

**CITY OF CORPUS CHRISTI
PROFESSIONAL MONITORING CONTRACT
PACKERY CHANNEL MONITORING 2015-2016
Amendment No. 11**

The City of Corpus Christi, Texas, hereinafter called "CITY", and Texas A&M University-Corpus Christi hereinafter called "TAMU-CC", hereby agree to amendment of the Contract as approved by City Council Motion 2008-052 on February 26, 2008, administratively amended on March 3, 2008, by Motion 2009-007 on January 13, 2009, by Motion 2009-091 on April 14, 2009, by Motion 2010-095 on April 27, 2010, administratively on September 21, 2010, by Motion 2011-212 on September 27, 2011, by Motion 2012-165 on September 11, 2012, by Ordinance No. 29993 on October 29, 2013, administratively on September 30, 2014, by Motion 2014-171 on December 16, 2014 as follows:

I. SERVICES TO BE PERFORMED

TAMU-CC hereby agrees to perform all consulting services necessary to monitor, perform, complete, and report the results of a comprehensive study of morphology and changes and current velocity at Packery Channel.

II. SCOPE OF SERVICES

TAMU-CC's services will be those necessary to provide the monitoring required to deliver an annual written report and presentation of the observations and results of the monitoring program that takes place during the term of this contract.

The monitoring program consists of three seasonal investigations of shoaling and scour in the channel and nearshore (Gulf of Mexico) as well as changes in the width/depth of the inland channel segment and beach width/volume as related to:

- Post-dredge and post-nourishment monitoring
- Future dredge planning and support
- Navigation safety and placement of aids to navigation where required
- Beach nourishment planning and support
- Sensitive habitat management at the Mollie Beattie Coastal Habitat Community (MBCHC)
- FEMA reimbursement documentation
- Data acquisition for application of structural stability assessment (coastal structures: jetties, revetment, bridge scour protection)
- Public awareness and community education/outreach
- Support and collaboration on vicinity coastal projects and concerns.

TAMU-CC will complete the tasks in Section II as set forth in the research proposal attached as Exhibit "A".

A. TASKS

Specific tasks to be undertaken are set out as follows:

Task 1. Project Management and Aerial Photography

1-1. Project Management

Project management includes historic analysis, reporting, survey organization and scheduling as well as presentations and generation of materials requested by the City of Corpus Christi. Additional support includes coordination with surveyors, engineers and other environmental

professionals to assist the City of Corpus Christi with related projects including potential dredge operations and/or FEMA reimbursement for storm damage.

1-2. Aerial Photography

Description: Acquisition of an annual set of rectified aerial photographs of the Packery Channel region including the entire channel from the GIWW to the Gulf of Mexico (GOM); including North Padre and Mustang Islands from the south end of the seawall to Newport Pass. Photographs are applied in ArcGIS environment for comparative analysis of change relative to key features and as a reference for overlay of data and terrain models. Bids received during 2015 show that the cost of aerial photography is comparable to the 2014 effort.

Purpose: For interpretation of large-scale changes in vegetation, dune line, and inter-tidal regions adjacent to the inland segment of the channel as well as along Padre and Mustang Islands. In addition, the aerials are appropriate for visuals and explanation aids to residents and laypersons.

Schedule: (1) annual set conducted Sept/Oct 2015 (pending weather conditions).

Task 2. Measurement of Morphologic change in Packery Channel and along Mustang and Padre Island.

2-1. Beach Profile Survey

Description: The beach profile survey provides information on changes occurring at 18 specified locations from the Nueces Kleberg County Line to north of Fish Pass. There are historic data for these locations since 1995. Elevation measurements are collected along transects that initiate landward of the dune or other landward limiting feature (seawall or pavement) and extend offshore up to one mile into the Gulf of Mexico.

Purpose: To document changes in features such as the dune toe (seaward limit of dunes) berm crest (most landward point of active sediment transport on the beach), and sand bars. The data are applied to calculate volumetric change along historically surveyed areas of the beach and sand volume which is required for sand placement and documentation for FEMA funding. Data is also applied to verify shoreline position data and to determine the maximum region of sheltering (Zone of Influence) by the jetties.

Schedule: (1) Annual survey conducted during peak summer condition (Sep/Oct 2015).

(3) Intensive surveys of beach nourishment area fronting the North Padre Island seawall (Sept/Oct 2015 and Feb/March 2016 and June 2016)

2-2. Shoreline Position surveys

Description: Elevation data are collected by RTK GPS across the beach from close to the dune toe to the water line along a zigzag path. The beach is surveyed from south of the Nueces Kleberg County Line to north of Fish Pass at Mustang Island State Park.

Purpose: These surveys are an efficient and low-cost way to measure changes in the width of the dry beach over the broad study area. Within days, a large section of the beach can be measured to determine changes in shoreline position from which regions of beach erosion and accretion can be determined and potential "hot spots" can be identified. Monitoring the seasonal position of the shoreline assists in management of beach vehicular access south of the inlet and addresses persistent regions of shoreline recession that have been identified fronting the North Padre Island Seawall and Whitecap Blvd as well as regions of receding shoreline north of the inlet near Newport Pass.

Schedule: (3) Surveys. Tentative survey schedule: Sep/Oct 2015, Jan/Feb 2016 and June 2016

2-3. Surveys of channel and nearshore depth and morphology (Features of seafloor and bottom of channel)

Description: These bathymetric surveys combine single-beam and multi-beam sonar coverage to provide high resolution of morphology (shoals, scour and bars). Seasonal series of data is

applied to interpretation of pathways of sediment transport.

Purpose: Data is applied to define features such as shoals (areas of deposition) and scour (areas of erosion) in the channel, nearshore and around structures. This data is applied to determine pathways of sediment transport and to calculate volumetric change for application to the estimation of the sand volume available for dredging. The data are applied to interpret trends in sediment transport as well as to calculate volumetric change of sand, for nourishment projects, and to identify potential regions of shoaling which could limit navigation. A primary application of this data is to assist with determining potential scheduling of dredging.

Schedule: (3) Surveys. Tentative survey schedule: Sep/Oct 2015, Jan/Feb 2016 and June 2016. (abbreviated – Basin to Gulf only). Additional surveys may be required if data indicate that depth-limited navigation is imminent.

2-4. Inland Channel Segment and Mollie Beattie Coastal Habitat Community (MBCHC)

Description: The inland channel segment bordering MBCHC continues to modify as the region adjusts to changes in water flow in the channel and over the wetland. These changes are best captured seasonally through a network of cross-sections that document changes in wetland extent, channel boundaries and shoreline change. Elevation is measured along transects (survey lines) roughly perpendicular to channel orientation starting at the location of mean higher high water (MHHW) shoreline position along the south shore and then extending across the channel to the location of MHHW shoreline position or until a limiting feature (such as coverage of a raised placement area) is defined. Measure the MHHW shoreline position along the south shore of Packery Channel from the HWY 361 Bridge to the Relief Channel west of the channel dog leg.

Purpose: These surveys define change in the inland segment of the channel that borders the MBCHC and changes in the elevation of the wetland. Analysis of these data sets provide quantification of change in primary (-5 ft) and upper bank (MSL) width along MBCHC. In addition the MHHW position of the west side of the inland channel segment (residential) is surveyed and compared to previous surveys to determine historic change in position.

Schedule: (2) Survey Sets (Transects and MHHW). Tentative survey schedule: Sept/Oct 2015, Jan/Feb 2016. Additional surveys may be required if data indicate that the rate of change has increased during the study period.

2-5. Event/Storm or Environmental Engineer Support Surveys

Description: In a continued effort to respond to reported City of Corpus Christi budgetary constraints, the monitoring program continues at a modified schedule to include (2) seasonal surveys (Sept/Oct 2015 and Jan/Feb 2016) and (1) transitional reduced-cost survey (June 2016). To accommodate monitoring concerns beyond these seasonal surveys this task provides for event survey or other survey requirements as needed. Such support outside of seasonal surveys could include but is not limited to dredge support, engineering support, environmental assessment (wetland), and sand placement activities outside the seasonal survey scope. The primary purpose of the event surveys is to facilitate timely pre- or post- storm surveys. Surveys may be needed beyond the seasonal designation, such as after storms, and to assist with the investigation of sensitive environmental habitat or anthropogenic influences on the coastal environment that are identified during the course of the three seasonal surveys. The cost is based upon the following survey suite but may be utilized as needed.

An additional line item is the maintenance of the water current monitoring stations in the GIWW and Packery Channel. Monitoring changes in current flow provides data for future studies of hydrodynamic change potentially associated with the addition of channels in the Lake Padre Island region of the study area. See Exhibit A.

- a. Shoreline position survey (1) Task 2-2.
- b. Abbreviated Bathymetry Survey (1)
- c. Bathymetric channel and nearshore survey (1) as described in Task 2-3.
- d. Beach profile survey (1) Task 2-1.
- e. Current monitoring in Packery Channel and GIWW

Purpose: To define morphology immediately before or after a storm event or related to sensitive habitat such as the MBCHC without time restrictions associated with the amendment process.

Schedule: To be determined

Deliverables:

ASCII data sets (x,y,z) NAVD88 State Plane south Zone FIPS 4205

Email status report (monthly or as updates are available)

Status Reports (post-survey reports)

Note: all surveys may be rescheduled based upon study findings or weather and sea conditions. Additional surveys may be recommended upon seasonal findings or evidence of change based upon observations in the field.

The proposal for Year 2015-2016 is attached as Exhibit "A".

III. FEES AUTHORIZED

The City will pay TAMU-CC a fixed fee not to exceed \$2,174,867.00 for providing all services during the contract term. The fee consists of an original contract fee of \$241,487.00, a fee for Amendment No. 1 of \$11,020.00, a fee for Amendment No. 2 of \$61,715.00, a fee for Amendment No. 3 of \$299,900.00, a fee for Amendment No. 4 of \$325,517.00, a fee for Amendment No. 5 of \$600.00, a fee for Amendment No. 6 of \$293,400.00, a fee for Amendment No. 7 of \$314,389.00, a fee for Amendment No. 8 for \$349,755.00, a fee for Amendment No. 9 for \$0.00, a fee for \$277,084.00 for Amendment No. 10 and a fee for \$350,703.00 for Amendment No. 11. This fee will be full and total compensation for all services provided and expenses incurred in performing the tasks specified in Section II.A. Invoices will be submitted to the Director of Capital Programs. Invoices will be submitted no more frequently than once per month for services rendered. All invoices shall be accompanied by a cover letter summarizing project status and the tasks undertaken during the time period covered by the invoice. Invoices will be based on the Task Fee as set out by this contract. Invoices will be sequentially numbered for each project, state the project name (Packery Channel Monitoring 2015-2016) and City project number (E14051). The letter shall state the number of the current invoice, the total authorized fee, the amount previously invoiced, and the current amount due. Statements will be based upon percent of project completed.

It is mutually acknowledged that fees authorized by this original contract not invoiced may be used to defray the costs and expenses of Amendment No. 10 for such additional tasks as may be directed by the City Manager or his designee. However, any task or additional service that requires additional funding beyond that authorized will be evidenced in writing as an amendment to this contract.

Contract	Fee
Original Contract	\$241,487.00
Amendment No. 1	\$11,020.00
Amendment No. 2	\$61,715.00
Amendment No. 3	\$299,900.00
Amendment No. 4	\$325,517.00
Amendment No. 5	\$600.00
Amendment No. 6	\$293,400.00

Amendment No. 7	\$314,389.00
Amendment No. 8	\$349,755.00
Amendment No. 9	\$0.00
Amendment No. 10	\$277,084.00
Amendment No. 11	\$350,703.00
Total	\$2,525,570.00

The fee for each Task of Amendment No. 11 is estimated as:

	Tasks	Fee
1.1	Project Management	\$53,506.00
1.2	Aerial Photography	\$21,582.00
2.1	Beach Profile Survey	\$49,752.00
2.2	Shoreline Position Survey	\$19,963.00
2.3	Surveys of channel and near shore depth and morphology (Bathymetric Survey)	\$97,293.00
2.4	Inland Channel Segment and Mollie Beattie Coastal Habitat Community	\$30,795.00
2.5	Event/Storm or Environmental/Engineer Support Surveys	\$77,812.00
	Total	\$350,703.00

IV. TERMINATION OF CONTRACT

The City may, at any time, with or without cause, terminate this contract upon thirty days written notice to TAMU-CC at the address of record. In this event, TAMU-CC will be compensated for its services on all stages authorized based upon TAMU-CC and City's estimate of the proportion of the total services actually completed at the time of termination.

V. LOCAL PARTICIPATION

The City Council's stated policy is that City expenditures on contracts for professional services be of maximum benefit to the local economy. TAMU-CC agrees that at least 75% of the work described herein will be performed by a labor force residing within the Corpus Christi Metropolitan Statistical Area (MSA). Additionally, no more than 25% of the work described herein will be performed by a labor force residing outside the Corpus Christi Metropolitan Statistical Area (MSA.)

VI. ASSIGNABILITY

TAMU-CC will not assign, transfer or delegate any of its obligations or duties in this contract to any other person without the prior written consent of the City, except for routine duties delegated to personnel of TAMU-CC staff. If TAMU-CC is a partnership, then in the event of the termination of the partnership, this contract will inure to the individual benefit of such partner or partners as the City may designate. No part of the fee may be assigned in advance of receipt by TAMU-CC without written consent of the City.

The City will not pay the fees of expert or technical assistance and consultants unless such employment, including the rate of compensation, has been approved in writing by the City.

VII. DISCLOSURE OF INTEREST

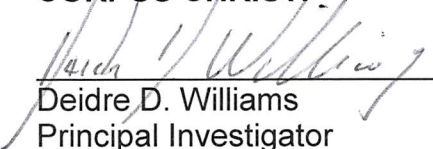
TAMU-CC further agrees, in compliance with City of Corpus Christi Ordinance No. 17112, to complete, as part of this contract, the *Disclosure of Interests* form attached hereto as Exhibit "B".

All other terms and conditions of the February 26, 2008 contract, as amended, between the City and Consultant shall remain in effect.

CITY OF CORPUS CHRISTI

J.H. Edmonds, P.E., Date
Director of Capital Programs


**TEXAS A&M UNIVERSITY –
CORPUS CHRISTI**

 8-26-2015

Deidre D. Williams Date
Principal Investigator

RECOMMENDED

Jay Ellington Date
Director of Parks and Recreation

 8.26.15

Dr. Luis Cifuentes Date
Vice President
Division of Research,
Commercialization and Outreach

APPROVED

Office of Management Date
and Budget

APPROVED AS TO LEGAL FORM

Legal Department Date

ATTEST

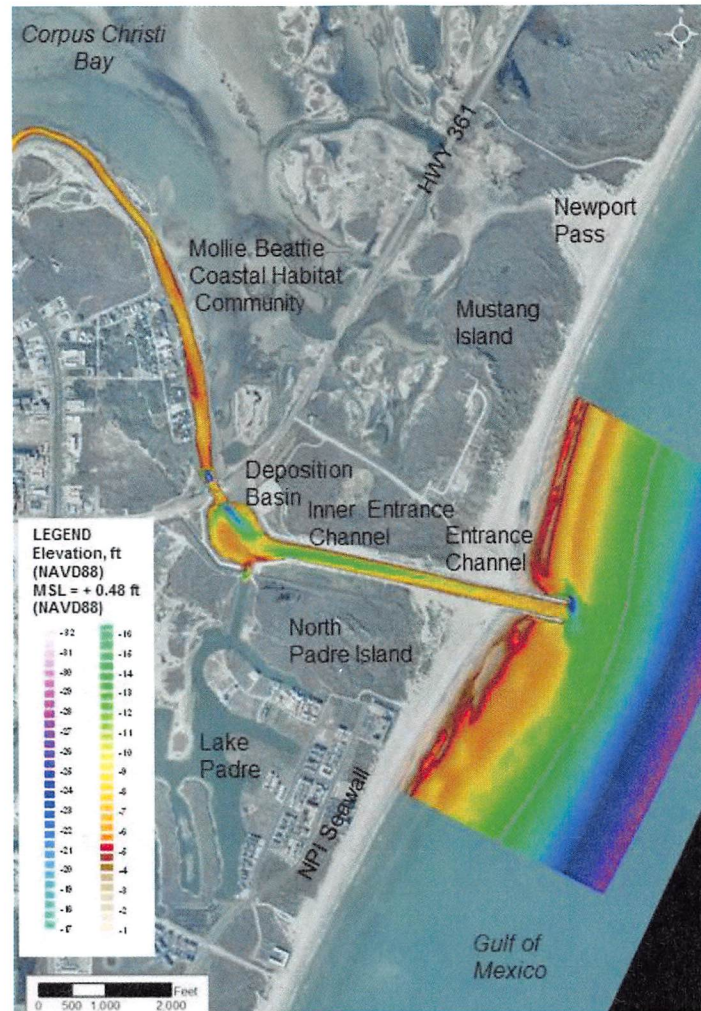
Rebecca Huerta, City Secretary

Project No. E14051
Accounting Unit: 3278-717
Account: 550950
Activity: E14051013278EXP
Account Category: ENV
Fund Source Name: Packery Channel TIF#2
Encumbrance No. _____

Packery Channel Monitoring Program Amendment #11 (2015/2016)

Project Tasks and Cost Estimate

June 22, 2015



Channel and nearshore morphology at Packery Channel (Apr 2015)

Submitted to:
The City of Corpus Christi

Submitted by:
Deidre D. Williams
The Conrad Blucher Institute for Surveying and Science
Texas A&M University-Corpus Christi

Packery Channel Monitoring Program Amendment #11 (2015/16)

Purpose

To continue to protect the City of Corpus Christi's vested interest in the inlet, beach (Mustang and North Padre Island), and sensitive habitat that comprise the Packery Channel System. This program supports the City of Corpus Christi's pro-active approach to research-based management of this system.

The monitoring program consists of three seasonal investigations of shoaling and scour in the channel and nearshore (Gulf of Mexico) as well as changes in the width/depth of the inland channel segment and beach width/volume as related to:

- Post-dredge and post-nourishment monitoring
- Future dredge planning and support
- Navigation safety and placement of aids to navigation where required
- Beach nourishment planning and support
- Sensitive habitat management at the Mollie Beattie Coastal Habitat Community (MBCHC)
- FEMA reimbursement documentation
- Data acquisition for application of structural stability assessment (coastal structures: jetties, revetment, bridge scour protection)
- Public awareness and community education/outreach
- Support and collaboration on vicinity coastal projects and concerns.

Focus of Monitoring Year 2015/2016

Monitoring and analysis will continue to focus on both the channel mouth and nourished region along the North Padre Island Seawall during 2015/2016. The following are specific areas of concern/interest over the next monitoring year.

- **Entrance Channel Shoal and Navigation**
Monitor changes in area of transient and persistent localized shoaling in the entrance channel that has previously stimulated two previous Notice to Mariners to be recommended (Sep 2011 and July 2014).
- **Reduction in Scour at Mouth and Potential for Ebbshoal Development**
An additional region of concern is located in the nearshore surrounding the channel mouth where ebbshoal development is monitored. No persistent shoaling has been identified at the channel mouth but transient shoals and bypass bar formation have repeatedly developed seasonally and in response to seasonal forcing and events such as Hurricane Ike. In addition, deep scour at the mouth is less developed than after construction, with the shallower nearshore depths merging at the channel mouth. Therefore, the nearshore is also a focus area for 2015/2016.
- **Beach Nourishment at North Padre Island Seawall**
The shoreline position fronting the seawall has steadily receded since placement during the combined nourishment conducted over the primary nourishment conducted during the winter of 2011/2012 and supplementary placement in 2012/2013. The rate of recession

has moderated and is comparable to that observed after the initial placement during 2005. At the present rate of change the shoreline at the south end of the seawall is predicted to approach the baseline 2011 position within 2 years in the absence of the influence of tropical storms or other extreme events. Post-construction monitoring between 2005 and 2011 determined that the recent rate of shoreline change along the shoreline stretching from the south jetty to 1-mile south of Bob Hall Pier is on the order of -2.43 ft/yr (including influence of nourishment at seawall). While the average rate of change calculated for the direct nourishment region along the seawall was on the order of -9.72 ft/yr. The rate of change is often accelerated immediately post-nourishment. As of Apr 2015, approximately 2-years post-nourishment, the shoreline at the south end of the seawall had receded on the order of 50 to 80 ft or at an average rate of 30 ft/yr. Within the placement area (Holiday Inn to Whitecap Blvd) the shoreline was either at or in advance (seaward) of the 2011 position by up to 50 ft (south end) during Apr 2015. Of interest was that the shoreline north of the placement area was landward of the 2011 position by up to 40 ft, likely related to a combination of management practices and strong winter forcing that continued into the late spring. The moderation of such change over the summer months will be a focus of the monitoring program during the summer of 2015.

- **Shoreline Change at North Packery**

The shoreline north of Packery Channel between the north jetty and Newport Pass advanced on the order of 50 to 70 ft between Nov 2013 and Feb 2014 and approximately 00 ft between Sep 2014 and Apr 2015. Prior to these two bursts of advance over two successive winter periods the shoreline had been relatively stable with moderate incremental advance observed since 2009. Additional analysis will investigate related changes in the nearshore morphology and the potential contribution of associated nearshore advance to shoaling at the mouth and in the entrance channel. The recent changes are attributed to a combination of maintenance practices and a greater influence of strong winter forcing over the winter of 2014/2015 on sediment transport.

- **Continuation of real-time Water Current Monitoring**

Water current has been monitored in the GIWW and in Packery Channel since 2006. This data provides information on potential changes in hydrodynamics as changes in channel morphology occur due to shoaling and scour. Additional changes in the channel system are proposed by local developers including the connection of the Laguna Madre to Packery via Lake Padre which may result in unanticipated changes to flow. Therefore the monitoring stations provide a baseline as well as provide for analysis of change in flow. The funding for these stations was originally provided by the USACE and intermittently as recently as 2014. No funding is presently available to maintain these stations. Although outside funding will continue to be sought, funding for this component is requested for 2015/16 to maintain continuity and avoid interruption of data collection.

Background

- Monitoring began in August 2003, prior to construction (originally funded by Galveston District, USACE and the Coastal Hydraulics Laboratory, Coastal Inlets Research Program).
- Inlet opened during Hurricane Emily (July 2005), one year prior to completion of construction (October 2006).

- Sponsorship of monitoring transferred to the City of Corpus Christi (2008 to present).
- Limited dredge in Deposition Basin at ramp to facilitate boat entry (Jan 2010).
- Notice to Mariners issued regarding elevation of Entrance Shoal (Sep 2010).
- Dredge (#1) of channel from Deposition Basin to Entrance Channel to within 550 ft of the channel mouth (completed March 2012). Total pay volume was 190,757 cu yd (HDR). Completion of dredge was deferred to Winter 2012/2013.
- Dredge (#2) of Inner Entrance Channel and Entrance Channel completed to within 550 ft of channel mouth (completed March 2013). Total volume was \approx 48,757 cu yd. Remaining 550 ft of Entrance Channel shoal was not removed.
- Notice to Mariners issued regarding elevation of Entrance Channel Shoal (Jul 2014).
- Greatest period of scour of persistent entrance shoaling to date during Apr 2015 (net loss of 12,000 cu/yd from Entrance Channel).

Ongoing Contribution of Program

- Program supports pro-active system management by the City of Corpus Christi.
- Analysis has supported decision to defer dredging, originally predicted at an interval of every 2-3 years, to 5 years from channel completion.
- Analysis has identified need (shoaling) for placement of aids to navigation.
- Seasonal data identified need for initiation of Notice to Mariners during September 2010 and July 2014 due to shoaling and potential of limited navigation at the channel mouth.
- Data and analysis applied to request FEMA reimbursement after Hurricane Ike.
- Data and analysis document measured condition (as opposed visual interpretation often reported by community).
- Data and analysis applied to assess post-dredge 2011/2012 condition for recommendation of Dredge #2 to complete to specifications.
- Monitoring of nourishment fronting seawall for vehicular access concerns and bollard placement.
- Analysis to support alternative dredge/nourishment funding sources such as CEPRAs grants initiating in 2015.

Continuation of Monitoring and Analysis

- Monitor persistence of bypass bar and increased nearshore shoaling at mouth for potential ebb shoal formation.
- Quantify post-dredge channel shoaling and scour and determine early trends.
- Quantify change in post-nourishment beach width and volume along seawall.
- Initiate warnings should the potential for depth limited seasonal monitoring of shoaling will allow adequate warning of navigation limitation and support dredge implementation or placement of navigation aids.
- Track Changes through historic beach profile and shoreline surveys for planning beach nourishment and/or redirection of vehicular access.
- Track changes in Inland channel bank expansion that could impact protected habitat, residential property, and Nueces County Park boundaries.
- Prepared to mobilize rapidly to monitor post-storm conditions as needed.

Seasonal Monitoring and Long-term Channel Management

The key to successful management of an inlet system is knowledge of the processes that force sand into and out of the system; and to identify developing and changing trends in sediment transport, particularly after major changes such as channel dredging or in the case of storm damage. Seasonal monitoring at Packery Channel provides for the tracking of changes over rapid short period and historic intervals which allows both 1) identification of trends in sediment transport and 2) deviation from established trends that could indicate a change in system dynamic and need for management action. The monitoring program has documented both a seasonal and event driven component to sediment transport in this system with shoaling most prevalent during the spring and throughout the summer as well as during storms. Future monitoring will determine if the change in channel depth due to dredging will alter the magnitude and rate of such seasonal change.

Monitoring Program Tasks

The 2015/2016 amendment to the existing contract (Project # E14051) for the Packery Channel Monitoring Program consists of five tasks. The five Tasks are outlined as a guide following the successful program implemented in 2008. The goal of the 2015/16 year is to measure and document the continued changes in post-dredge status of channel morphology and post-nourishment status of the adjacent beach. The program will continue to assist the City in the anticipation of future dredge events and document the annual pre-storm beach width and volume for FEMA reimbursement should the area sustain damage during seasonal hurricanes. The monitoring will directly support the City of Corpus Christi in the coordination of potential CEPPRA grant funded support of dredging and subsequent nourishment of the beach fronting the North Padre Island Seawall.

Unallocated Funds

The opportunity to apply funds previously unallocated may be exercised by the City of Corpus Christi with the potential to reduce the budget commitment for Amendment 11. The actual amount available will be assessed at the time of amendment authorization at the end of the summer storm season.

Task Implementation

Tasks 1-5 may be conducted simultaneously or independently and in the order that best supports the monitoring program goals.

Task 1. Project Management

1-1. Project Management

Description

Project management includes historic analysis, reporting, survey organization and scheduling as well as presentations and generation of materials in support of the management of the inlet and associated beach and wetland by the City of Corpus Christi. Additional support includes coordination with surveyors, engineers and other environmental professionals to assist the City of Corpus Christi with related projects including potential dredge operations and/or FEMA reimbursement for storm damage and assistance with planning for alternate project funding.

Cost:

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 53,904

Estimated Cost Task 1-1: \$53,506

1-2. Aerial Photography

Description: Acquisition of an annual set of rectified aerial photographs of the Packery Channel region including the entire channel from the GIWW to the Gulf of Mexico (GOM); including North Padre and Mustang Islands from the south end of the seawall to Newport Pass. Photographs are applied in ArcGIS environment for comparative analysis of change relative to key features and as a reference for overlay of data and terrain models. Bids received during 2015 indicate that the estimated cost of aerial photography is comparable to the 2014 effort.

Purpose: For interpretation of large-scale changes in vegetation, dune line, and inter-tidal regions adjacent to the inland segment of the channel as well as along Padre and Mustang Islands. Aerial imagery is particularly important to document adjacent regions that are outside of the topographic survey area. In addition, the aerial imagery is applied as a backdrop to channel and beach elevation data. The aerial images are critical for application to the development of visuals and explanation aids to City staff, residents and laypersons.

Schedule:

- (1) Annual set of imagery conducted Sep/Oct 2015 (pending weather conditions).
- (2) QA/QC of imagery and integration into GIS project

Cost:

Aerial Imagery: \$12,000 (Vendor acquired)

Salary/Wages/Supplies/Travel/F&A: \$ 9,634

Estimated Cost Task 1-2: \$ 21,582

Task 2. Measurement of Morphologic change in Packery Channel and along Mustang and Padre Island.

2-1. Beach Profile Surveys

Description:

Beach profile surveys provide detailed information describing changes in elevation and morphology at 18 specified locations along the beach stretching from the Nueces Kleberg County Line to north of Fish Pass at Mustang Island State Park. There are historic data for these locations since 1995. The beach profile survey has been conducted annually during the peak summer period to allow for analysis of change that reflects the same forcing agents active over the summer season. Elevation measurements are collected along transects that initiate landward of the dune or other landward limiting feature (seawall or pavement) and extend offshore up to one mile into the Gulf of Mexico. The surveys capture the region of active sediment transport and therefore extend offshore to a depth, referred to as the depth of the closure, beyond which limited movement of the sediment occurs.

A denser transect grid is applied along the beach fronting the North Padre Island (NPI) Seawall in an effort to quantify volumetric change and document changes in beach profile with greater detail. This information is applied to monitor change before during and after nourishment of the beach fronting the seawall and along the area south near Whitecap Blvd.

Purpose: To document changes in features such as the dune toe (seaward limit of dunes) berm crest (most landward point of active sediment transport on the beach), and sand bars. The data are applied to determine regions of erosion and to calculate volumetric change along historically surveyed areas of the beach. This data set is critical to the calculation of sand volume which is required for sand placement and documentation for FEMA funding. Data is also applied to verify shoreline position data and to determine the maximum region of sheltering along the beach (Zone of Influence) that is provided by the jetties. An additional set of beach profile transects was added to better describe the beach fronting the NPI Seawall to facilitate more accurate monitoring of changes in the recent beach nourishment. This focused survey along the nourishment area includes profiles at 400-ft to 1100-ft spacing to accommodate more accurate beach volume calculations for FEMA application.

Schedule:

- (1) One annual survey conducted during peak summer condition (Sep/Oct 2015).
- (3) Three intensive surveys of beach nourishment area fronting the NPI seawall (Sep/Oct 2015, Feb/Mar 2016 and Jun 2016).

Cost:

Annual Survey: \$ 19,900.00

NPI Seawall Surveys: \$17,925.00

Salary/Wages/Benefits/Supplies/Travel/F&A: \$11,927

Estimated Cost Task 2-1: \$49,752

2-2. Shoreline Position Surveys

Description: Elevation data are collected by RTK GPS across the beach from close to the dune toe to the water line along a zigzag path in order to cover the entire beach face. The beach is surveyed from south of the Nueces Kleberg County Line to north of Fish Pass at Mustang Island State Park.

Purpose: Shoreline position surveys are an efficient and low-cost way to measure changes in the elevation of the dry beach berm over the broad study area. Within days, a large section of the beach can be measured to determine changes in shoreline position from which regions of beach erosion and accretion can be determined and potential “hot spots” can be identified. Monitoring the seasonal position of the shoreline assists in management of beach vehicular access south of the inlet and addresses persistent regions of shoreline recession and resulting narrowing of beach that have been identified fronting the North Padre Island Seawall and Whitecap Blvd. This data is instrumental to the management of bollard placement along the North Padre Island Seawall.

Schedule:

- (3) Three Seasonal Surveys. Tentative survey schedule: Sep/Oct 2015, Jan/Feb 2016 and Jun 2016.

Cost:

Survey: \$11,700

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 8,263

Estimated Cost Task 2-2: \$19,963

2-3. Surveys of Channel and Nearshore Depth and Morphology (Features of seafloor and bottom of channel)

Description: These bathymetric surveys combine single-beam (nearshore/offshore) and multi-beam (channel) sonar coverage to provide high-resolution data sets that describe the morphology (shoals, scour and sandbars) on the channel bottom and seafloor. The analysis of seasonal data sets is applied to interpret pathways of sediment transport and to anticipate development of features such as bypass bars, channel shoals and ebb shoaling.

Purpose: Data is applied to define morphologic features such as shoals (areas of deposition) and scour (areas of erosion) in the channel, nearshore and around structures. This data is applied to interpret pathways of sediment transport and to calculate volumetric change for application to the estimation of the sand volume available for dredging. The data are applied to interpret trends in sediment transport as well as to calculate volumetric change indicating sand loss or gain, to prepare for nourishment projects, and to identify potential regions of shoaling which could limit navigation. A primary application of this data is to identify trends in shoaling which provides guidance in future dredge planning and the identification of navigation hazards.

Schedule:

(3) Three Seasonal Surveys. Tentative survey schedule: Sep/Oct 2015, Jan/Feb 2016 and Jun 2016 (abbreviated-Basin to Gulf only). Additional surveys may be required if data indicate that shoaling is rapidly increasing and depth-limited navigation is imminent.

Cost:

Survey: \$ 79,300

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 17,993

Estimated Cost Task 2-3: \$ 97,293

2-4. Inland Channel Segment and Mollie Beattie Coastal Habitat Community (MBCHC)

Description: The inland channel segment bordering MBCHC continues to modify as the region adjusts to changes in water flow in the channel and over the wetland. These changes are best captured seasonally through a network of cross-sections that document changes in wetland extent, channel boundaries and shoreline change. Elevation is measured along transects or survey lines, that are roughly perpendicular to channel orientation. The surveys start at the location of the mean higher high water (MHHW) shoreline position located along the western residential shore and then extend across the channel to the location of MHHW shoreline position or until a limiting feature (such as coverage of a raised placement area) is defined. The position of the MHHW shoreline position is measured along the residential side of the channel extending from the HWY 361 Bridge to the Relief Channel west of the channel dog leg. The MHHW position is not as well defined along the MBCHC due to extended sections of submerged area, therefore a MHHW position survey is not conducted on the east side of the channel.

Purpose: These surveys define morphologic change in the inland segment of the channel that borders the MBCHC as well as changes in the elevation across sections of the wetland. The purpose is to evaluate the response of the channel and wetland to the opening of the inlet and assess the approach to an equilibrium status. Analysis of this data set provides quantification of change in the primary (-5 ft) and upper bank (MSL) width along the channel bordering the MBCHC. In addition, the MHHW position of the west side of the inland channel segment (residential) is compared to historic survey data surveys to determine historic change in position.

Schedule:

(2) Survey Sets (Transects and MHHW). Tentative survey schedule: Sep/Oct 2014, Jan/Feb 2015. Additional surveys may be required if data indicate that the rate of change has increased during the study period.

Cost:

Survey: \$ 18,800

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 11,995

Estimated Cost Task 2-4: \$ 30,795

2-5. Event/Transitional Survey and/or Dredge Support

Description: In a continued effort to respond to City of Corpus Christi budgetary constraints, the monitoring program continues at a modified schedule to include (2) seasonal surveys (Sept/Oct 2015 and Jan/Feb 2016) and (1) transitional reduced-cost survey (June 2016). To accommodate monitoring concerns beyond these seasonal surveys the Event Task provides for event surveys or other survey requirements as needed. Such support outside of seasonal surveys could include but is not limited to dredge support, engineering support, environmental assessment (wetland, endangered species, modeling hydrodynamics), and sand placement activities outside the seasonal survey scope. The primary purpose of the event surveys is to facilitate timely pre- or post- storm surveys. Surveys may be needed beyond the seasonal designation, such as after storms, and to assist with the investigation of sensitive environmental habitat or anthropogenic influences on the coastal environment that are identified during the course of the three seasonal surveys. The cost is based upon the following survey suite but may be utilized as needed in support of management concerns on an as needed basis.

An additional line item is the maintenance of the water current monitoring stations in the GIWW and Packery Channel. Monitoring changes in current flow provides data for future studies of hydrodynamic change potentially associated with the addition of channels in the Lake Padre region of the study area. Monitoring includes the public online data access to real time measurement of water current velocity (<http://lighthouse.tamucc.edu/qc/138> and <http://lighthouse.tamucc.edu/qc/150>). These stations were previously funded by the USACE (2006-2014) but no funding has been identified or secured for 2015/16. Funding options will continue to be explored to fund these stations in the future.

The Task 2-5 cost is based upon the following Monitoring suite for budget development but may be utilized as needed in support of City of Corpus Christi Packery Channel management concerns on an as needed basis. Funds not allocated at the end of the contract period may be conserved for future applications.

- a. Shoreline position survey (1) Task 2-2.
- b. Abbreviated Bathymetry survey (1)
- c. Full bathymetric channel and nearshore survey (1) as described in Task 2-3.
- d. Beach profile survey (1) Task 2-1.
- e. Current monitoring in Packery Channel and GIWW

Purpose: To define changes in morphology, wetland boundaries, volume, and bathymetry of associated waterways related to issues outside of the umbrella of the seasonal surveys. To monitoring water current velocity and provide online real-time access.

Schedule:

Surveys conducted post-storm and as needed relative to management concerns during 2015/2016. Water current monitoring is continuous over the study period. Other tasks as directed by City of Corpus Christi staff.

Cost:

Survey: \$ 56,000

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 21,812

Estimated Cost Task 2-5: up to \$ 77,812

**Total Estimated Cost of 2015/2016 Monitoring Program Amendment 11:
\$ 350,703**

Cost Savings to City of Corpus Christi

In an effort to directly address budgetary constraints and comprehensive use of available funds CBI has provided cost savings through the following:

- 1. Conservation of funds in the Event Category 2010-2012 (Task 2-5).
Savings to City \approx \$ 63,381.72*
- 2. Conservation of funds in the Event Category 2014/2015 (Task 2-5).
Savings to City \approx \$ 60,000*
- 3. Calculation of F&A on Salaries/Wages only (no F&A calculated on survey support)*

Deliverables:

ASCII data sets (x,y,z) NAVD88 State Plane south Zone FIPS 4205

Email status report (monthly or as updates are available)

Status Reports (post-survey reports)

Note: all surveys may be rescheduled based upon study findings or weather and sea conditions. Additional surveys may be recommended upon seasonal findings or evidence of change based upon observations in the field.

**Packery Channel Monitoring Program
Estimated Budget
2015/2016**

Personnel	
Principal Investigator	\$ 43,805
Database Management/Support and Technical Staff	\$ 25,024
Subtotal Personnel (Salary/Wages)	\$ 68,829
Benefits	\$ 18,449
Total Personnel	\$ 87,278
Travel (Transportation to Surveys)	
Rental vehicle and fuel	\$ 2,960
Other Project Costs	
Materials and Computer (software upgrades repair allowance, backup/archive, desktop computer) and communications	\$ 8,000 \$ 360
Surveying/post processing (Subcontract)	\$ 203,625
Aerial Photography (Contract/PO)	\$ 12,000
Total Travel and Other	\$ 226,945
<hr/>	
Subtotal Salary/Wages	\$ \$68,829
Subtotal Benefits	\$ \$18,449
Subtotal Travel and Other	\$ 226,945
F&A (53% of salary and wages)	\$ \$36,480
Project Total	\$ \$350,703
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SUPPLIER NUMBER
TO BE ASSIGNED BY CITY
PURCHASING DIVISION

CITY OF CORPUS CHRISTI DISCLOSURE OF INTEREST

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA". See reverse side for Filing Requirements, Certifications and definitions.

COMPANY NAME: Texas A&M University-Corpus Christi

P. O. BOX: _____

STREET ADDRESS: 6300 Ocean Drive

CITY: Corpus Christi

ZIP: 78412

FIRM IS:

1. Corporation ☐
4. Association ☐

2. Partnership ☐
5. Other ☒

3. Sole Owner ☐

State-Controlled Institution of Higher Education

DISCLOSURE QUESTIONS

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name

Job Title and City Department (if known)

N/A

2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name

Title

N/A

3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name

Board, Commission or Committee

N/A

4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name

Consultant

N/A

FILING REQUIREMENTS

THE SECRETARY OF THE ARMY
WASHINGTON, D. C.

TO THE SECRETARY OF THE ARMY
FROM THE SECRETARY OF THE ARMY
SUBJECT: [Illegible]

1. [Illegible]
2. [Illegible]
3. [Illegible]

4. [Illegible]
5. [Illegible]
6. [Illegible]

7. [Illegible]
8. [Illegible]
9. [Illegible]

10. [Illegible]
11. [Illegible]
12. [Illegible]

13. [Illegible]
14. [Illegible]
15. [Illegible]

16. [Illegible]
17. [Illegible]
18. [Illegible]

If a person who requests official action on a matter knows that the requested action will confer an economic benefit on any City official or employee that is distinguishable from the effect that the action will have on members of the public in general or a substantial segment thereof, you shall disclose that fact in a signed writing to the City official, employee or body that has been requested to act in the matter, unless the interest of the City official or employee in the matter is apparent. The disclosure shall also be made in a signed writing filed with the City Secretary.
[Ethics Ordinance Section 2-349 (d)]

CERTIFICATION

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

Certifying Person: Dr. Luis Cifuentes **Title:** _____
Vice President for Research,
Commercialization and Outreach
(Type or Print)

Signature of Certifying Person:



Date: 8.26.15

DEFINITIONS

- a. "Board member." A member of any board, commission, or committee appointed by the City Council of the City of Corpus Christi, Texas.
- b. "Economic benefit". An action that is likely to affect an economic interest if it is likely to have an effect on that interest that is distinguishable from its effect on members of the public in general or a substantial segment thereof.
- c. "Employee." Any person employed by the City of Corpus Christi, Texas either on a full or part-time basis, but not as an independent contractor.
- d. "Firm." Any entity operated for economic gain, whether professional, industrial or commercial, and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust, and entities which for purposes of taxation are treated as non-profit organizations.
- e. "Official." The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads, and Municipal Court Judges of the City of Corpus Christi, Texas.
- f. "Ownership Interest." Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate, or holding entity. "Constructively held" refers to holdings or control established through voting trusts, proxies, or special terms of venture or partnership agreements."
- g. "Consultant." Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.

**Commission and Outreach
Vice President for Research
Dr. Luis Cifuentes**

COMPLETE PROJECT NAME
Project No. XXXX
Invoice No. 12345
Invoice Date:

	Contract	Amd No. 1	Amd No. 2	Total Contract	Amount Invoiced	Previous Invoice	Total Invoice	Percent Complete
Basic Services:								
Preliminary Phase	\$1,000	\$0	\$0	\$1,000	\$0	\$1,000	\$1,000	100%
Design Phase	2,000	1,000	0	3,000	1,000	500	1,500	50%
Bid Phase	500	0	250	750	0	0	0	0%
Construction Phase	2,500	0	1,000	3,500	0	0	0	0%
Subtotal Basic Services	\$6,000	\$1,000	\$1,250	\$8,250	\$750	\$1,500	\$2,500	30%
Additional Services:								
Permitting	\$2,000	\$0	\$0	\$2,000	\$500	\$0	\$500	25%
Warranty Phase	0	1,120	0	1,120	0	0	0	0%
Inspection	0	0	1,627	1,627	0	0	0	0%
Platting Survey	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
O & M Manuals	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
SCADA	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
Subtotal Additional Services	\$2,000	\$1,120	\$1,627	\$4,747	\$500	\$0	\$500	11%
Summary of Fees								
Basic Services Fees	\$6,000	\$1,000	\$1,250	\$8,250	\$750	\$1,500	\$2,500	30%
Additional Services Fees	2,000	1,120	1,627	4,747	500	0	500	11%
Total of Fees	\$8,000	\$2,120	\$2,877	\$12,997	\$1,250	\$1,500	\$3,000	23%