Lisa Marshall	\$0	\$0
Texas City Dike (TCD) Trash Initiative Meeting Houston, Texas – Monthly -An outcome of the P3P addressing concerns about the large amount of monofilament fishing line causing wildlife entanglements and water quality issues on the TCD. The project is a partnership with organizations and agencies working with the Texas City Waste Management Department to develop a campaign helping anglers and visitors to the TCD keep fishing line off the ground.	Cynthia Clevenger Lisa Marshall	\$0	\$0
Trash Bash Event Coordination Meetings Houston, Texas – Quarterly -These meetings provide regional coordination, site selection, training, outreach materials development and training, and organizational support for the regional Trash Bash events.	Mary Stiles	\$0	\$0
Bayou Preservation Association Symposium Houston, Texas - October 2017 -50th anniversary symposium for the Bayou Preservation Association. Staff learned the status of Galveston Bay watershed bayous and how they have changed over 50 years. Sarah was a presenter.	Sarah Bernhardt Cynthia Clevenger Lisa Marshall	\$0	\$100
Clean Waters Initiative: Using Watershed-based Plans (WBP) to Improve Water Quality Houston, Texas - October 2017 -This meeting provided a status update for total maximum daily load studies, implementing WBPs in coastal communities, and demonstrating water quality improvements through agricultural initiatives.	Lisa Marshall	\$0	\$0

EVENT, LOCATION, & PURPOSE	STAFF PERSON	EPA SECTION 320 FUNDS	TCEQ 100% STATE FUNDS
Texas General Land Office - Region 1 Technical Advisory Committee Meeting Texas City, Texas - November 2017 -The GLO and partners meet to discuss a synergistic approach to implement both green and gray projects that complement one another and create a more resilient coastal community for the counties of Brazoria, Chambers, Galveston, and Harris. The results are being used to develop the 2019 version of the Texas Coastal Resiliency Master Plan (Plan). The Plan is a long-term framework to mitigate damage from future coastal natural disasters and to preserve and enhance the state's coastal natural resources and built assets. The Plan will be submitted to the 2019 Texas Legislature.	Lindsey Lippert	\$0	\$0
Gulf of Mexico Shellfish Initiative (GoMexSI) Texas City, Texas – November 2017 -Based on the National Oceanic and Atmospheric Administration's (NOAA) National Shellfish Initiative and other state Shellfish Initiatives, the GoMexSI seeks input from stakeholders from across the Gulf of Mexico to identify common goals among the Gulf states, and those which are unique to each state. The GoMexSI protects and enhances shellfish resources in a way that creates sustainable water- dependent jobs while improving the water quality of our numerous Gulf estuaries, through long-term regional planning for the sustainable use of shellfish resources.	Lindsey Lippert	\$0	\$0
Executive Women in Texas Government San Marcos, Texas – November 2017 -This meeting provided information to address leadership in state government by encouraging courage, confidence, and compassion in the workplace.	Lisa Marshall	\$0	\$311
Coastal and Estuarine Research Federation Providence, Rhode Island – November 2017 -The conference provided staff information to address all aspects of coastal and estuarine scientific research, restoration and management in coastal communities, ecosystems, and watersheds, and to share lessons learned from successful restoration projects. In addition to many National Estuary Program (NEP) relevant presentations, numerous Galveston Bay specific research presentations were attended.	Sarah Bernhardt	\$1,556	\$0
NEP Fall Tech Transfer Meeting Boston, Massachusetts – November 2017 -The meeting provided a venue for technology transfer, education, training, and sharing of lessons learned between NEPs. Sarah presented a lightning talk on innovative operations.	Sarah Bernhardt	\$1,287	\$0

EVENT, LOCATION, & PURPOSE	STAFF PERSON	EPA SECTION 320 FUNDS	TCEQ 100% STATE FUNDS
Clean Waters Initiative: Freshwater Inflows Houston, Texas – November 2017 -This meeting provided an overview of freshwater inflows to the Trinity-San Jacinto estuary and an evaluation of adopted SB3 standards for the Trinity River.	Lisa Marshall	\$0	\$0
EPA Region 6, Quality Assurance Training, Quality Project, and Program Management Austin, Texas – December 2017 - Training topics covered included orientation to EPA quality assurance management, introduction to systemic planning, the data quality objectives process, quality management plan overview, and quality assurance project plan (QAPP) overview.	Bryan Eastham Cassidy Kempf	\$0	\$959
Texas Watershed Coordinator Roundtable Waco, Texas – January 23, 2018 -This meeting provided a forum for water professionals to establish and maintain dialogue between watershed coordinators, facilitate interactive solutions to common watershed issues faced throughout the state, and add to the fundamental knowledge conveyed at the short courses.	Lisa Marshall	\$0	\$21
Advanced Community Based Social Marketing (CBSM) Workshop, Houston, Texas – January 2018 -Held at the Houston Zoo, this workshop provided an in-depth exploration of how CBSM can be applied to attendees' own programs as well as addressing the effective use of social media, mobile apps, and websites. Attendees received materials and presentation templates to aid in communicating with stakeholders about the CBSM process and how to apply it to ongoing and future projects.	Cynthia Clevenger	\$0	\$695
Watershed Coordination Steering Committee Columbus, Texas – March 2018 -This meeting provided updates about projects in the Galveston Bay watershed and adjacent watersheds in the area; this meeting provided networking opportunities with other project managers and watershed coordinators.	Lisa Marshall	\$0	\$36
EPA - NEP 2018 Workshop Washington, D.C. – March 2018 -This meeting provided training, information transfer, and an opportunity for NEP directors to share lessons learned. Sarah presented as part of the Disaster Planning and Response session.	Sarah Bernhardt	\$1,877	\$71

EVENT, LOCATION, & PURPOSE	STAFF PERSON	EPA SECTION 320 FUNDS	TCEQ 100% STATE FUNDS
Texas General Land Office - Region 1 Technical Advisory Committee Meeting Galveston, Texas - April 2018 -The GLO and partners meet to discuss a synergistic approach to implement both green and gray projects that complement one another and create a more resilient coastal community for the counties of Brazoria, Chambers, Galveston, and Harris. The results are being used to develop the 2019 version of the Texas Coastal Resiliency Master Plan.	Lindsey Lippert Sarah Bernhardt	\$0	\$0
Trinity River Authority Strategic Plan Focus Group Livingston, Texas – April 2018 -Sarah and Lisa will participate in a facilitated strategic planning session as invited stakeholders.	Sarah Bernhardt Lisa Marshall (estimate)	\$0	\$0
TCEQ Trade Fair Austin, Texas - May 2018 -Lisa will present highlights of the GBEP's water and sediment quality and monitoring research accomplishments.	Lisa Marshall (estimate)	\$0	\$336
North Texas Association of Environmental Professionals (NTAEP) Membership Luncheon Dallas, Texas – May 2018 -Sarah will present highlights of <i>The Galveston Bay</i> <i>Plan</i> and learn about upper Galveston Bay watershed issues.	Sarah Bernhardt (estimate)		
EPA Program Evaluation Site Visit Tampa, Florida – May 2018 -Sarah will participate in an NEP Program Evaluation five-year site visit as an ex-officio director to learn about another NEP.	Sarah Bernhardt (estimate)	\$0	\$0
Total		\$4,720	\$2,529

SECTION 2.2: FISCAL 2018 GOALS AND ACCOMPLISHMENTS

The GBEP partners made notable achievements in improving water quality, restoring wetlands, protecting unique habitats, and educating the public in 2018. These achievements are highlighted in the following sections.

HABITAT AND LANDSCAPE-LEVEL CONSERVATION: CREATE, RESTORE, AND PROTECT IMPORTANT COASTAL HABITATS

The Texas coast features a wealth of coastal habitats that support a tremendous abundance and diversity of fish and wildlife. Although the habitat conservation efforts of the GBEP and its partners are bay wide, distinctive consideration has been given to the West Bay watershed. Preserving wetlands and natural areas is critical to maintaining the water quality and protecting valuable fish and wildlife habitat in this region.

Since 2000, the GBEP and its partners created, protected, and enhanced 29,051 acres of important coastal habitats, leveraging \$99,245,232 in local, industry, state, and federal contributions. During fiscal 2017, the GBEP protected and restored 1,869 (219 acres restored, 1,650 acres protected) acres of wetlands and coastal habitats, and leveraged \$3,184,537 in local, industry, state, and federal contributions. In addition, 11,800 linear feet of shoreline were protected through the installation of rock breakwaters and geotubes.

As of March 2018, an additional 65 acres of coastal habitat have been conserved via acquisition. Through acquisition and habitat management initiatives currently in progress, the GBEP and partners will conserve and/or enhance an additional 1,000 acres of coastal habitat by August 2018.

CAP

The Conservation Assistance Program (CAP) provides regional support for land conservation efforts within the Galveston Bay watershed. The CAP objectives included identifying and developing priority land acquisition projects, implementing conservation strategies, negotiating fee simple and conservation easement acquisitions, and closing land conservation projects. The CAP partnership between the GBEP and the GBF provided financial resources to coordinate efforts, develop and implement land acquisition projects, provide transactional support to local conservation organizations, and organize a workgroup of natural resource partners dedicated to perpetual land conservation efforts within the Galveston Bay watershed.

The efforts related to the CAP from 2011 through 2017 resulted in success of the program goals and objectives. The CAP successfully implemented or supported the completion of nine acquisition projects within the Galveston Bay watershed, totaling 5,716 acres. These projects displayed a high level of diversity in size, conservation method, habitat types, and property values. Both fee simple and conservation easement transactions were completed using a variety of state, federal, and private funding sources. CAP involvement varied from full identification, development, and implementation of conservation projects to simply providing funding to help defray unfunded costs associated with required due diligence.

Project Name	Year Completed	Size (Acres)	Funding Source	Project Lead
Savannah Oaks	2011	700	West Bay Coastal Impact Assistance Program (CIAP)	Ducks Unlimited
Bolivar Flats (Johnson Tract)	2013	62	North American Wetlands Conservation Act (NAWCA)	Houston Audubon Society
Bulanek Farms	2013	662	Texas Farm and Ranchlands Conservation Program	Texas Agricultural Land Trust
Coastal Heritage Preserve	2013	50	Coastal Wetlands Planning Protection and Restoration Act	Artist Boat
Anahuac National Wildlife Refuge Addition	2014	1,227	Migratory Bird Conservation Fund	The Conservation Fund
Cotton Bayou	2014	31	Private Foundation	GBF
Lone Pine Farm	2014	1097	Texas Farm and Ranchlands Conservation Program	GBF
Gordy Marsh	2015	1,739	NAWCA	GBF
Coastal Heritage Preserve	2016	46	West Bay CIAP	Artist Boat
Chocolate Bayou	2016	102	West Bay CIAP	GBF

Figure 2: CAP Completed Projects

WEST GALVESTON ISLAND BAYSIDE MARSH RESTORATION

The West Galveston Island Bayside Marsh Restoration Project is in an area of West Galveston Bay referred to as Gangs Bayou, Oxen Bayou, and Melager Cove. As with most all other near shore areas within West Bay, these areas have suffered severe habitat loss. The loss of shoreline features such as vegetated land spits, shoreline ridges, and oyster reefs that protected intertidal marshes from erosional forces is one reason for the area's decline in wetland habitats. Others include stream channelization, sediment diversion, hydrologic alterations, increased channel dredging, and dredge and fill activities, residential development, subsidence, and cattle grazing. Because of the tremendous natural and economic values of these areas and their habitat, Texas Parks and Wildlife Department (TPWD), along with many partners, has been proactively seeking resources to protect and restore shoreline habitats in West Bay and the Texas Gulf Coast.



Figure 3: Completed marsh mounds with rock breakwater in background. Photo courtesy TPWD.

The West Galveston Island Bayside Marsh Restoration Project constructed 3,800 linear-foot of rock breakwater that provides protection and enhancement to approximately 9.1 acres of existing estuarine marsh (emergent marsh, irregularly exposed mud flat, vegetated, non-vegetated sand flat, protected shallow open water) and approximately 13.8 acres of restored estuarine marsh complex (intertidal fringe marsh, salt flat marsh, sand flat and protected shallow water). After construction, the newly restored estuarine marsh complex, 3,235 linear feet of eroded shoreline, and 139 acres of former marsh that has converted to shallow water due to relative sea-level rise were planted with 93,000 sprigs of *Spartina alterniflora*.

IMPROVING & PROTECTING WATER QUALITY: SUPPORTING CORE CLEAN WATER ACT (CWA) PROGRAMS

In support of the EPA's core CWA goals the GBEP has worked to build capacity of local stakeholders through watershed protection planning and implementation of water quality improvement projects (WQIPs). Through this effort in coordination with other water programs of the TCEQ and local stakeholders, most of impaired waters in the five-county region surrounding Galveston Bay have some level of watershed protection or improvement being enacted.

WPPs

Bacteria Implementation Plan (I-Plan)

The Bacteria Implementation Group (BIG) is a thirty-one-member committee that has developed and is overseeing implementation of a plan, or I-Plan, to remedy high levels of bacteria in waterways identified in Total Maximum Daily Load projects in the Houston-Galveston region. Activities of the BIG are open to all interested parties, and people are encouraged to attend meetings and participate in the various water quality issues pertinent to the I-Plan. The BIG began implementation activities in 2013 and plans to continue implementation through 2036, with periodic reviews to track success and make necessary course corrections to improve success.

While most activities in the I-Plan are to be funded using existing funding sources, such as public works department budgets, grant funding opportunities through the TCEQ and other entities, other sources will be

needed to help sustain regional coordination efforts; advance the use of new or novel technology and best management practices (BMPs); and expedite implementation. The BIG continues to coordinate the implementation of BMPs listed in the I-Plan.

The Top Five Most and Top Five Least Impaired Water Bodies Project supported the BIG. Using information from the BIG, 10 watersheds were targeted to identify sources of bacteria pollution through targeted monitoring. Once the sources were identified, the sources were reported to the appropriate entity to correct, demonstrate improved water quality, and document the project to demonstrate the value of a prioritized watershed approach through outreach materials and workshops. In fiscal 2016, a desk review identified the top two most and top two least impaired water bodies. The Ground Truth Preliminary Action Report summarized the process for narrowing down the water bodies. In fiscal 2017, H-GAC sampled the wet and dry weather sites, reported sources to the appropriate entities, and presented data to interested groups. The Data Collection and Analysis Report (also referred to as the Source Identification Report) was completed in March 2017. The Final Report was completed in May 2017.

Galveston Bay Coalition of Watersheds

The increase in WPPs and I-Plans over time has created several autonomous groups, all with similar goals. After the re-formation of the Armand Bayou Watershed Partnership as a 501(c) 3 non-profit, options for the future of the Dickinson Bayou Watershed Partnership were explored. Based on this research, creation of a group with a larger focus (similar to the BIG) with support from local governments (like the Plum Creek Watershed Partnership in South Central Texas) was identified as a sustainable model for coordinating local watershed efforts.

Through this project, a coalition of watershed groups was created for the Galveston Bay area and includes a partnership with the GBF to maintain the existing Galveston Bay Bacteria Reduction Plan (GBBRP). The new coalition includes stakeholders from existing watershed groups including Dickinson, Highland, and Jarbo Bayous, as well as adjacent watersheds that will likely be developing WPPs or I-Plans in the future such as Moses Bayou. This regional approach:

- extends limited resources for coordinating implementation efforts,
- reduces the number of meetings stakeholders are asked to attend, and
- facilitates the information coordination already happening between watershed groups.

The Galveston Bay Coalition of Watersheds has had five stakeholder meetings where goals, a vision, and implementation priorities have been developed. The group of stakeholders continue to work on finding sustainable funding for the Coalition.

WQIPs

Ghirardi Family Water Smart Park

The City of League City with encouragement from the GBEP, sought and received a 2011 TCEQ CWA Section 319 Program grant to control nonpoint source (NPS) pollution within the city limits. The million-dollar grant and match from the GBEP funded the construction of the Ghirardi Family WaterSmart Park, a 3.75-acre park that features NPS best management green infrastructure features including rain gardens, pervious pavement, bios-wales, rain water harvesting and a green roof. This award-winning facility serves as a demonstration for residents, city staff and local developers as to how these practices can be implemented into landscapes and developments around League City and Galveston County. Additional tasks in fiscal 2015 included reviewing and re-writing existing city ordinances, completing a report on BMPs retrofit recommendations for the Creekside District to control NPS runoff, and completing modeling of runoff quantity and quality for areas of new developments, including how BMPs can best be utilized to reduce both. Monitoring of the BMPs occurred during most of fiscal 2015 but was suspended until a QAPP was developed for the fiscal 2016 contract. The QAPP was approved in June 2016. Because no rain events took place during the work week that met the criteria of greater than .29 inches of rain, the contract has been extended until May 2018. Several events have been sampled and soil testing has been added to the project. Because soil plays a key role in filtering pollutants for these BMPs, measuring the soil may offer insight into the filtration effectiveness.

Galveston Bay Fats, Oils, and Grease (FOG) Campaign

Starting in fiscal 2014, the FOG campaign has been a joint project with the WSQ and the PPE subcommittees. To coordinate outreach and education efforts to the upper Galveston Bay watershed in the Dallas area, the GBEP is funding a project with the City of Nassau Bay to implement the City of Dallas Water Utilities FOG outreach campaign called Cease the Grease. This project supports the CWA core program of addressing diffuse, NPS sources of pollution. The Dallas campaign not only shows measurable success in reducing FOG-

related sanitary sewer overflows, but the City of Dallas was also willing to allow the City of Nassau Bay to use their materials free of charge. The campaign has been implemented in the Galveston Bay region through the City of Nassau Bay and outreach materials and efforts have been tailored for the Galveston Bay region (see Figure 4). City of Nassau Bay in partnership with the GBF are tracking the progress of the campaign based on the number of impressions achieved through marketing and outreach activities, knowledge change throughout the campaign based on pre- and post-test data in outreach programs and other indicators developed by the campaign work group. Additionally, the GBF will request sanitary sewer overflow reports from the TCEQ and municipalities to track if a bacteria reduction results from campaign implementation. Tracking results are shared with campaign partners, the City of Dallas as well as potential future partners and other regions looking for examples of a successful FOG reduction campaign. Funding for fiscal 2017 incorporated launching a grease recycling station in the City of Nassau Bay. During fiscal 2018, a recycling station was established in the City of Seabrook. The campaign also created a new, more family oriented Grease Monster. The Cease the Grease Campaign has also continued its social media posts and marketing with local National Broadcasting Company affiliate KPRC and added a Pandora audio advertisement campaign that continued through fiscal 2018.



Figure 4. New Grease Monster Mascot.

Bacteria Source Tracking (BST) on Tributaries of Trinity and Galveston Bays

In fiscal 2018, Texas Water Resources Institute (TWRI) began a water quality monitoring regime that will help decisions makers make appropriate recommendations for addressing the bacteria impairments in Buffalo, Double, Cedar, and Dickinson Bayous and Clear Creek. Monthly sampling will be conducted by TWRI at one site on each waterbody for 12 months (5 total sites). Field parameters collected will include pH, temperature, conductivity, and dissolved oxygen. Samples will be delivered to the Texas A&M University (TAMU) Soil and Aquatic Microbiology Laboratory (SAML) where *E. coli* will be prepared for BST analysis. SAML will also conduct library-dependent BST and analyze *E. coli* isolates (4 isolates per sample) using the ERIC-PCR and RiboPrinting combination method. TWRI will collect approximately 75 known source samples from the local watersheds to improve the accuracy of the BST results. Known source sample isolates will be archived in the Texas *E. coli* BST Library. A QAPP was approved in February 2018 and sampling began in April 2018.

Green Infrastructure for Texas

Texas A&M AgriLife Extension Service (Texas AgriLife) operates a program called Green Infrastructure for Texas (GIFT). This project supports continued monitoring of GIFT's freshwater wetland restoration at Sheldon Lake State Park. In 2013, the Texas AgriLife and TPWD partnered together to establish a monitoring protocol for the newly created Phase II and Phase III prairie wetlands in Sheldon Lake State Park. The goal of the vegetation monitoring focused on understanding how the plant community changes by season and with time (post initial planting). Sampling has been conducted on a quarterly basis since 2003. This project supports continuation of the data collection for Phases II and III, and adds sites within Phase IV (one-year post construction) and future Phase V. The different wetland restoration techniques can then be compared to advance the knowledge base of wetland restoration.

Additionally, the GIFT program will initiate a minimum of one, but up to three, wetland demonstration projects. The wetland demonstration project(s) include, but are not limited to, the following sites: 1) a basin on the MD Anderson Cancer Center campus in the Texas Medical Center in Houston; 2) a three-and-a-half-acre basin on the Brazosport College campus in Lake Jackson; and 3) a minimum two-acre wetland at Exploration Green Recreation Area in Clear Lake City (Phase 1b and 1c of a total five planned phases).

CONTINUE BUILDING REGIONAL SUPPORT FOR PPE

The PPE subcommittee continued supporting the Back the Bay campaign in fiscal 2018 through GBEP funded projects and by partnering at outreach events. The GBEP staff also supported PPE by participating in speaking/presentation opportunities. Through these efforts, over 3,000 adults and children were exposed to the message of protecting and preserving Galveston Bay.

Examples of these activities include:

- Supported community-based events such as Boy Scouts, Back the Bay Day at the Houston Zoo, Trash Bash, Bay Day, and the Harvard Elementary School Science Night.
- Increased awareness of Galveston Bay and its value and actions that help protect the bay through a coordinated, regionally implemented campaign.
- Shared coordination with partner organizations on marine debris for a second Trash Summit workshop held at the United Way in October 2017. This was a continuation of efforts to coordinate regional planning and implementation as well as fill in missing gaps for projects, research, and communications on local trash, marine debris, and plastic pollution issues. This is in coordination with the EPA's Trash Free Waters initiative. The goal of this effort is to create the Greater Houston-Galveston Trash-Based Aquatic Action Plan. The Back the Bay message is being incorporated into the effort's outreach and education efforts. More information on this effort can be found on the website www.donttrashagoodthing.org.
- Coordinated with Trash Free Texas (an offshoot of EPA Trash Free Waters) efforts in the upper part of the watershed. Worked with the Trash Free Trinity group to add the lower Galveston Bay watershed to their website that captures litter/marine debris hotspots that can be adopted by stakeholders and volunteer groups. Partners are working to add areas in the lower watershed to the website's map. www.trashfreetrinity.com
- Partnered with several groups on the P3P to highlight messages about awareness on water pollution and marine debris risks to native wildlife such as fishing line at various education and outreach events.
- Participated with a workgroup of the P3P on a monofilament fishing line abatement project for the Texas City Dike. Several stakeholders identified a need for a fishing line abatement project on the dike due to the threat this material is causing to wildlife and water quality. In December 2017, a group of volunteers picking up fishing line from the dike and then weighed and analyzed the amount of line collected to get a baseline of how much debris was on the dike. Then partners conducted intercept questionnaires with anglers on the dike to get a sense of their fishing line containment and recycling habits. These data will be used to create a pilot campaign aimed at helping anglers keep the fishing line off the dike by using trash and/or recycling containers. These efforts have garnered a partnership with the City of Texas City's Solid Waste department.
- Partnered with the City of Pasadena Municipal Library for a Back the Bay presentation for their children's program that engaged 80 children with the message of litter and plastic pollution prevent.
- Coordinated and hosted 24 quarterly meetings of the GBC and its subcommittees.
- Coordinated, in partnership with Texas Sea Grant, a Post Harvey Task Force between October 2017 and December 2017. This initiative brought together researchers and field data scientists in the months following Hurricane Harvey. Three different groups met monthly via teleconference to coordinate data collection efforts under three broad categories: water quality, toxics, and habitats and critters. A list-serve (hosted by Texas Sea Grant) was established to aid with email communication during this time.



Figure 5. Volunteers with the P3P group analyzing monofilament fishing line debris collected at the Texas City Dike. Photo by the Houston Zoo.

Trash Bash

In March 2017, the GBEP coordinated the 23rd annual Trash Bash event at Sim Bayou, one of 15 clean-up sites across the Houston-Galveston area. The event promotes environmental stewardship and encourages volunteers to do their part at home by properly disposing of trash, household chemicals, and pet waste. Trash Bash supports two of the EPA's fiscal 2014 – 2018 Strategic Plan goals which include: 1) cleaning up our communities and advancing sustainable development, and 2) protecting America's waters.

At the event, 234 volunteers collected an estimated 2,200 lbs. of trash at Sim Bayou/Kuhlman Gully (satellite site). Their efforts enabled 40 pounds of materials to be recycled. Each year, Trash Bash meets or surpasses volunteer goals. In 2017, 3,242 volunteers from all over the Houston-Galveston area cleaned 150.1 miles of shoreline, collected approximately 51.9 tons of trash—including 574 tires—and recycled 1.46 tons of trash. The GBEP staff also provided Back the Bay and Cease the Grease campaign education at the Kuhlman Gully site.

In March 2018 the GBEP participated in the 25th annual Trash Bash cleanup at Galveston Bay (Virginia Point), a site coordinated by Scenic Galveston and the Gulf Coast Authority. Results of this event are not available at the time of submission.



Figure 6. Houston Zoo visitors making reusable tote bags out of t-shirts at the Back the Bay Day event in 2017.

Back the Bay

The GBEP implemented the Back the Bay public awareness campaign, involving key stakeholders, to reinforce implementation of the GBP's priorities. The goals of the Back the Bay campaign are to build awareness of the value of Galveston Bay, and encourage and motivate actions that support habitat conservation, water conservation, and water quality improvement. The campaign was incorporated into stakeholder projects and workgroups through the following:

- Continued to work with the PPE Subcommittee on identifying priority goals or the campaign and ways to incorporate the message into ongoing outreach and education efforts around the region.
- o P3P
 - A consortium of several area organizations including state and federal agencies who have created a network to educate, and conduct outreach including hands-on activities to bring about awareness of birds, turtles and other wildlife and the importance of preserving habitats.
 - Some of those key partners include: Houston Audubon, the GBF, the Houston Zoo, Turtle Island Restoration Network, Gulf Coast Bird Observatory, TPWD's Galveston Island State Park, and the

EPA Trash Free Waters initiative.

- Marine Debris Task Force
 - Participated in planning and education/outreach efforts for this group, which was an outcome of the 2015 Trash Free Waters stakeholder meeting held in Galveston. Some of the key partners with the group are Artist Boat, Galveston Island Parks Board of Trustees, Turtle Island Restoration Network, City of Galveston, and Moody Gardens.
- The GBEP provided Back the Bay campaign materials and messaging and reached over 2,180 adults and 865 children through targeted outreach events such as: Bay Day; Jane Long Festival; TCEQ Trade Fair; Pasadena Library, various community health and environmental safety fairs; Boy Scouts and TPWD Learn to Fish events; and stakeholder presentations.

IMPROVING RESOURCE MANAGEMENT THROUGH TARGETED RESEARCH THAT INCREASES ECOSYSTEM UNDERSTANDING

The GBEP continues to focus on providing ecosystem based M&R and encouraging the sharing of new information to inform resource managers. From this work, projects such as investigating mangrove restoration in Galveston Bay and monitoring the Galveston Bay system at monthly intervals were funded because of the fiscal 2014 – 2015 request for grant applications. In fiscal 2016, the M&R subcommittee supported a project that investigates the impacts of reservoirs on freshwater inflows, specifically the Lake Livingston reservoir. In 2015 the GBC approved funding to continue the Lake Livingston project in fiscal 2017 and a funding request was included in the fiscal 2017 work plan. For fiscal 2018, M&R funded projects to collect and analyze fish tissue samples to evaluate the risk associated with consumption of fish and crabs from a portion of Galveston Bay and to quantify the influence of freshwater inflow on the Trinity River delta salinity regime and biota.

The Impacts of Assimilative Capacity of Reservoirs on Coastal Inflows

The most recent Texas State Water Plan calls for 26 new reservoirs to increase water supplies by 1,500,000 acre-feet per year in 2060 to meet Texas' future water needs. Reservoirs are costly to build, and have ecologic and hydrologic impacts downstream by affecting freshwater inflow and the supply of sediment and nutrients to Texas coastal systems.

The goal of this project is to assess the assimilative capacity of the Lake Livingston reservoir and how it impacts coastal inflows. Lake Livingston's dam forms the upper boundary of the lower Galveston Bay watershed on the Trinity River. This project will monitor the inflows into Lake Livingston and the outflows to obtain before and after data for nutrients and sediments. Assimilative capacity changes depending on flows, so the study will obtain samples during low, medium, and high flows (ambient and event monitoring). The Lake Livingston reservoir may play an important role in controlling sediment and nutrient load variability to the coastal ecosystem. The effect Lake Livingston has in sequestering sediments and nutrients is not well understood; therefore, quantifying the assimilative capacity of Lake Livingston is critical in understanding the impacts of reservoirs on the health of the Galveston Bay ecosystem. The QAPP was approved in February 2016 and in March 2016, the United States Geological Survey (USGS), the subcontractor, began exploratory sampling to estimate residence time in Lake Livingston and get baseline data. In May 2016, the Houston Advanced Research Center (HARC) began routine and event sampling. Sampling has continued during fiscal 2018. Four events have been sampled – one low flow event, one ambient set of samples, and two high flow events.

Mangrove Restoration in Galveston Bay: Ecological Benefits and Effective Restoration Techniques

The overall objective of this project is to determine if, when, and where mangrove restoration should be implemented in Galveston Bay. Data will be collected from at least three sites of each of four habitat types: mature and restored salt marshes, and mature and restored mangrove stands. This data will be used to inform the following questions: which mangrove planting techniques yield near- and long-term mangrove restoration success at sites throughout Galveston Bay, are there specific ecosystem functions between existing mangrove stands and salt marshes in Galveston Bay, and how do these restoration sites compare to other Texas estuaries? In addition to the research component of this project, there is an outreach piece that educates the public on the importance of wetland restoration for NPS management and integrates research findings into outreach and stewardship programs. Texas A&M University Galveston (TAMUG) is the contractor for this project. The contractor interacted with the public at stormwater wetland volunteer days with the Texas AgriLife-Texas Community Watershed Partners (TCWP) stormwater wetland program and at the fall 2016 Marsh Mania event. The contractor continued to sample through spring 2017. The Final Report was submitted in June 2017.

Galveston Bay: Changing Land Use Patterns and Nutrient Loading. Causal or Casual Relationship?

The objective of this project is to continue monitoring Galveston Bay at monthly intervals using the Dataflow system to measure water quality parameters, collect nutrient and other data at fixed stations in Galveston Bay which can then be used to explain patterns in water quality such as chlorophyll data, and measure phytoplankton productivity, community composition, and the presence of harmful algal blooms, if present. The QAPP Revision for this project was approved in March 2017. The project was completed and Final Report submitted in May 2017.

Seafood Evaluation in a Portion of Upper Galveston Bay

A fish advisory targeting the area below Highway 146 down to a line from Red Bluff Point to Five Mile Pass to Houston Point has not been sampled recently. This area has a consumption advisory for catfish, blue crabs, and spotted seatrout due to PCBs and Dioxins. The area is a popular recreational fishing area for spotted seatrout. Fishing occurs regularly in Tabb's and Barnett bays that are contained in this advisory area. It is important to select a geographical area that is of a size that will allow an evaluation of tissue concentrations and risk that allows a high degree of confidence so that appropriate regulatory decisions can be made by the Commissioner of Health related to altering an existing fish consumption advisory. The Department of State Health Services (DSHS) will collect about 63 samples from this area. Four or five locations will be established in the area to collect fish and crab samples based upon habitat and areas where fishing occurs. Targeted species would include those species that are commonly eaten such as blue crab, spotted seatrout, red drum, black drum, sheepshead, catfish, flounder, and croaker. Once the samples are collected and analyzed, a risk characterization will be conducted to determine the adequacy of the current fish consumption advisory in the area. A limited number of samples will be run for full scans however, all samples will be run for PCBs and dioxins as there is a history of issues with these compounds. The project will produce data to be able to determine whether any change to the current advisory is needed in a portion of Galveston Bay. During fiscal 2018, the QAPP was approved in December 2017 and the sampling began in January 2018.

Characterization of the Influence of Freshwater Inflow on Trinity River Delta Indicators

Recent studies by the USGS have documented inconsistencies between gaged upstream flows on the Trinity River and monitored inflows at the mouth of the Trinity River. In addition, little is known about the influence of freshwater inflow on the salinity regime and response of multiple freshwater indicator fauna including Rangia clams and wild celery. Latest studies have also documented the recent and past abundances of Rangia clams in open bay portions of the Galveston Bay system. However, spatial and temporal trends in populations of Rangia clams and wild celery remain poorly documented within the shallow portions of the Trinity River delta. UHCL/EIH is conducting a comprehensive study that includes two components: 1) establishment of a network of shallow automated salinity monitoring sites; and 2) on the ground inventory of SAV and Rangia clams. The QAPP for this project was approved in January 2018 and equipment has been put in place.

SECTION 2.3: STRATEGIC ACTION PLAN GOALS TO FOCUS ON IN FISCAL 2019

- Conserve, restore, and enhance important coastal habitats.
- Reduce NPS pollutant loads.
- Minimize risk of waterborne illness resulting from contact recreation.
- Create a sense of personal ownership and shared responsibility among all cultural components of the community, including the public, industry, and government.
- Ensure that stakeholders receive the knowledge necessary to act on the GBEP's priorities in ways that benefit Galveston Bay and the entire community.
- Increase the number of partners actively involved in GBEP initiatives.
- Reduce human health risk from consumption of seafood contaminated with toxic substances.
- Increase understanding of intertidal oyster population dynamics and community structure of oyster reefs.
- Increase understanding of the Galveston Bay ecosystem.

FISCAL 2019 EXPECTED OUTCOMES

- Conserve, restore, and enhance important coastal habitats.
- Increase technical transfer from demonstration projects with local governments for improving storm water.
- Improve knowledge of sources of bacteria pollution in the lower Galveston Bay watershed.
- Increase coordination of marine debris and plastic pollution reduction efforts throughout the region.
- Increase the public's awareness of their connection to and effect on the Galveston Bay ecosystem.
- Increase coordination of environmental education efforts in the region.
- Continue to monitor the influence of freshwater inflows on Galveston Bay.
- Continue to monitor freshwater wetland restoration techniques.
- Create a complete Geographic Information System (GIS) database of oyster reef habitat in Galveston Bay.
- Complete the revision of the GBP.

FISCAL 2019 EXPECTED OUTPUTS

- Conserve and protect 250 acres of habitat.
- Restore and enhance 750 acres of habitat.
- Initiate at least two stormwater treatment wetlands projects.
- Complete/continue one bacterial source tracking project.
- Coordinate a LID workshop for municipalities in the Galveston Bay watershed.
- Coordinate/facilitate an environmental education workshop for educators who are working on environmental curriculum in the region.
- Complete two bird and wildlife habitat restoration projects that incorporate educational workshops, interpretive signage, and volunteer opportunities.
- Continue to participate in the coordination of Trash Bash.
- Continue the Back the Bay campaign.
- Complete data collection to determine if a seafood advisory is still necessary for a portion of Galveston Bay.
- Support two freshwater inflow research projects.
- Continue one project that monitors freshwater wetland restoration.
- Complete mapping oyster reef habitat and analysis of intertidal oyster population dynamics and community structure.
- Complete the State of the Bay Report, 4th Edition.
- Complete the revision of the GBP.
- Maintain the GBEP and Back the Bay websites.
- Initiate an estuary resilience assessment of the goals, objectives, and actions in the GBP revision.

FY 2018-2022 EPA STRATEGIC PLAN MEASURES IMPLEMENTED

The projects proposed for fiscal 2019 implement objectives of all three goals identified in the FY 2018-2022 EPA Strategic Plan, including:

Goal 1: Core Mission - Deliver real results to provide Americans with clean air, land, and water, and ensure chemical safety.

• Objective 1.2: Provide for Clean and Safe Water

As Objective 1.2 is the main goal of all NEPs, the GBEP's projects focus on safeguarding human health and maintaining, restoring, and/or improving water quality through a variety of methods including seafood safety programs, land conservation, and developing and implementing watershed based plans.

• Objective 1.3: Revitalize Land and Prevent Contamination

The GBEP's land conservation programs implement Objective 1.3 by enhancing the livability and economic vitality of the community. Land held in conservation increases the value of property adjacent to it, which equates to added tax revenue for the county.

Goal 2: Cooperative Federalism - Rebalance the power between Washington and the states to create tangible environmental results for the American people.

• Objective 2.1: Enhance Shared Accountability

The GBEP itself is an exercise in cooperative federalism both in its administration (a program of TCEQ and EPA), and its management committee (GBC). All projects are developed and implemented by a diverse partnership of federal and state agencies, local government, industry, and nonprofits.

• Objective 2.2: Increase Transparency and Public Participation

The GBEP is a stakeholder driven program, but in addition, many of our projects have significant education and outreach components that emphasize public participation to better partner with stakeholder and local communities to create tangible environmental results.

Goal 3: Rule of Law and Process - Administer the law, as Congress intended, to refocus the Agency on its statutory obligations under the law.

• Objective 3.3: Prioritize Robust Science

The GBEP's proposed monitoring and research projects were developed and selected by federal and state agencies, research and academia, and local industry to address current and future environmental hazards, develop new approaches, and improve the scientific foundation for environmental protection.

FISCAL 2019 STATE AND FEDERAL FUNDING

The total cost of the fiscal 2019 work plan is \$1,200,000. Fifty percent (\$600,000) of the project cost is provided by federal funds; 50 percent (\$600,000) in match is being provided by the TCEQ through a waste water treatment inspection fee, as described in Table 4 and Table 5. These tables exclude additional state and local funding.

Table 4. Fiscal 2019 Funding

PROGRAM	AMOUNT (\$)	% OF TOTAL
GBEP	\$1,200,000	100%
Total	\$1,200,000	100%

Table 5. Fiscal 2019 Budget Detail

Budget Detail- see also Fiscal 2019 Federal Projects	Amount (\$)
Salaries (includes Fringe and Indirect at 69.57% of Salaries)	\$627,207
Travel	\$7,500
Capital	\$0
Supplies	\$447
Contracts	\$6,000
Other	\$558,846
Total	\$1,200,000

PROJECT SCHEDULE

The execution of the tasks associated with this work plan will occur over a 36-month period, which is anticipated to begin September 1, 2018, and end August 31, 2021. The exact start date of the work plan and all due dates for deliverables are contingent upon the actual date the grant funds are awarded and contracts are executed.

The projects outlined in this work plan were developed by the NRU subcommittee, WSQ subcommittee, PPE subcommittee, and the M&R subcommittee, balanced by the Budget and Priorities subcommittee, and submitted to the GBC for approval in December 2017. The GBC approved the projects listed in this work plan at the January 31, 2018 quarterly meeting.

The project scopes of work will be submitted to the TCEQ Quality Assurance Officer to determine which projects in the work plan will require a QAPP. Under the authority granted by the EPA to the TCEQ to approve QAPPs for the GBEP, the GBEP staff and their project partners will develop QAPPs for projects determined by the TCEQ and the EPA to require QAPPs. QAPPs will be developed in accordance with the EPA requirements for QAPPs, EPA document QA/R-5.

SECTION 3: FISCAL 2019 PROJECTS

SECTION 3.1: FISCAL 2019 FEDERAL PROJECTS - SUMMARY

(Ctrl + Click to follow link)

PROJECT NAME	YEARS (FISCAL)	FEDERAL	STATE MATCH	TOTAL 2018 GBEP BUDGET	STATUS
Program Administration (Includes supplies, travel, salary, fringe and indirect)	2019	\$317,577.00	\$317,577.00	\$635,154.00	Annual
<u>1. GBEP Website Hosting and Maintenance</u>	2019	\$3,000.00	\$3,000.00	\$6,000.00	Annual
<u>2. Mickey Leland Environmental</u> <u>Internship</u>	2019	\$3,989.50	\$3,989.50	\$7,979.00	Annual
<u>3. Estuary Resilience Assessment</u>	2019	\$15,000.00	\$15,000.00	\$30,000.00	New
Administration Total		\$339,566.50	\$339,566.50	\$679,133.00	
<u>4. Conservation Assistance Program</u>	2018- 2019	\$50,000.00	\$50,000.00	\$100,000.00	Ongoing
NRU Total		\$50,000.00	\$50,000.00	\$100,000.00	
5. Bacteria Source Tracking on Tributaries of Trinity and Galveston Bays	2018- 2020	\$40,000.00	\$40,000.00	\$80,000.00	Ongoing
<u>6. Green Infrastructure for Texas</u> (<u>GIFT)</u>	2019	\$18,750.00	\$18,750.00	\$37,500.00	Ongoing
<u>7. Highland Bayou Watershed</u> <u>Protection Plan</u>	2019	\$31,297.50	\$31,297.50	\$62,595.00	New
WSQ Total		\$90,047.50	\$90,047.50	\$180,095.00	
<u>8. Trash Bash 2019</u>	2019	\$7,500.00	\$7,500.00	\$15,000.00	New
<u>9. Blackhawk Park Coastal Prairie</u> <u>Restoration and Education Project</u>	2019	\$26,800.00	\$26,800.00	\$53,600.00	New
<u>10. Know Your Watershed</u>	2019	\$19,170.50	\$19,170.50	\$38,341.00	New
11. Galveston Seawall Recycling	2019	\$9,210.00	\$9,210.00	\$18,420.00	New
PPE Total		\$62,680.50	\$62,680.50	\$125,361.00	
<u>12. Seafood Evaluation in a Portion</u> <u>of Galveston Bay</u>	2018- 2019	\$16,415.50	\$16,415.50	\$32,831.00	Ongoing
<u>13. Characterization of the</u> <u>Influence of Freshwater Inflow on</u> <u>Trinity River Delta Indicators</u>	2018- 2019	\$9,000.00	\$9,000.00	\$18,000.00	Ongoing
<u>14. Galveston Bay Intertidal Oyster</u> <u>Reef Mapping and Analysis</u>	2019	\$32,290.00	\$32,290.00	\$64,580.00	New
M&R Total		\$57,705.50	\$57,705.50	\$115,411.00	
FUNDING REQUEST GRANT TOTAL		\$600,000.00	\$600,000.00	\$1,200,000.00	

SECTION 3.2: FISCAL 2019 FEDERAL PROJECT - DETAIL

3.2A - ADMINISTRATIVE PROJECTS FOR FISCAL 2019

1. Galveston Bay Estuary Program Website Hosting and Maintenance

CCMP Actions Implemented: PPE-1, PPE-3, PPE-7, PPE-8

EPA's Strategic Plan Measures Implemented: Goal 2 – Cooperative Federalism, Objective 2.2 - Increase Transparency and Public Participation; Goal 3 – Rule of Law and Process, Objective 3.5 - Improve Efficiency and Effectiveness

Grantee/Contractor: Wilkins Group

Fiscal 2019 Budget: \$6,000

Total Project Budget: \$6,000

Milestones: N/A

Project period: September 2018 - August 2019

Status: Annual project

Objective(s): Support the three websites maintained by the GBEP for public participation, education, and outreach.

Project Description: This project provides support for three websites maintained by the GBEP:

- <u>www.gbep.texas.gov</u>: Tasks for the GBEP website include maintenance and updates as needed throughout the year, hosting, and domain name registration.
- <u>www.backthebay.org</u>: Tasks for the Back the Bay website include maintenance and updates as needed throughout the year, hosting, and domain name registration.
- <u>www.galvestonbayplan.com</u>: Tasks for the Plan Revision website include maintenance and updates as needed throughout the year, hosting, and domain name registration.

2. Mickey Leland Environmental Intern

CCMP Actions Implemented: PPE-3, General support of all Action Plans

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 - Cooperative Federalism, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: Goodwill Staffing Services/TCEQ

Fiscal 2019 Budget: \$7,979

Total Project Budget: \$7,979

Milestones: The selected intern will develop a white paper and final presentation that summarizes their efforts at the end of the summer internship period.

Project period: May – August 2019

Status: Annual project

Objective(s): An undergraduate or graduate college student will learn about environmental issues specific to the GBEP and gain professional work experience through a paid, full-time summer internship.

Project Description: The Mickey Leland Environmental Intern will generate a white paper and final presentation that summarizes their efforts at the end of the summer internship period. The intern will work on a project that helps to implement or track implementation of *The Galveston Bay Plan*.

3. Estuary Resilience Assessment

CCMP Actions Implemented: Galveston Bay Regional Monitoring Program.

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: The GeoTechnology Research Institute (GTRI) through HARC

Fiscal 2019 Budget: \$30,000

Total Project Budget: \$30,000

Milestones: Stakeholder workshop and draft report by December 2018.

Project period: September 2018- August 2019

Status: New project

Objective(s): This project will assess the goals, objectives, and actions in the GBP against a series of coastal resilience criteria, meeting the requirements identified in the EPA's NEP Funding Guidance Document.

Project Description: The final output of the project will be a companion document to the GBP and will provide resiliency adaptation considerations for implementers of the GBP. The document will be developed in coordination with subject matter experts and/or members of the Galveston Bay Council and its committees through workshops or via existing meeting structures. The project will follow the requirements identified in the EPA's NEP Funding Guidance Document.

Partners and Their Role(s): While the lead contractor is GTRI, the Estuary Resilience Assessment will draw on the expertise of all GBC members and subcommittee members including a diverse group of research institutions and federal, state, local, and non-governmental organizations that collect data in the watershed.

Outputs/Deliverables:

- Three stakeholder meetings or workshops,
- quarterly progress reports until contract expiration,
- final Estuary Resilience Assessment document and report August 2020, and
- final report.

Long-term Outcomes: Galveston Bay estuary is managed by all GBEP partners based on best known data and implementation efforts consider resiliency during project selection.

3.2B - NRU PROJECTS FOR FISCAL 2019

4. Conservation Assistance Program

CCMP Actions Implemented: HP-1, HP-5, SP-1, SM-5, PPE-1

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water, Objective 1.3 - Revitalize Land and Prevent Contamination; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: TBD (New solicitation)

Fiscal 2019 Budget: \$100,000

Total Project Budget: \$600,000

Milestones: Not applicable. Milestone dates for individual tasks are not applicable as project identification is a continuous task, and specific project support is applied for as needed.

Project period: September 2017- August 2022

Status: Ongoing project (\$200,000 in Grant #CE-00655006: fiscal 2018 \$100,000, fiscal 2019 \$100,000). The solicitation for a new project contractor was posted for bid on the Texas Electronic State Business Daily in February 2018. Solicitation closed March 20, 2018. Contractor will be selected in May 2018.

Objective(s): The goal of this project is to place 2,500 acres of coastal habitat in the Galveston Bay area in permanent conservation.

Project Description: The overall goal of the CAP is to support the GBEP and its partners' efforts to preserve wetlands and other important coastal habitats to protect the long-term health and productivity of Galveston Bay. The CAP will continue to accomplish these goals by:

- identifying priority conservation properties with the help and consensus of conservation partners;
- building funding strategies through grant identification, grant writing, and fundraising;
- working with willing sellers to negotiate fee simple or conservation easement transactions;
- carrying out legal, title, and other due diligence transaction support; and
- finalizing the sale and transfer of title to a third-party organization or government entity.

Partners and Their Role(s): While the lead contractor is TBD, the CAP workgroup is comprised of a diverse group of federal, state, local, and non-governmental organization resource managers.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- annual report due August 31 until contract expiration, and
- final report due August 2022.

Long-term Outcomes: The permanent conservation of coastal habitat and preservation of important hydrologic and water quality functions in lower Galveston Bay.

3.2C - WSQ PROJECTS FOR FISCAL 2019

5. Bacteria Source Tracking on Tributaries of Trinity and Galveston Bays **CCMP Actions Implemented:** NPS-3, WSQ-1

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: Texas AgriLife/Texas Water Resources Institute (TWRI)

Fiscal 2019 Budget: \$80,000

Project Total: \$240,000

Project received approval from the GBC to receive \$80,000 a year for three consecutive years, dependent on funding.

Milestones: Water Quality sampling will be completed by March 2019.

Project Period: September 2017 - May 2020

Status: Ongoing project (\$160,000 in Grant #CE-00655006: fiscal 2018 \$80,000, fiscal 2019 \$80,000). The QAPP was approved February 2018. Monthly sampling began in April 2018.

Objective(s): To gather information needed to address bacteria concerns in five watersheds of the Trinity and Galveston bays.

Project Description: Through this project, a water quality monitoring regime will be employed that will help decisions makers make appropriate recommendations for addressing the bacteria impairments in Buffalo, Double, Cedar, and Dickinson bayous and Clear Creek. Monthly sampling will be conducted by TWRI at one site on each waterbody for 12 months (5 total sites). Field parameters collected will include pH, temperature, conductivity, and dissolved oxygen. Samples will be delivered to the TAMU SAML where *E. coli* will be prepared for BST analysis. SAML will also conduct library-dependent BST and analyze *E. coli* isolates (4 isolates per sample) using the ERIC-PCR and RiboPrinting combination method. TWRI will collect approximately 75 known source samples from the local watersheds to improve the accuracy of the BST results. Known source sample isolates will be archived in the Texas *E. coli* BST library. Results of both the known source sampling and BST analysis will be reported in a project final report and presented as necessary.

Partners and Their Role(s): Contractor will be working with the SAML at TAMU to perform the sample analyses.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- draft QAPP due within 60 days of contract execution,
- final QAPP due within 45 days of draft,
- data results and interpretation due with QPRs, and
- final report due April 2020.

Long-term Outcomes: A better understanding of the sources contributing to bacteria pollution in the lower Galveston Bay watershed.

6. Green Infrastructure for Texas (GIFT)

CCMP Actions Implemented: HP-1, NPS-1, 2, PPE-1, 5

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water, Objective 1.3 - Revitalize Land and Prevent Contamination; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: Texas AgriLife /TCWP

Fiscal 2019 Budget: \$37,500

Project Total: \$111,698

Milestones: Begin planting the stormwater wetlands at Exploration Green, Phase 2 in fall 2018; begin designing a third stormwater wetland on the West campus of MD Anderson in fall 2018; begin planting stormwater wetland at Brazosport College in spring 2019; and finish freshwater wetland monitoring at Sheldon Lakes State Park in fall 2018.

Project Period: September 2017 - December 2019

Status: Ongoing project (\$111,698 in Grant #CE-00655006: fiscal 2018 \$74,198, fiscal 2019 \$37,500). The Sheldon Lake monitoring QAPP is being reviewed by TCEQ. Sampling will begin in once the QAPP has been approved. Stormwater wetlands are being planted at Exploration Green, the MD Anderson stormwater wetlands were not being well maintained by a subcontractor so they are being cleaned up, and plans are being developed for the stormwater wetlands at Brazosport College.

Objective(s): The goal of this project is to monitor freshwater wetland restoration in Sheldon Lake State Park and to develop several stormwater treatment wetlands.

Project Description: To establish green infrastructure, or natural drainage, in the Galveston Bay watershed, the TCWP will demonstrate a range of green infrastructure techniques using a multi-level approach, from individual property owners to large-scale undeveloped lands, with built-in applied research projects focused on water quality and quantity. The GIFT project brings together three TCWP programs—Freshwater Wetland Restoration, Stormwater Treatment Wetlands, and Green Stormwater Infrastructure—for a unified, holistic approach addressing current and emerging needs to protect surface water resources. Each of the programmatic areas has three components: 1) implementing on-the-ground demonstration projects for stormwater BMPs; 2) conducting research to study green infrastructure in situ; and 3) educating stakeholders to manage their water resources through courses, workshops, and publications.

Under this project, stormwater treatment wetlands are proposed to be developed in three areas where partnerships have already been initiated; an 8,500-square foot basin on the MD Anderson Cancer Center campus in the Texas Medical Center in Houston, a three and half acre basin on the Brazosport College campus in Lake Jackson, and five acres of wetlands at Exploration Green Recreation Area in Clear Lake City (Phase I of five planned phases). In addition, this project will monitor freshwater wetland restoration at Sheldon Lake State Park. The goal of the vegetation monitoring focuses on understanding how the plant community changes by season and with time (post initial planting). Sampling has been conducted on a quarterly basis since 2003. This project will continue the data collection for Phase II and III, but add sites within Phase IV (one-year post construction) and future Phase V.

Partners and Their Role(s): MD Anderson Cancer Center, Brazosport College, and Clear Lake City will provide MOUs and contribute to the planning of the stormwater wetlands; Sheldon Lake State Park will assist with the monitoring and provide the land.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- draft QAPP due within 60 days of contract execution,
- final QAPP due within 45 days of draft,
- signed MOUs by December 31, 2017, and
- final report due August 2018.

Long-term Outcomes: Green infrastructure BMPs installed and monitored and used to demonstrate the effectiveness of green infrastructure.

7. Highland Bayou Watershed Protection Plan (WPP) CCMP Actions Implemented: NPS-3; WSQ-1

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: Texas AgriLife

Fiscal 2019 Budget: \$62,595

Project Total: \$62,595

Milestones: Coordinate kick-off meeting with the GBEP by October 1, 2018 and develop an education and outreach plan by December 1, 2018.

Project Period: September 2018 - August 2019

Status: New project

Objective(s): The goal of this project is to update the Highland Bayou WPP to include load reduction estimates which incorporate flow data for both bacteria and dissolved oxygen, and to shepherd the WPP through the TCEQ and EPA Region 6 approval process.

Project Description:

Highland and Marchand bayous sometimes experience periods of low dissolved oxygen (DO) and elevated bacteria levels, which can result in adverse wildlife habitat conditions and can be harmful to human health. All the state's assessments (303d list) since 2002 have classified multiple segments within Highland Bayou (segment 2424A) and Marchand Bayou (segment 2424C) as impaired for these constituents of concern.

Texas AgriLife has coordinated the creation of a characterization report and a stakeholder driven draft WPP for Highland Bayou. The current draft WPP only addresses bacteria and does not include flow data. Recent guidance from the EPA indicates that the DO impairment and flow both need to be included for a WPP to meet all requirements for approval as a watershed based plan (WBP).

During fiscal 2018, the Texas Institute for Applied Environmental Research (TIAER) at Tarleton State University, with funding from the Texas Commission on Environmental Quality (TCEQ) Total Maximum Daily Load (TMDL) program is exploring options for modeling flow with existing data from surrogate watersheds using various methods. TIAER's goal is finding an acceptable protocol for addressing flow without collecting new data. Once an acceptable protocol is determined, the TCEQ TMDL program will fund a second year (fiscal 2019) of work to complete the modeling and associated load reduction calculations for both bacteria and dissolved oxygen.

Partners and Their Role(s): TIAER and TCEQ's TMDL program.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- Education and Outreach Plan by November 1, 2018,
- updated Highland Bayou WPP website by November 1, 2018,
- draft WPP by August 2019, and
- final report due August 2019.

Long-term Outcomes: Municipalities will use LID-friendly practices in the future.

3.2D - PPE PROJECTS FOR FISCAL 2019

8. Trash Bash 2019

CCMP Actions Implemented: PPE-1, PPE-3, PPE-5, SD-5

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 - Cooperative Federalism, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: The H-GAC

Fiscal 2019 Budget: \$15,000

Total Budget: \$15,000

Milestones: Trash Bash event will occur between March and April 2019.

Project Period: September 2018 - July 2019

Status: New. The GBEP Trash Bash Project Manager is a member of the Trash Bash Steering Committee, which will help plan the 2019 Trash Bash event.

Objective(s): The goal of Trash Bash is to promote environmental stewardship of our watershed through public education by utilizing hands-on educational tools and by developing partnerships between environmental, governmental, and private organizations.

Background: Trash Bash is a successful volunteer-based litter cleanup event that has been held at multiple sites in the Houston-Galveston area on an annual basis since 1994. In fiscal 2019 funding will be used to

support staff time and salaries to organize the event, and to develop a new interactive educational exhibit for all regional Trash Bash sites.

Project Description: The GBEP continues to support Trash Bash in 2019 by providing funds for partial staff support of the H-GAC Trash Bash Coordinator, and creation, design, and production of promotional and educational materials. For fiscal 2019, the GBEP staff will continue to support the event by exhibiting and volunteering at regional sites.

Partners and Their Role(s): Partners for this project include the H-GAC which organizes and coordinates the event, Gulf Coast Waste Disposal which provides equipment and t-shirts for the event, Texas Conservation Fund which manages the funding, and private and corporate sponsorships.

Outputs/Deliverables:

- Trash Bash Steering Committee meeting agendas and meeting minutes due July 31 annually, and
- final report due July 2019.

Long-term Outcomes: Increase awareness level of the connection between littering, how litter enters our waterways, and the negative impacts it has on neighboring communities, fish and wildlife by 10% at all Trash Bash locations. Decrease the amount of trash flowing into area waterways through educating citizens on appropriate actions i.e. do not litter in your neighborhood, along the roads, and support EPA Trash Free Waters initiative.

9. Blackhawk Park Coastal Prairie Restoration and Education Project CCMP Actions Implemented: PPE-1, PPE-3, PPE-7, HP-1, FW-6

EPA's Strategic Plan Measures Implemented: Goal 1 – Core Mission, Objective 1.2 - Provide for Clean and Safe Water, Objective 1.3 – Revitalize Land and Prevent Contamination; Goal 2 – Cooperative Federalism, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: City of Houston Parks and Recreation Department (CoH)

Fiscal 2019 Budget: \$53,600.00

Total Project Budget: \$53,600.00

Milestones: Complete 4 acres of invasive species removal and native plant installation by February 2019.

Project period: September 2017 - August 2020

Status: New project

Objective(s): To engage the community in restoring a city park to its historic coastal prairie pothole habitat. The project aims to involve the community in habitat restoration to learn the historic significance of coastal prairie, its benefit to wildlife, and the positive impacts that a prairie site can have to the community.

Description: The CoH's Natural Resources Management Program targeted 47-acres of undeveloped land within Blackhawk Park for prairie restoration. This area was identified as historic coastal prairie through satellite imagery, and still contains valuable prairie plants. These plants are currently being crowded out by non-native woody vegetation. Once restored, this park has the potential to provide significant ecosystem functions, habitat value for wildlife, and educational importance for surrounding urban and coastal communities. The GBEP is funding a ten-acre portion of the park through this project.

Partners and Their Role(s): The CoH will partner with the Student Conservation Association (SCA) to perform habitat management activities focusing on the removal of invasive species. The SCA will also lead community volunteers in planting native grasses and forbs that have been grown in the CoH's greenhouse by Master Naturalist volunteers.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- quarterly public education and volunteer events, and
- final report due July 2020.

Long-term Outcomes: Increase awareness level of the connection between the natural environment and the impacts the public can have on water quality and habitat preservation.

10. Know Your Watershed Educators Summer Institute CCMP Actions Implemented: PPE-1, PPE-3, PPE-7, HP-1, FW-6 **EPA's Strategic Plan Measures Implemented:** Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 – Cooperative Federalism, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: UHCL

Fiscal 2019 Budget: \$38,341.00

Total Project Budget: \$38,341.00

Milestones: An eight-day summer institute and an administrator symposium by the summer of 2019.

Project period: September 2017 - August 2020

Status: New project

Objective(s): To support formal K-12 education efforts to incorporate environmental education about the Galveston Bay watershed into regional classrooms.

Description: The goal of the project is to hold an eight-day summer institute to provide educators with resources and field experiences on environmental education. The focus will be on the importance of watersheds, wetland creation and restoration, marshes, storm drain water quality, and benefits of best management practices for citizens that improve water quality. Educators will have the opportunity to tour wastewater treatment plants and constructed outfall wetlands for stormwater treatments. Teachers will learn how they can use this information in their classrooms, schools, and/or community. Additionally, the project will hold a one-day symposium for school administrators that will address questions on what environmental education entails and how they can support classroom teachers to incorporate environmental education into their curriculum and lesson plans.

Partners and Their Role(s): The UHCL will partner with the GBF to provide support for creating and implementing the summer institute and the symposium. Additionally, in-field support will be provided by area municipalities and the Armand Bayou Nature Center.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- summer institute and symposium, and
- final report due July 2020.

Long-term Outcomes: Increase awareness level of the connection between the natural environment and the impacts that environmental education can have on the public's understanding of water quality and habitat preservation.

11. Galveston Seawall Recycling

CCMP Actions Implemented: PPE-1, PPE-3, PPE-7, NPS-1

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 - Cooperative Federalism, Objective 2.2 - Increase Transparency and Public Participation

Grantee/Contractor: The Park Board of Trustees of the City of Galveston (PBTG)

Fiscal 2019 Budget: \$18,419.50

Total Project Budget: \$18,419.50

Milestones: Purchase and placement of recycling receptacles by December 2018.

Project period: September 2017 - August 2020

Status: New project

Objective(s): The goal of the project is to provide recycling opportunities along approximately 6 miles of Galveston's seawall to reduce litter that could become marine debris effecting the stormwater system and Galveston Bay.

Description: This project is an outcome of the Marine Debris Task Force, a collective of various groups including Artist Boat, Texas General Land Office, Turtle Island Restoration Network, the GBF, and NOAA-Flower Garden Banks National Marine Sanctuary. The Task Force was formed after a workshop meeting in Galveston in 2015 for the Environmental Protection Agency's Trash Free Waters Initiative. The group identified the need to purchase 20 recycling cans and place at the seawall bus stops as well as a six-compartment recycle station that can be moved based to areas of highest need, particularly during special events. The project leverages \$58,500 of in-kind contributions from the PBTG. The Back the Bay message and logo will be

incorporated on the recycling cans as well as any outreach efforts.

Partners and Their Role(s): The PBTG will partner with Artist Boat to coordinate efforts to deploy the recycling receptacles and analyze the materials collected in the containers to evaluate the success of the project.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- recycling receptacles,
- map of where recycling containers are located,
- analysis of materials collected, and
- final report due July 2020.

Long-term Outcomes: Increase awareness level of the connection between the natural environment and the impacts that the public can have on water quality.

3.2E - M&R PROJECTS FOR FISCAL 2019

12. Seafood Evaluation in a Portion of Galveston Bay CCMP Actions Implemented: PH-1

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability; Goal 3 – Rule of Law and Process, Objective 3.3 – Prioritize Robust Science

Grantee/Contractor: Texas Department of State Health Services (DSHS)

Fiscal 2019 Budget: \$32,831

Total Project Budget: \$99,375

Project received approval from the GBC, dependent upon available funding, to receive remaining \$69,375 in fiscal 2019 work plan.

Milestones: Finish water quality sampling by March 2019.

Project period: September 2017 - August 2019

Status: Ongoing project (\$99,375 in Grant #CE-00655006: fiscal 2018 \$66,544, fiscal 2019 \$32,831). The QAPP was approved December 2017. Sampling began in April 2018.

Objective(s): To evaluate the risk associated with consumption of fish and crabs from a portion of Galveston Bay.

Project Description: Recently, fish tissue samples have been collected from the upper portion of the Houston Ship Channel to assess current fish advisories. However, the advisory area below Highway 146 down to a line from Red Bluff Point to Five Mile Pass to Houston Point has not been sampled lately. This area has a consumption advisory for catfish, blue crabs, and spotted seatrout due to PCBs and Dioxins. The area is a popular recreational fishing area for spotted seatrout. Fishing occurs regularly in Tabb's and Barnett bays that are contained in this advisory area. It is important that the targeted area that is selected is a geographical area that is of a size that will allow an evaluation of tissue concentrations and risk that allows a high degree of confidence so that appropriate regulatory decisions can be made by the Commissioner of Health related to altering an existing fish consumption advisory.

Approximately 63 samples will be collected and analyzed from this area. Four or five locations in the area will be selected to collect fish and crab samples based upon habitat and areas where fishing occurs. Targeted species would include those species that are commonly eaten such as blue crab, spotted seatrout, red drum, black drum, sheepshead, catfish, flounder, and croaker. Once the samples are collected and analyzed, a risk characterization will be conducted to determine the adequacy of the current fish consumption advisory in this location.

Partners and Their Role(s): The Geochemical Environmental Research Group lab at TAMUG will analyze the samples while the DSHS will do the sampling.

Outputs/Deliverables:

• quarterly progress reports until contract expiration,

- draft QAPP due within 60 days of contract execution,
- final QAPP due within 45 days of draft, and
- final report due July 2019.

Long-term Outcomes: To determine if a fish advisory continues to be necessary for a portion of Galveston Bay.

13. Characterization of the Influence of Freshwater Inflow on Trinity River Delta Indicators **CCMP Actions Implemented:** FW-1; FW-3; FW-7

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability; Goal 3 – Rule of Law and Process, Objective 3.3 – Prioritize Robust Science

Grantee/Contractor: UHCL/EIH

Fiscal 2019 Budget: \$18,000

Total Project Budget: \$60,000

Milestones: Continue Geographic Positioning System (GPS) surveys, water quality sampling, biological community collection during fiscal 2019 and begin statistical analysis by summer of 2019.

Project period: September 2017 - December 2019

Status: Ongoing project (\$60,000 in Grant #CE-00655006: fiscal 2018 \$42,000, fiscal 2019 \$18,000). The QAPP was approved January 2018. Sampling will begin in April 2018.

Objective(s): The objective of this project is to quantify the influence of freshwater inflow on the Trinity River delta salinity regime and indicator biota.

Project Description: Recent studies by the USGS have documented inconsistencies between gaged upstream flows on the Trinity River and monitored inflows at the Trinity River mouth. In addition, little is known about the influence of freshwater inflow on the salinity regime and response of multiple freshwater indicator fauna including *Rangia cuneate* (Rangia clams) and *Vallisneria americana* (wild celery). Recent studies have documented the recent and past abundances of Rangia clams in open bay portions of the Galveston Bay system. However, spatial and temporal trends in populations of Rangia clams and wild celery remain poorly documented within the shallow portions of the Trinity River delta. EIH therefore proposes to conduct a comprehensive study that includes three components: 1) remote sensing of submerged aquatic vegetation [(SAV) wild celery and other species] using unmanned aerial vehicles (UAV's) and on the ground surveys, 2) establishment of a network of shallow automated salinity monitoring sites and 3) an on the ground inventory of SAV and Rangia clams.

The first study element will utilize fixed wing and/or copter UAV's along with airboats to inventory SAV beds within the delta. Sites containing SAV will be delineated and input into geographic information system databases. This data and historical information will be used to establish a network of monitoring sites within the delta. During the second phase 10-25 automated temperature and salinity/conductivity meters, one to two water/tide level recorders, and one to two recording precipitation gages will be deployed at strategic locations within the delta region to characterize changes in salinity regime associated with freshwater input. The salinity/conductivity automated probes will automatically log salinity and temperature at varying intervals for over one and a half years. Data collected from these units will be compared to nearby National Oceanic Atmospheric Association tide and precipitation gages, and the USGS gage at Romayor to assess temporal and spatial patterns and correlations between precipitation, tide stage, freshwater inflow and the response of ambient salinity, SAV, and Rangia clams. Although the field portion of this project will end in one and a half years, it is anticipated that the meters will be deployed for an additional one to two years to collect additional data. The third concurrent phase of the project will be an inventory of SAV and Rangia clam beds.

Partners and Their Role(s): None

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- draft QAPP due within 60 days of contract execution,
- final QAPP due within 45 days of draft, and
- final report due July 2019.

Long-term Outcomes: A better understanding of the influence of freshwater inflow on salinity and indicator

biota.

14. Galveston Bay Intertidal Oyster Reef Mapping and Analysis **CCMP Actions Implemented:** SP-1-5, RSC-2

EPA's Strategic Plan Measures Implemented: Goal 1 - Core Mission, Objective 1.2 - Provide for Clean and Safe Water; Goal 2 – Cooperative Federalism, Objective 2.1 - Enhance Shared Accountability; Goal 3 – Rule of Law and Process, Objective 3.3 – Prioritize Robust Science

Grantee/Contractor: University of Houston (UH)

Fiscal 2019 Budget: \$64,580

Total Project Budget: \$64,580

Milestones: Develop a draft QAPP by November 1, 2018 and the final QAPP by January 1, 2019.

Project period: September 2018 - May 2020

Status: New Project

Objective(s): This project seeks to create a complete GIS database of oyster reef habitat in Galveston Bay while simultaneously assessing intertidal oyster population dynamics and community structure on selected reefs.

Project Description: Intertidal oyster shell reef locations in Galveston Bay have not been extensively mapped on a large scale in the last 20 years. Small scale exploratory projects have been conducted in Bastrop Bay and the Carancahua reef area in West Bay by the EIH utilizing drone and side scanning sonar. Ultimately drone and side scan sonar mapping will provide high quality data for future use. However, obtaining information on past intertidal reef locations will provide baseline data that can be used as a benchmark for analyzing restoration techniques in the bay and monitoring future growth/ loss of habitat.

The project proposes to use 2015 Texas Orthoimagery Program (TOP) aerial photography to build historic intertidal reef datasets. TOP data was recorded in a 0.5 m resolution, providing a higher quality image for habitat reclassification than other publicly available images.

After obtaining GIS created shapefiles of possible intertidal reef locations, ground-truthing will be conducted on a sub sample of locations to validate the analysis and collect current elevation data with a sub-meter accuracy GPS unit. On a sub sample of the mapped intertidal reefs, oyster population characteristics will be assessed. These metrics will include oyster abundance, size demography, reef structure (overall percent cover of shell, percentage of live oysters, and rugosity), and oyster condition (provides a relative index of oyster health). Additionally, the benthic associated macrofauna will be excavated and community composition determined. This community analysis will not only indicate the value of Galveston Bay intertidal reefs as habitat, but also provide a relative indication of the value of this habitat type for mobile nekton and birds.

Partners and Their Role(s): Black Cat GIS and Biological Services will create the GIS shape files and develop the online Story Map and Gulf Coast Bird Observatory will help assess the community structure on selected oyster reefs.

Outputs/Deliverables:

- quarterly progress reports until contract expiration,
- draft and final QAPP by November 1, 2018 and January 1, 2019, respectively,
- finals shapefiles showing intertidal oyster reef habitat due five months after QAPP approval,
- final white pater due by April 2020, and
- final report due April 2020.

Long-term Outcomes: A complete GIS database of oyster reef habitat in Galveston Bay while simultaneously assessing intertidal oyster population dynamics and community structure on selected reefs.

SECTION 3.3: FISCAL 2019 GRANT BUDGET SPREADSHEETS

2019 Grant Budget Totals	Administration	NRU	WSQ	PPE	M&R	Total Costs
Project #	915210	915210	915210	915210	915210	915210
Salaries	\$369,881	\$0	\$0	\$0	\$0	\$369,881
Contracts	\$6,000	\$0	\$0	\$0	\$0	\$6,000
Travel	\$7,500	\$0	\$0	\$0	\$0	\$7,500
Other	\$37,979	\$100,000	\$180,095	\$125,361	\$115,411	\$558,846
Supplies	\$447	\$0	\$0	\$0	\$0	\$447
Equipment	\$0	\$0	\$0	\$0	\$0	\$0
Construction	\$0	\$0	\$0	\$0	\$0	\$0
Sub-Total	\$421,807	\$100,000	\$180,095	\$125,361	\$115,411	\$942,674
Fringe 37.87%	\$140,074	\$0	\$0	\$0	\$0	\$140,074
Indirect 31.70%	\$117,252	\$0	\$0	\$0	\$0	\$117,252
GRANT TOTAL	\$679,133	\$100,000	\$180,095	\$125,361	\$115,411	\$1,200,000

3.3A - Fiscal 2019 Fiscal 2019 Grant Budget by Category - Summary

Fiscal 2019 GBEP Budget Summary by Grant Budget Category	Amount
Salaries	\$369,881
Salaries for staff members of GBEP	\$369,881
Contracts	\$6,000
1. Website Hosting Costs	\$6,000
Travel	\$7,500
Travel for program manager and to attend Fall NEP Tech Transfer meeting in San Francisco, CA	\$2,501
Travel for staff member to attend 2019 Gulf of Mexico Alliance All Hands Meeting in Mobile, Alabama	\$2,257
Travel for program manager to attend Spring EPA NEP Workshop in Washington DC	\$2,742
Other	\$558,846
2. Mickey Leland Intern	\$7,979
3. Estuary Resilience Assessment (ERA) Report	\$30,000
4. Conservation Assistance Program	\$100,000
5. Bacteria Source Tracking (Previously Approved FY 18-20 Project)	\$80,000
6. Green Infrastructure for Texas (GIFT)	\$37,500
7. Highland Bayou Watershed Protection Plan (contingent on NPS project)	\$62,595
8. Trash Bash	\$15,000
9. Blackhawk Park Coastal Prairie Restoration & Education Project	\$53,600
10. Know Your Watershed	\$38,341
11. Galveston Seawall Recycling	\$18,420
12. Seafood Evaluation (Previously Approved FY 18-19 Project)	\$32,831
13. Characterization of the Influence of Freshwater Inflow on Trinity River Delta Indicators	\$18,000
14. Galveston Bay Intertidal Oyster Reef Mapping and Analysis	\$64,580
Supplies	\$447
Supplies for Outreach and Education	\$447
Fringe and Indirect	\$257,326
2018 GRANT TOTAL	\$1,200,000

Fiscal 2019 Travel Summary by Trip	Amount
Fall NEP Tech Transfer Meeting in San Francisco, California (1-person travel, 4 days)	\$2,501
Airfare	\$1,200
Airport Parking	\$150
Lodging (\$147/night)	\$588
Hotel Tax (13.0%)	\$77
Taxi/transport	\$100
Per diem (\$59/day)	\$236
Conference registration	\$150
2019 Gulf of Mexico Alliance All Hands Meeting in Mobile, Alabama (1-person travel, 5 days)	\$2,257
Airfare	\$1,069
Airport Parking	\$150
Lodging (\$150/night)	\$450
Hotel Tax (14%)	\$63
Taxi/transport	\$100
Per diem (\$65/day)	\$325
Conference registration	\$100
Spring EPA-NEP Workshop in Washington, D.C. (1- person travel, 4 days)	\$2,742
Airfare	\$1,200
Airport Parking	\$150
Lodging (\$189/night)	\$756
Hotel Tax (14.5%)	\$110
Taxi/transport	\$100
Per diem (\$69/day)	\$276
Conference registration	\$150
2019 Travel Estimate Total*	\$7,500

*All out of state travel is dependent on management review and approval. Rates for fiscal 2019 are subject to change and estimates are based on previous trips from fiscal 2018 as well as the current fiscal 2018 federal and state per diem rates.

SECTION 4: ONGOING PROJECTS

SECTION 4.1: ONGOING FEDERAL PROJECTS - SUMMARY

(Ctrl + Click to follow link)

	Ongoing P	rojects Under	Grant # CE-00655006			#CE- 00655005
PROJECT NAME	TCEQ Contract Number	Funding Years (Fiscal)	2019 Budget	2018 Budget	2017 Budget	2014- 2016
1. GBEP Website Hosting and Maintenance	N/A	2017-2019	\$6,000	\$32,505	\$1,605	\$0
2. Mickey Leland Environmental Internship	N/A	2017-2019	\$7,979	\$8,333	\$8,404	\$0
15. State of the Bay Report, Fourth Edition	18-80343	2018	\$0	\$85,000	\$0	\$0
16. The GBEP CCMP Revision	17-70188	2017-2018	\$0	\$3,784	\$75,000	\$0
Administration Total			\$13,979	\$129,622	\$85,009	\$0
<u>4. Conservation Assistance Program</u>	18-80344	2018-2022	\$100,000	\$100,000	\$0	\$0
NRU Total			\$100,000	\$100,000	\$0	\$0
5. Bacteria Source Tracking on Tributaries of Trinity and Galveston Bays	18-80240	2018-2020	\$80,000	\$80,000	\$0	\$0
<u>6. Green Infrastructure for Texas (GIFT)</u>	18-80237	2018-2019	\$37,500	\$74,197	\$0	\$0
<u>17. Designing for Impact: Promoting Low Impact Development</u> <u>Implementation</u>	18-80339	2018	\$0	\$30,000	\$0	\$0
18. Galveston Bay Coalition of Watersheds (Coalition)	17-70186	2017	\$0	\$0	\$85,000	\$0
<u>19. Galveston Bay FOG Campaign</u>	14-43075	2014-2017	\$0	\$0	\$60,000	\$156,000
20. Stormwater BMP Testing at the Ghirardi Family Water Smart Park	16-60055					\$57,300
WSQ Total			\$117,500	\$184,197	\$145,000	\$213,300
21. White Oak Parkway Native Habitat Restoration and Outreach	18-80341	2018	\$0	\$45,000	\$0	\$0
22. Texas Estuarine Resource Network (TERN) Citizen Science Program in Galveston Bay	17-73627	2017-2018	\$0	\$27,392	\$25,000	\$0
23. Trash Bash 2015-2018	15-50886	2015-2018	\$0	\$5,000	\$5,000	\$6,500
PPE Total			\$0	\$77,392	\$30,000	\$6,500
<u>12. Seafood Evaluation in a Portion of Galveston Bay</u>	18-80234	2018-2019	\$32,831	\$66,544	\$0	\$0
<u>13. Characterization of the Influence of Freshwater Inflow on Trinity</u> <u>River Delta Indicators</u>	18-80338	2018-2019	\$18,000	\$42,000	\$0	\$0
24. The Impacts of Assimilative Capacity of Reservoirs on Coastal Inflows Phase II	16-60126	2016-2018	\$0	\$24,058	\$41,300	\$94,642
25. Freshwater Inflows to Galveston Bay: Relationship to HABs	17-70187	2017	\$0	\$0	\$80,000	\$0
M&R Total			\$50,831			
GRANT TOTAL-ONGOING PROJECT FUNDING			\$282,310	\$491,211	\$260,009	\$219,800

SECTION 4.2: ONGOING FEDERAL PROJECTS - DETAIL

4.2A - ONGOING ADMINISTRATIVE PROJECTS

15. The State of the Bay, Fourth Edition **CCMP Actions Implemented:** All

Grantee/Contractor: The GTRI through HARC

Total Project Budget: \$85,000 (\$85,000 in Grant #CE-00655006: fiscal 2018 \$85,000)

Milestones: QAPP approved in March 2018.

Project period: September 2017 - August 2019

Status: Ongoing. The QAPP was approved in March 2018. Draft outline of State of the Bay Outline/Structure is anticipated in Spring 2018. All project deliverables are tied to the draft GBP revision, which was released for public comment in March 2018. An amendment to update deliverable due dates and clarify data deliverables was finalized in spring 2018.

16. The GBEP CCMP Revision CCMP Actions Implemented: All

Grantee/Contractor: The H-GAC

Total Project Budget: \$95,000 (\$78,784 in Grant #CE-00655006: fiscal 2017 \$75,000, fiscal 2018 \$3,784)

Milestones: Second and third public workshops occurred in March 2017 and March 2018. Draft plan released for 30-day public comment period in March 2018.

Project period: September 2016 - December 2018

Status: Ongoing. Workshop Two completed in March 2017. Draft plan revision reviewed by GBC and its subcommittees in February 2018. Workshop Three completed in March 2018, including release of the draft plan for 30-day public comment, including both in person comment period via the workshop and project website (<u>www.galvestonbayplan.org</u>). An amendment adding funding and extending the end date to December 2018 added an executive summary and print copies as a deliverable.

4.2B - ONGOING NRU PROJECTS

None

4.2C - ONGOING WSQ PROJECTS

17. Designing for Impact: Promoting Low Impact Development Implementation CCMP Actions Implemented: NPS-2–7, NPS-10–11

Grantee/Contractor: The H-GAC

Total Project Budget: \$30,000 (\$30,000 in Grant #CE-00655006: fiscal 2018 \$30,000)

Milestones: The kickoff meeting with the City of Pearland has taken place and the list of issues limiting Low Impact Development is being developed.

Project period: August 2017 - December 2018

Status: Ongoing. Contract amendments are being discussed to realign some of the deliverables and budgeted items.

18. Galveston Bay Coalition of Watersheds (Coalition) **CCMP Actions Implemented:** HP-1, HP-5, SP-1, SM-5, PPE-1

Grantee/Contractor: Texas AgriLife

Total Project Budget: \$85,000 (\$85,000 in Grant #CE-00655006: fiscal 2017 \$85,000)

Milestones: Five Coalition stakeholder meetings and one public meeting have taken place. Goals, vision, and implementation priorities have been developed.

Project period: September 2016 - May 2018

Status: The project is on track. The final Coalition meetings will focus on finding sustainable funding for the Coalition. The GBBRP is revamping their outreach materials for boater waste and planning an on-site sewer facility education workshop.

19. Galveston Bay FOG Campaign

CCMP Actions Implemented: WSQ-1, 5, 6, PS-2, PPE-3

Grantee/Contractor: The City of Nassau Bay

Total Project Budget: \$216,000 (\$156,000 in Grant #CE-00655005: fiscal 2014 \$50,000, fiscal 2015 \$46,000, fiscal 2016 \$60,000; \$60,000 in Grant #CE-00655006: fiscal 2017 \$60,000)

Milestones: Two recycling stations have been installed; one at the City of Nassau Bay and one at Seabrook. Two more are being planned for League City and Friendswood.

Project period: September 2014 - August 2018

Status: Except for the two recycling stations that are being planned but not installed yet, the project is on track. The contractor continues to hold quarterly workgroup meetings and work with partners to find locations for the recycling stations. The outreach campaign includes social media posts on Facebook and Twitter. The contractor has also marketed the campaign with KPRC, a local TV station, and Pandora and they have had educational booths at many functions.

20. Stormwater BMP Testing at the Ghirardi Family Water Smart Park **CCMP Actions Implemented:** WSO-1, NPS-1, 2

Grantee/Contractor: Texas AgriLife

Total Project Budget: \$57,300 (\$57,300 in Grant #CE-00655005: fiscal 2015 \$57,300)

Milestones: Five events have been sampled.

Project period: September 2015 - June 2018

Status: The project is slightly behind schedule because qualifying rain events had not occurred until December 2017. The contractor has amended the contract to extend the sampling period and to add soil sampling of two of the green infrastructure features to give additional insight into the functionality of the BMPs.

4.2D - ONGOING PPE PROJECTS

21. White Oak Parkway Native Habitat Restoration and Outreach **CCMP Actions Implemented:** PPE-1, PPE-3, PPE-7, HP-1, FW-6

Grantee/Contractor: City of Houston Parks and Recreation Department

Total Project Budget: \$45,000 (\$45,000 in Grant #CE-00655006: fiscal 2018 \$45,000)

Milestones: Complete four acres of invasive species removal and native plant installation by February 2018.

Project period: September 2017 - August 2019

Status: Ongoing. Two community planting events have taken place, and two invasive plant removals and native plantings have been completed since September 16, 2017.

22. TERN Citizen Science Program in Galveston Bay CCMP Actions Implemented: PPE-1, PPE-5, PPE-8, SP-8, HP-7

Grantee/Contractor: TPWD

Total Project Budget: \$75,000 (\$52,392 Federal in Grant #CE-00655006: fiscal 2017 \$25,000, fiscal 2018 \$27,392) (\$20,000 State: fiscal 2018 \$20,000)

Funding shortfall of \$2,606 to be addressed through fiscal 2018-2019 state operating budget.

Milestones: A Seabird Scout Project working guidance plan established by January 2019.

Project period: August 2017 - August 2019

Status: Ongoing. This project is slightly behind schedule as TPWD is working on the executing the Memo of Understanding with their subcontractor Audubon Texas.

23. Trash Bash (2015-2018) CCMP Actions Implemented: PPE-1, PPE-3, PPE-5, SD-5

Grantee/Contractor: The H-GAC

Total Project Budget: \$16,500 (\$6,500 in Grant #CE-00655005: fiscal 2015 \$1,500, fiscal 2016 \$5,000; \$10,000 in Grant #CE-00655006: fiscal 2017 \$5,000, fiscal 2018 \$5,000)

Milestones: Annual event held in March.

Project period: September 2016 - July 2018

Status: Ongoing. In 2015, 2016, and 2017, the GBEP co-coordinated the Trash Bash event at Sims Bayou, one of over 15 clean-up sites across the Houston-Galveston area. In March 2018 the GBEP participated in the 25th annual Trash Bash cleanup at Galveston Bay (Virginia Point), a site coordinated by Scenic Galveston and the Gulf Coast Authority.

4.2E - ONGOING M&R PROJECTS

24. The Impacts of Assimilative Capacity of Reservoirs on Coastal Inflows Phase II **CCMP Actions Implemented:** FW-1-5, RSC-2

Grantee/Contractor: The GTRI through HARC

Total Project Budget: \$160,000 (\$94,642 in Grant #CE-00655005: fiscal 2016 \$80,000, fiscal 2017 (carried forward) \$14,642); \$65,358 in Grant #CE-00655006: fiscal 2017 \$41,300, fiscal 2018 \$24,058)

Milestones: Water quality samples have been taken for four events – one low flow, one ambient, and two high flow events.

Project period: September 2017 - May 2019

Status: Ongoing. Five out of the six events have been sampled: one low flow, one ambient, one winter, and two high flow events have been sampled. The final event will be a low flow event.

25. Freshwater Inflows in Galveston Bay: Relationships to Harmful Algal Blooms

CCMP Actions Implemented: FW-1, 7, SP-1

Grantee/Contractor: TAMUG

Total Project Budget: \$80,000 (\$80,000 in Grant #CE-00655005: fiscal 2017 \$80,000)

Milestones: QAPP was approved in June 2017 and daily data collection began in June 2017.

Project period: January 2017 - August 2018

Status: Ongoing. Daily samples continue to be taken from the Imaging Flow Cytobot.

SECTION 5: COMPLETED PROJECTS

SECTION 5.1: PROJECTS COMPLETED IN FISCAL 2018 - SUMMARY

(Ctrl + Click to follow link)

	Completed Projects Under		Grant # CE- 00655006	Grant #CE- 00655005	Grant #CE- 00F20801	
PROJECT NAME	TCEQ Contract Number	Funding Years (Fiscal)	2017 Budget	2014-2016	2011-2013	Final Report Submitted
<u>26. Conservation Assistance Program</u> (2011-2017)	11-13166	2011-2017	\$100,000	\$200,000	\$300,000	May 2018
27. 2017 Back the Bay Public Awareness Campaign	16-62004	2010 -2017	\$147,045	\$230,000	\$0	December 2017
<u>28. GBEP Status and Trends (S&T)</u> <u>Maintenance Project</u>	14-43803	2014-2017	\$0	\$173,228	\$0	August 2017
<u>29. Bacteria Implementation Group's</u> (<u>BIG) Top Five Most and Top Five Least</u> <u>Impaired Water Bodies</u>	15-52148	2015-2017	\$0	\$99,350	\$0	December 2017
30. M&R RFGA	14-42302	N/A	\$0	\$0	\$0	N/A
<u>30a. Mangrove Restoration in Galveston</u> <u>Bay: Ecological Benefits and Effective</u> <u>Restoration Techniques</u>	15-53391	2015-2017	\$0	\$138,518	\$0	December 2017
<u>30b. Galveston Bay: Changing Land Use</u> <u>Patterns and Nutrient Loading. Causal or</u> <u>Casual Relationship?</u>	15-53393	2015-2017	\$0	\$135,722	\$0	December 2017
GRANT TOTAL-PROJECT FUNDING			\$247,045	\$976,818	\$300,000	

SECTION 5.2: PROJECTS COMPLETED IN FISCAL 2018 - DETAIL

26. Conservation Assistance Program (2011-2017) **CCMP Actions Implemented:** HP-1, HP-5, SP-1, SM-5, PPE-1

Lead Implementer: GBF

Partners and Their Role(s): CAP Workgroup Facilitator: Shead Conservation Solutions; CAP Workgroup Members: TPWD, The Trust for Public Land, Armand Bayou Nature Center, U.S. Department of Agriculture (USDA), USDA Natural Resource Conservation Service, NRG Energy, The Artist Boat, USFWS, USFWS Texas Coastal Program, Houston Audubon, Katy Prairie Conservancy, UHCL/EIH, Texas AgriLife, Houston Wilderness, Texas State Soil and Water Conservation Board, Scenic Galveston, NOAA Restoration, The Conservation Fund, The Nature Conservancy, Gulf Coast Ecosystem Restoration Council.

Status: Complete. Final report will be sent to EPA in May 2018.

Objective(s): The goal of this project was to place 1,000 acres of coastal habitat in the Galveston Bay area in permanent conservation.

Description: The overall goal of the CAP is to support the GBEP and its partners' efforts to preserve wetlands and other important coastal habitats to protect the long-term health and productivity of Galveston Bay. The CAP will continue to accomplish these goals by:

- identifying priority conservation properties with the help and consensus of conservation partners;
- building funding strategies through grant identification, grant writing, and fundraising;
- working with willing sellers to negotiate fee simple or conservation easement transactions;
- carrying out legal, title, and other due diligence transaction support; and
- finalizing the sale and transfer of title to a third-party organization or government entity.

Accomplishments and Deliverable(s): See also fiscal 2018 Accomplishments. The CAP successfully implemented or supported the completion of 10 acquisition projects within the Galveston Bay watershed. These projects displayed a high level of diversity in size, conservation method, habitat types, and property values. Both fee simple and conservation easement transactions were completed using a variety of state, federal, and private funding sources. CAP involvement varied from full identification, development, and implementation of conservation projects to simply providing funding to help defray unfunded costs associated with required due diligence. Of the nine projects competed, four were managed by the GBF and six were managed by conservation partners. These completed transactions resulted in approximately 5,716 acres of perpetual land conservation within the Galveston Bay watershed.

15 projects received CAP funding to help finance due diligence costs associated with approved conservation projects. These funds helped organizations pay for surveys, appraisals, phase 1 environmental site assessments, legal title review, closing costs, and other necessary transactional actions. Some CAP contributions provided funding leverage and partnerships, which helped projects become more competitive for acquisition funding.

A total of 18 CAP workgroup meetings were held from 2012 through 2017. Conservation partners that attended meetings included nonprofit land conservation organizations, state and federal natural resource agencies, and private entities. Participation in meetings varied based upon eligibility and status of land conservation projects and need for CAP assistance. The GBF conducted 14 public speaking engagements to diverse audiences throughout the region. These presentations focused on land conservation opportunities, conservation tools and methods, and economic incentives for land conservation. The GBF attended and participated in more than 25 educational conferences, workshops, other land conservation related events. Some were purely educational to help the GBF staff promote permanent land conservation throughout the Gulf coast region.

Project period: August 2011 - November 2017

CWA Section 320 Funds: \$600,000 (\$300,000 in Grant #CE-00F20801: fiscal 2011 \$173,054/ fiscal 2012 \$126,946; \$200,000 in Grant #CE-00655005: fiscal 2014 \$94,450/ fiscal 2015 \$5,550/ fiscal 2016 \$100,000; \$100,000 in Grant #CE-00655006: fiscal 2017 \$100,000)

Long-term Outcomes: 5,716 acres of coastal habitat placed in permanent conservation.

CWA Core Program(s): Preserve land, protect water quality, foster collaboration between local, state, and federal partners (cooperative federalism).

27. Back the Bay

CCMP Actions Implemented: All

Lead Implementer: Texas Creative in concert with the GBEP

Partners and Their Role(s): EPA, TCEQ, Houston Zoo, GBF, H-GAC, P3P, American Bird Conservancy, Audubon Texas, and the Houston Audubon

Status: Complete. Final report sent to EPA on December 22, 2017.

Objective(s): To raise regional awareness and value of Galveston Bay, and promote environmentally-conscious actions—those that help preserve habitat, conserve water, and improve water quality.

Description: The campaign's goal to improve the environmental quality of Galveston Bay by increasing awareness about the bay's value among the public. The campaign educates citizens in the Houston-Galveston region and focuses on three main goals of improving water quality, conserving water, and protecting critical fish and wildlife habitats. Because the campaign started in 2010 after stakeholders identified lack of public awareness and public stewardship as one of the biggest threats to preserving Galveston Bay, this project is unique in that it engages stakeholders in the creative process to help design the outreach materials, website, public service announcements, video and digital materials as well as helping to identify key audiences. The GBEP has included stakeholders and partners in the planning and execution of the campaign throughout the entire process.

In 2016-2017, stakeholders identified trash and marine debris as a priority issue, and the campaign's theme and updated messaging and creative assets were designed with that in consideration. This message also aligned with the EPA's Trash Free Waters initiative.

Accomplishments and Deliverable(s):

- Produced three, 30-second TV spots, and two, 30-second radio spots in English and Spanish.
- Received over 1 million impressions for the 609 TV/radio spots that ran on the various media platforms.
- Special appearance on Houston Life, the mid-day show for KPRC-TV. The show featured GBEP partners working on conservation efforts in the region.
- Back the Bay Day event at the Houston Zoo on August 12, 2017. Over 7,300 visitors were at the zoo that day. The GBEP and partners directly engaged with over 350 zoo guests who received the campaign materials and information on how they can protect and preserve Galveston Bay. 81 participants signed a pledge to do a clean-up in their community or while visiting a park/natural area and received tools to aid in their efforts.
- The Back the Bay website update.
- Completed final report.

CWA Section 320 Funds: \$375,045 (\$230,000 in Grant #CE-00655005: fiscal 2017 (carried forward from fiscal 2016) \$230,000; \$147,045 in Grant #CE-00655006: fiscal 2017 \$147,045)

Long-term Outcomes: The campaign's goal is to raise awareness of everyone's connection to the bay and the valuable resources it provides. The campaign created several materials and messages that are available on backthebay.org and in the "Materials" section of the website. This project is a successful example of many stakeholders coming together to create a unique and adaptable public awareness campaign that is multidimensional. The campaign will continue to be supported by adapting the messaging and materials for outreach and education components of many partner programs and projects.

CWA Core Program(s): Preserve habitats, protect water quality, conserve water quantity, foster collaboration between local, state, and federal partners (cooperative federalism).

28. Galveston Bay Estuary Program Status and Trends (S&T) Maintenance Project CCMP Actions Implemented: All

Lead Implementer: TAMUG

Partners and Their Role(s): GLO, EPA, NOAA, TCEQ, TPWD, and the Texas Colonial Waterbird Society

Status: Complete. Final report sent to EPA on August 31, 2017.

Objective(s): To continue maintenance of the Galveston Bay S&T database by acquiring databases that describe the Bay's water and sediment quality, living resources, and land use and land cover and analyze them in relation to one another.

Description: The Galveston Bay estuary is a unique and productive biological system that is located in Southeast Texas adjacent to the Houston-Galveston metroplex. The bay is surrounded by urban, industrial, and agricultural land uses, and it is important to monitor and analyze the parameters pertaining to the bay's health.

The first Status and Trends assessment occurred in the early 1990s, however it was not until 2000 that a decision was made to continuously monitor and update the Status and Trends database to allow stakeholders to make judgments on the availability and quality of resources and processes forming the Galveston Bay system.

In 2014, personnel from the Center for Texas Beaches & Shores at TAMUG and the Texas Sea Grant College Program (TXSG) took over the Status and Trends Maintenance Project. TAMUG and TXSG staff have updated the database, integrated it with the Texas Coastal Planning Atlas, and made the data available through a new version of the Status and Trends website. The Status and Trends Atlas and other coastal data atlases can be accessed at http://newcoastalatlas.tamug.edu/atlaswebpage/statusandtrends/sntatlas.html

The Status and Trends database is part of the Galveston Bay Estuary Program regional monitoring plan, and it is a requirement of the Galveston Bay Plan. The Galveston Bay Plan guides the conservation and restoration of the estuary, and the Status and Trends database assesses the current state of the bay. By examining the health of Galveston Bay at an integrated, ecosystem level, it is possible to understand the ecosystem processes and the impacts of human uses on bay resources.

Accomplishments and Deliverable(s):

- updated a regional database that is integrated with the Texas Coastal Planning Atlas;
- completed a final report.

CWA Section 320 Funds: \$ 173,228 (173,228 in Grant #CE-00655006: fiscal 2015 \$115,228, fiscal 2016 \$58,000)

Long-term Outcomes: Improved access to data for the region to make better informed decisions.

CWA Core Program(s): NPS, stormwater, TMDLs

29. Bacteria Implementation Group's (BIG) Top Five Most and Top Five Least Impaired Water Bodies **CCMP Actions Implemented:** WSQ-1; NPS-3; PPE-3

Lead Implementer: Houston-Galveston Area Council

Partners and Their Role(s): Members of the BIG provide resources when requested.

Status: Complete. Final report sent to EPA in December 2017.

Objective(s): The goal of this project was to target 10 specific watersheds to conduct supplemental sampling and evaluation to identify specific sources of bacteria and reduce bacteria loading.

Description: H-GAC tracked bacteria levels in the BIG project area to determine the Top Five Most/Top Five Least Lists. The top five or "Most Wanted" are those streams with the highest geometric means relative to the state standards for bacteria and require the most improvement to reach those standards. The top five least or "Most Likely to Succeed" are those stream locations with the lowest geometric means relative to the state standards for bacteria and are most likely to reach the water quality standards with minor improvements. Through this project, H-GAC addressed these 10 targeted watersheds to identify sources of bacteria pollution through targeted monitoring. Once the sources were identified, reported those sources to the appropriate entity for correction, demonstrated improved water quality, and documented the project to demonstrate the value of a prioritized watershed approach through outreach materials and workshops.

Accomplishments and Deliverable(s):

- QAPP
- Quarterly progress reports
- Desk Review/Ground Truth Preliminary Action Report
- Source Identification Report
- Outreach and Education Report
- Final Report.

CWA Section 320 Funds: \$99,349.50 (\$99,349.50 in Grant #CE-00655006: fiscal 2015 \$51,812.07, fiscal 2016 \$43,270, fiscal 2017 (carried forward) \$4,267.43)

Long-term Outcomes: Improved water quality.

CWA Core Program(s): TMDLs

30. M&R RFGA

CCMP Actions Implemented: RSC-2, 4

Lead Implementer: TAMUG (Dr. Armitage and Dr. Quigg)

Partners and Their Role(s):

Status: Complete. Final reports sent to EPA December 2017.

Objective(s): The objective of this project is to fund research in four predetermined areas that were identified and prioritized by the Research and Monitoring Subcommittee.

Description: The M&R RFGA projects addressed the top four project areas identified and prioritized by the Monitoring and Research Subcommittee. Two projects were selected for funding based on the quality of submitted grant applications. The top four project areas were: Beneficial Flows in Galveston Bay: Quality, Quantity, and Patterns; Fauna of Galveston Bay: Benthic, Nekton, and Colonial Waterbirds; Wetland Habitat Management in Galveston Bay; and Economic and Social Valuation of Galveston Bay Habitats.

The top two ranked projects selected and awarded letters were sent to the chosen applicants on 10/31/2014. The projects chosen were entitled, "Mangrove Restoration in Galveston Bay: Ecological Benefits and Effective Restoration Techniques" submitted by Dr. Anna Armitage of TAMUG which received \$138,518 and "Galveston Bay: Changing Land Use Patterns and Nutrient Loading. Causal or Casual Relationship with Water Quality, Quantity, and Patterns" submitted by Dr. Antonietta Quigg of TAMUG which received \$135,722.

Individual M&R RFGA Project Descriptions:

29a. Mangrove Restoration in Galveston Bay: Ecological Benefits and Effective Restoration Techniques

The overall objective of this project was to determine if, when, and where mangrove restoration should be implemented in Galveston Bay. Data was collected from at least three sites of each of four habitat types: mature and restored salt marshes, and mature and restored mangrove stands. This data was used to inform the following questions: which mangrove planting techniques yield near- and long-term mangrove restoration success at sites throughout Galveston Bay, are there specific ecosystem functions between existing mangrove stands and salt marshes in Galveston Bay, and how do these restoration sites compare to other Texas estuaries? In addition to the research component of this project, there was an outreach piece that educates the public on the importance of wetland restoration for NPS management and integrates research findings into outreach and stewardship programs. The contractor interacted with the public at stormwater wetland volunteer days with the Texas AgriLife-TCWP stormwater wetland program and at Marsh Mania events.

29b. Galveston Bay: Changing Land Use Patterns and Nutrient Loading. Causal or Casual Relationship?

The objective of this project was to continue monitoring Galveston Bay at monthly intervals using the Dataflow system to measure water quality parameters, collect nutrient and other data at fixed stations in Galveston Bay which can then be used to explain patterns in water quality such as chlorophyll data, and measure phytoplankton productivity, community composition, and the presence of harmful algal blooms, if present.

Accomplishments and Deliverable(s):

- QAPPs
- Quarterly progress reports
- Final Reports.

CWA Section 320 Funds: \$274,240

29a. \$138,518 (\$138,518 in Grant #CE-00655006: fiscal 2015 \$138,518)

29b. \$135,722 (\$135,722 in Grant #CE-00655006: fiscal 2015 \$135,722)

Long-term Outcomes: Available data and supportable conclusions to be used by resource managers and improved CCMP management of Galveston Bay.

CWA Core Program(s): N/A (research to support water quality and stormwater improvements)