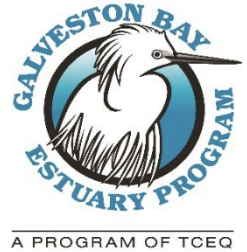


Monitoring & Research (M&R) Subcommittee Fiscal 2028 Proposal Summaries

Project	Lead Implementer
7. Building a Baseline for Sandy Beach Ecosystem Health: Monitoring the Ecological Effects of Beach Nourishment and Contaminant Exposure in Galveston Bay ¹	Texas A&M University at Galveston
8. Integrated monitoring of oyster larvae and environmental factors in Galveston Bay combining net-tow sampling and eDNA approaches	Texas A&M University at Galveston
9. Mapping Green Sea Turtle Foraging Using Galveston Bay Estuary System Isoscapes	Texas A&M University at Galveston
10. Design and Performance Metrics Decision Support for Green Infrastructure and Living Shorelines for Coastal Resilience	University of Houston
11. Expanded Evaluation of Micro- and Nanoplastic Pollution through Emerging Methods	University of Houston-Clear Lake
12. Post-Restoration Terrapin Nesting Habitat Surveys at Galveston Island State Park	University of Houston-Clear Lake
13. A Gap-Free, Multi-Parameter Water Quality Observatory for Galveston Bay Using Satellite Remote Sensing and AI	University of Texas at Arlington
14. Informing contact recreation safety: linking salinity and temperature to fecal indicator organism, enteric virus, and <i>Vibrio vulnificus</i> occurrence in Galveston Bay	University of Texas El Paso
15. Assessing PFAS Occurrence in Galveston Bay Dolphins	Texas A&M University
16. Assessing Emerging Contaminants in Game Waterfowl and their Habitats ¹	Texas A&M AgriLife Research
17. Assessment of legacy and emerging contaminants in sediment, water, and biota within Galveston Bay to inform science-based decision making for at-risk species and human health. ¹	Texas State University

¹ A revised version of this proposal was submitted to GBEP.

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)
Secondary Subcommittee (if applicable): Natural Resource Uses (NRU)
Tertiary Subcommittee (if applicable): Public Participation and Education (PPE)

Project Name:

Building a Baseline for Sandy Beach Ecosystem Health: Monitoring the Ecological Effects of Beach Nourishment and Contaminant Exposure in Galveston Bay
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Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Texas A&M University at Galveston

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*

[If other, please identify pass-through partner.]

Unique Entity ID (UEI) Number:	G8Y3L8JV2588
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Vendor Identification Number (VIN) or Tax ID:	74-6000541
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Contact Information:

Project Representative Name	Guilherme N. Corte
Project Representative Phone	409 261-7903
Project Representative Email	corte@tamug.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

September 1, 2027 – May 31, 2030

Amount Requested from GBEP:

\$145,229

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$60,753
FY 2029 (09/01/2028-08/31/2029)	\$61,946
FY 2030 (09/01/2029-05/31/2030)	\$22,530
Total	\$145,229

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

\$145,229

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

The proposed project will leverage complementary resources supporting field sampling, laboratory analyses, and ecological assessments of Texas sandy beaches. These resources, together with existing laboratory infrastructure, personnel, and ongoing biodiversity and beach nourishment monitoring, will expand the scope and value of the GBEP-funded activities by supporting contaminant analyses, eDNA characterization, and long-term ecological monitoring across the Galveston Bay Estuary System.
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SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☒ NPS-3 ☐ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☒ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

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

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 identify action items and state how the project implements actions of the *Galveston Bay Plan, 2nd Edition* Action Plans.]

Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-2 Support Nonpoint Source Education and Outreach Campaigns:

The project will support locally relevant education and outreach connecting beach health, bay health, and human well-being. By documenting biodiversity across 11 sandy beaches along the Galveston coast and contaminant exposure in representative beach organisms, the project will provide locally relevant examples for public education on stormwater runoff, water quality, pollution, shoreline management, and the ecological importance of beaches beyond recreation. The project will quantify 54 polycyclic aromatic compounds (PAHs), including the 16 U.S. Environmental Protection Agency priority compounds, and 26 polychlorinated biphenyls (PCBs), including nine dioxin-like congeners, in sandy beach species such as ghost crabs and ghost shrimps. These organisms occupy different portions of the beach ecosystem, with ghost crabs representing terrestrial and supralittoral habitats and ghost shrimps representing intertidal and shallow marine habitats. This whole-ecosystem approach will help communicate how biodiversity, contaminant exposure, and processes occurring on land, along sandy shorelines, and in adjacent coastal waters are interconnected within the broader Galveston Bay Estuarine System, highlighting sandy beaches as an important ecological link among terrestrial, estuarine, and marine environments.

PHA-2 Improve Regional Contact Recreation Risk Awareness:

Sandy beaches are among the most heavily used recreational environments in the Galveston region. This project will provide information on biodiversity, habitat condition, and contaminant exposure in beach organisms across 11 beaches monitored from 2025 through 2028. The resulting dataset will complement existing programs such as Texas Beach Watch and the Galveston Bay Foundation's Water Monitoring Team by documenting ecological conditions, biological communities, and contaminant exposure in beach fauna

that are not routinely monitored. By examining contaminants in organisms occupying different ecological zones, including terrestrial ghost crabs and marine ghost shrimps, the project will improve understanding of how contaminants are incorporated into beach food webs and identify locations or biological groups with elevated exposure. Although the project will not conduct a formal human-health risk assessment, these findings will contribute to broader awareness of ecosystem health and environmental conditions at heavily used recreational beaches.

Priority 2: Protect and Sustain Living Resources

HC-2 Habitat Restoration:

Sandy beaches within the Galveston Bay Estuarine System face increasing pressure from chronic erosion, storms, sea-level rise, human use, and coastal development. Beach nourishment is widely used to restore eroded shorelines and protect coastal infrastructure, but its ecological outcomes are rarely evaluated. A 2026 nourishment project on Galveston's West Beach was completed through CAP 204. Our team conducted baseline ecological monitoring before nourishment and has continued post-construction monitoring at the nourished site and two adjacent control areas, documenting short-term changes in benthic communities and preliminary evidence of recovery within months. Two additional nourishment projects planned for 2027-2028 provide a rare opportunity to extend this framework across multiple events and improve understanding of ecological responses and recovery trajectories. Surveys will encompass organisms occupying different ecological zones, from terrestrial and supralittoral ghost crabs to intertidal and shallow marine ghost shrimps and other beach-associated fauna. Together, regional biodiversity monitoring across 11 beaches and focused before-and-after assessments of nourishment projects will provide management-relevant information to improve the ecological design, implementation, and monitoring of future beach nourishment projects.

HC-3 Habitat Enhancement:

The project will evaluate habitat quality and native biodiversity across the terrestrial-to-marine beach gradient at 11 Galveston-area beaches. Monitoring species occupying contrasting zones will provide an integrated assessment of ecological condition across terrestrial, intertidal, and shallow marine habitats. At one recently nourished beach (West Beach), existing pre-nourishment biodiversity data will allow targeted evaluation of ecological change and recovery following nourishment. Results will help identify management practices that support native invertebrates, preserve food resources for shorebirds and surf-zone fishes, and sustain the ecological functions of beaches. These findings will inform shoreline-management strategies that balance habitat quality, coastal protection, and public access.

SC-1 Native Species Management:

Sandy beaches support diverse native species, including ghost crabs, ghost shrimps, amphipods, mole crabs, insects, shorebirds, surf-zone fishes, and many other organisms that are often overlooked in coastal monitoring and management. Through repeated surveys across 11 Galveston-area beaches from 2025 through 2028, the project will establish regional and long-term monitoring data for native sandy beach communities. The inclusion of organisms occupying different ecological zones, from dunes to submerged zones, will allow biodiversity to be evaluated across the entire beach ecosystem rather than within a single habitat zone. At one recently nourished beach, pre-nourishment data will provide an additional opportunity to identify species and ecological groups that are sensitive to disturbance and to track recovery through time. These data will support future management decisions intended to sustain native beach biodiversity.

Priority 3: Engage Communities

SPO-1 Stewardship Programs and Volunteer Opportunities:

Because sandy beaches are familiar and publicly accessible, they provide effective settings for environmental stewardship and community participation. The project will create opportunities for students, volunteers, and community members to participate in beach surveys, biodiversity monitoring, field demonstrations, and public outreach. Participants will learn that sandy beaches extend ecologically from terrestrial and supralittoral habitats to intertidal and shallow marine environments and will observe representative organisms such as ghost crabs and ghost shrimps. The research program already engages local stakeholders through activities with organizations such as the Surfrider Foundation, where participants learn about sandy beach ecology and observe local biodiversity and ecological processes.

Findings from the 11-beach monitoring network will be incorporated into future community-science activities, volunteer monitoring, student training, and public demonstrations.

SPO-2 Workshops and Events:

Results from regional biodiversity monitoring and the targeted post-nourishment assessment will be shared through public events, workshops, agency meetings, and opportunities such as the State of the Bay Symposium. These activities will present sandy beaches as living ecosystems extending from terrestrial habitats to the adjacent marine environment and providing habitat, coastal protection, recreation, tourism value, and support for coastal food webs. Project findings will be used to engage coastal managers, educators, students, local governments, community organizations, and the public.

SPO-3 Support Regional Initiatives:

The project will address a major regional knowledge gap by documenting the ecological condition and management needs of sandy beach ecosystems along the Galveston coast and their role within the broader Galveston Bay Estuarine System. By integrating biodiversity information across 11 beaches and across terrestrial, intertidal, and shallow marine portions of the beach ecosystem, together with contaminant analyses in representative beach species such as ghost crabs and ghost shrimps, the project will strengthen regional conservation and resilience initiatives. These analyses will provide information on contaminant exposure in organisms occupying different ecological zones and help connect pollution with biological and ecosystem condition. The targeted before-and-after assessment at one recently nourished beach will add management-relevant information on ecological recovery following shoreline intervention. Together, these components will promote recognition of beaches, dunes, shorelines, and nearshore habitats as biologically connected components of the broader Galveston Bay coastal system.

SPO-4 Local Government Outreach:

Local governments play central roles in beach access, nourishment planning, erosion response, tourism management, and shoreline maintenance. Over the past two years, the research team has worked with the Galveston Park Board to better understand management priorities and identify information needed to support decision-making. Building on this relationship, the project will generate practical information from 11 beaches on biodiversity, ecological condition, and the responses of species occupying different beach zones, complemented by contaminant analyses in representative organisms such as ghost crabs and ghost shrimps. These analyses will provide information on contaminant exposure across terrestrial and marine components of the beach ecosystem. In addition, the recently nourished beach with existing pre-nourishment biodiversity data will provide a focused case study of ecological change and recovery following shoreline management. Results will be communicated through technical summaries, maps, presentations, and outreach materials developed for municipalities, county partners, park managers, and other coastal decision-makers.

PEA-1 Key Issue Engagement:

The project will promote public engagement with major issues affecting Galveston Bay and its coast, including erosion, beach nourishment, biodiversity loss, recreational use, and coastal resilience. By presenting sandy beaches as biologically active ecosystems extending from terrestrial habitats to the shallow marine environment, rather than only as recreational spaces, the project will encourage broader discussion of how human activities affect beach biodiversity and ecological function and how communities can contribute to protecting these habitats. Regional biodiversity findings and the focused evaluation of one recently nourished beach will provide direct local examples of ecological change and recovery.

Priority 4: Inform Science-Based Decision Making

RES-1 Conduct Biological Stressor Monitoring and Research:

The project will monitor biological responses of sandy beach communities to environmental and anthropogenic stressors, including erosion, human use, urbanization, storms, pollution, and other forms of habitat disturbance. Repeated biodiversity surveys across 11 Galveston-area beaches from 2025 through 2028 will provide a regional assessment of ecological condition and temporal variability. The project will explicitly examine organisms occupying different ecological zones, including terrestrial and supralittoral ghost crabs and intertidal to shallow marine ghost shrimps, together with broader beach-associated communities. Contaminant analyses in representative beach organisms, including ghost crabs and ghost shrimps, will complement biodiversity monitoring by providing information on biological exposure to PAHs and PCBs across different portions of the beach ecosystem. Within this regional network, our team has

already collected biodiversity samples before and after nourishment at a recently nourished Galveston beach, as well as at two adjacent control areas, providing a strong foundation for evaluating ecological change and post-nourishment recovery. Integrating biodiversity, organism-based contaminant exposure, and responses to disturbance will help identify biological indicators of ecosystem condition, stress, and recovery across the terrestrial-marine beach continuum.

RES-8 Complete Coastal Resiliency and Acclimation Studies:

The project will evaluate how sandy beach ecosystems respond to erosion, storms, human use, pollution, and other coastal stressors through repeated biodiversity monitoring across 11 Galveston-area beaches. Because nourishment is an important adaptation strategy for shoreline erosion, storm impacts, and sea-level rise, our team has already collected biodiversity samples before and after nourishment at a recently nourished Galveston beach and at two adjacent control areas, providing a strong foundation for evaluating ecological change and recovery following nourishment. Two additional nourishment projects planned for 2027–2028 provide an opportunity to extend this monitoring framework and improve understanding of ecological responses and recovery trajectories across multiple nourishment events. Biodiversity monitoring will be complemented by contaminant analyses in representative organisms such as ghost crabs and ghost shrimps, providing information on biological exposure across terrestrial and marine portions of the beach ecosystem. Together, these approaches will improve understanding of the multiple stressors affecting sandy beach ecosystems and support management practices that enhance the long-term ecological resilience of Galveston-area beaches.

ACS-1 Tracking Ecosystem Health Indicators:

Sandy beach ecosystems are underrepresented in existing coastal monitoring frameworks. This project will generate information that can support the development and tracking of biological indicators of sandy beach health, including species richness, abundance, community composition, eDNA-based biodiversity, occurrence and abundance of key indicator taxa, contaminant exposure in representative beach organisms, and temporal change. Repeated surveys across 11 beaches will provide regional context for interpreting these indicators. At a recently nourished Galveston beach, biodiversity samples have already been collected before and after nourishment, together with samples from two adjacent control areas, allowing ecological responses and recovery to be evaluated through time. Monitoring organisms from different ecological zones—including terrestrial ghost crabs and marine ghost shrimps—and measuring PAHs and PCBs in these organisms will provide complementary information on biodiversity, biological exposure, and ecosystem condition across the beach-nearshore continuum. These indicators can contribute to future assessments of the Galveston Bay Estuarine System and its adjacent coastal habitats.

ACS-2 Access to Monitoring and Research Data:

The project will produce biodiversity and organism-based contaminant datasets, maps, technical reports, outreach materials, and scientific publications for GBEP partners, local governments, coastal managers, educators, community organizations, and the public. Results from repeated field biodiversity surveys across 11 beaches, eDNA analyses, contaminant analyses in representative beach organisms, and before-and-after nourishment samples already collected at a recently nourished beach and two adjacent control areas will be translated into accessible products that support science-based decision-making, long-term biological monitoring, and public understanding of sandy beach ecosystems. By integrating biodiversity and contaminant exposure across organisms occupying terrestrial, intertidal, and shallow marine zones, the resulting datasets will provide a more comprehensive representation of beach ecosystem health and its connection to the broader Galveston Bay Estuarine System.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☒ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☒ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☐ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☒ PPE: Conservation and environmental workforce development.
- ☐ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☒ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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:

[Please explain in detail how project addresses priorities selected. Attachments may be submitted via email in conjunction with this application.]

M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information

This project directly addresses the M&R priority by establishing integrated ecological, physical, molecular, and organism-based contaminant baselines for sandy beaches along the Galveston coast. Building on standardized surveys conducted across 11 Galveston-area beaches in 2025 and 2026, the project provides the spatial coverage needed to compare biodiversity and ecosystem condition across gradients of human use, shoreline modification, and management history. Biodiversity sampling spans the entire beach ecosystem, from dunes and terrestrial habitats through the intertidal zone to shallow submerged habitats, and integrates community surveys, population-level assessments of key species, and molecular analyses using environmental DNA (eDNA). Representative beach organisms, including species occupying terrestrial and marine portions of the beach ecosystem, have also been collected for contaminant analyses. Together, these complementary approaches provide a comprehensive characterization of beach biodiversity and ecological condition and establish reference conditions for evaluating future effects of storms, hurricanes, oil spills, harmful algal blooms, nonpoint-source pollution, and other natural and human-driven disturbances within the broader Galveston Bay Estuarine System.

The project also incorporates a strong temporal framework through before-impact, post-impact, and recovery assessments of beach nourishment, one of the most extensive shoreline-management interventions along the Galveston coast. Although nourishment projects are routinely evaluated from an engineering perspective, their ecological effects on biodiversity, habitat condition, contaminant exposure, and ecosystem recovery are rarely assessed. Our team has already collected biological samples before and after a recently completed nourishment project at the nourished beach and two adjacent reference sites, providing a strong foundation for evaluating whether biological communities and populations return toward pre-disturbance conditions, remain altered, or follow different recovery trajectories. Organisms collected for contaminant analyses will also allow biological exposure to be evaluated within this temporal framework. Two additional nourishment projects planned for 2027–2028 provide an opportunity to extend this approach across multiple events and management contexts. Together, these spatial and temporal datasets will help managers identify vulnerable beaches and species, detect environmental change, evaluate ecological responses to nourishment and other disturbances, and improve habitat restoration, spill-response planning, and long-term coastal resilience.

M&R: Assessment, exposure, and response to stressors, including environmental parameters and legacy contaminants

This project will evaluate how sandy beach ecosystems respond to interacting physical, chemical, and biological stressors, including beach nourishment, erosion, human use, urbanization, freshwater and stormwater inputs, nutrient enrichment, oil-derived hydrocarbons, and other contaminants of concern. Biological responses will be evaluated across the full dune-to-submerged gradient using complementary community, population, and molecular approaches. Field surveys will characterize beach-associated communities and populations of key species, while eDNA analyses will provide a complementary molecular assessment of biodiversity, including organisms that may be missed by conventional sampling.

The project will quantify 54 polycyclic aromatic compounds (PAHs), including the 16 U.S. Environmental Protection Agency priority compounds, and 26 polychlorinated biphenyls (PCBs), including nine dioxin-like congeners, in representative sandy beach organisms. Organisms for these analyses have already been collected as part of the ongoing biodiversity monitoring. Exposure assessments will focus on key species occupying different ecological zones, particularly ghost crabs in terrestrial and supralittoral habitats and ghost shrimps in intertidal and shallow marine habitats. This design will provide complementary measures of biological exposure across the terrestrial-marine beach continuum. By integrating contaminant concentrations in organisms with community biodiversity, population-level responses, eDNA-based community composition, and environmental conditions, the project will identify areas and taxa with elevated exposure and evaluate how multiple stressors relate to beach ecosystem condition. This integrated approach will provide practical information for contaminant monitoring, ecological assessment, habitat conservation, and sustainable beach management throughout the Galveston Bay Estuarine System.

NRU: Enhancement of existing or ongoing restoration and conservation efforts, with emphasis on adaptive management for previously completed projects

This project directly addresses the NRU priority by strengthening beach nourishment, one of the most widespread shoreline restoration and conservation practices along the Galveston coast, through ecological

monitoring that supports adaptive management. With erosion reaching approximately 6.86 feet per year along portions of Galveston Island, nourishment has become a central coastal-management strategy. However, nourishment projects are generally evaluated primarily from an engineering perspective, and their effects on biodiversity, habitat condition, contaminant exposure, and ecosystem recovery remain poorly understood. This lack of ecological performance data limits the ability of managers to refine nourishment design, implementation, and biological monitoring. By addressing this gap, the project will enhance an ongoing restoration strategy rather than duplicate existing efforts.

The project specifically applies adaptive management to a previously completed nourishment project. A major nourishment project on West Beach was completed through CAP 204 using hundreds of thousands of cubic yards of sediment from the Galveston Ship Channel. Immediately before construction in September 2025, the research team collected biological samples and environmental data at the nourishment site and two adjacent reference sites. Biodiversity sampling extended from dune and terrestrial habitats through the intertidal zone to submerged habitats and incorporated community surveys, population-level assessments of representative species, and molecular biodiversity analyses using eDNA. Representative beach organisms, including species occupying terrestrial and marine portions of the beach ecosystem, were also collected for contaminant analyses to evaluate biological exposure to PAHs and PCBs. Sampling was repeated following construction and again approximately six months later. This before-impact, post-impact, and recovery framework provides a rare opportunity to evaluate responses across multiple components of the beach ecosystem and determine whether biological communities, populations, and contaminant exposure return toward pre-construction conditions, remain altered, or follow different recovery trajectories.

Two additional nourishment projects planned for 2027 and 2028, including projects involving the beneficial use of dredged material, will provide opportunities to extend this integrated ecological monitoring framework across additional nourishment events and management contexts. Together, these assessments will provide managers with recommendations for improving nourishment design, refining biological and contaminant monitoring protocols, and ensuring that nourishment supports both shoreline protection and ecological function.

PPE: Conservation and environmental workforce development

This project addresses the PPE priority by using sandy beach ecosystems as accessible, hands-on training environments for students, early-career scientists, educators, volunteers, and community participants. Trainees will gain practical experience in biodiversity sampling across the dune-to-submerged beach gradient, population surveys of key beach species, organism collection, eDNA and other molecular approaches, collection and preparation of organisms for contaminant analyses, data management, ecological analysis, and science communication. This integrated training will expose participants to complementary methods spanning individual populations, biological communities, molecular biodiversity, and contaminant exposure. Because sandy beaches are familiar and publicly accessible, they provide an effective setting for developing technical skills while helping participants recognize beaches as biologically active ecosystems connecting terrestrial, estuarine, and marine environments.

The project will prepare participants for careers in conservation, coastal management, environmental consulting, academic research, nonprofit organizations, and local government by providing training in methods directly relevant to the Galveston Bay Estuarine System. These methods include biodiversity and population monitoring, molecular biodiversity assessment using eDNA, assessment of ecological responses to beach nourishment, evaluation of contaminant exposure in coastal organisms, mapping ecological patterns, managing environmental data, and communicating findings to managers and the public. Project activities and outreach products will also support K-12 education, community science, public workshops, and stewardship programs, thereby strengthening both technical workforce capacity and broader environmental literacy.

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☒ Make Investments that Address Coastal Resiliency
- ☐ Reduce Trash

[If yes, please summarize how the proposal addresses EPA Areas of Special Interest.]

The proposed project addresses coastal resiliency by improving how sandy beach ecosystems are monitored, restored, and managed in response to erosion, storms, sea-level rise, shoreline modification, pollution, and other human-driven stressors. Sandy beaches provide shoreline protection for coastal

communities while supporting tourism, recreation, biodiversity, fisheries, and wildlife habitat. Building on biodiversity monitoring across 11 Galveston-area beaches, the project will assess ecological condition from dune and terrestrial habitats through the intertidal zone to shallow submerged habitats using complementary community surveys, population-level assessments of key species, and molecular biodiversity analyses using environmental DNA (eDNA). This integrated approach will provide a more complete understanding of the ecological condition and resilience of sandy beaches within the broader Galveston Bay Estuarine System.

The project will also evaluate ecological responses to beach nourishment, an increasingly important strategy for addressing shoreline erosion, storm impacts, and sea-level rise. Our team has already collected biological samples before and after a recently completed Galveston nourishment project at the nourished beach and two adjacent reference sites, providing a foundation for assessing ecological change and recovery. Two additional nourishment projects planned for 2027–2028 provide opportunities to extend this monitoring framework across additional restoration events and management contexts. These assessments will generate practical information for designing and managing nourishment projects that protect shorelines while maintaining biodiversity and ecological function.

The project will further strengthen coastal resiliency by establishing organism-based contaminant baselines that can support evaluation of future pollution events and other disturbances. The project will quantify 54 polycyclic aromatic compounds, including the 16 U.S. Environmental Protection Agency priority compounds, and 26 polychlorinated biphenyls, including nine dioxin-like congeners, in representative beach organisms such as ghost crabs and ghost shrimps. These species occupy different portions of the beach ecosystem, with ghost crabs representing terrestrial and supralittoral habitats and ghost shrimps representing intertidal and shallow marine habitats. These analyses will characterize biological exposure to contaminants and help identify locations or taxa with elevated exposure that may be particularly vulnerable to environmental disturbance.

By integrating regional biodiversity monitoring, population and eDNA-based assessments, organism-based contaminant analyses, environmental measurements, and before-and-after assessments of nourishment, the project will provide coastal managers with science-based information to identify vulnerable beaches and species, evaluate restoration effectiveness, improve future nourishment practices, detect ecological change, and prioritize investments that support shoreline protection, ecosystem health, and long-term resilience throughout the Galveston Bay Estuarine System.

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:

Building on ongoing monitoring across 11 Galveston-area beaches, this project will integrate biodiversity assessments from dune to submerged habitats, population-level surveys, environmental DNA (eDNA), contaminant analyses in representative beach organisms, and before-and-after beach nourishment monitoring to evaluate the condition and resilience of sandy beach ecosystems within the Galveston Bay Estuarine System. The project will identify vulnerable beaches and species, characterize contaminant exposure, evaluate ecological responses and recovery following nourishment, and identify environmental drivers of ecosystem condition. Results will provide actionable information to support coastal resilience planning, habitat management, spill-response preparedness, and the science-based design, monitoring, and evaluation of shoreline restoration practices.

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

[Please explain in detail how project addresses priorities selected. Attachments may be submitted via email in conjunction with this application.]

No coastal ecosystem is more present in daily life than sandy beaches. They comprise approximately one-third of the world's shorelines and support fisheries and tourism, buffer communities from storms and sea-level rise, provide habitat for wildlife, and sustain coastal food webs (Defeo and McLachlan 2025). Their socioeconomic importance is substantial: U.S. beaches attract nearly 200 million visitors annually and generate approximately \$240 billion in local economic activity (Houston 2024). In Galveston alone, more than 7 million annual visitors support a tourism economy exceeding \$1.3 billion (Visit Galveston). Yet Galveston's sandy beaches are exposed to interacting stressors, including erosion, urbanization, stormwater runoff, recreational use, nutrient inputs, oil-derived hydrocarbons, and other contaminants.

Despite their ecological and economic importance, sandy beaches remain underrepresented in coastal monitoring. Within the Galveston Bay Estuarine System, no integrated effort currently evaluates their biodiversity, contaminant exposure in resident organisms, and responses to major shoreline interventions. This gap limits the ability of managers to develop science-based strategies for coastal resilience, habitat protection, spill-response preparedness, and long-term shoreline management.

The project has three objectives: (1) document biodiversity and ecological condition across Galveston-area sandy beaches; (2) establish a baseline of contaminant exposure in representative beach organisms; and (3) evaluate ecological responses and recovery following beach nourishment.

Objective 1: Biodiversity and ecological condition. Our team sampled 11 Galveston-area sandy beaches in 2025 and 2026, spanning heavily modified and less developed sites. Sampling encompasses the full beach ecosystem, from dunes and terrestrial habitats through the intertidal zone to shallow submerged habitats. We integrate community-level biodiversity surveys, population assessments of representative species, and molecular biodiversity analyses using environmental DNA (eDNA). Key organisms include ghost crabs representing terrestrial and supralittoral habitats and ghost shrimps representing intertidal and shallow marine habitats. Environmental variables include beach slope, sediment grain size, salinity, and degree of human modification. With project support, we will complete taxonomic and eDNA analyses of samples already collected and repeat standardized sampling in summers 2027 and 2028. This multiyear framework will reveal how natural variability, human use, and shoreline management shape biodiversity and ecological condition across the Galveston coast.

Objective 2: Contaminant exposure and ecosystem health. We will analyze representative sandy beach organisms to establish spatial baselines of contaminant exposure. Analyses will include 54 polycyclic aromatic compounds (PAHs), including the 16 U.S. Environmental Protection Agency priority compounds, and 26 polychlorinated biphenyls (PCBs), including nine dioxin-like congeners. Organisms for these analyses have already been collected as part of ongoing biodiversity monitoring. Particular emphasis will be placed on ghost crabs and ghost shrimps, which occupy different ecological zones and provide complementary information on contaminant exposure across the terrestrial-marine continuum.

Measuring contaminants directly in resident organisms will provide information on biological exposure and potential incorporation into coastal food webs. By integrating contaminant concentrations with biodiversity, population-level data, eDNA-based community composition, and environmental characteristics, the project will identify areas and taxa with elevated exposure and establish reference conditions against which future spills or pollution events can be evaluated. These data will support long-term ecosystem assessment, habitat management, pollution-response planning, and public awareness of beach environmental health.

Objective 3: Beach nourishment and adaptive management. Beach nourishment has become an important response to erosion along the Galveston coast, where shoreline retreat reaches approximately 6.86 feet per year in some areas. However, nourishment projects are generally assessed from an engineering perspective, while their ecological effects remain poorly understood. A major nourishment project on West Beach was completed through CAP 204 using sediment from the Galveston Ship Channel. Immediately before construction in September 2025, our team collected biological samples and environmental data at the nourishment site and two adjacent reference sites. Sampling extended from dune habitats to submerged zones and included community surveys, population-level assessments, eDNA, and organisms for contaminant analyses. Sampling was repeated following construction and again approximately six months later.

This before-impact, post-impact, and recovery framework directly addresses the M&R priority for baseline assessment of large-scale human modifications and the NRU priority for adaptive management of completed restoration projects. It provides a rare opportunity to determine whether biological communities and populations return toward pre-construction conditions, remain altered, or follow different recovery trajectories. Two additional nourishment projects planned for 2027 and 2028 will provide opportunities to extend this framework across additional nourishment events and management contexts.

Community engagement, workforce development, and project readiness. The project will provide hands-on training for graduate and undergraduate students in biodiversity surveys, population monitoring, molecular ecology, organism collection for contaminant analyses, data management, ecological analysis, and science communication. It will also create opportunities for volunteers and community members to participate in biodiversity monitoring, field demonstrations, and outreach. Existing activities with organizations such as the Surfrider Foundation already engage local participants in sandy beach ecology. Maps, plain-language summaries, community-science activities, and technical products will make results accessible to managers, local governments, educators, community partners, and recreational users.

The project is ready for immediate implementation. The investigators have already completed extensive field surveys across 11 beaches and collected samples for biodiversity, population, eDNA, and contaminant

analyses, including samples collected before and after nourishment at a recently nourished beach and adjacent reference sites. GBEP support will accelerate sample processing, data integration, and continued monitoring through 2028.

This project advances all four priorities of The Galveston Bay Plan by **(1) ensuring safe human and aquatic life** use through organism-based contaminant baselines; **(2) protecting and sustaining living resources** through biodiversity and population monitoring; **(3) engaging communities** through training, outreach, and accessible data products; and **(4) informing science-based decision making** through integrated ecological, molecular, contaminant, and nourishment-response monitoring. Together, these efforts will provide actionable information to support coastal resilience, habitat management, pollution-response planning, and science-based shoreline restoration throughout the Galveston Bay Estuarine System.

Project Urgency:

[Please indicate the need for receiving funding during this cycle; such as loss of other funding secured, loss of opportunity to implement project, potential of breach, etc.]

Funding during this cycle is urgent because field samples have already been collected and the project has reached the stage when taxonomic identification, eDNA processing, contaminant analyses, reagent purchases, and other laboratory processing must be completed. The investigators have the samples, personnel, field capacity, and established analytical workflows in place, but additional support is needed to complete these analyses and maintain continuity in the monitoring program. Without timely funding, samples may remain unanalyzed, delaying management-relevant results and weakening the value of the existing dataset.

Timely support is also essential because standardized sampling will continue for two additional years, creating a four-year dataset for Galveston-area sandy beaches. This time series will provide a rare opportunity to document understudied coastal biodiversity, detect ecological changes associated with human activities and environmental variability, and evaluate ecological responses to shoreline-management actions. Two additional nourishment projects are anticipated in 2027 and 2028, and pre-construction biodiversity, environmental, and organism-based contaminant baselines must be collected before sand placement. Once construction occurs, these baseline conditions cannot be reconstructed. Similarly, ecological and contaminant baselines established before the next hurricane, oil spill, or other disturbance will greatly improve the ability to quantify impacts and recovery. Delayed funding could therefore result in the permanent loss of critical sampling opportunities.

The work is particularly urgent because standardized, multiyear datasets describing sandy beach biodiversity, contaminant exposure, and ecological responses to nourishment remain lacking for the Galveston Bay Estuarine System. Without pre-disturbance baselines, it is difficult to distinguish chronic background conditions from acute impacts, limiting impact assessment, recovery monitoring, and long-term management. The investigators have already completed extensive biodiversity surveys from dune to submerged habitats, collected samples for population and eDNA analyses, and collected representative beach organisms for contaminant analyses. Funding will therefore immediately advance taxonomic identification, molecular processing, chemical analyses, data integration, and continued field monitoring. The project will complement existing programs such as Texas Beach Watch while providing an integrated assessment of biodiversity, biological contaminant exposure, and ecological condition across Galveston-area sandy beaches.

Other Plans Implemented:

[Please identify any third-party conservation plans this project implements, such as the Texas Coastal Management Plan, Texas Coastal Resiliency Master Plan, watershed-based plans, etc.]

Partners¹ and Their Roles:

Dr. Guilherme N. Corte (Principal Investigator, Texas A&M University at Galveston)

Dr. Corte will lead the overall project, including project coordination, study design, field sampling, biodiversity surveys, environmental DNA (eDNA) analyses, beach nourishment monitoring, data integration, statistical analyses, reporting, and stakeholder outreach. He will oversee assessments of sandy beach

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

biodiversity, ecosystem condition, ecological responses to nourishment, and the development of science-based recommendations for coastal management.

Dr. David Hala (Co-Principal Investigator, Texas A&M University at Galveston)

Dr. Hala will lead the environmental chemistry component of the project. He will oversee contaminant analyses in beach sediments and organisms, including the quantification of 54 polycyclic aromatic compounds (PACs), including the 16 U.S. EPA priority PACs, and 26 polychlorinated biphenyls (PCBs), including nine dioxin-like congeners. He will contribute to study design, quality assurance and quality control (QA/QC), contaminant data interpretation, ecological risk assessment, and the integration of contaminant and ecological datasets to support sustainable beach management.

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

☐ Yes

☒ No

[TBD.]

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes

☒ No

[TBD.]

Latitude/Longitude (Optional):

[degrees, minutes, and seconds format]

Location:

Galveston Bay shorelines

Projects Map

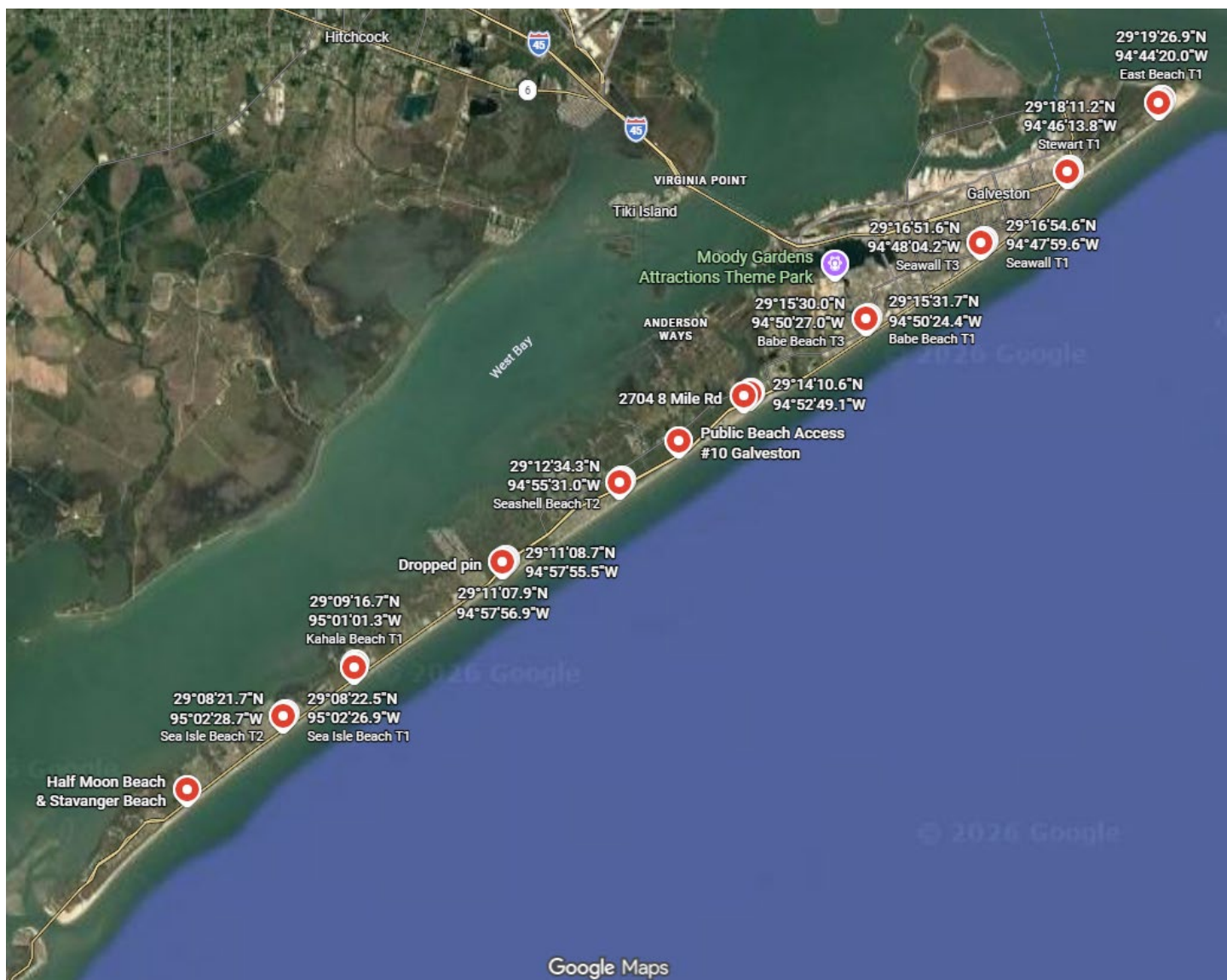


Figure 1. Locations of 11 Galveston-area sandy beaches sampled in both 2025 and 2026. Standardized biodiversity, eDNA, environmental, and contaminant monitoring will continue at these sites in 2027 and 2028 to support long-term assessment of ecological condition and change.

Supplemental Photos/Graphics (Optional):



Figure 2. Beach Access #10 before and after nourishment under CAP204. The left panel shows the site prior to nourishment, and the right panel shows post-nourishment conditions following sand placement. These images illustrate the substantial physical changes in beach width, surface characteristics, and shoreline condition associated with the nourishment project.



Figure 3. Locations of the beach nourishment impact and control sites on Galveston Island. Hershey Beach, at Public Beach Access #10, served as the nourished impact site, while Seashell Beach and Sunny Beach served as nearby non-nourished control sites for evaluating ecological responses and recovery following nourishment.



1. Measuring beach elevation and vegetation at a sampling site.



2. Field station set up on the beach for biodiversity and environmental sampling.



3. Processing samples and recording field data at the beach station.



4. Sample of ghost crab collected for population and ecological analyses.



5. Collecting sediment cores for benthic community and contaminant analyses.



6. Macrobenthos collected (Polychaetes and crustaceans).

Figure 4. Representative field activities conducted during sandy beach monitoring in the Galveston Bay Estuary System.

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$49,135
Fringe Benefits (###)% ²	\$11,232
Travel	\$0.00
Supplies	\$30,000
Equipment	\$0.00
Contractual	\$0.00
Construction	\$0.00
Other	\$6,064
Total Direct Cost	\$96,431

b. Indirect Costs³

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

³ Please attach Indirect Cost Agreement as an appendix if applicable

Distribution Base Amount (<i>identify Base type below</i>)	\$
Indirect Cost Rate for Reimbursement	% 54
Total Indirect Costs	\$ 48,798

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

[Description of costs associated with “Other” budget category.]

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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:

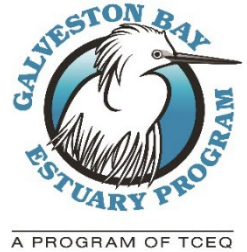
- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)
Secondary Subcommittee (if applicable): Natural Resource Uses (NRU)
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Integrated monitoring of oyster larvae and environmental factors in Galveston Bay combining net-tow sampling and eDNA approaches

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Texas A&M University at Galveston

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*

[If other, please identify pass-through partner.]

Unique Entity ID (UEI) Number: G8Y3L8JV2588

Vendor Identification Number (VIN) or Tax ID: 74-2125225

Contact Information:

Project Representative Name	Hui Liu
Project Representative Phone	(409)740-4716
Project Representative Email	liuh@tamug.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

12 months, 09/01/2027 to 08/31/2028

Amount Requested from GBEP:

\$165,859

Federal ☒ State ☐ No Preference ☐

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$165,859
FY 2029 (09/01/2028-08/31/2029)	\$0.00
FY 2030 (09/01/2029-05/31/2030)	\$0.00
Total	\$165,859

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

\$165,859

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

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

N/A

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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:

Better implementation of Galveston Bay Plan and GBEP stakeholder priorities requires science-based data collection consistently through meaningful and effective monitoring of ecosystem components that are interesting to natural resource managers, stakeholders, and decision makers. This project is designed to contribute to implementation of Galveston Bay Plan 2nd Edition Priority Area Actions through performing quality-assured monitoring activities focusing on oyster larvae to generate accessible research data to inform decision-making action plans of GBEP and TCEQ.

*Ecosystem assessment has been commonly accepted as a framework for management and restoration of estuarine ecosystems that are frequent subjected to natural and man-made disturbances (**Plan Priority 4**), which is often based on synthesis and analysis of accessible research data for tracking ecosystem responses to stressors and is highly needed to protection of natural living resources and assessment of the habitat status (i.e., oysters in **Plan Priority 2**). A **goal** of this project is to advance the long-term monitoring program of estuarine ecosystems in support of oyster restoration in Texas estuaries through combining net-tow sampling and eDNA approaches to generate high-quality data for better management of the valuable living resources in Texas. A set of ecosystem indicators and oyster larvae simultaneously collected with broad coverage in time and space in the bay will provide a complete picture of the Galveston Bay ecosystem along with the status of commercially important shellfish species (i.e., oysters) for decision-making by resource managers and stakeholders (**Plan Priority 2**). This project will engage with K-12 students (e.g. high school students already volunteered in a recent project), undergraduate/graduate students, adult volunteers from the local community (**Plan Priority 3**) on field sampling and laboratory work, promoting awareness and importance to protect the health of Galveston Bay considering natural and man-made disturbances.*

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☒ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☒ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☒ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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 outcome of this project is accessible research data to inform the implementation of Galveston Bay Plan and GBEP stakeholder priorities. Targeting key estuarine abiotic and biotic indicators (i.e., environmental factors, zooplankton and oyster larvae etc.), the proposed work benefits both M&R and NRU subcommittees for better management of these valuable natural living resources in response to external disturbances to Galveston Bay.

*Environmental and biological indicators (i.e., zooplankton, hydrological factors, and larvae of valuable species) are tightly connected. Systematic/consistent monitoring of these indicators using net-tow sampling simultaneously accompanied with eDNA approaches is novel and effective to generate informative data for baseline assessment of sudden disturbances and chronic changes to the Galveston Bay ecosystem (**M&R priorities**), meanwhile the data of larval oysters is currently lacking/insufficient but highly needed for conservation and management of native fish and wildlife (**NRU priorities**). Therefore, this project will provide cross-subcommittee benefits to the TCEQ/GBEP program.*

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☒ Make Investments that Address Coastal Resiliency
- ☐ Reduce Trash

Coastal resiliency is defined as a coastal ecosystem's capacity to absorb external disturbances and still maintain its fundamental structure, function, and identity. In history, few major natural (hurricanes, severe rainfalls and droughts etc.) and man-made (pollution, oil spills etc.) disturbances occurred occasionally in Galveston Bay. Knowing the resilience of the bay is prerequisite to perform post-disaster assessments and subsequent restoration actions. All these are based on the long-term baselines of key ecosystem components for better understanding of the resiliency of Galveston Bay. The proposed work of advancing existing monitoring programs of the bay through consistent net-tow sampling and eDNA approaches on data collection is well aligned with the EPA special interest on Coastal Resiliency in Galveston Bay.

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:

Project objectives are: (1) to develop a novel technique for long-term monitoring of estuarine indicators from combining the traditional sampling and eDNA approaches in Texas estuaries to generate benchmark data of larval oyster dynamics for better restoration and enhancement of oyster habitats in the bay; (2) to provide science-based guidance to agencies and stakeholders in selection of sites to maximize recruitment success, and potential oyster sanctuaries that could serve as sources of a reliable and consistent supply of pelagic oyster larvae.

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

While agencies and stakeholders have increased oyster restoration activities over recent years, a knowledge gap exists on pelagic oyster larvae and their habitats (environmental conditions and oyster reefs etc.). A major hurdle on better understanding of oyster larvae is their cryptic morphology, which is difficult to differentiate from other co-existing species. Accordingly, it is essential to unequivocally identify the cryptic larval stages of eastern oysters. In a recent study, we have examined oyster larvae in Galveston Bay using sampling and morphological identification (Liu et al., 2025). Based on morphological examinations, most of the bivalve larvae collected were oysters, but uncertainty exists that may correspond to other species. Without characterizing these samples genetically, it is problematic to quantify the proportion of oysters among the bivalve larvae sampled.

Traditional monitoring is expensive and inherently faces limitations, such as restricted fields of sampling and time-consuming lab sorting. To address these challenges, integrating novel techniques is essential. Environmental DNA (eDNA) is an emerging method for detecting and identifying species in aquatic environment offering enhanced sensitivity and noninvasive sampling capabilities. Therefore, eDNA has the potential to detect species that may not be sampled through field sampling and meanwhile provides a tool to genetically characterize these samples. We have initiated a pilot study of barcoding and metabarcoding analyses to aimed respectively to identify eastern oysters among morphologically sorted larvae and by characterizing the DNA from the samples determine the presence and relative abundance of this species. With this proposed project, we should be able to provide accurate estimates of the density and distribution of oyster larvae in Galveston Bay, which can be combined with a recently completed work on modeling larval dynamics of oysters (Li & Liu 2025) for improved prediction of the “sink, source and viability” of oyster larvae in the bay.

We plan to sample bivalve larvae and ambient hydrographic factors every month (September 2027 to August 2028 plus 3 backup cruises). During recently completed projects we have generated time series data including zooplankton and water properties (September 2022 and February 2026, TCEQ final report) and oyster larvae data (Fig.2). We have examined hurricane impacts on pelagic communities in Galveston Bay (Liu et al. 2021). In this project, we will extend the sampling coverage (Fig. 1) onboard RV/Milan of Texas A&M University to conduct horizontal net tows with 100 μ m mesh sizes and two replicates. Specimens will be preserved in duplicate. One sample will be preserved in 5% formaldehyde/seawater solution (Liu et al. 2021) and the other in 90% ethanol for metagenomic analyses aimed to identify oyster larvae. Concurrently, temperature, salinity, dissolved oxygen, and pH will be obtained using a calibrated Hydrolab DataSonde. Direction and speed of water currents will be measured using a current meter. In the laboratory zooplankton specimens will be processed for sorting oyster larvae following Liu et al. (2025) under a dissecting microscope (Leica 205C).

Water samples for eDNA analyses will be collected using a battery-operated transfer pump with the intake hose attached to a single-use self-preserving eDNA filter pack (45 mm-diameter glass fiber with a pore size 1.5 μ m; Smith-Root Inc.) attached on the intake end to a sterile collection tubing (Masterflex PharmaPure) from the mid-water column at each site. The intake tubing will be replaced between stations, and new gloves will be used whenever handling new filters or tubing. Sample size volumes of water will be maintained around 4 L measured using a flowmeter placed at the outlet end. Each self-preserving filter pack will be stored in its sterile bag and transported to the laboratory on ice in a previously sanitized cooler using a 10% chlorine solution. Whole genomic DNA will be isolated from filters using the DNeasy PowerSoil Pro (Qiagen), followed by treatment with the Zymo OneStep PCR Inhibitor Removal Kit (Zymo Research), then measured using the Qubit 2.0 Fluorometer (Thermo Fisher Scientific, Waltham, MA, USA). To tease out eastern oysters from bivalve larvae of other species, we will utilize two approaches. The first will involve genetic barcoding based on short amplicon (SA) High Resolution Melting (HRM) utilizing eastern oyster-specific primers (Alvarado Bremer unpublished). This approach will be carried on a sample subset where individual larvae will be visually separated, and those potentially corresponding to oysters will be used directly as template (without DNA isolation) in a HRM assay.

Sanger sequencing will be carried for a set of amplicons collected at random from one in every 20 specimens characterized with HRM. Metabarcoding primers will be developed based on the 16S rRNA oyster primers in conjunction with those listed by Gense et al. (2021) for bivalve species identification. Amplicons of the 16S rRNA will be prepared using three-step PCRs for high-throughput sequencing on the Illumina MiSeq platform (Illumina, San Diego, CA, USA). Amplification of the target region(s) will be confirmed by electrophoresis on a 1.5% agarose gel with SYBR Gold Nucleic Acid Gel Stain (Thermo Fisher Scientific). A second PCR will be performed to attach the Illumina MiSeq tags to the DNAs amplified in the first PCR. The products of the first PCR, after 10 X dilution, will be used as templates in the third PCR where sequence tags for discriminating samples will be incorporated. Next generation sequencing will be conducted at TAMU AgriLife Genomics and Bioinformatics Services (GBS). Reads will be deposited in the National Center for Biotechnology Information (NCBI). Negative and positive controls will be incorporated into all the steps of the analysis to check for false positives and to calibrate the metabarcoding experiments (Taberlet et al. 2018). The presence and relative abundance of oyster larvae will be derived from bioinformatic analyses. In addition, quantitative PCR (qPCR) will be used to detect and provide relative abundance estimates of eastern oysters. Assay specificity will be attained by utilizing the same oyster-specific primers (Alvarado Bremer unpublished) used in SA-HRM experiments. Relative quantification, based on calibrations using serial dilutions of eDNA (Fig. 3), will be compared with abundance estimates through sampling in the field as a proxy for prompt estimate of relative abundance of oyster larvae for management purposes.

Project Urgency:

Science-based management actions and decision-making of estuarine ecosystems are built upon high quality research data of key ecosystem components. With previous GBEP support, we have generated a set of accessible research data for addressing management issues in Galveston Bay (Li and Liu, 2025, Liu et al. 2025, and Lin et al., under review).

*Advancing the existing monitoring program for valuable living resources through combining field sampling and eDNA approaches is urgent to aid the implementation of Galveston Bay Plan and GBEP stakeholder developed priorities (**M&R priorities and NRU priorities**). Funding through GBEP provides an opportunity for us to initiate the effort of filling this much-needed data gap.*

Other Plans Implemented:

[Please identify any third-party conservation plans this project implements, such as the Texas Coastal Management Plan, Texas Coastal Resiliency Master Plan, watershed-based plans, etc.]

N/A

Partners¹ and Their Roles:

TPWD will coordinate with the project through ensuring that abundance estimates of pelagic oyster larvae in this project are aligned with their monthly survey of spats for better management and assessment of oyster fisheries.

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

☒ Yes

☐ No

Twin Crab Seafood Restaurant

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☒ Yes

☐ No

Co-PI Dr. Jaime Alvarado is a native Spanish speaker

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

Latitude/Longitude (Optional):
[degrees, minutes, and seconds format]

Location:
Galveston Bay

Projects Map

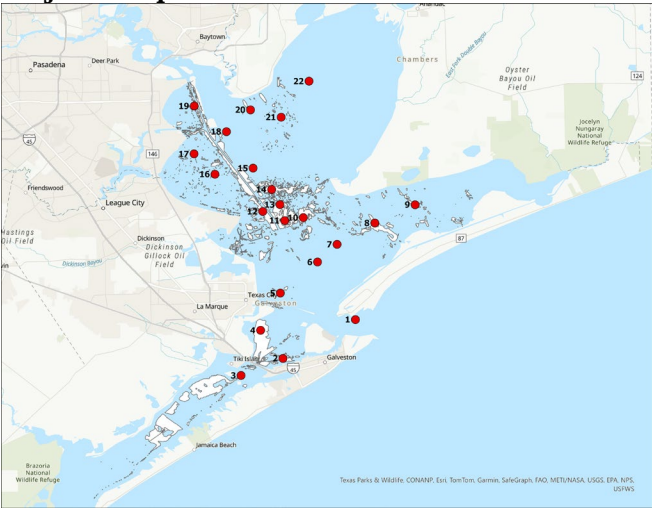


Figure 1. Study sites in Galveston Bay

Supplemental Photos/Graphics (Optional):

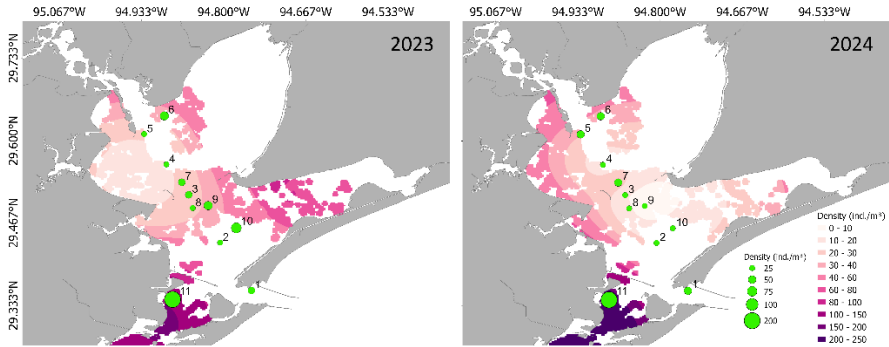


Figure 2. Spatial mapping the distribution of oyster larvae in Galveston Bay (Liu et al., 2025).

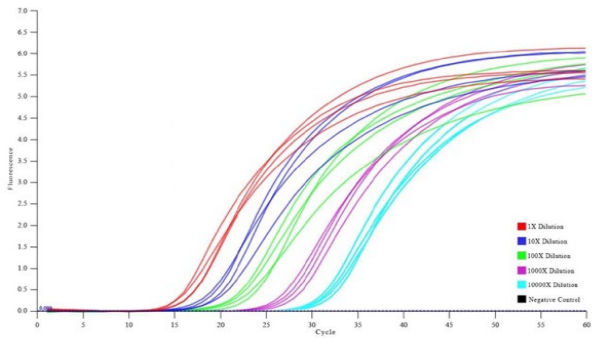


Figure 3. Example of a qPCR experiment using Lionfish DNA template dilutions (four replicates per dilution) to illustrate the differential detection of the fluorescent signal at a particular number of cycles (C_q value), which correlates with eDNA concentration. The 10,000 dilution (light blue lines) corresponds to the qPCR amplification using 250 femtograms of DNA using D-loop primers specific to Red Lionfish (from Thompson-Grim and Alvarado Bremer)

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$50,927
Fringe Benefits (Please see attachment #1) ²	\$9,960
Travel	\$4,200
Supplies	\$10,912
Equipment	\$0.00
Contractual	\$800
Construction	\$0.00
Other	\$46,617
Total Direct Cost	\$123,416

b. Indirect Costs³

Distribution Base Amount (identify Base type below)	\$ 78,599
Indirect Cost Rate for Reimbursement	% 54
Total Indirect Costs	\$ 42,443

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 165,859
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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.

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

³ Please attach Indirect Cost Agreement as an appendix if applicable

☐ **De Minimis Rate**— if Performing Party does not have a current negotiated indirect rate, Performing Party may use a standard rate of 15 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.

☐ **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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

Ship time (\$37,422 total): Ship time is budgeted for sampling oyster larvae in Galveston Bay. We request support for 15 daily cruises (up to 9 hours per trip) for the project. The FY26 rate expiring on 8/31/2026 for *M/V Earl Milan* is \$250/hour. Based on past year-to-year rate increases, a 10.88% escalation is applied to FY26 rate, resulting in an estimate of \$2,494.80 per trip for 15 trips (12 monthly + 3 backup). The total cost for ship time is \$37,422 during the project. ****University budgeting methodology considers ship time on research vessels to be rental of off-site facilities and excludes this amount from MTDC**

Graduate Student Tuition and Fees (\$7,395): \$493 per credit for 15 credits during the project, commensurate with committed effort. ****Graduate Student Tuition and Fees are excluded from MTDC**

Conference fees (\$1,200): \$600 per abstract for two abstracts

Genetic analysis & database (\$600): \$600 in total.

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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.
- Texas A&M University at Galveston reserves the right to further negotiate all terms and conditions of the agreement if an award is made, including but not limited to those terms and conditions that conflict with TAMU System Policy and the laws of the State of Texas applicable to TAMUG as an agency of the State of Texas.

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 post notification 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:

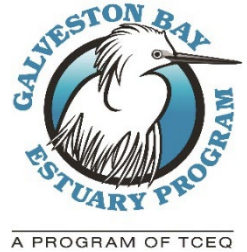
- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Natural Resource Uses (NRU)
Secondary Subcommittee (if applicable): Monitoring and Research (M&R)
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Mapping Green Sea Turtle Foraging Using Galveston Bay Estuary System Isoscapes

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Texas A&M University at Galveston

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*

N/A

Unique Entity ID (UEI) Number:

G8Y3L8JV2588

Vendor Identification Number (VIN) or Tax ID:

74-2125225

Contact Information:

Project Representative Name	Christopher Marshall
Project Representative Phone	409-740-4884
Project Representative Email	marshalc@tamug.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

09/01/2027-08/31/2029; 24 months

Amount Requested from GBEP:

[\$] 122,447

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$88,579.00
FY 2029 (09/01/2028-08/31/2029)	\$33,868.00
FY 2030 (09/01/2029-05/31/2030)	\$0.00
Total	\$122,447.00

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

\$122,447.00

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

The Gulf Center for Sea Turtle Research receives donations that can be used for research. Such resources will be used to supplement the bulk and compound specific stable isotope processing and analyses to enable complete processing of all samples.

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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:

The proposed research advances Galveston Bay's Priority Area Plan by directly supporting **Plan Priority 2: Protect and Sustain Living Resources** and **Plan Priority 4: Inform Science-based Decision Making**. Biogeochemical (bulk/compound-specific stable isotope analysis [SIA] and isotope isoscapes) and molecular (DNA Metabarcoding) tools will characterize new and existing hard structure habitats that green sea turtles and other marine organisms use for foraging. The use of compound-specific SIA will allow us to characterize green sea turtle movement throughout the bay. By identifying key foraging habitats, and spatial patterns of resource use, an ecological baseline can be created to guide adaptive management of native wildlife populations. These data will be synergistic with ongoing Gulf Center for Sea Turtle Research (GCSTR) and GBEP/TCEQ-funded projects and together will provide a broader, stronger evidence-based support for demographic and life-history data of species of greatest conservation need (SGCN). The proposed work will enhance ongoing conservation efforts for sea turtle populations that use all parts of the Galveston Bay Estuarine System (GBES), including a new focus on the beachfront, jetties, and other hard structures in the bay. In addition to understanding habitat use by sea turtles, the work will characterize new habitat used by many other marine species as well.

The project specifically implements FY2028 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**, **RES-2: Develop new and support existing efforts to conduct geochemical stressor monitoring and research**, and **RES-3: Develop new and support existing efforts to conduct physical stressor monitoring and research**. Sea turtles are keystone species and listed by the State of Texas as Species of Greatest Concern. They have significant impacts on the ecosystems they inhabit. However, despite their importance, and the increase of juvenile green sea turtle abundance in the GBES, relatively little is known about the habitats and food resources that support their growth and development. Using biogeochemical and molecular tools to understand the foraging behavior and movement of juvenile green sea turtles, and the emerging new hard benthic habitats provided by restoration work, will provide new insight into how biological (RES-1), geochemical (RES-2), and physical stressors (RES-3) impact their habitat utilization. This will be particularly true for areas of strong anthropogenic influence like jetties, dikes, and armored

shorelines and other hard structures produced through restoration efforts. As indicated in the Galveston Bay Plan, Priority Action Plans (SC-1) that conserve native species populations must also provide for, and support existing efforts, to conduct monitoring and research (RES-1, 2, and 3). This proposal fulfills that need and is a continuation of past GBEP funded work on physical stressors impacting GBES sea turtles that fulfilled those priorities.

Furthermore, this proposed research implements FY2028 Priority Area Actions for **ACS-1: Support tracking the status and trends of environmental and stressor indicators of Galveston Bay by ecosystem health** and **ACS-2: Expand the dissemination of easy-to-access Galveston Bay monitoring and research**. The use of isotopic maps, trophic data, and habitat-use information will expand monitoring capabilities and support existing research conducted by the GCSTR. These complementary biogeochemical and molecular tools have the potential to identify the past foraging history of stranded sea turtles, enabling long-term, widespread monitoring of sea turtle population behavior and the stressors they face as they grow and develop (ACS-1). Such information is critical for managers to identify sea turtle foraging "hotspots," enabling long-term monitoring efforts to protect vital resources for a growing sea turtle population at every life stage. 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.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☒ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☒ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☒ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☐ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☒ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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 directly addresses the priorities of the **Natural Resource Uses (NRU) and Monitoring & Research (M&R) Subcommittees** by generating information that supports the conservation and adaptive management of juvenile green sea turtles, a Species of Greatest Conservation Need. Using biogeochemical tools (stable isotope analyses [SIA]) that track and map carbon, nitrogen, and sulfur cycles in the GBES, paired with molecular tools (DNA metabarcoding), will identify critical foraging habitats and behaviors of sea turtles in the GBES and establish baseline stable isotope patterns throughout the bay. These baseline datasets will provide a framework for long-term monitoring of environmental change, allowing managers to understand how environmental and physical stressors like habitat restoration and coastal development influence sea turtles and other native species habitat use and food-web dynamics over time. It is likely these structures are increasing sea turtle foraging opportunities. Overall, this project contributes conservation efforts by providing vital habitat-use and life-history information in the GBES for a species of concern to the GBEP Subcommittees.

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☒ Make Investments that Address Coastal Resiliency
- ☐ Reduce Trash

This project directly supports the EPA's Area of Special Interest by making advancements that address coastal resiliency through improved understanding of habitat function within the Galveston Bay Estuary System (GBES). By investigating the foraging ecology and habitat use of sea turtles through biogeochemical (stable isotopes) and molecular (DNA metabarcoding) approaches, this research will identify vital new and existing foraging areas across the GBES (e.g., jetties, rocky armored shorelines, dikes, and other hard structured habitats) from restoration projects and have become valuable habitat within the estuary. These findings will provide resource managers with science-based information on how coastal infrastructure and restoration project may contribute to ecosystem function, biodiversity, and habitat connectivity in new and unpredictable ways. As coastal ecosystems continue to face increasing environmental pressures from development and climate change, understanding how native populations utilize these new formed hard, benthic habitats are becoming increasingly essential. It is likely these structures are increasing sea turtle foraging opportunities. With the datasets from this project, novel information will inform adaptive management strategies for restoration and conservation planning. Additionally, the project will provide opportunities for community engagement through volunteer participation in fieldwork and outreach, fostering stewardship, and increasing public awareness of the ecological value of resilient coastal habitats.

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:

Existing and new hard, rocky habitats such as jetties, rocky armored shorelines, groins, and dikes that result from new restoration projects will be characterized as foraging habitats necessary for Galveston Bay Estuary System green sea turtles, a species of greatest conservation need, using DNA barcoding and stable isotope-based isoscapes, thereby providing spatiotemporally explicit ecological data to support habitat conservation and species management.

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

Globally, there are seven species of sea turtles, of which five reside off the coast of Texas; three are common in the GBES. All are recognized as Species of Greatest Conservation Need (SGCN; TPWD, 2023). Green sea turtles play an important ecological role by regulating macroalgal, seagrass, and invertebrate communities, enhancing nutrient cycling, and maintaining habitat quality for numerous estuarine organisms (Bjorndal, 1985; Christianen et al., 2019; Leemans et al., 2020; Scott et al., 2020). These same habitats provide nursery grounds for commercially and recreationally important fisheries, stabilize shorelines, and enhance overall ecosystem resilience (Carruthers et al., 2002).

The GBES is one of the most dynamic estuarine ecosystems in the Gulf of Mexico, comprising a mosaic of hard-bottom habitats, tidal marshes, seagrass meadows, oyster reefs, and man-made structures that juvenile green turtles increasingly use. Following an oceanic life stage where they associate with floating *Sargassum*, juvenile green turtles in Texas recruit to nearshore habitats at sizes <25cm SCL (Arthur et al.,

2008; Howell et al., 2016). Initially, they recruit to beachfront jetties, then expand into back-bay habitats, and eventually transition to seagrass-dominated foraging grounds as they mature (Witherington et al., 2012; Howell, 2012; Howell et al., 2016; Howell, 2021). Movement studies by the Gulf Center for Sea Turtle Research (GCSTR) demonstrate that rocky jetties and armored, rocky shorelines from restoration projects appear to function as critical recruitment habitats for juvenile green turtles (unpublished data). It is likely these structures are increasing sea turtle foraging opportunities that support a growing population. This is one example of how coastal development in the GBES has directly impacted native populations, creating new habitats that support their survival. However, foraging habitats of juvenile green sea turtles are still not well known, and these new hard, rocky habitat that supports thriving macroalgal communities are particularly understudied to date. Characterizing the biodiversity and distribution of new and existing hard, benthic habitats will fill in data gaps and add to our understanding of the role that habitats impact the ontogeny, trophic ecology, and movement of sea turtles, as well as other species. Creating an isoscape for the GBES that includes these new habitats is essential for future adaptive management of this recovering species. We hypothesize that this work will uncover another ontogenetic shift in diet as the GBES supports the growth of juvenile green sea turtles.

A novel component of this project is the application of amino acid compound-specific stable isotope analysis (AA-CSIA) to characterize macroalgal communities throughout the GBES. Traditional bulk stable isotope analyses cannot distinguish whether variation in sea turtle isotope values reflects differences in diet or differences in the isotopic composition of primary producers. Due to the combined effects of variable nutrient sources, freshwater inflow, and hydrodynamic conditions throughout the GBES, macroalgal isotope values differ substantially among locations (Finlay et al., 1999; Besser et al., 2022). AA-CSIA overcomes this limitation by separating baseline isotopic variation from trophic enrichment, allowing individual foraging habitats to be distinguished with substantially greater precision. This will represent one of the first applications of AA-CSIA to investigate the foraging ecology of sea turtles. The resulting habitat-specific isotope signatures will establish chemical baselines that can be incorporated into future monitoring programs and restoration assessments.

Building on this macroalgal work, this project will create the first sea turtle focused stable isotope isoscape that describe spatial variation in carbon, nitrogen, and sulfur cycles throughout the GBES. These spatially explicit maps will provide a biogeochemical framework for assigning sea turtle foraging locations. The use of compound specific SIA will provide movement data among shoreline jetties, to back-bay hard, rocky habitats, to seagrass meadows (which commonly also have macroalgae), and other coastal environments. By combining isoscapes with Bayesian MixSIAR models, we will identify habitat "hotspots" that disproportionately contribute to juvenile turtle growth and development, and therefore can be impacted by coastal development, while simultaneously evaluating how environmental variability influences habitat use across the estuary.

Although SIA provides powerful time-integrated information on assimilated diet, it cannot identify prey to fine taxonomic resolution. To overcome this limitation, gastrointestinal contents collected from opportunistic GCSTR sea turtle necropsies will be analyzed using DNA metabarcoding (Sarkis et al., 2022). Preliminary analyses show we can identify consumed prey with greater precision than standard visual gut content analyses. This will allow for the identification of easily digested soft-bodied species (e.g., gelatinous zooplankton-jellyfish) via the analysis of DNA remnants. Samples collected from hard, rocky habitats will also use DNA metabarcoding to characterize their biodiversity. Last, DNA metabarcoding will be used to complement isotope analyses by validating dietary estimates, refining source groups incorporated into MixSIAR models and can identify previously undocumented prey resources. Tissues collected during necropsies provide the sea turtle component of the SIA analyses, increasing the number of isotopic samples, and improve estimates of tissue-specific trophic discrimination factors, which are critical for isotope modeling (Vander Zanden et al., 2014; Vanderklift et al., 2020). The GCSTR responds to 250+ stranded sea turtles a year and is well positioned to collect samples from necropsies to support this work.

This project will provide the first estuary-wide characterization of sea turtle foraging ecology that integrates bulk SIA, ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{34}\text{S}$), AA-CSIA of macroalgae, and DNA metabarcoding of sea turtle stomach contents and from samples of hard, rocky habitats. These tools will also be used to characterize new and existing rocky habitats, which have been largely ignored, and will enable spatial modeling of habitats. The resulting habitat maps, isotope baselines, and dietary data will provide resource managers with science-based information needed to identify critical foraging habitats, evaluate habitat restoration, prioritize conservation investments, and monitor ecosystem responses to future environmental change. These products will then complement ongoing GBEP- and GCSTR-supported monitoring efforts while establishing a long-term ecological baseline that can be incorporated into adaptive management throughout the GBES.

Project Urgency:

This project is urgent since juvenile turtle populations are impacted by rapid environmental changes driven by coastal development, restoration activities, shifting freshwater inflows, and climate-related disturbances. Establishing ecological baselines during this period of population recovery is critical for evaluating how these changes affect habitat quality and the resources that support Species of Greatest Conservation Need (SGCN). By integrating bulk ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{34}\text{S}$), AA-CSIA, and DNA metabarcoding, this project will develop the first habitat-specific isotopic baselines and estuary-wide isoscapes for Galveston Bay sea turtles. These spatially explicit datasets will identify productive foraging hotspots like seagrass meadows, jetty communities and marsh habitats as well as benthic and pelagic food webs that help sustain other species of greatest concern such as the opossum pipefish (*Microphis brachyurus lineatus*), Texas diamondback terrapin (*Malaclemys terrapin littoralis*), and saltmarsh topminnow (*Fundulus jenkinsi*). Collecting this baseline data will provide TPWD, GBEP, and other resource managers with a long-term monitoring framework to inform future conservation actions.

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).

Partners¹ and Their Roles:

The Gulf Center for Sea Turtle Research is the federal and state permitted lead for sea turtle rescue, recovery, rehabilitation, and research on the upper Texas coast. The GCSTR responds to all sea turtle strandings, live or deceased, from the TX-LA border through Surfside, TX and points south. The GCSTR also is conducting a long-term movement study using satellite and acoustic tags to monitor sea turtle movement throughout the GBES. The stranding information, movement data, and prior bulk SIA data will be utilized to complement the proposed research in this project.

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

☐ Yes

☒ No

NA

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes

☒ No

NA

Latitude/Longitude (Optional):

Multiple sampling locations. See map below.

Location:

Research will be conducted throughout the Galveston Bay Estuary System (GBES), including West Bay, Christmas Bay, Galveston Bay, and East Bay, spanning Galveston, Brazoria, and Chambers Counties. Sampling will occur at established Sea Turtle Acoustic Receiver Stations (STARS) established by the GCSTR in 2020, TPWD monitoring areas, and jetty locations.

Projects Map

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.



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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$46,447
Fringe Benefits (18%) ²	\$8,368
Travel	\$3,536
Supplies	\$4,660
Equipment	\$0.00
Contractual	\$5,300
Construction	\$0.00

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

Budget Category	Cost for Work to be Performed
Other	\$16,438
Total Direct Cost	\$84,749

b. Indirect Costs³

Distribution Base Amount (<i>identify Base type below</i>)	\$ 69,811
Indirect Cost Rate for Reimbursement	54%
Total Indirect Costs	\$ 37,698

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 122,447
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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:** Provisional as of 9/1/26 [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

- Research Vessel Rental and Fuel: The Texas A&M University research vessel cost is \$250/day. We estimate a total of 12 boat days for a total cost of \$3,000 to collect the samples over the life of the project (\$1,500 in FY ‘28).
- Graduate Research Assistant Tuition and Fees: Tuition and fees are budgeted in accordance with TAMU policies and practices as support for GRA participation in research projects. Funds are calculated at the currently established rate for Texas A&M University at Galveston and are proportionate to proposed/committed effort for the student. An estimated 5% escalation is included in year 2.

³ Please attach Indirect Cost Agreement as an appendix if applicable

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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.

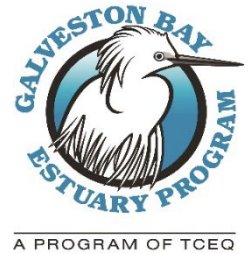
Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:

Please Submit Project Proposals (Microsoft Word Only – No PDFs) by **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov

M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Water and Sediment Quality (WSQ)
Secondary Subcommittee (if applicable): Monitoring and Research (M&R)
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Design and Performance Metrics Decision Support for Green Infrastructure and Living Shorelines for Coastal Resilience

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

University of Houston

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*

[If other, please identify pass-through partner.]

Unique Entity ID (UED) Number: QKWEF8XLMTT3

Vendor Identification Number (VIN) or Tax ID: 746001399

Contact Information:

Project Representative Name	Hanadi Rifai
Project Representative Phone	713-743-4271
Project Representative Email	rifai@uh.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

24 months

Amount Requested from GBEP:

[\$]275,747

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$142,121.00
FY 2029 (09/01/2028-08/31/2029)	\$133,626.00
FY 2030 (09/01/2029-05/31/2030)	\$0.00
Total	\$275,747.00

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

\$275,747.00

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

None.

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☒ NPS-2 ☐ NPS-3 ☒ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

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

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:

Green infrastructure (GI), nature-based solutions, best management practices and living shorelines (collectively referred to as GI) have received increasing interest as mitigation and adaptation strategies for ecosystem and human health. While several implementations are underway, there is a need for a comprehensive framework for the Galveston Bay system that identifies, classifies, and ranks the potential implementations that reduce risks and increase resilience to multiple stressors such as flooding, extreme heat, drought, and environmental quality. The project develops a risk-based decision support framework for GI with design and performance metrics that fills this gap. The proposed project implements several Galveston Bay actions including evaluating best management practices (RES-6), evaluating ecosystem services and economic valuation (RES-7), and completing coastal resiliency and acclimation studies (RES-8). Additionally, the project increases access to Galveston Bay ecosystem information (ACS) via the accessible decision support tools that are proposed. The project engages communities and contributes to ensuring safe human and aquatic life use and protecting and sustaining living resources based on the benefits and value added in GI implementation.

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.

Subcommittee Identified Priorities:

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

- ☒ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☒ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☒ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☐ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☒ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☒ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☒ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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 encompasses the entire Galveston Bay watershed system and adopts a systems level decision support framework development approach thereby responding to overall priorities and subcommittee priorities of the Galveston Bay Plan. By emphasizing resilience and mitigation and adaptation benefits, incorporating community and stakeholder input, and providing tools that can be customized at any scale and for multiple jurisdictions, the project addresses multiple priorities for each subcommittee. GI have water quality benefits (thereby allowing an assessment of impacts on environmental parameters and emerging and legacy pollutants), they reduce coastal erosion and other vulnerabilities, and available data from existing implementations provide examples of meaningful and effective monitoring. Incorporating existing and potential GI as is proposed in the project will contribute to a baseline assessment of large-scale, man-made changes to Galveston Bay at various time scales and geospatial resolutions. As a readily accessible and easy-to-use data, models, and decision-support tools, the proposed project supports management measures and watershed plans, improves knowledge and accessibility and evaluation of best management practice for addressing point and non-point sources of pollution.

Does the Project align with any EPA Areas of Special Interest?

- ☒ Reduce Nutrient Pollution to Protect Water Quality and Public Health

☒ Make Investments that Address Coastal Resiliency

☐ Reduce Trash

The project is directly aligned with EPA interests and direct focus on GI for improving water quality. For Areas of Special Interest, GI can play a key role in enhancing water quality particularly in terms of reducing nutrient pollution by capturing stormwater runoff and enabling plant uptake and soil filtration. Some GI will reduce the overall runoff volume, thereby reducing mass fluxes and loads. Additionally, the project aligns with EPA's priority of making investments that address coastal resilience. This is because GI use natural systems and living shorelines to absorb storm surge, reduce wave energy and erosion, and manage stormwater runoff. The project focuses on natural buffers (e.g. wetlands, dunes, oyster reefs) and soft environmental infrastructure in comparison or for use in conjunction with hardened infrastructure such as storm surge concrete barriers. The proposed project facilitates decision-making and an evaluation of the benefits and associated investments of various GI implementation strategies while taking into consideration public perception and acceptance.

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 project develops a prioritization and ranking decision-support system for identifying the most beneficial Green Infrastructure for the lower Galveston Bay Watershed using a systems-based approach where multiple GI types are evaluated individually and collectively in the context of mitigating multiple stressors that include extreme rainfall, extreme heat, drought, erosion, air, sediment and water quality degradation, storm surge and sea level fluctuations

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

Green infrastructure (GI), inclusive of nature-based solutions, best management practices and living shorelines continues to gain traction as a mitigation and adaptation strategy to address environmental quality and natural hazard stressor impacts. Despite their popularity, however, their implementation and performance assessment has lagged behind hard infrastructure. This is partly due to the lack of a comprehensive framework for integrating them into resilience and watershed action plans. In such a framework, the plausibility of a specific GI would be balanced by the benefits gained from its form and function. Importantly, and within the context of systems planning, the integration of multiple GI within a watershed would be evaluated whereas they are often evaluated in isolation. While many examples of individual GI exist, a key knowledge gap remains in terms of overall integration into resilience planning and developing standards for assessing their singular and compound performance as a resilience strategy. The proposed project addresses this gap and develops a prioritization and ranking decision-support system for identifying the most beneficial GI for Galveston Bay using a systems-based approach where multiple GI types are evaluated individually and collectively in the context of mitigating multiple stressors that include extreme rainfall, extreme heat, drought, erosion, air, sediment and water quality degradation, storm surge and sea level fluctuations. The proposed GI framework includes data, models and a decision-support user interface. The 2-year project includes six tasks:

Task 1 (year 1). Develop a GIS-based mapped database of current and potential locations for GI within the Galveston Bay Watershed (both landscape scale and relatively small-scale) including any data associated with their current or projected design and performance. The task also includes developing a curated bibliography of GI implementations and guidance manuals at the local and national scales.

Task 2 (year 1). Develop a knowledge base of the various types of GI and the criteria for their selection as a mitigation and adaptation technology in a relatively simplified and visual format to enhance accessibility to communities and stakeholders. The knowledge base would answer: What is it? What problem(s) does it solve? How does it help under existing and future conditions? The knowledge base will include examples of GI and provide communities and stakeholders with instructions/recommendations for GI projects. The knowledge base also qualitatively ranks GI in terms of their performance in a watershed using a matrix approach. Additionally, the knowledge base would be organized around benefits and not engineering types of GI and would emphasize the multiple benefits of each GI as appropriate (for example, flood reduction, water quality improvement, heat mitigation, habitat restoration, recreation, carbon sequestration, coastal resilience)

Task 3 (years 1&2). Develop a risk-based ranking decision support tool for exploring implementation of various GI within a watershed and the associated benefits from different perspectives including environmental and societal benefits. The tool would include topographic and hydrologic information (e.g. flood maps) and any other relevant information to inform GI implementation. The GIS-based tool enables users to set their required performance thresholds (or metrics) and assess the GI that would meet their established goals. So, for example, using the proposed tool, a watershed planner can display all available green space within their watershed, select the areas suitable for a specific GI, establish a specific performance threshold and observe the outcome. They can also layer different types of GI and evaluate their system performance in achieving the designated threshold.

Task 4 (year 2). Develop demonstration case studies using three pilot watersheds: coastal, rural and urban and several types of GI: rainwater harvesting, drainage infrastructure, wetlands, retention and detention ponds, permeable pavements, urban forests, living shorelines, and green roofs. A current and future visualization of various implementation schemes illustrate possible approaches for design and implementation of GI for mitigation or adaptation. This will be accomplished using mapped visualizations of ‘before’ and ‘after’ given specific performance thresholds (e.g., constructed wetlands for improving water quality to meet established standards for bacteria).

Task 5 (year 2). Develop the overarching decision support risk-based management framework that enables integrating GI within watershed action plans and/or resilience plans for specific geographies and jurisdictions. Implementing GI at the watershed scale is different than individual installations. Watershed level integration involves coordinating many interventions across multiple jurisdictions, land uses, and stakeholders to achieve measurable watershed-scale outcomes. The proposed overarching framework would encompass approaches that address the technical, institutional, economic, environmental, and social considerations for GI (e.g., governance, funding, maintenance) implementation at the watershed scale. Assessing the synergy of multiple GI implementations for watershed-scale outcomes will be enabled via weighted calculations that considers the various criteria; the weighting coefficients are based on community/stakeholder inputs and can be readily updated over time. At this level the approach would encompass an expanded qualitative ranking and matrix-based approach.

Task 6 (years 1&2). Develop an understanding of community perceptions and acceptance of GI at the community and watershed scales, both current and projected in light of resilience plans for the region and the focus on multiple stressors. This will be accomplished via stakeholder focus groups within the selected pilot watersheds, stakeholder interviews, and/or relatively simple web-based form surveys that emphasize establishing what people know about GI, what they value in terms of GI performance, what concerns them, and what would motivate them to advocate for GI within their communities and watersheds.

The outputs include a mapped database of current and potential GI within Galveston Bay, a GI knowledge database, a system-level risk-based decision support tool for GI ranking, three pilot demonstrations, a risk-based management framework for integrating GI within watershed action plans and/or resilience plans, and an assessment of stakeholder knowledge and acceptance of GI. Important critical outputs include time and cost: the time it takes for completing a GI project along with the differential in implementing GI and/or non-GI project (capital and maintenance); this at community and/or the watershed scales.

The outcome is re-shaping the conversation about GI from individual projects to an integrated distributed, interconnected network of natural and engineered systems that reduces multiple risks simultaneously while considering community and stakeholder perceptions and acceptance.

Project Urgency:

Almost all proposed mitigation projects for our region will take several years, if not decades, to complete. GI offer immediately realizable benefits at a relatively low level of investment. Understanding how to leverage the GI opportunities in the region to address multiple stressors is a unique feature for this class of mitigation and adaptation strategies. Delaying the project may jeopardize the potential to access state and federal funding for GI implementation projects.

Other Plans Implemented:

The Texas Water Development Board recently made available for public comment their guidance document on Nature Based Solutions indicating the increasing interest in flood resilience enhancements of GI. Other plans include the General Land Office Texas Coastal Management Plan, and their Texas Coastal Resiliency Master Plan. The project also benefits watershed action plans within the Galveston Bay System that address specific pollutant criteria.

Partners¹ and Their Roles:

The Galveston Bay Foundation (GBF) is a key partner in the proposed project based on their dedicated focus on GI and their expertise in designing, implementing, and assessing performance of these systems. Mr. Jeffrey Fato will lead GBF engagement in the project throughout all proposed activities and will guide the project team in developing the decision support framework and pilot demonstrations. Mr. Fato will facilitate community engagement and knowledge dissemination.

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

☒ Yes

☐ No

The goals of the project include guidance for communities of all sizes to leverage GI implementation for resilience of their community. While specific communities have not been identified, 3 pilots are proposed as demonstration case studies.

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes

☒ No

Latitude/Longitude (Optional):

[degrees, minutes, and seconds format]

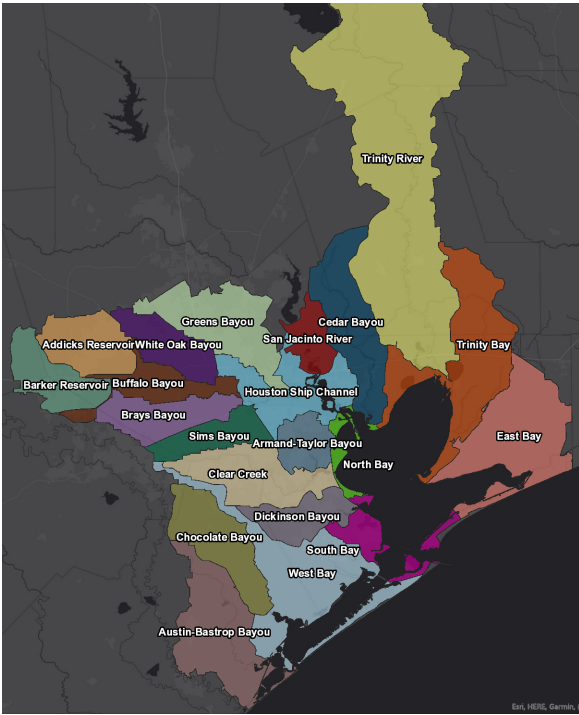
Location:

The entire Galveston Bay watershed is addressed by project.

Projects Map

Map of Galveston Bay System (source: <https://www.stateofgalvbay.org/overview/overview-of-galveston-bay>)

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.



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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$122,788.00
Fringe Benefits (###%) ²	\$13,293.00
Travel	\$5,000.00
Supplies	\$0.00
Equipment	\$0.00
Contractual	\$40,000.00
Construction	\$0.00
Other	\$0.00
Total Direct Cost	\$181,081.00

b. Indirect Costs³

Distribution Base Amount (<i>identify Base type below</i>)	\$ 166,081.00
Indirect Cost Rate for Reimbursement	% 57
Total Indirect Costs	\$ 94,666

² If fringe is not a single rate, please attach calculation or explanation as an appendix.
³ Please attach Indirect Cost Agreement as an appendix if applicable

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 275,747
--	------------

Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

[Description of costs associated with “Other” budget category.]

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Fringe Benefits
Indirect Cost Agreement Documentation



GALVESTON BAY FOUNDATION

PROTECT TODAY. PRESERVE TOMORROW.

July 23, 2026

Galveston Bay Estuary Program (GBEP)

RE: Letter of Support

Design and Performance Metrics Decision Support for Green Infrastructure and Living Shorelines for Coastal Resilience

Dear GBEP Officials,

The Galveston Bay Foundation (GBF) is pleased to support the University of Houston in the development of the *Design and Performance Metrics Decision Support for Green Infrastructure and Living Shorelines for Coastal Resilience* project.

GBF is a conservation non-profit organization founded in 1987. Our mission is to preserve and enhance Galveston Bay as a healthy and productive place for generations to come. We work to facilitate forward thinking solutions to challenges confronting Galveston Bay with programs in five broad categories: land conservation, habitat restoration, water quality, education, and advocacy.

GBF is heavily vested in Green Infrastructure and living shorelines and has in-house hands-on expertise and connectivity to the Galveston Bay System (GBS) and its constituencies. We plan to support all aspects of the proposed project by providing guidance, access to communities and stakeholders via our established relationships, and reviewing all proposed products, outputs, and outcomes. The proposed project is a natural fit for GBF efforts in this space and will enable GBF to strengthen the conversation with sponsors and funding agencies for additional implementations in the GBS.

Sincerely,

Bob Stokes

President

Galveston Bay Foundation

bstokes@galvbay.org

1725 Highway 146, Kemah, TX 77565 • Phone 281-332-3381 • Fax 832-284-4982

Sponsored awards are responsible for the actual fringe benefit costs incurred by each employee working on the project. Fringe benefit costs have been estimated based on actuals using the UH Fringe Benefit calculator located on the UH website. However, actual costs for fringe benefits are charged (billed) to the sponsored project at the time the cost is incurred, based on salary, selected benefits package and other variables applicable to the individual employee.

<https://www.uh.edu/human-resources/benefits/benefits-glance/>



itally signed by Arif M. Karim -
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Date: 2023.08.10 23:09:27 -05'00'

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 1746001399A3
ORGANIZATION:
University of Houston
5000 Gulf Freeway
Tech. Bldg. 1, Room 231
Houston, TX 77204-0912

Date: 08/03/2023
FILING REF.: The preceding
agreement was dated
12/17/2019

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: INDIRECT COST RATES

RATE TYPES:		FIXED	FINAL	PROV. (PROVISIONAL)	PRED. (PREDETERMINED)
<u>EFFECTIVE PERIOD</u>					
<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE(%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
PRED.	09/01/2020	08/31/2023	55.00	On Campus	Organized Research
PRED.	09/01/2019	08/31/2023	33.00	On Campus	Other Sponsored Activities
PRED.	09/01/2019	08/31/2023	26.00	Off Campus	All Programs
PRED.	09/01/2023	08/31/2024	55.00	On Campus	Organized Research
PRED.	09/01/2024	08/31/2027	57.00	On Campus	Organized Research
PRED.	09/01/2023	08/31/2024	35.00	On Campus	Other Sponsored Activities
PRED.	09/01/2024	08/31/2027	37.00	On Campus	Other Sponsored Activities
PRED.	09/01/2023	08/31/2027	26.00	Off Campus	All Programs
PROV.	09/01/2027	Until Amended			Use same rates and conditions as those cited for fiscal year ending Aug 31, 2027

*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, 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: 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). 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

Health Insurance

Unemployment Insurance

Severance Pay

Tuition Remission

A next proposal based on actual costs for the fiscal year ending 8/31/26, will be due no later than 2/28/27.

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:

University of Houston

(INSTITUTION)



(SIGNATURE)

Claudia Neuhauser

(NAME)

Interim Vice Chancellor/Vice President for Research

(TITLE)

8/11/23

(DATE)

ON BEHALF OF THE GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Arif M. Karim -S Digitally signed by Arif M. Karim -S
Date: 2023.08.10 23:08:36 -05'00'

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

08/03/2023

(DATE)

HHS REPRESENTATIVE: Denise Shirlee

TELEPHONE: (214) 767-3261

COMPONENTS OF PUBLISHED F&A COST RATE

INSTITUTION: **University of Houston**

FY COVERED BY RATE: **September 1, 2023 - August 31, 2027**

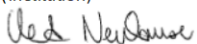
APPLICABLE TO: **ORGANIZED RESEARCH**

<u>RATE COMPONENT:</u>	<u>ORGANIZED RESEARCH FY 24 ON CAMPUS</u>	<u>ORGANIZED RESEARCH FY 25-27 ON CAMPUS</u>	<u>OTHER SPONSORED ACTIVITIES FY 24 ON CAMPUS</u>	<u>OTHER SPONSORED ACTIVITIES FY 25-27 ON CAMPUS</u>	<u>ALL PROGRAMS FY 24-27 OFF CAMPUS</u>
Building Depreciation	8.8	9.4	1.6	1.8	
Equipment Depreciation	7.1	7.6	0.9	1.0	
Interest	1.7	1.8	0.3	0.4	
Operation & Maintenance	10.4	11.2	6.0	7.6	
Library	0.5	0.5	0.2	0.2	
Utility Cost Adjustment	0.5	0.5			
Administration*	26.0	26.0	26.0	26.0	26.0
TOTAL	55.0	57.0	35.0	37.0	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.B. dated December 26, 2013.

CONCURRENCE:

University of Houston
(Institution)

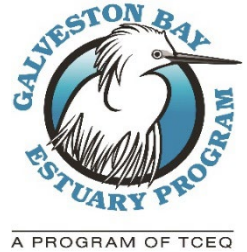

(Signature)

Claudia Neuhauser
(Name)

Interim Vice Chancellor/Vice President for Research
(Title)

8/11/23
(Date)

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)
Secondary Subcommittee (if applicable): Water and Sediment Quality (WSQ)
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Expanded Evaluation of Micro- and Nanoplastic Pollution through Emerging Methods
--

Project Previously Funded by GBEP? Yes ☒ No ☐

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Public University: University of Houston-Clear Lake

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*

[If other, please identify pass-through partner.]

Unique Entity ID (UEI) Number:	RD74AUNCTZJ1
Vendor Identification Number (VIN) or Tax ID:	State: 3-75975-9759-2; Federal: 74-6001399

Contact Information:

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

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

September 1, 2027 – August 31, 2029 (24 months)

Amount Requested from GBEP:

\$168,972 *See notes about scalability in Total Project Costs section below

Federal ☐ State ☒ No Preference ☐

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$ 82,026
FY 2029 (09/01/2028-08/31/2029)	\$ 86,947
FY 2030 (09/01/2029-05/31/2030)	\$ 0
Total	\$ 168,972

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

Requested funds:	\$168,972 (43% of total project costs)
Current study (FY26-FY28):	\$221,928 (full amount awarded to H-GAC; \$96,231.36 sub-award to UHCL)
Total project costs:	\$390,900
<i>*Notes about scalability:</i> The primary costs for the proposed project expansion are in salary and fringe, especially related to student participation (currently included at 100% support for two years of graduate thesis work and includes a stipend for the graduate student). Should the project be scaled down or costs reduced, student participation can be reduced or removed completely. If removed completely, the total requested funds are reduced to \$91,338. Below are updated calculations for the minimum cost of the project expansion. Note that if GBEP	

or the related subcommittees would still like to prioritize student support and/or workforce development in some capacity, estimated amounts can be provided for partial support of a student(s) in the project.

Requested funds (if scaled down to minimum): \$ 91,338 (29% of total project costs if scaled down)
Current study (FY26-FY28): \$ 221,928
Total project costs (if scaled down to minimum): \$ 313,266

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

The proposed study expands upon the FY26-28 GBEP funded Nature-based Stormwater Infrastructure Pollution Project, administered through the Houston-Galveston Area Council (HGAC), which provides \$221,928 in directly applicable in-kind and cash support, including sample collection, processing, and analysis infrastructure that the proposed project builds upon. **These leveraged funds represent 57% of the total project costs, if the proposed project is funded at the full requested amount.** The requested funds are to add Differential Scanning Calorimetry (DSC) and Pyrolysis-Gas Chromatography-Mass Spectrometry (Py-GC-MS) as supplemental methods for micro- and nanoplastic (MNP) quantification and to support a graduate student thesis project for two years.

In addition to these leveraged funds, EIH at UHCL houses remnant MNP samples from other projects related to microplastic enumeration (totaling over \$550K in grant funding) and UHCL personnel provide over 15+ combined years of experience working on MNP-focused research. Remaining samples, equipment, and refined protocols resulting from previous projects may be used to test and guide methods used in the proposed study, which represents a large cost savings in man-hours and supplies should these test samples been collected as part of the proposed work. Long-term storage for samples is also provided by UHCL at an average cost of \$10,000 per year. Costs for the proposed study are minimized based on existing supplies and personnel expertise and, while these costs are not calculated into the total leverage amount, they are relevant and necessary for keeping costs for the proposed project at a minimum.

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☒ NPS-2 ☐ NPS-3 ☒ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☒ PHA-5 ☒

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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:

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

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

Improve Water Quality Through Nonpoint Source Pollution Abatement (NPS)

NPS-1 Support watershed-based plan development and implementation: Understanding baseline environmental MNP concentrations is a critical step in evaluating potential impacts to human and aquatic life. Results from this study can be incorporated into existing and upcoming total maximum daily load (TMDL) I-Plans and watershed protection plans (WPP) in the Galveston Bay area. The output of the number of watershed-based plans would not be impacted by the proposed project, but the resulting knowledge could be used in future watershed-based plans to include baseline MNP concentration data, providing a more holistic review of pollutants discussed in the watershed.

NPS-3 Implement nonpoint source best management practices (BMPs): The proposed project extends the existing microplastic study to the nanoplastic fraction, which microscopy-based monitoring is unable to capture in the ongoing project. The results will directly inform MNP loads entering Galveston Bay through freshwater inflows and provide another metric for BMPs to consider. The output of the number of BMPs will not be impacted by the proposed expansion, but the added evaluation of nanoplastics, a contaminant not previously measured in these systems, can be considered for future infrastructure projects.

Promote Public Health and Awareness (PHA)

PHA-4 and PHA-5 Improve the safety of human shellfish and finfish consumption from bay waters: Plastic contaminants have been found in all trophic levels of marine organisms, including filter-feeding invertebrates like oysters and finfish, ultimately affecting the humans that consume them. Nanoplastics are of particular concern due to their sub-micron size which allows them to cross biological membranes and be incorporated into soft tissues or organs. While the proposed study does not directly influence these priorities, results from this work will bring expanded awareness to the concentration of MNP pollution in the waters entering Galveston Bay and provide baseline data for MNP loading which could affect the safety of human shellfish and finfish consumption.

Plan Priority 4: Inform Science-Based Decision Making

Collaborate with Research Institutions to Support Focus Area Applied Research and Monitoring (RES)

RES-1 Conduct Biological Stressor Monitoring and Research: The proposed applied research will provide baseline data needed for future understanding of an emerging contaminant on the aquatic life of Galveston Bay, building on the microplastic stressor data already being generated in the region.

RES-5 Conduct Monitoring and Research to Address Limits to Seafood Consumption: Similarly to PHA-4 and PHA-5, results of this expanded study will bring expanded awareness to the concentration of MNP pollution in the waters entering Galveston Bay and provide baseline data for MNP loading which could affect the safety of human shellfish and finfish consumption. Though the proposed project does not directly address this action, the resulting baseline data will be critical for establishing these criteria in the future.

RES-6 Evaluate Best Management Practice (BMP) Projects: The proposed project will expand ongoing water quality monitoring focused on microplastic pollution to the nanoplastic fraction through new and emerging technologies (e.g., DSC and Py-GC-MS). Results of the applied research will be used to inform watershed managers, especially in watersheds identified to have elevated MNP concentrations.

Increase Access to Galveston Bay Ecosystem Information (ACS)

ACS-2 Access to Monitoring and Research Data: The project team will disseminate study results through a variety of outreach activities for different audiences, including GBEP partners, decision-makers, bay user groups, the public (as opportunities are presented), and the scientific community (through conference presentations, peer-reviewed manuscripts, and/or graduate theses).

ACS-3 Track Galveston Bay Plan Implementation: The project team will work with GBEP and its partners to integrate the proposed project results into the Comprehensive Conservation and Management Plan for the Galveston Bay estuary and share it with the Council and stakeholders, as needed.

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.

Subcommittee Identified Priorities:

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

- ☒ WSO: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSO: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☒ WSO: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☐ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☒ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSO, PPE).
- ☐ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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 builds directly on the existing GBEP funded project extending the established work into the sub-micron nanoplastic fraction using the same samples, sites, and sampling events. Below are the additional FY28 subcommittee priorities that this project expansion addresses.

Water and Sediment Quality Subcommittee Priorities

Implementation and/or evaluation of best management practices that address point and nonpoint source pollution: As part of the ongoing study, microscopy-based monitoring captures only the microplastic fraction. By expanding the study to include emerging technologies such as DSC and Py-GC-MS we will be able to measure the nanoplastic fraction that current methods cannot detect. This will directly supplement the results to provide quantitative pollutant data across major watersheds within the lower Galveston Bay watershed which can inform prioritizing location or design of future nonpoint source BMPs.

Monitoring and Research Subcommittee Priorities

Meaningful and effective monitoring of existing, past, and new projects: The proposed work directly expands an existing GBEP funded monitoring project and incorporates emerging methods for MNP quantification and evaluation. Rather than initiating a standalone effort, the proposed expansion adds a nanoplastic measurement capability to the established monitoring framework, maximizing the value of the prior investment and producing a continuous micro-through-nano dataset from the same sampling design.

Assessment, Exposure, and Response to stressors, including but not limited to emerging contaminants: Nanoplastics are an emerging contaminant for which very few baseline data exist in Galveston Bay. The proposed project expansion establishes baseline nanoplastic concentrations in major contributing waterways under dry- and wet-weather conditions, supplementing a growing dataset for microplastic contaminant quantities in the lower Galveston Bay watershed.

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☐ Make Investments that Address Coastal Resiliency
- ☒ Reduce Trash

Reduce Trash: Generally, MNPs are a central focus of EPA's Trash Free Waters program and its Draft National Strategy to Prevent Plastic Pollution. By quantifying nanoplastic loading to Galveston Bay, the project supports EPA's objectives to increase measurement of trash loading into waterways (informing management interventions).

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 project builds directly on the existing GBEP funded project, extending the established work into the sub-micron nanoplastic fraction using the same samples, sites, and sampling events. This expanded effort will enable quantification of baseline nanoplastic loading in major contributing waterways. The results will identify priority watersheds for future BMP recommendations and provide an expanded baseline MNP dataset to inform science-based decision-making.

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

Anthropogenic debris, including plastics, is a pervasive global environmental issue (Rochman, 2020). Plastics are non-biodegradable by design; rather than breaking down, they weather into progressively smaller particles over time (Martin et al., 2017). Microplastics are defined as plastic particles less than 5 millimeters in diameter, and nanoplastics as those less than 1 micrometer (μm). Large coastal urban areas such as the Houston-Galveston complex are among the most critical settings for plastic-pollution research: Galveston Bay hosts most of the country's plastic manufacturers (Tunnell et al., 2020; Shruti et al., 2021) and supports the most economically important fishery in Texas. Microplastics have been documented at an average concentration of 44.5 pieces per liter in surface waters of Galveston Bay (Oakley et al., 2024) and have been found in tissues across all trophic levels of marine organisms including Galveston fish and oysters (Vegter et al., 2014; Avio et al., 2017; Mortuza et al., 2025). Because plastics are petroleum-derived, they adsorb hydrophobic contaminants such as polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) (Bakir et al., 2014), which can be transferred and amplified through the food web (Miller et al., 2020). These concerns are magnified at the nanoplastic scale: nanoplastics' high surface-area-to-volume ratio makes them more efficient vectors for adsorbed contaminants, and their sub-micron size allows them to cross biological membranes that larger microplastics cannot (Al-Mezrakchi et al., 2026; Yee et al., 2021). Despite this, essentially no baseline nanoplastic data exists for Galveston Bay, because conventional microscopy-based monitoring cannot detect the nanoplastic fraction.

Traditional visual enumeration methods, such as vacuum filtration and microscopy, are effective for quantifying microplastics but are fundamentally limited to particles above the optical resolution of the method and cannot detect or characterize the nanoplastic fraction. This is a critical gap: a 2025 study measuring nanoplastic concentrations across the North Atlantic found that nanoplastics may comprise a large fraction of marine plastic pollution by mass, suggesting that visual enumeration alone substantially underrepresents the true extent of plastic pollution in aquatic systems (Ten Hietbrink et al. 2025). Detecting and quantifying this sub-micron fraction requires analytical methods capable of resolving particles below the optical range, such as DSC and Py-GC-MS, which have been established and refined for nanoplastic quantification in environmental and water samples (Al-Mezrakchi et al., 2026; Okoffo et al., 2022; Gahn et al., 2026). It is necessary to continue validation of DSC and Py-GC-MS for environmental sample analysis as these technologies become more readily available.

The proposed project builds directly on the existing GBEP funded project. Due to funding limitations, the ongoing study utilizes novel techniques for evaluation of microplastic particles but does not allow for assessment of nanoplastic particle presence or composition. Here, we incorporate novel and emerging

analysis methods to leverage GBEP's investment by adding DSC and Py-GC-MS analyses to the same samples, sites, and sampling events included in the ongoing study. Rather than initiating a standalone study, the project completes the picture by capturing the full micro-through-nano size spectrum from a single, already-established sampling design, ultimately maximizing GBEP's return on investment. The proposed study will provide critical data on baseline nanoplastic loading in Galveston Bay watersheds, addressing the following objectives:

- Monitor background levels of MNP pollution in major contributing waterways to Galveston Bay.
- Compare concentrations between dry-weather (base flow) and wet-weather freshwater inflows.
- Identify sub-watersheds with the highest MNP loading for future BMP recommendations.

Using sites from the existing GBEP funded study, six (6) baseline monitoring sites will be located near the downstream extent of the non-tidal portion of major sub-watersheds. Water grab samples will be collected during a target of four dry-weather and four wet-weather events over one year. Should the proposed project expansion be funded, an additional water grab sample will be collected at each sampling event for expanded analyses. For DSC analyses, water samples will be passed through a large pore (e.g., 5 mm or greater) sieve and digested with hydrogen peroxide, then the filtrate will be dried. The residual remaining sample will be analyzed through DSC. For Py-GC-MS analyses, water samples will be digested with hydrogen peroxide then vacuum filtered through a 24-mm diameter 0.7 µm pore size glass filter. Filters will then be processed through the Py-GC-MS for analysis. Nanoplastic loading will be calculated from measured concentrations and discharge for each site and added to the database from the ongoing study to create a unique continuous micro-to-nanoplastic dataset within the lower Galveston Bay watershed. Results from these additional grab samples will be used to determine total MNP loads in a singular grab sample, without the added processing of additional filtration steps, staining, and microscopic enumeration, as is planned for the current GBEP funded study. Additionally, should the project expansion be funded, filtrate remaining from the samples collected as part of the current GBEP funded study will be retained so if we are able to analyze the remaining filtrate through either DSC, Py-GC-MS, or both methods, we will be able to assess the quantity of MNP particles which escape the existing study design.

The proposed project expansion addresses multiple emerging techniques for MNP enumeration, quantification, and identification. This expansion directly strengthens the currently funded GBEP study in adding quantification protocols to the nanoplastic fraction and evaluating the effectiveness of two methods for enumerating nanoplastic quantities (e.g., DSC and Py-GC-MS). Expansion of the existing project will allow us to better understand how these methods can be used in tandem to develop a holistic dataset for MNP concentrations in freshwaters flowing into the Galveston Bay estuary, as well as improving our ability to compare results from the Galveston Bay watershed to other waters at the national, and potentially global, scale. Additionally, comparative statistics among contributing drainages will identify the sub-watersheds with the greatest potential MNP pollution. Finally, the expansion also aids in workforce development by supporting an additional graduate student thesis, if funded in full.

Literature Cited provided as a separate attachment.

Project Urgency:

Building directly on the existing GBEP funded project (anticipated project end date is March 31, 2028), the proposed project expansion takes the next step to characterize the nanoplastic fraction of plastic pollution (e.g., the sub-micron particles that current microscopy-based monitoring cannot detect). To maximize GBEP's current investment and project efficiencies, the proposed study expansion is dependent on samples collected under the existing microplastic monitoring effort, for which field work begins in early FY27. Under the established protocol, the sub-micron filtrate must be retained and processed alongside the microplastic samples it is derived from, so the value of this expansion is greatest while the parent project is actively collecting samples in the field. Funding in this cycle allows nanoplastic characterization to proceed on the same samples, sites, and storm events already being monitored, preserving a continuous micro-through-nano dataset from a single sampling design. **Delaying to a later cycle would forfeit this alignment and require a separate, more costly standalone effort to recreate the baseline already being generated.**

Other Plans Implemented:

The Gulf of America Alliance's Governor's Action Plan: The proposed study expansion aligns with the priority issue item Threats to Human Health and Aquatic Life, which calls for Gulf-wide efforts to collect data, monitor water resource conditions and trends, and identify linkages between water quality and threats to human health or aquatic life, including plastic pollution, to support improvements within the Gulf

waters. By generating the region's first continuous baseline micro-through-nanoplastic dataset, the proposed project directly advances this monitoring and data-collection priority.

The Save Our Seas Act of 2018 (Marine Debris Act): The proposed study expansion aligns with the priority goal to conduct and support research addressing the most critical research needs related to microfiber and MNP pollution, as defined in the Marine Debris Report to Congress by NOAA's Marine Debris Program and the EPA's Trash Free Waters Program. The proposed characterization of the sub-micron plastic fraction addresses a research need not met by existing monitoring programs.

The Galveston Bay Report Card: Litter and trash are currently scored as "I" for insufficient data because there is no systematic bay-wide monitoring to evaluate this kind of pollution. The proposed study expansion helps address this gap by extending systematic monitoring to the nanoplastic fraction, for which regional data is scarce.

EPA Draft National Strategy to Prevent Plastic Pollution: The proposed study expansion supports Objective C (preventing trash and micro/nanoplastics from entering waterways) specifically the sub-objectives to increase measurement of plastic loadings into waterways (C3) and to fund research and demonstration of technologies that capture micro/nanoplastics in stormwater (C2).

Partners¹ and Their Roles:

Mandi Gordon, Lead PI - gordon@uhcl.edu; Environmental Institute of Houston (EIH), University of Houston-Clear Lake (UHCL); Associate Director, Research Programs

Ms. Gordon will provide administrative oversight, assist with project design and implementation, manage contractual obligations, and provide continuity with the existing GBEP-funded microplastic monitoring effort, of which she is a co-PI and listed as the Project Manager in the existing Quality Assurance Project Plan (QAPP).

Dr. Ruaa Al-Mezrakchi, Co-PI - almezrakchi@uhcl.edu; College of Science and Engineering, UHCL; Assistant Professor of Mechanical Engineering

Dr. Al-Mezrakchi brings expertise in nanomaterials, polymers, and innovative MNP analyses. She leads the nanoplastic characterization effort at UHCL, providing access to and analytical direction for DSC protocols. Dr. Al-Mezrakchi will also serve as the primary mentor for the student(s) associated with the project.

Dr. Asif Mortuza, Co-PI - mortuza@uhcl.edu; EIH, UHCL; Research Associate

Dr. Mortuza will provide day-to-day project management, coordination with project partners (including staff at Texas A&M University at Galveston), facilitate sample processing (including Py-GC-MS), conduct nanoplastic analysis, and be responsible for data management, statistical analysis, and report development. Dr. Mortuza will extend his role as Field and Laboratory Supervisor in the current QAPP to the proposed project expansion.

Dr. Jenny Oakley, Co-PI - jenny.oakley@h-gac.com; Houston-Galveston Area Council; Senior Water Resources Scientist

Dr. Oakley serves as the Lead-PI for the current GBEP funded project. In the proposed expansion, she will serve as a subject matter expert and participate in study design development and oversight. Dr. Oakley's participation in the study expansion is integral to the continuity of the two projects.

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

☒ Yes

☐ No

This project is led by the University of Houston-Clear Lake (UHCL), a Hispanic-Serving Institution, and supports graduate student research assistantships in the analysis of nanoplastic pollution. It brings a new cross-disciplinary partnership between UHCL's Environmental Institute of Houston and its College of Science and Engineering, pairing environmental monitoring with nanomaterials and polymer characterization expertise. The project also leverages the ongoing GBEP-funded microplastic monitoring

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

effort administered by the Houston-Galveston Area Council, building on that established partnership to expand regional capacity into nanoplastic measurement.

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes

☒ No

The proposed work expands an existing study and outreach is beyond the scope of the expanded work.

Latitude/Longitude (Optional):

N/A

Location:

See Figure 1. Sampling locations will be concurrent with the ongoing GBEP funded project. Samples will be collected from sub-watersheds distributed throughout the lower Galveston Bay watershed.

Projects Map

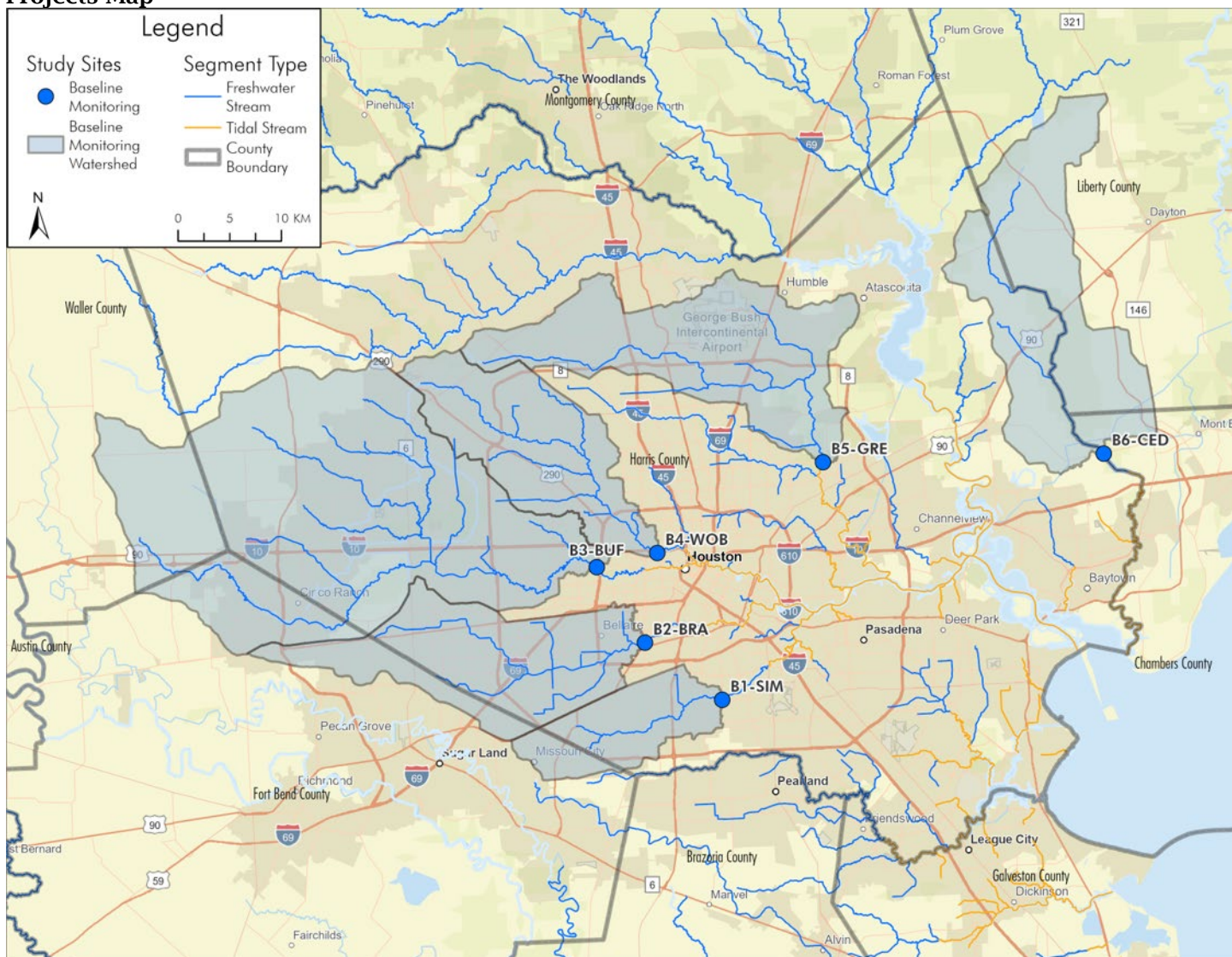


Figure 1 Project area map showing the study sites and corresponding sub-watersheds for micro- and nanoplastic assessment in the Houston-Galveston region.

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$ 106,849
Fringe Benefits (###)% ²	\$ 23,720
Travel	\$ 2,600
Supplies	\$ 5,000
Equipment	\$ 0.00
Contractual	\$ 0.00
Construction	\$ 0.00
Other	\$ 8,600
Total Direct Cost	\$ 146,769

b. Indirect Costs³

Distribution Base Amount (<i>identify Base type below</i>)	\$ 146,769
Indirect Cost Rate for Reimbursement	16 %
Total Indirect Costs	\$ 22,203

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 168,972
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

³ Please attach Indirect Cost Agreement as an appendix if applicable

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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

N/A

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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.

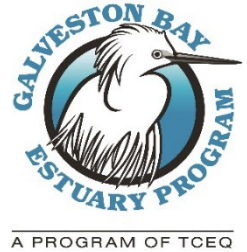
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)
Secondary Subcommittee (if applicable): Natural Resource Uses (NRU)
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Post-Restoration Terrapin Nesting Habitat Surveys at Galveston Island State Park
Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Public University: University of Houston-Clear Lake (UHCL); Environmental Institute of Houston (EIH)

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*

[If other, please identify pass-through partner.]

Unique Entity ID (UEI) Number:	RD74AUNCTZJ1
Vendor Identification Number (VIN) or Tax ID:	State: 3-75975-9759-2; Federal: 74-6001399

Contact Information:

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

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

September 1, 2027 – August 31, 2029 (24 months)

Amount Requested from GBEP:

\$132,243 *See notes about scalability in the Total Project Cost section below
Federal ☐ State ☒ No Preference ☐
Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$ 64,998
FY 2029 (09/01/2028-08/31/2029)	\$ 67,245
FY 2030 (09/01/2029-05/31/2030)	\$ 0.00
Total	\$ 132,243

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

Requested funds:	\$ 132,243 (28% of the total project cost)
Pending funds (USFWS):	\$ 48,000 (contract pending)
Pending funds (GOAA):	\$ 40,000 (funds applied for; response pending)
Awarded funds (TPWD and UHCC):	\$ 250,000 (GBEP funds approved for FY27)
Total project costs:	\$ 470,243 (if funds secured from all sources)

**Notes about scalability:*
The primary costs for the proposed project expansion are in salary and fringe, especially related to student participation (currently included at 100% support for two years of graduate thesis work and includes a stipend for the graduate student). Should the project be scaled down or costs reduced, student participation can be reduced or removed completely. **If removed completely, the total requested funds are reduced to**

\$54,608, assuming that the other leveraged funds are fully realized. Below are updated calculations for the minimum cost of the project expansion. Note that if GBEP or the related subcommittees would still like to prioritize student support and/or workforce development in some capacity, estimated amounts can be provided for partial support of a student(s) in the project.

Requested funds:	\$ 54,608 (14% of total if scaled down and other funds realized)
Pending funds (USFWS):	\$ 48,000 (contract pending)
Pending funds (GOAA):	\$ 40,000 (funds applied for; response pending)
Awarded funds (TPWD and UHCC):	\$ 250,000 (GBEP funds approved for FY27)
Total project costs:	\$ 392,608 (if funds secured from all sources)

If reduced the proposed project funding is reduced to the minimum, and one or more of the other leveraged funding opportunities is not realized, then changes may need to be made to the study design to accommodate the reduced funds.

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

The proposed project directly supplements a GBEP funded restoration project at Galveston Island State Park (GISP; \$250,000), coordinated through the Texas Parks and Wildlife Department (TPWD) and University of Houston Coastal Center (UHCC).

Additional leverage funds (\$48,000) are pending from the U.S. Fish and Wildlife Service (USFWS) Coastal Program for supplemental terrapin nesting surveys within the Galveston Bay estuary. Should the proposed study not be funded, USFWS funds may be used to cover some of the proposed tasks but are not sufficient for completing the full scope of the proposed work at GISP. These USFWS funds are anticipated to start on October 1, 2026.

Additionally, \$40,000 in funds have been requested from the Gulf of America Alliance (GOAA) for supplemental surveys in the Galveston Bay estuary. Should these funds be awarded, they are intended to expand survey efforts in spatial coverage, frequency, and duration. As of this proposal, these funds have not been awarded, and award notifications are planned for mid-fall 2026.

If all funds are awarded, these leveraged funds represent 72% of the total project budget.

In addition to these leveraged funds, EIH at UHCL maintains the longest, consistently running Terrapin Monitoring Program in the state. While GISP is not part of routine monitoring activities, general Terrapin Monitoring Program costs are ~\$10-20K per year for bi-annual surveys (depending on frequency and available time; estimate includes staff/student salary, vessel and vehicle use rates, and supplies). Costs for the proposed study are minimized based on existing supplies and personnel expertise from our Terrapin Monitoring Program activities. These costs are not calculated into the total leverage amount but are relevant and necessary for keeping costs for the proposed project at a minimum.

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐

PS-1 ☐ PS-2 ☐ PS-3 ☐

PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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:

The proposed project directly supplements a GBEP funded restoration project at Galveston Island State Park, coordinated through TPWD and UHCC. The partner project addresses priorities NPS-1, NPS-3, NPS-4, HC-2, HC-3, SC-1, SC-2, SPO-1, SPO-2, and SPO-3. The work included in the current proposal supplements these priorities in the following ways:

HC-2 (Habitat Restoration) and HC-3 (Habitat Enhancement): The proposed study supports this priority by compiling necessary post-construction monitoring data for the GBEP-funded restoration project. While terrapin are known to prefer shell hash and sandy beaches in areas along the Texas coast, actual use of available nesting habitat within GISP is largely unknown. Post-restoration nesting surveys will be critical in understanding how efforts may have changed or affected nesting site selection by female terrapin.

SC-1 (Native Species Management): As a Species of Greatest Conservation Need in Texas, better understanding of preferred nesting habitats for terrapin is needed by conservation managers. In Texas, formal nesting surveys have been documented only in the grey literature. The proposed work will fill knowledge gaps in terrapin nesting habitat preference and structure post-habitat restoration, and will represent the first formal nesting survey conducted in GISP.

RES-3 (Conduct Physical Stressor Monitoring and Research) and RES-8 (Complete Coastal Resiliency and Acclimation Studies): Physical stressors (such as coastal erosion or shoreline hardening) directly impact nesting habitats utilized by terrapin and other coastal wildlife. For conservation or resource managers to make informed decisions about habitat restoration, alteration, or management strategies, a better understanding of how these habitats are utilized by nesting terrapins is needed. The proposed study directly informs physical stressor monitoring and coastal resiliency decisions for preserving our native wildlife.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and

- ☐ Projects that may have lost/delayed funding from other federal sources.
- ☒ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☒ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☐ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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 directly supplements a GBEP funded restoration project at Galveston Island State Park, coordinated through TPWD and UHCC. In addition to the subcommittee priorities addressed by the funded project, the proposed project also addresses the following FY28 subcommittee priorities:

NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife. The proposed study will compile needed information about nesting habitat preference and availability at GISP for this Species of Greatest Conservation Need as well as provide necessary post-construction monitoring data for the GBEP-funded restoration project.

M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management practices). As a species of greatest conservation need in Texas, limited information about the nesting habitat preferences for the diamondback terrapin have constrained resource managers from making informed decisions related to conservation decisions. Additionally, the proposed study will provide data which can be used to develop Best Management Practices (BMPs) for future restoration efforts, such as those planned at Giraffe Head and in association with the Coastal Spine.

M&R: Assessment, exposure, and response to stressors, including Species of Greatest Conservation Need. Coastal and shoreline erosion, habitat loss, and sea level fluctuations have a direct effect on terrapin nesting habitat availability and selection. The proposed study will compile much needed information about preferred nesting habitats and how mitigation (e.g., restoration) efforts may improve habitat distribution.

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☐ Make Investments that Address Coastal Resiliency
- ☐ Reduce Trash

While the proposed project does not directly address EPA Areas of Special Interest, the GBEP funded partner project coordinated by TPWD and UHCC addresses investments in Coastal Resiliency. These include consistencies with the Texas Coastal Resilience Master Plan (Degraded or Lost Habitat, Bay Shoreline Change, and Inland Flooding), alignments with the EPA's goals for enhancing coastal resiliency, shoreline stabilization, and native coastal habitat restoration.

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 project directly supplements a GBEP funded restoration project at Galveston Island State Park, coordinated through TPWD and UHCC. Due to the paucity of information about preferred terrapin nesting habitat in GISP and the uncertainty of the impact that the shoreline restoration efforts by TPWD and UHCC may have on terrapin nesting habitat, we will conduct post-restoration nesting habitat surveys in restored and un-restored areas of GISP. By synergizing these projects, recommendations will be provided to resource and conservation managers to make informed decisions on future habitat restoration efforts.

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

In coastal areas, sea level fluctuations and anthropogenic development have a major impact on shoreline structure and composition. Marine and estuarine turtles rely on beaches and their associated marshes as critical nesting areas. The Diamondback Terrapin (*Malaclemys terrapin*; “terrapin”) is a species of greatest conservation need (SGCN) in Texas and has experienced declining distributions coast-wide from habitat loss (M. Gordon, *unpublished data*). Along the middle Texas coast, formal nesting surveys have been conducted in the Nueces Estuary (Halbrook, 2003; Baxter, 2015), Mission-Aransas Estuary (Baxter, 2017), and within the Aransas National Wildlife Refuge (Koza, 2006). Within Galveston Bay, little is known about preferred nesting habitats with most reports of nesting activity limited to grey literature (Hogan, 2002; George, 2014). While these formal surveys resulted in valuable information about potential nesting habitat preferences, none were successful in documenting actively nesting females except for one female observed on South Deer Island in Galveston Bay (Hogan, 2003). Potential nesting habitat types documented through these surveys include shell hash beaches, a mixture of shell and sandy shorelines, and areas adjacent to low-lying saltmarsh habitat. In May 2025, a nesting female was documented on the beach side of Galveston Island (Morris et al., *in review*). While terrapin show a propensity for nesting in beach dune systems in other parts of the species’ range, this observation in Galveston marked a novel report of preference specifically for sandy substrate. The lack of clarity in preferred nesting habitat type for terrapin in Texas is due to limitations in shoreline accessibility through private lands, anthropogenic impacts to historically utilized habitats, and limited funding for time intensive field surveys.

The nearly 2,000 acres of protected habitat within GISP serves as a refuge for nesting shorebirds, and potentially terrapin (<https://tpwd.texas.gov/state-parks/galveston-island/nature>). While no terrapin nesting activity has been reported within the park in recent years, terrapin observations have been reported through citizen scientists, anecdotal accounts, and iNaturalist (M. Gordon, *unpublished data*). Because the park spans the width of Galveston Island, a large amount of potential terrapin nesting habitat (e.g., saltmarsh, shell hash shorelines, sandy shorelines) are present. This variety in potential nesting habitat types provides a unique opportunity for researchers to better document the use of this park as protected nesting habitat. Project partners at TPWD and UHCC are planning to restore shoreline habitats in Dana Cove at GISP through relocation of oyster shell materials from UHCC’s coastal prairie property. The goal of this restoration project is to restore eroding shorelines within this part of GISP, but it is unclear if this effort will also improve nesting habitat availability for terrapin.

Due to the paucity of information about preferred terrapin nesting habitat in Galveston Bay and the uncertainty of the impact that the impending shoreline restoration efforts by TPWD and UHCC may have on terrapin nesting habitat, **we are requesting funds to support nesting surveys within GISP, including post-restoration nesting habitat surveys at Dana Cove.**

During nesting surveys, game cameras will be installed at strategically placed locations to passively monitor nesting activities (similarly to Baxter 2015, 2017). Shoreline habitats will be surveyed by foot at least once per week during nesting season (April-June) (see Guillen et al., 2015 for detailed transect survey methods). These surveys include access to areas of GISP by boat or by vehicle. If terrapin are encountered, habitat and morphometric data will be recorded for each individual captured following standardized protocols (see Guillen et al., 2015 for detailed methods). Individuals will be marked externally (e.g., notching) and internally (e.g., PIT tag) for identification in future survey efforts.

During nesting surveys, *in situ* habitat data (including sediment size, vegetation, elevation, etc.; outlined in George, 2014), will be collected in multiple locations throughout the park to best establish priority nesting area(s). These habitat data will be paired with landscape scale geospatial data (e.g., [USGS The National Map](#) digital elevation model [DEM], the [USGS National Land Cover Dataset](#) [NLCD], the [NOAA Coastal-Change Analysis Program](#) [C-CAP] dataset, the [NRCS Soil Survey Geographic Database](#) [SSURGO], etc.) in an ArcGIS Pro geospatial database and/or model to determine trends in preferred habitat location within GISP. Nesting survey results and subsequent geospatial maps will be shared with TPWD and UHCC so that best practice for future management decisions may be made within the park. Post-restoration surveys will be conducted along the restored shorelines of Dana Cove and other areas of priority habitat to assess potential changes in

nesting habitat use. Results of nesting surveys will also be submitted to the TXNDD for use by conservation managers in decision making for this Species of Greatest Conservation Need.

In addition to supporting post-restoration surveys as part of the GISP restoration project, data will also be shared with partners conducting restoration efforts in other parts of Galveston Bay, including The Nature Conservancy and TPWD for the impending Giraffe Head restoration project and as needed for development of other restoration projects, such as the Coastal Spine. By synergizing these projects, recommendations will be provided to resource and conservation managers to make informed decisions on improving terrapin nesting habitat in the future.

Literature Cited:

Baxter, 2015. CBBEP Report; **Baxter, 2017.** CBBEP Report; **George, 2014.** M.S. Thesis (UHCL); **Guillen et al., 2015.** UHCL Report #15-001; **Halbrook, 2003.** M.S. Thesis (TAMUCC); **Hogan, 2002.** USGS Report; **Koza, 2006.** M.S. Thesis (TAMUCC); **Morris et al., in review.** Herpetological Review.

Project Urgency:

This proposal is being submitted as a supplement to a GBEP-funded project coordinated by Texas Parks and Wildlife Department (TPWD) and the University of Houston Coastal Center (UHCC). The funded project is expected to break ground at the UHCC and Galveston Island State Park (GISP) in summer of 2027. If the proposed study is funded, then funds from the USFWS grant (previously mentioned in the leverage section) may be used for pre-restoration surveys at GISP in the Spring of 2027. Because of the funding timeline for the proposed study, GBEP funds would be used solely for post-construction surveys at GISP, but if restoration activities at GISP are delayed, the proposed project timeline may be able to accommodate pre-restoration survey efforts.

In addition to the urgency in timing with the paired TPWD/UHCC project, no formal terrapin nesting surveys have been conducted in GISP within the past decade, though terrapin have been documented through informal reports and anecdotal observations. Therefore, actual use of the associated habitat(s) as viable nesting areas is largely unknown. If funded, these pre-restoration survey efforts are critical to better understanding the nesting habitat use of terrapin within GISP.

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).

As part of the [Texas State Wildlife Action Plan](#) (SWAP), terrapin are recognized as a Species of Greatest Conservation Need. Resulting data from the proposed study will be provided to TPWD for inclusion in their species status reviews and ongoing monitoring database (the Texas Natural Diversity Database) to fill knowledge gaps which are integral in the development of management strategies.

Goals of the Gulf of America Alliance's Water Resources and Wildlife and Fisheries Teams (outlined in the [Gulf of Mexico Alliance's Governor's Action Plan IV](#)) 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.

Partners¹ and Their Roles:

Mandi Gordon, Lead PI – gordon@uhcl.edu; Environmental Institute of Houston (EIH), University of Houston-Clear Lake (UHCL); Associate Director, Research Programs

Ms. Gordon will provide administrative oversight, assist with project design and implementation, manage contractual obligations, conduct data analyses, and reporting.

Danielle DeChellis, Co-PI – dechellis@uhcl.edu; EIH, UHCL; Research Technician

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

Ms. DeChellis will provide day-to-day project management, coordination with project partners, facilitate sample processing, conduct field surveys, and be responsible for data management, statistical analysis, and report development..

Savannah Horton, Project Partner - savannah.horton@tpwd.texas.gov; TPWD; Coastal Ecologist, Restoration and Artificial Reefs

As PI for the GBEP funded restoration project, Savannah will act as a liaison between the two projects to ensure continuity and communication. Additionally, Savannah will assist with coordination of site access within GISP and synergy of project timelines between the two related studies.

Matthew Abernathy, Project Partner (msaberna@central.uh.edu); UHCC Texas Institute for Coastal Prairie Research and Education; Program Director

As Co-PI for the GBEP funded restoration project, Matthew UHCC liaison between the two projects to ensure continuity and communication. UHCC will participate in project meetings and provide input on the process, design, and monitoring of the project to ensure a successful output. Additionally, UHCC will facilitate media outreach related to the TPWD project, which may include details about the current project proposal through UHCL.

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

☐ Yes

☒ No

N/A

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes

☒ No

N/A

Latitude/Longitude (Optional):

29.21354, -94.95737 (Dana Cove Project Site for TPWD/UHCC Project)

Location:

Gulf Coast Prairie and Marshes Ecoregion → San Jacinto-Brazos Coastal Basin → Lower Galveston Bay Watershed → West Galveston Bay; entirely within lower Galveston Bay watershed

Projects Map



Figure 1 Galveston Island State Park boundary (yellow polygon) with Dana Cove noted. Dana Cove is the primary area of interest for the GBEP funded TPWD and UHCC shoreline restoration project. Proposed terrapin nesting surveys will be conducted throughout the state park in areas of preferred habitat (e.g., shell hash shorelines, sandy shorelines, low-lying marsh areas, etc.), including post-construction in areas where restoration activities occurred.

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$ 81,899
Fringe Benefits (###)% ²	\$ 18,522
Travel	\$ 1,300
Supplies	\$ 1,308
Equipment	\$ 0
Contractual	\$ 0
Construction	\$ 0
Other	\$ 12,077
Total Direct Cost	\$ 115,106

b. Indirect Costs³

Distribution Base Amount (<i>identify Base type below</i>)	\$ 107,106
Indirect Cost Rate for Reimbursement	16%
Total Indirect Costs	\$ 17,137

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 132,243
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

³ Please attach Indirect Cost Agreement as an appendix if applicable

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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

[Description of costs associated with “Other” budget category.]

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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.

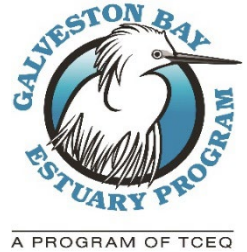
- Unless otherwise communicated or implied, GBEP requires 1 (one) completed copy of your Project Proposal per corresponding Subcommittee Coordinator.
- Project Proposals must be received electronically, through the email address of the relevant Subcommittee Coordinator listed on this page, by the deadline 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)
Secondary Subcommittee (if applicable): Water and Sediment Quality (WSQ)
Tertiary Subcommittee (if applicable): Public Participation and Education (PPE)

Project Name:

A Gap-Free, Multi-Parameter Water Quality Observatory for Galveston Bay Using Satellite Remote Sensing and AI

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Dr. Adnan Rajib, Assistant Professor, Department of Civil Engineering, University of Texas at Arlington

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*

[If other, please identify pass-through partner.]

<u>Unique Entity ID (UEI) Number:</u>	LMLUKUPJJ9N3
<u>Vendor Identification Number (VIN) or Tax ID:</u>	FED ID# 75-6000121 and TAX ID# 3714-714-7146

Contact Information:

Project Representative Name	Dr. Adnan Rajib
Project Representative Phone	817-272-6305
Project Representative Email	adnan.rajib@uta.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

09/01/2027 – 05/31/2030

Amount Requested from GBEP:

\$ 160,790

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$57,287.00
FY 2029 (09/01/2028-08/31/2029)	\$58,683.00
FY 2030 (09/01/2029-05/31/2030)	\$44,820.00
Total	\$160,790.00

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

\$ 160,790

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

\$ 0

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

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

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:

The project directly supports **Priority 4** by generating the first publicly available gap-free multi-parameter water quality database from satellite remote sensing and Artificial Intelligence.

- It is fully aligned with **RES-1** by providing 300-meter resolution, bay-wide chlorophyll-a maps for every day which would be highly critical for effective monitoring of biological stress, and **RES-2** by providing similar maps for suspended matter, dissolved organic matter, temperature, and salinity which represent a holistic set of geochemical stressors that govern Galveston Bay's habitat suitability and productivity.
- The project advances **ACS-1** by bringing these multi-parameter aquatic health indicators under one framework — helpful for tracking ecosystem conditions and trends from 2016 to the present, and **ACS-2** by openly distributing the data through a DOI-linked repository and an interactive web platform.

Under **Priority 3**, the project advances **SPO-2**, **SPO-4**, and **PEA-1** by organizing three in-person workshops to train local governments and agencies, while also increasing public awareness of key aquatic health hot spots and hot moments which are being persistently misestimated due to data gaps.

The project findings would thematically and indirectly support **FWI-2** under **Priority 2** by providing long-term, daily water quality data, revealing how Galveston Bay responds to changing freshwater inflows. Although the project will not directly quantify inflow volumes, the spatially distributed and temporally continuous data developed here will help identify emerging inflow signatures and evaluate their ecological and water quality implications. Finally, the project's overarching impact benefits **FWI-1** by providing agencies with previously unavailable data and tools to revise/prioritize regional planning and policies for sustaining freshwater inflows or mitigating the impacts of a lack thereof.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☒ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☐ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☒ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☐ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☒ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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:

See Appendix I

Does the Project align with any EPA Areas of Special Interest?

- ☒ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☒ Make Investments that Address Coastal Resiliency
- ☐ Reduce Trash

Reduce Nutrient Pollution to Protect Water Quality and Public Health. The project will provide daily chlorophyll-a, suspended matter, and dissolved organic matter data (as well as temperature and salinity) to identify eutrophication signals and algal-growth hotspots.

Make Investments that Address Coastal Resiliency. The multi-parameter datasets will help agencies evaluate how storms, droughts, warming, and changing freshwater inflows affect Galveston Bay habitats and support more informed monitoring, restoration, and resilience planning.

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 will reconstruct past 10+ years of water quality data across the Galveston Bay system. Harnessing open-access **satellite remote sensing observations, existing in-situ monitoring data, and Artificial Intelligence (AI)**, it will deliver the first publicly available, spatially distributed and temporally continuous, multi-parameter water quality database and interactive visualization platform for Galveston Bay.

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

Key Outcomes & Deliverables: The objective of this project is to develop gap-free, multi-source “fusion” time-series maps of 5 interacting water quality parameters: **Chlorophyll-a (Chl-a), Total Suspended Matter (TSM), Colored Dissolved Organic Matter (CDOM), Sea Surface Temperature (SST), and Sea Surface Salinity (SSS)**. All maps will be at **300-meter spatial resolution and daily temporal frequency**. They will cover the **entire Galveston Bay and span 2016 to present day** (with ~3-day latency). The data will be openly shared with stakeholders through both a DOI-linked repository for direct download and an interactive web platform for instant visualization. Finally, the project will organize three in-person workshops, potentially co-hosted with relevant stakeholder agencies, to provide hands-on training in data access and **gather feedback to refine** the underlying methods and validation framework.

Existing Gaps & Rationale for the Project: At present, state agencies and conservation groups rely on patchwork water quality monitoring, discontinuous historical datasets, small-scale models, and expert judgment. This baseline practice has long persisted because previous and even the most recent water quality projects in the region, though highly valuable, tend to focus on a single parameter, a few sites, or isolated events. They do not offer the combined view of multiple, interacting water quality parameters (e.g., salinity, temperature, turbidity, nutrients) and hazards (e.g., HAB) that jointly determine Galveston Bay’s overall aquatic health. Assessment of decision uncertainty under this fragmented baseline has therefore remained subjective. These persistent gaps clearly justify the need for this project.

Methodology and Validation: The project’s multi-source, multi-parameter fusion approach will leverage openly accessible and widely acknowledged satellite remote sensing data sources (**Table 1**). The fusion will be done through a **novel AI model**, recently developed by the H2I Lab at UT Arlington through a NASA-supported initiative: <https://www.earthdata.nasa.gov/dashboard/stories/wq-models>.

Table 1. Data sources to be used in developing the proposed multi-parameter framework for Galveston Bay. **PACE**= Plankton, Aerosol, Cloud, ocean Ecosystem, **OCI**=Ocean Color Instrument, **MODIS**=Moderate Resolution Imaging Spectroradiometer, **VIIRS**= Visible Infrared Imaging Radiometer Suite, **OLCI**= Ocean and Land Color Instrument, **SLSTR**= Sea and Land Surface Temperature Radiometer, **SMOS**= Soil Moisture and Ocean Salinity, **SMAP**=Soil Moisture Active Passive, **IOOS**= Integrated Ocean Observing System, **GCOOS**= Gulf of America Coastal Ocean Observing System. *Locally collected monitoring data, available through various stakeholders, will be considered as the project progresses. **DO as a proxy for CDOM validation. ***GCOOS includes data available through TCEQ, TPWD, and NOAA. See **Appendix III** for the references cited here.

Parameter	Source	Resolution	Start Year	Key Consideration/Role
Satellite Remote Sensing Sources				
Chl-a, TSM, CDOM*	PACE OCI [1]	1.2-km, 1-2 days	2024	Hyperspectral capability
	MODIS [2,3]	1-km, daily	2000	Long-term baseline
	VIIRS [4]	750-m, daily	2011	Improved than MODIS
	Sentinel-3 OLCI [5]	300-m, 1-2 days	2016	Highest resolution available
SST	MODIS, VIIRS, Sentinel-3 SLSTR [2-5]	750-m to 1-km, daily	2000	Long-term baseline
SSS	SMOS [6], SMAP [7]	40 to 150-km, 2-3 days	2010	Unsuitable resolution. Offshore conditions only
Ancillary Model & In-situ Data for Validation*				
SSS	TWDB BayCast [8]	250-m, daily	2015	Supplementing other data
SST, SSS, TSM, DO**	NOAA IOOS [9] GCOOS*** [10]	In-situ, daily	Variable	Model training/validation

This multi-source, multi-parameter fusion approach is highly justified because a single parameter or a single data source alone cannot capture the coupled nature of hydrological, biological, and biogeochemical

complexity in Galveston Bay. It is also critical to acknowledge that **higher spatial-temporal resolution cannot be the sole criterion to include or omit a particular data source**. For example, standard multispectral sensors (MODIS, VIIRS, Sentinel-3) are known for their limitations in optically complex nearshore coastal waters, where TSM and CDOM confound the Chl-a signal. NASA's latest mission called PACE, despite its slightly coarse resolution than MODIS/VIIRS and much coarser resolution than Sentinel-3, brings transformative hyperspectral (5nm) capability specifically designed to un-mix these overlapping and interacting water quality signals. These challenges promoted our fusion approach that seeks to resolve long-term data availability, resolution, and unique sensor capabilities.

Initial Proof-of-Concept for Matagorda Bay: The project team has developed some initial proof-of-concept results for Matagorda Bay (**Figure 1**). The Matagorda Bay case study shows that remote sensing, without post-processing and reconciliation, is not the cure-all. Indeed, remote sensing data sources have highly disparate formats, structures, and spatial-temporal resolutions (Table 1), and harmonizing them requires steps well beyond simple GIS processing. More critically, even for the same water quality parameter and on the same period of observation, there are substantial spatial gaps and value inconsistencies across data sources.

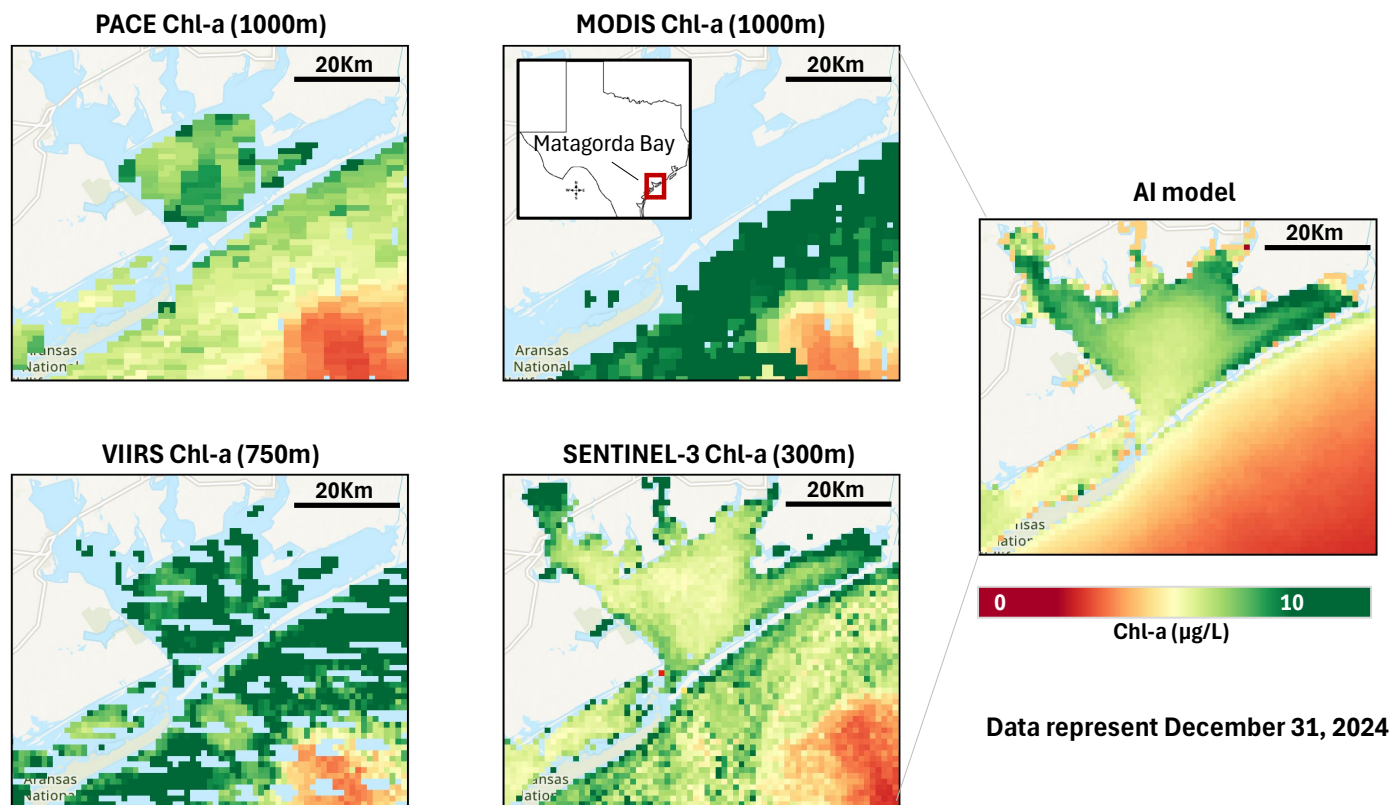


Figure 1. Spatial inconsistencies across data sources for a given water quality parameter (Chl-a in this case) on a given day (December 31, 2024, over Matagorda Bay). The proposed data fusion AI model can fill the gaps and create continuous time-series maps of 5 interacting parameters: **Chl-a, TSM, CDOM, SST, and SSS**, at **300-meter** spatial resolution and **daily frequency**, covering the entire Galveston Bay from **2016 to present day** (with ~3-day latency).

Data Visualization Tool for Stakeholders: All data and model codes will be shared through a DOI-enabled public repository, following rigorous validation with in-situ monitoring data (**Table 1**). Prior to making them accessible, a diverse group of stakeholders (see workshop plan below) will perform a qualitative evaluation. The validated output water quality maps will be further accessible through an interactive, open-access visualization interface in Google Earth Engine.

Stakeholder Workshop: Annual in-person workshops will be co-hosted with TCEQ (total 3 workshops throughout the project), bringing together a diverse group of practitioners, citizens, and coastal managers. These workshops will accomplish two objectives: (1) disseminate the outcomes, (2) gather stakeholder feedback to refine deliverables and evaluate research effectiveness in terms of improved decision-making. Example **metrics of improved decision-making** may include (1) agreement with independent in-situ data and stakeholder satisfaction scores from pre/post workshop surveys, (2) documented instances where the outputs informed existing habitat (e.g., oyster reef) restoration siting/timing, monitoring plans, and evaluation of prior projects, and (3) stakeholder commitments to continued use of the products in routine agency workflows,

along with identified pathways and resources for sustaining and further developing the data products beyond the project period. **Participant honoraria** are included in the budget for sustained engagement.

Project Urgency:

Funding during this cycle is important to preserve the current technical and stakeholder momentum garnered through recently concluded NASA-supported research.

Other Plans Implemented:

The project supports implementation of (1) **Texas Coastal Management Program** by providing a much-needed, spatially consistent and temporally continuous baseline information on the health of coastal waters, (2) **Texas Coastal Resiliency Master Plan** by helping coastal managers identify hot spots of water quality degradation, prioritize restoration and resilience investments, and evaluate ecosystem responses to storms, droughts, warming, and changing freshwater inflows, (3) **Texas Coastal Nonpoint Source Pollution Control Program/Clean Coast Texas** by expanding access to water quality information via interactive visualization dashboard and stakeholder training, and (4) **Texas Freshwater Inflow Needs and Environmental Flows Programs** by complementing existing monitoring efforts with a multi-parameter dataset and strengthening understanding of freshwater-inflow signatures to support regional water resource planning.

Partners¹ and Their Roles:

The proposal concept was shared with the **TWDB Coastal Science Division**, which encouraged its submission. If funded, the division will provide technical guidance on data validation and help connect the project with a broader community of stakeholders.

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

☒ Yes

☐ No

TBD

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes

☒ No

N/A

Latitude/Longitude (Optional):

Bounding box (W 95°01'00"-- W 94°27'00"/N 29°46'00"-- N 29°16'00")

Location:

Entire extent of Galveston Bay. See project map.

Projects Map

[See Appendix II](#)

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

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$71,556.00
Fringe Benefits (###)% ²	\$10,861.00
Travel	\$6,000.00
Supplies	\$6,000.00
Equipment	\$0.00
Contractual	\$0.00
Construction	\$0.00
Other - Workshop trainee stipend	\$13,500.00
Total Direct Cost	\$107,917.00

b. Indirect Costs³

Distribution Base Amount (<i>identify Base type below</i>)	\$ 94,417
Indirect Cost Rate for Reimbursement	% 56
Total Indirect Costs	\$ 52,873

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 160,790
--	------------

Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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.

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

³ Please attach Indirect Cost Agreement as an appendix if applicable

☐ **Other:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

[Description of costs associated with “Other” budget category.]

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

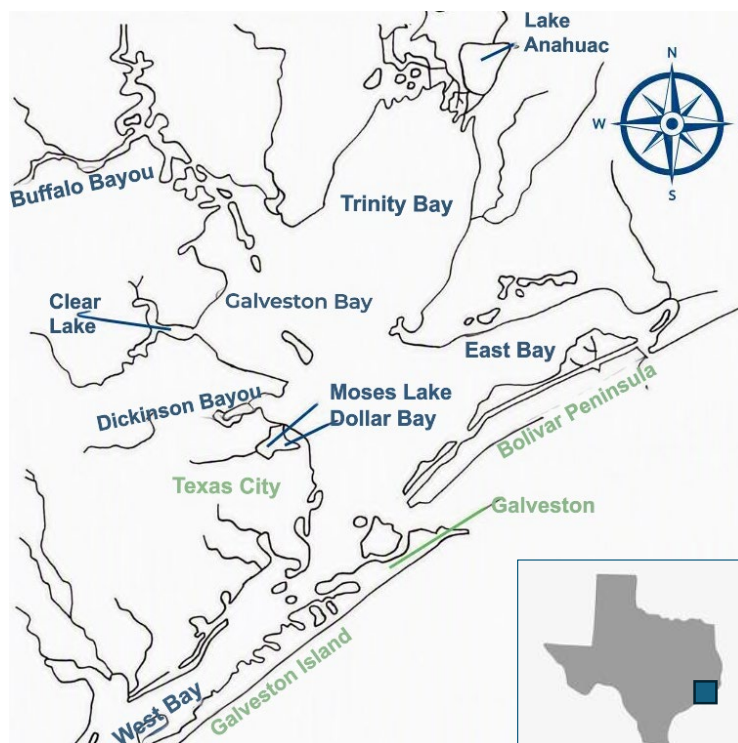
Appendix I. Subcommittee Priority Detail (explain in detail how project addresses priorities selected):

[1] **M&R: Assessment, Exposure, and Response to Environmental Stressors.** A key strength of the project is its ability to overcome limitations of existing M&R approaches, which are often spatially fragmented, temporally discontinuous, or focused on individual water quality parameters. By integrating multiple data sources and jointly mapping 5 interacting parameters, the project will provide a more complete view of Galveston Bay conditions. Specifically, the project will generate gap-free, daily maps of chlorophyll-a, total suspended matter, colored dissolved organic matter, sea surface temperature, and salinity at 300-meter resolution. **Unlike many existing remote sensing applications that examine a single parameter or rely on a single satellite source,** this integrated project will reveal interacting stressors, hotspots, long-term trends, and responses to storms, droughts, and freshwater-inflow changes, while maximizing the complementary capabilities of multiple satellites through Artificial Intelligence.

[2] **WSQ: Improve Knowledge and Accessibility of Pollution-Reporting Tools.** The project will transform fragmented and technically complex datasets into accessible products. A DOI-linked open repository and interactive web platform will allow agencies, researchers, and community groups to examine water quality patterns, unusual events, and locate monitoring gaps without requiring advanced technical expertise.

[3] **PPE: Workshops and Technical Assistance for Local Leadership.** Three in-person workshops will provide hands-on training in accessing, extracting, visualizing, and interpreting the project's novel multi-parameter data products. The workshops will also connect local leaders, agencies, nonprofits, and researchers while gathering feedback to refine the datasets and validation methods and evaluate project success.

Appendix II. Project Map

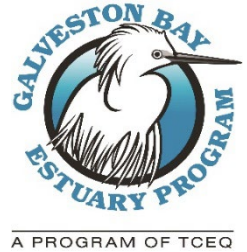


Appendix III. References

1. https://pace.oceansciences.org/access_pace_data.htm
2. http://dx.doi.org/10.5067/AQUA/MODIS_OC.2014.0
3. http://dx.doi.org/10.5067/TERRA/MODIS_OC.2014.0
4. <https://www.ospo.noaa.gov/products/ocean/color/>
5. <https://documentation.dataspace.copernicus.eu/Data/SentinelMissions/Sentinel3.html>

6. <https://coastwatch.noaa.gov/cwn/products/sea-surface-salinity-near-real-time-miras-smos.html>
7. <https://coastwatch.noaa.gov/cwn/products/sea-surface-salinity-near-real-time-smap.html>
8. <https://midgewater.twdb.texas.gov/>
9. <https://ioos.noaa.gov/>
10. <https://gisdata.gcoos.org/search>

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)
Secondary Subcommittee (if applicable): Water and Sediment Quality (WSQ)
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Informing contact recreation safety: linking salinity and temperature to fecal indicator organism, enteric virus, and *Vibrio vulnificus* occurrence in Galveston Bay

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Lauren Kennedy

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*

[If other, please identify pass-through partner.]

Unique Entity ID (UEI) Number:

C1DEGMMKC7W7

Vendor Identification Number (VIN) or Tax ID:

74-6000813

Contact Information:

Project Representative Name	Nicole Setzu
Project Representative Phone	915-747-6274
Project Representative Email	osp@utep.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

09/01/2027-05/31/2030 (2yrs 9m)

Amount Requested from GBEP:

[\$] 199,433

Federal ☒ State ☐ No Preference ☐

Is the project scalable? ☐

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$74,844
FY 2029 (09/01/2028-08/31/2029)	\$97,006
FY 2030 (09/01/2029-05/31/2030)	\$27,583
Total	\$199,433

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

[\$] \$199,433

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

NA

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☒ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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 will primarily address RES-4 Conduct Monitoring and Research to Address Limits to Contact Recreation but also contributes to PHA-3 Improve Contact Recreation Safety Through Watershed-Based Plans and ACS-2 Access to Monitoring and Research Data.

RES-4: This project will evaluate how fecal indicator bacteria and waterborne pathogens (enteric viruses, and the naturally occurring pathogen *Vibrio vulnificus*) occurrences vary across salinity and temperature gradients relevant to contact recreation in the Galveston Bay watershed. Thus, data on waterborne pathogens that are relevant to contact recreation in the Galveston Bay watershed will be produced. In addition, controlled laboratory experiments will replicate salinity and temperature conditions observed in the Galveston Bay watershed to compare the persistence of fecal indicators and *Vibrio vulnificus*. Together, the field and laboratory components will help determine when traditional fecal indicator monitoring may not fully characterize contact recreation risks. Thus, this project supports RES-4's priority issue that there is a lack of applied research monitoring data that prevents addressing the limits to human uses and helps to fill this knowledge gap. The project deliverables include a decision support tool, a white paper and a presentation to GBEP stakeholders of results. These outputs align with RES-4 by producing materials that inform contact recreation management in the Galveston Bay Watershed.

PHA-3: Watershed-based plans often rely on only fecal indicator bacteria to identify waters impaired by pathogen pollution and to make management decisions. This project will help determine when local environmental conditions, such as salinity and temperature, may indicate concern for enteric viruses and *Vibrio vulnificus*. The deliverables will inform development and implementation of watershed-based plans.

ACS-2: Finally, all data and code produced from the project will be publicly available through GitHub and Zenodo. By producing a transparent dataset and workflow, this project will increase access to recreational water quality data for watershed managers, public health agencies, and researchers.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☐ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☐ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☐ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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 M&R priority of Assessment, Exposure, and Response to stressors, with a specific focus on contact recreation standards. Current recreational water quality monitoring in Texas relies primarily on fecal indicator bacteria to assess fecal contamination and to inform beach advisories. However, fecal indicator monitoring may not capture all waterborne pathogen risks, including naturally occurring pathogens of concern in the Gulf, like *Vibrio vulnificus*. This project will produce preliminary monitoring data to evaluate whether salinity and temperature could help explain differences between fecal indicator bacteria, enteric viruses, and *Vibrio vulnificus* occurrences across the Galveston Bay watershed. These environmental variables are relevant because the Galveston Bay has a salinity gradient from freshwater inflows mixing with Gulf water and prior studies have shown that *Vibrio vulnificus* occurrence is associated with warm temperatures and brackish waters. The project will support interpretation of contact recreation standards by evaluating whether environmental conditions such as salinity and temperature, provide useful context for interpreting fecal indicator bacteria thresholds. By identifying conditions under which fecal indicator organism monitoring may not fully represent risks from enteric viruses and naturally occurring pathogens, this project will provide watershed managers with guidance to better assess public health risks in the Galveston Bay Watershed.

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health

☒ Make Investments that Address Coastal Resiliency

☐ Reduce Trash

This project addresses EPA's area of special interest related to coastal resiliency by improving our understanding of how changing environmental conditions, particularly salinity and temperature, influence recreational water quality and risks to the public in Galveston Bay. Warmer waters, changing freshwater inflows, and salinity variability can affect the occurrence and persistence of fecal indicators, enteric viruses, and naturally occurring pathogens such as *Vibrio vulnificus*. By producing a decision support tool for watershed managers, the project will help recreational water quality programs better anticipate and respond to pathogen risks under changing coastal conditions. These efforts support coastal resilience by strengthening public health preparedness and by improving interpretation of contact recreation risks in a changing estuarine environment.

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 project is to produce monitoring and applied research data that improve interpretation of contact recreation risks from fecal indicator organisms, enteric viruses, and *Vibrio vulnificus* across salinity and temperature gradients in the Galveston Bay watershed. The project will translate findings into practical tools that support watershed planning and recreational water quality management.

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

Recent monitoring found that 94% of Texas beaches tested had fecal indicator bacteria levels above the Environmental Protection Agency's Beach Action Value at least once in 2024. Such contamination can result in gastrointestinal illness and other adverse health outcomes among recreators. In the Houston and Galveston region, public health officials have also provided guidance about the naturally occurring pathogen *Vibrio vulnificus* that can cause severe wound infections after exposure to warm, brackish water. Unlike most fecal pathogens, *Vibrio vulnificus* can increase under favorable environmental conditions. Because it is not routinely monitored by recreational water quality programs, environmental conditions associated with elevated exposure risk are not captured by fecal indicator monitoring alone.

Prior Galveston Bay and Gulf Coast studies have shown that *Vibrio vulnificus* occurs in warm and brackish waters. However, much of this work has focused on seafood safety rather than contact recreation. In contrast, recreational water quality programs typically rely on fecal indicator bacteria such as *Enterococcus*. While these indicators are useful for identifying fecal contamination, they do not reflect public health risks posed by all pathogens. For example, in some cases, enteric viruses persist longer than indicator bacteria, and naturally occurring pathogens, such as *Vibrio vulnificus*, replicate independent of fecal contamination. We want to assess whether easily-measured environmental variables can help identify when fecal indicator monitoring could be missing increased risks from enteric viruses or naturally occurring pathogens.

Galveston Bay provides an ideal system to evaluate and to benefit from these relationships because it includes salinity gradients due to the freshwater inflows from the Trinity and San Jacinto Rivers mixing with seawater from the Gulf. In addition, increasing water temperatures affect pathogen persistence and occurrence and they may also modify how pathogens respond to salinity. Quantifying these relationships could allow watershed managers to use environmental conditions, and fecal indicator organism data, to identify periods where risks of contact recreation may not be fully captured by traditional monitoring alone.

We hypothesize that salinity and temperature can help identify when fecal indicator bacteria do not adequately reflect the occurrence and persistence of enteric viruses and *Vibrio vulnificus*. To test this hypothesis, we will i) Determine whether temperature and salinity help explain differences between fecal indicator bacteria, enteric viruses, and *Vibrio vulnificus* across the Galveston Bay watershed; ii) Quantify the effects of salinity and temperature on the persistence of *Enterococcus faecalis* and *Vibrio vulnificus* under controlled conditions; and iii) Translate findings into a decision support tool and white paper for watershed managers as well as peer reviewed publications to help the academic community build on the findings.

Objective i: Determine whether temperature and salinity help explain differences between fecal indicator bacteria, enteric viruses, and Vibrio vulnificus across the Galveston Bay watershed.

Task 1.1: Existing salinity monitoring and modeling data will be used to identify accessible shoreline locations spanning the natural salinity gradient of the Galveston Bay estuary. For example, candidate sites

include McCollum Park, Sylvan Beach Park, Bayshore Park, Seawolf Park, and Jamaica Beach. Final sites will be selected after confirming expected salinity ranges and safe shoreline access for sampling.

Task 1.2: Water samples will be collected from 10 locations across the Galveston Bay watershed on four dates, including two summer and two winter sampling events to capture seasonal temperature differences. InnovaPrep will be utilized to concentrate samples in the field. Eluted samples will be transported on dry ice and stored at -80°C until analysis. *Enterococcus* will be assessed on the day of sampling using IDEXX Enterolert assays. General water quality parameters including temperature, pH, and salinity will be assessed onsite. Molecular methods will be used to screen samples for a panel of microbial targets including norovirus, adenovirus, pepper mild mottle virus, crAssphage, *Enterococcus*, *Vibrio vulnificus*, *Escherichia coli*, and MS2. Targets with sufficient detection frequency will be quantified in all samples using droplet digital polymerase chain reaction (ddPCR).

Objective ii: Quantify the effects of salinity and temperature on the persistence of Enterococcus faecalis and Vibrio vulnificus under controlled conditions.

Persistence experiments will be conducted using *Enterococcus faecalis* and *Vibrio vulnificus* to represent fecal indicator bacteria and a naturally occurring pathogen of concern for contact recreation. Water samples will be collected from a low-salinity and a high-salinity sampling location in the Galveston Bay watershed and transported back to the lab on ice. To generate a salinity and dissolved solids gradient, the high-salinity water will be diluted with the low-salinity water to generate conditions to approximate conditions observed across the Galveston Bay watershed. The organisms will be inoculated into duplicate reactors across salinity (~5 ppt, 15 ppt, and 25 ppt) and temperature conditions (15°C and 30°C) in dark conditions to minimize photoinactivation and focus on salinity and temperature. Persistence will be measured over one week using selective culture-based methods.

Objective iii: Translate findings into a decision support tool and white paper for watershed managers as well as peer reviewed publications to help the academic community build on the findings.

Task 3.1: We will conduct a targeted literature review and meta-analysis following PRISMA guidelines of persistence studies of enteric viruses that report salinity, temperature, and water matrix conditions. This review will be used to contextualize occurrence patterns of enteric viruses observed in Objective i and to help identify environmental conditions under which viral persistence may differ from fecal indicator bacteria.

Task 3.2: To make the project findings accessible for watershed planning, we will develop a decision support matrix that identifies combinations of salinity, temperature, and *Enterococcus* concentrations associated with the increased likelihood of *Vibrio vulnificus* (informed by Objectives i and ii) and enteric virus occurrence (informed by Objective i and Objective iii, task 3.1). The tool will be designed to help watershed managers and recreational water quality programs interpret environmental conditions that may warrant additional caution. Instructions for its use will be included a white paper, which, if appropriate, will be presented at the State of the Bay Symposium. Finally, the results will be incorporated into peer-reviewed publications, and all data and code will be made publicly available via GitHub and Zenodo.

Project Urgency:

NA

Other Plans Implemented:

NA

Partners¹ and Their Roles:

NA

Does the Project work with new, smaller communities/partnerships?☐ Yes☒ No

[TBD.]

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes☒ No

[TBD.]

Latitude/Longitude (Optional):

[degrees, minutes, and seconds format]
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Location:

This project will focus on shoreline recreational waters across the Galveston Bay watershed, with sampling locations selected to span the natural salinity gradient in the bay. This includes lower salinity water (e.g., areas near Trinity Bay) and higher salinity waters (e.g., areas near West Bay). Candidate shoreline sampling locations include McCollum Park, Sylvan Beach Park, Bayshore Park, Seawolf Park, and Jamaica Beach.
--

Projects Map[\[Insert Map Here or Attach as an Appendix if Applicable\]](#)**Supplemental Photos/Graphics (Optional):**[\[Insert Here or Attach as an Appendix\]](#)

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$69,590
Fringe Benefits (17.03% Faculty Fringe) (0.88% Student Fringe)	\$11,341
Travel	\$10,000
Supplies	\$30,000
Equipment	\$0.00
Contractual	\$0.00
Construction	\$0.00
Other	\$13,804
Total Direct Cost	\$134,735

b. Indirect Costs²

Distribution Base Amount (identify Base type below)	\$ 120,931(MTDC)
Indirect Cost Rate for Reimbursement	% 53.5
Total Indirect Costs	\$ 64,698

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 199,433
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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

² Please attach Indirect Cost Agreement as an appendix if applicable

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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

PhD Student Tuition Remission Benefit

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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.

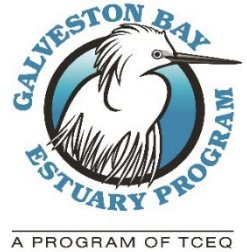
Submittal Process and Deadline [see 30 TAC § 14.7(8) and 30 TAC § 14.7(9)]:

Please Submit Project Proposals (Microsoft Word Only – No PDFs) by **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Galveston Bay Estuary Program

Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
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Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)

Secondary Subcommittee (if applicable): Choose an item.

Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Assessing PFAS Occurrence in Galveston Bay Dolphins

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Texas A&M University, College Station

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*

N/A

Unique Entity ID (UEI) Number:	JF6XLNB4CDJ5
Vendor Identification Number (VIN) or Tax ID:	74-6000531

Contact Information:

Project Representative Name	Yina Liu
Project Representative Phone	979-862-8494
Project Representative Email	yinaliu@tamu.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

September 1, 2027 – August 31, 2029

Amount Requested from GBEP:

\$99,474

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$49,257
FY 2029 (09/01/2028-08/31/2029)	\$50,217
FY 2030 (09/01/2029-05/31/2030)	N/A
Total	\$99,474

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

\$99,474

Is this an estimate? ☒

Leveraging (in-kind and/or cash):

N/A

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☒ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☒

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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 directly addresses PHA-1, PHA-5, SC-1, RES-2, RES-5, ACS-1, and ACS-2 by establishing a tissue-specific per- and polyfluoroalkyl substances (PFAS) profile in Galveston Bay's apex mammalian predator, the bottlenose dolphin (*Tursiops truncatus*). Because bottlenose dolphins occupy the same trophic position and target identical prey species (e.g., mullet, spotted seatrout) as local recreational and subsistence fishers, they serve as effective sentinels for human health. Utilizing stranded specimens from the Texas Marine Mammal Stranding Network (TMMSN), we will quantify PFAS concentrations and perform non-targeted chemical screening across dolphin organs (liver, brain, kidney, lung, blubber) and stomach contents. Analyzing prey items recovered from stomach contents provides a bio-integrated proxy for contaminant burdens in finfish species co-consumed by dolphins and local human populations. This approach directly advances native species management (SC-1) and geochemical stressor monitoring (RES-2), establishes apex predators as key ecosystem health indicators (ACS-1), and generates accessible research datasets (ACS-2) to inform finfish consumption safety (PHA-5), seafood advisory awareness (PHA-1), and seafood consumption limits (RES-5) across the Galveston Bay watershed.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☐ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☐ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☐ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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 directly addresses the Monitoring and Research (M&R) Subcommittee Priority to assess the exposure of **Species of Greatest Conservation Need (SGCN)**, specifically bottlenose dolphins (*Tursiops truncatus*), to **emerging contaminants** like per- and polyfluoroalkyl substances (PFAS). This study strategically leverages data collected from a previous GBEP-supported project, which produced a 5-year time series of PFAS in Galveston Bay water and sediment. Because several dolphin specimens were collected within overlapping timeframes, this project allows for an in-depth assessment of how ambient PFAS concentrations in water and sediment translate to exposure in an apex mammalian predator. Using bottlenose dolphins as sentinel species and bioindicators will maximize the value of GBEP's historical monitoring data, bridging the gap between environmental concentrations and biological impacts on the ecosystem and human health.

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☒ Make Investments that Address Coastal Resiliency
- ☐ Reduce Trash

This project directly addresses Coastal Resiliency by evaluating the biological and ecological resilience of Galveston Bay's food web under the burden of persistent chemical contamination. Coastal resilience

requires healthy, functional ecosystems capable of withstanding cumulative environmental stressors. As apex predators and key sentinel species, bottlenose dolphins reflect overall ecosystem health and stability. Because certain PFAS are recognized immunotoxins capable of suppressing immune function in humans and animals, quantifying organ-specific PFAS distributions allows us to evaluate potential risks to physiological resilience in native wildlife. Crucially, by leveraging Texas Marine Mammal Stranding Network's (TMMSN) long-term photo-identification catalog, we will pair tissue contaminant burdens with documented multi-year sighting histories and site fidelity for individual dolphins. This spatial and temporal integration resolves localized chemical exposure within specific areas of the estuary, establishing a robust baseline that directly informs the public health and socio-economic resilience of human communities relying on Galveston Bay seafood.

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 will analyze tissue-specific PFAS concentrations and utilize non-targeted analysis to assess a broader suite of chemical exposures in Galveston Bay bottlenose dolphins (*Tursiops truncatus*). By pairing these data from this project with our previously established 5-year time series of PFAS in local water and sediment, this study will map how ambient environmental contaminants translate to bioaccumulation in a critical apex sentinel species.

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

1. Introduction and Environmental Context

Coastal estuaries, particularly highly industrialized basins like Galveston Bay, serve as major environmental sinks for both legacy persistent organic pollutants (POPs) and emerging contaminants of concern (CECs). While regulatory frameworks have a long history of monitoring lipid-binding legacy contaminants, such as polychlorinated biphenyls (PCBs) and dioxins, our understanding of the distribution, partitioning, and long-term ecological risks of CECs like per- and polyfluoroalkyl substances (PFAS) is limited.

Unlike POPs, which are hydrophobic and preferentially accumulate in lipid-dense tissues such as blubber, PFAS exhibit different physicochemical and toxicokinetic behaviors. Because PFAS preferentially bind to proteins rather than lipids, they are often found accumulated in protein-rich organs, such as the liver, kidneys, and brain. Consequently, standard POP bioaccumulation models are not reliable for predicting PFAS organ distribution, highlighting the critical importance of tissue-specific assessments in key indicator species for coastal resource management.

2. Primary Project Objectives

To address these critical gaps in ecotoxicological data and connect PFAS concentration data in water and sediment to ecosystem and human/animal health, this project establishes three primary objectives:

Objective 1: Determine Organ-Specific PFAS Partitioning. We will quantify targeted PFAS concentrations across multiple organs, including liver, brain, kidney, lung, and blubber, as well as stomach contents (when available) in stranded Galveston Bay bottlenose dolphins (*Tursiops truncatus*) to establish baseline tissue-specific distribution. PFAS will be quantified using liquid chromatography tandem mass spectrometry (LC-MS/MS).

Objective 2: Conduct Non-targeted Emerging Contaminant Screenings. We will perform non-targeted analysis (NTA) using high-resolution mass spectrometry. Through NTA, we will screen these biological tissues for a wider suite of polar and semi-polar emerging contaminants, identifying novel chemical threats that escape standard targeted monitoring programs.

Objective 3: Integrate Environmental and Biological Datasets. We will pair these tissue-specific concentrations with GBEP's previously established five-year water and sediment PFAS database (spanning September 2017 to November 2023) to understand how the ambient estuarine environment affects PFAS exposures in an apex predator. In our previous study, we found that PFAS concentrations in Galveston Bay water and sediments exhibit significant spatial and temporal variation. Compounds like 6:2 FTS seem to be primarily associated with firefighting events, while low molecular weight PFAS (< C8) generally persist in the water column, and high molecular weight PFAS (> C8) are more dominant in sediment. These differential water/sediment PFAS distributions can play a significant role in dolphin exposures.

3. Specimen Sourcing and Multi-Organ Analytical Approach

This study leverages an invaluable biological resource through our partnership with the Texas Marine Mammal Stranding Network (TMMSN). The TMMSN tissue archive contains high-quality, biologically representative samples from stranded Galveston Bay dolphins. Currently, thirty-two archived specimens, spanning blubber, lung, brain, liver, and stomach contents, are readily available for analysis, and our project partner from TMMSN will collect additional tissues from stranding events occurring throughout the project performance period. This project further leverages TMMSN's long-term bottlenose dolphin photo-identification research, with a subset of these specimens known individuals with documented site fidelity or sighting history within Galveston Bay, in several cases spanning multiple years and in defined areas of the

estuary. Linking an individual's documented sighting history to its tissue burden enables spatial and temporal pairing of data specific to Galveston Bay.

Analyzing this multi-organ suite is essential for evaluating systemic health risks. For instance, determining PFAS accumulation in the liver allows us to assess systemic immunotoxicity risks, while quantifying concentrations in the brain provides insights into potential neurotoxic effects. To assess the cumulative chemical burden of these animals, we will leverage existing PCB and dioxin data for a subset of the same animals. We will integrate these data with PFAS to assess a comprehensive, multi-stressor, multi-organ ecotoxicological profile, mapping the combined pressures of lipophilic legacy contaminants and protein-binding emerging contaminants in the same individuals.

4. The Sentinel Connection: Maternal Transfer and Early-Life Exposure

As long-lived, site-resident apex predators, bottlenose dolphins are widely recognized as premier mammalian sentinels for human and ecosystem health. While traditional fish monitoring (e.g., mullet or croaker) provides a localized snapshot of contaminant exposure, resident dolphin tissues integrate chronic, bay-wide exposure over years and decades. Because dolphins share mammalian physiology, the toxicokinetic pathways, organ distributions, and chemical burdens observed in their tissues are directly translatable to human health models.

Recent research demonstrates that PFAS are actively transferred from mother dolphins to developing calves through lactation. Unlike legacy contaminants that mobilize alongside blubber lipids, protein-binding PFAS transfer directly from maternal blood and organs into protein-rich milk. Recent studies highlight that PFAS levels in dolphin milk can surpass established biological safety thresholds by orders of magnitude, making lactation a major, highly concentrated early-life exposure route during critical developmental stages. These findings confirm that Galveston Bay bottlenose dolphins are vulnerable to PFAS contamination. Therefore, the multi-organ investigation in this project provides essential context for understanding how persistent chemical stressors impact sentinel marine mammals in Galveston Bay. Because Galveston Bay bottlenose dolphins share the same geographic range and prey species (such as mullet and spotted seatrout) with local recreational and subsistence fishers, the contaminant pathways mapped in this study directly inform human health risk assessments.

Project Urgency:

The urgency of this project is driven by (1) a rare opportunity to integrate environmental and biological datasets from overlapping sampling periods, (2) documented exposure risks to a protected species, and (3) a rapidly evolving public health and regulatory landscape. Specifically, this study leverages GBEP's 5-year water and sediment PFAS time-series alongside archived bottlenose dolphin (*Tursiops truncatus*) tissues collected by the Texas Marine Mammal Stranding Network (TMMSN) during 2017 to 2023. Establishing this biological baseline is an urgent conservation priority for this protected marine mammal and designated Species of Greatest Conservation Need (SGCN). Recent research confirms that PFAS readily transfer from mother dolphins to calves during lactation, exposing neonates during critical developmental stages to elevated contaminant burdens. Ultimately, because resident dolphins share the same geographic range and target the same prey species (e.g., mullet and spotted seatrout) as local recreational and subsistence fishers, this research provides immediate, translatable data to support local human health risk assessments as the EPA continues to implement and tighten federal PFAS standards.

Other Plans Implemented:

N/A

Partners¹ and Their Roles:

Heidi Whitehead, Texas Marine Mammal Stranding Network (TMMSN) - TMMSN is authorized under a federal stranding agreement to respond to and collect stranded dolphin tissues, as well as a federal Letter of Authorization to conduct bottlenose dolphin research such as photo-identification. TMMSN will provide archived dolphin tissues, collect and sub-sample tissues from additional stranding events as opportunities arise during the performance period, maintain chain of custody and associated sample and life-history data, including matching sampled individuals to TMMSN's long-term photo-identification catalog where sighting histories exist, and review and/or contribute to project reports.

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

Does the Project work with new, smaller communities/partnerships?☐ Yes☒ No

N/A

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

☐ Yes☒ No

N/A

Latitude/Longitude (Optional):

N/A

Location:

Galveston Bay, TX

Projects Map

N/A

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$31,186
Fringe Benefits (##%) ²	\$10,802
Travel	\$0.00
Supplies	\$16,000
Equipment	\$0.00
Contractual - <i>TMMSN budget</i>	\$6,605
Construction	\$0.00
Other	\$0.00
Total Direct Cost	\$64,593

b. Indirect Costs³

Distribution Base Amount (identify Base type below)	\$ 64,593
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² If fringe is not a single rate, please attach calculation or explanation as an appendix.

³ Please attach Indirect Cost Agreement as an appendix if applicable

Indirect Cost Rate for Reimbursement	54%
Total Indirect Costs	\$ 34,881

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 99,474
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

N/A

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Appendix I

Letter of Commitment from Texas Marine Mammal Stranding Network (TMMSN) (also included as an email attachment). **A total of \$6,605 (Year 1: \$3,303; Year 2: \$3,302) is budgeted under “Contractual” for TMMSN.**

*Texas Marine Mammal Stranding Network
Dedicated to the Conservation of Marine Mammals through
Rescue, Rehabilitation, Research, and Education*



July 21, 2026

Dear Selection Committee,

On behalf of the Texas Marine Mammal Stranding Network (TMMSN), I am pleased to write this letter of commitment as a subrecipient partner for the proposal titled “Assessing PFAS in Galveston Bay Dolphins,” submitted in partnership with Texas A&M University – Geochemical and Environmental Research Group (GERG) for the performance period of September 1, 2027 – August 31, 2029.

TMMSN is the federally authorized marine mammal stranding response organization for the Texas coast. Under this proposed effort, TMMSN commits to providing the necessary personnel, facilities, and biological resources to fulfill our scope of work.

Specifically, TMMSN will:

- Commit approximately 32 archived tissue samples and associated level A, B, and C data from stranded bottlenose dolphins (*Tursiops truncatus*)
- Collect and sub-sample tissues from up to 10 additional stranded bottlenose dolphins (*Tursiops truncatus*) as animals become available.
- Maintain biological sample logging, stranding context/life history development, and strict chain-of-custody documentation.
- Package and ship frozen samples on dry ice to GERG

Participate in project coordination and review draft reports and project outputs. TMMSN’s current federal authorization (Stranding Agreement between TMMSN and NOAA-NMFS) remains active through June 30, 2029, covering the performance period. We are fully committed to participating in this project and executing the subaward agreement upon grant award.

Sincerely,

Heidi R. Whitehead

Heidi Whitehead
Executive Director
Texas Marine Mammal Stranding Network
4700 Avenue U.
Galveston, TX 77551
832-385-7811
Email: hwhitehead@tmmsn.org
www.DolphinRescue.org

Appendix II

Fringe Benefit Explanation

Fringe Benefits (\$10,802)

The fringe benefits rate for full-time faculty and staff is 18.9% of salaries plus \$1,185 insurance per FTE month. These rates are averages applied to proposal budgets for consistent treatment and are determined annually by the Texas A&M University System. 3% annual escalations are applied to the insurance rates starting in year 2.

**Appendix III
Indirect Cost Agreement**

Full PDF file is included as an attachment. Indirect cost for FY26 is 54%.

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**

<u>RATE COMPONENT:</u>	<u>ORGANIZED RESEARCH & INSTRUCTION FY 23 ON CAMPUS</u>	<u>ORGANIZED RESEARCH & INSTRUCTION FY 24-25 ON CAMPUS</u>	<u>ORGANIZED RESEARCH & INSTRUCTION FY 26 ON CAMPUS</u>	<u>OTHER SPONSORED ACTIVITIES FY 23-26 ON CAMPUS</u>	<u>ALL PROGRAMS FY 23-26 OFF CAMPUS</u>
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.B. dated December 26, 2013.

CONCURRENCE:

Texas A&M University - College Station
(Institution)

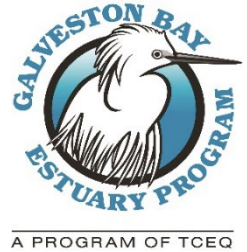
(Signature)

Joseph Duron
(Name)

Chief Administrative Officer
(Title)

9-14-2022
(Date)

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R)
Secondary Subcommittee (if applicable): Choose an item.
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Assessing Emerging Contaminants in Game Waterfowl and their Habitats
--

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Texas A&M AgriLife Research

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*

[If other, please identify pass-through partner.]

<u>Unique Entity ID (UEI) Number:</u>	KU3DCFJJTVN3
<u>Vendor Identification Number (VIN) or Tax ID:</u>	746000541

Contact Information:

Project Representative Name	Jacquelyn Grace
Project Representative Phone	979-645-0654
Project Representative Email	Jacquelyn.grace@ag.tamu.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

September 1, 2027 – May 31, 2030

Amount Requested from GBEP:

\$124,499

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$56,538
FY 2029 (09/01/2028-08/31/2029)	\$54,287
FY 2030 (09/01/2029-05/31/2030)	\$13,674
Total	\$124,499

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

\$124,499

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

This project will build upon a previously funded time series (5 years) of pharmaceutical and personal care product (PPCP) data in Galveston Bay, by extending that dataset for another two years, and adding wildlife samples.
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SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐
PS-1 ☐ PS-2 ☐ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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 directly addresses multiple Actions under Plan Priority Four (Inform Science-Based Decision Making) and Plan Priority Two (Protect and Sustain Living Resources).

RES-2 (Conduct Geochemical Stressor Monitoring and Research): This project will generate monitoring data on emerging contaminants — including pharmaceutical and personal care products (PPCPs) and microplastics — in water and sediment samples from Galveston Bay. This data will directly support GBP'18's stated interest in monitoring emerging contaminants.

RES-1 (Conduct Biological Stressor Monitoring and Research) and RES-3 (Conduct Physical Stressor Monitoring and Research): This project will assess microplastic and PPCP body burdens in vulnerable coastal avian species. Birds are valuable indicator species whose contaminant loads can reveal impacts on other, more cryptic species vulnerable to the same anthropogenic stressors.

SC-1 (Native Species Management): By tracking microplastic and PPCP loads in native coastal bird populations — species that serve as critical indicators of broader ecosystem health — this project supports the Bay's native species management priorities.

ACS-1 (Tracking Ecosystem Health Indicators): This project's use of birds as bioindicators contributes directly to regional ecosystem health tracking efforts.

ACS-2 (Access to Monitoring and Research Data): Project findings will be presented at the State of the Bay Symposia, and data synthesis reports will be freely available to the public. Results will also be published in peer-reviewed journals, ensuring findings reach both the scientific community and the general public at no cost.

ACS-3 (Track Galveston Bay Plan Implementation): As a continuation of a previous project conducted in 2021, this project will compare newly collected data against that baseline, contributing to the Bay's

longitudinal tracking of Plan implementation and environmental trends over time. This project also contributes to the broader body of research on the threats posed by anthropogenic contaminants to native species which directly supports the Bay's ongoing species conservation efforts.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: Supporting management measures and watershed-based plans through adaptive management, workforce development, and technical assistance.
- ☐ WSQ: Improve knowledge and accessibility of pollution reporting tools to empower the community.
- ☐ WSQ: Implementation and/or evaluation of best management practices that address point and nonpoint source pollution.
- ☐ NRU: Habitat Acquisition.
- ☐ NRU: Enhancement of existing or ongoing restoration-conservation efforts. Special emphasis on:
 - ☐ Adaptive management for previously completed projects; and
 - ☐ Projects that may have lost/delayed funding from other federal sources.
- ☐ NRU: Benefit to native fish and wildlife, including federal and state listed species, Species of Greatest Conservation Need, or nongame wildlife.
- ☐ NRU: Project urgency: Project must be completed in next 24 months or opportunity is lost.
- ☐ PPE: Connecting new audiences to existing/completed on-the-ground projects in the watershed.
- ☐ PPE: Empowering K-12 students and/or adults to positively impact their local environment through increased scientific literacy and community projects.
- ☐ PPE: Opportunities to host workshops/networking events to provide technical assistance for local leadership (local governments, MUDs, schoolboards, the public) on key topics.
- ☐ PPE: Conservation and environmental workforce development.
- ☐ M&R: Meaningful and effective monitoring of existing, past, and new projects (NRU: especially research and monitoring for diamondback terrapin and best management projects, WSQ, PPE).
- ☐ M&R: Baseline assessments for large-scale, man-made changes to Galveston Bay at an adequate timeline and spatial range to provide useful information.
- ☒ M&R: 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:

Some of the highest concentrations of microplastics, globally, have been reported in the Gulf of America, which is home to the majority of plastic manufacturers in the United States. Microplastic ingestion not only poses a physical threat to humans and wildlife, but also an ecotoxicological threat from chemicals associated with plastic production and those readily adsorbed from the environment onto the plastic particles. Pharmaceutical and personal care products (PPCPs) are a group of emerging contaminants of concern that can stick to plastics at much higher concentrations than the surrounding environment. These chemicals leach from plastics following ingestion by birds and in combination with the physical and microbial properties of microplastics can cause lethal or sublethal effects on vertebrates under different environmental conditions. Thus, microplastic ingestion and the chemicals associated with microplastics are emerging contaminants of concern that may be stressors for wildlife and those that consume them.

PPCPs, which include prescription and over-the-counter medications, antibiotics, hormones, fragrances, and cosmetics, enter the environment through wastewater effluent, agricultural runoff, and improper disposal. The persistence and bioactivity of PPCPs raise concerns about chronic exposure and sublethal effects on wildlife, including endocrine disruption, altered behavior, and impaired reproduction. Galveston Bay is at high risk for both microplastic and PPCP contamination due to the large number of industrial and fire-fighting activities and large volumes of urban/agricultural run-off. Indeed, previous GBEP-funded studies by our team indicate widespread PPCP contamination in Galveston Bay, Texas.

Galveston Bay is also home to the Mottled Duck (*Anas fulvigula*), the only native duck species that is year-round resident to the Gulf coast and a species of greatest conservation need in Texas. While habitat loss and degradation are the likely the primary drivers of Mottled Duck population decline in Texas, exposure to contaminants can also depress reproduction and limit survival. Prior research on Mottled Ducks on the Upper Texas Coast indicates that their exposure to legacy contaminants, such as lead, increases during periods of ecological stress and may negatively impact their resilience. This project will provide an initial assessment of microplastics and PPCPs in this vulnerable species in Galveston Bay.

A comprehensive understanding of the risks microplastic and PPCP contamination pose to wildlife is critical to establish whether mitigation would be beneficial, and if so, for the development of scientifically sound mitigation initiatives. However, most studies of these contaminants in the biota of the Gulf have focused on marine and freshwater fish, with few studies conducted in birds. In fact, very little knowledge exists regarding these contaminants for birds in general, and no studies that we are aware of have investigated mixtures of these contaminants in wild birds. Funding through this request would enable us to collect and analyze new samples as well conduct PPCP analyses for previously collected samples that will fill a knowledge gap of an emerging environmental hazard in wild game ducks in Galveston Bay, Texas.

Does the Project align with any EPA Areas of Special Interest?

- ☐ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☐ Make Investments that Address Coastal Resiliency
- ☒ Reduce Trash

Although this project does not directly reduce trash, it will generate data on the rate of ingestion of plastics by wildlife. Scientifically sound information on the effects of trash on wildlife can be incorporated into educational and outreach materials, and to provide data to funding agencies and governmental entities for trash reduction plans.

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 (1-2 sentences):

This project will measure concentrations of microplastics and an associated group of chemicals, pharmaceutical and personal care products, in Galveston Bay ducks. It will evaluate risk factors for contaminant exposure, including habitat contaminant levels and migratory tendency. The findings will inform conservation strategies for a group of wildlife of high cultural and economic importance to the region.

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

Background and Significance

The upper Texas coast, particularly Galveston Bay, serves as a vital wintering area for hundreds of thousands of ducks, sustaining both ecosystem health and local culture. Ducks are integral to nutrient cycling, food web integrity, vegetation management, and seed dispersal. Duck hunting is a deeply rooted tradition, connecting communities to coastal landscapes, providing a sense of place, and supporting local economies. Preserving waterfowl populations is crucial for maintaining both Galveston Bay's environmental integrity and the cultural heritage of surrounding communities.

Wetlands and estuaries often accumulate high contaminant levels, threatening the wildlife that rely on them, like waterfowl. However, the risks posed by emerging environmental contaminants to Texas waterfowl, and the subsequent risks to human consumers, remain poorly understood. Pharmaceutical and personal care products (PPCPs), for example, are considered 'pseudo-persistent'—continuously introduced into waterways faster than they degrade—and are linked to reproductive issues, behavioral changes, and endocrine dysfunction. Microplastics and PPCPs frequently co-occur in aquatic systems, with microplastics acting as carriers for PPCPs. Plastics and PPCPs are both emerging toxicological concerns for wild birds, and a small number of laboratory studies suggest complex antagonistic and synergistic interactions between the two *in vitro*. However, no studies have yet examined the association between microplastics and PPCPs in wild waterfowl.

Recent research led by co-PI Dr. Liu, funded by the Galveston Bay Estuary Program, revealed widespread PPCP distribution, e.g., progesterone, in Galveston Bay. Additionally, prior research by PI Dr. Grace found that approximately one-third of ducks on the upper Texas Coast contain microplastics at any one point in time, suggesting widespread ingestion. However, this prior work focuses on migratory duck species, and thus we were unable to evaluate links between habitat contamination and wildlife contamination.

Project Goals

This project aims to address these knowledge gaps through the following objectives:

1. **Quantify PPCP, and microplastic concentrations in duck tissues (breast, liver)** from Galveston Bay, focusing on migratory Green-Winged Teal and resident Mottled Ducks. We predict that PPCP concentrations will correlate with microplastic concentrations, since plastics can carry these contaminants.
2. **Assess relationships between environmental contaminant loads and tissue loads** in migratory and resident ducks. We hypothesize that resident species (which remain local) will show stronger associations between tissue concentrations and current/historic environmental contaminant levels compared to migratory ones.
3. **Evaluate public health risk** by measuring PPCP contaminants in breast tissue (most consumed by hunters) and mapping environmental concentrations.

Methods and Approach

We will target Green-Winged Teal (*Anas carolinensis*), which are widely hunted and preliminary evidence suggests high microplastic concentrations, and Mottled Ducks (*Anas fulvigula*), the Gulf Coast's only resident duck with high site fidelity, making them reliable local indicators for chronic contaminants like PPCPs.

We will collect specimens in November and December, during peak hunting season, across Years 1 and 2. We will rely on hunter donations for these collections, which we have used in the past to evaluate microplastics in migratory ducks. We will hire an undergraduate and graduate student who will work with TPWD and local hunting clubs to obtain donations of carcasses at hunting check points and/or clubs. Water

and sediment will be collected from hunting areas (identified through hunter interviews), stored in pre-washed HDPE bottles and Whirl-pak bags, respectively, kept on ice, and transported to Texas A&M University. All collections will comply with state and federal permits and ethical guidelines. We will additionally measure PPCPs in archived duck tissues collected by Dr. Grace in 2023, which overlap with Dr. Liu's prior GBEP funded project evaluating PPCPs in water samples.

Lab analysis will be conducted in Dr. Liu's facility, specializing in PPCP detection across more than 12 compounds in environmental and biological matrices. Tissue samples will be processed using protocols optimized for animal tissues and analyzed via high-performance liquid chromatography tandem mass spectrometry (LC-MS/MS).

Data Analysis

We will use Pearson correlation to examine relationships between PPCPs and microplastic concentrations. To predict tissue concentrations, we will use general linear models with both current and historic environmental contaminant data as predictors and differentiating between migratory and resident species. We will also archive specimens to allow for expanded future analyses, increasing the study's impact.

While waterfowl are highly mobile, tracking data from Louisiana indicate limited movement early in the wintering season. Most microplastics observed in these ducks will have been recently ingested locally (cleared within 1-2 days). PPCPs are retained much longer; thus, migratory ducks' tissue concentrations will reflect a blend of prior exposures and current local intake, while resident ducks (Mottled Ducks) will primarily reflect local contaminant exposure.

Expected Outcomes

- Establishment of a spatially explicit, public dataset of PPCP and microplastic concentrations in Galveston Bay waterfowl, water, and sediment.
- Enhanced understanding of potential risk for hunters and wildlife managers.
- Recommendations for wetland stewardship to guide safe game consumption and conservation.

Community Engagement

Findings will be disseminated via community events, educational materials, and through partnerships with conservation organizations. Results will also be shared with state agencies (e.g., Texas Parks and Wildlife Department) and at regional scientific conferences attended by wildlife professionals and environmental managers.

Conclusion

This project will provide critical data for protecting the health of Galveston Bay ecosystems, waterfowl populations, and hunting communities from emerging contaminants. By linking environmental contaminant loads to tissue bioaccumulation in consumed parts of waterfowl, the findings will inform sustainable management and stewardship of Texas's coastal resources and traditions.

Project Urgency:

Current contaminant assessments are necessary to evaluate the health of waterfowl populations, especially for Mottled Ducks, which are a Species of Greatest Conservation. Contaminants can depress reproduction and longevity, and additional information could inform conservation initiatives. Rapid funding would also enable us to build seamlessly on the results of prior GBEP funding that assessed PPCPs in Galveston Bay water. Immediate funding would allow for collection of new samples and maximize the scientific return on our archived tissue repository. To ensure data viability for PPCP contaminant suites, the analysis must occur soon before extended storage thresholds jeopardize PPCP detection. Analyzing these samples leverages past GBEP investments by providing complementary context to Liu's findings, extracting maximum data from a finite, perishable resource.

Other Plans Implemented:

Texas State Wildlife Action Plan: The contaminant assessment in this study supports the Action Plan for Mottled Duck, a Species of Greatest Conservation Need by contributing to research on threats to this species that can be used for Knowledge Gap Analysis.

Gulf Coast Ecosystem Restoration Council's Comprehensive Plan: Contaminant assessments in water, sediment, and wildlife of Galveston Bay supports the Goals and Objectives of "Conserving/Protecting Habitat" and "Protecting Living Coastal and Marine Resources."

North American Waterfowl Management Plan: The proposed project supports the goal of protecting waterfowl habitat by generating information on threats to habitat quality.

Governors' Action Plan IV for Healthy and Resilient Coasts: This project advances the Governors' Action Plan IV by generating actionable science. Specifically, it advances the Wildlife and Fisheries Team goal of understanding and supporting wildlife populations and priority of supporting efforts to protect wildlife through the action of generating data that will inform management practices that support conservation needs.

Strategic Bird Monitoring Guidelines for the Northern Gulf of Mexico: These Guidelines identify uncertainties of high importance to avian management in the Northern Gulf of Mexico. This project contributes to filling the identified gap of knowledge related to contaminant burdens in waterfowl and in Gulf avian habitats.

One Gulf Program: This project directly contributes to Strategic Goals 1 and 2 of the One Gulf Program by improving understanding of the Gulf as a large marine ecosystem and improving understanding of the connections between environmental and human health to benefit both.

Partners¹ and Their Roles:

Co-PI: Dr. Yina Liu (Assistant Professor, yinaliu@tamu.edu, halo-carbon.org) and Dr. Michael Shields (Associate Research Scientist and Laboratory Manager, mshields@tamu.edu), Geochemical and Environmental Research Group, Texas A&M University. Dr. Liu and Dr. Shields will conduct geochemical analyses on sediment, water, and tissue samples.

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

- ☒ Yes
☐ No

This project works with local hunters and hunting clubs by relying on their donations for specimen collection, location mapping, and outreach, broadening participation and expanding local stewardship.

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

- ☐ Yes
☒ No

At this time, we do not believe the project is subject to Title VI requirements, although we will continue to assess the language requirements for outreach materials.

Latitude/Longitude (Optional):

TBD

Location:

Specific locations for sampling will be determined in consultation with hunting clubs, individual hunters, and land managers, but will primarily be marsh areas (i.e., brackish marsh, saltgrass flats, tidal wetlands, freshwater wetlands, flooded fields, and fringe marshes, such as are found in East Bay, Jocelyn Nungaray National Wildlife Refuge, Bolivar Peninsula, and Swan Lake.

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

Projects Map

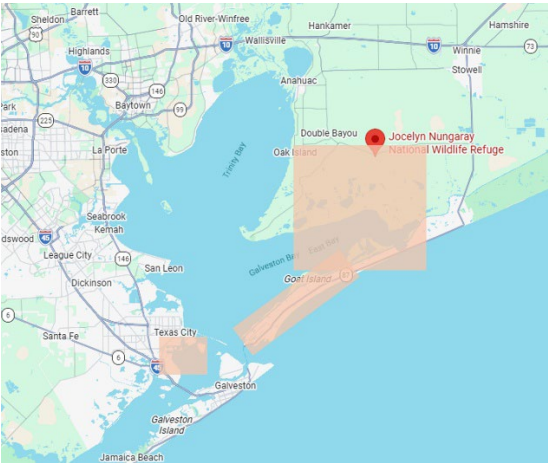


Figure 1: Map of the potential study area in Galveston Bay, Texas. Orange blocks indicate potential sites for water, sediment, and waterfowl sampling. Exact locations will be determined in consultation with hunters and land managers.

Supplemental Photos/Graphics (Optional):

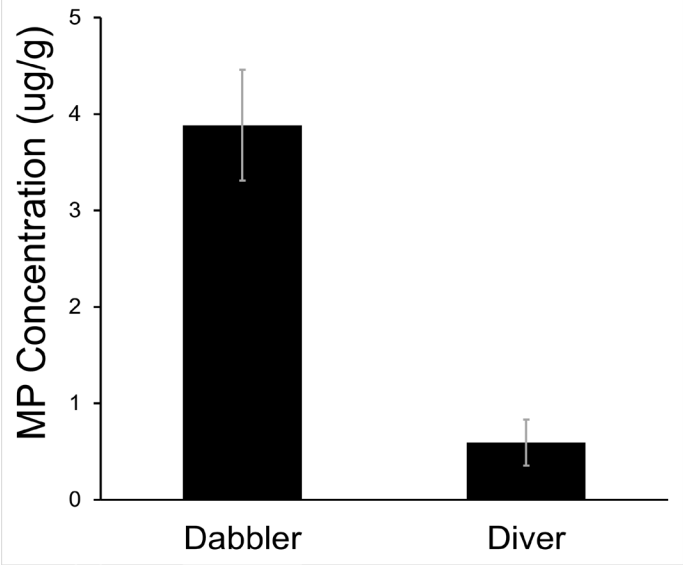


Figure 2: Concentrations of microplastics (MP) per gram of visceral mass in dabbling and diving ducks in Texas and Louisiana. Dabbling species had significantly higher concentrations of microplastics than diving species ($p<0.0001$).

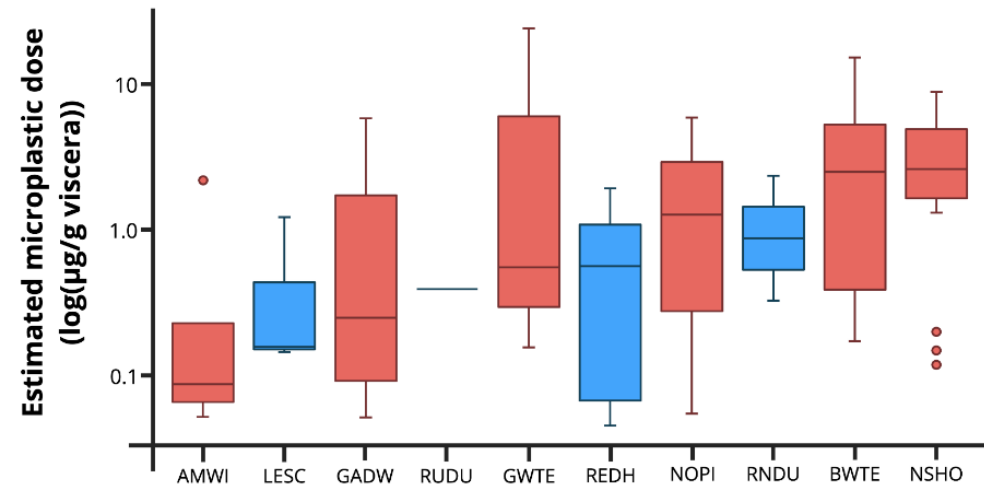


Figure 3: Concentrations of microplastics per gram of viscera mass for ten species of waterfowl on the upper Texas coast. AMWI is American Wigeon (*Mareca americana*), LESC is Lesser Scaup (*Aythya affinis*), GADW is Gadwall (*Mareca strepera*), RUDU is Ruddy Duck (*Oxyura jamaicensis*), GWTE is Green-winged Teal (*Anas carolinensis*), REDH is Redhead (*Aythya americana*), NOPI is Northern Pintail (*Anas acuta*), RNDU is Ring-necked Duck (*Aythya collaris*), BWTE is Blue-winged Teal (*Spatula discors*), and NSHO is Northern Shoveler (*Spatula clypeata*). We currently have no data for Mottled Ducks, a gap that would be filled by this study.

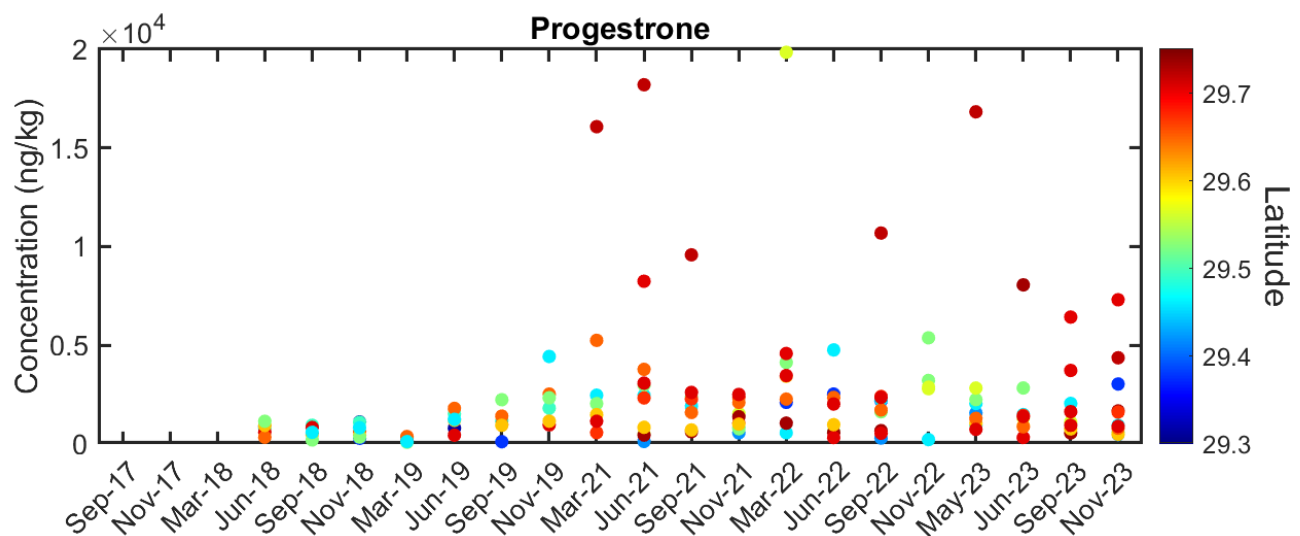


Figure 4: Time series plot of progesterone in surface sediment samples. (Data collected by co-PI Dr. Liu from a previously funded GBEP project). Funding for this project would allow us to extend this time series.

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$34,389.00
Fringe Benefits (###%) ²	\$6,978.00
Travel	\$2,000.00
Supplies	\$9,300.00
Equipment	\$0.00
Contractual	\$22,500.00
Construction	\$0.00
Other	\$8,741.00
Total Direct Cost	\$83,908.00

b. Indirect Costs³

Distribution Base Amount (<i>identify Base type below</i>)	\$ 75,167
Indirect Cost Rate for Reimbursement	% 54.0

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

³ Please attach Indirect Cost Agreement as an appendix if applicable

Total Indirect Costs	\$ 40,591
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c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$ 124,499
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this (Cost Budget) section.]

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

[Description of costs associated with “Other” budget category.]

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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:

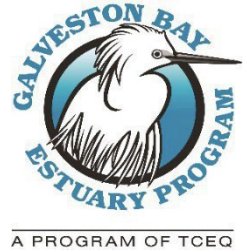
- GBEP intends to accept only complete Projected Proposals in a layout and format constituting a filled version of this proposal document with all applicable sections therein addressed; however, GBEP may, in its sole discretion, consider and accept nonconforming Project Proposals in the best interest 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 **July 24, 2026 to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
 NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
 PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
 M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
 Programmatic Projects: Lisa.Marshall@tceq.texas.gov

Galveston Bay Estuary Program Fiscal 2028 Project Proposal



Please complete this proposal form and submit to the appropriate Subcommittee Coordinator (end of form) by **July 24, 2026**. 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 fiscal 2028 (FY 2028) Priority Area Actions that were developed by GBEP subcommittees for FY 2028 at the June 2026 meetings. Any proposal implementing the Plan may be submitted, but proposals implementing the FY 2028 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.

Timeline of Proposals:

Task	Date Due
Release of Request for Proposals	June 22, 2026
Proposals Due	July 24, 2026
Send Proposals to Subcommittees Members for Review	August 12, 2026
Present Proposals to Subcommittees for Council Recommendation	September 2, 2026 (NRU and PPE) September 9, 2026 (M&R and WSQ)
Present Proposals to B&P Subcommittee for Final Recommendation	September 30, 2026
Present Proposals to Galveston Bay Council for Approval	October 14, 2026

SECTION TWO: SUBMITTAL – GENERAL INFORMATION

Primary Subcommittee: Monitoring and Research (M&R).
Secondary Subcommittee (if applicable): Water and Sediment Quality (WSQ).
Tertiary Subcommittee (if applicable): Choose an item.

Project Name:

Assessment of legacy and emerging contaminants in sediment, water, and biota within Galveston Bay to inform science-based decision making for at-risk species and human health.

Project Previously Funded by GBEP? Yes ☐ No ☒

Lead Implementer / Categories of Eligible Recipients [see 30 TAC § 14.7(3)]:

Texas State University

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*

[If other, please identify pass-through partner.] N/A

Unique Entity ID (UEI) Number:	HS5HWWK1AAU5
Vendor Identification Number (VIN) or Tax ID:	37547547549 (VIN); 746002248 (EIN)

Contact Information:

Project Representative Name	Jessica Dutton, Ph.D.
Project Representative Phone	(512) 245-1015
Project Representative Email	jdutton@txstate.edu

Project Dates / Duration (beginning no earlier than September 1, 2027 – ending no later than May 31, 2030) [see 30 TAC § 14.7(5)]:

September 1, 2027, to May 31, 2030

Amount Requested from GBEP:

\$571,406

Federal ☐ State ☐ No Preference ☒

Is the project scalable? ☒

Amount Requested per year (if applicable):

FY 2028 (09/01/2027-08/31/2028)	\$323,258
FY 2029 (09/01/2028-08/31/2029)	\$219,118
FY 2030 (09/01/2029-05/31/2030)	\$29,030
Total	\$571,406

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

\$571,406

Is this an estimate? ☐

Leveraging (in-kind and/or cash):

N/A

SECTION THREE: GALVESTON BAY PLAN, 2ND EDITION IMPLEMENTATION

Grant recipient activities to be funded must implement the Plan, but proposals implementing the FY 2028 Subcommittee Priorities (Section Four) will be considered above others. This selection criteria provides for the selection of multiple recipients as needed.

The *Galveston Bay Plan, 2nd Edition* Action Plans 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/>

Galveston Bay Plan Priority Area Actions Addressed:

Plan Priority 1: Ensure Safe Human and Aquatic Life Use

NPS-1 ☐ NPS-2 ☐ NPS-3 ☐ NPS-4 ☐
PS-1 ☒ PS-2 ☒ PS-3 ☐
PHA-1 ☐ PHA-2 ☐ PHA-3 ☐ PHA-4 ☐ PHA-5 ☐

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 3: Engage Communities

SPO-1 ☐ SPO-2 ☐ SPO-3 ☐ SPO-4 ☐
PEA-1 ☐ PEA-2 ☐ PEA-3 ☐

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 supports implementation of the Galveston Bay Plan by providing science-based information needed to protect aquatic life, support watershed management decisions, and determine if humans are exposed to contaminants through consumption of seafood from the bay. Texas State University (San Marcos, TX) and Cove Environmental, LLC (Stillwater, OK) will conduct field sampling in four locations throughout the bay to assess spatial variability in concentrations of legacy [trace elements, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins] and emerging (micro/nanoplastics) contaminants, nutrients, and conventional water quality parameters (e.g., salinity, pH, dissolved oxygen concentration). Environmental concentrations will be determined for sediment and water. The bioaccumulation of each contaminant will be determined by measuring the concentration in fish and invertebrate tissues and biological effects measured using acute and chronic aqueous and sediment toxicity tests. Environmental and tissues concentrations will be used to determine whether concentrations exceed water and sediment quality guidelines for the protection of estuarine life, adverse biological effects threshold levels, and human health advisory levels.

By evaluating contaminant occurrence, biological exposure, and measured biological response, this project will: 1) identify areas around the bay where contaminants are having a greater effect on aquatic life and therefore need further investigation and monitoring, and 2) produce an ***Integrated Legacy and Emerging Contaminant Assessment Framework*** to guide future monitoring, restoration, and watershed management decisions. Furthermore, fish and invertebrate species examined in this study are an important food source for protected species or those listed under TPWDs Species of Greatest Conservation Need (SGCN) such as bottlenose dolphin (*Tursiops truncatus*), Kemp's Ridley turtle (*Lepidochelys kempii*), green sea turtle (*Chelonia mydas*), Texas diamondback terrapin (*Malaclemys terrapin littoralis*), whooping crane (*Grus americana*), reddish egret (*Egretta rufescens*), Atlantic tarpon (*Megalops atlanticus*), and scalloped hammerhead shark (*Sphyrna lewini*); therefore, collected data can be used to determine if protected species are at risk from contaminant exposure.

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.

Subcommittee Identified Priorities:

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

- ☐ WSQ: 1
- ☐ WSQ: 2
- ☒ WSQ: 3
- ☐ WSQ: 4
- ☐ NRU: 1
- ☐ NRU: 2
- ☐ NRU: 3
- ☐ NRU: 4
- ☐ PPE: 1
- ☐ PPE: 2
- ☐ PPE: 3
- ☐ PPE: 4
- ☒ M&R: 1
- ☒ M&R: 2
- ☒ M&R: 3
- ☐ M&R: 4

Subcommittee Priority Detail:

This project directly supports the FY2028 Monitoring & Research and Water & Sediment Quality priorities by establishing baseline assessments and evaluating the occurrence, exposure, and biological response to legacy and emerging contaminants within the Galveston Bay watershed. Texas State University and Cove Environmental, LLC will integrate targeted field sampling, biological exposure assessment, aquatic toxicity testing, and laboratory analyses for legacy contaminants (trace elements, PAHs, PCBs, dioxins), emerging contaminants (micro/nanoplastics), nutrients, and conventional water quality parameters. Results will provide the Galveston Bay Estuary Program with practical, science-based information to support adaptive management of point and nonpoint source pollution while prioritizing future monitoring, restoration, and watershed management activities.

Does the Project align with any EPA Areas of Special Interest?

- ☒ Reduce Nutrient Pollution to Protect Water Quality and Public Health
- ☒ Make Investments that Address Coastal Resiliency
- ☐ Reduce Trash

This project supports EPA Areas of Special Interest by generating science-based information to improve water quality and protect aquatic life within the Galveston Bay watershed. Targeted field sampling, laboratory analyses, and aquatic toxicity testing will evaluate nutrients, legacy contaminants (trace elements, PAHs, PCBs, dioxins), emerging contaminants (micro/nanoplastics), and biological response. The resulting data will help identify priority areas for watershed management, support future nutrient reduction strategies, and provide baseline information for long-term protection and resilience of the Galveston Bay ecosystem.

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 project will investigate the spatial variability of legacy (trace elements, PAHs, PCBs, dioxins) and emerging (micro/nanoplastics) contaminants, and nutrients in sediment, water, and biota collected throughout the Galveston Bay system. The study will measure field concentrations to determine whether values exceed water and sediment quality guidelines for the protection of estuarine life, adverse biological effects threshold levels, and human health guidelines. Stable isotope analysis in conjunction with the concentration of each contaminant will be used to elucidate how each contaminant is transferred through the food web based on dietary sources ($\delta^{13}\text{C}$) and relative trophic position ($\delta^{15}\text{N}$). Lab-based acute and chronic toxicity tests using benthic organisms and field-collected water and sediment will be used to determine whether the mixture of contaminants is in great enough concentration to result in lethal and/or sublethal effects.

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

The Galveston Bay system is influenced by diverse point and nonpoint sources that contribute nutrients, legacy contaminants [in particular, trace elements (e.g., As, Hg, Pb), PCBs, and dioxins], emerging contaminants, and other environmental stressors to receiving waters. While existing monitoring programs have documented the occurrence of many contaminants, chemical occurrence alone often cannot determine whether contaminant mixtures are resulting in measurable ecological impacts. Resource managers require integrated, science-based information that evaluates contaminant occurrence, biological exposure, and biological response to effectively prioritize future monitoring, restoration, and watershed management activities.

Texas State University, in partnership with Cove Environmental, LLC, proposes to develop an ***Integrated Legacy and Emerging Contaminant Assessment Framework*** for the Galveston Bay system through a multidisciplinary approach combining targeted field investigations, biological exposure assessment, laboratory analyses, and aquatic toxicity testing. The project will evaluate representative tributaries, receiving waters, estuarine transition zones, and other priority watershed locations spanning a range of urban, industrial, municipal, agricultural, and nonpoint source influences. Sampling locations will be selected using existing watershed information, available monitoring data, stakeholder input, and known or suspected areas of environmental concern to maximize the scientific and management value of the project.

Firstly, sediment, water, and biota will be collected from four sites around the bay and the concentration of each contaminant measured in each sample. Species to be investigated include red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), southern flounder (*Paralichthys lethostigma*), hardhead catfish (*Ariopsis felis*), Atlantic croaker (*Micropogonias undulatus*), striped mullet (*Mugil cephalus*), blue crab (*Callinectes sapidus*), white or brown shrimp (*Litopenaeus setiferus*/ *Farfantepenaeus aztecus*), eastern oyster (*Crassostrea virginica*), fiddler crab (*Uca longisignalis*), mud crab (*Panopeus obesus*), grass shrimp (*Palaemonetes* spp.), clam worm (*Nereis succinea*), and salt marsh cordgrass (*Spartina alterniflora*) (n ≥ 10 per species at each site). This covers species with different contaminant exposure pathways, diets, trophic positions, and importance to commercial and/or recreational fisheries. At least 10 sediment and water samples will be collected at each location. Trace elements to be investigated include Ag, Al, As, Cd, Cr, Cu, Fe, Hg, Pb, Se, Sn, and Zn, whereas for PAHs, PCBs, and dioxins, individual compounds or congeners will be measured and the total contaminant concentration calculated (e.g., ΣPAH , ΣPCB). Nutrients to be investigated include total nitrogen, nitrate, ammonia, and phosphate. The spatial variability in the concentration of each contaminant can then be assessed to identify hotspots within the bay. General water quality parameters (temperature, pH, salinity, dissolved oxygen concentration) will also be recorded at time of sample collection. General sediment characteristics will also be determined (e.g., moisture content, grain size, organic matter content).

Secondly, environmental and species-specific contaminant concentrations will be used to calculate biota sediment accumulation factors (BSAFs) for benthic organisms and determine whether contaminants exceed sediment and water quality guidelines for the protection of estuarine life, adverse biological effects threshold levels, and human health advisory levels for seafood consumption.

Thirdly, contaminant concentrations will be combined with stable isotope values ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) for each species to elucidate how each contaminant behaves in the food web [e.g., calculate biomagnification factors (BMFs) for contaminants that biomagnify] and estimate trophic position. For predatory fishes and blue crab, R packages will be used to determine niche overlap and determine the dietary sources of each contaminant.

Finally, acute and chronic aqueous and sediment aquatic toxicity testing will be conducted to evaluate biological response in benthic organisms (e.g., polychaete worms, benthic amphipods, grass shrimp) to complex contaminant mixtures that may not be fully characterized through chemistry alone. End points will focus on mortality, growth, and reproduction. Toxicity tests will be conducted using water and sediment from each site and will follow standardized EPA testing methods. A high mortality rate and/or decreased reproductive success may indicate adverse population-level effects for benthic species residing in the bay.

Chemical occurrence, biological exposure, and toxicity data will be evaluated together to better understand relationships among contaminant sources, environmental distribution, and ecological effects. As information is generated, the project team will retain flexibility to refine analytical priorities, expand evaluation of contaminants of interest, or conduct targeted follow-up investigations where results indicate potential contaminant hotspots or unexpected biological responses.

Spatial analyses will be performed to identify geographic patterns in contaminant occurrence, biological exposure, and ecological response throughout the Galveston Bay watershed. These analyses will identify areas exhibiting elevated contaminant concentrations, biological inhibition, or other indicators of ecological concern, allowing the project to distinguish localized hotspots from broader watershed-scale trends. The resulting information will provide a science-based framework for prioritizing future monitoring, restoration, source-control activities, and adaptive watershed management. Furthermore, many of the investigated species are sentinel species and can be used to assess overall ecosystem health. In addition, most species are prey items for protected or SGCN species that reside in the bay system; elevated levels of contaminants in these investigated species may indicate that species with greater conservation and management needs are at risk of deleterious health effects. Finally, the contaminant concentration data will be used to determine whether people who consume fish and shellfish from the bay are at elevated risk of exposure, and if so, the findings can be discussed with the Texas Department of State Health Services (TDSHS) who oversee advisories.

Project results will be compiled into an ***Integrated Legacy and Emerging Contaminant Assessment Framework*** consisting of geospatial analyses, supporting analytical data, recommendations for future monitoring and restoration, and a comprehensive technical report for the Galveston Bay Estuary Program. The project is also expected to provide a graduate research opportunity through Texas State University, with project data supporting development of a master's thesis focused on contaminant occurrence, biological exposure, and ecological response within the Galveston Bay watershed while providing valuable workforce development opportunities in aquatic environmental science.

By integrating contaminant occurrence, biological exposure, biological response, and spatial assessment into a single science-based investigation, this project will provide the Galveston Bay Estuary Program with practical information to guide future monitoring, restoration, and watershed management decisions while establishing a scientifically defensible baseline that can be refined and expanded through future collaborative investigations.

Project Urgency:

Galveston Bay continues to experience increasing pressures from urbanization, industrial activity, changing land use, and legacy and emerging contaminants. Although numerous monitoring programs have documented environmental conditions, important information gaps remain regarding contaminant occurrence, biological exposure, and ecological response across the watershed. Identifying spatial patterns and contaminant hotspots is essential for directing future monitoring, restoration, and management resources where they will have the greatest benefit. This project addresses that need by establishing a comprehensive baseline assessment capable of identifying areas of elevated contaminant occurrence and biological inhibition while providing the flexibility to investigate emerging areas of concern identified during the study. Funding during this cycle will allow Texas State University and Cove Environmental, LLC to generate science-based information that directly supports implementation of the Galveston Bay Plan and establishes a framework for long-term adaptive monitoring and watershed management.

Other Plans Implemented:

In addition to supporting implementation of the Galveston Bay Plan, this project advances the objectives of the Texas Coastal Management Program by providing science-based information to support protection and management of coastal resources. The project also supports the Texas Coastal Resiliency Master Plan by establishing baseline environmental conditions and identifying spatial patterns in contaminant occurrence and biological response that can inform future restoration and resilience planning. Where applicable, project findings will complement watershed protection plans, Total Maximum Daily Load (TMDL) implementation efforts, and other regional water quality initiatives within the Galveston Bay watershed. Finally, this project supports the Texas Conservation Action Plan (TCAP) by determining whether protected and SGCN species residing in the bay are at risk of contaminant exposure through their diet. The TCAP addresses that water quality is an issue that needs further research because coastal bays and estuaries are home to fishes, birds, and terrapins, some of which have SGCN status. In addition, these bays are also nursery grounds for marine fish, including sharks listed as SGCN. A healthy coastal ecosystem is not only required for species that live in it, but also is important for the local economy, e.g., through commercial and recreational fishing and birding activities.

Partners¹ and Their Roles:

This project is a collaboration between Texas State University (PI: Jessica Dutton, Ph.D.) and Cove Environmental, LLC (Co-PIs: Shannon Scott and Justin Scott, Ph.D.; subaward recipient, see Appendix A for letter of commitment). Texas State University will serve as the lead implementer and provide overall project management, scientific oversight, graduate student mentorship, permitting support, field coordination, and will lead the field sample collections throughout the Galveston Bay system. Texas State University will also complete the stable isotope analysis component of the project. The project will support a master's thesis through Texas State University, providing graduate research and workforce development opportunities while expanding the scientific value of the project. Cove Environmental LLC will serve as the primary technical partner and will lead all contaminant and nutrient laboratory analyses, aquatic toxicity testing, quality assurance/quality control, data integration, interpretation, and preparation of the final technical report and project deliverables. Texas State University and Cove Environmental LLC will jointly develop the sampling strategy, evaluate project findings, identify potential contaminant and biological-response hotspots, and adapt subsequent sampling and analytical efforts as needed based on project results. They will also co-write all manuscripts for publication and conference presentations. This collaborative approach combines Texas State University's aquatic toxicology expertise and field capabilities within Texas bays with Cove Environmental's expertise in environmental chemistry, aquatic toxicology, and integrated contaminant assessment.

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

- ☐ Yes
☒ No

[TBD.]

Is the project subject to Title VI requirements?

To meet federal nondiscrimination guidance and laws (Title VI), TCEQ requires information and services to be provided in languages other than English when significant numbers of beneficiaries are of limited English-speaking ability (LEP). If 5% or more of the population within your project area is LEP and share a common language, then you are required to provide outreach in the alternative language. For statewide projects, Spanish language outreach is required. As Title VI compliance could impact the project budget, please reach out to the primary subcommittee coordinator for this application with questions on determining applicability.

- ☐ Yes
☒ No

[TBD.]

Latitude/Longitude (Optional):

Field sampling will occur close to these locations:

Galveston: 29°19'47.70"N, 94°39'46.52"W

Texas City: 29°22'45.89"N, 94°52'18.46"W

Baytown: 29°42'59.44"N, 95°1'16.29"W

Oak Island: 29°39'16.47"N, 94°41'56.51"W

Final sampling locations will be determined collaboratively by Texas State University and Cove Environmental, LLC using existing monitoring data, watershed characteristics, stakeholder input, and project objectives.

Location:

To assess the spatial variability in legacy and emerging contaminants, and nutrient concentrations throughout Galveston Bay and the biological impacts, four locations (Galveston Bay, Texas City, Baytown, and Oak Island) were selected for the field-based study. All these areas have varying degrees of trace elements, PAH, PCB, dioxin, micro/nanoplastic, and nutrient contamination due to their relative proximity to sources of point and non-point source pollution. These include, but are not limited to, oil and gas refineries, industrial manufacturing facilities, chemical processing facilities, plastic production facilities, metal refineries, industrial wastewater discharges, urban runoff, sewage treatment plants, agricultural runoff, oil spills, and routine shipping traffic moving along the intracoastal waterway and between the Gulf of Mexico and Galveston and the Port of Houston complex.

Projects Map

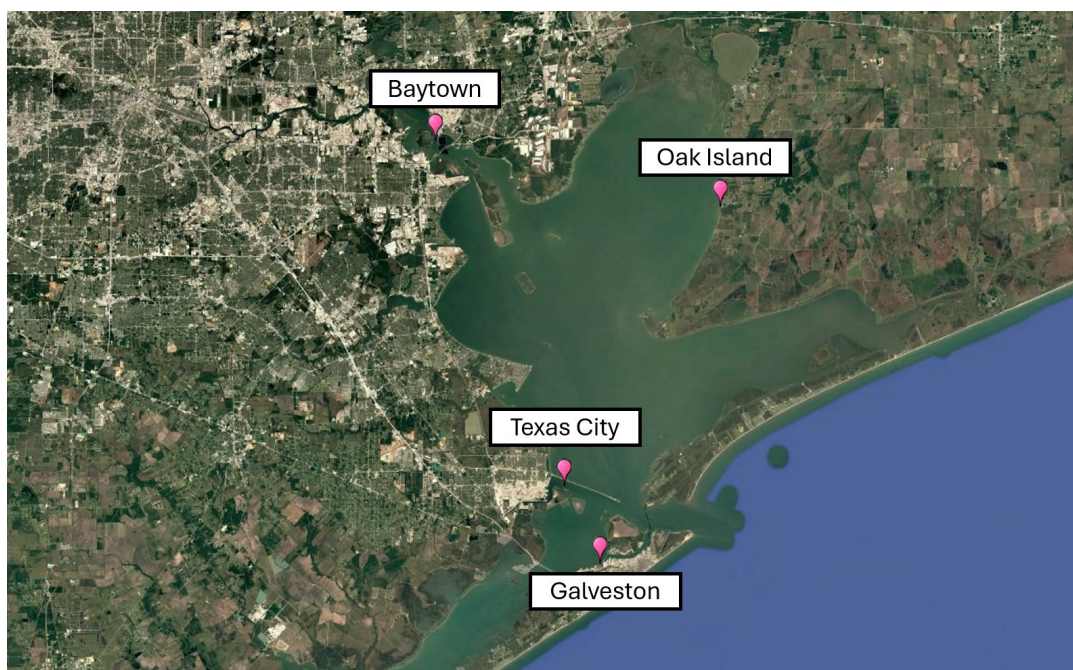


Figure 1. Map showing the four proposed sampling areas in the Galveston Bay system

Supplemental Photos/Graphics (Optional):

N/A

¹ If partners are subgrantees completing work reimbursable under GBEP funding, a letter of commitment from the partner must be submitted as an appendix with the application.

Please see Appendix A for the letter of commitment.

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:

a. Direct Costs

Budget Category	Cost for Work to be Performed
Salary / Wages	\$94,460
Fringe Benefits (17% and 28%) ²	\$20,554
Travel	\$21,000
Supplies	\$3,000
Equipment	\$0.00
Contractual (Cove Environmental, LLC)	\$315,000
Construction	\$0.00
Other	\$28,000
Total Direct Cost	\$482,014

b. Indirect Costs³

Distribution Base Amount (<i>identify Base type below</i>)	IDC Base = \$177,014
Indirect Cost Rate for Reimbursement	50.5%
Total Indirect Costs	\$89,392

c. Maximum Authorized Reimbursement

Maximum Authorized Reimbursement (Direct and Indirect Costs)	\$571,406
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Indirect Cost Distribution Base. The Distribution Base above is (check one):

- ☐ direct salary/wages and fringe benefits
☒ modified total direct costs
☐ other direct cost Base

If other direct cost Base, identify:

The indirect cost rate is (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 15 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.

☐ **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:** [Examples: De Minimis Rate with a base of direct salary and wages (less than or equal to actual indirect costs) or Provisional Rate. If this is a Provisional Rate, include the following language: Provisional Rate: The subsequent adjustment of the indirect cost rate is subject to the requirements of Article 9 of this section (refers to the Cost Budget section of awarded grants).]

² If fringe is not a single rate, please attach calculation or explanation as an appendix.

Please see Appendix B for the fringe benefit rate calculation and explanation.

³ Please attach Indirect Cost Agreement as an appendix if applicable

Please see Appendix C for the IDC Agreement.

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

Boat rental and associated travel costs for the Captain: \$15,000 Shipping charges: \$200 Stable isotope analysis: \$12,800

Travel. In order to be reimbursable, travel costs must be specifically authorized in advance of the travel. Travel costs will be reimbursed only in the amount of actual costs, up to the maximum allowed by law for employees of the State of Texas at the time the cost is incurred.

Budget Categories. The Budget Categories above are representative of the items of cost found in TxGMS and 2 CFR Part 200, and have the definitions, requirements, and limitations found therein. Construction costs are not reimbursable without prior, specific written authorization from TCEQ.

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 post notification 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 **July 24, 2026, to the relevant Subcommittee Coordinators below:**

WSQ Subcommittee: Christian.Rines@tceq.texas.gov
NRU Subcommittee: Lindsey.Lippert@tceq.texas.gov
PPE Subcommittee: Zoe.Gapayao@tceq.texas.gov
M&R Subcommittee: Jenelle.Estrada@tceq.texas.gov
Programmatic Projects: Lisa.Marshall@tceq.texas.gov