Galveston Bay Estuary Program
Fiscal 2026 M&R Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

Monitoring and Research (M&R)

Project Name:

Continuum Approach for evaluating variable inundation influences on Hydro Biogeochemical attributes for Trinity-San Jacinto Estuary at Galveston Bay

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

☐ Federal, State, or Local Government ☐ Council of Government ☒ Public ISDs or Universities
☐ Nonprofit ☐ Other*

[Please also indicate entity category (state, local, public university, nonprofit, etc.).] Public University

Unique Entity ID (UEI) Number: AND: FRCKHD9EKUY9

VIN or Tax ID:

75-6001353

Contact Information:

Project Representative Name	Dr. Naima Ansar Khan
Project Representative Phone	+1 5754058036
Project Representative Email	Naima.khan@tamuc.edu

Amount Requested from GBEP:

$389,551.00

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☐

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	**$129,120.00**
FY 2027 (09/01/2026-05/31/2027)	**$129,842.00**
FY 2028 (09/01/2027-05/31/2028)	**$130,589.00**
Total	**$389,551.00**

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

September 1, 2025 – May 31, 2028

Project Urgency:

This funding cycle is required to start a new project:
09/01/2025-08/31/2026: Site visit, Sample and Data collection, Instrument purchase, Instrument installation at research site, senior personnel and Graduate student hire.
09/01/2026-05/31/2027: Continue with data collections, data analysis based on field survey and seasons, develop continuum approach which is composed of process-based predictive model coupled with ModEX and ICON (Integrated Coordinated Open Networked) science principles.
09/01/2027-05/31/2028: Data generation by using ModEX platform, reporting, graduating graduate students and manuscript submission.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

None

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

[Please indicate source, amount, and status (secured, potential, etc.)]
N/A

Partners* and Their Roles:

[Please identify project partners and detail what roles they will play in project implementation.]

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

This project directly supports biological stressors (RES-1) and geochemical stressors (RES-2) through the findings on shifting of microbial activities which are important for nutrient cycling, pollutants removal or identifying pollutant rich area, and degradation of organic matter within the ecosystems due to variable tidal inundation periods. This project will work to evaluate the coupled behavior of fresh water influx and sea water intrusion pulses on tidal wetlands biogechemical properties. Moreover, our research has implication on RES-6 (water quality), RES–7 (ecosystem services), RES-8 (resiliency risk for coastal services). Understanding the limits to Galveston Bay's resiliency which depends on soil and water quality requires knowledge about Best Management Practices effectiveness for improved water quality, determination of ecosystem services, and the study of resiliency risk for coastal habitats. Hydro biogeochemical properties (surface water-groundwater interactions, freshwater-saltwater intrusion, soil minerals, microbes, nutrients, pollutants etc.) acquired by sample analysis and deploying sensors will give us in-depth knowledge to fulfill the following plans for Galveston Bay 2nd Edition Final report:

1) Quantitative statistics of fresh water inflows (top-down flows) and salt water intrusion (bottom-up flows) into Trinity-San Jacinto Estuary to evaluate the variable inundation extent and duration spatially and temporally.
2) Predictive model will provide us information on variable inundation influence on hydro biogeochemical attributes (e.g., aerobic vs anaerobic zone extent, soil respiration, microbial activity, pollutant removal, and geochemical reactions pathways for temperature and inflows fluctuations etc.) to hold healthy estuarine production for Trinity-San Jacinto Estuary.
3) Collaborate with Research Institutions to Support Focus on Applied Research and Monitoring Action Plan. This plan will be achieved by Embedding ICON (Integrated Coordinated Open Networked) science principles throughout the research life cycle can help to ensure that new data are at the right scale and can be used to link disciplines (e.g., hydrology, biogeochemistry, and community ecology).

Moreover, this research has plan to attend international conferences (American Geophysical Union and Soil Science Society of America) as well as publishing peer reviewed journals which can fulfill the Action Plan ACS-2 - disseminate monitoring and research results using a variety of outreach tools tailored to each audience.

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 4: Inform Science-based Decision Making

RES-1 ☒	RES-2 ☒	RES-3 ☐	RES-4 ☐
RES-5 ☐	RES-6 ☒	RES-7 ☐	RES-8 ☒
ACS-1 ☐	ACS-2 ☒	ACS-3 ☐	

Plan Priority Area Actions Detail:

[Please state the action and output addressed and how the project contributes to implementing the output.]

This project works directly to evaluate and predict hydro biogeochemical properties (water inflows, water quality, soil characterization, redox chemistry, microbial community, nutrient flux etc.) under spatially and temporally variable inundation extent for Trinity-San Jacinto Estuary. This research will implement field survey, laboratory experiments, and machine learning ModEX to predict estuarine vulnerability. This research will fulfill the research gap in evaluating and predicting the variability of inundation extent and duration due to different driving factors such as climate change, manmade infrastructures, different water holding capacity for adjacent wetlands etc. This research will also fill up the research gap on evaluating and predicting the influence of variable inundation on biogeochemical attributes which are important for holding the estuaries biodiversity and health.

Continuum approach for developing process-based predictive model with the help of ModEX approach and ICON science principles, will be able to generate data that can predict biogeochemical status of Trinity-San Jacinto Estuary under variable inundation period. Those generated data from predictive model will be strong enough to explain the resiliency of estuarine ecosystem to hold biodiversity.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☐ NRU (Protect and Sustain Living Resources)
☒ WSQ (Ensure Safe Human and Aquatic Life Use)
☐ PPE (Engage Communities)

Other Subcommittee Detail:

Water and Soil Quality (WSQ) subcommittee has intention and plan to work on biogeochemical reactivity with variability in water inflows for Galveston Bay to observe the estuarine health. Water and Soil quality always determine the health of biodiversity of the estuarine ecosystem. WSQ subcommittee has priority to evaluate the bay-wide water and sediment quality which is one of the major targets for this current proposal with an extension of developing predictive model.

Other Plans Implemented:

[Texas Coastal Management Plan, Texas Coastal Resiliency Master Plan, Texas Wetland Conservation Plan, GCJV Conservation Plans, etc.]

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

M&R Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☒ Meaningful and effective monitoring of existing, past, and new projects (NRU: especially species of concern, WSQ, PPE).
☐ Baseline assessments for large-scale, man-made changes to Galveston Bay.
☒ Assessment, exposure, and response to stressors, including **but not limited to**:
- Species of greatest conservation need;
- Contact recreation standards;
- Environmental parameters;
- Emerging contaminants; and
- Legacy contaminants.

Subcommittee Priority Detail:

The proposed research meets two priorities identified by M&R subcommittee:

1. Meaningful and effective monitoring of existing hydro biogeochemical attributes and their vulnerability due to variable inundation periods arises from climate change, manmade constructions, environmental changes etc.: Proposed research has aim to predict future hydro biogeochemical situation under variable inundation conditions which will help decision makers and researcher to understand the most vulnerable biodiversity groups, their geolocations, and the associated factors.
2. Assessment, response, and prediction to hydro biogeochemical stresses from variable inundation conditions by using machine learning (ModEX platform) to generate new data for holding healthy biodiversity and nutrient cycling for Trinity-San Jacinto Estuary, is another priority for this research.

Does the Project work with new, smaller communities/partnerships?

☐ Yes
☒ No

[TBD.]

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

The ability to understand the influences of variable inundation on hydro biogeochemical structure of estuarine ecosystem zone across the scale (hydrologic, biologic, geochemical, local to regional etc.) is limited. This is a challenge as variable inundation has direct, but unknown, influences over the scaling of biogeochemical functions in an estuarine ecosystem. The influence of variable inundation on biogeochemical processes cannot yet be accounted for such an scaling theory. This research has aim to quantify the direction, magnitude, and duration of changes in inundation pattern and to find out the major drivers to change that inundation regimes for Galveston Bay Estuarine ecosystem in terms of climate, land-use, and other environmental changes.

The objective is to advance predictive understanding on hydrological, ecological, and biogeochemical processes due to variable inundation regimes by developing a process-based model with data integration facility under dry and wet conditions based on mass conservation principles, with differential equations that will be able to describe coupled hydrological, ecological, and biogeochemical processes. The predictive model will rely on existing knowledge (from first objective) related to processes, including theories or empirical relationships between discharge and water storage in targeted tidal zone, biogeochemical reaction rate dependence on temperature and water content, and redox reactions etc. Field survey, laboratory experiments, and predictive model development can combinedly name as “ModEX” approach will be main theory to evaluate and predict variable inundation impact on hydro biogeochemical system in estuarine ecosystem to hold healthy biodiversity and environmental flow. This proposed research project has target to couple ModEX approach with ICON (Integrated Coordinated Open Networked) science principles to fulfill the continuum approach for evaluating and predicting hydro biogeochemical resiliency during variable inundation period across the scales for Galveston Bay Estuarine Ecosystem.

Full Project Description (1,000 words or less):

Watersheds around Galveston Bay are interconnected to biological, hydrological, and geological components and complex due to fresh water bodies (the Trinity River, the San Jacinto River and all of the creeks, bayous, and a small area of adjacent land) connected to the saltwater Bay. Watersheds play a critical role as contributors of pulses of nutrients, organic matter, determining chlorophyll-a concentration, and contaminants attenuation or intrusion to the Bay through freshwater inflows from tributaries which are variable in timing and seasonality. This fresh water inflows provide critical benefits to the Bay's ecosystems that support the Bay's fish, wildlife, invertebrates, plankton, and wetland plants. Bay system will turn vulnerable without proper inflow of freshwater, nutrients, and sediments from rivers and streams. The water moving to the Galveston Bay shows variable runoff and inflow dynamics which also cause Variable Inundation regimes resulted from different lateral inputs (due to presence of tidal systems), upslope inputs (due to freshwater inputs), wetland's water holding capacity, climate change, manmade dams and reservoirs etc. Regardless of where water comes from, inundation occurs when the rate of water supply is greater than the rate of export via infiltration, evapotranspiration, and runoff. We define variably inundated ecosystems (VIEs) as those that experience dynamic shifts between the presence and absence of inundated conditions, at any spatial and temporal scale.

Water quantity, in the form of freshwater inflows and later salt water intrusion, is intrinsically linked to water quality and the health of estuaries in Galveston Bay. The tremendous productivity of its estuary relies on both good water quality and plentiful flows (water quantity) from its watershed. Estuarine ecosystem is degrading as inflows become smaller, more irregular or variable, and of lower quality due to multiple anthropogenic and non-anthropogenic reasons. Although there is few research on evaluating water quality parameters (water temperature, dissolved oxygen, salinity, turbidity, pH, dissolved oxygen, nutrients, Fecal Indicator Bacteria, inorganic and organic toxics in sediment and oil spill) to complement biological fisheries and sea food monitoring, there is a huge gap in observing variable inundation influence on hydro biogeochemical attribute for estuaries in Galveston Bay area. A variety of factors influence water retention, infiltration and flow, such as land surface relief, topographic slope, subsurface permeability, evapotranspiration, and human-based modifications of the landscape. There is a research need to evaluate the variable inundation patterns in Galveston Bay estuaries to understand the hydro biogeochemical attributes to hold important bay and estuarine ecosystem. Also, urgent research needs to evaluate and predict the resiliency of variably inundated estuarine health to hold biodiversity.

Galveston Bay is the largest of 12 estuaries in Texas and is the seventh largest in the nation. Among them, Trinity-San Jacinto Estuary is the largest estuary in Texas with an area of 345,280 acres and is the seventh largest estuary in the nation. An estuary is "nature's nursery and life laboratory." Without a well-functioning estuary, water quality would be affected, flooding and erosion would persist, there would be little local seafood in restaurants, and recreational and commercial fishing would dramatically decline. Estuaries, where tides mix saltwater and freshwater, are dynamic biogeochemical mixing zones characterized by sharp chemical gradients that regulate biological activity. Changes in duration and extent of inundation associated with tides and fresh water inflow control soil saturation and salinity, which influence redox dynamics, and hydrologically driven exchange of carbon, nutrients, and pollutants. Biological activity such as vegetation gradient may change from salt-sensitive (e.g., low-lying forests, freshwater marshes) to salt-tolerant species (e.g., mangroves, saltmarsh etc.), crab burrows that alter hydrologic flow paths due to change in inundation duration and extent. Understanding of variable inundation influences on biogeochemical reactivity across a broad range of scales is important for informing a diverse suite of needs across models, decision makers, and other interested parties. More generally, perturbations like variable inundation can drive biogeochemical systems away from steady-state to unsteady-state assumptions. In-depth research is required to quantify the direction, magnitude, and duration of changes in inundation patterns and to evaluate the major drivers to alter the spatial and temporal inundation in Trinity-San Jacinto Estuary.

Standardized field survey, sample collection and analysis followed by Sedimentary Microbial fuel cell installation in multiple locations of Trinity-San Jacinto Estuary to collect primary data on hydro biogeochemical status:

1. Field survey and data collection: Standardize field survey for soil and water samples collection from multiple locations of Trinity-San Jacinto Estuary and laboratory measurements followed by installation of Sedimentary Microbial Fuel Cell (SMFC) will be the first part of the methods for this proposal to measure of biogeochemical properties (e.g., metals & heavy metal concentrations, cations-anions, oxidation-reduction potentials, temperature, microbial community, carbon content, redox potential, redox-active elements, microbial genetic potential, sediment grain size etc.) and processes (redox buffering condition, CO2 production and methanogenesis etc.) related to variable inundation. These primary scale biogeochemical data under variable inundation periods will help us to understand the health and resiliency of Trinity-San Jacinto Estuary. Temporal and spatial GIS map layers will collect and analyze them with ArcGIS and remote sensing software to evaluate the patterns of inundation.

Process-based predictive model development – ModEX coupled with ICON science principles:

2. Process-based predictive model development: To advance predictive understanding of hydro biogeochemical characteristics for variably inundated ecosystem Trinity-San Jacinto Estuary, a process-based model with data integration facility will develop to simulate hydrological and biogeochemical processes under different inundation periods (dry and wet conditions) that will be able to describe coupled hydrological, ecological, and biogeochemical processes. The predictive model will rely on gathered data from field survey and existing knowledge related to processes such as empirical relationships between discharge and water storage in targeted estuarine zone, biogeochemical reaction rate dependence on temperature and water content, and redox reactions etc.
3. Hybrid approach: The process-based and data driven spatially distributed model (above mentioned) that couple with top-down and bottom-up flow dynamics and reactive transport to understand the hydro biogeochemical dynamics in variably inundated Trinity-San Jacinto Estuary. This hybrid approach has the potential to optimize the characterization and prediction of inundation dynamics by incorporating the strengths of multiple models to achieve predictions with minimized uncertainty and greater accuracy than either model alone.
4. ModEx approach: Coordinated integration between model development and data generation is the key to increasing the ability to predict the future ecosystem function and ecological integrity. Process-based predictive model with above mentioned hybrid approach (commonly known as machine learning) iterating between model-guided data generation and observation-informed model development. This iterative cycle between models and 'experiments' (i.e., real-world data generation) has been termed as 'ModEx'. The ModEx approach will be using experimental or field data to parameterize and calibrate targeted model and generate new data based on known model input needs.
5. ModEx approach coupled with ICON (Integrated Coordinated Open Networked) science principles: Across the continuum of ModEx, it is important to consider the scales at which models and measurements needs to operate. ICON is based on intentional design of research efforts to be Integrated across disciplines and scales, Coordinated across research efforts via consistent methods, Open throughout the research lifecycle, and Networked across stakeholders to understand collective needs. This research is proposing to use ICON principles for *in situ* data generation and remote sensing, jointly guided by model-generated predictions. Embedding ICON throughout the research life cycle can help to ensure that new data are at the right scale and can be used to link disciplines (e.g., hydrology, biogeochemistry, and community ecology).

Variable inundation has impacts on physical [sediment transport], chemical [water quality], and biological/ecological [invertebrate communities] attributes of cross-connected estuarine ecosystem. Due to intense periods of inundation and drought, these systems are often referred to as hotspots or ecosystem

control points, with disproportionately high reaction rates or areas of high diversity. Field survey, laboratory experiments, and predictive model (ModEX approach) will need to understand these complex hydro biogeochemical processes under variable inundation duration and extend. Ability to predict the hydro biogeochemical processes for cross-VIE ecosystem will open a new door for decision makers towards Best Management Practices of Galveston Bay.

Latitude/Longitude (Optional):

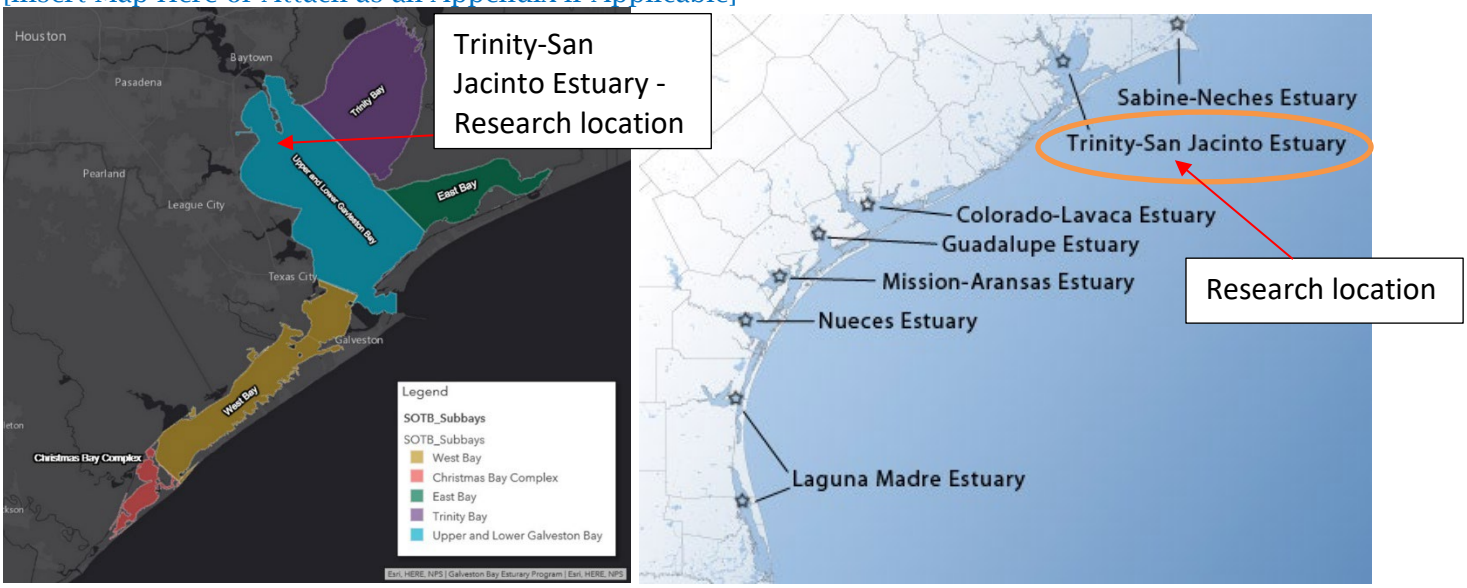
[degrees, minutes, and seconds format]

Location:

Galveston Bay: Trinity-San Jacinto Estuary

Projects Map

[Insert Map Here or Attach as an Appendix if Applicable]



Map Source: GBEP website

Supplemental Photos/Graphics (Optional):

[Insert Here or Attach as an Appendix]

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	**Cost for Work to be Performed**
Fringe Benefits **(18.9% FOR FICA, MEDICARE, AND RETIREMENT. PLUS $1,104/PERSON-MONTH FOR INSURANCE)**[1]	$44,390.00
Travel	$10,000.00
Supplies	$15,000.00
Equipment	$35,000.00
Contractual	$34,321.00
Construction	$0.00
Other (like salaries for graduate students, Participant Support Costs, One course release time)	$205,381.00
Total Direct Cost	**$299,702.00**
Indirect Costs	**$89,849.00**
Total	**$389,551.00**

Indirect Cost Agreement

Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

[1] If fringe is not a single rate, please attach calculation or explanation as an appendix.

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 1756001353A1
ORGANIZATION:
Texas A & M University – Commerce
The Texas A & M University System
Division of Finance and Administration
2800 University Drive
Commerce, TX 75428

Date: 04/15/2024
FILING REF.: The preceding agreement was dated 01/22/2020

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: Facilities And Administrative Cost Rates

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

	EFFECTIVE PERIOD				
TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PRED.	09/01/2020	08/31/2024	36.00	On Campus	All Programs
PRED.	09/01/2020	08/31/2024	11.00	Off Campus	All Programs
PRED.	09/01/2024	08/31/2028	39.00	On Campus	All Programs
PRED.	09/01/2024	08/31/2028	11.00	Off Campus	All Programs
PROV.	09/01/2028	Until Amended			Use same rates and conditions as those cited for fiscal year ending August 31, 2028.

*BASE

Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials, supplies, services, travel and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, student tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000.

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:
The fringe benefits are specifically identified to each employee and are charged individually as direct costs. The directly claimed fringe benefits are listed below.

TREATMENT OF PAID ABSENCES:
Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

OFF-CAMPUS DEFINITION: The off-campus rate will apply for all activities: a) Performed in facilities not owned by the institution and where these facility costs are not included in the F&A pools; or b) Where rent is directly allocated/charged to the project(s). Actual costs will be apportioned between on-campus and off-campus components. Each portion will bear the appropriate rate.

FRINGE BENEFITS:

FICA
Retirement
Worker's Compensation
Life Insurance
Unemployment Insurance
Health Insurance
Accrued Compensated Absences

The next indirect cost rate proposal, based on actual costs for the fiscal year ending August 31, 2027, will be due no later than February 29, 2028.

Equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds $5,000.

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

Texas A & M University - Commerce The Texas A & M University System
(INSTITUTION)

Toni Burton
(SIGNATURE)

Toni Burton
(NAME)

Assistant Controller
(TITLE)

4/23/2024
(DATE)

ON BEHALF OF THE GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES
(AGENCY)

Darryl W. Mayes -S
Digitally signed by Darryl W. Mayes -S
Date: 2024.04.17 08:35:58 -04'00'
(SIGNATURE)

For Arif Karim
(NAME)

Director, Cost Allocation Services
(TITLE)

04/15/2024
(DATE)

HHS REPRESENTATIVE: Theodore Foster
TELEPHONE: (214) 767-3261

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 39% of (check one):

☐ Salary and fringe benefits

☒ Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

☒ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

[Description of costs associated with "Other" budget category.]
During field visit, research team will need to stay at hotel. Duration of stay in hotel may vary due to seasonal variability. During our field visit, we may need to hire additional person to help us in field work like carrying Sedimentary microbial fuel cell, collecting soil and water samples etc.

System Office of Budgets and Accounting
THE TEXAS A&M UNIVERSITY SYSTEM

June 25, 2024

MEMORANDUM

TO: Chief Financial Officers
Academic Institutions and Service Agencies

FROM: Verna Fritsche, Director, Accounting

SUBJECT: FY2025 Budgeting for Fringe Benefits on Sponsored Agreements

For fiscal year 2025, please use the fringe benefit rates listed below when calculating fringe benefits for sponsored agreement budgeting purposes. This will not impact reimbursements from sponsored agreements, as fringe benefits will continue to be reimbursed at the actual dollar amount expensed, rather than the budgeted amount.

Beginning July 2000, the State is not required to pay Social Security and Medicare for students who meet certain criteria. For the purposes of fringe benefit budgeting, students that meet the criteria will be called FICA Exempt Students. For students who do not meet the criteria, choose the employee category that applies to them.

Fiscal Year 2025 Fringe Benefits for Budget Purposes

Employees Eligible for all Fringe Benefits	18.9% of direct salaries & wages PLUS A fixed monthly dollar amount for group insurance
Employees Not Eligible for Group Insurance & Retirement	10.7% of direct salaries & wages
FICA Exempt Students Eligible for Group Insurance But Not Eligible for Retirement	3.0% of direct salaries & wages PLUS A fixed monthly dollar amount for group insurance
FICA Exempt Students Not Eligible for Group Insurance & Retirement	3.0% of direct salaries & wages

Fiscal Year 20243 Fixed Monthly Dollar Amount for Group (Medical & Basic Life) Insurance

Classification of Employee	Fixed Monthly Insurance Amount
Faculty and Staff – Full Time (100%)	$1,104
Faculty and Staff – Part Time (50% - 99.99%)	$545
Insurance Eligible Student [b]	$283
Combined (all employees) [a]	$950

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System Office of Budgets and Accounting
THE TEXAS A&M UNIVERSITY SYSTEM

June 25, 2024

MEMORANDUM

TO: Chief Financial Officers
Academic Institutions and Service Agencies

FROM: Verna Fritsche, Director, Accounting

SUBJECT: FY2025 Budgeting for Fringe Benefits on Sponsored Agreements

For fiscal year 2025, please use the fringe benefit rates listed below when calculating fringe benefits for sponsored agreement budgeting purposes. This will not impact reimbursements from sponsored agreements, as fringe benefits will continue to be reimbursed at the actual dollar amount expensed, rather than the budgeted amount.

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[h] UCI Member rates range from .01% to .30% based on previous claim experience. See the rate for each Member in the FY2025 budget instructions.

[i] Leave Termination Member assessments range from .13% to 2.15% based on previous years' experience. Each Member determines the rate to use for their institution/agency/health science center.

Texas AgriLife Extension Service Exception

If the employee has a civil service appointment and is in TRS, the rate is 18.48%
If the employee has a civil service appointment and is in ORP on or after 9-1-95, the rate is 16.83%.
If the employee has a civil service appointment and was enrolled in ORP before 9-1-95, the rate is 18.73%.

Monthly State Contributions to Group (Medical and Basic Life) Insurance Premiums

Coverage	Full Time (100%)	Part Time (75%-99.99%)	Part Time (50%-74.99%)
Employee Only	$965.90	$965.90	$480.60
Employee and Spouse	$1,246.94	$1,246.94	$621.12
Employee and Children	$1,161.16	$1,161.16	$578.24
Employee and Family	$1,361.40	$1,361.40	$678.36

These fringe benefit percentages and amounts listed in this letter are estimates derived from the average population of all Texas A&M members, if a member's values differ, the member could use the different amounts based upon their employee population. If different numbers are used, the methodology must be documented by the member.

Please call Verna Fritsche at (979) 458-6090 if you have any questions.

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SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.
-

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:
Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov
NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov
M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Galveston Bay Estuary Program
Fiscal 2026 M&R Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

Monitoring and Research

Project Name:

Galveston Bay Bottlenose Dolphin Exposure to Legacy Contaminant Stressors

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

☐ Federal, State, or Local Government ☐ Council of Government ☒ Public ISDs or Universities
☐ Nonprofit ☐ Other*

Public University: University of Houston-Clear Lake

Unique Entity ID (UEI) Number: AND: **VIN or Tax ID:**

RD74AUNCTZJ1	74-6001399

Contact Information:

Project Representative Name	Jenny Oakley
Project Representative Phone	281-283-3947
Project Representative Email	oakley@uhcl.edu

Amount Requested from GBEP:

$299,730.45

Federal ☐ State ☐ No Preference ☒
Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$204,854.73
FY 2027 (09/01/2026-05/31/2027)	$94,875.72
FY 2028 (09/01/2027-05/31/2028)	$0.00
Total	$299,730.45

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

September 1, 2025 – August 31, 2027

Project Urgency:

The proposed project is leveraging work conducted by the University of Houston-Clear Lake, the Galveston Bay Foundation, and the National Marine Mammal Foundation funded through the National Oceanic and Atmospheric Administration's (NOAA) RESTORE Science Program to evaluate stressors to dolphins in Galveston Bay. In the next 5-9 years, the NOAA Damage Assessment, Remediation, and Restoration Program (DARRP) and its state Trustee partners will decide if they will pursue a Natural Resource Damage Assessment (NRDA) for Galveston Bay dolphins impacted by exposures to contaminants. In an effort to inform that decision, a portion of the NOAA RESTORE project involves remote tissue sampling of dolphins during one summer season to investigate PCB and dioxin contaminants in dolphin blubber. The proposed project will build on that work by adding a winter season tissue sampling effort to investigate seasonal differences in PCBs and dioxins and will add mercury as an evaluated contaminant. The leveraged project started in FY24, and the tissue sampling portion of the project is scheduled for the summer of 2025, so this funding cycle is perfectly timed to complement the existing work. If funded, the Galveston Bay Estuary Program would be recognized as a project partner for the leveraged NOAA RESTORE ongoing work and would be instrumental in expanding our understanding of legacy contaminants on an important sentinel species for human and ecosystem health in Galveston Bay.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

$468,730.45

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

The proposed project is leveraging work conducted by the University of Houston-Clear Lake, the Galveston Bay Foundation, and the National Marine Mammal Foundation funded through the National Oceanic and Atmospheric Administration's (NOAA) RESTORE Science Program. Direct costs associated with the proposed project objectives such as travel, equipment, and supplies equal $167,000. Volunteer time through the Field Assistant Volunteer Program is estimated at $2,000. Total leveraged value: $169,000.

Partners* and Their Roles:

Key Personnel: Name, Project Role, Email, Institutional Affiliation, Professional Title

Sherah McDaniel, Co-PI, McDanielS@uhcl.edu, University of Houston-Clear Lake, Research Associate
Kristi Fazioli, Key Personnel, kfazioli@chartedmarine.com, Charted Marine Consulting, Co-PI of the Galveston Bay Dolphin Research Program
Vanessa Mintzer*, Subgrantee Lead, vmintzer@galvbay.org, Galveston Bay Foundation, Director of Research, Co-PI of the Galveston Bay Dolphin Research Program
Alyssa Quackenbush, Key Personnel, aquackenbush@galvbay.org, Galveston Bay Foundation, Research Associate
Ryan Takeshita*, Subgrantee Lead, ryan.takeshita@nmmpfoundation.org, National Marine Mammal Foundation, Lead Scientist and Deputy Director of Conservation Medicine

*Please see: Appendix 3 – GBF Letter of Commitment – Oakley.pdf, and Appendix 4 – NMMF Letter of Commitment – Oakley.pdf.

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION
Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

The proposed project will implement the following actions of Plan Priority 4: Inform Science-Based Decision Making:

- **Collaborate with Research Institutions to Support Focus Area Applied Research and Monitoring (RES)-** This project is a collaboration between the Environmental Institute of Houston, at the University of Houston-Clear Lake (a research Institution), the Galveston Bay Foundation (a non-profit, NGO), and the National Marine Mammal Foundation (a non-profit, NGO) to conduct applied research and monitoring to evaluate concentrations of dioxins, PCBs, and mercury in bottlenose dolphins in Galveston Bay. The proposed work will address **RES-2** (Conduct Geochemical Stressor Monitoring and Research), **RES-3** (Conduct Physical Stressor Monitoring and Research, and **RES-5** (Conduct Monitoring and Research to Address Limits to Seafood Consumption).
- **Increase Access to Galveston Bay Ecosystem Information (ACS)**-The results of the proposed work will be disseminated according to the timeframe and outputs by activity for the following actions: **ACS-1**: (Tracking Ecosystem Health Indicators) and **ACS-2**: (Access to Monitoring and Research Data).

The proposed project will enhance the Galveston Bay Plan by providing data on bottlenose dolphins, an ecologically important top-predator in Galveston Bay, that serves as an ideal sentinel for both human and ecosystem health. Bottlenose dolphins or marine mammals are mentioned three times in the Galveston Bay Plan, but there are currently no data reported in the Plan about their distribution, abundance, or health.

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 4: Inform Science-based Decision Making

RES-1 ☐	RES-2 ☒	RES-3 ☒	RES-4 ☐
RES-5 ☒	RES-6 ☐	RES-7 ☐	RES-8 ☐
ACS-1 ☒	ACS-2 ☒	ACS-3 ☐	

Plan Priority Area Actions Detail:

RES-2 Conduct Geochemical Stressor Monitoring and Research: The proposed project will investigate biomagnification of legacy toxins: Polychlorinated biphenyls (PCBs), dioxins, and mercury in bottlenose dolphins in Galveston Bay. Dioxins, PCBs, and mercury are legacy contaminants currently responsible for human consumption seafood advisories in upper Galveston Bay (PCBs and dioxins) and in all Texas coastal waters (mercury). The life history of dolphins makes them an ideal species to act as sentinels of human and ecosystem health. Many dolphins are residents in estuaries, live long lives, and feed at a high trophic level on the same local prey sources as humans. These similarities make dolphins ideal bioindicators for the effects of xenobiotic contamination on estuarine ecosystems and human health.

Specific Activities and Outputs: The proposed project will address the following activities and outputs listed in the Galveston Bay Plan for RES-2: Present results at the State of the Bay Symposia and incorporate results into the State of the Bay Report. Collect geochemical stressor research data and share the results through publications on the GBEP website. Support the development and public delivery of geochemical stressor research by sharing the results of the proposed project through various means of delivery including presentations, technical reports, and integration of results into education and outreach activities.

RES-3 Conduct Physical Stressor Monitoring and Research: The data collected during the proposed project will inform research on the influence of physical changes to the Bay (bay circulation and freshwater inflow) in the context of multiple stressors on bottlenose dolphins. Physical changes to the water chemistry of the Bay, which is influenced by bay circulation and freshwater inflow, has been shown to correlate with how dolphins are distributed throughout the Bay (Fazioli and Mintzer, 2020; Mintzer and Fazioli, 2021). To build on this previous work, we will collect water quality variables such as water temperature and salinity during sightings of dolphins throughout the Bay. These data will help inform future work investigating how dolphins respond to changes in physical changes throughout the Bay. Additionally, freshwater inflow and bay circulation are important variables to consider when investigating how contaminants enter, disperse, and affect dolphins in Galveston Bay.

Specific Activities and Outputs: The proposed project will address the following activities and outputs listed in the Galveston Bay Plan for RES-3: Present results at the State of the Bay Symposia and incorporate results into the State of the Bay Report. Collect physical stressor data and share the results through publications on the GBEP website. Support the development and public delivery of physical stressor research by sharing the results of the proposed project through various means of delivery including presentations, technical reports, and integration of results into education and outreach activities.

RES-5 Conduct Monitoring and Research to Address Limits to Seafood Consumption: The proposed project will investigate concentrations of PCBs, dioxins, and mercury in bottlenose dolphins in Galveston Bay. These data may be used indirectly to discuss and inform seafood consumption research and outreach as dolphins are ideal bioindicators for comparing contaminant concentrations in tissues and their resulting effects on health.

Specific Activities and Outputs: The results of the proposed project may provide indirect supplemental information to support seafood consumption research. Reporting and sharing these new data through technical publications and outreach materials will support meaningful connections with dolphins as the sentinel species, between human and ecosystem health, as it relates to contaminants (PCBs, dioxins, and mercury) resulting in seafood advisories.

ACS-1: Tracking Ecosystem Health Indicators: There is currently a lack of data on bottlenose dolphins in the Galveston Bay Plan. Project partners will disseminate data, status, and trends of routine monitoring of Galveston Bay bottlenose dolphins and their stressors related to the health and sustainability of the Bay.

Specific Activities and Outputs: The data collected during the proposed project can be used to support regional monitoring that are included in the Galveston Bay Report Card and to provide information on bottlenose dolphins in the Galveston Bay Plan. These data can also be used to support regional data reporting efforts by integration into the Galveston Bay Regional Monitoring Database as applicable.

ACS-2: Access to Monitoring and Research Data: The results of the proposed project will be integrated into easy-to-access resources and dissemination efforts for a wide range of audiences.

Specific Activities and Outputs: This project will contribute to the collection and dissemination of monitoring and research data. The results of the proposed project can be presented at the State of the Bay Symposia and integrated into a technical report, presentations, and outreach materials.

Please see: Appendix 2 – Literature Cited – Oakley M&R Proposal.pdf.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☒ NRU (Protect and Sustain Living Resources)
☒ WSQ (Ensure Safe Human and Aquatic Life Use)
☒ PPE (Engage Communities)

Other Subcommittee Detail:

The proposed project will implement the following other Galveston Bay Plan Priority Area Actions by supporting the following:

Priority 1: Ensure Safe Human and Aquatic Life Use: The proposed project will address the action items: improve water quality through nonpoint source pollution abatement (NPS) and promote public health and awareness (PHA) by using dolphins as a sentinel species to provide connections between legacy contaminants in dolphins to both human and ecosystem health.

NPS-2 Support Nonpoint Source Education and Outreach Campaigns: The results of the proposed project can be used to create specific messaging connecting dolphin health to human and bay health to foster public awareness, improve education, and encourage action to improve water quality.

PHA-5 Improve Finfish Consumption Safety Through Watershed-Based Plans: Because dolphins primarily use finfish as a food source and the contaminants evaluated (PCBs, dioxins, and mercury) biomagnify, they are a good indicator of consumption concerns for top predators, humans included, that also use finfish as a food source from Galveston Bay. The results of the proposed project can inform, raise awareness, and provide examples of consumption safety concerns.

Priority 2: Protect and Sustain Living Resources: The proposed project will support habitat species conservation (SC) by providing contaminant data for native dolphins in Galveston Bay.

SC-1 Native Species Management: Currently, bottlenose dolphins are only mentioned once in the Species Conservation Action Plan, and it is stated that they are "increasingly reported." Due to a lack of research in upper Galveston Bay, the Galveston Bay Dolphin Research Program (GDRP) initiated a year-round boat-based population monitoring program in 2014 and has documented over 1,000 individuals within Galveston Bay including ~200 individuals exhibiting long-term residency in upper Galveston Bay (Mintzer et al., 2022). The results of the proposed project may be considered as baseline data to inform decisions on future NRDA resource allocation to Galveston Bay to restore or sustain the native resident dolphin population. These contaminant data along with long-term monitoring data on dolphins are important to the successful management of this native apex species within Galveston Bay.

Priority 3: Engage Communities: The proposed project will support preserving Galveston Bay through stakeholder and partner outreach (SPO) and support public education and awareness (PEA) to engage the public in a dialogue about the importance of bottlenose dolphins and the challenges they face in Galveston Bay.

SPO-1 Stewardship Programs and Volunteer Opportunities: The proposed project will be integrated into volunteer opportunities available through the GDRP's Field Assistant Volunteer Program, allowing participants to become ambassadors of Galveston Bay. The GDRP has trained 93 volunteer citizen scientists to date, including 27 new volunteers in 2024 alone.

SPO-2 Workshops and Events: The results from the proposed project will be presented at the State of the Bay symposia. Additionally, the results can be integrated into workshops and events, providing opportunities for the public to receive education on the bottlenose dolphins that inhabit Galveston Bay.

SPO-3 Support Regional Initiatives: The proposed project would begin address the lack of data on Galveston Bay bottlenose dolphins in the Galveston Bay Plan. Including charismatic dolphins in existing and future regional initiatives would be a great way to connect people with the Bay.

SPO-4 Local Government Outreach: Bottlenose dolphins are federally managed under the Marine Mammal Protection Act, and a National Marine Fisheries Scientific Permit is necessary to conduct this work. The on-going long-term population monitoring of dolphins in Galveston Bay is reported at a federal level, but nothing is reported to the state. The proposed project would begin to close the gap between government entities and inform local governments on threats to the health of this important species residing wholly in local waters. The expected results of the proposed project can help inform contaminant levels and effects on state resources like finfish by expanding our understanding of contaminant transfer through the food web.

PEA-1 Key Issue Engagement: The proposed project will continue to develop, support, and promote public awareness along with education/outreach and continue a dialogue with the public about key issues affecting Galveston Bay and what can be done to mitigate those issues. The GDRP will integrate data collected from the proposed project into public outreach/booth events, the GDRP Quarterly Newsletter, and social media to spread awareness about the issues affecting dolphins and Galveston Bay. Key outreach materials are being translated into Spanish for increased accessibility (e.g. both English and Spanish versions of "Dolphin Safe Boating Tips" are available on the GDRP website).

PEA-2 Adult Education: The proposed project will continue to support and promote public education activities that aim to change behaviors and attitudes of community members in and around Galveston Bay by using dolphins as a flagship species. The GDRP has trained 93 volunteer citizen scientists to date, including 27 new volunteers in 2024 alone. Volunteer workshops are held to train citizen scientists about our research and their responsibilities for assisting with boat-based dolphin surveys and land-based research conducted at Seawolf Park in Galveston. Volunteers also receive training in outreach engagement and conservation messaging to help host GDRP outreach/booth events. Training workshops will continue to be held in accordance with program needs.

PEA-3 K-12 Education Efforts: The GDRP continues to support grades K-12 with Texas Essential Knowledge and Skills aligned dolphin-based lessons by allowing teachers to check out **"The Pod"** for use in their classrooms. The curriculum focuses on dolphin biology and conservation, including lessons on the species' role in food webs and as indicators of ecosystem health. Moreover, Galveston Bay Foundation's education team offers 45-minute classroom dolphin workshops that also highlight GDRP research and the importance of dolphins. The Pod and workshop curricula can be updated to include sections about the threats of contaminants on humans and marine life using data from the proposed project.

Please see: Appendix 2 – Literature Cited – Oakley M&R Proposal.pdf.

Other Plans Implemented:

Marine Mammal Commission Strategic Plan: The proposed project addresses the priority topics "Improve Population Assessment and Health Surveillance", "Assess and Address Anthropogenic Threats Facing Marine Mammals", and "Engage with Marine Mammal Protection Act Stakeholders"

Programmatic Environmental Impact Statement for the Marine Mammal Health and Stranding Response Program: The proposed project addresses the Biomonitoring and Research – Sample Collection.

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

M&R Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☒ Meaningful and effective monitoring of existing, past, and new projects (NRU: especially species of concern, WSQ, PPE).
☐ Baseline assessments for large-scale, man-made changes to Galveston Bay.
☒ Assessment, exposure, and response to stressors, including **but not limited to**:

- Species of greatest conservation need;
- Contact recreation standards;
- Environmental parameters;
- Emerging contaminants; and
- Legacy contaminants.

Subcommittee Priority Detail:

Meaningful and effective monitoring of existing, past, and new projects: The proposed project will provide meaningful and effective monitoring of existing and new projects resulting in legacy contaminant concentrations in bottlenose dolphins that reside in Galveston Bay. The Galveston Bay Dolphin Research Program (GDRP), a collaboration between the Environmental Institute of Houston at the University of Houston-Clear Lake and the Galveston Bay Foundation has been conducting photo identification (photo-ID) monitoring of dolphins in upper Galveston Bay since 2014. These baseline monitoring data are critical to inform targeted tissue sampling of long-term resident dolphins for the project and provide details on the areas of the Bay where they have been observed over the previous 10 years (e.g., individual dolphins that spend a large portion of their lives in areas of the Bay with known or suspected high contaminant levels can be targeted). The new project will investigate PCBs, dioxins, and mercury in tissues of bottlenose dolphins. By combining information about dolphin abundance, distribution, residency, and movements (from past photo-ID efforts) with new blubber contamination levels (from our current RESTORE project and this proposed project), we can develop a more nuanced and meaningful understanding of how dolphins use habitats across Galveston Bay, which dolphins may be most vulnerable to contaminants (i.e., explore differences in site fidelity and age class groups), and where restoration/conservation efforts may provide the most benefits to dolphins and other local natural resources.

Assessment, exposure, and response to stressors, including species of greatest conservation needs, environmental parameters, and legacy contaminants: The proposed project will evaluate exposure of legacy contaminants to bottlenose dolphins in Galveston Bay. Bottlenose dolphins are a protected species under the Marine Mammal Protection Act, and dolphins in Galveston Bay are particularly at-risk due to a unique combination of petroleum/chemical industry, freshwater exposures, shipping traffic, entanglements from fishing gear, and proposed large-scale infrastructure projects. The PCB and dioxin samples collected in the winter of 2026 from the proposed project will be combined with additional samples collected in the summer of 2025 as part of a project funded through the NOAA's RESTORE Science Program to evaluate stressors to dolphins in Galveston Bay. All of the PCB and dioxin samples collected through both studies will be used to evaluate the cumulative effects of stressors on dolphins in Galveston Bay. The mercury samples will be analyzed separately and a baseline evaluation of the concentration of mercury in dolphins in Galveston Bay will be summarized in the final report for this proposed project. Our proposed project, in conjunction with the RESTORE project, is specifically designed to provide state and federal natural resource managers with the best-available science about how exposure to and health effects from legacy contaminants contribute to the multiple stressors impacting Galveston Bay dolphins, so that they can design and monitor effective conservation projects for the dolphins and their ecosystem.

Does the Project work with new, smaller communities/partnerships?

☒ Yes

☐ No

This project includes partnership with the National Marine Mammal Foundation, a program that has not previously partnered with the Galveston Bay Estuary Program.

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

The primary objective of our study is to assess PCBs, dioxins, and mercury concentrations in Galveston Bay bottlenose dolphins. The expected results of elevated concentrations of these contaminants, particularly compared to other populations both regionally and internationally, could result in a focus of resources to Galveston Bay to continue to investigate these legacy contaminant pollutants, and better inform the design and implementation of restoration/conservation projects to benefit dolphins and our shared Galveston Bay ecosystem.

Full Project Description (1,000 words or less):

Background

The life history of bottlenose dolphins (*Tursiops truncatus;* hereafter, "dolphins") in our coastal waters makes them an ideal species to act as sentinels of human and ecosystem health. Many dolphins are residents in estuaries, live long lives, and feed at a high trophic level, similar to humans. They consume the same local prey sources (e.g., flounder, croaker, and trout). These similarities make dolphins ideal bioindicators for the effects of xenobiotic contamination on estuarine ecosystems and human health (Fair and Becker, 2000; Ross, 2000; Irwin, 2005). Dolphins are protected under the Marine Mammal Protection Act, and Galveston Bay dolphins are designated as a Bay, Sound, and Estuary stock (NOAA Fisheries, 2021, 2022). Currently, there are insufficient data to determine population trends for the stock, but NOAA Fisheries has concern for the stock due to current and future stressors, including large-scale infrastructure projects, freshwater impacts, fishery interactions, and industrial toxins (Philips and Rosel, 2014; NOAA Fisheries, 2022).

A variety of factors may influence dolphin abundance and distribution, including environmental variables such as temperature, salinity, prey distribution and abundance, and anthropogenic disturbance (Shane, 1980; Hastie et al., 2004; Moreno, 2005; Mazzoil et al., 2008; Huther, 2010; Fazioli and Mintzer, 2020; Mintzer and Fazioli, 2021). Prey distribution, water temperature, and salinity are important predictors for movements and behaviors of the Galveston Bay dolphins, which can be influenced by the deep Houston Ship Channel that funnels high salinity seawater and larger prey species in from the Gulf of Mexico to upper portions of Galveston and Trinity Bay (Moreno, 2005). Past studies have suggested that dolphins do not selectively avoid areas with high levels of contamination (Smultea and Würsig, 1995). Dolphins are regularly observed throughout Galveston Bay (GDRP, 2024) (Figure 1), even in areas in close proximity to Superfund sites and other potential sources of pollution.

Polychlorinated biphenyls (PCBs), dioxins, and mercury are legacy contaminants currently responsible for human consumption seafood advisories in upper Galveston Bay (PCBs and dioxins) and in all Texas coastal waters (mercury). In vertebrates, PCBS and dioxins can cause cancer, severe skin lesions, alter liver function, and may impair immune system, nervous system, and reproductive functions (Schwacke et al., 2012). They can be absorbed through dermal contact or ingested as they accumulate through the food chain. Mercury can affect the reproductive, excretory, and central nervous systems (Wolfe et al., 1998; Kershaw and Hall, 2019). Previous work has shown a significant correlation between PCB concentrations in dolphins and local human populations (Kucklick et al., 2011).

The Galveston Bay Dolphin Research Program (GDRP), a partnership between the Environmental Institute of Houston at the University of Houston-Clear Lake and Galveston Bay Foundation, initiated a year-round boat-based population monitoring program in 2014 using mark-recapture techniques (photo-identification) to track individuals over time using unique nicks and notches on their dorsal fins. These data have shown that there are long-term resident dolphins living in upper Galveston Bay, mixing with transients from the Gulf of Mexico (Mintzer et al., 2022). Resident dolphins are at especially high risk from exposures to contaminants of concern found in water, sediment, and prey species within this region. The GDRP has also conducted remote biopsy tissue sampling (2015-2018) for a variety of different analyses including sex determination, epigenetics, and stable isotope analysis. Thus far, the sex has been determined for 50 individuals, and the age has been estimated for 24 individuals. The GDRP currently has 48 sub-samples awaiting mercury analysis. To date, over 50 samples have undergone preliminary analysis for PCBs, dioxins, and other chemical pollutants. These preliminary data suggest that dolphins in Galveston Bay may have elevated exposure levels to PCBs and dioxins, but more samples are needed to understand the extent of their impact on individuals, their cumulative effects with other stressors, and how contaminant levels in dolphin tissue may change seasonally.

The GDRP is partnering in a 5-year highly collaborative effort funded by NOAA's RESTORE Science Program and led by the National Marine Mammal Foundation, with field efforts beginning August 2024. Galveston Bay was chosen for this project to test the population consequences of multiple stressors (PCoMS) model aimed at helping decision makers evaluate relative impacts of individual stressors and their cumulative effects on dolphins at both the individual and population level. This project will include a remote tissue sampling effort (Figure 2) in summer of 2025 with the goal of analyzing PCBs and dioxins in the blubber of dolphins. The proposed project seeks to collect additional tissue samples in the winter of 2026 and combine the data analysis with the samples taken as part of the RESTORE project, thereby leveraging field work efforts to maximize contaminant analysis in both projects. Skin tissue sub-samples taken as part of both efforts will be added to archived samples and allow us to complete the first ever assessment of mercury concentrations in Galveston Bay dolphins. Additionally, blubber tissue sub-samples collected during winter 2026 surveys will increase sample sizes and add a temporal analyses component to the RESTORE project for PCB and dioxin analyses. The primary objective of our study is to assess PCB, dioxin, and mercury concentrations in Galveston Bay dolphins.

Objectives

1. Evaluate concentrations of mercury in dolphins in Galveston Bay.
2. Contribute additional analytical chemistry results (PCBs and dioxins) from winter blubber samples for inclusion in the population consequences of multiple stressors (PCoMS) model as part of the on-going NOAA RESTORE Science Program funded work on Galveston Bay dolphins.

These data can be used to inform decision makers during potential future Natural Resource Damage Assessments, as needed, for Galveston Bay dolphins impacted by exposures to contaminants, either as baseline data for future spills/events or to inform assessments at existing Superfund sites. Additionally, should the results show elevated concentrations of these contaminants, particularly compared to other populations both regionally and internationally, it could support a future focus of resources to Galveston Bay to continue to investigate these legacy contaminant pollutants and develop restoration/conservation projects to benefit Galveston Bay dolphins and their ecosystem.

Please see: Appendix 2 – Literature Cited – Oakley M&R Proposal.pdf.

Latitude/Longitude (Optional):

N/A

Location:

Samples will be collected from dolphins within Galveston Bay (Figure 1).

Projects Map

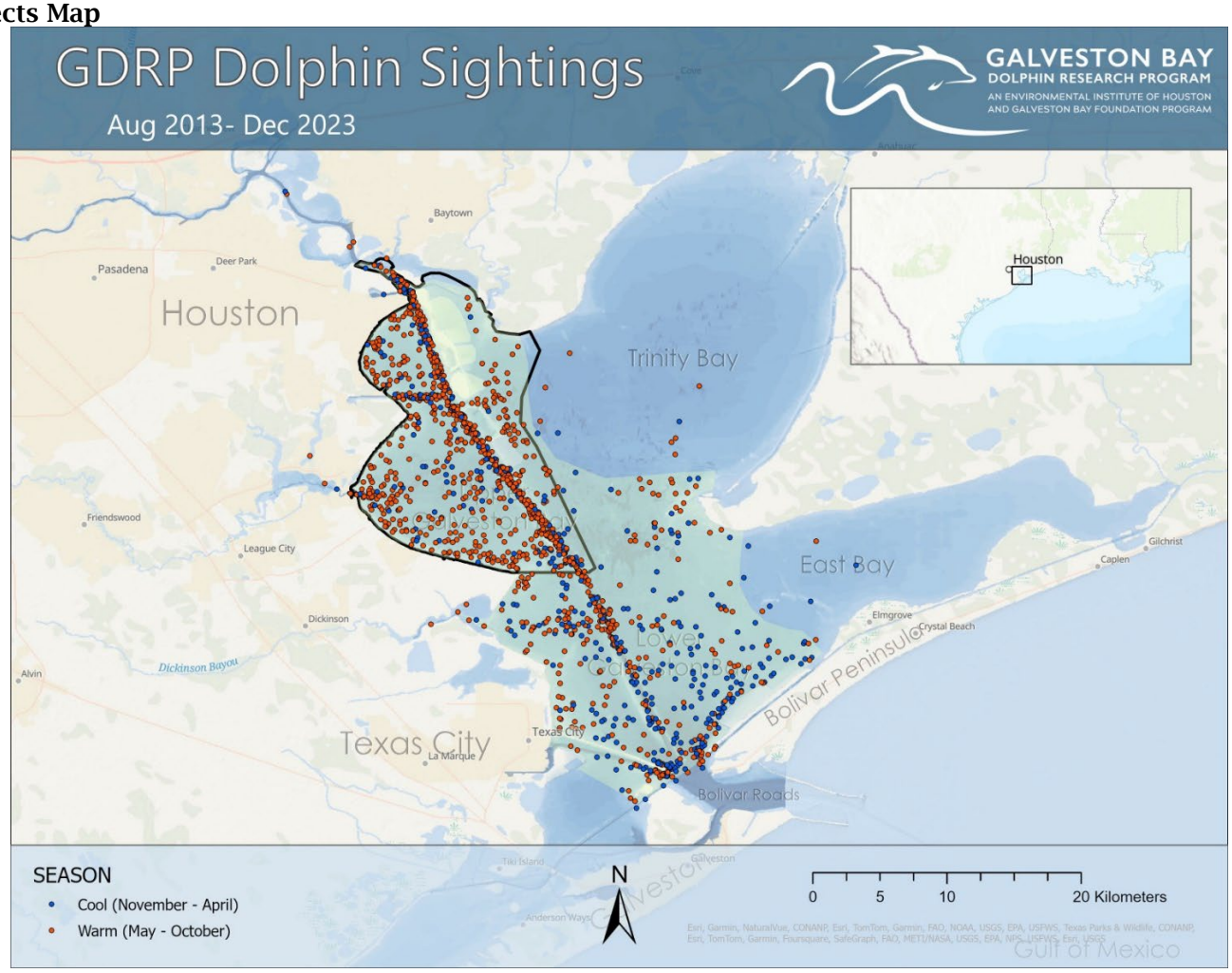


Figure 1. Map of Galveston Bay showing the Galveston Bay Dolphin Research Program's dolphin sightings by season. The black outlined area in the upper western portion of the Bay was the original regular survey area until 2021 when the study area was expanded to the green shaded area.

Supplemental Photos/Graphics (Optional):

Figure 2: Tissue samples are collected remotely using a crossbow and modified dart with a biopsy sampling head. The sample is divided for various analyses including PCBs, dioxins, and mercury.

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	Cost for Work to be Performed
Salary / Wages	$103,059.13
Fringe Benefits (36%)	$37,101.29
Travel	$6,260.10
Supplies	$9,560.00
Equipment	$0.00
Contractual	$97,775.00
Construction	$0.00
Other	$4,632.80
Total Direct Cost	**$258,388.32**
Indirect Costs	$41,342.13
Total	**$299,730.45**

Indirect Cost Agreement

Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

*Please see attached "**Appendix 1- 2025 UHCL IDC Agreement**" for the federally negotiated indirect cost agreement for the University of Houston-Clear Lake which is 16% of the modified total direct costs (which excludes equipment over $5,000 in value) for all "off campus" grants or contracts.*

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 16% of (check one):

☐ Salary and fringe benefits

☒ Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

☒ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

N/A

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:

Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Galveston Bay Estuary Program
Fiscal 2026 M&R Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

M&R

Project Name:

Distribution of key emergent pollutants in the aquatic biota (oysters and fish), sediments and surface waters of Galveston Bay.

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

☐ Federal, State, or Local Government ☐ Council of Government ☒ Public ISDs or Universities
☐ Nonprofit ☐ Other*

Texas A&M University at Galveston

Unique Entity ID (UEI) Number: AND:

G8Y3L8JV2588	EIN: 74-2125225

VIN or Tax ID:

Contact Information:

Project Representative Name	Dr. Antonietta Quigg
Project Representative Phone	409-740-4990
Project Representative Email	quigga@tamug.edu

Amount Requested from GBEP:

$132,594

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☐

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$65,407
FY 2027 (09/01/2026-08/31/2027)	$67,187
FY 2028 (09/01/2027-05/31/2028)	$0.00
Total	$132,594

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

2 years: 9/1/2025 – 8/31/2027

Project Urgency:

Contaminants of emerging concern (CEC) is a term used by water quality professionals to describe pollutants that have been detected in environmental monitoring samples, that may cause ecological or human health impacts, and typically are not regulated under current environmental laws. According to the US EPA (https://www.epa.gov/wqc/), the CECs of greatest concern are per- and polyfluoroalkyl substances (PFAS) chemicals, pharmaceuticals, and micro-plastics.

PFAS are often called "forever chemicals" due to their very slow breakdown in the environment which also allows them to accumulate in people and animals. Some estimates suggest 98% of humans have some level of PFAS in their blood. In March 2023, the US EPA made its first attempt to nationally regulate PFAS in drinking water. It is thought that ~500,000 Texans live in communities with contaminated groundwater. Yet, Texas does not have any established metrics because of the paucity of available data. This project will measure the proposed US EPA PFAS of greatest concern in the Galveston Bay: PFOA, PFOS, PFNA, PFHxS, PFBS, and GenX.

Annually, billions of prescriptions are filled across the U.S. The potential for hormones and **pharmaceuticals** to be present in drinking water is of great concern because unintentional exposure to some of these bioactive compounds could result in adverse effects on human health. At low doses, they can exert a wide range of effects including endocrine disruption and antibiotic resistance. Pharmaceuticals are known to be entering the environment, particularly after storms and/or flood events, but again there is a paucity of information available for levels in Texas, and in particular in the water and aquatic life in Galveston Bay.

With the help of the Galveston Bay Estuary Program funding, the community is beginning to understand the extent of **plastic** pollution in Galveston Bay. For example, the team at UHCL is measuring the microplastics found in oysters, while others at TAMU(G) are looking at levels in fish, and a diverse group of stakeholders meets annually at the Texas Plastic Pollution Symposium.

These CEC's are present in aquatic biota (oysters and fish), sediments, drinking and surface waters, but we do not know the spatial extent, nor do we know what are "typical" concentrations occurring in Galveston Bay. A meta-analysis is proposed to bring together available data on these and other CEC's as well as measuring their concentrations in collected materials.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

$132,594

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

None declared at this time.

Partners* and Their Roles:

Given the cost of field work, we will work with GBEP researchers and stakeholders interested in collaborating to use a "split" sample approach. By this we mean that we will share samples, collection protocols and locations. In this way, the overall number of samples and data available will be significantly higher than working in a traditional mode. Thus far the following partners have agreed to participate:
Texas Parks & Wildlife Department (TPWD), Dickinson, TX - shellfish and fish samples from their regular monitoring program
Dr Jenny Oakley (UHCL) – oyster samples; project funded
Dr Anna Armitage (TAMUG) – marsh sediment and plant samples; project funded
Dr David Hala (TAMUG) – fish samples; new proposals pending
All interested partners are welcome to split/share sample materials for analysis.

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

Plan Priority One: Ensure Safe Human and Aquatic Life Use

The proposed project will measure nonpoint sources and potential point sources of CECs in Galveston Bay to raise public health and awareness.

Action Plan: NPS-2 Support Nonpoint Source Education and Outreach Campaigns
Action Plan: PS-3 Increase Wastewater Treatment Facility Compliance
Action Plan: PHA-1 Improve Seafood Advisory Awareness

Plan Priority Three: Engage Communities

The proposed project will support public education and awareness initiatives.

Action Plan PEA-1 Key Issue Engagement

Plan Priority Four: Inform Science-Based Decision Making

The proposed project will collaborate with research institutions to support research and monitoring and to increase access to Galveston Bay ecosystem information.

Action Plan: Collaborate with Research Institutions to Support Focus Area Applied Research and Monitoring (RES), specifically
RES-1 Conduct Biological Stressor Monitoring and Research
RES-5 Conduct Monitoring and Research to Address Limits to Seafood Consumption.

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 4: Inform Science-based Decision Making

RES-1 ☒	RES-2 ☐	RES-3 ☐	RES-4 ☐
RES-5 ☒	RES-6 ☐	RES-7 ☐	RES-8 ☐
ACS-1 ☐	ACS-2 ☐	ACS-3 ☐	

Plan Priority Area Actions Detail:

This project aims to increase the current understanding of the distribution of CECs in Galveston Bay. The project will use sophisticated instruments (e.g., GC-MS, LC-MS/MS) to quantify the levels of priority chemicals in the waters and biota (oysters, fish) from Galveston Bay. The specific priority area actions addressed are as follows:

Plan Priority One: Ensure Safe Human and Aquatic Life Use

In accordance with the Galveston Bay Plan, there are several crucial factors that determine safe human and aquatic life use of Galveston Bay. The foremost of these is the quality of the surface water in the lower watershed. Water quality is a key indicator of the health of the bay. The 2017 Galveston Bay Report Card deemed it as generally good, especially in the open bay. Seafood consumption safety however received a grade of C in the same Report Card, and a grade of D for rivers and bayous. Contamination from polychlorinated biphenyls (PCBs) and dioxins (toxic pollutants that are driving factors in seafood consumption advisories). People who eat fish or shellfish contaminated by PCBs and dioxins can develop long-term, serious illnesses. *Little is known however about emergent pollutants including CEC's*.

Plan Priority Three: Engage Communities

Protecting and promoting the health of Galveston Bay is important, but communicating to residents and visitors is a challenge. Long-term success in environmental awareness and stewardship takes time and is not simple. To adequately engage communities, two Action Plans were identified by the PPE subcommittee. By working with available tools (e.g., the Galveston Bay Action Network), GBEP and its stakeholders, we will raise awareness in the community of CECs in Galveston Bay. Given that pharmaceuticals are materials that all residents are aware off, while there is a growing body of interest in microplastics in the environment, especially biota that people consume (oysters, fish), we will leverage interest in these materials primarily to raise overall understanding of CECs in Galveston Bay. In doing so, we want to preserve Galveston Bay through stakeholder and partner outreach activities.

Plan Priority Four: Inform Science-Based Decision Making

RES-1: Conduct Biological Stressor Monitoring and Research

The surface waters of Galveston Bay have been shown to be polluted with CECs. However, there is a general lack of knowledge on concentrations in associated with the known major contaminant sources (see project map) and biota. Most data to date has been collected in response to major events (hurricanes, fires) and so there is a strong need to develop baseline data/levels. We will determine CECs (**PFASs, pharmaceuticals and microplastics**) levels in water, sediments and biota (oysters, fish, dolphins) sampled from Galveston Bay. The results of this project will contribute to the US EPA database of CEC concentrations which is needed to develop policies to protect communities. The bay must be managed to ensure its productivity and ecological diversity on a long term, sustainable basis while also supporting a diverse group of stakeholders. This research will help stakeholders better understand the health of the bay which will hopefully translate to better stewardship decisions and actions by both residents and visitors. GBEP and its partners support science-based decision making; this project will provide necessary data to help preserve Galveston Bay for future generations.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☒ NRU (Protect and Sustain Living Resources)
☒ WSQ (Ensure Safe Human and Aquatic Life Use)
☒ PPE (Engage Communities)

Other Subcommittee Detail:

The results of this project will be of relevance to the WSQ, NRU and PPE Subcommittees as it will quantify the extent to which CECs are present in Galveston Bay, potential point and non-point sources, as well as body burdens in a variety of biota. This knowledge will contribute to goals to understand pollution sources, fate and distributions. With a broad watershed understanding, we will work with PPE to engage communities to help them understand potential sources of risk.

Other Plans Implemented:

This project contributes to the Texas Coastal Management Plan, particularly as it concerns (i) supporting protection of natural habitats and wildlife and (ii) provides baseline data on the health of gulf waters (https://www.glo.texas.gov/coast/grant-projects/cmp/grants).

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

M&R Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☒ Meaningful and effective monitoring of existing, past, and new projects (NRU: especially species of concern, WSQ, PPE).

☐ Baseline assessments for large-scale, man-made changes to Galveston Bay.

☒ Assessment, exposure, and response to stressors, including **but not limited to**:

- Species of greatest conservation need;
- Contact recreation standards;
- Environmental parameters;
- Emerging contaminants; and
- Legacy contaminants.

Subcommittee Priority Detail:

The proposed project addresses the M&R Subcommittee's identified priorities as follows:

1) **Exposure response across trophic levels:**

The project will use highly sophisticated instruments (e.g., LC– GCMS) to quantify the concentrations of a variety of CECs including the 6 US EPA priority PFASs. pharmaceuticals and microplastics

- in surface water at the mouths of the major rivers and bayous entering Galveston Bay (during a low and high flow period),
- in biota (phytoplankton, zooplankton, oysters, fish, dolphins) from Galveston Bay,
- in drinking water from major industrial facilities (5), wastewater treatment plants (5), formerly used defense sites (5) and major airports (2) (see project map) known to be important sources of PFASs and potentially other CECs,
- The proposed project complements existing GBEP funded studies as it focuses attention on quantifying important emergent chemicals or CEC's.
- By collaborating with other funded GBEP scientists, we will "split" samples whenever possible to increase the overall knowledge of emergent chemicals in Galveston Bay. For example, we will work with teams from the Hala, Guillen and other labs to split oyster and fish samples and measure PFAS concurrently with microplastics and other chemicals being measured. This will reduce the overall cost of the project and increase the overall spatial and temporal distribution of samples collected (and concurrent data such as lat, long, salinity, temp, etc…)
- The knowledge of PFAS body-burdens in biota will enable a dietary risk assessment to be performed to estimate likely human exposure from the consumption of PFAS-tainted seafood (oysters, fish muscle).

2) Project Component: Results translated to plain language/practical knowledge:

- The results of this project will contribute to the US EPA database of CEC concentrations which is needed to develop policies to protect communities.
- We will work with GBEP and their stakeholders to translate the findings to enable stewardship decisions and actions. GBEP and its partners support science-based decision making; this project will provide necessary data to help preserve Galveston Bay for future generations.
- A flyer (one pager) will be developed to explain the significance of the research and distributed to TCEQ personnel, extension agents and others.
- We will visit with the various working groups to increase stakeholder engagement and the distribution of the project findings.

Does the Project work with new, smaller communities/partnerships?

☒ Yes

☐ No

If funded, the PI's will work with other funded GBEP researchers to develop new partnerships and enhance existing partnerships. In addition, the findings will be shared with the US EPA database of CEC concentrations and for example, the "PFAS project lab" which is developing a nationwide database of PFAS measurements (see Salvatore et al. 2022). If other similar such databases exist for the CECs being measured, we will share our findings with them too.

We will contribute data collected to the Galveston Bay Regional Monitoring Database (GBRC) (https://galvbaydata.org/) and therefore make it available to the entire community.

We will also work with the Monitoring and Research Subcommittee and the Water and Sediment Quality subcommittee stakeholder groups to establish a grade (GBRC) for emerging contaminates measured as part of this project. This will involve collating available data and comparing it to the standards established by the US

EPA and TCEQ, as available. In order to be able to post a grade each year, we will need to determine the "hot spots" in Galveston Bay, and develop a mechanism, if possible, to continuously measure a subset of CEC's at those locations. Since many of these CEC's are still awaiting regulatory thresholds, this process will need to be sensitive to both stake holder identified needs, engagement and information provided by the federal agencies. The PI's are open to ideas to develop a long term strategy for providing these details.

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

Contaminants of emerging concern (CEC) is a term used by water quality professionals to describe pollutants that have been detected in environmental monitoring samples, that may cause ecological or human health impacts, and typically are not regulated under current environmental laws. CECs of greatest concern are per- and polyfluoroalkyl substances (PFAS) chemicals, pharmaceuticals, and micro-plastics. US EPA attempts to nationally regulate CECs is struggling because of the paucity of available data yet we know these chemicals maybe present in the drinking water and biota that we consume. This project will measure the *exposure response across trophic levels* to a selection of CECs and then translate the results to both *plain language/ practical knowledge*. At low doses, these CECs may exert a wide range of adverse effects on the biota and perhaps, the humans that consume the biota. *These CEC's are present in aquatic biota (oysters and fish), sediments and surface waters, but we do not know the spatial extent, nor do we know what are "typical" concentrations occurring in Galveston Bay.* A meta-analysis is proposed to bring together available data on these and other CEC's as well as measuring their concentrations in newly collected materials.

Full Project Description (1,000 words or less):

Contaminants of emerging concern (CEC) is a term used by water quality professionals to describe pollutants that have been detected in environmental monitoring samples, that may cause ecological or human health impacts, and typically are not regulated under current environmental laws. According to the US EPA (https://www.epa.gov/wqc/), the CECs of greatest concern are per- and polyfluoroalkyl substances (PFAS) chemicals, pharmaceuticals, and micro-plastics[1-3]. At this time, nearly 500,000 Texans live in communities with CEC contaminated groundwater, but there is little to no information available on the kinds present. Without this critical information, citizens cannot advocate for policy or mitigation strategies or protect themselves. Following the contamination of ecosystems (**Fig. 1**), CECs may disrupt biological processes and elicit a wide range of toxic effects on aquatic species (e.g., fish), including inhibiting growth, disrupting reproduction and increasing oxidative stress. These chemicals are also known to negatively impact humans either directly (e.g., through aerosols) or indirectly (e.g., through diets). *The persistent nature of these chemicals, combined with their toxicity, illustrates a necessity for contemporary research to investigate their distributions*.

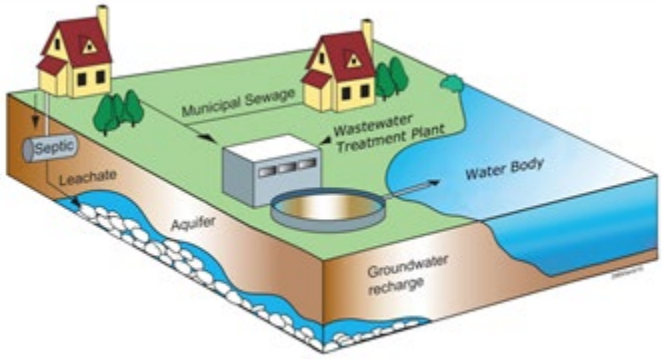


Fig. 1: Movement of CECs in the environment (USEPA).

Galveston Bay is at the nexus of water/food/energy and other sectors in the region. It is home to a billion dollar commercial and recreational fishery. It is located south of Houston (4th largest city in US) and the Dallas/Fort Worth metroplex. Concurrently, Houston is the leading domestic and international center for virtually every segment of the energy industry (e.g., 14.3% of the nation's oil production is done in the refineries clustered in the Houston area), making the watershed/bay at risk from this vast commerce[4]. For example, in response to a major fire which blazed for more than a week (storage tanks at the International Terminals Company in Deer Park (Houston, TX, March 2019), US EPA priority PFASs were measured in Galveston Bay (**Fig. 2**)[2]. In surface waters in the months after the fire, there were 4× to ~300× higher PFASs than what would be found a year later. PFOS was the most abundant homolog, was found in eastern oysters (*Crassostrea virginica*), red drum (*Sciaenops ocellatus*), gafftopsail catfish (*Bagre marinus*), and spotted seatrout (*Cynoscion nebulosus*) [2]. As a result, we calculated the hazard ratio for seafood safety and suggested an advisory of 1–2 meals of fish per week to be protective for human exposure; levels in oysters indicated no immediate concerns for the dietary exposure of humans[2]. These results highlight the need for continual monitoring to assess the fate and seafood advisories for PFASs. Further, Galveston Bay is often impacted by major floods or hurricanes. After Hurricane Harvey, pharmaceuticals, PAH, PCBs and other CECs and legacy chemicals were measured in the bay[3].

Objectives:

Overall objective: *To determine CEC levels surface and drinking waters, sediments and biota of Galveston Bay in order to assess potential adverse health effects to biota and humans.*

Specific Objective 1: Measure CECs (PFASs, pharmaceuticals and microplastics) levels in water, sediments and biota (oysters, fish, dolphins) sampled from Galveston Bay.

Specific Objective 2: Contribute to the US EPA national database of contaminant concentrations.

Specific Objective 3: Support GBEP and its partners in science-based decision making and stewardship decisions and actions.

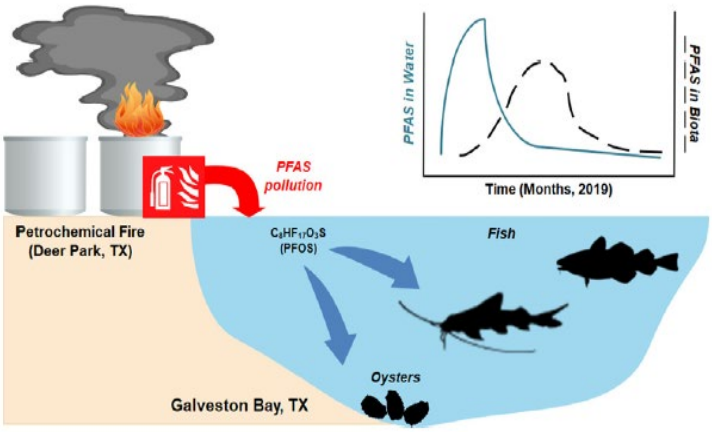


Fig. 2: Movement of PFAS after fire at tanker farm (Nolen et al. 2022).

Experimental Design and Methods: Surface water and drinking water samples will be sampled from various dock-side locations, focusing on areas that are thought to be sources of CECs including the 'forever chemicals' known as PFASs around Houston Galveston Bay (see project map below for target areas). We will sample major industrial facilities (5), wastewater treatment plants (5), formerly used defense sites (5) and major airports (2) based on these maps.

By working with project partners (see above), we will examine previously archived tissue samples of dolphins and collect fresh samples of oysters and fish (i.e., red drum, spotted seatrout) which will be analyzed for CEC body-burdens using standard protocols for each CEC. We have experience measuring PFASs, pharmaceuticals and microplastics, hence our focus will be these emergent pollutants[2,3].

This will allow us to examine the source(s), fate and transport of CECs to determine the overall spatial distributions in water, biota (oysters, fish), and in sediments associated with marshes around Galveston Bay. Given the large scope of the project, we will coordinate with other funded GBEP projects to leverage sampling opportunities. For example, GBEP is already funding projects examining microplastics, so we will partner with those entities to split samples (e.g., Guillen, Hala). This will allow us to develop a "big picture" view of CECs in Galveston Bay food webs, without bearing the entire expense in one project.

Potential Impact and Project Outcomes: The data generated will be submitted to national databases as well as developing a database associated with the project in which all the CECs and ancillary data (e.g., lat, long, water quality) will be deposited to provide an overall portfolio of emergent pollutants in Galveston Bay. The work contributes to the Galveston Bay Plan by addressing 3 key areas: Plan Priority One: Ensure Safe Human and Aquatic Life Use (NPS-2, PS-3, PHA-1), Plan Priority Three: Engage Communities (PEA-1) and Plan Priority Four: Inform Science-Based Decision Making (RES-1, RES-5).

References cited:

1. Prevedouros, K., et al. 2006 *Environmental Science and Technology* 40, 32–44.
2. Nolen, R. M. et al. et al. 2022 *Science of The Total Environment* 805, 150361.
3. Steichen, J. L. et al. 2020 *Frontiers in Marine Science.* 7, 186.
4. Barrientos, M. et al. 2022 Houston Facts. *Greater Houston Partnership*. 62 pages.

Latitude/Longitude (Optional):

See maps below

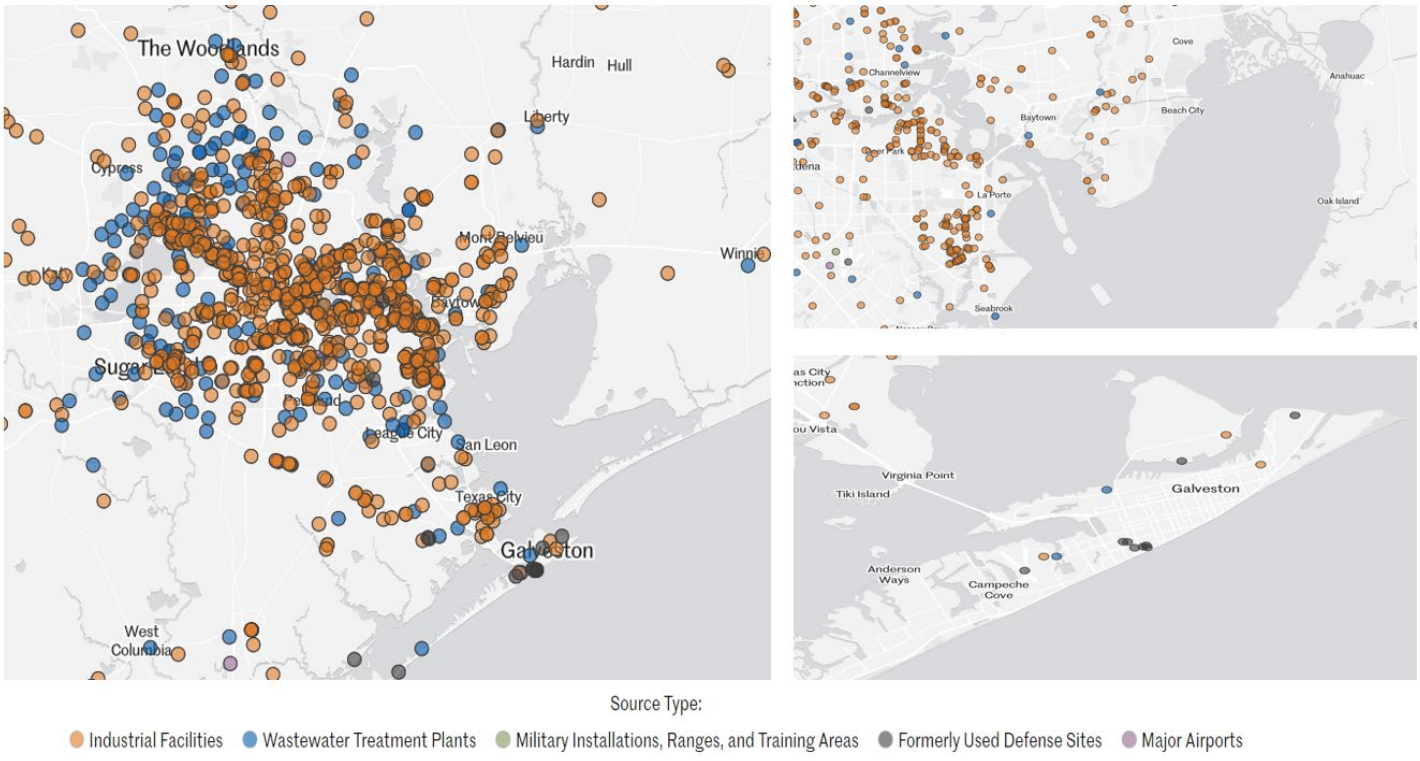
Location:

Sampling for biota will be opportunistic (e.g., that performed by TPWD, and colleagues such as those included in the partner list above), and dockside sampling for surface water samples at sites including (but not limited to) major industrial facilities (5), wastewater treatment plants (5), formerly used defense sites (5) and major airports (2) (see project map).

Laboratory analysis will be performed at the research facilities of Texas A&M University at Galveston (TAMUG).

Projects Map

Map shows likely sources of 'forever chemicals' aka PFASs around Houston Galveston Bay. EPA is attempting to nationally regulate this type of chemical in drinking water. Though there is no comprehensive national tracking of the origins of PFAS pollution, researchers from the PFAS Project Lab have compiled a nationwide database of *likely* sources of contamination (Salvatore et al. 2022). We will sample major industrial facilities (5), wastewater treatment plants (5), formerly used defense sites (5) and major airports (2) based on these maps. We will measure concentrations of other CECs collected from the same sample locations.



Supplemental Photos/Graphics (Optional):

N/A

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	Cost for Work to be Performed
Salary / Wages	$44,458
Fringe Benefits **(Please see appendix** Faculty: 18.9% + $1,044/mo Grad: 10.7% + $283/mo**)**[1]	$10,436
Travel	$5,500
Supplies	$10,500
Equipment	$0.00
Contractual	$0.00
Construction	$0.00
Other	$17,315
Total Direct Cost	**$88,209**
Indirect Costs	$44,385
Total	**$132,594**

Indirect Cost Agreement

Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

Please see appendix for a copy of Texas A&M University at Galveston's IDC rate agreement.

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 54.0% of (check one):

☐ Salary and fringe benefits

☒ Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

☒ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining

[1] If fringe is not a single rate, please attach calculation or explanation as an appendix.

the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

$17,315 (13.06% of total budget. Costs included:
- Publication Costs: $3,000
- Instrument Maintenance Fees: $6,500
- Conference Registration Fees: $1,800
- Graduate Student Tuition & Fees: $6,015 (excluded from MTDC)

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.
-

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.

- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:
Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Galveston Bay Estuary Program
Fiscal 2026 M&R Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

This proposal is submitted for consideration under both the M&R and PPE subcommittees, per recommendations made by sub-committee leads to the Project Representative on 07/19/24.

Project Representative's Note: the proposal has been completed using the M&R Project Proposal form, but if additional information is needed for consideration by the PPE subcommittee, please do not hesitate to reach out. I have copy-pasted some relevant sections from the PPE project proposal template in order to facilitate both committees with project review. These specific subcommittee sections are noted in **BOLD RED** font when applicable.

Project Name:

Contaminant Accumulation in a Sentinel Species: Are Terrapin What They Eat?

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

☐ Federal, State, or Local Government ☐ Council of Government ☒ Public ISDs or Universities

☐ Nonprofit ☐ Other*

Public university (University of Houston-Clear Lake; Environmental Institute of Houston)

Unique Entity ID (UEI) Number: RD74AUNCTZJ1 **AND:** **VIN or Tax ID:** 3-75975-9759-2

Contact Information:

Project Representative Name	Mandi Gordon
Project Representative Phone	281-283-3794
Project Representative Email	gordon@uhcl.edu

Amount Requested from GBEP:

$263,382.00

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$120,745.40
FY 2027 (09/01/2026-08/31/2027)	$146,636.60
FY 2028 (09/01/2027-08/31/2028)	N/A
Total	$263,382.00

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

24 months (2 years), beginning September 1, 2025 and ending August 31, 2027

Project Urgency:

The proposed project will serve as an expansion of two ongoing (UHCL and USGS) studies being conducted during a period which overlaps the first year of the proposed project (September 1, 2025 through August 31, 2026). Pilot studies and preliminary data analyses for both of these studies conducted prior to the proposed project start date will lend valuable information to improving efficacies and efficiencies for protocols implemented in the proposed project.

The proposed study will also serve to expand previous outreach and education programs established by Galveston Bay Foundation.

Finally, the proposed study may also synergize with another project proposal submitted to the Gulf of Mexico Alliance (GOMA) during the same project period (September 1, 2025 through August 31, 2027).

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

Requested project costs:	$ 263,385.78	
Existing leverage/in-kind funds:	$ 597,500.00	
Potential additional leverage:	$ 100,000.00	*from pending proposals submitted to other agencies
Total costs (including leverage):	$ 960,885.78	

(see Leveraging section for explanation of leverage/in-kind funds)

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

In-kind funds were calculated using estimated costs for: 1) salary (based on estimated time) supported by internal and external project partners; 2) sample processing costs supported by internal and external project partners; and 3) estimated costs for outreach materials or programs already in place to support the proposed project. Below is a breakdown by each participating agency of contributed costs used to calculate these leverage funds. Please note: no time will be tracked or reported as part of the proposed study; all estimated costs detailed below are anticipated should the proposed study be selected for funding at the requested amount.

In-Kind funds provided by UHCL:	$ 60,000.00
In-Kind funds provided by USGS:	$ 30,000.00
In-Kind funds provided by GBF:	$ 7,500.00

In addition to in-kind funds provided by external partners, this project leverages funds and resources from other projects funded (or potentially funded) by external agencies. One project was funded by the Matagorda Bay Mitigation Trust (MBMT). This project started in September 2024 and extends through the first year of the currently proposed project period. The other project has been submitted to the Gulf of Mexico Alliance (GOMA) and is pending approval as of the submission of this project proposal. Below is a breakdown of estimated leverage funds from each of these external agencies:

Leverage funds from the ongoing study with the Matagorda Bay Mitigation Trust:	$ 500,000.00
Leverage funds from the proposed study with the Gulf of Mexico Alliance:	$ 100,000.00
Total Leverage/In-Kind funds included in calculation of Total Project Cost:	**$ 697,500.00**

In addition to the leverage and in-kind funds noted above, the USGS may support expenses for per- and polyfluoroalkyl (PFAS) sample analyses at a cost of $350 per sample. The final amount for sample analyses will vary depending on the total number of samples collected through the proposed study, but should we be successful in collecting the number of samples anticipated in the study (~30), additional funds from this type of leverage/in-kind work could increase the total project amount by an additional $10,500 (or more) from the total noted above.

Partners* and Their Roles:

Project Lead:

Mandi Gordon (gordon@uhcl.edu), Environmental Institute of Houston (EIH), University of Houston-Clear Lake (UHCL), Senior Biologist – Mandi will serve as the principal investigator on the project. She will also serve as a committee member for an M.S. graduate student funded through the project and will be responsible for coordination between project partners, completion of contract deliverables, and communications with GBEP project management.

Project Collaborators (funded through proposed study):

Natasha Zarnstorff (nzarnstoff@galvbay.org), Galveston Bay Foundation (GBF), Water Quality Programs Manager – Natasha currently coordinates the GBF water quality program, including volunteer and participatory science-based monitoring. She also the primary caretaker of Pear, GBF's ambassador Diamondback Terrapin. Her role will be to assist with field activities, coordinate with Galveston Bay Foundation's volunteer base, and support education and outreach efforts.

Cindy Wilems (cwilems@galvbay.org), Galveston Bay Foundation (GBF), Director of Education – Cindy currently manages the education programs at GBF. Her role will be to oversee implementation of K-12 educational curricula and programming focused on estuarine organisms such as Diamondback Terrapins.

Lisa Scobel (lscobel@galvbay.org), Galveston Bay Foundation (GBF), Marine Debris Programs Manager – Lisa currently coordinates the marine debris program at GBF, including efforts for microplastic and Nurdle Patrol surveys. Her role will be to expand education and outreach of marine debris and contaminant bioaccumulation in coastal organisms.

Additional External Project Partners:

David Lee Haskins (dhaskins@eaest.com), E.A. Engineering, Science, and Technology (EAEST), Scientist IV, Water and Natural Resources – Dr. Haskins is an expert in evaluating contaminant bioaccumulation in herpetofauna from the southeastern U.S. His role will be to serve as expert consult for analyses of contaminants of interest. Dr. Haskins may also serve as an outside committee member for a M.S. graduate student funded through this project and provide expert training to project personnel.

Natalie Karouna (nkarouna@usgs.gov), U.S. Geological Survey's (USGS) Eastern Ecological Science Center, Research Ecologist – Dr. Karouna is the acting lead principal investigator on a concurrent USGS study evaluating PFAS contamination in Diamondback Terrapin populations along the Atlantic coast of the United States. Her role will be to facilitate data integration and sharing between the proposed study and ongoing USGS assessment. Dr. Karouna may also serve as an outside committee member for a M.S. graduate student funded through this project.

Additional Internal Project Partners:

Cindy Howard (howard@uhcl.edu); College of Science and Engineering, University of Houston-Clear Lake (UHCL), Professor – Dr. Howard is an expert in ecotoxicology and ecology. She will be serving as a topical expert and may participate as a graduate committee member for a M.S. graduate student funded through this project.

Ruaa Al Mezrakchi (almezrakchi@uhcl.edu); College of Science and Engineering, University of Houston-Clear Lake (UHCL), Assistant Professor of Mechanical Engineering – Dr. Al Mezrakchi is an expert in microplastic and nanoplastic analyses. Her role will be to serve as expert counsel and assist with laboratory analyses of samples collected as part of the proposed project. Dr. Al Mezrakchi may also serve as a committee member for an M.S. graduate student funded through this project.

TBD, College of Science and Engineering, University of Houston-Clear Lake (UHCL), M.S. Graduate Student – funds provided through this opportunity will support one graduate student in the M.S. in Environmental Science program through the UHCL College of Science and Engineering.

TBD, College of Science and Engineering, University of Houston-Clear Lake (UHCL), Undergraduate Researcher – funds provided through this opportunity may support one or more undergraduate researchers in Environmental Biology, Biology, or Engineering programs through the UHCL College of Science and Engineering.

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

For consideration by the M&R Subcommittee (Galveston Bay Plan Priority Four Actions): The proposed study supports or supplements multiple components of the Galveston Bay Plan. Specific to the Research and Monitoring (RES) Actions, we propose a collaborative inter-agency study between multiple institutions for applied research and monitoring by evaluating the effects of biological stressors (**RES-1**), geochemical stressors (**RES-2**), and physical stressors (**RES-3**) on terrapin and their associated prey items. Additionally, we propose to increase access to Galveston Bay ecosystem information (ACS Actions) through data-sharing and interagency collaboration (**e**) and dissemination of monitoring and research results to a range of audiences, including local communities (**ACS-2**).

For consideration by the PPE Subcommittee (Galveston Bay Plan Priority Three Actions): The proposed study supports or supplements multiple components of the Galveston Bay Plan. Specific to the Stakeholder and Partner Outreach (SPO) Actions, we propose a collaborative study between applied research and educational outreach experts to support stewardship programs and volunteer opportunities for stakeholders (**SPO-1**) and provide workshops or events related to sharing information about contaminant bioaccumulation from applied research with Galveston Bay stakeholders (**e**). Additionally, we propose to support and expand on existing programs in Galveston Bay to engage the public in a dialog about key issues related to longevity and emerging contaminant bioaccumulation (**PEA-1**), support existing programs in Galveston Bay that change behaviors and attitudes in Galveston Bay with a focus on adult education (**PEA-2**), and support existing K-12 Galveston Bay estuary-related curricular materials for regional use (**PEA-3**). All education and outreach support will use results of the applied research to guide information provided and shared with communities at all levels.

For consideration by all GBEP Subcommittees: To the best of our knowledge, no project focused on trophic accumulation of contaminants in Diamondback Terrapin has been funded by GBEP to date. The proposed study offers a unique opportunity for GBEP to support research related to a coastal, estuarine-dwelling Species of Greatest Conservation Need as well as a species which represents the "next-step" in contaminant bioaccumulation analyses for shoreline-dependent species. Terrapin serve as a sentinel species for accumulation of contaminants in larger and longer-lived vertebrates than those species previously studied through GBEP funds and dissemination of information related to the effects of contaminant accumulation is imperative for local communities to better understand the coastal environment. In addition to the subcommittee-specific Actions addressed above, below we note additional Galveston Bay Plan Actions addressed by the proposed study and indicate which proposed project objective (outlined in the Project Summary section of this document) addresses these Actions.

Plan Priority One: Ensure Safe Human and Aquatic Life Use

The proposed study addresses the following priorities for ensuring safe human and aquatic life use:

- Support nonpoint source education and outreach campaigns (**NPS-2**; proposed study objective 2)
- Improve regional contact recreation risk awareness (**e**; proposed study objective 2)

Plan Priority Two: Protect and Sustain Living Resources

While the proposed study does not directly address current Plan priorities for protection and sustainability of living resources, we provide the opportunity to examine contaminant effects to a species currently ignored by the Galveston Bay Plan's Species Conservation (SC) action items (**supplemental to SC-1**). We also provide the opportunity to evaluate contaminant effects on a group of organisms (herpetofauna) historically underrepresented in ecotoxicology research. Evaluation of contaminants in terrapin allows for baseline data compilation which can be related to living resources by examining the effects of persistent contaminants in terrapin and how they accumulate in organisms residing in their essential habitat (*Spartina* dominated saltmarshes).

Galveston Bay Plan Priority Area Actions Addressed:

M&R SUBCOMMITTEE Plan Priority 4: Inform Science-based Decision Making

RES-1 ☒	RES-2 ☒	RES-3 ☒	RES-4 ☐
RES-5 ☐	RES-6 ☐	RES-7 ☐	RES-8 ☐
ACS-1 ☒	ACS-2 ☒	ACS-3 ☐	

M&R SUBCOMMITTEE Plan Priority Area Actions Detail:

RES-1: Conduct biological stressor monitoring and research
We address concerns about biological stressors by evaluating the overall effects of contaminants on terrapin health. By evaluating contaminant levels in prey sources (*Littorina* snails and *Spartina* grasses), we aim to better understand the implications of contaminant loading in organisms consumed by terrapin.

RES-2: Conduct geochemical stressor monitoring and research
We address concerns about geochemical stressors by evaluating the trophic bioaccumulation and potential biomagnification of contaminants in terrapin from Galveston Bay.

RES-3: Conduct physical stressor monitoring and research
We address concerns about physical stressors by evaluating the level of and potential effects of contaminant bioaccumulation in terrapin from Galveston Bay. By determining the amount of accumulation observed in terrapin, we will compile baseline information important to our understanding of the overarching effects of these compounds.

ACS-1: Tracking ecosystem health indicators
We aim to aid in tracking ecosystem health indicators by providing data related to contaminant bioaccumulation and trophic interactions to the Galveston Bay Regional Monitoring Database and by supporting regional monitoring and data reporting efforts. We plan to coordinate with GBEP to develop ways in which data collected through the proposed study will be used in this capacity, as needed.

ACS-2: Access to monitoring and research data
We aim to support activities from ACS-2 by providing information and data relevant to the State of the Bay Symposia, the Galveston Bay Regional Monitoring Database, and the State of the Bay Report. We plan to coordinate with GBEP to develop ways in which data collected through the proposed study will be used in this capacity, as needed.

For all Plan Priority Area Actions, results will be presented at the State of the Bay Symposia. Data will be shared for inclusion on the GBEP website, the UHCL website, and other locations, as applicable. Public dissemination of the data will be done through development of a technical report that will be made publicly available, presentation at a regional professional conference, development of a white paper (if applicable and valid), and other avenues as opportunities arise. We also plan to coordinate with GBEP to develop ways in which data collected through the proposed study will be incorporated into the State of the Bay Report, as needed. Finally, results for this and subsequent Plan Priority Area Actions will be incorporated into education and outreach programs supported by the proposed project in order to inform local Galveston Bay communities about the accumulation and impacts of these contaminants.

Galveston Bay Plan Priority Area Actions Addressed:

PPE SUBCOMMITTEE Plan Priority 3: Engage Communities

SPO-1 ☒ SPO-2 ☒ SPO-3 ☐ SPO-4 ☐

PEA-1 ☒ PEA-2 ☒ PEA-3 ☒

PPE SUBCOMMITTEE Plan Priority Area Actions Detail:

SPO-1: Stewardship programs and volunteer opportunities

Utilizing volunteer programs coordinated by partners included in the proposed study, we aim to support existing programs by providing opportunities to assist with field work and data collection. Volunteers will be allowed to participate in field activities and assist with outreach events, as needed.

SPO-2: Workshops and events

Utilizing events or programs coordinated by partners included in the proposed study, we aim to share information about effects of contaminant accumulation in coastal habitats. Using results of the applied research to guide development of or inclusion of information in outreach and events, local communities may be engaged through hands-on or person-to-person interactions.

PEA-1: Key issue engagement

Accumulation and dispersion of long-term, persistent compounds, such as microplastics and PFAS, is an evolving issue for many communities in the Galveston Bay area. Through the proposed study, we aim to support ongoing awareness and education programs or campaigns in the region using results of the applied research to support development of curricula or program content.

PEA-2: Adult education

Through volunteer programs, Master Naturalist groups, university programs, and other potential outreach groups, we aim to support ongoing adult education efforts in communities surrounding Galveston Bay. As opportunities arise, we intend to disseminate information about terrapin and contaminant analyses using results of the applied research to support development of curricula or program content.

PEA-3: Kindergarten to 12th grade (K-12) education efforts

Through Galveston Bay Foundation's Education Department, we plan to support ongoing K-12 education efforts. This includes implementation and expansion of existing programs teaching topics such as trophic interactions, animal adaptations, and conservation efforts using results of the applied research to support development of program content.

For all Plan Priority Area Actions, results will be presented at the State of the Bay Symposia. Data will be shared for inclusion on the GBEP website, the UHCL website, and other locations, as applicable. Public dissemination of the data will be done through development of a technical report that will be made publicly available, presentation at a regional professional conference, development of a white paper (if applicable and valid), and other avenues as opportunities arise. We also plan to coordinate with GBEP to develop ways in which data collected through the proposed study will be incorporated into the State of the Bay Report, as needed. Finally, results for this and subsequent Plan Priority Area Actions will be incorporated into education and outreach programs supported by the proposed project in order to inform local Galveston Bay communities about the accumulation and impacts of these contaminants.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☒ NRU (Protect and Sustain Living Resources)
☒ WSQ (Ensure Safe Human and Aquatic Life Use)
☐ PPE (Engage Communities)

Other Subcommittee Detail:

If funds through the M&R subcommittee are limited or the following proposal is deemed better suited for another subcommittee, we would like to be considered by the other subcommittees. Though not as extensively addressed as in the M&R and PPE subcommittees, below are details specific to the WSQ and NRU committees that may warrant funding through these other groups.

Water and Sediment Quality (WSQ) Subcommittee

NPS-2: Support non-point source education and outreach campaigns
We aim to supplement this Action by supporting continued outreach and education efforts to a wide range of audiences. Efforts will be focused on terrapin in Galveston Bay, though data related to contaminant analyses resulting from the study will be incorporated into existing programs to increase awareness about non-point sources of contaminants.

PHA-2: Improve regional contact recreation risk awareness
Should the opportunity arise, we can supplement this Action by supporting continued outreach and education efforts related to persistent contaminant accumulation in coastal habitats and the organisms residing within these living shorelines. While terrapin are no longer a primary source of food for humans (though they once were), education about how contaminants accumulate and potentially bio-magnify in higher order vertebrates may serve to increase public awareness.

Natural Resource Uses (NRU) Subcommittee

SC-1: Native species management
While terrapin are not specifically addressed in the Galveston Bay Plan, they are recognized by the Texas Parks and Wildlife Department (TPWD) as a species of Greatest Conservation Need (TPWD 2020). Additionally, the International Union for the Conservation of Nature classifies terrapin as "Vulnerable" with observed population declines range-wide (https://www.iucnredlist.org/species/12695/507698). Data collected will be provided to TPWD to support native species management in Texas.

Other Plans Implemented:

In addition to Actions addressed in the Galveston Bay Plan, the proposed study also addresses aspects of other state and gulf-wide plans and strategies.

The proposed study addresses concerns and data deficiencies outlined in the Gulf of Mexico Diamondback Terrapin Conservation Action Plan developed by The Nature Conservancy and partnering Gulf states (including members from the proposed project team). Specifically, pollution and marine debris were listed as some of the highest-ranking threats Gulf-wide.

As part of the Texas Conservation Action Plan, terrapin are recognized as a Species of Greatest Conservation Need and resulting data from the proposed study will be provided to the Texas Parks and Wildlife Department for inclusion in their species status reviews and ongoing monitoring database (the Texas Natural Diversity Database).

Goals of the Gulf of Mexico Alliance's Water Resources and Wildlife and Fisheries Teams (outlined in the Gulf of Mexico Alliance's Governor's Action Plan) include multiple actions related to interagency collaborative efforts to prioritize research on threats to species of conservation need, with multiple studies focused on impacts to terrapin already funded Gulf-wide through different incentive programs.

M&R SUBCOMMITTEE SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

M&R Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☐ Meaningful and effective monitoring of existing, past, and new projects (NRU: especially species of concern, WSQ, PPE).

☐ Baseline assessments for large-scale, man-made changes to Galveston Bay.

☒ Assessment, exposure, and response to stressors, including **but not limited to**:

- Species of greatest conservation need;
- Contact recreation standards;
- Environmental parameters;
- Emerging contaminants; and
- Legacy contaminants.

M&R Subcommittee Priority Detail:

The proposed project directly addresses the "Assessment, exposure and response to stressors" priority by evaluating effects of bioaccumulation of emerging and legacy contaminants in a species of greatest conservation need. Legacy contaminants of interest that may be evaluated in the project include per- and polyfluoroalkyl substances (PFAS) and mercury or other heavy metals. Emerging contaminants of interest include microplastics, though should newly recognized contaminants of interest be identified as the project progresses (if funded), they may be considered for additional analyses as funding allows. Contaminant levels will be evaluated in terrapin, as well as two prey sources – *Spartina* grasses and *Littorina* snails. Contaminant loading in terrapin will be compared to health panel analyses (e.g., comprehensive blood chemistry [CBC], hematocrit, etc.) to elucidate correlations with loading amounts and effects on general health parameters.

In addition to legacy and emerging contaminants of interest, environmental parameters will be recorded during all applied research field sampling events and the effects of these environmental parameters may be extrapolated if data are applicable and robust enough for analyses. These parameters include, but may not be limited to, water temperature, air temperature, water clarity, salinity, conductivity, dissolved oxygen, pH, precipitation rates, etc.

Does the Project work with new, smaller communities/partnerships?

☐ Yes

☒ No

While the proposed study does not initially involve work with new or smaller communities and partnerships, the Galveston Bay Foundation Education Team continually assesses the need to facilitate new partnerships and offer K-12 curriculum throughout the Greater Houston-Galveston area. Should an opportunity arise during this project period to facilitate existing terrapin educational programming to new schools/programs, Galveston Bay Foundation staff will work to foster these partnerships for future expansion of terrapin education and outreach.

PPE SUBCOMMITTEE SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

PPE Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☒ Continuation or expansion of established education, outreach, or engagement programs.
☐ Partnering with new local entities or smaller NGOs to reach new communities.
☒ Connecting new audiences to existing/completed projects or the natural habitat.
☐ Opportunities for GBEP and partners to host workshops/networking opportunities for stakeholders on key topics.

PPE Subcommittee Priority Detail:

Continuation or expansion of established education, outreach, or engagement programs:
Galveston Bay Foundation (GBF) has conducted environmental education programs in various forms since 1987. In 2018, GBF's Classroom STEM Workshop program was expanded to include a variety of watershed and bay-related topics that are relevant to K-12 classrooms across the region (now titled the "Bay to Schools" program). Since this expansion, the workshops have reached over 11,000 students and are garnering so much interest that GBF requires additional staff and resources to accommodate school needs. Via current GBEP funding for the "Bay to Schools" program, GBF has been able to provide these workshops for free to all public schools, reaching over 3,700 students from January to July 2024 (compared to reaching 1,800 students within the same timeframe in 2023). This increase shows the importance of the program and encourages GBF to find additional funding to continue to offer the program for free. This funding will also be used to host community clean ups and nurdling event to provide hands on education about the effects of microplastics on the environment. These clean up events will also include information about local species and how they are impacted, such as the terrapin. With this funding GBF will be able to incorporate nurdling into existing water quality monitoring training workshops. This will provide volunteers with additional citizen science training and allow for a larger network of stakeholders to understand microplastics impacts on the environment. Presentation will also be hosted with the Texas Master Naturalist or other local interest groups about terrapin and the implications of this study.

Connecting new audiences to existing/completed projects or the natural habitat:
With funding, GBF will be able to promote Bay to Schools with new schools as well as incorporate new terrapin-related research and information into current workshops.

Does the Project work with new, smaller communities/partnerships?

☐ Yes
☒ No

While the proposed study does not initially involve work with new or smaller communities and partnerships, the Galveston Bay Foundation Education Team continually assesses the need to facilitate new partnerships and offer K-12 curriculum throughout the Greater Houston-Galveston area. Should an opportunity arise during this project period to facilitate existing terrapin educational programming to new schools/programs, Galveston Bay Foundation staff will work to foster these partnerships for future expansion of terrapin education and outreach.

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

This project aims to evaluate and inform researchers, conservation managers, and the general public about contaminant accumulation in a sentinel species (Diamondback Terrapin) in Galveston Bay. Our primary goal is to evaluate trophic bioaccumulation of longevity and emerging contaminants of concern in terrapin and their primary prey sources. Using results of applied research, we will expand education and outreach efforts about this Species of Greatest Conservation Need, including details about how contaminants accumulate across trophic levels.

Full Project Description (1,000 words or less):

Background Information

While inshore and nearshore coastal habitats face many issues globally, accumulation of anthropogenic contaminants is an ongoing concern. Estuaries represent transitional and depositional zones between freshwater and marine environments. Additionally, along the Gulf coast, estuaries represent areas of significant cultural and socioeconomic impact. Emerging and longevity contaminants of concern, such as microplastics (plastic particles < 5-mm diameter), per- or polyfluoroalkyl substances (PFAS), mercury, and heavy metals are filtered through estuarine marshes and shoreline habitats. Contaminant "sinks" or depositional areas may affect the habitat and wildlife in these communities, resulting in trickle-up socioeconomic impacts.

Increased accumulation of contaminants in shoreline habitats is especially concerning, as many organisms consumed by humans utilize these areas. Previous, recent, and ongoing contaminant studies have focused on contaminant accumulation in sediments, concentrations at differing depths within the water column, and accumulation in tissues of migrant species (e.g., birds) or specimen from open water habitats (e.g., fish and shellfish). Sentinel species can be used to model potential risk to humans, especially in regards to contaminant accumulation. Use of shoreline-dependent sentinel wildlife species aids humans in understanding the potential effects of contaminant accumulation and biomagnification where humans recreate and live.

In general, herpetofauna remain under-represented in ecotoxicology research. The Diamondback Terrapin (*Malaclemys terrapin*, "terrapin") is a semi-aquatic estuarine turtle which serves as an ideal candidate sentinel species for evaluating contaminant bioaccumulation in shoreline dwelling wildlife. Terrapin represent a transitional species between fully-aquatic and fully terrestrial organisms, are long-lived, reside in low-lying marshes that serve as primary filtration areas for anthropogenic contaminants, and are consumers of organisms which may harbor contaminants (e.g., *Littorina* snails and *Spartina* grasses). As a species of conservation concern, an understanding of how contaminants accumulate through terrapin and their prey is essential for understanding how these compounds may affect this long-lived species.

An important component of disseminating results of scientific research involves public education and outreach. Sharing information across a wide range of individuals can lead to increased participation and interest by local citizens, recreational enthusiasts, students, and public educators. Providing hands-on experiences for K-12 students to learn about estuarine animals, such as the Diamondback Terrapin, is integral in fostering awareness, appreciation, and eventual stewardship for the Galveston Bay ecosystem. Such experiences are strengthened when connected to current research data and practices.

Study Goals and Objectives

The proposed project aims to fill knowledge gaps related to contaminant bioaccumulation and biomagnification through a multi-faceted, interdisciplinary approach. Our **primary goal** is to evaluate baseline concentrations of contaminants of concern (e.g., microplastics, PFAS, mercury, heavy metals) in *Spartina* grasses (primary producer), *Littorina* snails (primary consumer), and terrapin (apex consumer) from Galveston Bay. Our **secondary goal** is to support existing and ongoing outreach and education efforts within shoreline communities by incorporating research-driven results into educational programs. Our **final goal** is to make data resulting from this study publicly available for use by researchers, students, educators, and professionals for future assessments of contaminants in estuarine habitats and communities.

General Project Methods

To address our goal of establishing baseline concentrations of contaminants of concerns, we will use tissue samples collected during previous and ongoing surveys to evaluate contaminant accumulation and potential amplification across three trophic levels within a shoreline community: 1) *Spartina* grasses, 2) *Littorina* snails, and 3) terrapin. Tissue samples (whole tissue or blood) will be analyzed for microplastics using a combination of organic digestion, phosphorescent staining, scanning electron microscope (SEM), energy dispersive x-ray spectrometry (EDS), or similar. Tissue samples will be analyzed for PFAS contaminants using established protocols by partners at the U.S. Geological Survey. Tissue samples will be analyzed for mercury contaminants by partners at E.A. Engineering, Science, and Technology using standardized procedures. Finally, tissue samples will be analyzed for heavy metal contaminants using standardized laboratory procedures developed by current UHCL Faculty.

Funding will also allow our partnering agency, the Galveston Bay Foundation, to increase capacity and amplify their fundamental classroom-based Bay to Schools STEM workshops. These workshops focus on the importance of estuaries and how seemingly vastly different habitats are intertwined, interconnected, and impact neighboring bays. These workshops are tailored to fit individual K-12th grade classroom needs and include topics such as importance and function of wetlands, trophic interaction, estuarine animal adaptations, climate change and coastal resiliency, environmental careers, and how to implement real change via environmental leadership skill-building. Results from contaminant analyses will be incorporated into existing and previously established Environmental STEM Education Programs as reasonable and feasible, and GBF's animal ambassador program.

Anticipated Outputs and Outcomes:

- Final report with summary of data and findings (may also result in an open-access peer-reviewed scientific publication)
- Publicly accessible and shareable scientific dataset related to microplastic and PFAS contaminant levels in *Spartina* grasses, *Littorina* snails, and terrapin
- Implementation of Classroom STEM Workshops in Galveston Bay Area Schools
- Funding for graduate students and Student Conservation Associate interns to assist with field surveys, data analyses, report development, and STEM programs

Latitude/Longitude (Optional):

See Location section below for general coordinates of survey areas. A map of proposed survey areas is also included in the Projects Map section.

Location:

As part of our long-term Texas Diamondback Terrapin Monitoring Program, the University of Houston-Clear Lake has identified four priority (e.g., "primary") locations of known Texas Diamondback Terrapin populations in West Galveston Bay:

- Green's Lake: N29° 16' 13.4538", W94° 59' 23.8236" (WGS84)
- South Deer Island: N29° 16' 21.5256", W94° 54' 42.2778" (WGS84)
- Sportsman's Marsh: N29° 15' 21.0990", W94° 56' 25.5084" (WGS84)
- Sweetwater Preserve: N29° 16' 3.9144", W94° 53' 22.5486" (WGS84)

In addition to these long-term monitoring locations, samples may be collected from terrapin in other (e.g., "secondary") regions of Galveston Bay, including but not limited to:

- Mud Island: N29° 4' 56.5680", W95° 8' 51.885" (WGS84)
- Halls Lake: N29° 11' 23.7690", W95° 6' 23.0538" (WGS84)
- Shell Island: N29° 27' 3.4740", W94° 55' 40.6740" (WGS84)
- Goat Island Complex: N29° 28' 8.0904", W94° 38' 47.4612" and N29° 30' 57.603", W94° 32' 21.1884" (WGS84)

See Figure 1 in Projects Map section below for distribution of potential survey areas.

Projects Map

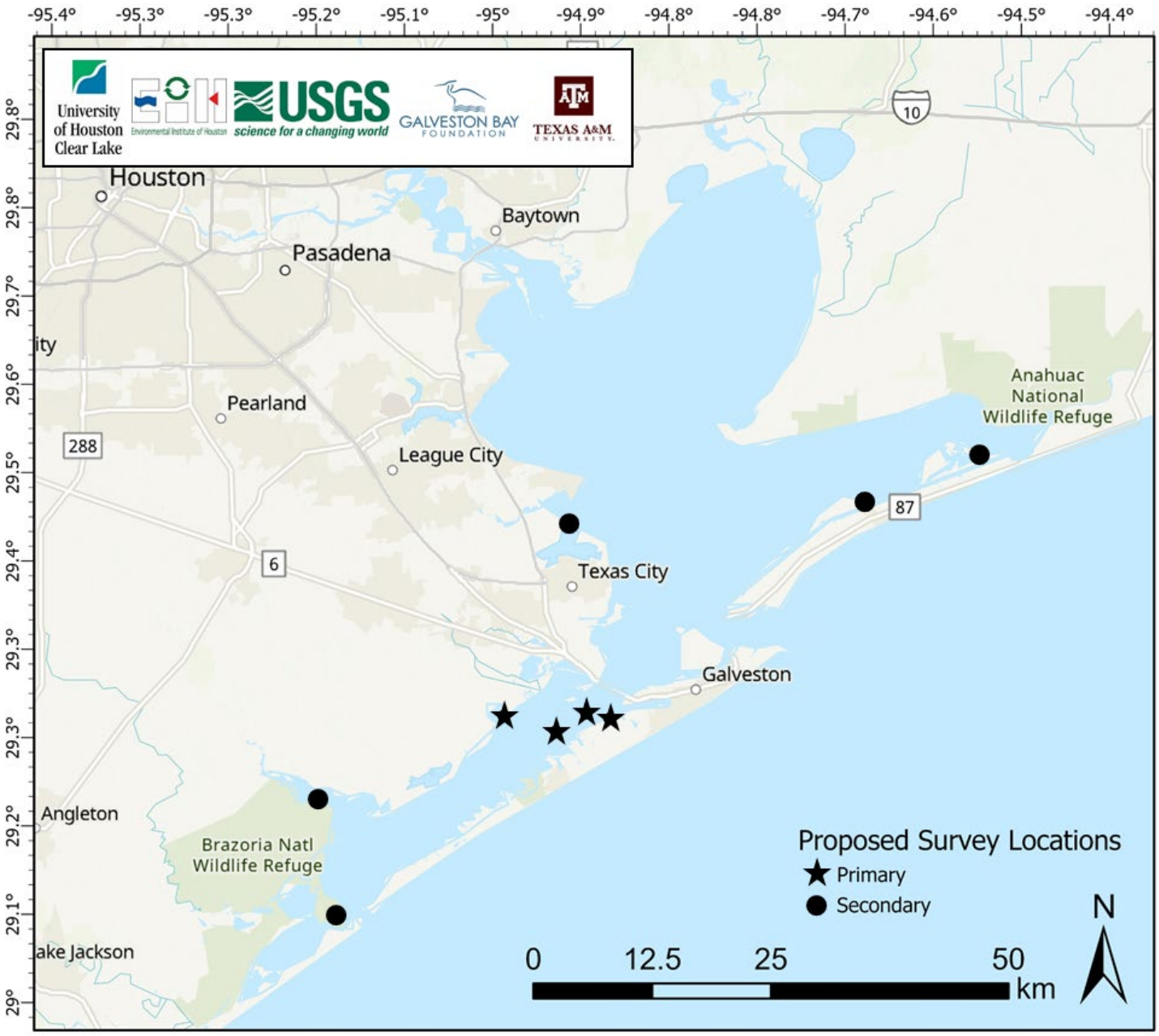


Figure 1 Map of Galveston Bay with primary and secondary proposed terrapin survey locations noted. Samples will be collected from portions of the Lower Galveston Bay Watershed, representative of the Implementation Location for all Action items to be addressed by the proposed study.

Supplemental Photos/Graphics (Optional):

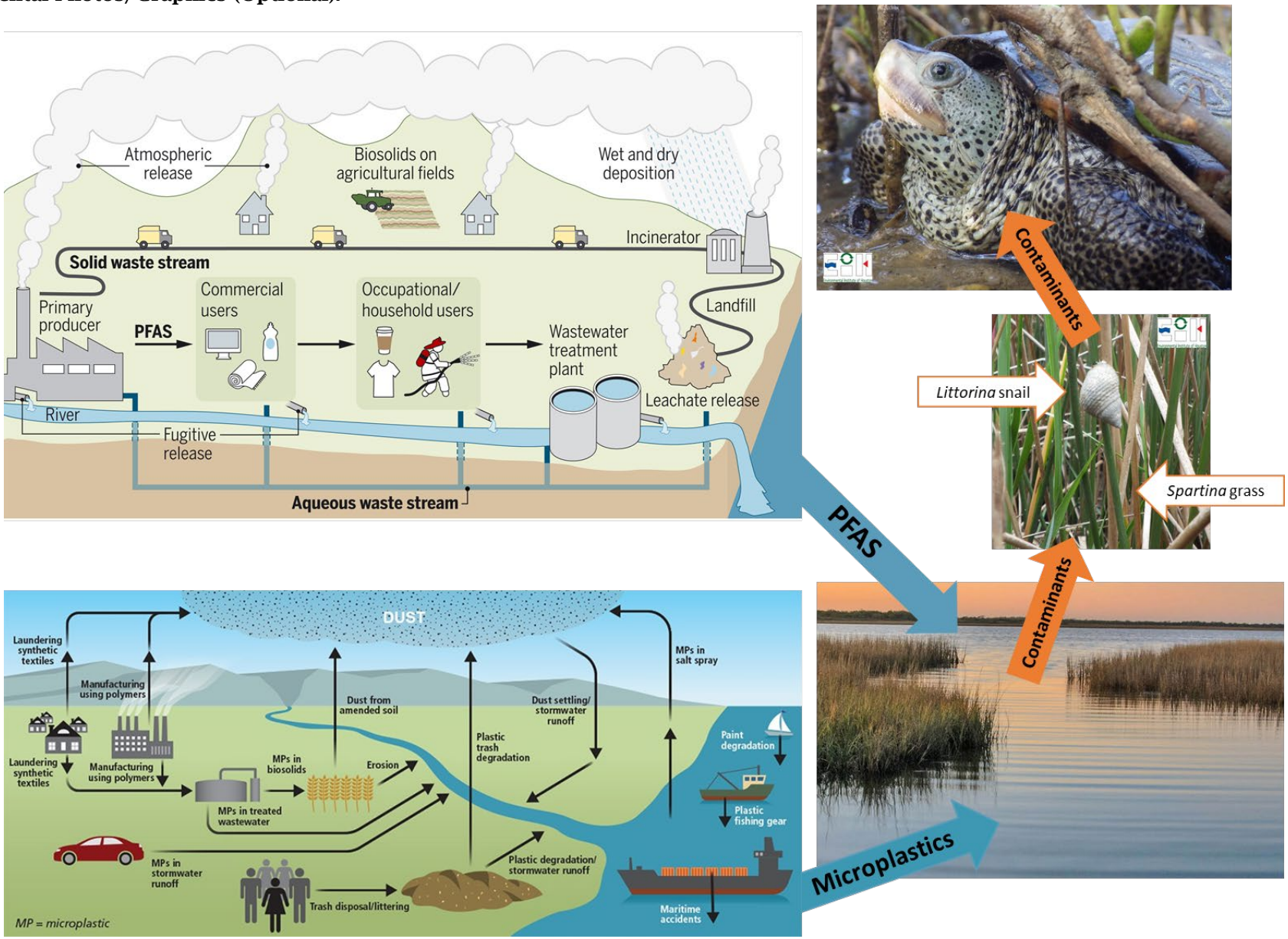


Figure 2 Examples of pathways for contaminant bioaccumulation in higher order vertebrates. Adapted from Yirka (2022; https://phys.org/news/2022-02-impact-pfas-containing-products-environment.html), Peters et al. (2021; https://www.haleyaldrich.com/resources/articles/microplastics-legislation-is-imminent-why-should-you-care/), and The Nature Conservancy (https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/clive-runnells-family-mad-island-marsh-preserve/).

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	Cost for Work to be Performed
Salary / Wages	$ 117,455.75
Fringe Benefits **(15% for students, 36% for staff;** averages to ~22.07%)[1]	$ 25,920.22
Travel	$ 8,530.00
Supplies	$ 17,780.00
Equipment	$ 0.00
Contractual	$ 49,999.26
Construction	$ 0.00
Other	$ 7,923.20
Total Direct Cost	**$ 227,608.43**
Indirect Costs	$ **35,777.35**
Total	**$ 263,385.78**

Indirect Cost Agreement

Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

[Insert Indirect Cost Agreement or Attach as an Appendix if Applicable]

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 16% of (check one):

☐ Salary and fringe benefits

☒ Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

☒ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining

[1] If fringe is not a single rate, please attach calculation or explanation as an appendix.

the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

[Description of costs associated with "Other" budget category.]

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.
-

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.

- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:
Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Galveston Bay Estuary Program
Fiscal 2026 NRU Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

Natural Resource Uses (NRU)

Project Name:

Informing ongoing management of environmental water transactions to preserve or enhance tidal bayou function in East Bay.

Project Previously Funded by GBEP? Yes ☐ No ✓

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

The primary applicant, Texas Water Trade (TWT), is a nonprofit with university partner, Texas A&M University-Corpus Christi (TAMU-CC) receiving a subaward.

Unique Entity ID (UEI) Number: DPE7D8R64GB6

AND:

VIN or Tax ID: 83-2740232

Contact Information:

Project Representative Name	Kevin De Santiago
Project Representative Phone	(361) 695-0418
Project Representative Email	desantiago@texaswatertrade.org

Amount Requested from GBEP:

$163,016

Federal ☐ State ☐ No Preference ✓

Is the project scalable? ✓

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$112,079.00
FY 2027 (09/01/2026-05/31/2027)	$ 50,937.00
FY 2028 (09/01/2027-05/31/2028)	$ 0.00
Total	$163,016.00

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

September 1, 2025 – August 31, 2027

Project Urgency:

The study will provide necessary guidance on adaptively managing environmental water transactions to preserve or enhance tidal bayou function in the Lower Galveston Bay Watershed in response to abnormally dry to drought conditions such as those experienced in the past couple years. This information is critical to ongoing projects in East Bay and its watershed.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

Total Project Cost: $233,016

Amount Requested from GBEP: $163,016
Leveraging Amount: Up to $70,000

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

Texas Water Trade is leveraging the costs of transacted water purchased from Chambers-Liberty Counties Navigation District totaling up to $70,000 of secured funds from a corporate partner.

Partners* and Their Roles:

TWT will manage the project, perform continuous water quality monitoring, and perform analysis and reporting. TWT will oversee the environmental water transactions related to this study.

Dr. Daniel Coffey from TAMU-CC will sample nekton communities and nutrients, manage and analyze data, and perform analysis and reporting (please see letter of commitment).

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

FWI-2 Freshwater Inflows Research and Management:

Though the Trinity and San Jacinto Rivers and Galveston Bay Basin and Bay Area Expert Science Team (BBEST) recognized the Trinity-San Jacinto Estuary as a sound ecological environment, climate variability, drought, and increasing freshwater demand have and will continue to impact this vulnerable ecosystem. Beyond agency regulation and other measures, Senate Bill (SB) 3 passed by the 87th legislature in 2007 lists market-based transactions as a possible approach in addressing gaps in environmental flow needs, but these practices have not lived up to their potential on the coast.

The goal of the Sustain Freshwater Inflows (FWI) Action Plan is to sustain freshwater inflows to Galveston Bay with supporting freshwater inflow research and management listed as an objective (FWI-2). The proposed study offers a unique opportunity to investigate the outcome of a semi-controlled field experiment, informing the adaptive management of transacted water to restore or enhance tidal bayou function, specifically habitat provision for nekton species such as blue crab, brown and white shrimp, gulf menhaden, etc. Water quality, nutrients, and primary production will be investigated as potential drivers of observed patterns in the nekton community response.

HC-3 Habitat Enhancement:

Due to relatively localized watersheds, tidal bayou streamflow is largely dependent on regional precipitation making their ecological function as a productive, low saline habitat exceptionally vulnerable to drought. The proposed study will restore and/or enhance function which will be largely dependent on rainfall conditions in 2026.

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 2: Protect and Sustain Living Resources

HC-1 ☐	HC-2 ☐	HC-3 ✓
SC-1 ☐	SC-2 ☐	
FWI-1 ☐	FWI-2 ✓	FWI-3 ☐

Plan Priority Area Actions Detail:

FWI-2 Freshwater Inflows Research and Management
Output: The study will collect data and share results and partner publications on freshwater inflows research and management on the GBEP website.
Performance measures: Study will help contribute to the following performance measures: 1) Number of research studies addressing the annual and seasonal freshwater inflow and freshwater management needs of Galveston Bay and 2) Number of GBEP website visits.

HC-3 Habitat Enhancement
Output: Funding of this study will help achieve GBEP's objective in leveraging funds to enhance existing degraded habitats. Additionally, study findings will be used to advocate for further funding of water transactions to benefit natural habitats and native species throughout the Lower Galveston Bay Watershed.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

✓ WSQ (Ensure Safe Human and Aquatic Life Use)
☐ PPE (Engage Communities)
✓ M&R (Inform Science-Based Decision Making)

Other Subcommittee Detail:

Plan Priorities:
Ensure Safe Human and Aquatic Life Use
The Plan and GBERAP recognize the relationship between water quantity and quality. Environmental water transactions are a novel practice to augment environmental flows to maintain estuarine productivity and potentially improve water quality. The findings of this study could establish managed freshwater releases as an effective tool in managing nonpoint source pollution in tidal streams and improving function **(NPS-3)**.

Inform Science-Based Decision Making
The study will focus on physical and biological stressors to better understand their impact on tidal bayou ecosystem function (habitat provision) in Galveston Bay (**RES-1/RES-3**).

Other Plans Implemented:

The 2023 Texas Coastal Resiliency Master Plan lists multiple Tier 1 projects in East Bay focusing on restoring and protecting wetlands and shoreline. While these projects are critical to rebuilding and promoting wetland resiliency, the water transactions proposed in the current study target a separate issue contributing to wetland vulnerability and enhancement of ecosystem function e.g., nutrient delivery, salinity moderation to support these objectives in unison. Additionally, the project will aid the GCJV's habitat objectives in the Texas Chenier Plain augmenting freshwater inflows to maintain brackish conditions in estuarine environments.

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

NRU Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☐ Habitat acquisition.

✓ Enhancement of existing or ongoing restoration/conservation efforts.
- Special emphasis on adaptive management for previously completed projects.

✓ Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- Special emphasis on projects addressing seagrasses, intertidal reef/shell hash, and benthic mapping.
- Any species monitoring projects should be a collaboration/partnership between subcommittees.

✓ Brings funding, work leverage, or multiple goal benefits to the subcommittee.

✓ Takes into consideration the results of the Estuary Resilience Action Plan.

✓ Project urgency: Project must be completed in next 24 months or opportunity is lost.

Subcommittee Priority Detail:

Texas Water Trade and partners will be implementing water transactions totaling volumes of 2,000 acre-feet (AF) annually to benefit East Bay and its watershed through 2033. These transactions are supported by an agreement with the Chambers-Liberty Counties Navigational District and corporate and foundational support. TWT is leveraging water costs to further understand the impact of this work on tidal bayou function, specifically habitat provision to nekton species (blue crab, gulf menhaden, white and brown shrimp, etc.). Study findings could spur additional for water transactions aimed at restoring or enhancing tidal bayou function which support various economically and ecologically important species. More importantly, the information is critical to aid in managing ongoing projects in East Bay.

In the Galveston Bay Estuary Resilience Action Plan, stakeholder experts identified increasing drought and warming air and water temperatures as current and future stressors for Galveston Bay. In summary, these stressors affected several GBEP priorities/goals as they apply to environmental flows by: 1) increasing evapotranspiration and straining freshwater supplies and inflows, 2) concentrating nutrients and degrading water quality, 3) reducing base flow of streams and stream function, and 4) increasing salinity beyond those favorable for estuarine species such as oysters. For all of these stressors, monitoring and research was cited as required measures to better understand impacts and how they could be mitigated.

Does the Project work with new, smaller communities/partnerships?

✓ Yes
☐ No

The project works with public and private landowners in rural communities, a regional water authority, corporate sponsor, and NGOs to implement environmental water transactions to benefit local economies and ecology and preserve cultural values.

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

The proposed study offers a unique opportunity to study the outcome of a semi-controlled experiment, informing the adaptive management of transacted water to restore or enhance tidal bayou function, specifically habitat provision for nekton species such as blue crab, brown and white shrimp, gulf menhaden, etc. Water quality, nutrients, and primary production will be investigated as potential drivers of observed patterns.

Full Project Description (1,000 words or less):

Tidal streams are unique estuarine systems where streamflow is influenced by tides giving rise to dynamic and productive environments that harbor numerous ecologically and economically important species. However, tidal streams across the Texas Coast have been the subject of multiple efforts to understand and assess water quality impairments which can impact human use and habitat provision (Neffinger et al. 2024). Quigg et al. (2009) suggested that tidal stream vulnerability to such impairments, specifically in the urbanized Dickinson Bayou Watershed, are magnified by their intrinsically low flushing rates which increases residence times of pollutants in the system. Tidal bayous, a type of tidal stream, in the Galveston Bay Watershed are highly dependent on regional rainfall and municipal and agricultural returns making them vulnerable to diminished freshwater inputs. To compound these issues, increased freshwater demand from growing populations, increased evapotranspiration from warming temperatures, and increased drought further strain water resources and environmental flows (GBERAP 2023), threatening these habitats and their ability to function.

Tidal bayous in the East Bay Watershed provide habitat for numerous economically and ecologically important species (Margo 2017) and distribute freshwater inflows to numerous upper estuarine habitats (i.e., wetlands, estuarine lakes, bays, etc.). The region is largely rural, distinguishing it from western urbanized watersheds in the greater Galveston Bay Watershed. Nonetheless, development in this region (e.g., agricultural levees, roadways, and canal dredging) has contributed to significant loss of freshwater and estuarine wetland habitats by restricting overland flow and increasing saltwater intrusion (Feagin et al. 2020).

Environmental water transactions are voluntary, market-based mechanisms that increase freshwater inputs to rivers, streams, estuaries, and other coastal environments. TWT, Galveston Bay Foundation (GBF), and The Nature Conservancy (TNC) have secured two multiyear agreements with the Chambers-Liberty Counties Navigation District (CLCND) to purchase and manage freshwater in support of wildlife and estuarine environments in Chambers County. In 2023, TWT, GBF, TNC, and Manomet (manomet.org) delivered

transacted water to public and private landowners creating over 2,000 acres of high quality habitat for migratory birds during the fall, winter, and spring migratory peaks. However, prolonged drought conditions revealed the need to be more responsive to the loss of tidal bayou function during dry periods by implementing more direct introductions of freshwater into these systems. To accomplish this, TWT is planning to allocate a portion of transacted water (200-500 AF) in the coming years to enhance tidal bayou function.

The proposed study offers a unique opportunity to study the outcome of a semi-controlled field experiment, informing the adaptive management of transacted water to restore and/or enhance tidal bayou function, specifically habitat provision for key nekton species, such as blue crab (*Callinectes sapidus*), brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*), Gulf menhaden (*Brevoortia patronus*), that directly or indirectly support ecological function and commercial, recreational, and tourism industries in Galveston Bay. To accomplish this, Dr. Coffey's lab at TAMU-CC will sample nekton communities using a before-after control-impact (BACI) experimental design. Specifically, nekton will be sampled for the two months before and after (4 months total) freshwater is released at four treatment (impact) sites in Onion Bayou and four control sites in an adjacent bayou (e.g., Easy Bay Bayou, TBD by field reconnaissance) with no additional freshwater releasement. Nekton will be collected using seines (10-m length × 4.6 m width, with 4.76-mm mesh) hauled parallel to each stream bank covering an area of 46 m^2. Three independent seine hauls (total area 138 m^2) will be taken at each of the eight sites, with two sampling events conducted each month totaling 192 samples over the entire 4-month period. Individual nekton >120 mm in length from each seine haul will be identified, photographed, and released, whereas smaller individuals will be preserved in 10% buffered formalin and processed in the laboratory. In the laboratory, fishes and crustaceans in each sample will be sorted, counted, identified to the lowest possible taxon (typically species), and measured to the nearest 0.1 mm. If more than 22 individuals of the same species were collected in a single haul, the largest, smallest, and 20 randomly sampled individuals will be measured.

At each sampling site, water quality (salinity, temperature, pH, dissolved oxygen), chlorophyll, and nutrient samples (ammonia nitrogen, total Kjeldahl nitrogen, total phosphorus, nitrate-nitrite, total organic carbon, and total suspended solids) will be collected during each sampling event to account for environmental variability and assess potential changes following freshwater releasement. Continuous salinity data will be recorded by TWT using sondes strategically positioned at a subset of impact and control sites to account for the dynamic conditions and variability in tidal bayous.

The overall **goal** of this project is to investigate the response of nekton communities to managed freshwater releases in tidal bayous. Specifically, this project will inform ongoing work by: 1) investigating the efficacy of introducing transacted water to enhance tidal bayou function by comparing nekton and water quality responses in control and impact areas, 2) characterizing the spatial and temporal extent of nekton response to managed freshwater releases, and 3) investigating the role of water quality and nutrient response in provision of habitat. In conjunction with adjacent wetland creation and associated bird use monitoring in the East Bay Watershed, this study will underscore the importance of adaptively managing transacted water to restore and enhance both freshwater and estuarine ecosystems on the Texas Coast.

Latitude/Longitude (Optional):

[degrees, minutes, and seconds format]

Location:

The study area will include four treatment (impact) sites in the tidal segments of Onion Bayou and four control sites in an adjacent tidal stream (e.g., East Bay Bayou or other TBD) in the East Bay Watershed.

Projects Map

Figure 1. Location of Onion Bayou for treatment (impact) site selection for freshwater releasement. Control sites in an adjacent tidal stream with no freshwater releasement will be selected following field reconnaissance.

Supplemental Photos/Graphics (Optional):

[Insert Here or Attach as an Appendix]

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	**Cost for Work to be Performed**
Salary / Wages	$9,410.20
Fringe Benefits **(13.65% & 28%)**[1]	$1,543.51
Travel	$4,945.00
Supplies	$875.01
Equipment	$0.00
Contractual	$132,963.00
Construction	$0.00
Other	$0.00
Total Direct Cost	**$149,736.72**
Indirect Costs	$13,278.86
Total	**$163,015.58**

Indirect Cost Agreement

Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

New OMB rules will take effect 10/2024 changing de minimis rate to 15% and subaward limit caps to $50K. De minimis rate and MTDC reflect new rules (MTDC includes salaries, fringe, travel, and up to the first $50,000 of each subaward).

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 15% of (check one):

☐ Salary and fringe benefits

✓ Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

☐ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A

[1] If fringe is not a single rate, please attach calculation or explanation as an appendix.

Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

✓ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

[Description of costs associated with "Other" budget category.]

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.
-

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.

- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:
Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Galveston Bay Estuary Program
Fiscal 2026 PPE Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

Public Participation and Education (PPE) (primary); NRU and M&R (considerations)

Project Name:

From Scat to Conservation: Community-based research of Galveston Bay's ghost wolves

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

Michigan Technological University (a public, higher-educational institution)

Unique Entity ID (UEI) Number: 38-6005955

AND:

VIN or Tax ID: 38-6006309

Contact Information:

Project Representative Name	Kristin Brzeski
Project Representative Phone	(262)844-5946
Project Representative Email	kbrzeski@mtu.edu

Amount Requested from GBEP:

$ 12,600

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$ 6,000.00
FY 2027 (09/01/2026-05/31/2027)	$ 6,000.00
FY 2028 (09/01/2027-05/31/2028)	$ 0.00
Total	$ 12,000.00

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

09/01/2025–05/31/2027

Project Urgency:

The urgency of sampling scat from the unique coyotes that live on Galveston Island and surrounding mainland is heightened by the rapid ongoing development in the area. Implementing community-based education and science integration is essential to involve residents in conservation efforts to seed and foster a collective responsibility for preserving biodiversity. This approach will enhance data collection, raise awareness, develop ways for engagement and community contribution, and ensure sustainable conservation practices across the bay.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

In total, this community engagement program is estimated to need $ 50,000 of financial support, for which we have secured funding for the genetic processing of noninvasive (scat) samples. In this proposal, we request funding from the GBEP PPE program to assist with the outreach and educational component of the project, including travel for in-person events, cost to develop educational material, and recruitment workshops.

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

We have secured $ 40,000 in donations earmarked to implement our community-based program of collecting noninvasive genetic samples and serve as the basis for the educational component of this proposed program. These donations include gifts from the 1) Foundation For The Carolinas and the 2) California Community Foundation.

Partners* and Their Roles:

Dr. Bridgett vonHoldt (not a subgrantee), Professor at Princeton University is an active, ongoing partner and collaborator in this research program. Her role will be to assist in the genetic component (e.g., DNA sequencing, analysis), where her partnership is integral for completing this proposed study. She will further assist with developing the educational and outreach materials for this proposal's success.

Further, we are developing a wonderful relationship with Artist Boat's Executive Director (Karla Klay) where we wish to keep finding ways in which we can collaborate and partner for this PPE to be successful on Galveston Island. Although not formally discussed with respect to this proposal, our interactions with Artist Boat have been amazing and we plan to keep building our relationship.

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

This proposal will build a new opportunity for volunteers (residents of communities) and students (enrolled in local high schools and colleges). The latter will be a result of new partnerships developed with local educational institutes such as TAMU Galveston campus. This program will thus be the foundation for connecting this proposal to two additional FY2026 Priority Area Actions of "Protect and Sustain Living Resources" (Species Conservation Acton Plan SC-1) and "Inform Science-based Decision Making" (Monitoring and Research Action Plan RES-1). As my collaborative team already has built a history of public engagement and science-based discussions for species and habitat conservation, we will continue to share our findings in educational sessions with local City Officials to build a dialogue regarding habitat preservation and wildlife conservation which stem from this proposed noninvasive community engagement program. We envision this program's infrastructure is easily implemented in other Texas coastal communities (or even nation-wide) to assist in raising awareness for nature-based solutions that help increase the resiliency of coastal habitats and communities in a time that climate change and coastal development are enhancing the erosion of critically important coastal ecosystems. This proposal will be highly accessible across all educational and student levels, from building experiential learning programs for K-12, college (2- and 4-year institutions), and continuing education options. In thinking more nationally for a geographically broader impact and inclusivity, the Galveston Bay region will serve as a role model for this innovative focus on science-based community engagement programs. As a professor, I will integrate this program into my undergraduate course at MTU (Conservation Genetics, FW4128). Experiential learning activities significantly enhance learning outcomes and retention, allowing student to apply theoretical concepts to real-world situations. It is well established that participation in citizen science leads to broader understanding, acceptance, and advocacy.

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 3: Engage Communities

SPO-1 ☒ SPO-2 ☒ SPO-3 ☒ SPO-4 ☒
PEA-1 ☒ PEA-2 ☒ PEA-3 ☒

Plan Priority Area Actions Detail:

This proposed program will directly and immediately engage communities who wish to help protect and preserve the coastal ecosystems of Galveston Bay. Further, given our ongoing relationships with local City Officials (**SPO-4**), we will also provide crucial information regarding science-based options for nature-based solutions regarding resilience to climate change. As such, we focus on **SPO-1** and **SPO-2** through the building of citizen science based experiential learning and research contributions. These events are to directly recruit community members and students to be trained and collect coyote scat, data on location and quality of the biomaterials, learn about the biological systems, and interact with the research team directly. Workshops and educational materials will bridge the relationship between science and conservation action/recommendations. We envision that such would be one of many foundational activities that contribute towards a regional or state-wide initiative (**SPO-3**) for coastal ecosystem preservation. This proposal has the central mission that concomitant with experiential learning for various communities, we also will educate program participants directly through 1) exhibits at the Chamber of Commerce and hopefully the East End Lagoon on Galveston Island (**PEA-1**) as well as recruit volunteers from continued (**PEA-2**) and primary educational school programs (**PEA-3**). This proposal will also make available educational materials (e.g., from my MTU course Conservation Genetics, FW4128 and other material generated in this effort) for any teacher to incorporate into their own course development.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☒ NRU (Protect and Sustain Living Resources)
☐ WSQ (Ensure Safe Human and Aquatic Life Use)
☒ M&R (Inform Science-Based Decision Making)

Other Subcommittee Detail:

Our proposal overlaps with the Natural Resource Uses subcommittee's priority area of "Native Species Management" (**SC-1**) that aims to 1) protect/sustain living resources, 2) engage communities (this proposal), and 3) provide information for science-based decisions with respect to native species. Galveston's coyotes (i.e., ghost wolves) are unique in that they thrive in coastal habitats on barrier islands and mainland coastal prairies. These coyotes carry a substantial amount of genetic ancestry from the critically endangered and endemic Red wolf. With the loss of their habitat (both through urban development and climate change) threatening their persistence, our proposal will work to include community members to conduct science that will provide significant suggestions for any future economic growth on Galveston Island as it pertains to natural spaces, corridors, and intact ecosystems. This proposal will inform us about where ghost wolves thrive, where they move to when disturbed or their territory is destroyed, and how to mitigate human-wildlife interactions by protecting or building natural spaces for wildlife. Results of this effort will be immediate while developing long-term efforts as an ongoing commitment as the region grows. We hope to contribute towards a conversation that will equally value natural spaces alongside economic goals. We already collaborate with the Galveston Island Humane Society, Artist Boat, the Galveston Bay Foundation, and the Texas Conservation Alliance on these such goals but without funding to realize them. Our proposed work will also overlap with monitoring biological stressors (**RES-1**) as it pertains to the life history traits of ghost wolves, which includes reproduction, survival, diet, and movement. When disturbances occur (inclement weather, habitat conversion, etc.), we will have the temporal data to understand immediate responses to such environmental stressors and match with life history responses (territory shifts, diet changes, compensatory litter size or lifespan changes, etc.).

Other Plans Implemented:

We do not have an active Plan connected to this proposal yet. We continue to be in communication with Galveston City Officials and work with the Texas Parks and Wildlife Department (Urban Wildlife/Ecology Program) to consider how wildlife and urban ecology research will contribute towards a larger initiative of preserving coastal habitat.

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

PPE Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☒ Continuation or expansion of established education, outreach, or engagement programs.
☒ Partnering with new local entities or smaller NGOs to reach new communities.
☒ Connecting new audiences to existing/completed projects or the natural habitat.
☒ Opportunities for GBEP and partners to host workshops/networking opportunities for stakeholders on key topics.

Subcommittee Priority Detail:

We recently launched our program called **Scat-Track: Canine Conservation through Citizen Science**, which is a community-based engagement program that utilizes *www.citsci.org*, a global NSF-funded platform for implementing citizen science research. This initiative includes a web platform and phone application for streamlined data collection and database management. Our Scat-Track project has already been shared with eight pilot test participants that has resulted in the collection of >130 scat samples since January 2024 (see map below). The program will have an associated website with detailed instructions for sample identification, collection, and safety protocols. This proposal aims to support the ongoing development of Scat-Track with three primary educational goals: 1) integrate Scat-Track data into 2- or 4-year undergraduate college curriculum, 2) improve community learning of canine ecology and conservation through dissemination of research results, and 3) expand participant recruitment across the Gulf coast (the historic red wolf range) to establish a long-term education and data collection mechanism. Citizen science projects have a well-vetted history of engaging the public in scientific data collection, effectively gathering extensive data across different habitats and regions while simultaneously educating participants about the science to which they are contributing. Indeed, the rediscovery of red wolf ancestry in Galveston coyotes was largely due to a citizen scientist who noticed the distinct appearance of local coyotes. This observation led to the emergence of our Galveston coyote research program and the many townhalls and outreach events that have followed, spurring the development of Scat-Track, which aims to reach a broad audience to collect data for long-term research objectives while providing educational content. This will be achieved through the *www.citsci.org* application and my associated Scat-Track website that is focused on data collection and data dissemination paired with educational content. I will continue to hold regular regional public presentations with my team and local partners to maintain a presence in our long-term study sites along the Texas coast. My team will also develop educational materials for dissemination to a diverse set of educational programs and educational centers for residents, visitors, and tourists. Scat-Track aims to positively impact views of coyote and wolves by sharing research and educational content through web-based and in-person methods. I will develop educational modules on canine ecology and conservation, incorporating videos, expert interviews, non-technical text, and interactive content.

Does the Project work with new, smaller communities/partnerships?

☒ Yes
☐ No

We have an active, ongoing collaboration with Bayou City Waterkeeper, Galveston Bay Foundation, Galveston Island Humane Society, Moore-Odom Foundation, Texas Conservation Alliance, Artist Boat, and the Texas Parks and Wildlife Department (Urban Wildlife/Ecology Program). We are developing the dialogue with other stakeholders (Houston Zoo, Moody Gardens, Texas Audubon, and Texas Master Naturalist Program Galveston Chapter) to find ways that build community engagement and educational opportunities for ecosystem preservation.

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

Our proposal aims to couple citizen science with novel noninvasive genomic tools to determine how environmental conditions preserve the endangered red wolf DNA found in coyotes (locally called Ghost Wolves) in the Galveston Bay ecosystem. We will build upon our previous work with the Galveston area coyotes to gain deeper insights into how ghost genetic red wolf ancestry influences both individual organisms and the broader ecosystem.

As part of the **Education Plan**, our proposed project will develop a community-based program for collecting noninvasive genetic data. This program will feature online portals for reporting results and interactive learning, which will also support classroom education. We have funding and ongoing efforts to establish the genetic methodologies and analyze data to answers question such as how many coyotes persist in the region, how much red wolf ancestry they carry in their genomes, what they eat, and what habitats they use.

We are requesting funding and working to establish partnerships in this proposal to continue developing educational materials for citizen science recruitment and outreach. This includes travel support, workshop development, and generating educational materials about Galveston Bay's 'Ghost Wolves.'

Full Project Description (1,000 words or less):

Successful citizen science can radically advance scientific and conservation goals. For instance, eBird, an open access platform for reporting bird observations, has contributed to hundreds of journals articles and impacted management of birds across the western hemisphere, while engaging more people in nature. Similarly, we previously worked with a regional river otter program in northern California that incorporated citizen art to fund scholarships and watershed restoration. Given the dual benefits of impacting community involvement in science while advance conservation and research goals, we are dedicated to growing and sustaining Scat-Track: Canine Conservation through Citizen Science. Scat-Track is designed to engage the public to noninvasively collect wild canine genetic material from scat across coastal Texas ecosystems. These data will be used to learn about the red wolf DNA that persists in coastal coyotes. Specifically, these results will determine: (1) if red wolf genetic material persists in small pockets or is widespread throughout coyotes of coastal Texas, (2) what they eat across seasons and landscapes, (3) how many individuals persist, (4) where they move and how they are impacted by stressors, such as development and extreme weather. While the broader research aims to understand the processes that maintain red wolf DNA in coastal Texas, here we are requesting **support to continue developing and implementing Scat-Track across Galveston Bay**.

To date, we have developed a simple and exportable protocol that allows citizen scientists to collect meaningful biomaterial for genetic analysis. The goal is to host online material with regularly updates and educational opportunities for volunteers, and the curious, to learn about ecology and conservation. Basic management involves working with teachers or students for daily operations, such as mailing sampling kits and contacting contributors, and periodically adding new education modules and updating the website with the latest information. Our roadmap for expanding participation is as follows. **1) Enhance and continue in-person and field efforts across the Gulf Coast coastal ecosystems with established partners**. We will support this strong participant base with specific educational materials, such as the Galveston Island ghost wolf research page. **2) Expand participant recruitment through field interactions, seminars, webinars, and classroom visits**. Current partners supporting this effort include Baylor University, Saint Mary's University, Audubon Delta, University of Louisiana Lafayette, Mississippi State University, Oklahoma State University, Arkansas State University, Red Wolf Coalition, and Princeton University. Academic partners will also introduce Scat-Track to undergraduate students. **3) Leverage social and public media to galvanize additional participants throughout the historic red wolf range**. The combined social media presence among current partners exceeds 8 million followers across platforms like Facebook, Instagram, YouTube, and X. This will grow with a sustained social media campaign, supported by MTU News and Media Relations department. Based on previous national media attention for our Galveston coyote work, including features in the New York Times, PBS docuseries EcoSense for Living and Chasing the Tide, ABC News, CNN, CBS News, and the Atlantic, I am confident Scat-Track will reach millions and become an institutionalized program, like eBird or the River Otter Project.

We are requesting funds to support the expansion of Scat-Track throughout Galveston Bay. This includes funds for in-person travel, recruitment workshops, and public presentations, as well as funds for developing and printing educational materials for the public and partner with organizations, and hosting recruitment events that support Scat-Track efforts.

Scat-Track aims to contribute towards **building a scientifically literate public**, which fosters a culture of curiosity and can drive progress in conservation and sustainability. We have the potential to reach millions of people through online material and engage hundreds in scat collection, impacting science literacy and perceptions of canines across the country, and specifically across coastal Texas. **Science communication** has the power to build trust in science through translating complex scientific concepts in understandable ways. We are dedicated to impactful science communication through public speaking and online content, utilizing best practices for framing a strong, clearly articulated conservation science message for town halls, podcasts, educational material, and webinars.

Scat-Track Program strives to be inclusive by working to provide information in multiple languages to ensure accessibility for diverse communities, specifically Spanish and to engage individuals from different backgrounds, fostering a more representative participant group. We will continue to work with or develop new partnerships with the following groups to boost community engagement and educational opportunities: Bayou City Waterkeeper, Galveston Bay Foundation, Galveston Island Human Society, Houston Zoo, Moody Gardens, Moore-Odom Foundation, Texas Audubon, Texas Conservation Alliance, Texas Master Naturalist Program Galveston Chapter, Texas Parks and Wildlife Department (TPWD Urban Wildlife/Ecology Program), and Artist Boat.

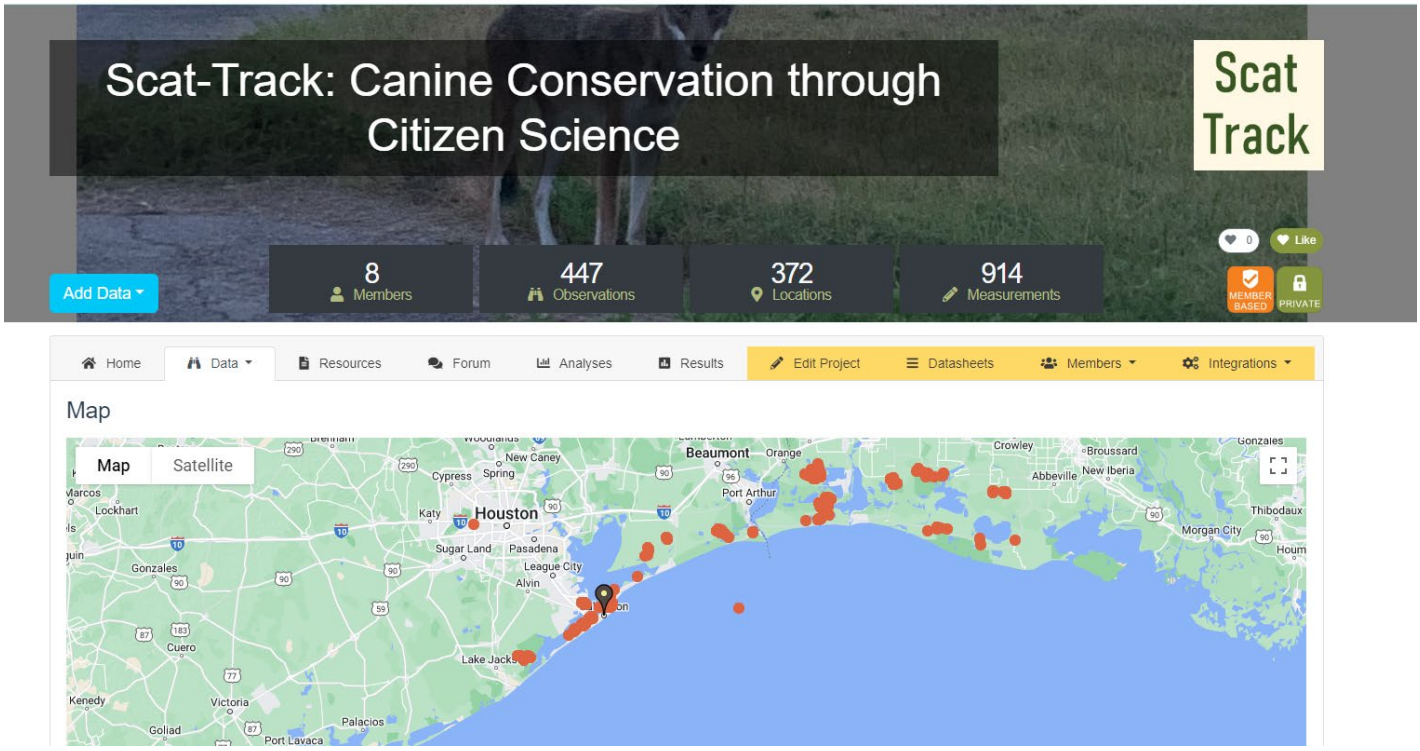
Latitude/Longitude (Optional):

Latitude: 29°16'45" N
Longitude: 94°49'33" W

Location:

Galveston Island and any community on coastal Galveston Bay

Projects Map



Map of locations of current scat samples and contributors from Scat-Track. Through this project, where we are proposing to develop educational material to share with partners and our extensive network, we aim to expand and enhance both science data collection and biodiversity education.

Supplemental Photos/Graphics (Optional):

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	**Cost for Work to be Performed**
Salary / Wages	$0.00
Fringe Benefits **(##%)**[1]	$0.00
Travel	$3,500
Supplies	$4,000
Equipment	$0.00
Contractual	$2,500
Construction	$0.00
Other	$0.00
Total Direct Cost	**$10,000.00**
Indirect Costs	$2,600.00
Total	**$ 12,600.00**

Indirect Cost Agreement

Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 26% of (check one):

☐ Salary and fringe benefits

☐ Modified total direct costs

☒ Other direct costs base

If other direct cost base, identify: Off campus education project. 26%

This rate is less than or equal to (check one):

☒ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

[1] If fringe is not a single rate, please attach calculation or explanation as an appendix.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

[Description of costs associated with "Other" budget category.]

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:

Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Galveston Bay Estuary Program
Fiscal 2026 M&R Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

M&R

Project Name:

Development of a Comprehensive Regional Wetlands Database and Economic Valuation of Ecosystem Services

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

☐ Federal, State, or Local Government ☒ Council of Government ☐ Public ISDs or Universities
☐ Nonprofit ☐ Other*

Houston-Galveston Area Council

Unique Entity ID (UEI) Number: AND: VZFJDZCKG8C7

VIN or Tax ID:

1-741557575-6

Contact Information:

Project Representative Name	Thushara Ranatunga, PhD
Project Representative Phone	832-681-2551
Project Representative Email	Thushara.Ranatunga@h-gac.com

Amount Requested from GBEP:

$200,000

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$103,290.57
FY 2027 (09/01/2026-05/31/2027)	$96,709.43
FY 2028 (09/01/2027-05/31/2028)	$0.00
Total	$0.00

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

2 years

Project Urgency:

The importance of this project is underscored by several critical factors. Firstly, the wetlands in the Houston-Galveston region, including the Lower Galveston Bay watershed, have not been updated or accurately classified in detail in a significant amount of time for analysis (Jacob and Lopez, 2005). This has resulted in outdated data, which have hindered effective management and conservation efforts. Recent advancements in artificial intelligence, particularly deep learning, combined with the Houston-Galveston Area Council's initiative to collect region-wide high-resolution aerial images and LiDAR point cloud data in 2024, and earth observation satellite imageries including SMAP and LandSat, provide an unprecedented opportunity to create a state-of-the-art wetland geospatial database and inventory. This will significantly enhance the quality and usefulness of the information, allowing for more effective conservation strategies. Secondly, comprehending the ecosystem services provided by wetlands is vital. These ecosystems play a crucial role in air purification, water filtration and cooling, nutrient cycling, soil conservation and generation, crop pollination, climate regulation, carbon sequestration, storm and flood surge protection, and hydrological maintenance. Assessing the economic value of these services is essential for making informed decisions and garnering public support for conservation and sustainability efforts. This project aims to address these urgent needs, leveraging cutting-edge technology to safeguard and optimize the invaluable benefits that wetlands provide.

Reference: Jacob, J.S. and Lopez, R. Wetland Loss – Lower Galveston Bay Watershed 1992 – 2002, A rapid assessment method using GIS and Aerial Photography. Contract Report No 582-3-53336 for the Galveston Bay Estuary Program.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

$1,071,000

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

2024 acquired Remote Sensing data and computing resources will be available at no-cost for this project. Their total cost for the Lower Galveston Bay Watershed area is $871K.

- 2024 Lidar point cloud: $800K
- 2024 Natural color and Color Infrared Aerial imagery: $49K
- Computing resources and GIS and Remote Sensing data analysis software packages - $22K

Partners* and Their Roles:

N/A

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

This project directly aligns with the **Evaluate Ecosystem Services and Determine Economic Valuation** priority of the RES action plan and the **Provide Access to Monitoring and Research Data** priority of the ACS action plan. It offers a most recent, comprehensive, high resolution, and detailed classification of region wide wetlands inventory useful for analysis, which will serve as the foundation for evaluating ecosystem services and determining their economic valuation.

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 4: Inform Science-based Decision Making

RES-1 ☐	RES-2 ☐	RES-3 ☐	RES-4 ☐
RES-5 ☐	RES-6 ☐	RES-7 ☒	RES-8 ☐
ACS-1 ☐	ACS-2 ☒	ACS-3 ☐	

Plan Priority Area Actions Detail:

Implementation of RES-7 and ACS-2

RES-7: Evaluate Ecosystem Services and Determine Economic Valuation

- **Objective**: Conduct research on ecosystem services and determine an economic valuation of bay resources
- **Implementation**: The project will present the findings related to wetland classification, identified ecosystem services, and their economic valuation. This will help disseminate valuable research outcomes to stakeholders and the public. Additionally, the updated wetland inventory maps and economic valuation data from the project can be shared on the GBEP website, making this information accessible to stakeholders and the public. The results of the wetland classification and economic valuation studies can also be integrated into the State of the Bay Report. This ensures that the report includes the latest research and data, enhancing its relevance and impact.

ACS-2: Providing Access to Monitoring and Research Data (ACS-2):

- **Objective**: Expand the dissemination of easy-to-access Galveston Bay monitoring and research data.
- **Implementation**: The project will make the newly acquired wetland data readily accessible through the Regional Monitoring Database and other outreach tools. The high-resolution maps and classification data will be shared with GBEP partners, decision-makers, and the public, ensuring that the latest information is available for informed decision-making.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☐ NRU (Protect and Sustain Living Resources)
☒ WSQ (Ensure Safe Human and Aquatic Life Use)
☒ PPE (Engage Communities)

Other Subcommittee Detail:

The results of this project will help provide valuable insights for stakeholders, local governments, non-profits, and others interested in wetlands, wetland functions, and their benefits to water quality, wildlife, and greenspace preservation. A direct accounting will assist the NRU Action Plan: Support Habitat Conservation by updating the location and trends of all wetland types within the GBEP watershed, informing decision-makers and resource managers about critical risks to migratory and resident populations of waterfowl and other wildlife. The project will also benefit WSQ Action Plans by supporting NPS-1 implementation goals, as the website will enable stakeholders to conduct detailed watershed-level analyses, enhancing implementation efforts. Natural wetlands are known to act as biological filters (Forbes, 2010) and are natural carbon sinks. The economic evaluation trends of such wetlands will support NPS-2: Support Nonpoint Source Education and Outreach Campaigns, by providing information about the impact of different non-point source stressors and build an economic case for sustaining and restoring these habitats. The project will include at least one workshop and one training event to share the results and make the data and methods more accessible, in support of SPO-2 (Workshops and Events) and SPO-4 (Local Government Outreach).

Forbes, Margaret, et. Al, 2010, Freshwater Wetland Functional Assessment Study. GBEP Final Report – 582-7-77820. May 2010. https://gbep.texas.gov/completed-projects/.

Other Plans Implemented:

Project results can be used by local and regional stakeholders implementing watershed protection plans (WPP) and Total Maximum Daily Load (TMDL) implementation plans, (e.g., Upper Gulf Coast Oyster Waters TMDL, Double Bayou WPP, Clear Creek WPP, Bacteria Implementation Group, Highland and Marsh Bayou WPP).

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

M&R Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☐ Meaningful and effective monitoring of existing, past, and new projects (NRU: especially species of concern, WSQ, PPE).
☐ Baseline assessments for large-scale, man-made changes to Galveston Bay.
☒ Assessment, exposure, and response to stressors, including **but not limited to**:
- Species of greatest conservation need;
- Contact recreation standards;
- Environmental parameters;
- Emerging contaminants; and
- Legacy contaminants.

Subcommittee Priority Detail:

The project addresses the assessment, exposure, and response to environmental stressors through creation of detailed, high-resolution, and up-to-date wetlands inventory, and economic valuation of key ecosystem services. It focuses on ecosystem services such as water quality, air quality, water supply, stormwater regulation/flood protection/erosion control, climate regulation/carbon sequestration, and others where different stressors related to the services are evaluated. Additionally, the project will provide information for management and conservation strategies based on these economic valuations, supporting informed decision-making, and promoting sustainable resource allocation. By raising public awareness through the GBEP website, white papers, and presentations, the project can garner public support for wetland conservation initiatives and influence policy changes, thereby enhancing ecosystem services and promoting effective estuary preservation efforts.

Does the Project work with new, smaller communities/partnerships?

☐ Yes

☒ No

[TBD.]

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

This project aims to address the important and urgent need for updated wetland information using advanced AI technologies, updated geospatial data including LiDAR, Aerial and Satellite imageries. It will deliver a comprehensive inventory of detailed classified wetlands and economic evaluation of various ecosystems services within the identified wetlands. Addressing and evaluating key services will ensure the continued provision of critical ecosystem services and enhance the economic valuation of wetlands, contributing to the sustainable management of the Galveston Bay Estuary Program area. The findings will be disseminated through the GBEP website, interactive geospatial web tools, white papers, and public presentations to raise awareness and influence policy for effective estuary preservation.

Full Project Description (1,000 words or less):

Overview

Wetlands in the Lower Galveston Bay area play a critical role in maintaining ecological balance and providing numerous benefits, yet their current classification and accuracy is outdated and requires significant enhancement. This project aims to address these issues by leveraging advanced artificial intelligence (AI) techniques and high-resolution aerial imagery, alongside LiDAR data and satellite imagery, to update and classify wetlands accurately and in greater detail. Additionally, the project will evaluate the economic value of ecosystem services provided by these wetlands, thereby informing decision-making, and promoting sustainable management practices.

Outdated Wetlands Classification

The existing available wetlands data for the Galveston Bay Watershed area consists of limited classifications with varying resolutions from multiple sources including GBEP funded wetland delineation project completed in 2005. This information is outdated, of insufficient resolution and in need of significant updates to reflect current environmental conditions. The current limitations hinder effective management and conservation efforts of these crucial habitats. Wetlands play a vital role in providing essential ecosystem services, such as water filtration, flood and surge protection, carbon sequestration, and serving as habitats for numerous species. Without accurate and up-to-date data, it becomes challenging to implement effective conservation strategies and monitor ecological changes over time. Therefore, updating wetland delineations and classifications is essential to preserve these ecosystems and maintain their valuable services.

High-Resolution Aerial/Satellite Images and LiDAR

The use of high-resolution aerial images, LIDAR data, and Satellite imagery significantly enhances the ability to identify and classify wetlands accurately. High-resolution imagery provides detailed visual true-color and color-infrared information, allowing for the detection of fine-scale features within wetland areas. LiDAR offers precise elevation data and vegetation density information, which is crucial for understanding the topography, hydrography, and environmental health of wetlands. Satellite imageries such as Soil Moisture Active Passive (SMAP), LandSat are critical for assessing variation in surface moisture content, vegetation, and other land characteristics. Combining these technologies enables a comprehensive analysis of wetland characteristics, leading to more accurate classification and better-informed management decisions. The H-GAC's collection of high-resolution aerial images and LIDAR data in early 2024 presents a timely opportunity to apply these advanced datasets and techniques.

Utilizing AI and Deep Learning for Wetland Classification

Recent advancements in AI and deep learning algorithms offer powerful tools for updating and classifying wetlands. Techniques like the U-Net architecture have proven highly effective in image segmentation tasks, making them ideal for identifying and classifying wetland areas from geospatial data. Deep learning algorithms can process large datasets quickly and accurately, identifying subtle features that traditional methods might miss. This capability is especially valuable for updating the classification of wetlands, providing precise and reliable data as the basis for informed conservation and management efforts.

Importance of Understanding Economic Value of Ecosystem Services

Wetlands offer numerous ecosystem benefits/services that are vital to both, the environmental health and human well-being, as well as the protection and sustainability of infrastructure assets and investments. These services include water quality improvement, air quality enhancement, water supply regulation, stormwater management, flood and surge protection, erosion control, and climate regulation through carbon sequestration. Understanding the economic value of these services is vital for informed decision-making and garnering public support for conservation initiatives. By quantifying the economic benefits that wetlands offer, their significance can be underscored, promoting investment in their preservation and sustainable management.

Conducting Economic Analysis of Ecosystem Services within Wetlands

Evaluating the economic value of ecosystem services within wetlands requires detailed analysis and robust methodologies. This project will use the InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) model, a widely recognized tool for assessing the value of natural resources. The InVEST model allows for the quantification of ecosystem services in monetary terms, providing a clear picture of the economic benefits derived from wetlands. Additionally, the project will incorporate literature-based valuation methods previously used by H-GAC. By conducting these analyses, the project will generate valuable data that can inform policy decisions, resource allocation, and public awareness campaigns.

Project Methodology
Deep Learning Algorithms: The project will utilize deep learning algorithms, particularly the U-Net architecture, to analyze high-resolution Aerial and Satellite images, and LIDAR data for wetland identification and classification. U-Net's ability to perform precise image segmentation makes it ideal for recognizing various wetland features, enabling accurate classification and mapping of wetland areas and ecosystems.
Economic Evaluation: For the economic evaluation of ecosystem services, the project will employ the InVEST model alongside literature-based valuation methods previously used by H-GAC. InVEST models will be used to assess the economic value of services such as water filtration, flood / surge protection, carbon sequestration, and habitat provision.

Expected Outcomes
- Updated Wetland Classification:
  - Accurate, up-to-date, and detailed maps of the wetlands inventory in the Lower Galveston Bay area, classified using advanced AI techniques and high-resolution remote sensing data. The output is expected to include all major wetlands classes and detail classes such as Salt Marshes, Brackish Marshes, Mangroves, Fresh Marshes, and Forested Wetlands.
- Economic Valuation:
  - Comprehensive economic valuation of key ecosystem services provided by wetlands, using the InVEST model and valuation methods used by H-GAC.
- Informed Decision-Making:
  - Enhanced data to support informed decision-making and policy development for wetland conservation and management.
- Public Awareness:
  - Increased public awareness of the importance of wetlands and the economic value of their ecosystem services, disseminating through the GBEP website, interactive geospatial web tools, white papers, and public presentations to raise awareness promoting support for conservation efforts.

Conclusion
This project addresses the urgent need to update wetland delineation and classification in the Lower Galveston Bay Watershed using advanced AI and deep learning algorithms. By integrating up-to-date high-resolution aerial imagery, LIDAR data, and Satellite imagery, the project will provide accurate and detailed maps of wetland areas. Additionally, the economic valuation of ecosystem services using the InVEST model along with H-GAC's previously utilized ecosystem valuation methods, will underscore the substantial benefits provided by wetlands, supporting informed decision-making, and promoting sustainable management practices. Through these efforts, the project aims to enhance wetland conservation and ensure the continued and sustained provision of vital ecosystem services.

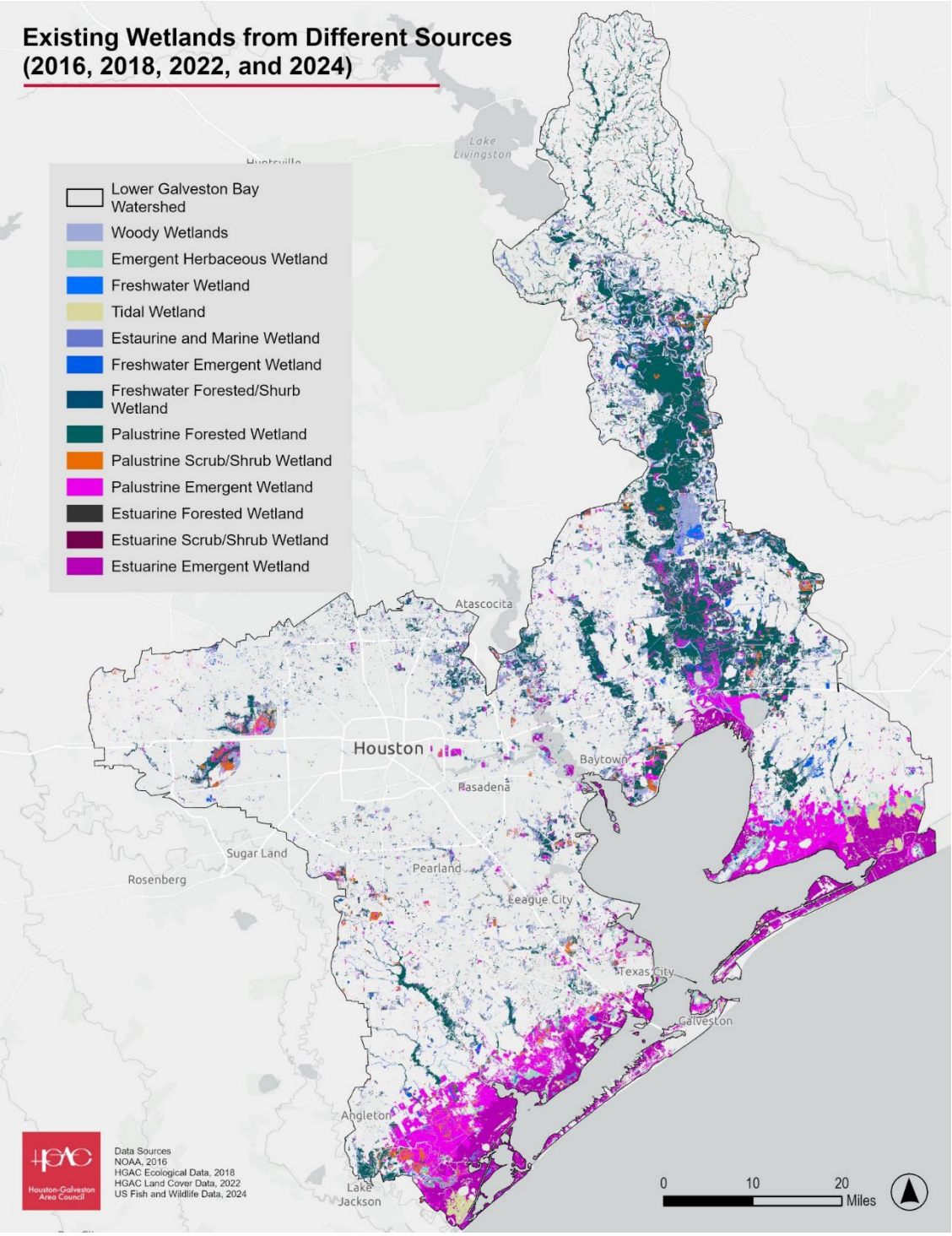
Latitude/Longitude (Optional):

29°40'47.5"N 94°58'22.3"W

Location:

Galveston Bay Estuary Program Watershed area

Projects Map



Supplemental Photos/Graphics (Optional):

[Insert Here or Attach as an Appendix]

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	**Cost for Work to be Performed**
Salary / Wages	$97,807.06
Fringe Benefits (46.27%)	$45,255.33
Travel	$5,821.22
Supplies	$0.00
Equipment	$0.00
Contractual	$0.00
Construction	$0.00
Other	$32,060.48
Total Direct Cost	**$0.00**
Indirect Costs **(13.32%)**	$19,055.91
Total	**$200,000.00**

***Other:** Staff-hour based allocations for facility rental, GIS/Data network services, and internal services.

Indirect Cost Agreement
Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

[Insert Indirect Cost Agreement or Attach as an Appendix if Applicable]

Indirect Cost Reimbursable Rate. The reimbursable rate (See Appendix A) for this Contract is 13.32% of (check one):

☒ Salary and fringe benefits

☐ Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

☒ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

[Description of costs associated with "Other" budget category.]

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.
-

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:

Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Appendix A. 2024 Indirect Rate Agreement

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

COGNIZANT AGENCY
NEGOTIATION AGREEMENT

Houston-Galveston Area Council
Houston, Texas

Date: February 22, 2024
Filing Ref: March 8, 2023

The indirect cost rates contained herein are for use on grants and contracts with the Federal Government to which Office of Management and Budget 2 CFR 200 applies, subject to the limitations contained in the Circular and in Section II, A below.

SECTION I: RATES

Type	Effective Period Start	End	Rate	Base	Location	Applicable To
FIXED						
Indirect	1/1/2024	12/31/2024	13.32%	(a)	All	All Programs
Fringe Benefit Rate	1/1/2024	12/31/2024	46.27%	(b)	All	All Programs

Basis for Application

(a) Direct salaries and wages, including applicable fringe benefit costs.
(b) Direct chargeable salaries and wages. The fringe benefit rate should not be applied to any release time (vacation, sick, holiday, and other paid absences).

Treatment of Fringe Benefits: Fringe benefits and release time (vacation, sick, holiday, and other paid absences) applicable to direct salaries and wages are included in the fringe benefit rate cited above.

SECTION II: GENERAL

A. LIMITATIONS: The rates in this Agreement are subject to any statutory and administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the department/agency or allocated to the department/agency by an approved cost allocation plan were included in the indirect cost pool as finally accepted; such costs are legal obligations of the department/agency and are allowable under governing cost principles; (2) The same costs that have been treated as indirect costs have not been claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the department/agency which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. CHANGES. The fixed rate contained in this agreement is based on the organizational structure and the accounting system in effect at the time the proposal was submitted. Changes in the organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rate in this agreement, require the prior approval of the authorized representative of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowances.

C. THE FIXED RATE contained in this agreement is based on an estimate of the cost which will be incurred during the period for which the rate applies. When the actual costs for such a period have been determined, an adjustment will be made in the negotiation following such determination to compensate for the difference between the cost used to establish the fixed rate and that which would have been used were the actual costs known at the time.

D. NOTIFICATION TO FEDERAL AGENCIES: Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

E. SPECIAL REMARKS: Please confirm your acceptance of the terms of the indirect cost rate agreement by signing and returning this letter to me. Please retain a copy for your records.

SECTION III: ACCEPTANCE

The undersigned official warrants that he/she has the proper authority to execute this agreement on the behalf of the State Agency:

Christina Ordonez-Campos, CPA Digitally signed by Christina Ordonez-Campos, CPA Date: 2024.02.23 08:03:20 -06'00'

(Signature)

Christina Ordóñez-Campos, CPA

(Name)

Chief Financial Officer

(Title)

Houston Galveston Area Council

(Agency)

02/23/2024

(Date)

By the Cognizant Federal Agency:

JACQUELINE SMITH Digitally signed by JACQUELINE SMITH Date: 2024.02.22 16:19:03 -05'00'

(Signature)

National Policy, Training and Compliance Division
U.S. Environmental Protection Agency

Negotiated by: Jacqueline Smith
Telephone: (202) 564-5055

Galveston Bay Estuary Program
Fiscal 2026 M&R Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

M&R

Project Name:

Ecosystem effects of the Pelican Island Bridge Collision and Vacuum Gas Oil Spill in Galveston Bay

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

☐ Federal, State, or Local Government ☐ Council of Government ☒ Public ISDs or Universities
☐ Nonprofit ☐ Other*

Texas A&M University at Galveston (Public University)

Unique Entity ID (UEI) Number: **AND:** G8Y3L8JV2588

VIN or Tax ID:

EIN: 742125225

Contact Information:

Project Representative Name	Dr. David Hala
Project Representative Phone	409-795-8072
Project Representative Email	halad@tamug.edu

Amount Requested from GBEP:

$103,479

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$46,881
FY 2027 (09/01/2026-08/31/2027)	$56,598
FY 2028 (09/01/2027-05/31/2028)	$0.00
Total	$103,479

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

9/1/2025 – 8/31/2027 (2 years)

Project Urgency:

The recent barge collision (5/15/2024) with the Pelican Island bridge in Galveston made national news and resulted in the release of ~2,000 gallons of environmentally toxic vacuum gas oil (VGO) into Galveston Bay. The objective of this 2-year project proposal is to use an interdisciplinary approach to study oil spill impacts on the Galveston Bay ecosystem. The proposed approach integrates hydrodynamic modeling (to predict oil dispersal), acoustic tracking (to study changes in fish biodiversity and habitat use), analytical chemistry (to quantify the exposure of fish to oil derived polycyclic aromatic hydrocarbons or PAHs), and pollutant biotransformation capability (i.e., biomarker cytochrome p450 (or CYP450) enzyme activities in fish). Taken together, we will study oil spill impacts on the Galveston Bay ecosystem through comparison with baseline pre-spill data and provide predictive insights for future disasters.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

$103,479

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

The baseline analysis polycyclic aromatic hydrocarbons (PAHs) in select fish species from Galveston Bay (i.e., spotted seatrout, red drum, and gafftopsail catfish), has already been performed through an existing grant from the Matagorda Bay Mitigation Trust (MBMT) to the P.I. (2021 - 2024). And therefore, has already made a substantial contribution towards providing baseline data.

Partners* and Their Roles:

TPWD has provided initial samples of fish that represent the pre-spill baseline datasets. TGLO Disaster Assessment personnel provided access to the slicked site for VGO sample collection.

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

The proposal addresses the following Galveston Bay Plan (2nd Edition) Priorities:

1) Ensure Safe Human and Aquatic Life Use
RES-1: Conduct Biological Stressor Monitoring and Research: This project will study the bioaccumulation of various high molecular weight polycyclic aromatic hydrocarbons (or PAHs) that are characteristic of vacuum gas oil (VGO) (Wang et al., 2016), in fish collected from the vicinity of the Pelican Island bridge collision and spill. Gas chromatography and mass spectrometry (GCMS) will be used to profile PAHs in fish collected immediately after the spill and compared with already analyzed fish samples collected 1-2 years prior to the spill (as part of an MBMT funded project). The fish selected for analysis include the commercially and ecologically relevant species: spotted seatrout (*Cynoscion nebulosus*), gafftopsail catfish (*Bagre marinus*), and red drum (*Sciaenops ocellatus*).

In addition to measuring pollutant body-burdens in muscle and livers from fish, we will also quantify the activities of various hepatic biomarker enzymes that are responsible for pollutant biotransformation to determine the intrinsic metabolic capability of each fish species and physiological stress following oil exposure.

2) RES-5: Conduct Monitoring and Research to Address Limits to Seafood Consumption: The fish species selected for monitoring are commercially and ecologically valuable and include spotted seatrout, gafftopsail catfish, and red drum. Specifically, red drum and spotted seatrout are two of the major recreational fish species that together contribute up to $570 million in annual revenue to the state of Texas (TPWD, 2012). Therefore, the quantification and comparison of pollutant levels (i.e., PAHs) in these species pre- vs. post-disaster will allow assessment of seafood consumption safety in the commercially important species. Of specific relevance to human health, we will also conduct a Level of Concern (LOC) risk assessment for cancer risk from seafood consumption (FDA, 2010). This risk assessment considers the body-burdens of toxic high molecular weight PAHs (such as benzo[a]pyrene) in the fish and estimates human exposure given anticipated amounts of annual seafood consumption.

3) ACS-1: Tracking Ecosystem Health Indicators: We will assess changes in fish habitat use and distributions post-spill using novel tagging and acoustic transmitter technologies deployed in the impacted area (and compare with pre-disaster habitat use assessments). Taken together, our proposed project will contribute to an interdisciplinary impact assessment framework that integrates the use of hydrodynamic modeling (to predict oil dispersal), acoustic tracking (to study biota habitat use post spill), and analytical chemistry or GCMS to quantify the exposure of fish (PAH body-burdens), to assess likely ecosystem and health effects (i.e., biotransformation enzyme activities).

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 4: Inform Science-based Decision Making

RES-1 ☒	RES-2 ☐	RES-3 ☐	RES-4 ☐
RES-5 ☒	RES-6 ☐	RES-7 ☐	RES-8 ☐
ACS-1 ☒	ACS-2 ☐	ACS-3 ☐	

Plan Priority Area Actions Detail:

In addition to addressing select priorities of the Galveston Bay Plan (2nd Edition) detailed in the previous section, this proposal addresses the following M&R subcommittee priorities (2024):

1) Baseline assessments of large-scale, man-made changes to Galveston Bay: Galveston Bay is a major route for oil tanker traffic, accommodating ~30–50% of the U.S. oil and chemical industry capacity. Furthermore, in the previous two decades ~170,000 gallons/year of oil and gas spills have been reported in Galveston Bay (Rowe et al., 2020). The impacts of such episodic disruptions have not been comprehensively studied. Therefore, the recent and ephemeral nature of the current disaster, immediate collection of slicked oil, acoustic monitoring of fish species in the vicinity of the spill, and access to fish tissue samples pre- and post-spill, present an invaluable opportunity for impact analysis. Specifically, the comparison of datasets collected post-spill with those previously collected through an MBMT funded project further provides an invaluable opportunity to compare impacts of the oil spill on the Galveston Bay ecosystem to prior baseline datasets.

2) Assessment, exposure, and response to stressors: This proposal advances knowledge of the linkages between exposure to a human-made disturbance (i.e., oil spill) and its effects on the ecosystem response of fish in Galveston Bay. The proposed research builds upon the expertise of all P.I.'s and extends their foundation of studying the environmental exposure of persistent pollutants in various Gulf of Mexico coastal ecosystems (Galveston Bay, Matagorda Bay, Sabine Lake). Furthermore, the project uses an interdisciplinary impact assessment framework that integrates hydrodynamic modeling (to predict oil dispersal), acoustic tracking (to study ecosystem effects such as changes in habitat use by fish), analytical chemistry (to quantify exposure), and pollutant biotransformation capability (i.e., stress biomarker analysis). This framework will advance our understanding of post-disaster impacts on the ecosystem of Galveston Bay and provide predictive insights into the exposure and response for future disasters.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☒ NRU (Protect and Sustain Living Resources)
☒ WSQ (Ensure Safe Human and Aquatic Life Use)
☒ PPE (Engage Communities)

Other Subcommittee Detail:

This proposal addresses other subcommittee priorities in the following ways:

1) WSQ: Development of indicators of water quality: The project studies the impacts of a recent oil spill on ecosystem functions by monitoring changes in fish habitat use and distributions using novel tagging and acoustic transmitter technologies deployed in the impacted area (and which will be compared with pre-disaster habitat use assessments).

2) WSQ: Support management measures: The project uses an interdisciplinary approach that integrates the use of hydrodynamic modeling (to predict oil dispersal), acoustic tracking (to study biota habitat use post-spill), and analytical analysis to quantify the exposure of fish (PAHs body-burdens) and likely health effects (i.e., biomarker enzyme activities). Taken together, this framework will advance our understanding of oil spill disaster impacts on the aquatic ecosystem of Galveston Bay and provide predictive insights for future disasters.

3) NRU: Benefit to native fish and wildlife: The project monitors pollutant levels in commercially and ecologically important fish species that includes spotted seatrout and red drum, both of which contribute up to $570 million in annual recreational fishing revenue to the state of Texas (TPWD, 2012). The quantification and comparison of pollutant levels in these species pre- vs. post-disaster will also allow assessment of wildlife health impacts and enable a seafood consumption safety assessment for human exposure.

4) NRU: Project urgency: The recent and ephemeral nature of the current disaster, immediate collection of slicked oil, acoustic monitoring of fish species in the vicinity of the spill, and access to fish tissue samples pre- and post-spill, present an invaluable opportunity for impact analysis. Specifically, there is concern for the VGO spill as it comprises PAHs that are known toxicants. The proposed 2-year project duration is sufficient to complete all proposed analyses.

5) PPE: Continuing education: This project will recruit a graduate student who will be provided with interdisciplinary training on fluid dynamics modeling, biodiversity assessments, mass spectrometric, and enzyme assay analyses. The project also provides excellent training opportunities to involve undergraduate students with the interdisciplinary research. We anticipate up to 4 undergraduate researchers to participate per year in the proposed 2-year project.

Other Plans Implemented:

The proposal addresses the priorities of the Texas Coastal Management Plan (CMP) priority area of:

1) Supports protection of natural habitats and wildlife; and 2) Provides baseline data on the health of gulf waters: This project will measure pollutant (PAHs) body-burdens in commercially important fish species collected in the vicinity of a recent barge collision and oil spill into Galveston Bay. Comparison of levels with the same fish species collected pre-spill will allow assessment of post-spill exposure in aquatic wildlife (versus a prior baseline). Furthermore, the study will also allow effective comparison of pre- vs. post-spill habitat use by fish (using novel acoustic tracking methods) and provide information on changes in ecosystem use.

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

M&R Subcommittee Identified Priorities

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☒ Meaningful and effective monitoring of existing, past, and new projects (NRU: especially species of concern, WSQ, PPE).
☒ Baseline assessments for large-scale, man-made changes to Galveston Bay.
☒ Assessment, exposure, and response to stressors, including **but not limited to**:
- Species of greatest conservation need;
- Contact recreation standards;
- Environmental parameters;
- Emerging contaminants; and
- Legacy contaminants.

Subcommittee Priority Detail:

This project addresses the following M&R subcommittee priorities:

1) Effective monitoring: Persistent pollutants, such as high molecular weight PAHs that are characteristic of VGO will be measured in the body-burdens of select commercially and ecologically important fish species. These include gafftopsail catfish, spotted seatrout, and red drum. Specifically, spotted seatrout and red drum together contribute up to $570 million in annual recreational fishing revenue to the state of Texas (TPWD, 2012).

2) Baseline assessments: Pollutant body-burdens measured in fish collected post-spill will be compared with those already measured in the same fish species pre-spill. Therefore, allowing assessment of changes in pollutant exposure relative to a previous baseline. Furthermore, habitat use of fish as measured pre- vs. post-spill using novel acoustic tracking methods will also provide information on changes ecosystem use.

3) Assessment of exposure and response: This project will study the likely health effects of oil exposure in fish by quantifying the hepatic activities of key pollutant biotransformation (CYP450) enzymes. These enzymes serve as biomarkers of exposure to oil pollution. In addition, we will also conduct a Level of Concern (LOC) risk assessment for cancer risk from seafood consumption (FDA, 2010). This risk assessment considers the body-burdens of PAHs (such as benzo[a]pyrene) in fish muscle tissue and estimates human exposure given anticipated amounts of annual seafood consumption.

Does the Project work with new, smaller communities/partnerships?

☐ Yes

☒ No

None currently.

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

The objective of this 2-year project is to use an interdisciplinary framework to study the environmental impacts of the recent barge collision (5/15/2024) with the Pelican Island bridge that released ~2,000 gallons of toxic vacuum gas oil (VGO) into Galveston Bay. The proposed approach will integrate the use of hydrodynamic modeling (to predict oil dispersal), acoustic tracking (to study fish biodiversity and habitat use), analytical chemistry (to quantify oil-derived PAHs exposure), and pollutant biotransformation capability (i.e., biomarker response) in the exposed fish.

Full Project Description (1,000 words or less):

The recent barge collision (5/15/2024) with the Pelican Island bridge in Galveston (TX) made the national news and reported the release of ~2,000 gallons of environmentally toxic vacuum gas oil (VGO) into Galveston Bay. Hydrodynamic simulations (by co-P.I. Dr. Du) accurately predicted the dispersal of oil (**Fig. 1 (a)**), which agreed with sites slicked by the oil (**Fig. 1 (b)**).

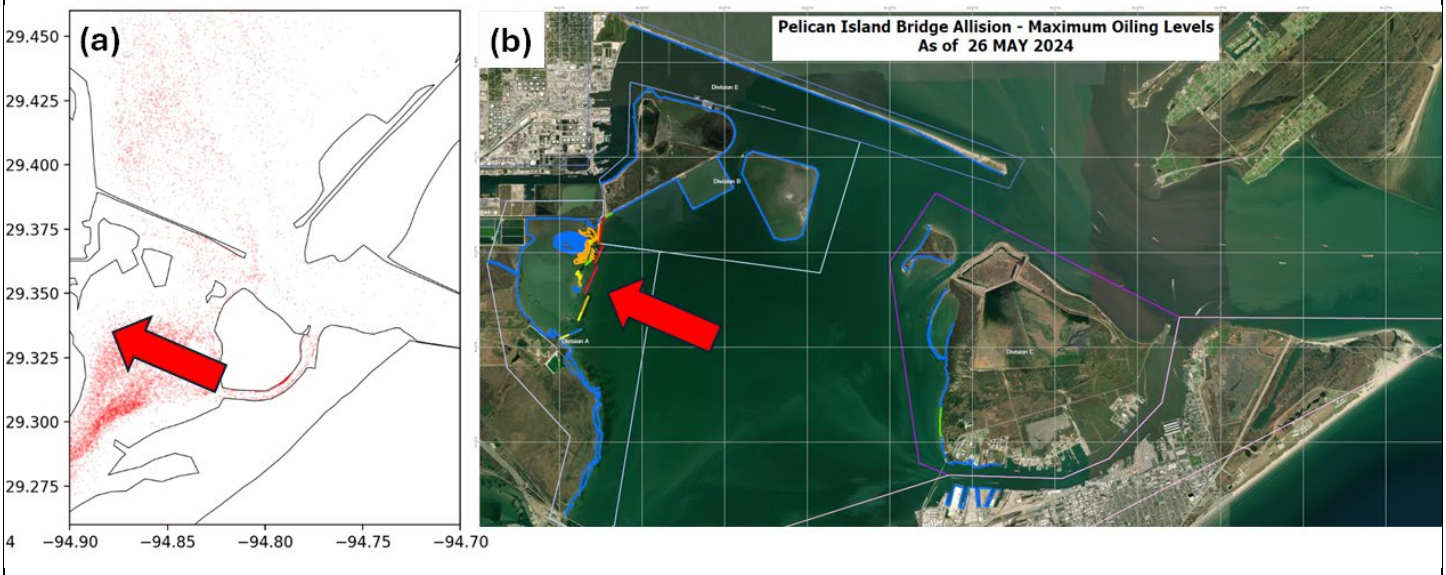


Fig. 1. (a) Shows results of hydrodynamic modeling by the co-P.I. (Dr. Du) which predicts the extent of oil dispersal and likely locations of its slick along the eastern shoreline of West Bay. **(b)** A map provided by TGLO indicates the shoreline impacted by the spilt oil. The two red arrows shown on (a) and (b) indicate agreement between hydrodynamic model predictions of oil dispersal and sites slicked.

Rationale and Objective: Galveston Bay connects the northern Gulf of Mexico with the Houston ship channel and is therefore a major shipping route for oil tankers (Rowe et al. 2020). The barge collision with the Pelican Island bridge on May 15th, 2024, was a particularly detrimental event as it resulted in the release of ~2,000 gallons of environmentally toxic vacuum gas oil (VGO) into Galveston Bay (Cohen, 2024). The *objective* of this 2-year project proposal is to use an interdisciplinary approach that integrates hydrodynamic modeling (to predict oil dispersal), acoustic tracking (to study fish biodiversity and habitat use), analytical chemistry (to quantify the exposure of fish), and pollutant biotransformation capability (i.e., biomarker enzyme activity in fish); to study oil spill impacts on the Galveston Bay ecosystem (through comparison with baseline pre-spill data) and provide predictive insights for future disasters.

Specific Aims: We have *four* specific aims: (1) Quantify body-burdens of PAHs in various fish species collected post spill (and compare with PAH profiles previously quantified in pre-disaster samples as baseline); (2) Characterize biomarker response to PAHs exposure by quantifying the enzymatic activities of pollutant biotransformation (CYP450) enzymes; (3) Monitor changes in fish habitat use and distributions using novel tagging and acoustic transmitter technologies deployed in the impacted area (and compare with pre-disaster habitat use assessments); and (4) Develop an interdisciplinary impact assessment framework that integrates the use of hydrodynamic modeling (to predict oil dispersal), acoustic tracking (to study biota habitat use, and changes if any, post spill), and analytical chemical analyses to quantify the exposure of aquatic biota (PAH body-burdens) and likely health effects (i.e., biotransformation enzyme activities).

Experimental Design and Methods:

1) Slicked VGO sample collection: Up to 2 Liters of slicked VGO have already been collected following the spill (**Fig. 2**). These samples were collected along the eastern shoreline of West Bay (**Fig. 1**).

Fig. 2. Photos taken of the slicked VGO site. The site sampled was the most heavily slicked and is also indicated by the red arrows in **Fig. 1**. Up to 2 Liters of slicked oil was sampled along the shoreline and is stored at -20°C for subsequent GCMS analysis. The barge collision and spill occurred on May 15th (2024), whereas the slicked samples were collected on May 18th (3 days later). The composition of PAHs will be quantified in the VGO samples using GCMS.

2) Hydrodynamic modeling: The co-P.I. (Dr. Du) has developed a hydrodynamic model based on the SCHISM (Semi-implicit Cross-scale Hydroscience Integrated System Model) for the model domain of the northwestern Gulf of Mexico with a focus on Galveston Bay (Du et al., 2019 and 2020). The model will inform the spatially varying susceptibility in the lower bay to the oil spills.

3) Acoustic tracking of fish: Omnidirectional acoustic receivers have been deployed at several locations in West Bay and near the oil spill. The receivers are well positioned to acquire movement data for acoustically tagged fish from the bay (Steffen et al., 2023).

4) GCMS analysis of VGO in slicked crude and fish body-burdens: The P.I.'s have extensive experience with the quantifications of PAHs in various Gulf of Mexico ecosystems (and including fish from Galveston Bay) (Cullen et al., 2019; Hernout et al., 2020; Steichen et al., 2020).

5) Fish sample collection: At present, approximately n=10-15 fish per species have been sampled from the vicinity of the spill in West Bay. Therefore, tissue samples from the following samples are at-hand, spotted seatrout (*Cynoscion nebulosus*), gafftopsail catfish (*Bagre marinus*), and red drum (*Sciaenops ocellatus*), and will be processed for PAHs body-burden analysis and biomarker CYP450 enzyme analysis.

6) Biomarker enzyme activities: The detoxication biomarker enzyme activities in fish will be assessed in the subcellular fraction obtained from liver homogenates. The activities of various CYP450 isoforms will be tested (Conaway et al., 1996).

References cited:

Cohen (2024): https://www.cbsnews.com/news/barge-collision-galveston-texas-bridge-released-oil-spill-update/
Conaway et al., (1996): DOI: 10.1093/carcin/17.11.2423
Cullen et al., (2019): https://doi.org/10.1016/j.scitotenv.2018.09.128
Du et al., (2019): doi:10.5194/os-15-951-2019; **(2020):** https://doi.org/10.1016/j.scitotenv.2019.135364.
FDA (2010): https://www.fda.gov/food/food-safety-during-emergencies/protocol-interpretation-and-use-sensory-testing-and-analytical-chemistry-results-re-opening-oil
Hernout et al., (2020): https://doi.org/10.1016/j.envadv.2020.100001
Rowe et al., (2020): https://doi.org/10.1371/journal.pone.0243734
Steichen et al., (2020): https://doi.org/10.3389/fmars.2020.00186
Steffen et al., (2023): https://doi.org/10.1016.j.ecss.2023.108545
TPWD (2012): https://www.researchgate.net/publication/275034836_Enhancement_of_Texas_sciaenids_red_drum_and_spotted_seatrout
Wang et al., (2016): https://doi.org/10.1021/acs.energyfuels.5b02803

Latitude/Longitude (Optional):

Not applicable

Location:

West Bay, Galveston Bay watershed.

Projects Map

Not applicable

Supplemental Photos/Graphics (Optional):

Not applicable

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	Cost for Work to be Performed
Salary / Wages	$37,961
Fringe Benefits **(Please see appendix** Faculty: 18.9% + $950/mo Grad: 3% + $283/mo)[1]	$7,744
Travel	$2,483
Supplies	$12,000
Equipment	$0.00
Contractual	$0.00
Construction	$0.00
Other	$9,115
Total Direct Cost	**$69,303**
Indirect Costs	$34,176
Total	**$103,479**

Indirect Cost Agreement

Please note: If using a rate different from your entity Indirect Cost Agreement; a letter of exemption from the appropriate authority must be provided with the application, or a statement must be included certifying that the recipient has elected to be reimbursed for an amount less than its total indirect costs, that unreimbursed indirect costs are part of the recipient's contribution to the success of the project, and that the recipient will pay for all unreimbursed indirect costs using funds available to it for that purpose.

Please see appendix for a copy of Texas A&M University at Galveston's IDC rate agreement.
54% IDC rate x $63,288 MTDC = $34,176 Indirect Costs

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 54% of (check one):

☐ Salary and fringe benefits

☒ Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

☒ **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

[1] If fringe is not a single rate, please attach calculation or explanation as an appendix.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

The amount for the "Other" category is 8.81% of the total budget:
Conference registration fees - $600
Publication costs - $2,500
Student tuition and fees - $6,015
Total Other: $9,115

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.
-

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.

- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:
Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Galveston Bay Estuary Program
Fiscal 2026 M&R Project Proposal

Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by August 5, 2024. No late submittals will be considered for funding.

This Call for Project Proposals complies with 30 Texas Administrative Code (TAC) § 14.7, which lays out requirements for a competitive solicitation by TCEQ for grant awards. For convenience, specific citations to 30 TAC § 14.7 are identified in the text.

SECTION ONE: INTRODUCTION

Purpose [required by 30 TAC § 14.7(1)]: The purpose of the proposed grant from the Galveston Bay Estuary Program (GBEP), a program of the Texas Commission on Environmental Quality (TCEQ), is to implement *The Galveston Bay Plan, 2nd Edition* (the Plan), a comprehensive conservation and management plan falling under Section 320, of the Federal Water Pollution Control Act (33 U.S.C. Section 1330), for a designated national estuary in the State of Texas.

Objective and Allowable Activities [see 30 TAC § 14.7(4)]: The objective of this grant is to implement the GBEP stakeholder developed priorities for FY2026 (FY2026 Priority Area Actions) that were developed by GBEP subcommittees for fiscal 2026 at the June 2024 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

Authority [see 30 TAC § 14.7(2)]: Grants issued by GBEP under this solicitation are authorized by: the Federal Water Pollution Control Act (Clean Water Act) § 320 (33 UNITED STATES CODE § 1330), commonly referred to as the National Estuary Program; TEX. WATER CODE § 5.124; and 30 TAC ch. 14.

Match Requirement [see 30 TAC § 14.7(10) and 30 TAC § 14.7(11)]: No matching funds are required. Therefore, there is no need to adjust or waive any matching funds requirement.

Multiple Awards [see 30 TAC § 14.7(7)]: GBEP anticipates awarding funds for multiple proposals. GBEP intends to award grants to that combination of proposals which best implements the Plan, factoring in all criteria identified in this Call for Project Proposals, the availability of funds, and the most effective division of funds between awards.

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Subcommittee:

M&R

Project Name:

Developing Molecular Tools for Demographics and Distribution of Galveston Bay Estuary System Sea Turtles

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:
The lead implementer must be in one of the following categories of eligible recipients. Please indicate which category applies to your entity. If the proposing party is not already paired with a lead implementer in one of the categories listed below, the proposing party will need to partner with an eligible recipient in one of these categories to be selected for funding. Please reach out to GBEP staff with any questions.

☐ Federal, State, or Local Government ☐ Council of Government ☒ Public ISDs or Universities
☐ Nonprofit ☐ Other*

Public University- Texas A&M University at Galveston

Unique Entity ID (UEI) Number:	AND:	VIN or Tax ID:
G8Y3L8JV2588		EIN 742125225

Contact Information:

Project Representative Name	Christopher Marshall
Project Representative Phone	409-740-4884
Project Representative Email	marshalc@tamug.edu

Amount Requested from GBEP:

$99,826.00

Federal ☐ State ☐ No Preference ☐
Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2026 (09/01/2025-08/31/2026)	$60,505.00
FY 2027 (09/01/2026-08/31/2027)	$39,321.00
Total	$99,826.00

Project Dates / Duration (beginning no earlier than September 1, 2025 – ending no later than May 31, 2028) [see 30 TAC § 14.7(5)]:

September 2025 - August 2027

Project Urgency:

The Gulf Center for Sea Turtle Research at Texas A&M University at Galveston has established a long-term, in-water sea turtle monitoring program in the Galveston Bay Estuary System (GBES). Over time, this work has been integrated in the Center's rescue, recovery, and rehabilitation programs to widen the ability to track sea turtles in the GBES. The proposed work presented here will further expand and complement our ability to determine how sea turtles use the GBES habitats, provide a new tool to investigate the demographics and distribution in the GBES, and determine the feasibility of estimating sea turtle density. Such data will be important to State of Texas wildlife managers since sea turtles are a "species of greatest conservation need" as well as assist wildlife rescue and rehabilitation programs during sea turtle cold stuns.

Total Project Cost (including Leveraging Amounts, if any; provide leveraging information where indicated below):

The total amount requested from GBEP is $99,826.00.

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

Staff support, and graduate student tuition and fees for six semesters (YR: Fall, Spring, Summer, YR 2: Fall, Spring and Summer) ***are not requested*** in this proposal and should be considered as leverage. This allows for more requested funds to go toward sampling supplies, analytical costs, and some salary support for a student technician and the PI. ***The total amount requested from GBEP is $99,826.00.***

Partners* and Their Roles:

The Gulf Center for Sea Turtle Research is the lead for sea turtle rescue, recovery, rehabilitation, and research on the upper Texas coast. All sea turtle strandings, live or deceased, are channeled through the organization for either rescue or recovery and further research. The GCSTR also participates in in-water research in which sea turtles are captured and tagged with satellite and acoustic tags to monitor their travel throughout the Gulf of Mexico. The stranding information, as well as the results from in-water research will be utilized as comparative data for the proposed eDNA research in this project.
USFWS, NOAA, and Texas Parks and Wildlife oversee the state and federal permits for the GCSTR to work with these endangered animals.

***If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted under the application.**

SECTION THREE: *GALVESTON BAY PLAN, 2ND EDITION* IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY2026 Priority Area Actions will be considered above others.

The FY2026 Priority Area Actions are found at:
https://gbep.texas.gov/ensure-safe-human-and-aquatic-life-use/
https://gbep.texas.gov/protect-and-sustain-living-resources/
https://gbep.texas.gov/engage-communities/
https://gbep.texas.gov/inform-science-based-decision-making/

The proposed research enacts the Galveston Bay Priority Plan 4: Inform Science-based Decision Making through biological monitoring, tracking ecosystem health indicators (using sea turtles), and provide demographic and distribution data on the sea turtle species that utilize the Galveston Bay Estuary System to wildlife managers. The use of new molecular tools will coincide with current TCEQ funded projects to provide updated demographic baseline data for ***species of greatest conservation need***. These assessments will enhance existing and ongoing conservation efforts for the sea turtle species that utilize all areas of Galveston Bay, delivering focus to adaptive management strategies. As indicator species, this work will also address important data gaps regarding a major living resource that also influences benthic habitats of the GBES.

Specifically, the proposed research will enact FY2026 Priority Area Actions for ***SC-1*** (Projects that sustain and restore native species populations), ***RES-1*** (Develop new and support existing efforts to conduct biological stressor monitoring and research), and ***RES-3*** (Develop new and support existing efforts to conduct physical stressor monitoring and research). Using molecular tools to understand the demographics and distribution of sea turtles in the GBES will provide a new insight into how biological (***RES-1***) and physical stressors (***RES-3***) change the distribution (and possibly density) of sea turtles in the GBES, particularly green sea turtles that may cold stun during winter cold fronts. As indicated in the Galveston Bay Plan, it is important that Priority Action Plan ***SC (1 & 2)*** also provide information for Action Plans for ***RES (1-3)***, which this proposed research does.

Furthermore, the proposed research enacts FY2026 Priority Area Actions for ***ACS-1*** (Support tracking the status and trends of environmental and stressor indicators of Galveston Bay ecosystem health), and ***ACS-2*** (Expand the dissemination of easy-to-access Galveston Bay monitoring and research). The development of molecular tools to characterize the demographics and distribution of Galveston Bay Estuary System Sea Turtles ***will augment existing research conducted by the Gulf Center for Sea Turtle Research (GCSTR) that is currently funded by the Galveston Bay Estuary Program***. These tools have the potential to enable greater sampling of sea turtles and provide a more comprehensive understanding of where sea turtles are in the GBES, where the "hotspots" of sea turtle activity are (***ACS-1)***, as well as their demographics. Such information is critical for managers, but additionally, such information will be important to understand how long-term trends in biological and physical stressors, (such as cold-stunning events) change sea turtle density. This will also inform wildlife responders as to where to apply their limited resources to rescue turtles during winter cold fronts. These data will be shared with state (TPWD) and federal (USFWS, NOAA) partners that oversee management and conservation of these species of greatest conservation need. Additionally, data will be presented at the State of the Bay Symposium, national/international scientific meetings, and published in peer-reviewed journals.

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 4: Inform Science-based Decision Making

RES-1 ☒	RES-2 ☐	RES-3 ☒	RES-4 ☐
RES-5 ☐	RES-6 ☐	RES-7 ☐	RES-8 ☐
ACS-1 ☒	ACS-2 ☒	ACS-3 ☐	

Plan Priority Area Actions Detail:

Appropriate management of sea turtles in the Galveston Bay Estuary System requires accurate data regarding the seasonal use of particular areas by various species. Data from the GCSTR in-water research and stranding program indicate seasonal shifts of green, loggerhead and Kemp's ridley sea turtles. Environmental factors such as freshwater influxes, seagrass and shoreline erosion, and extreme weather events (cold weather fronts impact their movement and use of the GBES). Additionally, anthropogenic changes, such as marine construction, dredging, fishing and boating also affect their habitat use. This project will deliver insights into how sea turtles are impacted by biological stressors (***RES-1***) and how their habitat use changes throughout the year following quarterly sampling (***RES-3***). Record keeping of the physical and biological alterations of the bay system will be compared to the molecular movement data, as well as stranding and in-water research results. As sea turtles are considered an indicator species of ecosystem well-being, their use of Galveston Bay indicates sustainability and bay health (***ACS-1***). Marine organisms are not always easy to access, and monitoring efforts can be challenging. With this new molecular tool, we will expand the dissemination of Galveston Bay research (***ACS-2***) by delivering this data to our local stakeholders and partners such as USFWS, TPWD, NOAA, as well as wider audiences of the GCSTR.

Does the project implement any other *Galveston Bay Plan 2nd Edition* Priority Area Actions, or the other Subcommittee priorities?

☒ NRU (Protect and Sustain Living Resources)
☐ WSQ (Ensure Safe Human and Aquatic Life Use)
☐ PPE (Engage Communities)

Other Subcommittee Detail:

In the Galveston Bay Plan, the species conservation action plan has a mission to protect and sustain living resources. Species conservation is linked to habitat conservation, as health of an ecosystem directly impacts the health of the species inhabiting the area. Sea turtles are threatened or endangered species that thrive in the Galveston Bay Estuary System. To protect native species of concern, baseline data and the demographics of each species must first be addressed. As sea turtle populations continue to recover globally, impacts to local populations have lasting effects. The information acquired from this effort will present stakeholders the material required to make informed decisions about conserving these threatened and endangered native animals. This project contributes to conservation efforts through the Gulf Center for Sea Turtle Research (***SC-1***) by providing sea turtle presence/absence, distribution, and density, as well as habitat use in the GBES of a species of concern for the GBEP Subcommittee Natural Resource Use (NRU).

Other Plans Implemented:

Texas Coastal Study (USFWS), Texas Conservation Plan (TPWD), Texas Coastal Management Plan (TXGLO), Texas Wetland Conservation Plan (via seagrasses and benthic habitat).

SECTION FOUR: SUBCOMMITTEE PRIORITIES / FACTORS TO BE USED TO SELECT AWARDS [see 30 TAC § 14.7(6)]

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority. This selection criteria provides for the selection of multiple recipients as needed.

M&R Subcommittee Identified Priorities
Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

☒ Meaningful and effective monitoring of existing, past, and new projects (NRU: especially species of concern, WSQ, PPE).
☐ Baseline assessments for large-scale, man-made changes to Galveston Bay.
☒ Assessment, exposure, and response to stressors, including **but not limited to**:
- Species of greatest conservation need;
- Contact recreation standards;
- Environmental parameters;
- Emerging contaminants; and
- Legacy contaminants.

Subcommittee Priority Detail:

Sea turtle demographics and distribution in the GBES acquired through new molecular tools will greatly expand our ability to understand how increased freshwater influxes, extreme winters, erosion, and benthic ecology alterations affect these endangered and threatened species. Seasonal movement data acquired from strandings, in-water research and the new molecular tools of eDNA will provide meaningful and effective monitoring, through the comparison of past, existing and new projects focusing on species of concern. The movement of these animals through seasonal shifts will demonstrate healthy baselines as well as show cause for concern due to changes in environmental parameters, and emerging anthropogenic harm.

Does the Project work with new, smaller communities/partnerships?
☐ Yes
☒ No

N/A

SECTION FIVE: PROPOSAL DETAILS

Grant recipient activities must implement the Plan. Additional recipient selection criteria includes whether a project addresses a subcommittee priority.

Project Summary:

The Gulf Center for Sea Turtle Research (GCSTR) is the lead for sea turtle rescue and recovery on the upper Texas coast. Recent data regarding sea turtle stranding recoveries, and from sea turtles captured as part of the in-water research program, demonstrate that three species of sea turtles (Green [*Chelonia mydas*], Kemp's ridley [*Lepidochelys kempii*], and loggerheads [*Caretta caretta*]) utilize the Galveston Bay Estuary System throughout the year. Stranding data have known biases since injured or deceased sea turtles may be carried by currents far from the habitat they were using. In-water capture and satellite tagging of sea turtles, while effective, is labor intensive and costly. The use of environmental DNA (eDNA) is a relatively new molecular tool and has been developed for measuring presence/absents of species, species distribution, species density, and even population assessments for a variety of species. The proposed research will allow the GCSTR to expand its capability to characterize the demographics and distribution of sea turtles in the GBES. These data will be used to compare and support similar data acquired from stranding, and in-water research. The GCSTR is well positioned to conduct this work. An important feature of this work is the ability to validate eDNA from the field. Here, the GCSTR's sea turtle hospital will be used to validate eDNA signatures from known sea turtle species held in mesocosms in the rehabilitation hospital. Such work will provide a non-invasive method of detecting sea turtles and allow us to corroborate the efficacy of this molecular tool for real time evasive animal habitat use in the GBES.

Full Project Description (1,000 words or less):

The use of environmental DNA (eDNA) methods have been increasingly applied to assess presence/absence, distribution, and density of wildlife populations over the last decade. The promise of eDNA technology as new universal biomonitoring tools has been realized for species detection and biodiversity metrics, with the publication rate growing rapidly (Bessey et al., 2021; Jarman, Berry, & Bunce, 2018; Koziol et al., 2019; Taberlet, Coissac, Hajibabaei, & Rieseberg, 2012). The development of easily accessible and low-cost sampling methods, and the increased access of genomic analyses to isolate specific species, eDNA tools have become more commonplace for such studies.

The Gulf Center for Sea Turtle Research (GCSTR) has demonstrated that three of the seven sea turtle species reside in, or use the Galveston Bay Estuary System (GBES). Stranding data from the upper Texas coast show that green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), and loggerhead (*Caretta caretta*) turtles use the entirety of the GBES (i.e., all bays of the Galveston Bay estuary including the upper Texas coast shoreline). All sea turtles are federally protected under the Endangered Species Act. The five species found in the GBES are threatened, endangered, or critically endangered. The State of Texas refers to sea turtles as "species of greatest conservation need." The GCSTR is conducting the first long-term monitoring program to understand the distribution of GBES sea turtles, and the biological and physical stressors that influence their movement, distribution, and habitat use.

Numerous studies rely on stranding data to determine stock levels; however, stranding data have known biases. Stranded sea turtles, do not necessarily indicate actual geolocation and habitat use, and many mortality events are never recovered (Hart, Mooreside, & Crowder, 2006). Stranded animals are often pushed towards a shoreline, or along the coast, and out of their presumed natural habitat due to tides and currents. In-water programs (the capture of wild sea turtles) are frequently used to assess sea turtle demographics and distribution. GBES sea turtles captured by the GCSTR's in-water program also applies satellite and acoustic tags, which provides long-term movement data. In-water work is costly, labor intensive, and limited by physical access and weather. ***eDNA methodologies offers additional lines of evidence that are non-invasive, relatively low-cost, and less labor intensive.*** Genetic information does not require visual observation, capture, or recovery of the organism (Adams et al., 2019); data are collected by simply acquiring a water sample. eDNA tools enable forensic detection of species-specific genetic material shed into the environment by an organism (Farrell et al., 2022). In conjunction with the current in-water research program, as well as their rescue, recovery, and rehabilitation programs, the GCSTR is well positioned to utilize eDNA analyses as a method to confirm stock assessments provided by in-water captures, and stranding data.

The objectives of the proposed research is to develop and assess species-specific molecular tools to identify sea turtle presence/absence and habitat use. This will be accomplished by 1) determining the

efficacy of eDNA protocols on turtles in the GBES using the sea turtle hospital to validate the methodologies, 2) assessing the detectability of eDNA levels when comparing locations with high vs. low flow-currents, 3) sample 10-known sea turtles hot spots seasonally throughout the GBES to determine presence/absence, distribution, and density, and 4) corroborate eDNA derived data with stranding and in-water data; assess the efficacy of eDNA as a monitoring tool.

Environmental DNA analyses are an increasingly utilized tool in population density studies and a preferred method for stakeholders (Harper et al., 2020). Use of eDNA technology are leading tools used to assess presence/absence and qualitative abundance that can identify sea turtle critical habitats. In the GBES study area, we will identify the presence/absence of specific sea turtle species and test the method's ability to provide quantitative vs. qualitative abundance of each species seasonally.

It is expected that eDNA analyses will have exceptional utility in predicting the severity of cold-stunning events for green sea turtles in the GBES, and in Texas. Sea turtles are prone to cold stunning events, which eDNA analyses could assist in the prediction of the number of impacted animals. Green sea turtles, like all sea turtles, are ectothermic and regulate their body temperature based on external environmental climate. When the water temperature falls below 10°C for longer than 12 hours, these animals will "cold stun", and lose controlled movement. The GCSTR has rescued and recovered 450+ green sea turtles during cold stun events since January of 2021. Due to climate change, the number of cold stuns in our region has increased from one event every 2- 3 years to multiple events every year, and the number of impacted animals will only increase over time. While sea turtles have the ability to escape the shallow bays for deeper water, often these cold fronts occur so rapidly that escape is not possible. Furthermore, eDNA analyses are likely to provide additional lines of evidence that will enhance cold-stun model forecasting (Shaver et al., 2017). This work will provide new tools to measure physical and biological stressors and their impact on sea turtle use of the GBES.

Last, it is expected that eDNA analyses could provide critical information to industry working in coastal waters. Numerous dredging and beach renourishment projects have the potential to impact sea turtles due to the unknown presence or absence, activity level, or seasonal shifts on the upper Texas coast. Sea turtle habitat use in the GBES continues to be poorly understood while industry and port growth has expanded. It is crucial to establish the presence or absence and habitat use of sea turtles before major construction projects occur in the GBES, including the coastal spine project, and proposed wind farms offshore of Galveston and the Louisiana coast. Current movement studies by the GCSTR, and others, indicate that this area is a significant migratory path and foraging area for sea turtles (Marshall, pers. comm.; Howell & Shaver, 2021). With the use of eDNA technology, the GCSTR will be able to provide current habitat use for these critically endangered and threatened sea turtle species.

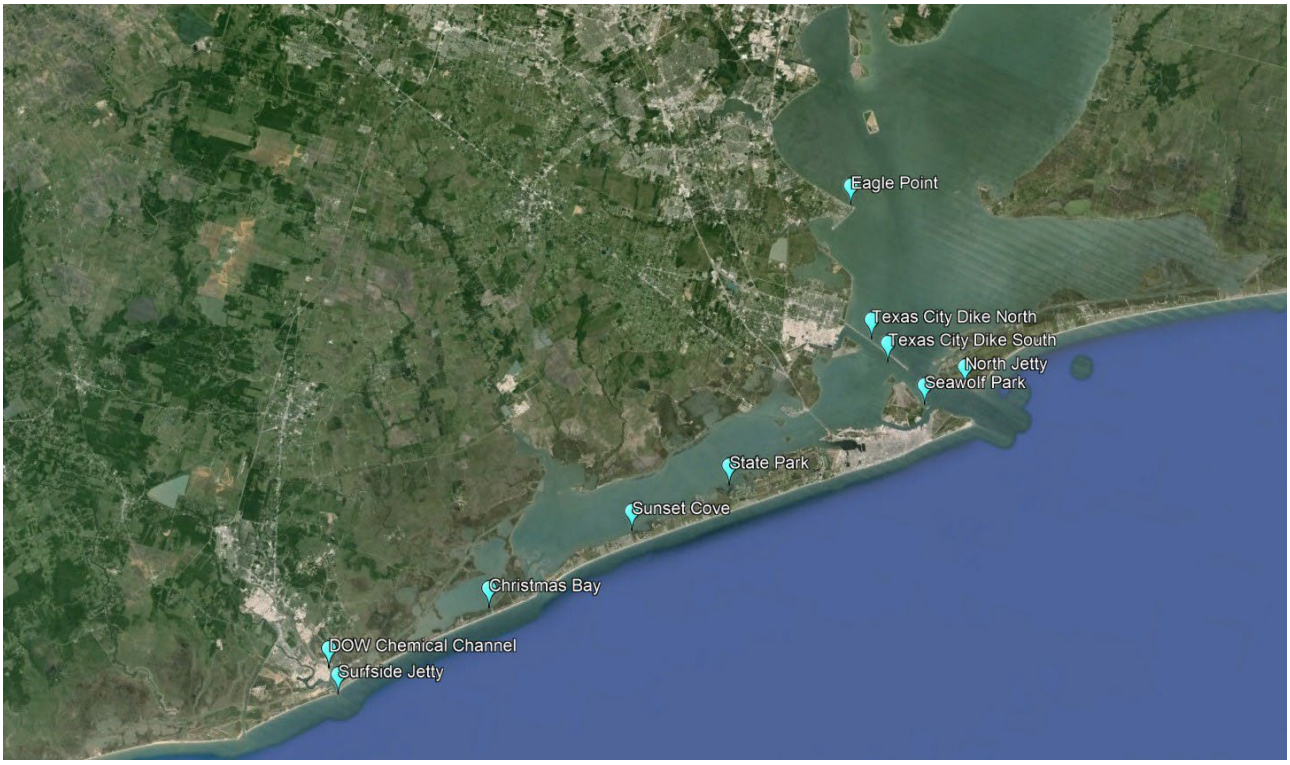
Latitude/Longitude (Optional):

29°13'45.372" N, 94°59'36.301" W

Location:

Galveston Bay Estuary System (Christmas, West, South, East, and Galveston Bays)

Projects Map



Ten shoreline locations will be utilized as sampling sites to coincide with in-water data acquired through the STARs acoustic array as well as common points of sea turtle strandings.

Supplemental Photos/Graphics (Optional):

Gulf Center for Sea Turtle Research Rehabilitation Hospital

SECTION SIX: BUDGET DETAILS

Grant Payments [see 30 TAC § 14.7(12)]: All grant payments will be made on the basis of reimbursement for allowable costs (as defined in 2 CFR Part 200, Subpart E). All payments for awarded proposals will be reimbursements of allowable costs incurred after both parties have entered (signed) a grant agreement for the project.

Budget. Authorized budgeted expenditures for work performed are as follows:

Budget Category	**Cost for Work to be Performed**
Salary / Wages	$29,037.00
Fringe Benefits	$5,233.00
Travel	$1,302.00
Supplies	$21,200.00
Equipment	$0.00
Contractual	$0.00
Construction	$0.00
Other	$8,050.00
Total Direct Cost	*$64,822.00*
Indirect Costs	*$35,004.00*
Total	**$99,826.00**

Indirect Cost Agreement

[Indirect Cost Agreement has been attached as an Appendix]

Indirect Cost Reimbursable Rate. The reimbursable rate for this Contract is 54% of (check one):

☐ Salary and fringe benefits

X Modified total direct costs

☐ Other direct costs base

If other direct cost base, identify:

This rate is less than or equal to (check one):

X **Predetermined Rate**— an indirect rate that is negotiated between the Performing Party and its federal cognizant agency and supported by a current Negotiated Indirect Cost Rate Agreement (NICRA) letter. A Predetermined Rate is not subject to adjustment except as provided by 2 Code of Federal Regulations (CFR) § 200.411.

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of ten percent of Modified Total Direct Costs (MTDC) in lieu of determining the actual indirect costs of the service. Costs must be consistently charged as either indirect or direct costs.

☐ **Provisional Rate**— an experienced-based rate agreed to by Performing Party and TCEQ in the absence of a NICRA rate negotiated with the applicable federal cognizant agency.

☐ **Partial Reimbursement Rate**— a reimbursement rate agreed to between TCEQ and Performing Party that is less than the rate authorized under TxGMS or, where applicable, 2 CFR Part 200. Performing Party contributes all of its unreimbursed indirect costs to the successful performance of the project or projects funded under this Contract, in accordance with Article 9 of this section.

☐ **Other:**

Other. If Budget Category "Other" is greater than $25,000 or more than 10% of total Contract budget, identify the main constituents:

N/A

SECTION SEVEN: CONTRACT REQUIREMENT [see 30 TAC § 14.7(15)]:

- By submitting this Project Proposal, you acknowledge that, if you become a successful grant recipient selected for a grant award, you must enter into a signed grant agreement or contract with TCEQ following the announcement of that award.

SECTION EIGHT: ACKNOWLEDGMENTS

Please read and understand the following:

- By submitting this Project Proposal, you acknowledge that information on how grant payments will be made is contained in the Budget Details section describing direct and possibly indirect costs. You further acknowledge that grant payments will be reimbursements on the basis of allowable costs incurred and that selected recipients will receive contract documents addressing allowable costs, unallowable costs, and reimbursement.
- By submitting this Project Proposal, you acknowledge your understanding that Project Proposals do not require matching funds and that a TCEQ director does not need to adjust or waive any matching funds requirement.
- By submitting this Project Proposal, you acknowledge that, if GBEP elects to hold a pre-submittal meeting relating to this Project Proposal, GBEP will notify you of the meeting's time and location indicating whether attendance is mandatory.

SECTION NINE: QUESTIONS AND PRE-SUBMITTAL MEETINGS [see 30 TAC § 14.7(13) and 30 TAC § 14.7(14)]:

- There are no pre-submittal meetings scheduled.
- For requests for additional, pre-submittal information **[see 30 TAC § 14.7(13)]**, please contact the corresponding Subcommittee Coordinator listed on this page.
-

SECTION TEN: ADDITIONAL INSTRUCTIONS

In submitting your Project Proposal, please refer and adhere to the following instructions and guidelines concerning materials and information required to be submitted by potential grant recipients:

- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest of the state.
- Unless otherwise specified by GBEP, formal signatures are not required on Project Proposals.
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline listed on both this page and the first page of this Project Proposal document.

Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:
Please Submit Project Proposals (Microsoft Word Only – No PDFs) by August 5, 2024 to the relevant Subcommittee Coordinators below:

WSQ Subcommittee
Christian.Rines@tceq.texas.gov

NRU Subcommittee
Lindsey.Lippert@tceq.texas.gov

PPE Subcommittee
Lisa.Marshall@tceq.texas.gov and Matthew.Abernathy@tceq.texas.gov

M&R Subcommittee
Jenelle.Estrada@tceq.texas.gov

Appendix: Budget Justification

Senior Personnel- Total Budget Requested $23,394.00 for Two Years
Dr. Christopher Marshall, Department of Marine Biology (Texas A&M University, Galveston Campus) will serve as the lead PI and project manager. Dr. Marshall is requesting 1-month salary support in YR 1 of the grant, and one-half month salary support for YR 2 of the grant (includes a 3% annual escalation).

Undergraduate Student Support- Total Budget Requested $10,876.00 for two years.
An undergraduate student worker is requested to assist in the processing of samples and genetic lab work. After samples have been collected, they must be processed for DNA extraction and analysis. A student worker is requested to assist with this process for four semesters (two years, including summers). The student will participate for 10 hours per week, at $12.00 an hour, for 44 weeks per year, which, including fringe benefits totals $5438.00. This position will be for two years.

Supplies- Total Budget Requested $21,200 for Two Years
We request funds for supplies for this project. Sterile containers, Van Dorn samplers, reagents to stabilize eDNA and applicable consumable supplies are all required for sampling. For DNA processing and analysis, DNA extraction kits, as well as supplies needed for gel electrophoresis will be purchased. A kayak is requested to alleviate funding required to charter a University vessel, as well as necessary safety equipment, trailer, and tow straps. Fuel for the GCSTR truck for travel to field sites is also requested.

Other costs- Total Budget Requested $8,050 for Two Years
Some sites are only accessible using the TAMUG research vessels. Funds are requested to charter a vessel eight times for quarterly sampling over two years. Vessels rates are $150/day, totaling $1200.00 for the project. Each positive sample will be analyzed through genome sequencing. Computing costs and data analysis software are also requested to complete this work. Funds are requested to attend the Southeast Regional Sea Turtle Meeting, or another appropriate scientific meeting, in spring of 2027. This meeting will provide an opportunity for this research to be presented to sea turtle biologists conducting research in the southeastern United States.

Appendix: Indirect Cost Agreement

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 1746000531A1

ORGANIZATION:
Texas A & M University - College Station
200 Technology Way
A & M System Bldg, Suite 1281
College Station, TX 77845-3424

DATE:09/02/2022

FILING REF.: The preceding agreement was dated 08/07/2019

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: Facilities And Administrative Cost Rates

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

	EFFECTIVE PERIOD				
TYPE	**FROM**	**TO**	**RATE(%)**	**LOCATION**	**APPLICABLE TO**
PRED.	09/01/2022	08/31/2023	51.50	On Campus	Organized Research & Instruction
PRED.	09/01/2023	08/31/2025	52.50	On Campus	Organized Research & Instruction
PRED.	09/01/2025	08/31/2026	54.00	On Campus	Organized Research & Instruction
PRED.	09/01/2022	08/31/2026	32.00	On Campus	Other Sponsored Activities
PRED.	09/01/2022	08/31/2026	10.50	Off Campus	IPA Programs
PRED.	09/01/2022	08/31/2026	26.00	Off Campus	All Programs

TYPE	FROM	TO	RATE(%)	LOCATION	APPLICABLE TO
PROV.	09/01/2026	Until Amended			Use same rates and conditions as those cited for fiscal year ending August 31, 2026.

*BASE

Modified total direct costs, consisting of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first $25,000 of each subaward (regardless of the period of performance of the subawards under the award). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, rental costs of off site facilities, tuition remission, scholarships and fellowships, participant support costs and the portion of each subaward in excess of $25,000. Other items may only be excluded when necessary to avoid a serious inequity in the distribution of indirect costs, and with the approval of the cognizant agency for indirect costs.

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are specifically identified to each employee and are charged individually as direct costs. The directly claimed fringe benefits are listed below.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

OFF-CAMPUS DEFINITION: OFF-CAMPUS DEFINITION: For all activities performed in facilities not owned by the institution and to which rent is directly allocated to the project(s) the off-campus rate will apply. Grants or contracts will not be subject to more than one F&A cost rate. If more than 50% of a project is performed off-campus, the off-campus rate will apply to the entire project.

FRINGE BENEFITS:
FICA, Retirement, Worker's Compensation, Life Insurance, Unemployment Insurance, Health Insurance, Accrued Compensated Absences

APPLICABILITY OF RATES: Texas A&M Research Foundation (EIN: 74-1238434), Texas Engineering Experiment Station (EIN: 74-1974733), Texas Engineering Extension Service (EIN: 74-2270626), Texas Agri-Life Research (FKA as Texas Agricultural Experiment Station) (EIN: 74-6000541), Texas Agri-Life Extension (FKA Texas cooperative Extension) (EIN: 74-6000537), Texas Transportation Institute, (EIN: 74-2270624), Texas A&M University at Galveston (EIN: 74-2125225), Texas A&M Health Science Center (EIN: 74-2907553), Texas Forest Service (EIN: 74-6014065),Texas A&M University System (EIN: 74-2648747), Texas Veterinary Medical Diagnostic Laboratory (EIN: 26-3850570), Shared Services Center Commercialization (EIN: 74-2648747), Texas Division of Emergency Management(TDEM), (EIN: 84-1876045).

Your next F&A proposal based on actual costs for the fiscal year ending 08/31/2025, is due in our office by 02/28/2026.

Equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds $5,000.

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

Texas A & M University - College Station

(INSTITUTION)

(SIGNATURE)

Joseph Duron

(NAME)

Chief Administrative Officer

(TITLE)

9-14-2022

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Arif M. Karim -S Digitally signed by Arif M. Karim -S Date: 2022.09.13 13:48:14 -05'00'

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

9/02/2022

(DATE) 6554

HHS REPRESENTATIVE: Denise Shirlee

Telephone: (214) 767-3261

COMPONENTS OF PUBLISHED F&A COST RATE

INSTITUTION: **Texas A&M University - College Station**

FY COVERED BY RATE: **September 1, 2022 - August 31, 2026**

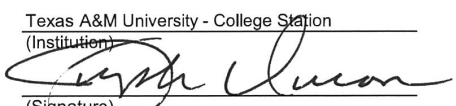
APPLICABLE TO: **ORGANIZED RESEARCH**

RATE COMPONENT:	ORGANIZED RESEARCH & INSTRUCTION FY 23 ON CAMPUS	ORGANIZED RESEARCH & INSTRUCTION FY 24-25 ON CAMPUS	ORGANIZED RESEARCH & INSTRUCTION FY 26 ON CAMPUS	OTHER SPONSORED ACTIVITIES FY 23-26 ON CAMPUS	ALL PROGRAMS FY 23-26 OFF CAMPUS
Building Depreciation	6.6	6.9	7.3	1.0	
Equipment Depreciation	4.4	4.6	4.9	4.0	
Interest	2.7	2.8	3.0	0.1	
Operation & Maintenance	10.3	10.7	11.3	0.9	
Library	1.5	1.5	1.5		
Administration*	26.0	26.0	26.0	26.0	26.0
TOTAL	51.5	52.5	54.0	32.0	26.0

* Reflects provisions of Appendix III to Part 200 of Uniform Guidance—Indirect (F&A) Costs Identification and Assignment, and Rate Determination for Institutions of Higher Education (IHEs), C.8. dated December 26, 2013.

CONCURRENCE:

Texas A&M University - College Station
(Institution)


(Signature)

Joseph Duron
(Name)

Chief Administrative Officer
(Title)

9-14-2022
(Date)

Calculations::
PI: ($18,477 x 18.9%) + ($950 x 1.5 mos.) = $4,917
Undergrad ($10,560 x 3%) = $316
Total = $5,233

System Office of Budgets and Accounting
THE TEXAS A&M UNIVERSITY SYSTEM

June 25, 2024

MEMORANDUM

TO: Chief Financial Officers
Academic Institutions and Service Agencies

FROM: Verna Fritsche, Director, Accounting

SUBJECT: FY2025 Budgeting for Fringe Benefits on Sponsored Agreements

For fiscal year 2025, please use the fringe benefit rates listed below when calculating fringe benefits for sponsored agreement budgeting purposes. This will not impact reimbursements from sponsored agreements, as fringe benefits will continue to be reimbursed at the actual dollar amount expensed, rather than the budgeted amount.

Beginning July 2000, the State is not required to pay Social Security and Medicare for students who meet certain criteria. For the purposes of fringe benefit budgeting, students that meet the criteria will be called FICA Exempt Students. For students who do not meet the criteria, choose the employee category that applies to them.

Fiscal Year 2025 Fringe Benefits for Budget Purposes

Employees Eligible for all Fringe Benefits	18.9% of direct salaries & wages PLUS A fixed monthly dollar amount for group insurance
Employees Not Eligible for Group Insurance & Retirement	10.7% of direct salaries & wages
FICA Exempt Students Eligible for Group Insurance But Not Eligible for Retirement	3.0% of direct salaries & wages PLUS A fixed monthly dollar amount for group insurance
FICA Exempt Students Not Eligible for Group Insurance & Retirement	3.0% of direct salaries & wages

Fiscal Year 20243 Fixed Monthly Dollar Amount for Group (Medical & Basic Life) Insurance

Classification of Employee	Fixed Monthly Insurance Amount
Faculty and Staff – Full Time (100%)	$1,104
Faculty and Staff – Part Time (50% - 99.99%)	$545
Insurance Eligible Student [b]	$283
Combined (all employees) [a]	$950

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e

[a] If the classification of the employee who will be working on the sponsored agreement is known, use the above figure that applies to them. Otherwise, use the combined amount ($950).

[b] The fixed monthly insurance amount ($283) is based on half of the GIP state contributions. However, several System Members have chosen to supplement the remaining half of the contribution or the remaining health premium amounts, whichever is less, if one of the following requirements is met. (The supplement is optional for System Members.)

1. The graduate assistant hired by June 1, 2004.
   or
2. The graduate assistant received a supplement in FY2004.

Below are two tables, *for informational purposes only*. The first table is a breakdown of the fringe benefit percentages. The second table details State monthly contribution towards group (medical and basic life) insurance premiums for insurance eligible employees.

Breakdown of The Fringe Benefit Percentages

	TRS Eligible Employees[c]	ORP Eligible Employees [d]	Employees Not Eligible for a Retirement Plan	FICA Exempt Students
Social Security on first $174,900 (employer portion) [e]	6.20%	6.20%	6.20%	NONE
Medicare	1.45%	1.45%	1.45%	NONE
Workman's Comp. Ins. [g]	.51%	.51%	.51%	.51%
Unemployment Comp. Ins. [h]	.30%	.30%	.30%	.30%
Retirement Plan	8.25% [c]	8.50% [f]	NONE	NONE
Leave Termination [i]	2.15%	2.15%	2.15%	2.15%
TOTAL	18.86%	19.11%	10.61%	2.96%
Fringe Benefit Rate for Budgeting Purposes	**18.9%**	**19.1%**	**10.7%**	**3.0%**

[c] Teacher Retirement System. The retirement contribution for employees participating in TRS will remain at 8.25% in FY2025.

[d] Optional Retirement Program.

[e] $168,800 was effective 1/1/2024. Social Security is subject to change as determined by federal law. For calendar year 2025, employee wages subject to social security increased to an estimated $174,900.

[f] Employees with an ORP start date on or before 8/31/95 are provided the same contribution during FY2025 as they received during FY1995 (8.5%). The state contribution will remain at 6.60% in FY2025. Each member will supplement 1.9% to maintain the 8.5% contribution.

[g] WCI Member assessments range from .10% to .51% based on previous claim experience. See the assessment for each Member in the FY2025 budget instructions.

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[h] UCI Member rates range from .01% to .30% based on previous claim experience. See the rate for each Member in the FY2025 budget instructions.

[i] Leave Termination Member assessments range from .13% to 2.15% based on previous years' experience. Each Member determines the rate to use for their institution/agency/health science center.

Texas AgriLife Extension Service Exception

If the employee has a civil service appointment and is in TRS, the rate is 18.48%
If the employee has a civil service appointment and is in ORP on or after 9-1-95, the rate is 16.83%.
If the employee has a civil service appointment and was enrolled in ORP before 9-1-95,
the rate is 18.73%.

Monthly State Contributions to Group (Medical and Basic Life) Insurance Premiums

Coverage	Full Time (100%)	Part Time (75%-99.99%)	Part Time (50%-74.99%)
Employee Only	$965.90	$965.90	$480.60
Employee and Spouse	$1,246.94	$1,246.94	$621.12
Employee and Children	$1,161.16	$1,161.16	$578.24
Employee and Family	$1,361.40	$1,361.40	$678.36

These fringe benefit percentages and amounts listed in this letter are estimates derived from the average population of all Texas A&M members, if a member's values differ, the member could use the different amounts based upon their employee population. If different numbers are used, the methodology must be documented by the member.

Please call Verna Fritsche at (979) 458-6090 if you have any questions.

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