**NOTICE OF SHORELINE TASK FORCE REGULAR MEETING**
**CITY OF SOUTH PADRE ISLAND**

# TUESDAY, OCTOBER 13, 2020

3:00 PM 4601 PADRE BOULEVARD SOUTH PADRE ISLAND, TX 78597

1.Call to Order

2.Pledge of Allegiance

3.Public Comments and Announcements

*This is an opportunity for citizens to speak to Council relating to agenda or non-agenda items. Speakers are required to address Council at the podium and give their name before addressing their concerns. [Note: State law will not permit the City Council to discuss, debate or consider items that are not on the agenda. Citizen comments may be referred to City Staff or may be placed on the agenda of a future City Council meeting]*

4.Regular Agenda

4.1. Approval of the minutes from the regular meeting on September 22, 2020. (Boburka)

4.2. Discussion and action to recommend to City Council to authorize the City Manager to enter into contract negotiations for the beach and dune study that is funded by the Coastal Management Program (CMP) Cycle 24 funds with the highest-ranked firm. (Boburka)

4.3. Update and discussion on department projects: (Boburka, Hughston)
-Dune Educational Median
-TX Urban Forestry Grant
-RESTORE Act

5.Adjourn

NOTE:

*One or more members of the City of South Padre Island City Council may attend this meeting; if so, this statement satisfies the requirements of the OPEN MEETINGS ACT.*

DATED OCTOBER 9, 2020

_____
Angelique Soto, City Secretary

I, THE UNDERSIGNED AUTHORITY, DO HEREBY CERTIFY THAT THE ABOVE NOTICE OF MEETING OF THE SHORELINE TASK FORCE OF THE CITY OF SOUTH PADRE ISLAND, TEXAS IS A TRUE AND CORRECT COPY OF SAID NOTICE AND THAT I POSTED A TRUE AND CORRECT COPY OF SAID NOTICE ON THE BULLETIN BOARD AT CITY HALL/MUNICIPAL BUILDING ON **OCTOBER 9, 2020**, AT/OR BEFORE 3:00 PM AND REMAINED SO POSTED CONTINUOUSLY FOR AT LEAST 72 HOURS PRECEDING THE SCHEDULED TIME OF SAID MEETING.

_____
Angelique Soto, City Secretary

THIS FACILITY IS WHEELCHAIR ACCESSIBLE, AND ACCESSIBLE PARKING SPACES ARE AVAILABLE. REQUESTS FOR ACCOMMODATIONS OR INTERPRETIVE SERVICES MUST BE MADE 48 HOURS PRIOR TO THIS MEETING. PLEASE CONTACT BUILDING OFFICIAL, BELINDA TARVER AT (956)761-8103.

**CITY OF SOUTH PADRE ISLAND**
**SHORELINE TASK FORCE**
**AGENDA REQUEST FORM**

**MEETING DATE:** October 13, 2020

**NAME & TITLE:** Kristina Boburka, Shoreline Director

**DEPARTMENT:** Shoreline Department

**ITEM**
Approval of the minutes from the regular meeting on September 22, 2020. (Boburka)

**ITEM BACKGROUND**
Approval of the minutes from the regular meeting on September 22, 2020.

**BUDGET/FINANCIAL SUMMARY**
None

**COMPREHENSIVE PLAN GOAL**
N/A

**LEGAL REVIEW**
Sent to Legal:
Approved by Legal:

**RECOMMENDATIONS/COMMENTS:**

# MINUTES OF REGULAR MEETING
# CITY OF SOUTH PADRE ISLAND
# SHORELINE TASK FORCE

**Tuesday, September 22th, 2020**

## I. CALL TO ORDER.

The Shoreline Task Force of the City of South Padre Island, Texas held a regular meeting on Tuesday, September 22th, 2020, at the Municipal Complex Building, 2nd Floor, 4601 Padre Boulevard, South Padre Island Texas. Chairman Virginia Guillot called the meeting to order at 3:00 p.m. A quorum was present with Task Force Chairman Virginia Guillot, Task Force Members Stormy Wall, Abbie Mahan, Robert Nixon, Norma Trevino, and Michael Sularz.

City Council members present were: Ken Medders and Kerry Schwartz. City staff members present were: City Manager Randy Smith, Chief of Police Claudine O'Carroll, Environmental Health Director Victor Baldovinos, City Planning Administrative Assistant Marta Martinez, City Secretary Nikki Soto, and Shoreline Director Kristina Boburka.

## II. PLEDGE OF ALLEGIANCE.

Chairman Virginia Guillot led the Pledge of Allegiance.

## III. PUBLIC COMMENTS AND ANNOUNCEMENTS:

Task Force Member Mahan lead public comments supporting the Shoreline Department and their readiness for storm Beta. Chairman Guillot offered secondary support and noted that there were large tides presented from Beta. South Padre Island Resident Erica Lerma Macaulay stated her position against the further ordinance of single pole shade structures and would like to see the return of pop up tents for herself and larger families in need of an expansive shade structure. Shoreline Director Boburka made a series of public comments giving project updates from previous meetings. The following updates were given: Sunset parking was in review to adjust the street in becoming a one way, engineers are working on the sunset walkover terminus switching southward, beach showers discussions with Shoreline Operations Manager, Coastal Management Program Cycle 26 City Council chose to move forward with Sea Island and the Lifeguard Towers ranked in the previous order, on shore beach nourishment is seeking when next maintenance dredge is available.

## IV. REGULAR AGENDA

### I. APPROVAL OF THE SEPTEMBER 8TH, 2020 REGULAR MEETING MINUTES.

Task Force Member Mahan made a motion, seconded by Task Force Member Nixon to approve the regular meeting minutes as submitted. Motion carried unanimously.

## II. PRESENTATION ON PARTAC'S FINAL PARTICLE TRACING STUDY REPORT.

Shoreline Director Boburka gave an update on the Partrac final reporting. Material placed offshore at the berms showed southwestern movement onto the shoreline for a majority of trending data. The berms showed an overall stable deposit site for long term installation. Chairman Guillot requested further data review on a later meeting and Task Force Member Nixon inquired on the tidal wave interaction of particle tracing.

## III. DISCUSSION AND POSSIBLE ACTION TO RECOMMEND TO CITY COUNCIL RESTRICTIONS ON THE FOLLOWING:

i. **GRILLING**
ii. **CANOPIES**
iii. **LOUD MUSIC**
iv. **OVERNIGHT BEACH ACCESS PARKING HOURS**

Chairman Guillot opened the discussion on the Task Force need to improve and increase beach access. She finds it important to keep open conversations on all topics to provide the best beach and amenities possible. Task Force Member Mahan opted to abstain from discussion and action towards this agenda item. The discussion continued with what is allowable by City Ordinance and that grilling is permitted but open fires are not. Task Force Member Wall stated his opposition to grilling on the beach while Task Force Member Nixon saw the need to find middle territory. Director of Environmental Health Victor Baldovinos gave clarity on some regulations and how they are being patrolled throughout city limits. Towards the end of the discussion Chief of Police Claudine O'Carroll gave insight on overnight parking and the patrols done to ensure public safety throughout the night at the beach accesses. Task Force Member Nixon made a motion for all regulations to stay in place, but was countered that no action need to be taken.

## V. ADJOURNMENT.

There being no further business, Chairman Guillot adjourned the meeting at 3:54 p.m.

_____ _____

Kristina Boburka, Shoreline Director Virginia Guillot, Chairman

**CITY OF SOUTH PADRE ISLAND**
**SHORELINE TASK FORCE**
**AGENDA REQUEST FORM**

**MEETING DATE:** October 13, 2020

**NAME & TITLE:** Kristina Boburka, Shoreline Director

**DEPARTMENT:** Shoreline Department

**ITEM**
Discussion and action to recommend to City Council to authorize the City Manager to enter into contract negotiations for the beach and dune study that is funded by the Coastal Management Program (CMP) Cycle 24 funds with the highest-ranked firm. (Boburka)

**ITEM BACKGROUND**
A beach and dune study was awarded through CMP with Cycle 24 funds to perform an update of the 1993 Morton study. Three statements were received in response from the request for proposals that was posted and advertised. Each statement received was scored and all scores were averaged.

**BUDGET/FINANCIAL SUMMARY**
CMP Funds: $90,000; Local match from beach nourishment fund: $60,000

**COMPREHENSIVE PLAN GOAL**
Chapter III. Parks and Resources
GOAL 1: The City shall ensure protection and conservation of natural resources, such as beaches, dunes, wetlands, Laguna Madre waterfront and native flora and fauna, allowing for their sustainable use and enjoyment by future generations.
Objective 1.1 Beach and dunes shall be protected from both natural and artificial erosion.

**LEGAL REVIEW**
Sent to Legal:
Approved by Legal:

**RECOMMENDATIONS/COMMENTS:**

RFP 2022-SL-02 – Professional Services for the Assessment and Investigation of the Beach and Dune Conditions at South Padre Island

Statement of Proposals Received from:

- AECOM
- LJA Environmental Services
- Integral Consulting

Ranking of SOQs based on Selection Grading (average):

1. AECOM- 94.25/100
2. Integral- 93.75/100
3. LJA- 91.5/100

Individual Grades by Selection Committee:

Kristina Boburka, Shoreline Director
- AECOM- 91/100
- LJA- 89/100
- Integral- 95/100

Erika Hughston, Grant & Special Project Administrator
- AECOM- 90/100
- LJA- 89/100
- Integral- 93/100

Virginia Guillot, Shoreline Task Force Chairwoman
- AECOM- 100/100
- LJA- 95/100
- Integral- 96/100

Rob Nixon, Shoreline Task Force Vice Chairman
- AECOM- 96/100
- LJA- 93/100
- Integral- 91/100

AECOM Imagine it. Delivered.

# Assessment and Investigation of the Beach and Dune Conditions at South Padre Island

RFP 2020-SL02

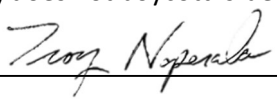
City of South Padre Island

September 11, 2020

4601 Padre Blvd.
South Padre Island, TX 78597

## CERTIFICATION and ACKNOWLEDGMENT

The undersigned affirms that they are duly authorized to submit this Proposal, that this Proposal has not been prepared in collusion with any other Respondent, and that the contents of this Proposal have not been communicated to any other Respondent prior to the official opening. To the extent this Contract is considered a Contract for goods or services subject to § 2270.002 Texas Government Code, Respondent certifies that it: i) does not boycott Israel; and ii) will not boycott Israel during the term of the Agreement.

Signed By:  Title: Vice President

Typed Name: Troy Naperala Company Name: AECOM Technical Services, Inc.

Phone No.: 231-486-2804 Fax No.:

Email: troy.naperala@aecom.com

| | | | | |
|---|---|---|---|---|
| Bid Address: | 19219 Katy Freeway, Suite 100 | Houston | Texas | 77094 |
| | P.O. Box or Street | City | State | Zip |
| Order Address: | 19219 Katy Freeway, Suite 100 | Houston | Texas | 77094 |
| | P.O. Box or Street | City | State | Zip |
| Remit Address: | 19219 Katy Freeway, Suite 100 | Houston | Texas | 77094 |
| | P.O. Box or Street | City | State | Zip |

Federal Tax ID No.: 95-2661922

DUNS No.: 003184462

Date: September 10, 2020


# Introduction (A)

## Introducing AECOM

AECOM is built to deliver a better world. As a fully integrated firm, we connect knowledge and experience across our local, national, and global network of experts to help clients solve their most complex challenges at the local level. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated, and vital. For this proposal, we are submitting as *AECOM Technical Services, Inc. (AECOM)* and we welcome this opportunity to present this Statement of Proposal to the City of South Padre Island (SPI) for coastal engineering services associated with providing an Assessment and Investigation of the Beach and Dune Conditions at South Padre Island.

AECOM has a diverse group of coastal planning and engineering professionals whose experience encompasses coastal protection and restoration along the Gulf Coast, but particularly in Texas. Leveraging our diverse skillsets, our team takes pride in building consensus across complex groups of stakeholders with varying priorities on the Texas coast. AECOM's goal is to provide SPI with exceptional and responsive service, as described in the **Project Approach** section. AECOM's knowledge of Texas' coastal environments and our comprehensive experience with coastal and marine construction will combine to exceed your expectations. AECOM offers SPI key resources located in our Houston offices. In addition, AECOM's national technical experts for beach design, construction, and management will be engaged to the benefit of SPI for successful execution of the project.

## Strong Coastal Texas Presence

The majority of AECOM's key staff for the Project is based out of the southeast Texas region, which will provide SPI with local team members who can respond quickly to needs and are familiar with the area and its stakeholders, as described in the **Staffing Profile** section. In addition, our team is at the forefront of coastal management in Texas and is pioneering sound approaches to sustainable coastal practices for stakeholders of the coast. This is recognized through our history of traditional engineering and design projects for coastal shoreline projects, such as our award winning shoreline protection project at Virginia Point, but moreso by efforts such as the Texas Coastal Resiliency Master Plan (including regional sediment management planning), South Padre Island Beach-Fx modeling, and Shoal Point Placement Area management, all of which are discussed in more detail within the **References & Experience** section and are unique within Texas given the breadth of services AECOM has provided.

AECOM's Texas-based coastal team also includes a key local subcontractor for this opportunity, *Hanson Professional Services, Inc. (Hanson)*. Hanson's experience on South Padre Island will serve to further enhance AECOM's in-house capabilities, forming a project team with deep Texas roots and a foothold in the Rio Grande Valley region. In addition, AECOM and Hanson also bring successful local collaborative project experience.

# Key Benefits of Selecting AECOM

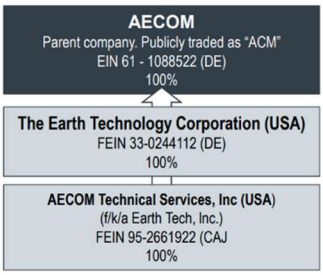
The AECOM coastal team has the depth, breadth, and skills to serve SPI with the creativity, innovation, and consensus building experience necessary to provide a comprehensive assessment of the City's beaches and dunes, along with strategic recommendations on management practices aimed at providing SPI with the best protection possible while considering the City's economic well-being. We bring the following competitive advantages to SPI:

- **Technical Knowledge of SPI –** AECOM's coastal team has experience with the beach and dune system at South Padre Island through our work on Beach-Fx Modeling as part of the U.S. Army Corps of Engineers (USACE) Coastal Texas Study, the Texas General Land Office (GLO) Texas Coastal Resiliency Master Plan, and a number of municipal projects, all pertaining to the delicate balance between landowners, coastal resources, and economic growth.
- **Innovative Coastal Management** – AECOM has completed some of the most innovative coastal restoration and resource management projects on the Texas coast. We take pride in tailoring our projects to site specific needs, as well as client and stakeholder preferences.
- **Texas Coastal Leadership and Collaboration** – AECOM has been integrating stakeholders and building consensus on resource management approaches along the Texas coast for years through our coastal master planning work with the GLO. Our team brings the collaborative experience and authority to make a complex, multi-stakeholder project work.

# Company Profile

## *Company Ownership Structure*

Work under this contract will be performed by AECOM Technical Services, Inc. AECOM Technical Services, Inc. is a wholly owned subsidiary of Earth Tech, Inc. – 08/03/1995 to 11/09/2008; The Earth Technology Corporation -- 11/26/1991 to 08/03/1995; The Earth Technology Corporation (Western) -- 12/26/1983 to 11/26/1991; Ertec Western, Inc. – 08/05/1981 to 12/26/1983; Fugro U.S., Inc. – 09/29/1970 to 08/05/1981, itself a subsidiary of AECOM, a Delaware corporation whose stock is publicly traded on the New York Stock Exchange (ACM/NYSE). An abbreviated graphical representation of the AECOM Technical Services, Inc. ownership structure is provided in the following graphic image: Note: This graph does not depict all companies owned by AECOM. A listing of all AECOM subsidiaries and affiliated companies can be provided upon request. AECOM Technical Services, Inc. qualified to do business in Texas on 8/3/1981. Charter No. 0005184706




A graphical representation of the ATS ownership structure is provided. ATS is qualified to do business in Texas as of 8/3/1981 under Charter No. 0005184706.

## *Year AECOM was Founded and Incorporated*

AECOM was founded in 1990 and is incorporated in Delaware. Work under this contract will be performed by AECOM Technical Services, Inc., a wholly owned subsidiary of AECOM, which was incorporated in 1970 in the State of California.

## Location of AECOM Company Headquarters and Relevant Field Offices

The corporate headquarters for AECOM Technical Services, Inc. is located at One California Plaza, 300 South Grand Ave., Suite 1100, Los Angeles, CA 90071. AECOM has offices nationwide, including more than ten offices in Texas. Our Houston, Texas office will serve as primary office in support of this contract. We will also use resources from our other Texas offices in Austin and San Antonio as necessary. In addition, resources from any of our other Texas field offices or offices nationwide may be accessed for special expertise or additional workforce depth.

## Number of AECOM Employees

World-wide, AECOM (the parent company) has more than 77,300 employees. Based on recent Federal Government reporting, AECOM employs more than 46,000 staff across the United States, including more than 2,400 in Texas. The majority of employees anticipated to be assigned to this project are located in our Houston office. Additional employees with specific subject matter expertise are located in offices across the country.

## AECOM Point-of-Contact

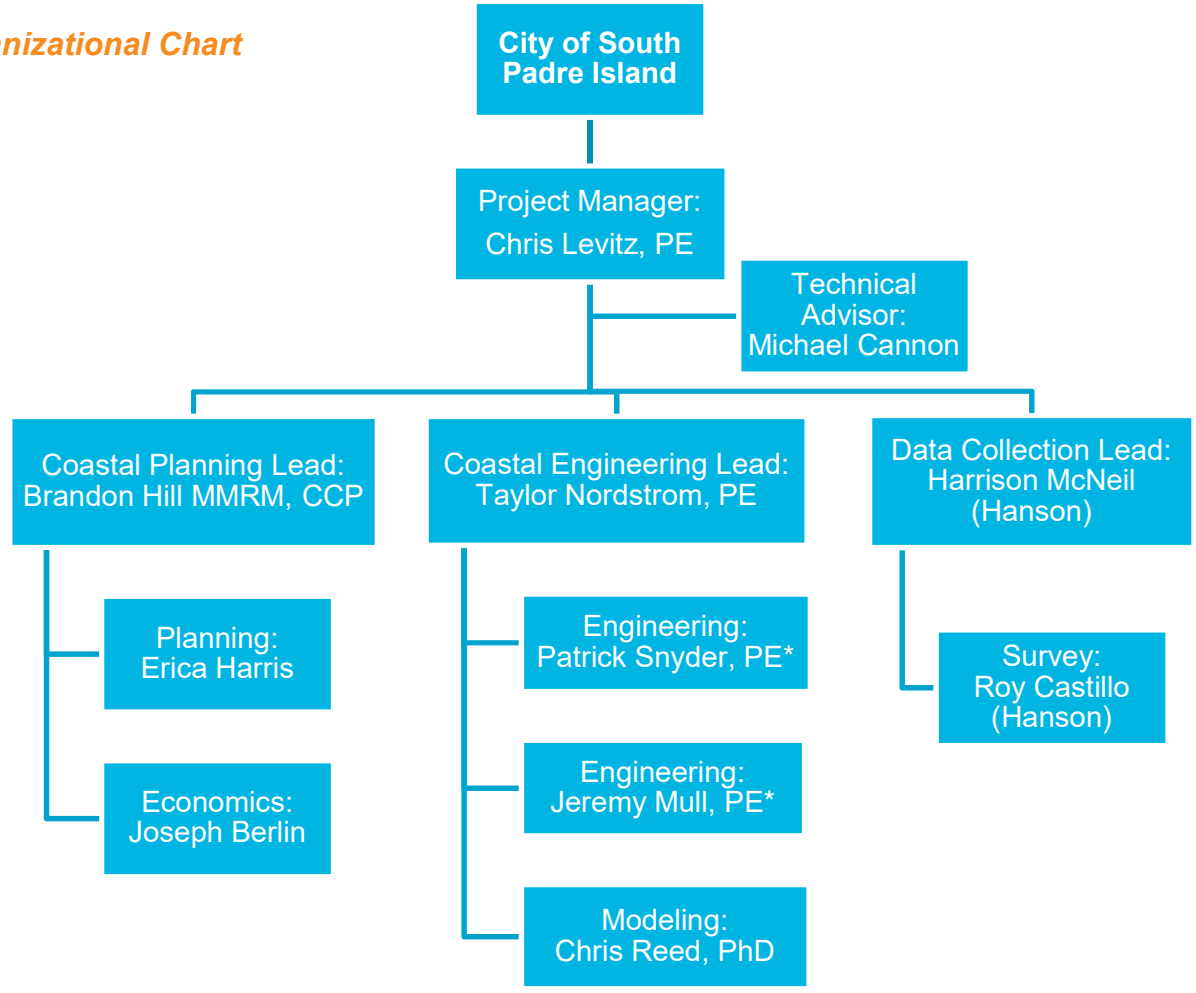
***Project Manager***

**Name/Title:** Chris Levitz, Coastal Manager
**Address:** 19219 Katy Freeway, Suite 100
Houston, TX 77094
**Phone:** 281.675.3518
**Email:** chris.levitz@aecom.com

***Authorized Signatory***

**Name:** Troy Naperala, Vice President
**Phone:** 231.392.9685
**Email:** troy.naperala@aecom.com

## Organizational Chart




**Licensed outside of the State of Texas*


# Staffing Profile (B and C)

AECOM offers SPI a highly experienced, multi-disciplinary team that has a history of delivering successful projects along the Texas coast. Our project manager and key staff listed within this section provide the know-how to tackle the range of tasks outlined in the project approach. We offer SPI a unique combination of Texas coastal experience combined with comprehensive national beach management knowledge. The entire team presented have a long history of collaboration and leveraging these skillsets to provide our clients with robust project solutions. An **Organization Chart**, highlighting our proposed key team members for each technical expertise category, is provided on the previous page. A brief overview of our key staff follows with resumes also provided for reference.

**Chris Levitz** will serve as the *Project Manager* for AECOM, a role he has held for several past and ongoing coastal engineering projects in Texas, including his recent work managing the development of the Texas Coastal Resiliency Master Plan for the Texas General Land Office (GLO). As the project manager, Chris will work to organize, assemble, and direct the AECOM team for the life of the project. Identifying the right team members to maximize client satisfaction is an area of pride for him, and this effort will be no exception. Chris has experience in managing many projects simultaneously, with a successful history of keeping projects on time and on budget while still exceeding client expectations. Additionally, he provides the team with expertise in coastal design, stakeholder coordination, and project implementation. Chris specializes in bringing diverse stakeholders together to form mutually beneficial solutions to complex coastal projects. **Michael Cannon** will serve as the Technical Advisor for this project, leveraging years of experience on the Gulf Coast and nationally with management of federal-scale projects related to beach nourishment, storm risk management, and public involvement.

The *Coastal Planning* role is one our team found important to designate for purposes of this project, as all alternatives and design require not only SPI support, but the support of all stakeholders, including the Island residents and tourism industry. **Brandon Hill** will serve as the lead for this role, leveraging his institutional knowledge and extensive regional experience with coastal resource management to guide the team and coordinate with stakeholders. He will lead the planning division of the team helping to facilitate actionable recommendations that consider the technical analysis and the community-specific drivers. Brandon will supported by one of our national coastal management and planning specialists, **Erica Harris**. Erica brings a history of assembling complex documents and plans that address many of the most pressing coastal issues Our senior economist, **Joseph Berlin**, brings extensive experience in developing coastal cost-benefit analyses, including recently leading efforts to assist the United States Army Corps of Engineers (USACE) in performing Beach-Fx analysis of the South Padre Island beach and dune

complex. Joseph is highly respected in his field and has served to assist in many economic model certifications, including Beach-Fx.

Supporting our coastal planning efforts, **Taylor Nordstrom** will lead the *Coastal Engineering* team, facilitating coordination with the City of South Padre Island to promote innovative approaches to developing a beach and dune template and management strategies that are suited to SPI. Taylor provides the ability to tie planning and engineering efforts together seamlessly, providing an ideal counterpart to Brandon. She is supported by **Patrick Snyder**, who has worked on projects directly pertaining to SPI's beach and dunes, analyzing regional sediment management needs for the island, as well as the entire Texas coast under the Coastal Resiliency Master Plan. Patrick provides the team with a breadth of experience in planning, designing and executing beach and dune nourishment projects across the United States and the Caribbean. Our team will also utilize **Jeremy Mull** and his national experience with coastal shoreline focused projects. Jeremy has spent time on demanding projects requiring innovative and new approaches to better understanding the risks associated with changing and eroding shorelines, providing the team with additional depth when it comes to realizing impacts of communities with varying levels of shoreline management. In support of the coastal engineering design, **Chris Reed** provides comprehensive modeling experience. Chris has many years of experience providing coastal hydrodynamic, wave, and sediment transport modeling support along the Texas coast, and has worked closely with the USACE historically in development of 2D and 3D software under this spectrum. This knowledge is invaluable, as Chris can call upon his local and regional experience to provide high-level judgement on critical coastal processes, such as erosion and hydrodynamic patterns.

The AECOM project team provides a roster of coastal scientists and engineers with experience in crafting beach and dune design that caters to site specific conditions and stakeholder needs, and the versatility to craft the ideal design for the SPI beach and dune system that will serve as a catalyst for an update to the City's Chapter 22 of the Code of Ordinances.

Supporting AECOM in this The team's *Data Collection* effort will be led by **Harrison McNeil** of Hanson Professional Services (Hanson) who provides experience with SPI and the environments on the island, with insights of optimal methods to collect data and information across the project area to better inform the plan development process. Harrison's familiarity with the Texas coast, and specifically SPI, will be an asset to the entire team when needs are identified during project execution. Supporting Harrison is **Roy Castillo**, a registered professional land surveyor in Texas, that has a long history of completing data collection across the state. This team brings full capabilities to collect data in a number of ways, allowing rapid execution and efficient processes. AECOM is excited to partner with Hanson on this effort, continuing a successful collaboration focused on our clients.

# Project Manager (B)

## Chris Levitz, PE, CFM – Project Manager

**Education**

- BS/Civil Engineering/University of Texas at Austin
- Coastal Engineering Certification/Old Dominion University

**Registrations and Certifications**

- 2010/PE/Texas/107494
- 2008/CFM/Texas/1357-08N
- AECOM Certified Project Manager

Mr. Levitz specializes in resilience planning and design, with a strong coastal and flood risk focus. Through these efforts he has made consensus building in the coastal community a priority, working to align community development goals along the coast with ecological and long-term climate change needs. Developing approaches to merge green and gray infrastructure for a more resilient and adaptable coast is his focus, bringing these elements into planning and design for the coastline. These efforts have resulted in multiple award-winning projects, including living shoreline types of projects with Sylvan Beach and Virginia Point to large-scale master planning with the Texas Coastal Resiliency Master Plan. Each of these project's successes were based on understanding local economic and ecological needs and crafting a project to align with them.

Mr. Levitz has significant experience working on an assortment of coastal and flood risk projects, including work for the United States Army Corps of Engineers (USACE), Federal Emergency Management Agency (FEMA), Texas General Land Office (GLO), and many other state and local clients. He has completed coastal projects along the entire Texas coast and throughout the state, the Atlantic coast and along the Great Lakes coastline. His experience includes modeling (hydraulic, coastal, and climate change), design, permitting, and planning efforts. Through these efforts, Mr. Levitz often serves as the project manager or technical lead, providing the comprehensive vision for plans, studies, and designs.

### *Texas Coastal Resiliency Master Plan, Project Manager, Texas Coast, Texas General Land Office*

The State of Texas, through the General Land Office, determined a need for a resiliency master plan of the entire Texas coast. AECOM serves as the engineer for the project and has responsibilities to develop coastal strategies for all regions of the coast, including structural, nature-based and non-structural solutions. Efforts include technical analysis (cost, economics, physical, risk, environmental, and feasibility), planning, outreach, and management. These efforts were being done in cooperation with client team members, as well as academic and outreach entities, to ensure the Resiliency Master Plan is a living document that is constantly being improved and that all recommendations within the report are the most efficient and beneficial for the State of Texas. AECOM has worked with the GLO to issue Resiliency Plans in 2017 and 2019.

AECOM is continuing to work with the GLO to enhance and expand the scope of the Texas Coastal Resiliency Master Plan. AECOM is working with the GLO to further refine coastal resiliency outlooks through modeling of marsh retreat and storm surge scenarios, expand economic analyses for both traditional and non-traditional benefits, complete conceptual engineering design and analyses for key projects, and enhanced coordination with Federal and local entities to expand beneficial use of dredged material opportunities and coordinate funding strategies (including BP disaster related funding streams) for project execution. AECOM is broadening the Plan's scope of actions to include community infrastructure and storm surge suppression in combination with ecological and policy-based actions, including correlating ecosystem services to function as part of hazard mitigation in the state.

### *Hydraulic Design Manual – Coastal Chapter, Project Manager, Texas Coast, Texas Department of Transportation*

TxDOT determined a need for a coastal chapter to be added to their Hydraulic Design Manual. Mr. Levitz serves as the AECOM project manager leading the effort to assemble content regarding coastal design guidance with respect to water levels, waves, currents, erosion and scour, relative sea level rise, building materials, and an overall guidance framework. This effort includes reconnaissance efforts through

meetings with external DOTs and federal agencies to recognize coastal guidance from other entities of relevance to the effort.

Additional efforts include a case study applying the newly developed coastal chapter to a coastal scour analysis for construction of a new bridge in Aransas County, Texas. Enhancements to the coastal chapter include developing standard TxDOT scope templates related to coastal hydraulics and a relative sea level rise template for applying proper considerations to a given coastal infrastructure project.

### *Texas Ports Mission Plan, Project Manager, Texas Coast, Texas Department of Transportation – Maritime Division*

AECOM worked with TxDOT to develop a statewide Ports Mission Plan (PMP) that is inclusive of land-based connectivity, port capital improvements, and ship channel enhancement. AECOM is developing individual reports for each of the three port system elements along with an executive summary serving as the PMP to be provided to the Texas Legislature. These efforts are being completed in coordination with the ports and the Port Authority Advisory Committee. AECOM is developing procedures to prioritize improvement projects for connectivity, port facilities, and ship channels along the Texas coast.

### *Advisory Data and Product Development, Coastal Erosion Hot Spot Subtask, Coastal Engineering Lead, Texas Coast, FEMA*

Responsibilities included managing a team of coastal engineers to complete an investigation of Gulf beach and dune impacts from Hurricane Harvey using a combination of post-storm imagery and LiDAR data. Erosional impacts to the beaches and dune along the entire impacted coastline were identified and evaluated for nourishment or stabilization needs to prevent increased coastal flood risk to communities. Through this analysis, where data was available, quantified amounts of lost sand beach sediment was calculated, exceeding 10 million cubic yards in areas of primary impact. Additionally, historical shoreline data was evaluated for the study area, which aided in determining areas likely naturally restore though dune and beach restoration versus locations unlikely to benefit from natural sediment supplies.

### *Indianola Beach Nourishment and Shoreline Stabilization Phase II, Project Engineer, Calhoun County/TX, Calhoun Port Authority/GLO:*

The shoreline along the western edge of Matagorda Bay has suffered increased erosion over recent years with the expansion and deepening of the Matagorda Ship Channel. As a result, Indianola Beach was nearly eroded away completely. The design for Phase II of the project is a continuation of beach nourishment and shoreline armoring that extends south of the completed Phase I. Responsibilities have included wind and wave modeling of the coastline, sediment transport modeling utilizing GENESIS and SBEACH, groin design and placement and development of necessary construction documents which included plans, specifications and a construction cost estimate.

### *Sylvan Beach Shoreline Protection and Beach Nourishment, La Porte, TX, GLO, City of La Porte and Harris County*

Sylvan Beach, located in upper Galveston Bay, is a recreational park owned by Harris County and jointly managed/operated with the City of La Porte. AECOM worked with the GLO and the City of La Porte to develop a cost-effective erosion control system which maximized recreational opportunities. AECOM designed a shoreline armoring system consisting of articulated concrete mattresses and stone fill/armoring to stabilize the bluff as a GLO CEPRA project. It included a structural concrete walk which anchored the shoreline system and provided access to the bayfront. Pocket beaches were also included as an integral part of the shoreline system. This effort included: geotechnical investigation and surveys; preparation of construction plans and specifications; support of section 10/404 permitting; cost estimating; sand source evaluation; post-Hurricane Ike damage assessment, bidder evaluation and construction oversight support. Sylvan Beach was awarded First Place in the Parks and Natural Areas Projects over $500,000 Category from the Houston-Galveston Area Council (HGAC).

# Key Staff (C)

## Michael Cannon – Technical Advisor

**Education**

- BS / Hydrology / University of New Hampshire

Mr. Cannon has over 35 years of experience in the performance and management of water resource projects with a focus on plan formulation, policy compliance and storm damage/ economic risk analysis. He has completed numerous flood risk and coastal storm damage risk mitigation feasibility studies involving the evaluation of flood or erosion risk and the development of alternative risk management measures and plans. He has prepared the benefit cost studies for projects including the beach nourishment projects constructed from Sandy Hook to Manasquan NJ, Long Beach NY, Rockaway Beach/ Jamaica Bay NY, Galveston TX, and the Fire Island Emergency Stabilization. His recent projects include the Re-Evaluation of the Passaic River Flood Risk Management Project (Tidal and Mainstem), preparation of the General Re-Evaluation Report and FEIS for Fire Island Inlet to Montauk Point Study, support for the North Atlantic Coast Comprehensive Study (NACCS) including preparation of the Project Performance Evaluation and the NACCS Main Text, and Planning, Benefit Cost and Drainage assessments for the New York and New Jersey Harbor and Tributaries Study (HATS).

### *Fire Island Inlet to Montauk Point Reformulation Study, Project Director, USACE New York District*

Project Director for analysis of both interim and long-term solutions to an array of coastal storm damage problems along this 83-mile study area. Responsible for supervising project planning and preparation of Final Report Documents. Managed an interdisciplinary team including multiple AECOM offices and consulting firms for studies on project design, analysis of natural resource impacts, preparation of NEPA Documents and development and implementation of public outreach strategies. These efforts culminated in the construction of approximately $300M in interim projects and development of a comprehensive resilience plan representing agreement between the USACE and the Department of the Interior. The comprehensive plan incorporates about 18 miles of traditional beach and dune nourishment, enhanced inlet bypassing and feeder beaches to provide regional sediment management, creation of emergent bayside habitat to support endangered species recovery, intensive monitoring and periodic beach fill to maintain barrier island continuity, and non-structural protection of low-lying bayside structures. The initial project cast is estimated to be $1.5B and the Chief of Engineers Report was signed in July 2020.

### *New York and New Jersey Harbor and Tributaries Study (HATS), Project Director, USACE New York District*

As Project Director Mr. Cannon is overseeing the AECOM efforts in support of the HATS project. The HATS Project is evaluating a number of alternatives including 13 alternative storm surge barriers and shore-based measures. The goal is to reduce the impacts of storm surge in the area from the entrance to Raritan Bay, through NY Harbor, upstream to Troy Locks near Albany. The AECOM efforts in support of this analysis include evaluation of drainage and pumping requirements, benefit to cost analysis, incremental economic assessments, and staffing and logistical support for public meetings and report assembly and distribution.

### *Rockaway Beach and Jamaica Bay General Reevaluation, Project Director, USACE New York District*

As Project Director Mr. Cannon oversaw the alternatives evaluation for the Rockaway Beach Re-Evaluation Study. The evaluation applied lifecycle analysis to evaluate future conditions, storm damages and project benefits. The analysis includes assessments of shorefront damages due to waves, erosion and flooding using the Beach Fx Model. The Beach Fx Model is the USACE certified model for evaluating morphologic response, storm damages and the benefits of coastal storm risk management projects. The evaluation also incorporated the effects of bayside flooding from Jamaica Bay and cross island flooding (storm surge overtopping the Beach and dune and flowing to Jamaica Bay). Cross shore flood depths calculated using XBeach were incorporated into HEC-FDA to calculate flood damages. Beach use and

recreation value estimates were based on user surveys that captured changes in beach usage with use values based on the Travel Cost Method. (TCM).

Alternatives to provide High Frequency Flood Risk Management (HFFRM) in Jamaica Bay were also evaluated. Mr. Cannon lead the H&H modelling of interior drainage, development of interior pump station requirements and the overall benefit cost assessments. These HFFRM features were scaled to be compatible with possible future storm surge barriers to be evaluated as part of the New York and New Jersey Harbor and Tributaries Study.

### *North Atlantic Coast Comprehensive Study (NACCS), Deputy Project Manager, USACE North Atlantic Division and Baltimore District*

AECOM, as part of a Joint Venture, has assisted the Coastal Planning Center of Expertise at the North Atlantic Division in the NACCS. Specific efforts include preparation of the Performance Evaluation Report, engineering assessments for design of typical measures, development new economic depth damage relationships, public outreach documents and assistance with report development and production. Duties: Supervised staff and provided technical guidance and review of documents. Lead investigator for the collection of post storm data and the development of an expert elicitation panel to develop updates to existing wave, inundation and erosion damage relationships for use in coastal areas.

### *Sabine Pass to Galveston Bay Shoreline Erosion Feasibility Study, Project Manager, USACE-Galveston District*

Project Manager for characterization and economic analysis of future without-project conditions for 90 miles of Texas Gulf Coast shoreline. Directed updates to building inventory and reach delineation. Responsible for preparation of a lifecycle storm damage model using input from EST (Empirical Simulation Technique). Responsible for preparing model review/certification package for Planning Center of Expertise review.

### *Protocol Testing for the Planning Models Improvement Program for Institute for Water Resources (IWR), Project Manager, USACE*

Project Manager for model evaluation and Model Certification Recommendations for the Ecosystem Response Model (ERM) developed by the Mobile District, and the Beach-Fx model developed by the Coastal & Hydraulics Laboratory (CHL) of the Engineer Research and Development Center. The project included detailed evaluations of both models in accordance with the Draft Protocols and EC 1105-2-407 Planning Models Improvement Program, Model Certification, and an assessment of the Protocols and recommendations for improvement in the model review and certification process. The project included detailed evaluations of both models in accordance with the Draft Protocols and EC 1105-2-407 Planning Models Improvement Program, Model Certification, and an assessment of the Protocols and recommendations for improvement in the model review and certification process.

### *Project Information Reports for Post Hurricane Ike Restoration of Galveston Seawall, Texas City, Port Arthur, Freeport and North Padre Island HSSP Projects and the White Oak Bayou and Clear Creek Flood Control Projects, USACE, Galveston District*

Plan Formulation specialist and ITR Reviewer overseeing economic benefit and annual cost assessments under a compressed schedule (45 days from request for Proposal).

## Brandon Hill, MMRM, CCP – Planning Lead

**Education**

- BS/Ocean and Coastal Resources/Texas A&M University at Galveston
- Masters of Marine Resource Management/Texas A&M University at Galveston

**Registrations and Certifications**

- 2020/Certified Coastal Practitioner/Coastal Zone Foundation
- 2019/Lean Six Sigma GreenBelt

Mr. Hill is a Coastal and Environmental Planner with more than six years of resource management experience working in academia, local government, and consulting. His Masters of Marine Resource Management was earned during his time at Texas A&M University at Galveston where he ran a NASA-funded lab that focused on creating cutting edge beach management practices based on remote sensing technologies and published undergraduate and graduate thesis, and dozens of whitepapers and presentations. While working as the shoreline director for the City of SPI from 2016-2019 he was trained in Lean Six-Sigma practices, brought the City into compliance with the Texas Open Beaches Act, completed more than $1.7 million in coastal infrastructure projects, and initiated the collaborative particle tracing sediment study through the US Geologic Service and US Army Corps of Engineers. Mr. Hill is a Coastal Zone Foundation Certified Coastal Practitioner and has worked on a myriad of coastal and water resource projects, such as resource management projects for Texas municipalities and ports, and planning work for the Texas General Land Office (GLO) including regional hydrologic plans, facilitating living shorelines, and engagement of state and federal agencies on updating coastal inventory databases.

Examples of technical publications include;

Graduate Thesis – An Analysis of the Factors that Influence the Sargassum Migratory Loop (May 2016)

Undergraduate Thesis - Sargassum Early Advisory System (SEAS): Developing the Standard Operating Procedure of Investigating the Hourly Growth Rate of Sargassum While Suspended in the Neritic Coastal waters off of Galveston, Texas (May 2014)

White papers and Presentations –

- Fate and Transport of Nearshore Berms at South Padre Island (USACE and SPI)
- Grain Size Trend Analysis (GSTA) on the inner Continental Shelf, South Padre Island, Texas
- Development and Implementation of Sargassum Early Advisory System (SEAS): An Investigation of the Loop System, Warm Water Eddies, Currents and Energy that Create Sargassum Locomotion
- An investigation into Neritic Water Conditions as Primary Driver of Vegetative Fragmentation Rates of Sargassum Naitans and Sargassum fluitans
- Sargassum Early Advisory System (SEAS): A comparison of Sargassum landing amounts vs cold fronts on the Gulf Coast
- French-American Workshop on Sargassum; The Captain of Sargassum Sea

### *Coastal Resiliency Master Plan, Coastwide, Texas*

Mr. Hill has participated in several aspects of the GLO's Coastal Resiliency Master Plan including leading the coordination between stakeholders when bringing conceptual projects to fruition. This is an exercise in consensus building while applying the best technical practices. He has worked with stakeholders to create a cohesive regional hydrologic strategy and helped several agencies coordinate regarding a living shoreline alongside the Bahia Grande.

### *City of South Padre Island Windsport Venue*

The mitigation strategy to be proposed in pursuing regulatory permits was crafted by Mr. Hill as part of AECOM and Hanson's services to the City. The property, which lies just on the West side of PR 100, is primarily tidal flats which presents unique challenges in how you develop it while mitigating potential damages on site. The proposed strategy of utilizing aspects of the planned development as mitigation opportunities and the arguments presented therein are an example of the AECOM project teams' innovation and willingness to think "outside of the box" to facilitate the client's vision.

## Erica Harris – Planning

**Education**

- MS / Oceanography /Oregon State University
- BS / GIS and Spatial Analysis / 2008

Erica Harris is a coastal and climate scientist specializing the influence of an evolving climate on exacerbating hazard impacts. Her experience is focused on climate vulnerability and adaptation planning projects, including: evaluation of large storm impacts, inundation mapping, risk and vulnerability assessments of diverse asset types, and adaptation strategy development. Her skillset reflects a blend of science, engineering, policy, and spatial analysis through involvement on collaborative projects focused on understanding and adapting to existing and future climate conditions.

In addition to being a technical specialist, she is also able to interpret information for non-scientists. She has worked on numerous multi-agency projects focused on providing land use managers and planners with locally relevant information and tools to enhance climate resilience while maximizing co-benefits in the environmental, economic, and social sectors where possible.

### *Texas Coastal Resiliency Master Plan, Texas Coast, Texas General Land Office*

Coastal and Climate Scientist assisting with the refinement and implementation of the Texas Coastal Resiliency Master Plan. Roles include: serving as a technical reviewer for an assessment of existing tools available for evaluating the value of ecosystem services; assisting the GLO with development of a potential alternative mitigation credit system to protect/enhance shoreline ecosystems and fund implementation of identified projects; and assisting regular coordination efforts with a technical working group composed of experts from public agencies, the private industry, and non-governmental organizations.

### *Coastal Chapter Hydraulic Design Manual, TxDOT, Texas*

Key contributor developing updated content for the Texas Department of Transportation (TxDOT) Hydraulic Design Manual (HDM) Coastal Chapter. Content includes: a background on nearshore processes, potential flood and erosion impacts to transportation infrastructure, flood and erosion mitigation strategies, guidance for incorporating long-term processes to enhance resiliency of roadways, and water level/wave design guidance and considerations. This new chapter of the HDM provides procedures recommended for analyzing and designing resilient roadway infrastructure in the coastal environment. As a follow-up task to the project, Ms. Harris is also leading the content development of a train-the-trainer workshop to provide guidance for TxDOT district offices on how to use the updated HDM Coastal Chapter.

### *Sea Level Rise Update, California American Water, Monterey, California*

Coastal scientist performing an updated coastal erosion analysis as a part of the Environmental Impact Report/Environmental Impact Statement for the California American Water's (CalAm) Monterey Peninsula Water Supply Project. Tasks included examination of the risk of slant well exposure to inundation as a result of potential coastal erosion during future sea level conditions and extreme storm events.

### *Matilija Dam Removal Ecosystem Restoration Project, Ventura County Watershed Protection District, Ventura County, California*

Coastal scientist providing support for a sediment transport modeling effort at the mouth of the Ventura River to examine how sediment released from removal of the Matilija Dam may respond to the dynamic coastal environment. Tasks include examination of the nearshore and offshore wave climate and selection of characteristic wave events to be used as input for the wave and sediment transport model.

### *Climate Change Vulnerability Assessment, Naples, Florida*

Project technical lead conducting a city-wide vulnerability assessment of public assets, including transportation assets, at risk to a suite of climate stressors (sea level rise, coastal storms, extreme heat, and precipitation). Key vulnerabilities identified will be used to inform the development of an adaptation plan to increase the long-term resilience of the city's built and natural infrastructure. As a part of this effort, Erica also leads a climate change working group, composed of representatives from all city departments, to ensure the plan reflects the City's priorities and maintains City ownership.

## Joseph Berlin – Economics

**Education**

- MA / Economics / University of New Mexico
- BS / Business Administration, Accounting / Louisiana State University

Joseph Berlin is a Principal Economist specializing in cost-benefit analyses of environmental restoration projects, water projects, and transportation projects. He has developed models for estimating the benefits of harbor improvement projects and has experience with the economic models used for estimating the benefits of water projects, transportation projects, and environmental restoration projects. He has experience in writing policies, procedures, research and white papers and/or other public presentations for technical and/or public audiences.

### *South Padre Island Beach-Fx Analysis, Lead Modeler, USACE Galveston District*

Evaluated the benefits of beach nourishment alternatives to reduce coastal storm damage with Beach-Fx. Worked collaboratively with USACE Galveston District staff to troubleshoot and repair model based on previous Beach-Fx experience.

### *Economic Analysis of Widening the Houston Ship Channel 2019, Lead Economist, Port of Houston*

Prepared a review of the Feasibility Study Economics Appendix. Estimated the National Economic Development (NED) benefits with current data by using HarborSym. Estimated the net NED benefits based upon annualized benefits and cost. The Report will be submitted to the Corps of Engineers.

### *Section 204f Channel Deepening Feasibility Study, Lead Economist, Port of Corpus Christi Authority*

Prepared the Feasibility Study Economics Appendix for deepening channels within the Corpus Christi Harbor to allow the full loading of Very Large Crude Carriers (VLCCs). Estimated the NED benefits of the project by using HarborSym. Estimated the net NED benefits based upon annualized benefits and costs.

### *Hashamomuck Cove Coastal Storm Risk Management Study, Lead Modeler, USACE New York District*

Used the Beach-Fx Model to evaluate the economic benefits of beach nourishment. Estimated the reduction in coastal storm damages under several alternatives based upon historical storm data. Evaluated the impact of coastal storm damages upon hurricane evacuation routes. Estimated the recreation NED benefits of beach nourishment. Estimated the net NED benefits based on life cycle cost.

### *East Rockaway to Rockaway Inlet and Jamaica Bay, NY Reformulation Study: Economic Reformulation, Beach-Fx Alternative Analysis, Lead Economist, USACE New York District, New York, New York*

Used the Beach-Fx Model to evaluate beach improvements to reduce coastal storm damage to the Rockaway Peninsula. The Beach-Fx Model is the USACE certified model for evaluating the benefits of coastal storm damage reduction projects. The evaluation considered potential sea level changes.

### *Texas Coastal Resiliency Master Plan, Lead Economist, Texas General Land Office*

Estimating the economic impact from construction of Texas Coastal Resiliency Projects and estimating the economic benefits of improving environmental attributes of the Texas coast.

## Taylor Nordstrom, PE – Coastal Engineering Lead

### Education

- BS / Civil Engineering / University of Texas at Austin
- Coastal Engineering Certification / Old Dominion University

### Registrations and Certifications

- 2018 / PE / TX / 131201 (Civil)
- HAZWOPER 40-hour
- AECOM Certified Project Manager

Ms. Nordstrom has six years of experience working on coastal restoration, coastal/maritime planning, and coastal management projects. Her relevant experience includes design (erosion control structures, living shorelines, site development, beneficial use of dredged material), modeling (coastal flooding), construction oversight, site monitoring (wetlands, oyster reefs), large-scale planning for state agencies (coastal master planning, ports master planning), outreach (technical advisory committee meetings, stakeholder outreach), and other technical analyses. Ms. Nordstrom is a Young Member leader for the Coasts, Oceans, Ports, and Rivers Institute (COPRI) of ASCE Houston Chapter and a member of the American Beach and Shore Preservation Association (ASBPA).

### *Texas Coastal Resiliency Master Plan, Deputy Project Manager, Texas General Land Office*

Ms. Nordstrom serves as the Deputy Project Manager assisting the Texas General Land Office (GLO) with developing the 2019 Texas Coastal Resiliency Master Plan. The Plan was published in March 2019 and will help the GLO guide coastal management and funding administration throughout the state's 18 coastal counties. Ms. Nordstrom's responsibilities include: developing criteria to assess coastal project performance; coordinating storm surge modeling efforts (SLAMM, SWAN+ADCIRC) between GLO, the U.S. Army Corps of Engineers, and Texas A&M University-Corpus Christi; formulating adaptive management strategies for proposed coastal projects; and enhancing inter-agency coordination with federal, state, and local entities to expand beneficial use of dredged material opportunities. The total cost of the recommended projects in the 2019 Plan is $5.4 billion.

### *Shoal Point Dredge Placement Site Owner Representative, Lead Engineer, Texas General Land Office*

AECOM is serving as the Owner Representative to place dredged material at the Texas General Land Office (GLO) owned Shoal Point Dredge Placement Area (PA) in Texas City, TX. Primary tasks include preparing procedures for the Sampling and Analysis Plan (SAP) for dredged material planned for placement at the PA, preparing Placement procedures for proper site construction and long-term management, reviewing submittals from third-parties planning to place material at Shoal Point, and providing construction oversight of dredged material placement at the PA. Ms. Nordstrom's responsibilities included preparing the Dredge Placement Procedures, coordinating placement schedules and construction activities with the GLO and third-party contractors, and construction oversight.

### *Corpus Christi Ship Channel BU Site Development, Project Manager, Port of Corpus Christi Authority*

AECOM prepared bid documents for construction of several Beneficial Use (BU) sites for dredged material originating from projects in the Corpus Christi region. The project leveraged permit-level conceptual designs from the Corpus Christi Ship Channel 75-ft Deepening Project for three BU sites adjacent to the Corpus Christi Ship Channel. The work involved preparing 60-, 95-, and 100-percent bid packages, including drawings, specifications, and a design documentation report for the BU sites. The work included assessing wind and wave impacts at the sites, analyzing shoreline erosion and shoreline protection measures, determining the geotechnical stability of subsurface conditions and the design features, design for special aquatic site construction, and cost evaluations of the final construction. Responsibilities included project management, leading the design technical tasks, assisting in agency coordination, and leading the development of the final bid drawings, specifications, and design report.

## Patrick Snyder, PE – Engineering

### Education

- MS / Coastal Engineering / University of Delaware
- BS / Civil and Environmental Engineering, Engineering and Public Policy (Double Major) / Carnegie Mellon University

### Registrations and Certifications

- 2014 / PE / FL / 76969
- 2018 / Certified Floodplain Manager / FL / US-18-10319

Mr. Snyder is a coastal engineer whose experience includes all aspects of coastal engineering project formulation and implementation from engineering feasibility studies and design through bidding and contract preparation, construction oversight, and project monitoring for beach restoration projects and coastal structures throughout the US and in the Caribbean. Mr. Snyder has performed detailed statistical construction cost analyses and conducted numerical modeling studies on climate change, wave/current interaction, storm-induced shoreline impacts, and sediment transport dynamics. He has been responsible for the design, development, and geotechnical analysis of dredge borrow areas. Additionally, he has experience permitting projects at the state and federal level throughout the southeast and has conducted floodplain modeling and analysis in support of FEMA flood insurance studies.

### *Corpus Christi Shipping Channel 75 ft Deepening Project Feasibility Study, Port of Corpus Christi Authority, Corpus Christi, TX*

Mr. Snyder is the technical lead responsible for feasibility analysis and design of an approximately 7 million cubic yard beach and dune restoration along the southern end of San Jose Island as a Beneficial Use of Dredged Material (BUDM) from the proposed deepening of the CCSC.

### *Various Private Clients throughout The Bahamas and Caribbean*

Mr. Snyder was an investigator responsible for site evaluation, planning, and engineering design of various shoreline protection and beach management projects for both resorts and private homeowners throughout the Caribbean, including the design of seawalls, revetments, breakwaters, and beach restorations.

### *South Island Emergency Beach Fill Project, Hilton Head Island, SC*

Mr. Snyder was the primary investigator responsible for a post-disaster (Hurricane Matthew) storm impact assessment, development of project worksheets for FEMA damage assessments, and the design and permitting of a beach fill project to address those impacts. Additionally, in order to address immediate threats to upland infrastructure exposed by storm erosion, Mr. Snyder rapidly developed plans utilizing sand scraped from the intertidal beach for the reconstruction of breached dunes and the emergency construction of a protective beach berm along a portion of the shoreline that had been critically eroded.

### *Bathtub Reef Beach/Sailfish Point Renourishment Project, Martin County, FL*

Mr. Snyder was the primary investigator responsible for investigation of sediment resources in St. Lucie Inlet and the development of beach-compatible sand borrow areas. He designed the sediment sampling plan and oversaw Vibracoring operations, adapting the sampling plan in the field based on the samples collected and conditions encountered. He designed a plan for the dredging of beach-compatible sand based on a geological investigation of the collected cores as well as seafloor and subbottom surveys of the study area.

### *Island-wide Beach Renourishment Project, Hilton Head Island, SC*

Mr. Snyder was the primary investigator responsible for engineering feasibility study, geotechnical investigation and development of offshore borrow areas, Delft3D model analysis of dredging impacts to inlet flow patterns, engineering design, analysis, and modeling, permitting, development of design plans and project scope, and post-project physical monitoring for a 2.0 MCY beach renourishment project. In addition, Mr. Snyder rapidly developed updates to project plans and beach fill quantities in response to multiple tropical storms – most notably Hurricane Matthew- that struck the project during construction and necessitated frequent re-evaluation of fill needs.

## Jeremy Mull, PE – Engineering

### Education

- MS / Coastal and Ocean Engineering / Oregon State University
- MS / Oceanography / University of Alaska, Fairbanks
- BS / Environmental Studies / University of California, Santa Barbara

### Registrations and Certifications

- 2013 / PE (Civil) / California, #C82163
- AECOM Certified Project Manager

Mr. Mull is a coastal engineer with 10 years of consulting experience during a 15-year career in coastal engineering and science. He has a diverse background in engineering, physical oceanography, and coastal geomorphology. At AECOM, he has participated in a variety of projects focused on coastal vulnerability to flooding and inundation, sea level rise and climate change adaptation, tsunamis, structure design, coastal erosion, and shoreline restoration. He has authored technical papers in research journals, presented project work at technical conferences, and meets often with clients and communities to discuss and develop projects. His technical work has included analysis of nearshore wave processes, modeling of storm-induced dune erosion and structure overtopping, tsunami modeling, analysis of long-term shoreline retreat, coastal flood mapping, statistical analysis of wave and water level data, sediment transport analysis and modelling, and terrain modeling. He also has experience in shoreline restoration and the design and costing of coastal flood protection structures including breakwaters, revetments, seawalls, beaches, and living levees. He has project experience in California, Hawaii, Washington, Alaska, New York, Massachusetts, Florida, and British Columbia. Mr. Mull is interested in using engineering to help communities and agencies understand and prepare for the hazards associated with erosion, long-term shoreline change, sea level rise, and tsunamis.

### *FEMA Region I Coastal Erosion and Sea Level Rise Study, Massachusetts, Rhode Island, and New Hampshire*

Coastal Engineering Lead and Deputy Project Manager. AECOM conducted a successful pilot study, later expanded to a much larger study, to produce future coastal erosion hazard maps for the shorelines along Massachusetts, Rhode Island, and New Hampshire for the Federal Emergency Management Agency (FEMA). The maps account for historical trends in bluff, beach, and dune erosion and incorporate projected future sea level rise. Mr. Mull has led the development of the technical approach, which includes analysis of bathymetric and topographic LiDAR data, historical aerial photographs, tide gage data, wave data, local sea level rise projections, and analysis of wave setup and runup. Mr. Mull met with key stakeholders to discuss the project and how coastal communities could use the maps for future planning.

### *Port of San Francisco Shoreline Improvement and Design, Crane Cove, San Francisco, California*

Coastal Engineer and Engineer of Record. The Port of San Francisco requested a coastal engineering analysis and design for of the shoreline in Crane Cove in San Francisco Bay. Mr. Mull helped develop a beach nourishment and revetment design to improve safe public shoreline access, provide a small boat launch, and prevent coastal erosion and flooding. The analysis included determination of design wave conditions, sediment transport, wave setup and runup, and future sea level rise. Mr. Mull reviewed the coastal engineering analysis and design, stamped the coastal drawings, and served as the coastal engineer of record. FEMA Post-Harvey Coastal Erosion Hot Spot Analysis, Texas

### *City of Olympia Sea Level Rise Response Plan, Olympia, Washington*

The City of Olympia requested that AECOM develop a sea level rise response plan to address existing and future flooding issues in the downtown area, including at the Port of Olympia and Budd Inlet wastewater treatment plant. Mr. Mull assisted in a climate science review, developing a sea level rise planning framework, vulnerability and risk assessment, strategy development and evaluation (including development of conceptual shoreline protection structures and features), and development of the plan, which laid out an actionable strategy to address flooding and SLR in the downtown area. The plan analyzes options for protecting downtown and develop recommendations, implementation schedules, decision-making thresholds, funding needs, and emergency response approaches to address SLR vulnerabilities and risks in the future.

## Chris Reed, PhD – Modeling Lead

**Education**

- Post Doctorate Studies / Coastal Engineering Department / University of Florida
- PhD / Engineering Science and Mechanics / University of Florida
- MS / Engineering Science and Mechanics / University of Florida
- BS / Engineering Sciences / Georgia Institute of Technology

Dr. Chris Reed has 30 years of experience in conducting sediment transport, hydrodynamic, water quality, stormwater, fate and transport analysis in support of feasibility studies, design, and permitting. His modeling experience includes rivers, lakes, bays estuaries and tidally and wind dominated coastal regions along the Atlantic, Pacific and Gulf coasts. He has focused on the development and application of purpose-built one, two- and three-dimensional transport models for specialized applications in these areas. He has developed and applied hydrodynamic models for circulation, water quality, shoreline response, sediment transport, inlet dynamics, and storm surge analysis. Dr. Reed is also experienced in the application of standard process-based transport models including EFDC, DELFT3D, CMS, ADCIRC, HEC, SWWM, UNET, HSPF, WaSh, STWAVE, and SWAN as well as many others. He is a co-author on the CMS model hydrodynamic and transport model, which is part of the USACE supported SMS software package. Dr. Reed has applied these models for industrial clients and governmental agencies and often coordinates with academic institutions.

Dr. Reed is experienced with the design and implementation of field measurement programs, data collection and data analysis techniques. He has designed and participated in field measurement projects for obtaining boundary, calibration, and validation data and for site characterization and assessment.

### *Packery Channel Sediment Transport Study and Jetty Design, Corpus Christi, TX (USACE, Galveston District)*

Dr. Reed conducted a sediment transport study to estimate the sediment transport adjacent to and into a proposed channel with jetties. The analysis included applications of the STWAVE model to determine local wave conditions and the GENESIS model to estimate sediment transport and beach evolution. Additional work was conducted to provide design wave conditions for jetty design. The results of the analysis were used to estimate sand bypassing requirements and design wave conditions.

### *Hampton Breach Sediment Transport Breakwater Design Hampton, VA*

The City of Hampton, Virginia was pursuing a design plan and Joint Permit Application to restore the beach at Factory Point and to improve navigation channels in Back River. The beach was breached and subsequently destroyed during a storm in 1998. The breach has reduced the protective characteristics of the shoal and shoreline. As a result, wave energy has a higher potential of passing into the Back River area, and sediment transport into channels and other features is occurring. The project has a number of components, including the preparation of construction documents (specifications) for the channel improvements, beach restoration and breakwater designs, design and permitting of the breakwaters themselves, and a Shoreline Management Plan. Dr. Reed conducted sediment transport modeling needed to support the design of breakwaters to protect the restored beach. The GENESIS shoreline evolution model has been used for the modeling analysis. The model was calibrated to historical shoreline evolution data. A number of alternative breakwater designs were evaluated with the calibrated model and combined with construction and long-term maintenance costs to determine the optimum design.

### *Indianola Groin Field Design and Analysis, Texas GLO, Indianola, TX.*

The Indianola beaches are located on the western shoreline of Matagorda Bay and were experiencing excessive erosion, and subsequently exposing upland structures to potential storm surge damage. Dr, Reed conducted sediment transport and shoreline evolution modeling to support eh design of the groin and detached breakwater system. The modeling was calibrated to historical erosion data and then used to optimize the groin field design, reduce potential for down-drift erosion and estimate the need for initial and maintenance nourishment in the adjacent beach reaches.

## Harrison McNeil (Hanson) – Data Collection Lead

Mr. McNeil has been exposed to multiple facets of environmental science as they pertain to the coastal realm. Both academically and professionally he has over 10 years of experience studying the Gulf Coast and its resources. Mr. McNeil is especially well versed in coastal habitats and geospatial analysis via ArcGIS. Most recently he has been responsible for hosting public meetings, environmental plan development for local government, wetlands delineations and UAV (drone) operations across the country.

### Education

- BS / Ocean and Coastal Resources / Texas A&M University at Galveston
- MS / Marine Resource Management / Texas A&M University at Galveston

### Registrations and Certifications

- FAA Licensed Small UAV Pilot
- Certified Wetland Delineator
- CPR and First Aid Certification
- Certified Coastal Practitioner (In-Progress)

### *Sinton Site Development UAV Operations*

Collected high-resolution aerial imagery and topographic data for 2,500 acres site during various stages of development. Planned and conducted all data collection, postprocessed data to derive deliverables including topographic contours and volumetric calculations.

### *City of South Padre Island Windsurf Venue Permit Consultation*

Conducted meeting with City officials and local stakeholders for the purpose of creating a Windsurfing park in federally designated critical habitat. Developed preliminary design and presented project to state and federal agencies at USACE Joint Evaluation Meeting.

### *Nueces County-Owned Kleberg Tract*

Planned and hosted public outreach and scoping meeting for land use and restoration plan for 3800 acre tract on North Padre Island. Developed various exhibits from UAS (drone) imagery and various spatial analytics. Development report for the County for best management practices for tract including 5 miles of beach dune complex.

### *Cameron County Beach Monitoring*

Conducted bird use surveys on South Padre Island beaches for Cameron County to fulfill special condition requirements of Beach Nourishment permit. Assisted County in attempts to extend permit prior to resubmission.

### *Seabreeze Drainage Study*

Conducted UAV operations to collect survey grade elevations of residential development in Corpus Christi. Utilizing real time kinematic GPS in conjunction with UAS to generate contours elevations at one-tenth of a foot with a ground sampling distance of 1 pixel per square inch.

## Roy Castillo (Hanson) – Survey

**Registrations and Certifications**

- Registered Professional Land Surveyor / Texas (1994) / No. 5061

Mr. Castillo has over 35 years' experience in surveying with over 23 years in the management sector with professional experience in land title surveys, right of way and easement surveys, boundary retracement surveys, detailed topographic surveys for engineering design, aerial mapping control surveys, hydrographic surveys, port and harbor surveys, oil and gas drilling site surveys, historical title research and map preparation.

### *NAVFAC Mid-Atlantic Sites, Norfolk / Portsmouth, VA*

This project included development of primary and secondary Horizontal and Vertical Control for aerial mapping. Performed the installation of aerial control panels consisting of photo identification points, painted and fabric panels. Performed field measurements of the control points. Reviewed project calculations, developed and standardized a formal Survey Report of data results for aerial triangulation and mapping deliverables.

### *Survey Lead, NAVFAC Mid-Atlantic Sites, Virginia Beach / Chesapeake, VA*

This project included development of primary and secondary Horizontal and Vertical Control for aerial mapping. Researched private property owners and coordinated access into private properties. Performed the installation of aerial control panels consisting of photo identification points, painted and fabric panels. Performed field measurements of the control points. Reviewed project calculations, developed and standardized a formal Survey Report of data results for aerial triangulation and mapping deliverables.

### *Survey Lead, Storm Water Master Plan Project, City of Corpus Christi, Corpus Christi, TX*

Coordinated the GPS survey operations for the horizontal and vertical verification of LIDAR Mapping of a 306 square mile study area in Corpus Christi, Texas.

### *Survey Lead, Storm Water Master Plan, Texas Department of Transportation Corpus Christi District, Corpus Christi, TX*

Coordinated the GPS Survey operations for the horizontal and vertical verification of LIDAR Mapping of a 26 square mile study area in Padre and Mustang Island near Corpus Christi, Texas.


# Project Experience (D, E, F and G)

## Similar Project Experience (D)

### Texas Coastal Resiliency Master Plan

**Client:** Texas General Land Office

**Contact:** Joshua Oyer
Coastal Resources Division Project Manager
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512-475-5130

**Location:** Texas Coastwide

**AECOM Services:** March 2016 – Present

**AECOM Budget:** $3.9M

**AECOM Project Manager:** Chris Levitz

**Relevant Experience**

- Consensus Building
- Coastal Planning
- Resilient Dune and Beach Design
- Coastal Modeling
- Coastal Economic Analysis

In March 2019, the Texas General Land Office (GLO) released the second Texas Coastal Resiliency Master Plan (Resiliency Plan or Plan), an ambitious coastal planning effort to restore, enhance and protect more than 367 miles of coast and 3,300 miles of bays and estuaries for the State of Texas. The Resiliency Plan was selected by the Climate Change Business Journal for a project merit award in 2019 under the climate change adaptation and resilience category. The Resiliency Plan emphasizes shoring up the coast by using nature- and infrastructure-based projects that are reviewed by and coordinated with a Technical Advisory Committee of over 200 coastal experts and stakeholders, including members of federal, public, and private entities. The recommendations made in the Resiliency Plan are backed by current findings on Texas coastal environments, storm surge and relative sea level rise predictions, economic benefits, and ecosystem services, among others. By championing a statewide Resiliency Plan to guide coastal management, the GLO will assure that Texas works to restore, enhance, and protect its coastlines and communities now and in the future.

AECOM has been the sole engineering contractor working with the GLO to develop the Texas Coastal Resiliency Master Plan since the first iteration in 2017, and currently serves in this capacity working towards the 2023 Plan. AECOM's role has been multi-faceted, including both planning and technical tasks. AECOM's planning tasks included facilitating stakeholder engagement and collaboration, identifying opportunities for innovative restoration methodologies for marine habitats (living shorelines, sediment management planning, sea level rise adaptation measures), and writing/producing the final Resiliency Plans. The technical tasks undertaken by AECOM include project reviews, economic

analyses, coastal resiliency project design guides, coastal modeling, and initiating a Technical Working Group (TWG) working to value ecosystem services.

The TWG, which began meeting in early 2020, is comprised of subject matter experts on ecosystem service economic valuations and hazard mitigation funding. To improve the future project selection process, the GLO is interested in gaining a better understanding of the costs and the value of the benefits provided by green and hybrid green-gray infrastructure solutions for coastal resiliency. This interest is part of a greater goal to evolve the project evaluation process by modifying the metrics used to better capture the important values that the nature-based components provide, so that green-gray hybrid infrastructure projects may score higher in evaluation tools, gain greater access to funding sources, and ultimately provide greater project solutions than traditional gray infrastructure alone. The aim is that through the course of this project, GLO and AECOM can work collaboratively with the TWG to advance this field and work toward better tools, data, and best practices for integrating green and hybrid infrastructure into Texas coastal resiliency planning for a stronger and more resilient Texas coastline.

Through the Resiliency Plan, AECOM is working to communicate that the Texas Gulf Coast is a dynamic and changing environment. The multitude of investigations conducted by the world's top coastal researchers point to a future Texas coast that has already been and will continue to be susceptible to sea level rise, subsidence, and erosion. In order to plan for changing future scenarios, AECOM continues to look to understand probable changes to the coastal environment that can be addressed by ecological planning, monitoring, and adaptive management. In addition, AECOM will continue to assess gaps in resiliency and recovery needs within Texas to open the door for new solutions to help Texas's coastal communities develop as responsible stewards of their coastal assets.

# SPI Wind and Water Sport Venue

**Client:** City of South Padre Island

**Contact:** Kristina Boburka
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956-761-3837

**Location:** South Padre Island, Texas

**AECOM Services:** February 2020 – Present

**AECOM Budget:** $15K

**AECOM Project Manager:** Chris Levitz

**Relevant Experience**

- South Padre Island Processes
- Stakeholder Engagement
- Consensus Building

The bays, beaches, estuaries, and wetlands and drainageways of the Rio Grande Valley offer a rich and complex ecosystem of marine and wildlife habitat that support fishing, swimming, boating and world class birding opportunities for local citizens and visitors. These rich habitats complement each other and play an important part in the high quality of life available to local citizens and visitors. Hanson Professional Services and AECOM worked together to provide the City or South Padre Island with an innovative approach to developing the venue as envisioned by the City staff, leadership and regional stakeholders.

AECOM offered their services as sub-consultants to Hanson Professional Services to conduct a desktop-level review of Hanson's Water and Wetlands Delineation and Habitat Characterization of the approximate 137-acre project review area. Preparation of the mitigation plan included consideration of many mitigation options in coordination with the City.

The resources surveyed within the approximately 137-acre Project Review Area (PRA) were found to be degraded and heavily impacted by ongoing anthropogenic activities. Historically, the PRA has been leased to a private wind-sport club and has provided unrestricted vehicular access to the Laguna, allowing those engaging in watersports the opportunity to drive their equipment-loaded vehicles across the tidal flats, and thereby gain access to an unrestricted shoreline. The unfettered access has resulted in impacts on the critical habitat of the piping plover and surrounding marsh vegetation. Wetland vegetation and tidal flat habitat are currently impacted by the access to and use of the PRA.

The proposed mitigation strategy uses the PRA as the compensatory mitigation site. The slopes associated with the designed permeable-surface parking areas, laydown area, and permeable-surface vehicular paths would be graded at a 4 to 1 ratio and planted with native halophytic vegetation creating 10,093 square feet (0.232 acre) and 11,979 square feet (0.275 acre) of brackish marsh and salt marsh, respectively (Exhibit 16). This planting and strategic design element allow for the impacted resources to be mitigated within the project footprint, avoiding further site impact or a need for upland conversion. The approximately 58,806 square feet (1.35 acres) of impacted tidal flats would be offset by the 80.85 acres of tidal flats that would be protected from anthropogenic impacts through the installation of the vehicle deterrents such as signage and bollards.

The interim hydrogeomorphic model (iHGM) for initial potential functional capacity unit (FCU) impacts are calculated as a worst-case scenario based on fill or an impervious cover being placed within jurisdictional waters before any compensatory mitigation. The plan outlines the short and long-term avoidance and mitigation methods and outlines the observation and survival expectations associated with the various components. Due to the current degraded state of the PRA habitat, the combination of preserving the currently impacted tidal flats and the creation of marsh habitat in conjunction with planned project components offer commensurate mitigation measures.

# SPI Beach-Fx Modeling

**Client:** Texas General Land Office

**Contact:** Joshua Oyer
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512-475-5130

**Location:** South Padre Island, Texas

**AECOM Services:** February 2020 – August 2020

**AECOM Budget:** $100K

**AECOM Project Manager:** Chris Levitz

**Relevant Experience**

- South Padre Island Processes
- Sediment Management
- Coastal Risk Analysis
- Dune and Beach Modeling

South Padre Island, located on the southern tip of Texas, is a tourist destination with many high-rise structures facing the Gulf of Mexico. Construction of the Brownsville Ship Channel jetties impacted the natural movement of sand from the south, impacting the natural berm width and lessening the town's protection from coastal storms. Periodically, the beneficial use of dredged material from maintaining the Brownsville Ship Channel has been used to improve coastal storm protection. As part of the Texas Coastal Study, a U.S. Army Corps of Engineers study for which the Texas General Land Office is a non-federal project partner, an analysis was undertaken to determine if scheduled planned beach nourishment qualified as a federal project, which would reduce the non-federal cost share.

Beach-Fx is an event-based, Monte Carlo life-cycle simulation model developed by the USACE to strengthen the linkages between engineering analysis, alternative analysis, and economic justification for coastal storm damage reduction projects. The certified program assists users in evaluating and analyzing the benefits and costs of hurricane protection and storm damage reduction projects. Beach-Fx uses information on historic storm responses and associated damage functions to determine the total cost of erosion, inundation, and wave damages to structures and contents with various project alternatives.

By modeling the storm responses under with- and without- project conditions, Beach-Fx measures the overall reductions in storm damage. The simulation results are used for a comparative analysis of alternative beach improvements and to support a feasibility level benefit-cost analysis.

The original Beach-Fx results described in the 2018 Draft Report for the Coastal Texas Study did not include planned nourishment of all highly developed reaches. AECOM evaluated all the prior inputs to Beach-Fx for reasonableness. AECOM then used Beach-Fx to evaluate multiple beach nourishment alternatives with different reaches nourished, berm widths, and nourishment cycles under changing sea level conditions. AECOM summarized the reduction in structure damages as average annual values for each alternative to determine their net National Economic Development (NED) benefits and benefit-cost ratio. The reanalysis resulted in an additional reach included in the federal project.

# TxDOT Coastal Chapter

**Client:** Texas Department of Transportation

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**Location:** Texas Coastwide

**AECOM Services:** January 2019 – Present

**AECOM Budget:** $230K

**AECOM Project Manager:** Chris Levitz

**Relevant Experience**

- Coastal Guidance Document
- Coastal Risk Assessment
- Coastal Processes

The Texas Department of Transportation (TxDOT) determined a need to add a coastal chapter to their Hydraulic Design Manual (HDM), given the significant amount of roadway infrastructure within areas of coastal influence—nearly one quarter of the Texas population is along the coast. AECOM was selected for their technical and planning expertise in the coastal field along with their transportation design history in Texas. Under this effort, AECOM developed a coastal chapter to include in the HDM providing guidance to agency project managers and professional design engineers. This guidance recommends when coastal analysis should be considered during infrastructure design and how best to complete these analyses. AECOM also employed the newly developed guidance in a pilot project scenario and provided TxDOT with training in the coastal concepts presented within the chapter.

**Task Order 1: HDM Coastal Chapter 15**

This chapter includes an array of coastal concepts, beginning with general coastal applicability to transportation infrastructure to assist the reader in determining whether their design project should consider coastal influences. After determining applicability, AECOM provided content covering coastal water levels, which includes tides and relative sea level rise, as well as coastal dynamic forces—both waves and currents. Following this was guidance on determining design water levels, with consideration of the structure type, coastal conditions and wave effects. The next section discussed resulting risks for structures along the coast from erosion, primarily discussing scour but also covering the concept of long-term coastal shoreline changes due to sediment transport. AECOM also provided insight to coastal construction materials, living shorelines, and other unique considerations for coastal systems. This chapter will be appended to the existing Hydraulic Design Manual as Chapter 15, to assist designers in taking a proactive approach to mitigate risk to coastal transportation structures in the long-term.

**Task Order 2: Key Allegro (Bayshore Drive) Bridge Evaluation, TxDOT HDM Training, and Chapter Maintenance**

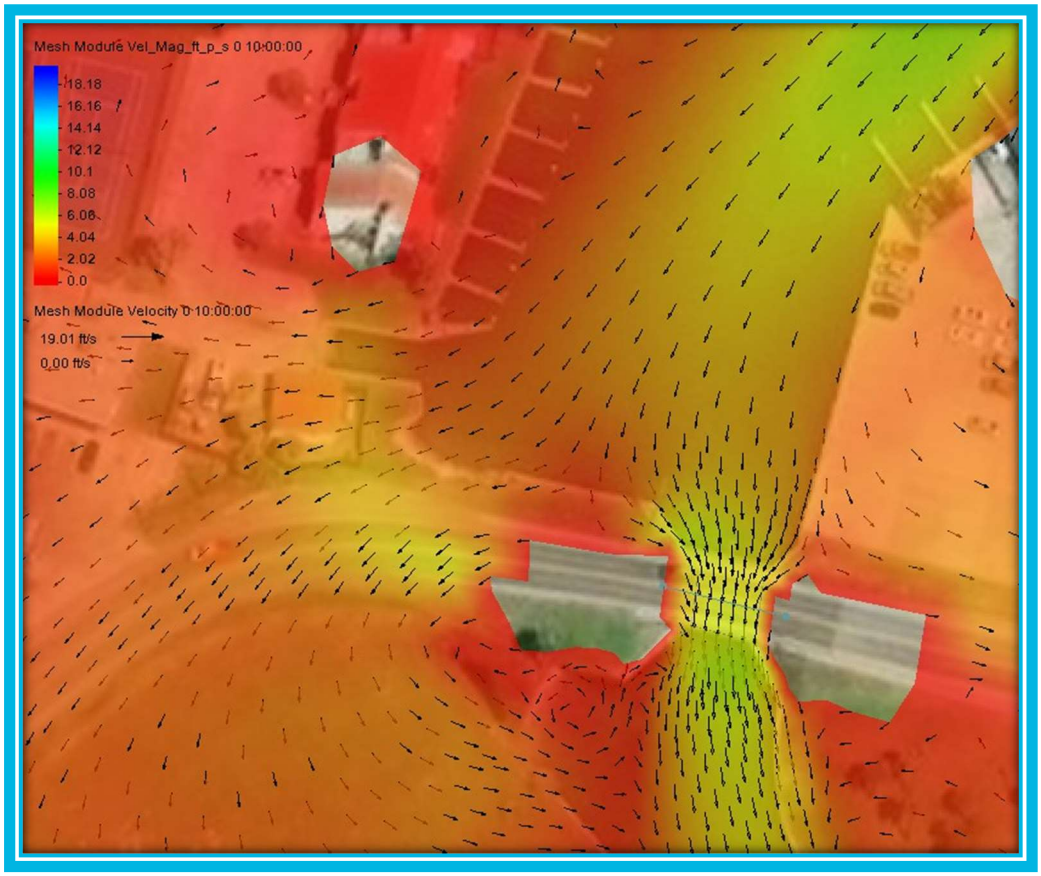
As a follow-up to the chapter development three items were scoped to be completed by AECOM to support the initial contract: modeling and report on coastal impacts to Key Allegro Bayshore Drive Bridge; TXDOT Training on Chapter 15; and further chapter updates to align with the anticipate release of latest version of the Federal Highway Administration (FHWA) HEC-25 manual.

For the first item, TxDOT was designing a replacement bridge for the Bayshore Drive Bridge in Rockport, Texas. The project was fast-tracked as a result of the existing bridge being damaged from Hurricane Harvey in August 2017, and the bridge serves as the only mainland access for the Key Allegro island community and is an off-system bridge with restricted space. AECOM developed a technical approach that employed the HDM coastal chapter guidance. Tasks

included assessing hydraulics regarding the design elevations, completing a scour evaluation, and developing recommendations for erosion countermeasures. Deliverables included a hydraulic data sheet and report discussing the bridges relative level of risk with respect to each task. Design parameters were developed through various levels of analyses and for various recurrence intervals matching both FHWA and TxDOT standards. The design water elevations were based on the HDM Level Two analysis procedure, FEMA FIS coastal transects, and FEMA STWAVE model results. The design velocities were developed from hydraulic numerical modeling. The design wave height was a desktop level assessment and application of FEMA STWAVE and the nearest Wave Information Studies (WIS) station. Scour analysis was performed for the design still water plus sea level rise, and it does not include wave effects. The design of embankment and abutment protection was also included in the report.

For the second item, the AECOM team prepared a training presentation on the HDM Coastal Chapter 15 for internal use at TxDOT. The presentation was divided into five main parts: introductory information to help determine when it's appropriate to consider coastal conditions in project design; factors that contribute to stillwater levels; nearshore processes, such as waves and currents, and how we can combine them with stillwater levels to create a design elevation to use in the project; common sources of coastal erosion and ways to mitigate it in project design; and conclude with key lessons learned and cover any additional questions. During the presentation there were several break-out sessions with interactive case studies, allowing the information learned to be applied. One breakout session on design elevations utilized the actual Key Allegro Bridge project.

Finally, the ongoing maintenance of the chapter will be completed once the latest version of FHWA HEC-25 is released, as well as incorporating any other edits as requested by TxDOT.



# Virginia Point Living Shoreline

**Client:** Texas General Land Office and Scenic Galveston

**Contact:** Lalise Mason
Habitat Restoration Chair
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713.725.8101

**Location:** Galveston Bay, Texas

**AECOM Services:** October 2006 – December 2019

**AECOM Budget:** $350K

**AECOM Project Manager:** Chris Levitz

**Relevant Experience**

- Shoreline Processes
- Shoreline Design
- Innovative Solutions in Constrained Location

The Virginia Point Peninsula Preserve is located near Galveston Bay, Texas is owned and maintained by the locally-based nonprofit group Scenic Galveston, Inc. The 3,000-acre preserve features undisturbed, native coastal tallgrass prairie and is bordered to the south and east by over 10,000 feet of shoreline along Galveston Bay, much of which historically suffered from rapid erosion that in some areas exceeded 10 feet per year. The persistent wave impacts along the shoreline sloughed large portions of the clayey uplands into the bay each year, creating an eroding bluff almost five feet in height in the areas of heaviest erosion and equating to a loss of over 90 acres of valuable coastal habitat between 1956 and 1995 alone. The Virginia Point Wetland Protection Project used a living shoreline approach (combining engineered structures with nature) to stabilize the eroding shoreline.

The Virginia Point Wetland Protection Project was the culmination of 10 years of planning, alternatives analysis, permitting, and final design that AECOM performed in coordination with Scenic Galveston and the Texas General Land Office. Over the course of the design process, AECOM accounted for environmental considerations (e.g. American Oystercatcher nesting, oyster recruitment, impacts to the coastal prairie), unique design components based on aesthetics and client preferences, and mitigate construction challenges (e.g. site access by barge only, rip rap placement techniques). AECOM also served as the construction oversight engineer, and construction of the project was completed in September 2016. The final design included over 6,000 linear feet of nearshore, segmented limestone breakwaters with parallel to the Virginia Point shoreline at a cost of approximately $4 million dollars. The placement and spacing of the breakwaters were designed to produce several large cells behind the breakwaters to allow for up to 35 acres of future marsh creation. The breakwater cells were designed to retain and accumulate sediment naturally to create a sediment bed for marsh planting, and some of this acreage was planted in 2018 and 2019. Three years of post-construction monitoring, led by AECOM, was completed at the site as of 2019.

An innovative breakwater design and construction method was used to achieve three-fold project goals of (1) improving overall site aesthetics while mitigating shoreline erosion, (2) providing ecological benefits to the wetland complex, and (3) minimizing overall cost. Variable or “undulating” breakwater crest elevations from a high- to low-crest elevation offered cost-saving benefits by reducing the cross-sectional area of the breakwaters, thereby minimizing the volume of stone needed per linear foot of breakwater construction and providing environmental benefits to bird species. The crenulated breakwater crests support bird populations by providing isolated, elevated nesting areas above mean high water levels that are offshore, protected from inland predators, and benefit territorial species that do not like to roost or nest in close proximity to other birds. The unique approach to living shoreline design earned the project an inaugural Best Restored Shore award from the American Shore & Beach Preservation Association in 2019.

# AECOM Project Successes (E)

## FEMA Harvey Coastal Erosion Hot Spot

**Client:** FEMA Region 6
**Location:** Central and Upper Texas Coast
**AECOM Project Manager:** Chris Levitz

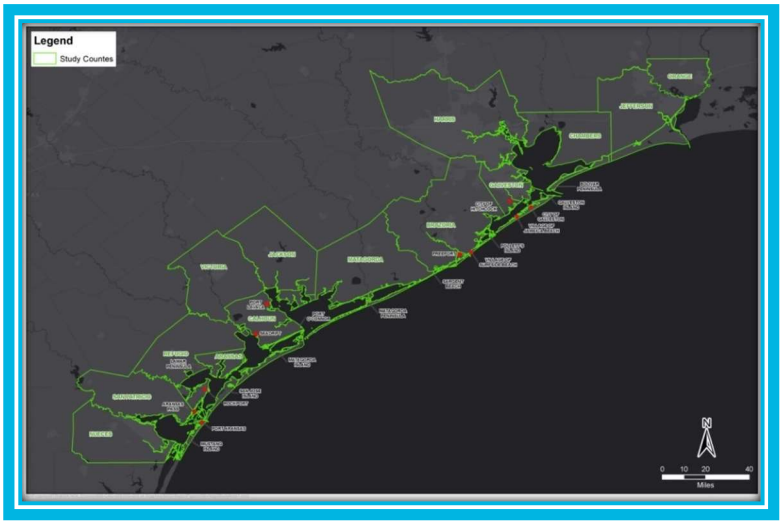
### Success Factors

- Zero Change Orders
- Emergency Response – Rapid Timeline and Execution
- Innovative Data Analysis Assisting Federal Funding Decisions
- Provided Value to Robust Beach and Dune System

As documented by the National Hurricane Center (NHC) Tropical Cyclone Report, Hurricane Harvey made landfall as a Category 4 storm on August 26th, 2017 at the northern end of San Jose Island, east of Rockport, on the Texas coast. The storm moved inland and made a second landfall on the northeast coast of Copano Bay and within 12 hours weakened to a tropical storm. The storm slowed and began to loop back to the coast, moving offshore in Matagorda Bay on August 28th. Once offshore again, and upon re-entering the Gulf of Mexico, the storm followed a north-northeast trajectory while maintaining tropical storm level winds, and ultimately made final landfall on August 30th on the southwestern Louisiana coastline. The storm caused torrential rains, particularly in southeast Texas, but it also generated storm surge and waves that caused erosion of the coastline across a portion of the Texas coast.

Compass was contracted by Federal Emergency Management Agency (FEMA) in October 2017 to identify erosion and degradation of natural coastal features as a result of Hurricane Harvey, and to investigate whether the erosional changes identified could increase the level of coastal flood risk for coastal communities in Texas. Increased levels of coastal flood risk for a given community were then defined as erosion hot spots. The analysis did not attempt to determine the magnitude of the increased level of coastal flood risk; rather, the analysis took a qualitative approach, supplemented by quantitative findings, to determine erosion hot spots that were then recommended for further study and potential future restoration. The erosion hot spot analysis was conducted using imagery and topographic data from pre- and post-storm investigations to identify locations of the coast that experienced erosion from the storm.

Compass established a study area for consideration under the coastal erosion hot spot analysis by developing a region of potentially impacted coastal counties. The study area extends from Nueces County on the southwestern extent to Orange County on the northeastern extent, covering 14 coastal counties in total. Within these counties, areas of coastal flood hazard analysis from FEMA coastal models were used to establish areas of analysis. Review of hindcast storm surge data the NHC Hurricane Harvey Report allowed Compass to identify communities of interest for erosional impacts at the initiation of the analysis. In addition, the Compass team prioritized developed locations in the study area given the analysis purpose.



# Moses Lake Living Shoreline

**Client:** Galveston Bay Foundation
**Location:** Moses Lake, Galveston Bay, Texas
**AECOM Project Manager:** Chris Levitz

## Success Factors

- Zero Change Orders
- Mitigated issues with construction contractor
- Innovative project design, maximizing protection and habitat creation
- Adapted design to changing site conditions

The Moses Lake Shoreline Protection Project is a multi-phase living shoreline erosion control project located in Texas City, Texas that was constructed in phases spanning more than a decade. The northwestern shoreline of Moses Lake (adjacent to Galveston Bay) abuts the Texas City Prairie Preserve, a habitat and wildlife conservation area managed by The Nature Conservancy. In what has become a common trend along the Texas coast, the compound effects of sea level rise and subsidence have degraded much of the shoreline and exposed the upland prairie to the direct effect of wind and vessel wake-driven waves. These effects have caused long stretches of coastal upland shoreline to erode directly into Moses Lake. At Moses Lake, erosion had been occurring at an average rate of 2 to 3 feet per year since 1970, with many locations of accelerated erosion exceeding this. The Texas City Prairie Preserve, one of the last remnants of native, tallgrass coastal prairie habitat remaining on the Texas coast, is home to a variety of threatened avian species, including white ibis, peregrine falcons, white-tailed hawks, and Forster's terns. As the prairie is lost to open water, the birds and other wildlife species supported by the habitat are also declining.

The Moses Lake Shoreline Protection Project was a living shoreline project that included engineered structures and natural features to protect the shoreline. The project included construction of a series of segmented, nearshore, limestone riprap breakwaters that reduce wave energy on the shoreline by forcing waves to break at the breakwaters, rather than directly onto the shoreline. In a collaborative effort between AECOM (previously URS), Galveston Bay Foundation, The Nature Conservancy, the Texas General Land Office, and other partners, the Moses Lake Shoreline Protection Project has stabilized over 9,000 linear feet of coastal prairie shoreline from erosion using these breakwaters. In addition to the breakwaters, the project has created approximately 2.5 acres of estuarine marsh by beneficially using dredged material (BUDM) and marsh planting in the breakwater cells.

AECOM was responsible for the alternatives analysis, design, and construction oversight of all phases. Phase 1 of the project was completed in 2001 and protected 1,600 linear feet of shoreline. This phase of the project was constructed from the water by dredging a temporary flotation channel adjacent to the overall project footprint and placing portions of the dredge spoil materials landward of the breakwaters to provide sediment for contractor-led marsh planting. Phase 2 of the project was completed in 2012 and protected 1,800 feet of shoreline. This phase of the project was constructed from land and was planted by volunteers after sediment had naturally accumulated by the project. Phase 3, the final phase of the project, protected an additional 6,000 feet of eroding shoreline. The third phase was constructed from the water using shallow-draft construction techniques that did not rely on using a local dredge. Similar to Phase 2, the breakwaters will accumulate sediment naturally and be planted with volunteer-led marsh plantings. The progression of shoreline, breakwater, and habitat responses over more than 10 years of post-construction site development has been well-documented and has been successful in protecting the shoreline while improving coastal habitat. The project is an archetype for living shoreline design and is a good indicator that incorporating the environmental conditions of ecologically sensitive sites during design can enhance coastal natural habitats, provide benefits to resident and migratory species, and improve the overall resiliency of coastlines.

# Coastal Erosion and Sea Level Rise Study

**Client:** FEMA Region 1
**Location:** Rhode Island, Massachusetts, New Hampshire, and Maine
**AECOM Project Lead:** Jeremy Mull

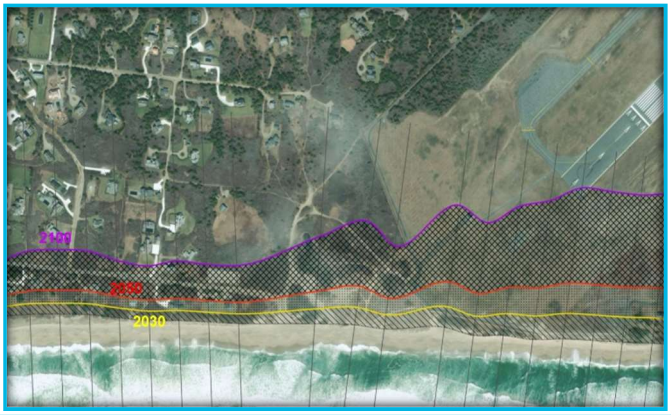
**Success Factors**

- Innovative approach to coastal risk assessment
- Long-term changes evaluated
- Resilience focused
- Federal process focused

Coastal erosion is a hazard that threatens lives, property, and resources along much of the US coastlines. Erosion is generally expected to accelerate due to future sea level rise, putting more areas at risk. Although many agencies have investigated future coastal flooding and inundation due to sea level rise, few have addressed the related but distinct hazard of future shoreline retreat over large, regional scales. This is important to highlight because there are several communities at relatively high coastal bluff elevations that are not directly vulnerable to future coastal flooding per se, but are directly vulnerable to future coastal bluff retreat. To help address the risk that erosion poses, FEMA requested that AECOM conduct shoreline erosion analysis to produce future coastal erosion hazard maps and other products that can help communities plan mitigation actions and ultimately reduce risk.

AECOM worked with CDM Smith in a Joint Venture Partnership (Compass) and completed a pilot study for FEMA Region I to develop projected coastal erosion hazard maps due to sea level rise in the New England area for several future time periods (the years 2030, 2050, and 2100). The purpose of the pilot study was to develop a technical methodology to analyze historical trends in shoreline change, evaluate multiple future sea level rise projections and timeframes, estimate future erosion rates, develop maps of future coastal erosion hazard areas, and synthesize a technical approach that could be expanded to other areas. The future erosion forecasts are detailed and incorporate differences in shoreline geomorphology (e.g., sandy beach and dune versus, erodible coastal bluff, rocky headland, erosion protection structure, etc.), which are important to consider as not all shorelines will respond in the same manner to sea level rise. The study incorporated statistical analysis of long-term historical trends in shoreline change (e.g., erosion versus accretion). Coastal engineering analysis included evaluation of future sea level rise projections, analysis of wave buoy and tide gauge data, calculations of wave setup, runup, and the depth of closure for sediment transport on sandy beaches.

The developed hazard maps consider multiple sea level rise scenarios and future timeframes to provide stakeholders with key information for planning. For example, analysis for the year 2030 provides maps for community members to develop short-term strategies. Analysis for the years 2050 and 2100 provides maps for community members to develop more long-term strategies. Overall, the maps can be used increase resilience and reduce risk due to future sea level rise. The study has been ongoing since 2016 and now includes approximately 1,400 miles of shoreline.



# Shoal Point Placement Area Management

**Client:** Texas General Land Office
**Location:** Galveston Bay, Texas
**AECOM Project Manager:** Chris Levitz

**Success Factors**

- Coastal management
- Custom client-focused solution
- Diverse stakeholder collaboration
- Comprehensive services

The Texas General Land Office had a unique coastal management project need and identified AECOM as the right team to assist them in addressing it. The GLO had recently taken ownership of a historical dredged material placement area that was no longer actively in use. GLO's goal was to develop management procedures and assurances that would allow them to proactively manage and utilize Shoal Point placement area once again. AECOM has assisted the GLO in comprehensive services to achieve this goal and return the placement area to a revenue generator for the State. Under this effort, AECOM has provided environmental site investigations, engineering evaluations, procedure development, and construction management.

The project required AECOM to bring a range of skillsets to the effort to holistically understand the challenge at hand and provide effective solutions and recommendations. This project required collaboration between AECOM environmental scientists, geologists, coastal engineers, and planners. Initial efforts focused on characterizing the site itself in its existing state to understand possible contamination risks and feasibility of future use as a dredged material storage area. Upon completion of this effort, AECOM worked directly with GLO's Commercial Leasing Division to develop user procedures that would align with State contracting requirements.

The dredged material placement procedures developed by AECOM walk a potential user, or Applicant, through the necessary steps they would need to take to be able to use Shoal Point as a dredged material placement area. This entails providing sediment sampling and placement plans to GLO's Engineer, in this case AECOM, through the AECOM developed procedure process. AECOM then would serve as the GLO's representative to review all Applicant submittals and ultimately determine the suitability of the site to receive the applicant's dredged material. The Engineer would then continue this coordination and review of the potential user's operations through project construction to ensure consistency with the placement procedures. Although the procedures were developed with the Shoal Point placement area in mind, the placement procedures are intended to be used for any future placement area owned and operated by the GLO. Subsequently, AECOM provided construction oversight and management of the first Applicant's delivery of roughly 150,000 CY of dredged material to the site, successfully completed in early 2020.

AECOM provided beneficial services to the GLO in this effort by developing and implementing practices that were comprehensive form an engineering standpoint to achieve successful dredged material placement projects, while also making the procedures user friendly. By understanding the complex group of stakeholders involved—dredgers, ports, private industry, and regulatory and state agencies—and providing workable solutions and methodology derived from AECOM's diverse experience, AECOM was able complete the project as initially desired.

As an added value, AECOM worked with the GLO to develop a long-term plan for the site to allow GLO to generate further revenue beyond the site's physical limitations in its pre-construction condition. This will be accomplished by allowing future users to construct additional site capacity at Shoal Point presuming those enhancements are the responsibility of the users, rather than the GLO. This is valuable to users, because the cost of site improvements is not overwhelming in comparison to other project investments associated with the dredging activities and there is an otherwise limited storage capacity of dredged materials in the region. This is similarly valuable to the GLO, as any user site enhancements would increase the capacity of the site at no cost to the State, while increasing the potential of the site to contain more dredged material and thereby generate more income for the GLO.

# Rockaway Beach

**Client:** USACE, New York District
**Location:** New York, NY
**AECOM Project Director:** Michael Cannon

**Success Factors**

- Complex beach and dune valuation
- Risk assessment
- Beach-focused alternative analysis
- Compliant with federal requirements

Rockaway Peninsula, located in Queens County, New York, is a low lying, dense urban area that is subject to the effects of tidal surge flooding, back bay flooding, and barrier island overwash. Consistent, historic beach erosion has impacted the natural dune system and narrowed the barrier islands, lessening the area's ability to self-protect against storms.

Beach-Fx is an event-based, Monte Carlo life-cycle simulation model developed by USACE to strengthen the linkages between engineering analysis, alternative analysis, and economic justification for coastal storm damage reduction projects. The certified program assists users in evaluating and analyzing the benefits and costs of hurricane protection and storm damage reduction projects.

Beach-Fx uses information on historic storm responses and associated damage functions to determine the total cost of erosion, inundation, and wave damages to structures and contents with various project alternatives. By modeling the storm responses under with- and without- project conditions, Beach-Fx measures the overall reductions in storm damage. The simulation results are used for a comparative analysis of alternative beach improvements and to support a feasibility level benefit-cost analysis. Beach-Fx tools, such as the Sea Level Rise Configuration and Back Bay Flooding Attribute, allow the users to estimate project-specific situations for the duration of the project. Nourishment options, such as Emergency Nourishment and Planned Nourishment, can be used to model future beach fill placement as a result of dune or berm width changes. Beach-Fx also has the ability to model rebuilding restrictions, which impact subsequent damage estimates.

AECOM has utilized Beach-Fx to analyze Rockaway Peninsula without- and with- project alternatives under constant and changing sea level conditions. AECOM has imported storm-response SBEACH data to the Beach-Fx Shore Response Database (SRD), including storm events representative of major Hurricanes Irene and Sandy. AECOM calibrated the Beach-Fx project to ensure the historic shoreline change measures are captured in the model. AECOM used Beach-Fx to evaluate three beach restoration and period maintenance alternatives and two structural alternatives, which considered a composite or buried seawall. To evaluate a structural alternative within Beach-Fx, AECOM utilized modified SBEACH data that considered overtopping coefficients, as well as modified damage functions to reduce wave damage as a product of flood elevation. AECOM summarized the reduction in damages and emergency nourishment cost savings as average annual values for each alternative to determine the shorefront net benefits and benefit-cost analysis.

# History of Cost Estimates and Budget Constraints (F)

AECOM's team has a history of completing work successfully and within allocated budgets. We take efforts to scale our team appropriately for a given client and project which results in effective budget management. AECOM also has a diverse and lengthy project history that provides significant insights to proper budget management for a range of project types. This experience also provides the team with knowledge into construction cost estimates, allowing us to leverage a wealth of knowledge to best estimate the level of effort expected for coastal construction. AECOM utilizes the following tools to maintain budget management success:

- *Project Management Plan (PMP)* – The PMP provides both the project manager as well as the entire team with an understanding of scope, deliverables and project expectations.
- *Lead Verifier Process* – AECOM uses a Lead Verifier process that utilizes senior staff early and late in the project process to independently assess project methodology and approach to work towards a sound process and prevent any missteps right from project startup.
- *Monthly Project Reviews* – AECOM staff hold monthly project reviews to check on project status relative to the level of effort, and if any issues are identified, a mitigation plan is implemented to get back on track immediately, preventing irreparable budget issues.

Project budgets are listed in Section D for each project. None of these projects have required change orders due to exceeding original estimated levels of effort, and only received additional funds for additional scope as requested by the clients. Below is one example of construction project bidding processes that AECOM served as the engineer for per sections D and E. Pre-bid estimates and contractor bid amounts are listed for comparison. Virginia Point Living Shoreline was also a construction project that AECOM supported through the bid process, but the GLO does not release all submitted budgets. AECOM only can show our pre-bid estimate and the selected contractor's budget for reference.

## Moses Lake Living Shoreline Bids

AECOM Pre-Bid Estimate:

- $1,832,500

Contractor Bids:

- $1,578,300
- $1,617,330
- $1,627,670
- $1,639,788


## Virginia Point Living Shoreline Bids

AECOM Pre-Bid Estimate:

- $4,180,500

Contractor Budget:

- $3,796,355

# Workload Capacity and Timeliness (G)

## Producing design work and planning work concurrently for state, local and port clients

The AECOM team members selected for this project represent an experienced, synchronized team that has, on many occasions, worked with one another on a myriad of simultaneous projects. The Texas coastal team at AECOM facilitates state planning efforts, local shoreline design projects, large scale port and channel improvements, and subsequent BUDM projects concurrently on a weekly basis. It is the proven project management approach that AECOM utilizes along with a culture of Quality and Technical Excellence that helps make this possible.

## AECOM depth of resources

AECOM believes in the importance of redundancy to offer a deep roster of professionals who can bring industry-leading service with the flexibility and fluidity that our clients often require. AECOM is a global firm that can draw from areas of expertise to help facilitate consistent performance should outside variables necessitate that a key team member is replaced. Should this occur, SPI will be notified immediately and forwarded the resume of the proposed replacement for their approval. The AECOM project team will have the capability to adapt to external and internal factors to provide the project-specific services which SPI expects. This level of redundancy also allows AECOM to provide the highest level of quality in our projects, because we have a large team of qualified professionals to provide technical and independent reviews of all finished products.

## Schedule management during Covid

COVID19 has represented a paradigm shift in the global consciousness; the engineering and planning sector has not been immune to its impact, but we believe that no company has better performed throughout this period than AECOM. Through strategic management practices and leveraging the innovation of its employees, AECOM has managed to not only continue to deliver during these unprecedented times, but has thrived. AECOM has continued to deliver projects on schedule and has retained all of its coastal staff since Covid19 began to change corporate workstyles.

The AECOM team views this project as an opportunity to come alongside SPI as a partner. The City is seeking to gain valuable knowledge to help guide its coastal management into the future and needs to know that this information and strategy will be obtained in a timely and appropriate manner. The Project Team has a history of consistently delivering projects on time and under budget. The schedule for this project will be managed by the PM who will be in frequent contact with SPI. With a focus on minimizing impacts to schedule the AECOM team will manage the phased approach of the project with respect to the ongoing engagement and feedback generated from the stakeholders, City staff, and leadership.


# Project Approach (H)

The AECOM project team will approach the Assessment and Investigation of the Beach and Dune Conditions at South Padre Island with a focus on integrating ecological and community infrastructure priorities along with long-term resiliency in light of coastal risks and vulnerabilities. Our team has been leading the push to address coastal risks by incorporating both green and gray infrastructure concepts into more comprehensive projects, and we have constantly rebutted the idea that there are no new ways to solve an old problem. This can be seen in our unique breakwater designs and in our large-scale coastwide planning, as AECOM works to push the envelope with what can be done with engineered and natural materials along the coast.

AECOM's coastal team is no stranger to innovation. For the past five years, AECOM has led the Texas Coastal Resiliency Master Plan development as the sole engineering contractor alongside the Texas General Land Office and the Harte Research Institute (HRI) out of Texas A&M Corpus Christi (TAMUCC). One of AECOM's primary tasks in this endeavor has been to work, both internally and with our 200+ person Technical Advisory Committee, to determine not only how to increase coastal resiliency, but how to do so by identifying the most current and oftentimes unique solutions to problems along the coast. Through this effort, AECOM has been working to identify living shoreline techniques and beach types that are ideal for the various regions of our state's coastline.

In an effort to provide SPI with a comprehensive, technically sound, and potentially inventive solution that not only achieves shoreline stability and vital storm protection, but does so in a manner that is adaptable to changing conditions and community needs, AECOM presents the following phased project approach for consideration.

## Approach to Project Management

Our dedicated Project Team will ensure a collaborative, independent, and proactive Project Management approach focusing on early communication and decision making, our core principles. We will allocate the right resources to help facilitate SPI's aspirations and needs. We offer a project team relationship built on trust, openness, transparency, responsibility, and appreciation. Overall progress will be monitored against the agreed program, with an analysis of any potential risks identified and shared with the SPI team. Our focus will be on identifying and mitigating risks to cost and program to maintain delivery within the overall scope and budget. We will be using AECOM's Technical Excellence templates, tools, and techniques for monthly reporting on the program, financial forecasting, cashflows, risk management, and change control.

Quality control and peer reviews will be conducted throughout the duration of the project to confirm that all aspects of the project, including all deliverables, are reviewed for consistency and accuracy prior to submittal and general distribution.

# Data Collection

AECOM proposes to initiate the project by conducting coordination meetings with SPI and additional stakeholders at the onset of work. These meetings would be an opportunity for preliminary screening of high-level design concepts from both sides and to identify any key restrictions, needs, or opportunities. Understanding the priorities of the project stakeholders is critical to determining a mutual path forward one that serves both the proposed City infrastructure, but also the local ecosystem. Part of this discussion will revolve around the City's vision for the future and the existing and projected growth and how these factors will be impacted as flooding conditions are anticipated to become more frequent and of a greater magnitude.

AECOM would also establish baseline shoreline conditions, both ecological and geomorphological, through site visits and data collection surveys. This process would begin with a dual-approach in-situ and desktop analysis of the existing conditions of SPI's beach and dune system. The desktop portion of the review will consist of familiarizing the team with existing surveys and studies, as provided by SPI, which reflect past conditions and management recommendations. The field surveys will be conducted by AECOM and Hanson as described below. This baseline information will inform both current conditions as well as desired post-project conditions. The geomorphological characterization of the shoreline will be important for understanding sediment trends in the vicinity of the City and the shoreline's response to future impacts. This data will allow AECOM to develop a Beach Maintenance Plan that will suit the City's unique needs as they pertain to the beach.

## Beach Topographic Survey and Erosion Study

Hanson shall conduct a topographic survey of the City's approximate 4 miles of beach from the mean high tide to the historic building line. Topographic data will be collected via a combination of unmanned aerial system (UAS/drone) operations and traditional "on-the-ground" surveys utilizing real-time kinematic GPS. Ground control points and on-the-ground transects will be will incorporated to increase the accuracy of the collected data. AECOM, supported by Hanson, will analyze the topographic data to determine erosion/accretion trends along City beaches by utilizing available topographic data and previously conducted studies by SPI or other reputable sources (i.e. University of Texas Bureau of Economic Geology).

## Literature Review and Public Outreach

In keeping with AECOM's goal to make the City's plan a technical analysis informed by stakeholder consensus, Hanson will assist in reviewing existing beach maintenance plans and ordinances throughout the Texas coast, as well as scientific papers regarding best management practices. Additionally, AECOM in conducting public forums to garner public input for location-specific needs, with the number of forums necessary determined in coordination with SPI and project stakeholders. AECOM brings significant experience in holding public and stakeholder engagement events during Covid and can work with SPI to conduct these meetings virtually while still maintaining successful interaction and feedback.

# Shoreline/Habitat Assessment

Coordination will be integral to successful execution of the Assessment and Investigation of the Beach and Dune Conditions at South Padre Island, as taking into consideration the needs of the island stakeholders alongside the technical data will be the only way to implement a truly comprehensive project approach that captures both infrastructure and ecological characteristics for the project site. While Hanson will be collecting the topographic and UAS data needed to develop alternatives, AECOM's team is capable of collecting a range of shoreline geotechnical information, with the level of detail determined in coordination with SPI and project stakeholders.

To enhance the project team's ecological understanding, AECOM will leverage our team's local environmental knowledge to supplement the studies furnished by others and work to coordinate with other SPI stakeholders to discuss environmental limitations and opportunities.

The data collected under the first phase will be analyzed and utilized in determining whether the shoreline within the City limits is homogenous enough to fall under one recommendation, or if the system would be best served if there were a number of allowable practices and beach/dune templates within particular zones. The decision of whether and how to implement this land-use based zoning would be informed by City leadership, staff, and SPI identified stakeholders.

The information will be paired with modeled storm data, which will be derived from historical precedent and forecasted considering relative sea level rise for the region.

## Develop and Evaluate Alternatives

Upon completion of the initial stakeholder engagement and data collection to establish baseline conditions, AECOM would develop an alternatives memo or report that provides various paths forward. Unique solutions or combinations of various solutions would be identified according to site-specific conditions, along with various means of implementing the various alternatives. Our team has experience morphing more traditional engineering structures into new concepts, such as the SPI Windsport Venue project, where we utilized planned construction slopes as onsite mitigation by mimicking the adjacent tidal wetland elevations and vegetative cover.

The major alternatives will revolve around the proposed potential divisions or zones along the shoreline and the existing or future land use vision adjacent to the beach and dunes that will inform those zones. Understanding these key factors and local conditions will allow the AECOM team to better identify potential beach and dune templates (typical beach profiles, dune width/height requirements) and management strategies that are more likely to be successful. AECOM will also integrate the particle tracing work that SPI has completed to date to determine possible alternatives for sediment placement to achieve the potential beach and dune template alternatives.

## Engagement

AECOM recognizes that the City of South Padre Island needs to balance storm surge protection, private and public beach access, and viewsheds. The AECOM project team will provide sound technical recommendations for SPI while assisting in public consensus building. In addition to the weekly or bi-weekly project meetings with City leaders and staff, AECOM proposes that engagement be an ongoing and integral aspect of the project approach. A series of steering committee and/or community engagements can be part of the efforts that can represent a stand-alone phase of the project while still allowing communication with stakeholders to take place throughout the project lifecycle. Should social distancing impact the engagement process, AECOM will use technologies such as Microsoft Teams to facilitate constructive communication. The larger steering committee and community engagement meetings may take the form of a Microsoft Teams call or online questionnaire. This crucial step is more than just a planning formality; it is necessary when it comes to developing any sort of engineering or management practice that is intended to be incorporated into public ordinance. This engagement phase can be tailored by SPI in order to meet their needs and timeline.

## Design Recommendations

Once the alternatives have been considered and the feedback from all stakeholders is considered, AECOM will provide SPI with a final report which represents the culmination of all processes engaged in up to this point. The report will summarize historic conditions and previous findings for the SPI beach and dune system, as well as collate the public responses and considerations taken into account while creating the recommendations. The report will also consist of engineering recommendations for the project, including sediment type/grain size requirements, sediment management, optimal sediment placement locations, a series of proposed beach/dune templates as design renderings, zoned to consider infrastructure and ecological needs, and a maintenance plan for future work, all culminating in a

comprehensive beach management plan to provide SPI with the best possible shoreline protection and management.

## Proposed Project Schedule

| Phase | Duration |
|---|---|
| Data Collection and Shoreline/Habitat Assessment | 2-3 Weeks |
| Develop and Evaluate Alternatives | 3 Months |
| Engagement<br><br>*The engagement of stakeholders will be a continual aspect of the project; however, the specific form and function that this phase takes may influence the project timeline to allow for sufficient input.* | 2-3 Weeks |
| Design Reccomendations | 3 Months |
| **Total Project** | **6-8 Months** |

## Project Team Organization and Structure

Per the provided Organization Chart, the AECOM team proposes a functional structure of team members who will offer reliable and expedient insights to SPI. Project Manager Chris Levitz brings with him an abundance of experience in facilitating complex coastal plans, particularly those involving consideration of multiple interdependent variables. He will be the direct point of contact for SPI to the AECOM Project Team.

The project will be further divided into three divisions: data collection, engineering, and planning. Each branch of the project team will be led by experts in the field and staffed by team members hand-selected for their project experience and specialty. The data collection division will be led by Hanson. Hanson offers an experienced survey team that is familiar with the Island and can provide flexible and comprehensive data collection based on the expressed needs of the City. The coastal engineering division will focus primarily on the technical specifications required to provide SPI with the maximum protection possible within the natural and logical parameters present at City beaches. The planning division will help to integrate regulatory guidance, stakeholder needs, best practices, and the vision expressed by SPI into the proposed beach type(s), and maintenance plan.

As described under the above Key Staff section, the members are well suited to help address the unique challenges inherent in the proposed project. The team structure will be tailored to help meet SPI's needs.

## Assumptions

1. The City of South Padre Island will provide all relevant documents, including historical sediment analysis, coastal management plans, aerial photos, historical survey data, public or private beach access improvement plans, surveys and map data, and existing geotechnical data.
2. Services do not include hazardous material, sediment, or other environmental testing, or remedial response or design to advise the client or respond to encountered field conditions.
3. The schedule may be influenced by the necessary evolution inherent in stakeholder engagement. Should any public, steering committee, City staff or leadership outreach result in a need to allow for more time, the schedule would be revised accordingly.

AECOM Imagine it. Delivered.

# Statement of Proposal for 2020-SL02

# Assessment and Investigation of the Beach and Dune Conditions at South Padre Island

*Prepared for*
**City of South Padre Island**
ATTN: City Secretary
4601 Padre Boulevard
South Padre Island, TX 78597

*Prepared by*
**Integral Consulting Inc.**
16225 Park Ten Place, Suite 500
Houston, TX 77084

September 11, 2020

Integral Consulting Inc.
16225 Park Ten Place, Suite 500
Houston, TX 77084
Telephone: 281-732-7961

September 11th, 2020 RFP 2020-SL02

City Secretary
City of South Padre Island
4601 Padre Boulevard
South Padre Island, TX 78597

Subject: **Statement of Proposal for RFP 2020-SL02: Assessment and Investigation of the beach and dune conditions at South Padre Island**

Dear City Secretary:

Integral Consulting Inc. is pleased to submit this Statement of Proposal for an Assessment and Investigation of the Beach and Dune Conditions at South Padre Island for your consideration. Integral has assembled a highly qualified team of coastal engineers, scientists, ecologists, and surveyors with the deep local and broad project experience necessary to conduct and implement the technical and environmental assessments required to successfully complete this project.

Integral has a strong commitment to supporting coastal resilience and finding the best solutions to meet the City's needs with respect to preserving and enhancing the natural dune and beach systems on the Island. Keith Brodock, the Project Manager, has extensive project experience with Coastal Resiliency and Coastal Engineering projects in Texas and around the United States. Dr. Patrick Friend, the Project Lead, is an internationally-renowned Coastal Consultant and Scientist who has worked with the City as an adviser on coastal matters. Most recently, Dr. Friend was the Project Manager for the highly successful Nearshore Berm Sediment Tracing project. Our strengths are best summarized by some of our clients.

*"The Integral team has shown excellent performance in managing a large interdisciplinary team in successful research programs on behalf of the U.S. Department of Energy. They have been hardworking, cost-effective, and a pleasure to work with, consistently coming up with effective solutions to meet complex marine environmental challenges."– Jesse Roberts, Water Power Environmental Lead, Sandia National Laboratories*

In this proposal, you will see that we have the capacity and qualifications to fulfill the City's needs, and we believe that our proposed approach will deliver the best solutions for years to come. If you have any questions or require additional information, please contact Patrick Friend at 281-732-7961.

Sincerely,

Patrick Friend

Keith Brodock, P.E., P.P
Project Manager | Managing Principal
kbrodock@integral-corp.com

Patrick Friend, Ph.D., P.G.
Project Lead | Strategic Adviser
pfriend@integral-corp.com

# Contents

# A. Introduction

South Padre Island has it all for anyone who loves the coast. As an international tourist destination it provides the full spectrum of recreational and leisure opportunities, from high thrill amusement park rides, water slides, and high rise hotel views, to more subdued recreational opportunities including sand castle building, volleyball, fishing, and sailing. There is also a solid foundation in a nature focused ecotourism sector with turtle conservation and bird watching specific opportunities adjacent to nearby Padre Island National Seashore. The common thread among all of these unique defining features of South Padre Island is its coastal setting and relatively natural beach and dune experience that provides access for all users.

South Padre Island is a relatively narrow, low-relief barrier island along the south Texas coastline that is frequently impacted by erosive winter storm events, and infrequent but extremely damaging major hurricanes. Additionally, relative rates of sea level rise are higher than global averages due to subsidence along the Texas coastline, which exacerbates flooding and increases the inland incursion of erosive storm waves. The natural back-beach dune system along the City of South Padre Island (SPI) coastline from the Brazos-Santiago Pass to the northern end of the City limits is discontinuous due to numerous beach access points and removal of sand by beachfront property owners. The present dune system comprises a modified, flat-topped dune of some 10-12 ft. elevation, with an extensive planting of successfully introduced vegetation that provides some resistance to erosion. Scarping is common in the winter, particularly towards the northern, more erosive part of the City. Linear wooden walkways extend from the historic building line vehicular access points to the upper beach.

The City of South Padre Island has received funding from the Texas Coastal Management Program and the National Oceanic and Atmospheric Administration to conduct an Assessment and Investigation of the Beach and Dune Conditions at South Padre Island. The beach-dune system provides critical protection to the community of SPI from storm waves and elevated water levels. The beaches and dunes are nourished, and dune vegetation is planted, on a regular basis, thus maintaining this first line of protection for the City and its infrastructure.

Studies and monitoring have occurred since the original 1993 beach and dune management plan was developed; the science, engineering, and geomorphological understanding of beaches, dunes and various approaches to improving community resiliency have evolved since then.

**Our approach is to leverage existing investments in past research, monitoring and modeling, fill data gaps and, working with the City, evaluate a set of potential dune and beach configurations that would maximize storm protection while balancing the competing needs of access, ocean views, and economic development. By coupling the proposed technical work with our unique professional experiences, we strive to document the existing condition of the beach and dune system along SPI, clearly identify any weak points, review the existing permitting and regulatory environment and develop a set of recommendations to lay out a plan for at least the**

**next 10+ years that can be permitted and streamlined to increase the resiliency of SPI, and to enhance the "natural" coastal environment which makes it such a desirable location.**

Coastal regions throughout the U.S. are experiencing the impacts of increased coastal hazards from flooding, storms, and erosion as well as sea-level rise and. Integral has developed a new science-based framework called Coastal ADAPT (Adaptation Decision and Planning Tool) that uses a variety of modeling approaches to examine potential adaptation strategies to coastal hazards and sea-level rise related climate change risks. The SPI Dune and Beach investigation aligns well with the Coastal ADAPT framework, which characterizes the physical processes, historic condition, and geomorphology of the system and assesses hazard, exposure, and risk for any chosen infrastructure type, in this case, the dune system.

Shoreline characterization is a vital component of any coastal project. Integral provides technical and environmental studies, engineering evaluation and design, and permitting to support coastal zone projects throughout the U.S. Our multidisciplinary expertise includes assessment of biological and ecological impacts on sensitive habitats, marine species, and wildlife; remediation in coastal zones; benthic habitat mapping and more.

This beach and dune investigation project is a critical one, with the goal to develop a short term (~10 year) beach and dune management strategy (aka short term adaptation strategy). **By evaluating existing conditions and potential future engineering and management options, our value-added results can specify not just the engineering specifics of how much sand, where to place it and how to maintain it, but through a phased approach, we can provide results of the study as a comparison between measures of impact that promote community engagement**. For example, a finding that the north part of the island needs a certain number of cubic yards of sand is difficult for the average community member to understand. Therefore, we propose to also identify the potential differences between various approaches that the community can readily understand as a measure of impact, such as the number of structures vulnerable or the distance of potential erosion from design storm events. These measures of impact will be decided during the engagement with the City as the project progresses but represents a difference of how our Team will communicate the importance of the work to the City and support decision-making and community engagement.

## Team Introduction

Our Team consists of local experts familiar with South Padre Island, as well as a deep technical team with extensive experience conducting coastal research and improving resiliency around the country using nature-based solutions. Our Team is led by Integral Consulting, Inc., who will manage the project and handle the geomorphic and engineering analyses; Bio-West will provide ecologic and permitting guidance, and Naismith Marine will provide terrestrial and nearshore surveying of beach and dune profiles. Each teaming firm is summarized below with a short bio of each contributing team member; complete resumes for each of the key team members, showing qualifications and documented expertise, are found in Appendix C.

Our Team has combined to provide SPI with a solid technical and engineering basis for future beach and dune management, while bringing together expertise and experience in both engineering with nature (EWN) and policy development to support the City in improving its coastal storm protection and sustaining its economy.

### *Integral Consulting—Geomorphology, Coastal Modeling, Engineering and Project Management*

Integral Consulting Inc.'s (Integral's) mission is to apply science and engineering expertise across a wide range of public and private enterprises to identify technically sound and cost-effective solutions to complex problems. Integral is an internationally recognized science and engineering consulting firm founded in 2002 and headquartered in Seattle, WA. Integral is an employee owned company, employing around 150 staff in 15 offices around the U.S. Our Gulf Coast office in Houston, TX, is part of the Company's Marine Science and Engineering Group based in Santa Cruz, CA. **Integral is different than most consulting firms: our mission is based around the truth in science and applying the best available science to inform decisions.** Our experienced and dedicated team of professionals and support staff are recognized experts in the fields of ocean sciences, sediment transport, coastal geology, coastal engineering and modeling, and coastal resiliency. Some of our projects are included below that illustrate a small portion of our capabilities.

Integral brings a diverse skill set of technical knowledge, innovative approaches, critical and comprehensive interpretations, data handling and state-of-the-science hands on and modeling experience to address the requirements for this project. We have a strong history of providing cost-effective and resilient projects throughout the US and Gulf Coast region, please see the project descriptions below for a taste of our capacity.

Integral engineers use risk-based principles to evaluate engineering options based on technical and economic criteria to develop cost-effective, safe, and sustainable practical solutions. We use analytical tools such as multi-criteria decision analysis to identify sustainable coastal solutions.

Integral offers comprehensive design and construction support services. We also prepare bid and tender documents that clearly define project requirements and objectives, and provide proven construction oversight experience to ensure that projects are successfully completed within budgetary constraints without a myriad of change orders.

**Integral Project Engineer and Principal in Charge, Mr. Keith Brodock, P.E., P.P. has led multiple complex projects in Texas, including remediation, and construction projects, each completed on time and on budget. Integral Project Lead, Dr. Patrick Friend, has advised the City of South Padre Island on a number of coastal matters since 2016, and was Project Manager for the successful Nearshore Berm Tracing Project, completed for the City of South Padre in 2020. Dr. Friend will be available throughout the project duration as a local point of contact.**

### Bio-West—Ecology and Permitting Procedures

Bio-West is a multi-disciplinary environmental firm based in Rosenberg, TX, that has been providing natural and cultural resource support for Gulf Coast projects for over 39 years. Bio-West has completed more than 1700 projects and has contracted with federal and state agencies including Texas Parks and Wildlife and Texas GLO. Bio-West has un-paralleled experience in dune environments and the Coastal Division Office supports an integrated team of coastal ecologists and marine biologists. Bio-West staff are also state and federal permitting specialists, with a solid track record and understanding of permitting processes of the type required in this project. Mr. Matthew Chastain of Bio-West is a Professional Wetland Scientist (PWS) License Number 2281, renewal date 10/30/2022, and is the Bio-West Project Manager.

### Naismith Marine Services—Surveying


Surveying for the project will be performed by Naismith Marine Services of Rockport, TX. Naismith has undertaken regular surveys and monitoring of South Padre Island beaches for over 12 years and is highly familiar with the requirements for surveying transects from baseline to beyond depth of closure. Naismith Marine have worked closely with the Texas GLO and the City of South Padre on similar surveying projects in the past. Jim Naismith is a Registered Professional Land Surveyor and Licensed State Land Surveyor, License No. 4828, Renewal date 12/31/2020.

Integral is very accustomed to undertaking this type of multi-disciplinary project that requires utilizing staff expertise from its different offices nationwide and employing local experienced specialist subcontractors. An organizational chart showing positions and names of the key management team and subcontractors is shown in Figure 1.

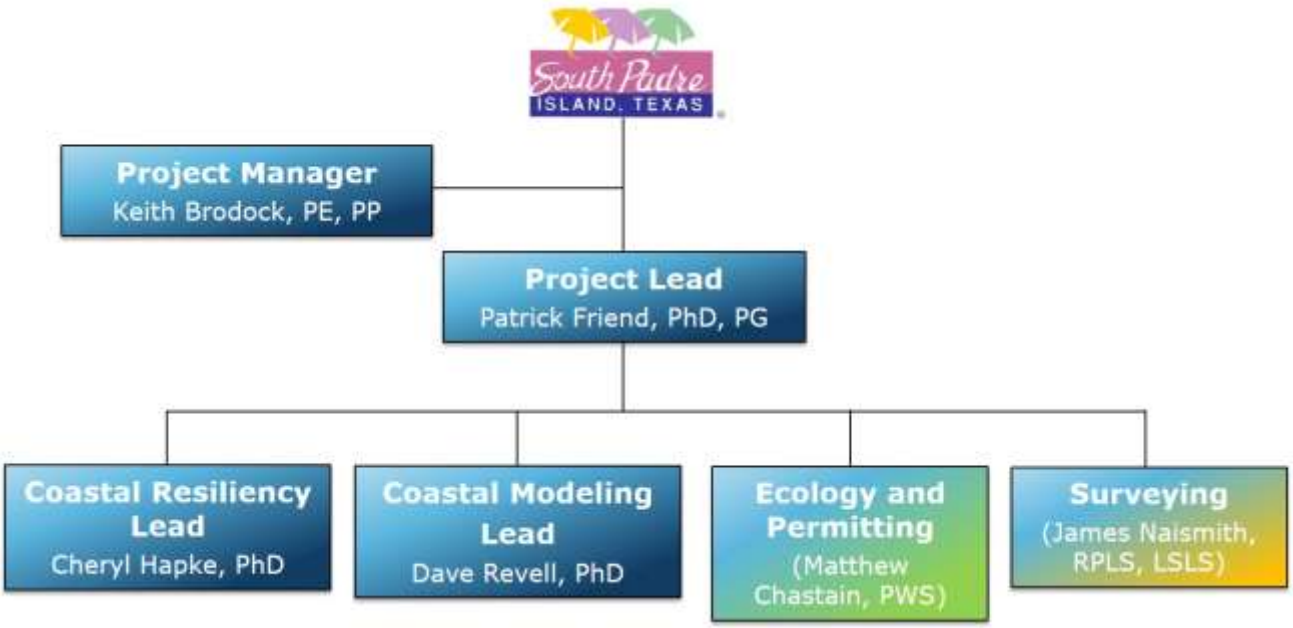



Figure 1. South Padre Island Project Team Organization. Team members in blue boxes are Integral staff; multi-colored boxes indicate team sub-consultants.

## Contact Information

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*Integral Corporate Office*
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Seattle, WA 98104
www.integral-corp.com

## Quality Assurance and Quality Control

To ensure that all work products meet the highest standards, Integral follows an internal quality assurance review process for all project deliverables follow a quality management plan specific to each project. Project-specific quality specifications establish data and analysis quality objectives for the project, detail the methods used to collect project data, and describe the procedures followed to establish the usability of those data for analyses to be conducted. All deliverables and presentations that contain data, analytical results, engineering and designs, or other technical findings are subjected to quality assurance review.

## Project Management

Project management and technical co-ordination with the City of South Padre Island will be through Integral's Houston, TX office. Coastal Resiliency Assessment and Model Development will be conducted in Integral's Santa Cruz, CA and St Petersburg, FL office locations. The core management team comprises: Keith Brodock, P.E., P.P., Project Manager; Patrick Friend, Ph.D., P.G., Project Lead; Cheryl Hapke, Ph.D. (Coastal Resiliency Lead); Dave Revell, Ph.D. (Coastal Modeling Lead).

# B. Project Manager Qualifications and Experience

## *Keith Brodock, PE, PP*

Mr. Keith Brodock, P.E., P.P. is a licensed **Professional Engineer** and **Professional Planner** with more than 15 years of experience as Project Manager in environmental engineering, multi-disciplinary design, and construction. He is a full-time employee of Integral Consulting, with the job title of Principal. Mr. Brodock has overseen projects across the country and is currently managing coastal protection and sediment related construction projects in Texas and elsewhere in the U.S. As a professional engineer, Mr. Brodock has responsibilities ranging from oversight of assessment and investigation to preparing design drawings/specifications and project execution. Mr. Brodock received his Bachelors of Science in Chemical Engineering from Clarkson University in Potsdam, New York. Mr. Brodock's Texas Professional Engineering license (No. 127823) is current, and a copy of license card, renewal date June 30, 2021 is attached. All projects that Mr. Brodock has completed have been conducted with full legal and regulatory compliance.

Mr. Brodock has studied and trained others on leadership and project management since graduation, and he applies his skills to projects under his management. In 2011, he completed the Project Management Bootcamp, designed by PSMJ Resources, Inc. to focus on the project management needs of engineering, and construction firms. Mr. Brodock reinforces proper project management principles to Integral's staff while applying his extensive project management and leadership experience to the projects he manages.

In addition to his project management expertise, Mr. Brodock has wide experience leading multidisciplinary design, permitting, and construction teams to project completion in compliance with all legal requirements. His level of responsibility has ranged from Project Engineer to Project Manager to Principal-in-Charge. For Mr. Brodock's full resume, example projects and publications, please see Appendix C.

### Documented Specialized Expertise

***Coastal Protection Feasibility Study and Living Shoreline Design***
***Project cost: $2.4M. Change orders: none. Project dates: 2012-Present***

Mr. Brodock is the **Project Manager** and licensed **Professional Engineer** responsible for evaluating shoreline armoring / restoration along Fox Point State Park in Wilmington, Delaware, for an important national insurance company. Fox Point State Park is part of the Atlantic coastal system and is subject to significant tidal cycles, damaging wave energy, and the potential for subsidence. Mr. Brodock completed a feasibility study for armoring the 1.4-mile shoreline, excluding the

mudflat cove area, as a way to limit subsidence of certain portions of the shoreline. As a preliminary data collection effort designed, in part, to evaluate deposition/scour in the waterway, Mr. Brodock led a team to plan and execute an in-water investigation within the approved budget and schedule. He is currently evaluating, as a design engineer, conceptual designs for a living shoreline project with wave attenuation devices placed in the waterway to protect the future living shoreline. The final design will incorporate anticipated site changes due to the impacts of climate change and increased wave action.

***Coastal Water Treatment Plant - Design and Construction***
***Project cost: $182K. Change orders: none. Project dates: 2018-2019***

Mr. Brodock was **Lead Design and Construction Engineer** and **Project Manager** for a water treatment plant control system upgrade in La Marque, Texas, near an inlet to Galveston Bay, for a private trust. Working with a technology vendor, Mr. Brodock evaluated the feasibility of several control technologies before selecting one product for the controls design. He developed a cost estimate for the final design, construction, and implementation of the project. Mr. Brodock and his team were awarded the project following a presentation of the approach and costs to the client. Mr. Brodock oversaw the team of engineers to complete the design and to procure, program, and install the equipment. In fact, he was one of the on-site engineers performing the installation. Despite a complete loss of programming during shipping of the control system, leading to extensive re-work, Mr. Brodock was able to complete the project under budget without the need for change orders. He was able to provide additional provide cost savings measures and increased monitoring capabilities beyond the initial project scope while still remaining under budget. These new project features have already saved the client thousands of dollars in labor by eliminating the need for emergency response actions.

***Post Hurricane Sandy Remediation System - Feasibility Study, Design, and Construction***
***Project cost: $45K. Change orders: none. Project dates: 2012-2016***

Mr. Brodock was **Project Manager** and **Lead Design Engineer** for a new remediation system along Gravesend Bay, New York after Hurricane Sandy destroyed the previous system for a fuel oil distribution company. Taking into account lessons learned from the Hurricane Sandy experience, Mr. Brodock performed a feasibility analysis of several potential designs, including a replacement-in-kind of the previous system. He concluded that the previous system was unacceptably susceptible to damage from future storms with increasing frequency and strength expected from climate change. He selected and adapted a common household technology into a commercially-viable system, which provided for quicker deployment, removal, and replacement, as needed. The new system additionally had a lower physical profile and was less susceptible to future storm damage. Mr. Brodock presented the new design to the agency overseeing the project and obtained approval. He oversaw the team of engineers and field technicians installing and commissioning the new system on-time and on-budget. The system was successful and allowed our client to close out the project with the agency.

***Engineering Analysis of Water Flow on a Coastal Peninsula***
***Project cost: $283K. Change orders: none. Project dates: 2012-2015***

Mr. Brodock served as the **Project Manager** and **Project Engineer** for an analysis of water flow on the coastal peninsula of Far Rockaway, Queens, New York, for a national law firm. The project area was located about 400 ft. from Jamaica Bay and about 1,200 ft. from the Atlantic Ocean. Mr. Brodock led a team of engineers and data scientists to understand water movement on the peninsula. Using LiDAR data of the area and ground-based land surveyor data collection, combined with specific monitoring points, he developed and proved a water flow model that demonstrated a flow endpoint in nearby Jamaica Bay.

## Selected Publications, Presentations, Posters

**Brodock, K.** 2019. Climate change and environmental justice. Panel presentation at the 2019 New York State Bar Association Environmental and Energy Law Section, January 18, New York, NY.

**Brodock, K.** 2018. Technological advances changing the way we conduct investigation and remediation within the next 10 years. Panel presentation at the 2018 Dow Environmental Remediation and Restoration Global Meeting, March 7, Lake Jackson, TX.

Studer, J., M. Hasegawa, E. Christine, D. Allen, C. Turner, **K. Brodock**, and J. Rhodes. 2005. Surfactant-enhanced recovery of No. 2 fuel oil from beneath a building along coastal New Jersey: A case study. Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water Conference, Costa Mesa, CA, August 17–19. National Ground Water Association.

Tornatore, P.M., J. Rhodes, and **K. Brodock**. 2005. Improving experience based engineering estimates for environmental liabilities using Decisioneering® software. 2005 NGWA Conference on Remediation: Site Closure and the Total Cost of Cleanup, Houston, TX, November 7–8. National Ground Water Association.

# C. Integral Team Qualifications and Experience

This section introduces each of the key personnel who will be engaged in completing the work on this project. For succinctness we have included bios of key individuals here, with their resume and full documented specialized project experience and publications in Appendix C.

### *Project Lead, Patrick Friend, PhD, PG*

Dr. Patrick Friend is an international coastal and marine scientist, with more than 20 years of industry and academic experience in project delivery, project management and data collection/survey for both governmental and private sectors. His primary areas of scientific expertise are sediment transport, coastal erosion, and coastal geomorphology. Dr. Friend's expertise as an economic geologist encompasses opportunity screening, strategic planning, probabilistic risk assessment, asset evaluations and acquisitions, quality assurance, and due diligence.

Dr. Friend has consulted extensively for port and harbor authorities, and both public and private coastal stakeholders. After gaining his PhD from the University of Southampton in 2001, he spent 8 years as a Research Fellow at the world-renowned National Oceanography Centre, UK, where he was Project Lead on three large, multidisciplinary European Union projects. He spent 10 years in the global offshore energy industry, working in multiple countries as a Senior Geologist and Senior Basin Analyst. He is presently managing and developing coastal resiliency projects in West Africa, the Gulf of Mexico and elsewhere in the U.S. Dr. Friend was Project Manager for the successful Nearshore Berm Sediment Transport study for the City of South Padre Island, completed in 2019. Dr. Friend has authored numerous scientific reports and papers on topics ranging from sediment transport pathways in dredged estuaries to the erodibility of beaches and saltmarshes in the coastal zone. He is a licensed Professional Geologist in the State of Texas: License No. 12981, renewal date Sept. 30 2021 (see copy of license card attached to this proposal). All projects that Dr. Friend has led or managed have been carried out with full legal, regulatory and permitting compliance.

#### Relevant Projects

#### Coastal Erosion and Sediment Science

- Beneficial Use Dredge Material (BUDM) for Nearshore Berm Construction, South Padre Island, Gulf of Mexico, Texas— **Project Manager**
- Trend Vector Modeling of Sediment Transport Pathways Offshore of a Gulf Coast Barrier Island, South Padre Island, Texas—**Project Lead**
- Erosion Rates, Erosion Thresholds, and Settling Velocities of Cohesive Sediments in the Humber Estuary, England—**Project Lead**
- Hydrodynamic Model Calibration for MOSE Flood Protection Project, Venice, Italy—**Project Lead**

- Transport Pathways of Sediment in a Dredged Estuarine System, Southwest England—**Project Lead**
- Demonstration of a New Tool for the Rapid, In Situ Mapping of Contaminated Sediments, Washington, DC—**Project Manager**
- Bio-dependent Bed Parameters as a Proxy for Saltmarsh Sediment Stability, Ria Formosa, Portugal—**Project Lead**

### *Coastal Resiliency Lead, Cheryl Hapke, PhD*

Dr. Cheryl Hapke is a Coastal Geologist and Senior Consultant with more than 20 years of experience in coastal evolution and coastal change processes in a variety of geomorphic settings including barrier islands and rocky and reef-fringed coasts. Her work focuses on morphodynamics of coastal systems on various time scales from storms to multiple decades, with application towards solving societal problems such as sea level rise through adaptation planning. Dr. Hapke's studies have scaled from large regional assessments of historical coastal change, to barrier island response to extreme storm events, to forecasts of future behavior using statistical models. She has extensive experience overseeing and managing large projects and coordinating across diverse groups of stakeholders and partners. She has also served as a technical advisor on coastal change hazards to state and federal agencies and international groups and authored numerous peer-reviewed journal articles. Dr. Hapke's research has been influential in moving the field of coastal evolution and hazards forward and has a high degree of societal relevance. Dr. Hapke gained her PhD from UCAL Santa Cruz in 2002. All projects that Dr. Hapke has led or managed have been carried out with full legal, regulatory and permitting compliance.

## Relevant Projects

*Coastal Resiliency*

- Model-Based Decision Support Framework for Sea Level Rise Adaptation, Captiva Island, Florida— **Project Lead**
- Coastal Vulnerability and Shoreline Processes, Fire Island, New York— **Principal Investigator**
- Tidal Inlet Evolution and Morphodynamics, Fire Island, New York—**Principal Investigator**
- National Assessment of Coastal Change Hazards, East and West Coasts, U.S.— **Lead Investigator**

### *Coastal Modeling Lead, David Revell, PhD*

Dr. David Revell is a coastal geomorphologist and modeler with more than 25 years of experience as a consultant and academic studying marine, coastal, and estuarine processes, working to integrate science and management of coastal processes and climate change. He has served as a technical advisor and facilitator to multiple federal, state, and local jurisdictions related to ocean and coastal management. He has been involved in a wide variety of community stakeholder processes ranging from evaluating erosion hazard alternatives to sea level rise and climate change vulnerability impacts to lagoon management, water quality, and marine spatial planning. Dr. Revell currently advises multiple local jurisdictions and government agencies on dune and sediment management, climate change, estuary processes, inlet management, and local coastal program updates. All projects that Dr. Revell has led or managed have been carried out with full legal, regulatory and permitting compliance.

#### Relevant Projects

***Coastal Resiliency, Erosion mitigation, Vulnerability Assessment and Hazards Modeling***

- Erosion, Transportation and Recreation Adaptation and Management Plan, City of Santa Cruz, California—**Modeling and Project Lead**
- Goleta Beach Erosion Projects, County of Santa Barbara, California—**Coastal Modeling and Project Lead**
- Neskowin Shoreline Assessment, Neskowin, Tillamook County, Oregon— **Project Lead**
- Natural Gas and Electricity Infrastructure Vulnerability Assessment, San Diego Region, California **–Project Lead**
- The Nature Conservancy's Coastal Resilience Program, Ventura County, California— **Project Lead**
- Coastal Resiliency: Phases 1 and 2, Santa Barbara, California—**Coastal Modeling Lead**

### *Bio-West Project Manager, Matthew Chastain, PWS*

With more than 13 years of experience in natural resource consulting industry, Mr. Chastain has managed and conducted a diverse array of natural resources fieldwork along the Texas and Louisiana coast. He has supervised and participated in the development and design of mitigation and restoration areas, coastal dune swale communities, and estuarine wetlands within Texas and Louisiana, as well as supervised and assisted in the survey and collection of detailed baseline information of marine resource and ecological communities. Mr. Chastain has utilized his extensive

knowledge of coastal dune/swales and estuarine systems, vegetation, estuarine and marine resources (tidal/mud flats, dune systems, reefs, seagrass beds, etc.) sediment type and hydraulics to determine the placement, depth, and frequency of wetland and dune creation. He has implemented both planned and "flexible" design plans based on existing or unknown field conditions. Mr. Chastain has managed and participated in multiple restoration and creation projects including design and oversight, harvesting and planting, invasive species control, site maintenance, and adaptive management. Mr. Chastain has performed habitat, endangered and threatened species assessments, USACE and state environmental permitting for impacts to waters and wetlands, wetland mitigation creation and monitoring, and habitat restoration. He holds an MNRD in natural resource development and a BS in renewable natural resources, both from Texas A&M University. He is accredited as a Professional Wetland Scientist, License Number 2281, renewal date 10/30/2022. All projects that Mr. Chastain has led or managed have been carried out with full legal, regulatory and permitting compliance.

### Relevant Projects

- Beneficial Use and Mitigation Monitoring Program, Sabine Pass, LA – **Project Manager and Coastal Ecologist**
- Dredge Material Placement Area Design, Permitting and Monitoring, Port Bolivar, Galveston County, TX – **Project Manager and Coastal Ecologist**

## *Naismith Marine Project Manager, James Naismith, RPLS, LSLS*

Jim Naismith has more than 30 years of experience in all aspects of land and hydrographic surveying along the Texas Gulf Coast, including conducting beach profiling surveys at South Padre Island since 2008. He gained his MSc in Civil Engineering in 1998 from Texas A&M. Mr. Naismith has completed numerous dock conditions surveys; surveys for dredging and marine construction; lost item and clearance surveys; magnetometer; and shallow seismic surveys. Hurricane and disaster response experience includes debris mapping/identification, debris removal, navigation hazard location/removal, submerged vessel location/marking, shoal detection, and post-hurricane channel clearance. Mr. Naismith is a Registered Professional Land Surveyor, Texas #4828, renewal date 12/31/2020, and a Licensed Land Surveyor, Texas. All projects that Mr. Naismith has led and conducted have been carried out with full legal, regulatory and permitting compliance.

### Relevant Projects

- South Padre Island Beach Profile Surveys, Texas, 2008 – 2020 - **Professional Land Surveyor and Hydrographic Surveyor**

# D. Integral Team Project Experience,

## Nearshore berm placement for beach nourishment, South Padre Island, TX

## Client: City of South Padre Island

**Project Description**: The City of South Padre Island wished to examine the effectiveness of using beneficial use dredge sediment (BUDM) placed offshore as a method to nourish the beach on South Padre Island to mitigate the effects of erosion, particularly at the north end of the City. The project involved the placement of 2000 kg of tracer material on a specially constructed offshore berm in a licensed placement area, then the monitoring of the tracer and collection of over 900 sediment samples for analysis. The results showed unequivocally that BUDM from the nearshore berm was able to nourish the beach both to the north and south opposite the placement area.

Findings from the Nearshore Berm Tracing Project are shaping how Integral is approaching this Beach and Dune Conditions Investigation. **Our overall goal is to help the City improve its natural coastal beach and dune protections by assessing its existing conditions, evaluating vulnerabilities associated with different placements, and to make recommendations on improving the storm resiliency and cost effectiveness of future sediment placements.** Results from this nearshore berm tracing project raise important questions about the most effective way to nourish the beaches and sustain the dunes.

**Project Innovation:**
The project used a highly innovative 'dual-signature' tracer to monitor the movement of material from the nearshore berm to the South Padre Island beach. A unique sampling device was developed to measure an exact amount of beach sediment at each sample location; this assisted in quantifying movement of material from offshore to the beach and helped determine the effectiveness of offshore dredge material placement as a means of beach nourishment.

**Firm/PM Responsibilities:**

- Safely deploy tracer on nearshore berm
- Co-ordinate multi-agency monitoring and sampling program
- Co-ordinate sample analysis and reporting
- Evaluate effectiveness of strategy to use nearshore berm as beach nourishment method
- Deliver intermediate and final reports and present results as necessary at National and local conferences.

**Firm/PM role, Project Cost, Project Dates**
Prime role. Project cost: $77,000. Project dates: 2018-2020. No change orders or delays.

**Team Leader, Staff Assigned to Project available to work under this RFP:**
Dr. Patrick Friend (Partrac Project Manager). Dr. Friend will be assigned to work under this RFP.

**Client Project Manager Contact**:
Brandon Hill, AECOM, Office Tel: 713-278-4601 brandon.hill@aecom.com

Figure 2. a. Collection of sand samples for tracer analysis on South Padre Island Beach; b. Innovative 'dual signature' (fluorescent and magnetic) natural sand particles used to track sand movement.

## Beach and Dune Assessment at Fire Island, NY

## Client: Fire Island National Seashore

**Project Description**: The National Seashore at Fire Island, NY, experiences coastal change including erosion and loss of natural coastal protective systems (dunes) due to a number of different forcing factors. Regular winter storms erode the beaches, which often recover naturally, although there are zones of persistent erosion due to lack of local sediment supply. In 2012, Hurricane Sandy, significantly impacted this barrier island, including widespread damage to the island communities, extensive dune overwash and the formation of a breach. The project was established before Sandy hit, so there was a baseline to understand how the massive storm reconfigured the island. The effort involved an extensive field component to collect beach profiles and nearshore bathymetry to understand processes driving coastal change, as well as analysis of historical data (LiDAR, shorelines, and beach profiles) to examine previous events. The study revealed significant variations in the morphology and sediment supply along the island, which was correlated to areas of chronic erosion versus areas that were more stable and thus expected to recover naturally and more quickly. The results were incorporated into a new resource management plan for the park, and provide foundational information to inform a USACE regional sediment management plan (Fire Island to Montauk Point Reformulation Plan).

**Project Innovation**: In order to generate detailed maps of the nearshore zone in a high wave energy environment, specialized equipment and techniques were developed to launch single-beam sonar equipped jet-skis from the beach. The results shed enormous light on variations in island response to storms and long-term evolution.

**Firm/PM Responsibilities**:

- Complete a comprehensive analysis of the state of the beach-dune system
- Collect beach profiles and nearshore bathymetry
- Develop models to document and predict response and recovery from major storms (Hurricane Sandy) and seasonal nor'easters.

**Firm/PM role, Project Cost, Project Dates**
Prime role. Project cost: $450,000. Project dates: 2012-2018, with no change orders or delays.

**Team Leader, Staff Assigned to Project available to work under this RFP:**
Dr. Cheryl Hapke (USGS Project Manager). Dr. Hapke will be assigned to work under this RFP.

**Client Project Manager Contact**:
Alex Romero, Fire Island National Seashore Superintendent, Office Tel: 631-687-4751
(Note: Alex Romero is new incumbent; superintendent at time of project was Chris Soller)

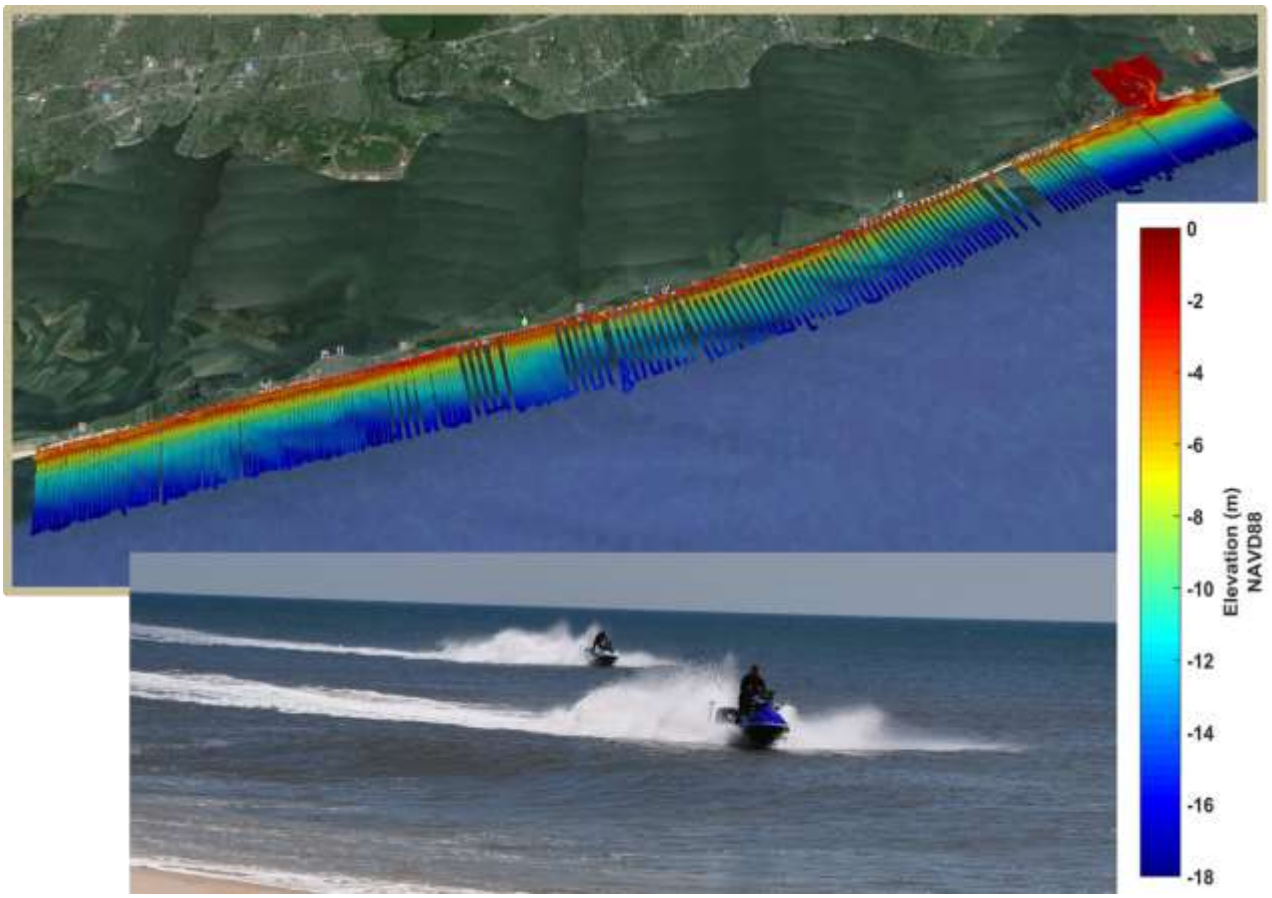



Figure 3. A combination of RTK-equipped jet-skis and on land profiles allowed for the first comprehensive map of the entire beach and nearshore system at Fire Island, including the breach cause by Hurricane Sandy.

## Malibu State Beach Erosion Response

## Client: California State Parks

**Project Description:** Integral recently completed design and supporting technical report for a living shoreline engineered log jam and cobble berm nourishment project at Malibu Beach State Park in California to address ongoing erosion issues at the federal historic landmark Adamson House Estate adjacent to an internationally designated World Surfing Reserve. Specific work tasks included topographic analysis, identifying causative processes, geomorphic analyses, conceptual engineering design, cost estimating, and a permitting roadmap. Integral led the project engineering and geomorphic team and continues to support California State Parks in the bid and permitting process. The project is considered a short term (~10 year) climate-change adaptation pilot project to allow the coastal management community to learn about the efficacy of such a living shoreline approach, including what types of adaptive management actions might be needed.

**Innovation:** Integral developed a natural, "green," "living shoreline" approach to address the erosion at the Adamson House rather than a traditional hard or "gray" engineering approach like that used at nearby locations that have resulted in a loss of beach. This project approach has evaluated and designed a solution to address both fluvial (creek) scour and wave induced erosion using native materials historically found at the site before substantial human intervention.

**Firm/PM Responsibilities:**

- Evaluation of historic conditions and timeline of past interventions
- Site survey and topographic analysis
- Geomorphic analysis of the causative physical processes
- Conceptual engineering design
- Cost Estimate
- Permitting roadmap and regulatory engagement

**Firm/PM role, Project Cost, Project Dates**
Prime role. Project cost: $35,000. Project date: 2020 with continued construction and permitting support. No change orders or delays. Client has requested a scope/fee estimate for additional work.

**Team Leader, Staff Assigned to Project available to work under this RFP:**
Dr. David Revell. Dr. Revell will be assigned to work under this RFP.

**Client Project Manager Contact**:
Danielle LeFer – California State Parks, Danielle.LeFer@parks.ca.gov, 818-880-0365

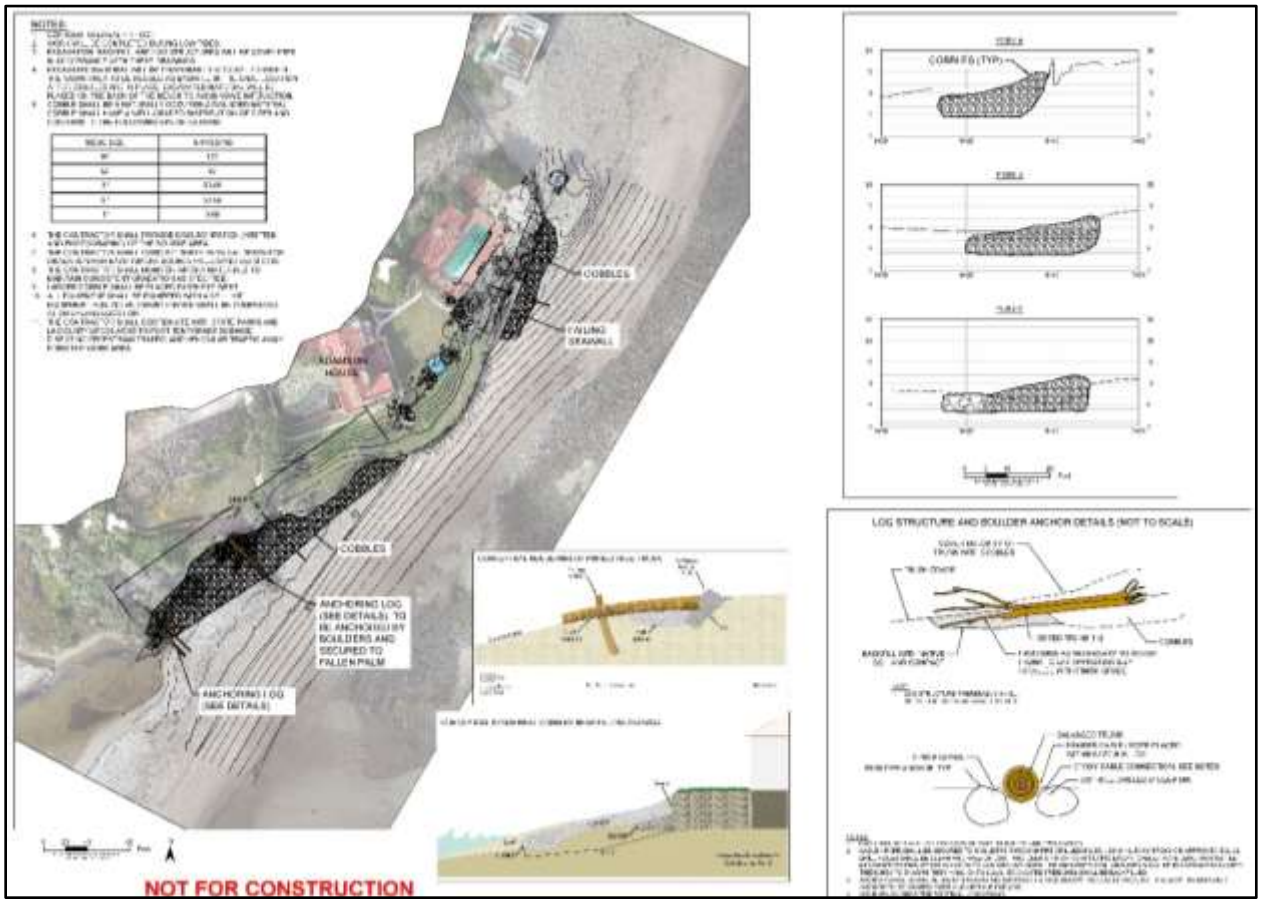



Figure 3. Conceptual design of living shoreline erosion solution for Malibu State Park.

## Beach Profile Surveys of South Padre Island, TX

## Client: City of South Padre Island

**Project Description**: This project is in support of the beach nourishment and monitoring along South Padre Island. Detailed cross-section surveys were completed from the dune line to beyond the depth-of-closure offshore. The upland portion of the survey is completed with GPS-RTK; the surf zone completed with GPS-RTK on a sled; and the hydrographic survey is completed with a dual frequency single-beam echo sounder. Approximately 40 sediment grab samples were obtained during one survey. Naismith has completed surveys each year since 2008.

**Project Innovation:** Naismith has consistently brought state-of-the-art surveying technologies to South Padre Island in a cost-effective manner to complete surveys on time, within the project budget, and with zero project personnel or public safety concerns during the surveying.

**Firm/PM Responsibilities**:

- Beach survey

- Surf zone survey
- Hydrographic survey to beyond depth of closure
- Ensure safety of personnel and tourists while conducting survey

**Firm/PM role, Project Cost, Project Dates**
Sub to HDR. Project cost: $40,000. Project dates: 2008-2020, with no change orders or delays.

**Team Leader, Staff Assigned to Project available to work under this RFP:**
Jim Naismith (Naismith Marine Project Manager). Mr. Naismith will be assigned to work under this RFP.

**Client Project Manager Contact**:
Cameron Perry, HDR Inc., Office Tel: 361-696-3352

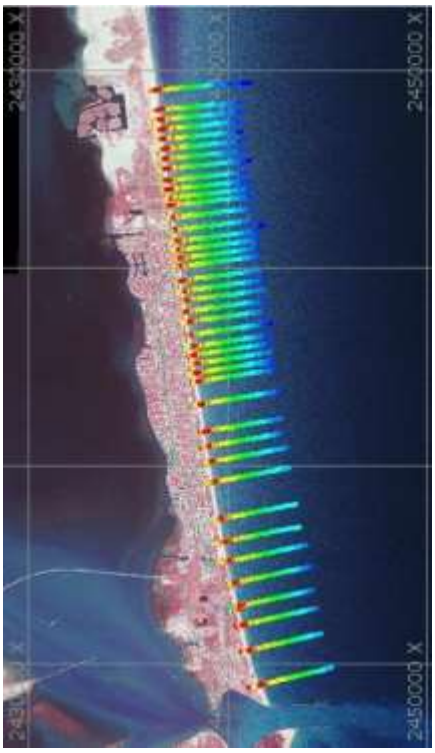



Figure 4. Surveyed beach and offshore profiles, South Padre Island

## Beneficial Use and Dune Mitigation Monitoring Program, Cameron Parish, LA

## Client: Cheniere Energy Inc.

**Project Description**: Sabine Pass LNG, (SPLNG), a large-scale, liquefied natural gas (LNG) company currently operates two marine dock facilities along the Sabine-Neches River in Sabine Pass, LA. BIO-WEST currently oversees and monitors multiple mitigation and restoration areas

under an umbrella mitigation plan, including coastal dune, freshwater, estuarine, and saltmarshes, through creation, enhancement, and restoration efforts on various properties adjacent to and downstream of the main operation. Specific to dune protection and management, SPLNG currently pumps maintenance dredge material on a semi-annual basis to create, supply, or enhance approximately 1.5 miles of dunes along the Gulf of Mexico at the Louisiana Point Beneficial Use Area. This created/maintained dune system acts as a barrier, protecting approximately 250 acres of high marsh, low marsh, and tidal flat mitigation areas under the same permit.

**Project Innovation:**
Bio-West conducted vegetation assessments and successional planning to ensure compliance with agency re-vegetation requirements. This led to the early determination that natural re-colonization of the dune system was the most efficient mitigation method; this was an innovative and cost-efficient route to ensuring success criteria were met.

**Firm/PM Responsibilities**:

- Assisted client with pumping rates, sediment analysis, suitability, and permitting
- Assisted SPLNG with dune vegetation assessments and successional planning to ensure compliance with agency re-vegetation requirements
- Developed a mitigation maintenance plan that includes semi-annual elevation mapping, surveys and cross-sectional analysis, quadrat and line transect vegetation sampling and assessments, aerial photograph interpretation, and comparison and analysis of monitoring efforts

**Firm/PM role, Project Cost, Project Dates**
Prime role. Project cost: $105,000 Year 1, then $65-85,000/year. Project dates: Ongoing - commenced 2012.

**Team Leader, Staff Assigned to Project available to work under this RFP:**
Matthew Chastain (Project Manager). Mr. Chastain will be assigned to work under this RFP.

**Client Project Manager Contact**:
Montana Patin, Senior Coordinator, Environmental and Regulatory Projects, Office Tel: 713-375-5043
montana.patin@cheniere.com

# E. Integral's Project Successes

**Integral is committed to the success of its projects not only in the effective accomplishment of project objectives, but in the fiscal accuracy of the project execution.** Integral utilizes well-established tools and in-house procedures to smoothly, cost-effectively manage programs. We use Deltek's Vision to track project tasks and costs in real time and prepare monthly budget projections Monthly progress reports provide a brief description of the work completed during the month, raise any potential schedule or budget issues, and provide a summary for the project managers, staff, and clients as needed. We use Microsoft Project for detailed schedules, providing summaries of major tasks at the level of detail needed. Feedback and verification of the quality of work are key components for project success; the Integral process includes independent peer reviews, calculation checks, and document editing. The following projects demonstrate Integral's success at managing complex projects for a variety of clients.

### *Coastal Protection Feasibility Study and Living Shoreline Design*

**Team Leader:** Keith Brodock, P.E.

**Project Description and Team Role**: Integral was responsible for evaluating shoreline armoring / restoration along Fox Point State Park in Wilmington, Delaware. Fox Point State Park is part of the Atlantic coastal system and is subject to significant tidal cycles, damaging wave energy, and the potential for subsidence. As the project manager and engineer, Mr. Brodock completed a feasibility study for armoring the 1.4-mile shoreline, excluding the mudflat cove area, as a way to limit subsidence of certain portions of the shoreline.

**Project Success and Innovation:** To overcome site uncertainty and save resource expenditure during evaluation of deposition and scour in the waterway, Mr. Brodock and Dr. Friend led a focused team to plan and execute an in-water investigation within the approved budget and schedule. The effort is currently supporting conceptual designs for an innovative living shoreline project with wave attenuation devices placed in the waterway to protect the future living shoreline. The final design will incorporate anticipated site changes due to the impacts of climate change and increased wave action. Integral communicated project progress and had regular client meetings throughout the project duration.

**Change orders:** None

### *Coastal Water Treatment Plant, Design and Construction, La Marque, TX*

**Team Leader:** Keith Brodock, P.E.

**Project Description and Team Role:** Integral's team lead, Mr. Brodock, was the Lead Design and Construction Engineer and Project Manager for a water treatment plant control system upgrade in La Marque, Texas, near an inlet to Galveston Bay. The Integral team evaluated the feasibility of several control technologies before selecting one product for the controls design. Integral developed a cost estimate for the final design, construction, and implementation of the project.

**Project Success and Innovation:** Integral was awarded the project following a presentation of the innovative approach and cost savings to the client. Integral designed, procured, programed, and installed the equipment. Despite a complete loss of programming during shipping of the control system, leading to extensive re-work, Integral was able to complete the project under budget without the need for change orders. These new project features have already saved the client thousands of dollars in labor by eliminating the need for emergency response actions. Integral's commitment to the client was demonstrated by significant cost-benefits achieved during this project.

**Change orders**: None

### *Post-Hurricane Sandy Remediation System, Feasibility Study, Design, and Construction*

**Team Leader:** Keith Brodock, P.E.

**Project Description and Team Role:** Integral a new remediation system along Gravesend Bay, New York after Hurricane Sandy destroyed the previous system. Taking into account lessons learned from the Hurricane Sandy experience, Integral performed a feasibility analysis of several potential designs, including a replacement-in-kind of the previous system. Integral concluded that the previous system was unacceptably susceptible to damage from future storms with increasing frequency and strength expected from climate change.

**Project Success and Innovation:** Integral selected and adapted a common household technology into a commercially-viable system, which provided for quicker deployment, removal, and replacement, as needed. The new system additionally had a lower physical profile and was less susceptible to future storm damage. Integral led the team of engineers and field technicians installing and commissioning the new system on-time and on-budget. The system was successful and allowed the client to close out the project with the agency. Integral was able to respond efficiently to client needs by rapidly installing the cost-effective and readily available new system.

**Change orders**: None

### *Engineering Analysis of Water Flow on a Coastal Peninsula*

**Team Leader:** Keith Brodock, P.E.

**Project Description and Team Role:** Integral provided engineering analysis of water flow on the coastal peninsula of Far Rockaway, Queens, New York. The project area was located about 400 ft. from Jamaica Bay and about 1,200 ft. from the Atlantic Ocean. The Integral team of engineers and data scientists provided an assessment to understand water movement on the peninsula.

**Project Success and Innovation:** Integral recommended the use of LiDAR and innovative data analysis of the topography of the area combined with specific monitoring points to validate a water flow model that demonstrated a flow endpoint in nearby Jamaica Bay. The water flow analysis assisted the client in developing planning and strategy for future work. The use of LiDAR and

innovative data analysis resulted in a more efficient use of budget and provided significant cost benefits to the client.

**Change orders**: None

### *Malibu State Beach Erosion Response, California State Parks*

**Team Leader:** David Revell, Ph.D.

**Project Description and Team Role:** Integral recently completed design and supporting technical report for a living shoreline engineered log jam and cobble berm nourishment project at Malibu Beach State Park in California to address ongoing erosion issues at the federal historic landmark Adamson House Estate adjacent to an internationally designated World Surfing Reserve. Specific work tasks included topographic analysis, identifying causative processes, geomorphic analyses, conceptual engineering design, cost estimating, and a permitting roadmap. Integral led the project engineering and geomorphic team and continues to support California State Parks in the bid and permitting process. The project is considered a short term (~10 year) climate-change adaptation pilot project to allow the coastal management community to learn about the efficacy of such a living shoreline approach, including what types of adaptive management actions might be needed.

**Project Success and Innovation:** Integral developed a natural, "green," "living shoreline" approach to address the erosion at the Adamson House rather than a traditional hard or "gray" engineering approach like that used at nearby locations that have resulted in a loss of beach. This project approach has evaluated and designed a solution to address both fluvial (creek) scour and wave induced erosion using native materials historically found at the site before substantial human intervention. Integral's commitment to the client during this project has resulted in a scope and fee request for additional work.

**Change orders**: None

# F. Project Management Accuracy

The Integral Team is committed to the accuracy and dependability of projected cost estimates. By implementing real-time project management tools, we have the unique advantage of tracking budgets as closely as needed with no lag time between timecard entry and the receipt of financials.

Each project that Integral undertakes is closely monitored to ensure design conformance and correct quantities, with close coordination with the sub-contractor.

**Using these tools, the Integral Team can assure that projects are completed with a high degree of technical accuracy, within the budgeted costs, and on schedule.**

Table 1 highlights the five projects listed above in order of budget to illustrate that Integral has consistently provided cost-effective project completion without the need of costly change orders.

Table 1. Integral Project Fiscal Summary

| Project Description | Fiscal Information | Change Orders |
|---|---|---|
| Coastal Protection Feasibility Study and Living Shoreline Design | Original Bid: $2.4 Million<br>Total Cost: $2.4 Million | No Change Orders Required |
| Engineering Analysis of Water Flow on a Coastal Peninsula | Original Bid: $300,000<br>Total Cost: $283,000 | No Change Orders Required |
| Coastal Water Treatment Plant - Design and Construction | Original Bid: $182,000<br>Total Cost: $165,000 | No Change Orders Required |
| Post-Hurricane Sandy Remediation System - Feasibility Study, Design, and Construction | Original Bid: $50,000<br>Total Cost: $45,000 | No Change Orders Required |
| Malibu State Beach Erosion Response, California State Parks | Original Bid: $25,000<br>Total Costs: $25,000 | No Change Orders Required |

# G. Project Capacity

**Capacity to achieve**

The capacity to complete the project for the City and remain on schedule is a key priority for Integral's proposed team. **Integral and its subcontractors will identify appropriate staff for each task and will commit to keeping those individuals on the project unless exceptional circumstances are encountered.** Integral has a long history of providing appropriate and consistent staff for our clients. We have carefully selected our key staff from local and national offices to provide the best value to the City. We are confident that the staff identified will perform the project tasks in a timely and cost-effective manner.

**Project Scheduling**

To support the project staff in prioritizing project tasks, Integral uses Microsoft Project software for project scheduling. This software allows detailed schedules to be developed and, simultaneously, can provide a "roll-up" or summary of the major tasks, which is typically the level of detail needed for management briefings and community meetings. In addition, tasks and subtasks are linked so that the entire project schedule is automatically updated when one date is changed. We can, upon the City's request, include a summary-level version of the project schedule in the monthly progress report.

**Commitment and Availability**

Our staff are also selected for their commitment to projects and their availability to remain for the project duration and to adapt to the changing needs of a client. Project Lead, Dr. Patrick Friend, is highly focused and committed to the successful outcome of this project, as shown by his project leadership record for the past 20 years. Dr. Friend knows well and has worked with all Integral's staff members previously.

**Contingency Plan**

**In the event that a change in a key staff member is required, we will recommend replacement staff who are equally or more qualified, and will await approval of the new staff prior to making the staff change.** We are confident that the Integral Team is the best for the project completion and includes multiple qualified staff with capacity that can accommodate any unforeseen staffing changes.

# H. Proposed Approach to Scope of Work

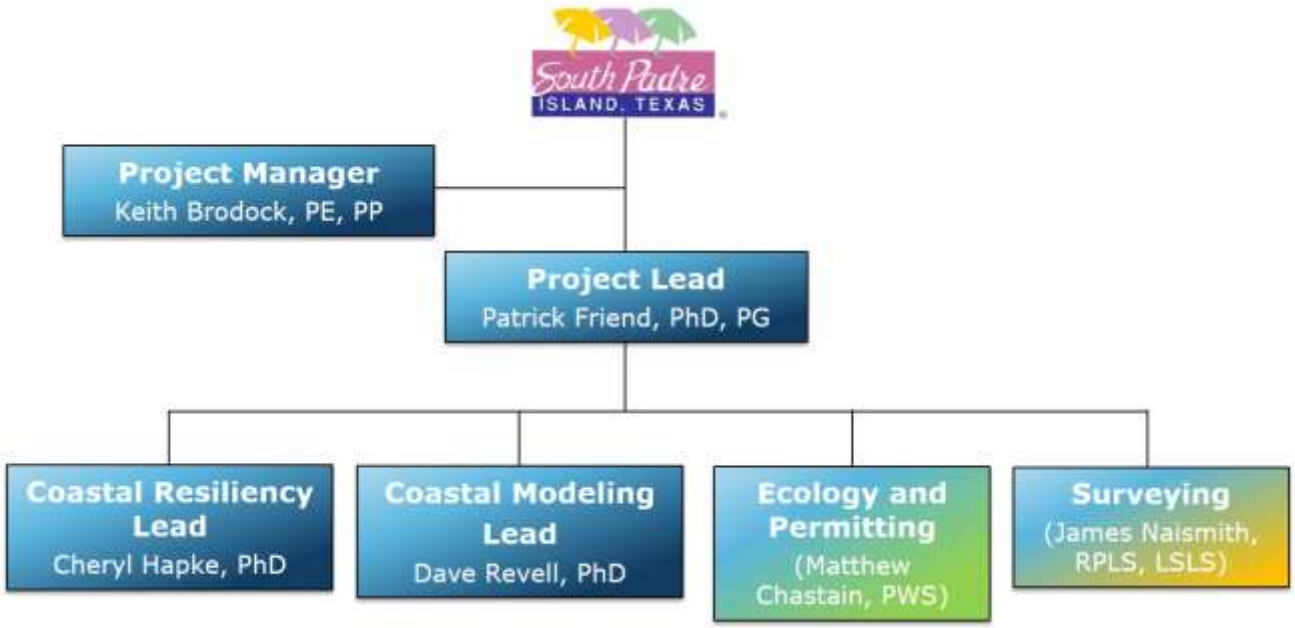
Our approach to this project is to leverage existing City and State data collection investments from past research, monitoring and modeling efforts. These leveraged historic data will be combined with a new survey and mapping of existing conditions. We will also conduct a geomorphic and statistical analysis to understand how existing conditions relate to historic storm and erosion patterns, evaluate historic recurrence intervals for storm patterns and wave climatology, model the impacts of various storms on existing conditions, and work with the City to identify a plausible set of potential dune and beach designs for evaluation.

**The chosen set of potential dune and beach designs will be guided by the principles of maximizing storm protection while balancing the competing needs of access, ocean views, and economic development.** Modeling the resiliency of each design to various storm events would allow for an informed discussion as to the community desired level of protection as well as the relative costs and maintenance requirements. One of the modeled scenarios will be the existing ordinance and practice of maintaining dune crest elevation of 10 -12 feet. Other scenarios to be informed by City engagement during the project may consider a wider beach, higher dune crests, emergency storm preparations at key vulnerable locations (e.g. volleyball courts), or different volume and location of sand placement based on information from the Nearshore Berm Tracer Study to provide a few examples. **Whatever the findings of the technical analysis, the Team will develop engineering design sketches, a dune vegetation and maintenance plan, as well as to make recommendations for the updating of existing ordinances and future work to prepare the City for a healthy coastal environment and future climate changes.**

## Organization and Structure of Project Team

The structure of the project team is shown in the organizational chart. Integral technical leads will work closely with the sub-consultants, Bio-West and Naismith Marine, under the leadership of the Project Lead (Dr. Friend) and the Project Manager, Mr. Brodock, P.E..

It is anticipated that the majority of the proposed work will be completed by Integral (70%) and the sub-consultants will each contribute 10% (Naismith Marine) and 20% (Bio-West) to the overall project.




Organizational chart of Project Team: Integral staff shown in blue.

## Quality Assurance and Quality Control

Integral follows an internal quality assurance review process for all project deliverables and follows a quality management plan specific to each project. See A. Introduction for more details on Quality Assurance and Control.

## Project Management

Project management and technical co-ordination with the City of South Padre Island will be through Integral's Houston, TX office. See A. Introduction for more details on Project Management.

## Project Work Plan

Our approach to the work in this proposal is to undertake a phased approach (Figure 5) to assess, investigate, and evaluate the beach and dune conditions at SPI in their present state (RFP Scope A). Building on the existing conditions assessment (Integral Phase or Task 1), the study will conduct a vulnerability assessment to examine the likely impacts to the beaches and dunes with storms and sea level rise now, and under future conditions with climate change (Integral Phase or Task 2). Beaches and dunes that are presently stable and have been historically maintained with via nourishment programs may require new configurations (widths, elevations, vegetation) to remain stable under future conditions and provide the highest-level of protection to the community (RFP Scope B). In our Phase 3, we will model and evaluate the impact of various storms on potential dune/beach configurations  Integral considers a healthy and stable, ecologically functional dune habitat to be a key component part of the maintenance plans for dunes; it is for this reason that we will review, in conjunction with Bio-West, the most suitable dune vegetation types capable of

reinforcing or offering new, improved resilience against existing storm erosion hazards as well as sea level rise accelerated coastal hazards in the future.

**The proposed phased approach provides an overarching framework that will provide the science and solutions for both Scopes A and B of the RFP.** As such, Scope A and B are not addressed separately in the details of our work plan below; rather they are combined as part of a holistic approach to develop a past, current, and future assessment of the beach-dune system and the protection it provides to the community of SPI. The four phases will be accomplished as a series of tasks and subtasks, detailed in Table 2. Our goal is to leverage existing previous work, fill data gaps, and complete the project efficiently with a clear roadmap of alternatives that may be considered to maintain the beaches and dunes and provide the community with the greatest level of protection.

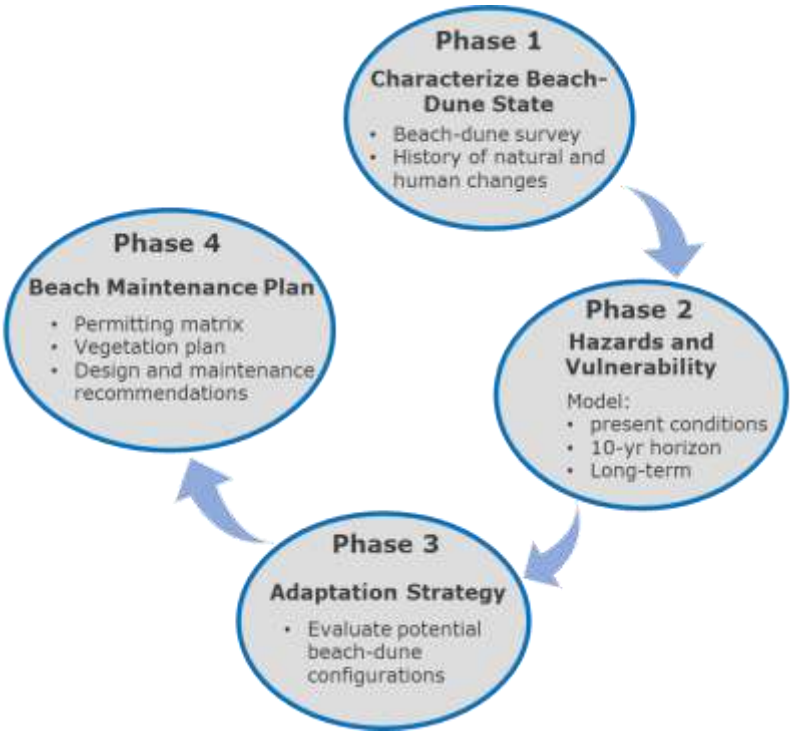



Figure 5. Framework to accomplish assessment and investigation of beach and dune conditions and develop maintenance plan at South Padre Island.

## *Phase 1—Characterize and Evaluate State of Beaches and Dunes*

A substantial amount of data exist for SPI, both in a long record of historical shorelines and a variety of LiDAR topographic data and field surveyed beach profiles. Our proposed beach and dune assessment and investigation will leverage previous studies and utilize existing data wherever possible.

Previous investigations of the beach and dune system at SPI include evaluation and assessment of shoreline position and annual averaged rates of change, dune elevation and width, and dune vegetation reported in the 2012 Erosion Response Plan (ERP). The shoreline positions and rates of change in the ERP were obtained from the Texas Shoreline Change Project (https://www.beg.utexas.edu/research/programs/coastal/the-texas-shoreline-change-project). The ERP divides SPI into three areas - north, central, and south, and presents the averaged shoreline change rate within each area, as opposed to providing a detailed alongshore perspective. The dune elevations are reported as averages or ranges for each of the three areas. Lastly, the ERP provides descriptions of dune "depth" or how wide the dune field is in a cross-shore direction, and concludes and recommends that a 200 foot wide dune field needs to be maintained to prevent the beaches and dunes from rapidly eroding, which would result in the loss of protection to community infrastructure. In addition to the largely qualitative 2012 ERP, a statewide shoreline change assessment by Paine and Caudle (2019) includes South Padre Island and provides an update to the 2012 rates of change reported in the ERP.

In addition to the analyses presented in the ERP, HDR Engineering, Inc. conducted the design and permitting of several beach-dune nourishment projects. As part of their effort, they established an annual monitoring program (2008-2015) to assess how the beach changed over time on profiles spaced approximately 1000 feet apart at long-established survey control monuments. In addition to beach profile changes, shoreline positions were extracted from the profiles to evaluate shoreline change over the project period. The study included a wave modeling component to assess alongshore variability in wave forcing to provide insight for the variable alongshore rates of coastal change. This analysis and monitoring is very useful and forward thinking and the data will help inform projections of long term change.

**However, both of these studies miss an analysis of storm recurrence frequencies and resultant erosion impacts, which is a key factor in considering the stability and level of protection provided by the dunes.** Can our dunes handle a 20 year winter storm event, or a Category 3 hurricane? We will provide insight into the questions regarding the level of protection provided by the dunes from a major hurricane and a series of more traditional storm wave events that might typically represent a stormy winter season. Our aim is to provide information on how vulnerabilities to these coastal hazards may change over time and with future sea level rise.

The Integral team proposes to conduct a substantially more quantitative assessment of the beach-dune system at SPI than was completed for the ERP, but it will be complimentary so as to provide an update to the previous information. We will incorporate as much as possible about coastal change and processes from the previous efforts, and plan to expand the investigation to produce a more systems-wide evaluation of the coastal processes driving beach and dune change at SPI. This will include an evaluation of the level of protection afforded by the existing dune system and potential enhancements of the dunes. Our goal is to determine the optimal configuration and needed enhancements for a variety of seasonal wave conditions as well as an extreme storm event.

## 1.1 Characterize the present coastal state

The first subtask will characterize the current state, or configuration, of the beaches and dunes (RFP Scope A) using a variety of metrics extracted from field surveys. **The metrics will include beach width, dune width, elevation of the dune crest and toe, beach and dune volume, and shoreline position.** A series of cross-shore profiles that extend seaward across the dune and beach, and into the nearshore to water depths of 25-30 ft. will be surveyed in the field using standard surveying techniques to capture the both the subaerial and subaqueous portions of the beach profile. The subaqueous portion of the beach is especially important for understanding the sediment budget along SPI, as it can serve as both a source and sink of sediment that's reworked by waves during stormy and calm conditions. The profiles will be surveyed at the location of established survey control markers along which numerous historical data exist. Naismith Marine, a proven and certified contractor, will conduct the beach profile survey using the same protocol they have established for past surveys at SPI. Metrics will also be extracted from the most recent available LiDAR data that was collected in 2019 by the TX GLO to examine short-term changes to the beach-dune system.

The 2019 survey also included the collection of aerial photographs which will aid in characterizing the state of the dune vegetation (percent area), which is an important component of dune stability. Healthy dune vegetation provides a stabilizing root network that enhances the stability of the dunes. **During field surveys of the beach profiles, measurements will also include identifying the vegetation extent along each profile, to evaluate whether there have been significant changes since the most recent aerial photographs (2019).**

In addition to the beach and dune metrics, Integral will evaluate the available wave data from nearby buoys and previously developed wave models to quantitatively characterize the dominant southeast wind and wave direction as well as the more northerly wind and waves associated with winter cold fronts. The wave and climatological analysis will be used to run an extreme value analysis to identify the recurrence interval of wave heights and directions over different periods of time (e.g. 1 year, 5 year, 10 year, 100 year). The extreme value wave events will then be used for modeling present and future impacts described in detail in Task 2 below. Following this analysis we will identify a final set of wave conditions to evaluate using XBeach geomorphic modeling to assess the resiliency of the various dune configurations to different types of storms and hurricanes and identify potential changes to the profiles and a measure of impact (e.g. number of structures).

## 1.2 Establish baseline metrics

To evaluate the present "health" and resiliency of the beaches and dunes on SPI, a baseline condition is required for comparison to understand how vulnerable the system is today, as compared with periods in the past. The baseline condition will be established using the same metrics derived in Task 1.1 (width, height volume, etc.) and will be developed from older LiDAR and beach profile data, which are available dating back to 2000 (LiDAR) and the 1990s (beach profiles). We will evaluate which historical dataset(s) best represent a low-vulnerability system, due to nourishment projects, lack of recent large storms, or both. The baseline and the current states will then be compared to generate an evaluation of the health of the present system and to understand

the temporal component of change which will be critical to the development of the beach maintenance plan (Phase 4; Figure 1). The historical data will also be examined to understand how the beach and dunes have changed in response to past wave events, including from a major storm event such as Hurricane Dolly in 2008, and several "typical" winter storm seasons for which we have before and after data.

**Deliverables: geospatial data, interim report with description of present state of coast, maps of present island vulnerability**

### *Phase 2—Hazard Identification and Vulnerability Assessment*

The vulnerability of the beach-dune system will be assessed by investigating the processes that drive coastal change. XBeach will be used to model coastal erosion potential under a range of storm wave and future sea level rise conditions. XBeach is particularly suited for modeling coastal erosion (e.g., volume, width, elevation) processes on timescales of single storm and wave events, as it simulates tidal and wave driven sediment transport and coastal erosion, and is a readily available free open-source model. The model will be forced with offshore wave conditions and will utilize the available historical buoy data, hindcast of Federal Emergency Management Agency (FEMA) waves (used in the Flood Insurance Rate Maps), and total water level outputs from FEMA. A statistical extreme value analysis will be conducted on the hindcast and historic wave conditions from available buoys and hindcast data sets to identify a set of characteristic storm conditions associated with various recurrence intervals.

Figure 6. Dune scarping near E. Sunset Dr. at the northern end of the City where some of the highest erosion rates are occurring

The historic and future modeling of storm and water-level scenarios will be evaluated relative to the existing profiles of the beach-dune system (Task 1.1) to determine the water levels most likely to cause erosion and overtopping of the beach and dunes in their current state, as well as on the baseline system identified in Task 1.2. The outcome of this phase will be the identification of what storm wave conditions, would most likely result in beach and dune erosion currently, and under future conditions with elevated water levels associated with climate change. Dune vegetation loss

will be approximated with % cover and projected dune erosion based on the results of Task 1.1. As a value-add, and to support the City in communicating study results, we will also report various storm, dune configurations and scenarios in terms of a single measure of impact (e.g. number of structures).

**Deliverables: Technical memorandum of results of vulnerability assessment, including maps of future erosion and vulnerability**

### *Phase 3—Evaluate Beach and Dune Adaptation Strategy*

Results of the vulnerability assessment and the modeling framework will be used to determine what the optimal beach-dune configuration(s) are to provide the best protection for the City of South Padre Island. Various potential adaptation strategies, focused on beach-dune nourishment and vegetation planting, will be evaluated to understand what the nourishment engineering design specifications will need to be, and how these engineering considerations are likely to change in the future as conditions continue to change. Design specifications will be developed in relation to the metrics identified in Task 1.1, including recommendations for beach and dune-field width, elevation of the beach berm and primary dune crest and toe, and shoreline position. The modeling in Phase 2 will also help to establish an adaptation pathway that identifies points in the future when, along some portions of the island, the beach and dunes may not be able to be maintained. That threshold, as well as alternative adaptation strategies, will be considered for the development of the beach maintenance plan (Phase 4).

Although, the beaches and dunes provide the first-line protection to the community from storm waves, the optimal profile may not be an acceptable alternative if assets like views or beach access are reduced. Arriving at a balance of the potentially conflicting issues of protection versus maintaining assets will require regular communication and interaction with the City and community members. In cases where the optimal configuration and close alternatives are not acceptable, we will provide recommendations for alternative adaptations such as storm preparation (e.g. temporary protective berms).

Figure 7. Beach nourishment at South Padre Island using a piped sand/water slurry

**Deliverables: Technical memorandum describing optimal configurations(s) and adaptation pathway**

### *Phase 4—Design configurations and Beach/Dune Maintenance Plan*

Integral (working with Bio-West) will make recommendations for a monitoring program to identify when the beach-dune system has changed significantly enough (a trigger point) to warrant action (e.g., nourishment). The monitoring can be done using field surveys or be based on remotely collected data such as LiDAR or new, innovative techniques such as Structure from Motion (SfM).

**Integral will develop a beach maintenance plan based on the results of our modeling, and vegetation considerations, that will take into account design modifications required to provide a beach and dune profile for achieving maximum practicable resiliency.** The plan will include recommendations for the frequency and type of nourishment (i.e. direct beach placement, offshore berm placement), and will include the identification of thresholds in time or water level, when the original design specification may no longer provide the desired protection.

A beach and dune design, and habitat maintenance plan will be led by Bio-West and developed in collaboration with the rest of the team based on the findings and outcomes of Phases 1-3. The Integral team will work closely with Bio-West in the plan development, review all subcontractor contributions and sharing results from modeling and vulnerability outcomes to devise the most practicable strategy.

## 4.1 Permitting Coordination and Strategy

To assist with potential permitting efforts and navigate the regulatory process, Integral will coordinate a number of teleconference meetings between the City, and USACE as lead permitting agency to ask questions, solicit feedback, and receive project information and permitting updates for any necessary approvals to implement new design recommendations and modifications to existing beach and dune design configurations, nourishment intervals or placement methods and

areas offshore recommended as a result of this proposal. Other regulatory agencies, e.g. Texas GLO, will be included as appropriate and identified by the City.

**Integral, through its subcontractor Bio-West, will assist the City with a permitting roadmap, a document that lays out the design, organization, and permitting strategies for all aspects of the project, including the formulation of desktop reviews and field survey protocols, identifying potential construction techniques and schedules, and delineating and drafting proactive responses to potential issues.**

Integral, through its subcontractor Bio-West will assist the City in proactively addressing issues and agency requirements as well as preparing conceptual plans and outlines, meeting minutes, and agendas to address agency comments and answer any pertinent questions prior to any formal permitting effort. Once a final strategy is decided, a permitting matrix will be produced for the City, outlining the various regulatory approvals that will be required to incorporate any design recommendations and modifications proposed as a result of the project evaluations.

Bio-West will provide a single point of contact to Integral for the purposes of project interface, budget tracking and forecasts, project updates, and scheduling. Bio-West Project Manager will provide project updates, field data, and progress reports on a regular schedule through both telephone and email correspondence, and will assume the role of QA/QC, participating in interactive review and revision of project data, documentation, permits, and agency submittals as necessary.

## 4.2 Beach and Dune Maintenance and Management Plan

**Integral's subcontractor Bio-West will draft a Dune Habitat Maintenance and Management Plan ("Plan") that incorporates the findings from Phases 1-3 of the proposed project.** The general purpose of the Plan will be to provide guidance to SPI to maintain and adopt a stable, ecologically functional beach-dune system appropriate for the south Texas coast that reduces maintenance costs, alleviates public safety concerns, and benefits the aesthetic and culture of the community of South Padre Island. The plan will include all applicable figures, exhibits, typical plan and cross-sections, adaptive long-term management techniques, planting regimes, new plant types, and other necessary components to meet the City's needs. Development of the plan will be guided by the most recent available research and protocols, including the Texas General Land Office's (GLO's) The Dune Protection and Improvement Manual (Fifth Edition), Galveston Parks Board 2014 Dune Maintenance Manual, National Oceanic and Atmospheric Administration (NOAA) Sea Grant Consortium 2016 Dunes Manual, and various other industry standard manuals, models, and practices, as applicable, to assist with the development of the Plan. Note: it is proposed to assess new habitat types that may be more salt-tolerant or provide enhanced dune resilience to mitigate future sea level rise and climate change hazards.

## Approach to Project Management

The overall Integral approach to project management and management systems are outlined in the Introduction and Past Experience sections (Sections A and E through G). For the presently proposed work, we will additionally include the following:

- Local contact Dr. Patrick Friend available 281-732-7961
- Project Management Plan developed during project kickoff
- Quality Management Plan developed during project kickoff
- Regular updates on project schedule, costs, and progress provided to SPI
- Participation in stakeholder meetings as needed
- Reporting - Progress reports as necessary throughout the project, as well as live updates by web meeting or in person to City of SPI at least monthly
- Final report to include Presentation Support as required by SPI.

## Project Timeline

The proposed project schedule and timeline are detailed in Table 2. From award of contract, we anticipate completion of the project within an 18 month period. All deliverables will be electronic submittals, and there will be both DRAFT and FINAL versions of deliverables with comments and feedback provided by the City in a single consolidated set of comments.

Table 2. Timeline and schedule for completing the project

| Project Timeline | | 2020 | | 2021 | | | | | | | | | | | | 2022 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **South Padre Island Beach and Dune Study** | **Subtask** | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr |
| Task 1 Characterize beaches and dunes | 1.1 Present state | | | | | | | | | | | | | | | | | | |
| | 1.2 Baseline metrics | | | | | | | | | | | | | | | | | | |
| Task 2. Hazard and vulnerability assessment | | | | | | | | | | | | | | | | | | | |
| Task 3. Adaptation strategies | | | | | | | | | | | | | | | | | | | |
| Task 4. Design and beach maintenance plan | 4.1 Permitting strategy | | | | | | | | | | | | | | | | | | |
| | 4.2 Maintenance plan | | | | | | | | | | | | | | | | | | |

# I. Comments/change requests to Standard Form of Agreement

Integral understands that the City is in the process of drafting a new Standard Form of Agreement template which will be made available during any negotiation process as a result of this proposal, therefore no comments or change requests are included with this submission.

# Appendix A

# Certification and Acknowledgment

## CERTIFICATION and ACKNOWLEDGMENT

The undersigned affirms that they are duly authorized to submit this Proposal, that this Proposal has not been prepared in collusion with any other Respondent, and that the contents of this Proposal have not been communicated to any other Respondent prior to the official opening. To the extent this Contract is considered a Contract for goods or services subject to § 2270.002 Texas Government Code, Respondent certifies that it: i) does not boycott Israel; and ii) will not boycott Israel during the term of the Agreement.

Signed By: _____ Title: Managing Principal | Project Manager

Typed Name: Keith Brodock Company Name: Integral Consulting Inc.

Phone No.: 212-440-6702 Fax No.: None

Email: kbrodock@integral-corp.com

| | | | | |
|---|---|---|---|---|
| Bid Address: | 16225 Park Ten Place, Suite 500 | Houston | TX | 77084 |
| | P.O. Box or Street | City | State | Zip |
| Order Address: | 719 2nd Avenue, Suite 700 | Seattle | WA | 98104 |
| | P.O. Box or Street | City | State | Zip |
| Remit Address: | 719 2nd Avenue, Suite 700 | Seattle | WA | 98104 |
| | P.O. Box or Street | City | State | Zip |

Federal Tax ID No.: 48-1266683

DUNS No.: 122573988

Date: 9/10/2020

The undersigned further affirms that Integral Consulting Inc. is a qualified business entity, not in receivership or contemplating same, and has not filed bankruptcy.

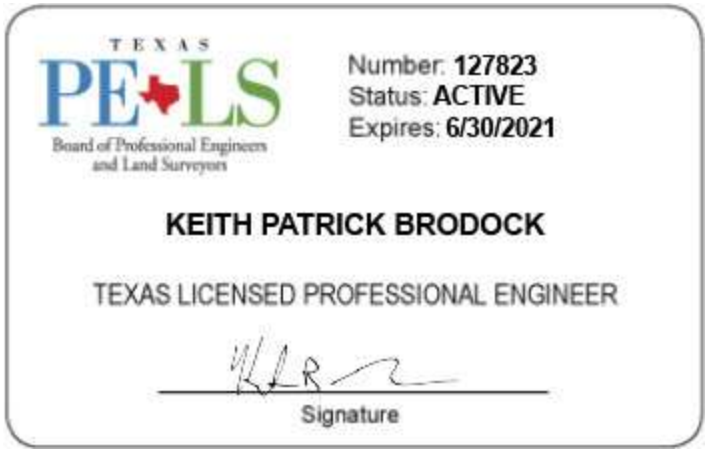
Signed

_____

Keith Brodock, P.E., P.P.

# Appendix B

# Copies of Professional Licenses


TEXAS
PE LS
Board of Professional Engineers and Land Surveyors
Number: 127823
Status: ACTIVE
Expires: 6/30/2021
KEITH PATRICK BRODOCK
TEXAS LICENSED PROFESSIONAL ENGINEER
Signature

***PATRICK LYNN FRIEND, PG***

**Geology**

License #12981

Expires September 30, 2021

In accordance with the provisions of the Texas Geoscience Practice Act, the Texas Board of Professional Geoscientists hereby certifies that the above named individual has been licensed as a Professional Geoscientist.

**Becky L. Johnson, PG, TBPG Chairman**

# *Society of Wetland Scientists*
# *Professional Certification Program, Inc*

renews the designation

# Professional Wetland Scientist

For

## Matthew Evans Chastain

In recognition of all the professional requirements approved by the Society of Wetland Scientists Certification Renewal Program, and verified by the Society's Certification Renewal Review Panel. Professional Wetland ScientistNumber 2281 issued on 10/30/2012 and recertified on 12/21/2017. Due to recertify again by 10/30/2022.

James E. Perry, PhD, PWS
President

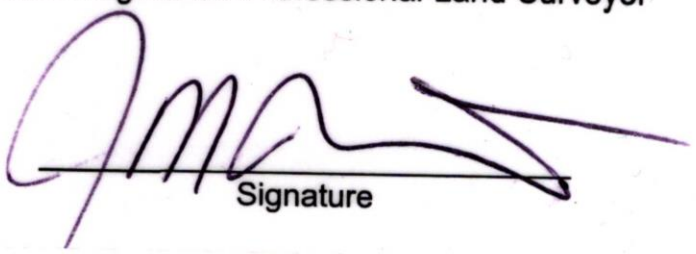
Pat Frost, PWS
Certification Renewal Chair

TEXAS
PE LS
Board of Professional Engineers and Land Surveyors

Number: **4828**
Status: **Registered**
Expires: **12/31/2020**

**JAMES MOZENEY NAISMITH**

Texas Registered Professional Land Surveyor



Signature

# Appendix C

# Professional Resumes

# Keith P. Brodock, P.E., P.P.
***Project Manager | Managing Principal***

### *Education and Credentials*

B.S., Chemical Engineering, Clarkson University, Potsdam, New York, 2003

Professional Engineer, Alabama (License No. 39484), Delaware (License No. 18630), Illinois (License No. 062.069589), New Jersey (License No. 24GE05352100), New York (License No. 089004), North Carolina (License No. 044100), Maryland (License No. 44309), Montana (License No. 66155), Texas (License No. 127823)

Professional Planner, New Jersey (License No. 33LI00638600)

Leadership in Energy and Environmental Design Accredited Professional (2009)

### *Continuing Education and Training*

Delaware Valley Safety Council Basic Orientation Plus (Expires 10-2020)

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2003 to present)

Hazardous Waste Operations Management and Supervisor 8-Hour Certification (2004)

OSHA 10-Hour Construction Safety Training (2012)

PSMJ Resources, Inc. Project Management Bootcamp (2011)

Solvay West Deptford Contractor Training (Expires 10-2020)

Transportation Worker Identification Credential (Expires 2024)

1001 6th Avenue
11th Floor
New York, NY 10018

212.440.6702
kbrodock@integral-corp.com

## Professional Profile

Mr. Keith Brodock is a licensed Professional Engineer and Program Manager with more than 15 years of experience in Coastal and Environmental engineering, Remediation and Restoration Design, and Construction. As a Professional Engineer, Mr. Brodock has responsibilities ranging from oversight of investigation and remediation to cost estimation and project execution.

Mr. Brodock has managed projects across the country and is currently managing Coastal Protection and sediment related construction projects in Texas and elsewhere in the U.S. As a professional engineer, Mr. Brodock has responsibilities ranging from oversight of assessment and investigation, to preparing design drawings/specifications and project execution.

He routinely advises clients on due diligence matters, risk management, site investigation and remediation, regulatory climate, and mitigation measures for contaminated properties. Mr. Brodock has considerable experience in developing strategic plans for remediation that meet wide-ranging stakeholder needs. He is a remediation design engineer and serves as resident engineer on multiple construction projects in the New York City and New Jersey areas. He is also a specialist in applied photogrammetry. Mr. Brodock also has substantial litigation support experience on cases involving a range of remediation issues, engineering cost analysis, and liability allocation.

In addition to his project management expertise, Mr. Brodock has wide experience leading multidisciplinary design, permitting, and construction teams to project completion in compliance with all legal requirements. His level of responsibility has ranged from Project Engineer to Project Manager to Principal-in-Charge.

## Relevant Experience

***Coastal Protection Feasibility Study and Living Shoreline Design, Wilmington, Delaware***—Project Manager and licensed Professional Engineer responsible for evaluating shoreline armoring / restoration along Fox Point State Park in Wilmington, Delaware, for an important national insurance company. Fox Point State Park is part of the Atlantic coastal system and is subject to significant tidal cycles, damaging wave energy, and the potential for subsidence. Completed

a feasibility study for armoring the 1.4-mile shoreline, excluding the mudflat cove area, as a way to limit subsidence of certain portions of the shoreline. As a preliminary data collection effort designed, in part, to evaluate deposition/scour in the waterway, led a team to plan and execute an in-water investigation within the approved budget and schedule. Currently evaluating, as a design engineer, conceptual designs for a living shoreline project with wave attenuation devices placed in the waterway to protect the future living shoreline. The final design will incorporate anticipated site changes due to the impacts of climate change and increased wave action.

***Coastal Water Treatment Plant - Design and Construction, La Marque, Texas***—Lead Design and Construction Engineer and Project Manager for a water treatment plant control system upgrade in La Marque, Texas, near an inlet to Galveston Bay, for a private trust. Working with a technology vendor, evaluated the feasibility of several control technologies before selecting one product for the controls design. Developed a cost estimate for the final design, construction, and implementation of the project. The project was awarded following a presentation of the approach and costs to the client. Oversaw the team of engineers to complete the design and to procure, program, and install the equipment. One of the on-site engineers performing the installation. Despite a complete loss of programming during shipping of the control system, leading to extensive re-work, completed the project under budget without the need for change orders. Able to provide additional provide cost savings measures and increased monitoring capabilities beyond the initial project scope while still remaining under budget. These new project features have already saved the client thousands of dollars in labor by eliminating the need for emergency response actions.

***Post Hurricane Sandy Remediation System - Feasibility Study, Design, and Construction, New York***—Project Manager and Lead Design Engineer for a new remediation system along Gravesend Bay, New York after Hurricane Sandy destroyed the previous system for a fuel oil distribution company. Taking into account lessons learned from the Hurricane Sandy experience, performed a feasibility analysis of several potential designs, including a replacement-in-kind of the previous system. Concluded that the previous system was unacceptably susceptible to damage from future storms with increasing frequency and strength expected from climate change. Selected and adapted a common household technology into a commercially-viable system, which provided for quicker deployment, removal, and replacement, as needed. The new system additionally had a lower physical profile and was less susceptible to future storm damage. Presented the new design to the agency overseeing the project and obtained approval and oversaw the team of engineers and field technicians installing and commissioning the new system on-time and on-budget. The system was successful and allowed our client to close out the project with the agency.

***Engineering Analysis of Water Flow on a Coastal Peninsula, New York***—Served as the Project Manager and Project Engineer for an analysis of water flow on the coastal peninsula of Far Rockaway, Queens, New York, for a national law firm. The project area was located about 400 ft from Jamaica Bay and about 1,200 ft from the Atlantic Ocean. Led a team of engineers and data scientists to understand water movement on the peninsula. Using LiDAR data of the area and ground-based land surveyor data collection, combined with specific monitoring points, developed and proved a water flow model that demonstrated a flow endpoint in nearby Jamaica Bay.

***Environmental, Geotechnical, and Green Infrastructure Evaluations, Multiple Public Park Sites, New York City***—Principal-in-charge for multiple investigations of public parks throughout all five boroughs of New York City. Overseeing a team of managers, engineers, and scientists to evaluate the presence or absence of contaminants at public park development sites. Additionally, serving as lead engineer for green infrastructure evaluations and preliminary designs. Geotechnical engineer subcontractor is evaluating site geotechnical properties in preparation for development design.

***PFAS Soil Remediation, New Jersey***—Project Manager for construction of a soil remediation for PFAS constituents. Led the construction team in contingency planning, scheduling, and documentation of construction work. Developed engineering solutions as site conditions changed from design.

***State Superfund Remediation and Stormwater Design, Maspeth, Queens, New York***—Acted as engineer in responsible charge of the design of a state Superfund remedial cap. Remedial cap was designed for direct discharge of stormwater to Newtown Creek. Collaborated with NYS Department of Transportation (NYSDOT) and NYSDEC to develop a design consistent with the needs of both agencies. NYSDOT would be constructing the designed cap as part of its construction of a nearby bridge.

***Environmental Remediation Estimates Using Monte Carlo Analysis, Various Locations, U.S.***—Determined and communicated environmental remediation cost risk to clients. Assisted owners with their internal budgeting process to communicate to their management the likely, best, and worst case scenarios. By understanding the range of costs associated with the project, management was equipped to make better decisions on expense allocation. Certain projects incorporated the management science of decision-tree analysis to consider alternate remedial technologies. In fact, the client was able to select a remedy based on the risk profile.

## Key Publications/Presentations/Posters

Palko, E., and K. Brodock. 2020. PFAS 101. New Jersey Site Remediation Conference, February 5, New Brunswick, NJ.

Brodock, K. 2019. Climate change and environmental justice. Panel presentation at the 2019 New York State Bar Association Environmental and Energy Law Section, January 18, New York, NY.

Brodock, K. 2018. Technological advances changing the way we conduct investigation and remediation within the next 10 years. Panel presentation at the 2018 Dow Environmental Remediation and Restoration Global Meeting, March 7, Lake Jackson, TX.

Studer, J., M. Hasegawa, E. Christine, D. Allen, C. Turner, K. Brodock, and J. Rhodes. 2005. Surfactant-enhanced recovery of No. 2 fuel oil from beneath a building along coastal New Jersey: A case study. Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water Conference, Costa Mesa, CA, August 17–19. National Ground Water Association.

Tornatore, P.M., J. Rhodes, and K. Brodock. 2005. Improving experience based engineering estimates for environmental liabilities using Decisioneering® software. 2005 NGWA Conference on Remediation: Site Closure and the Total Cost of Cleanup, Houston, TX, November 7–8. National Ground Water Association.

Rhodes, J., and K. Brodock. 2005. Estimating environmental liabilities using probabilistic engineering methods. Web seminar.

## Professional Affiliations

Interstate Technology & Regulatory Council, *Vapor Intrusion (VI) Mitigation* team leadership (2020 to present), *Optimizing In Situ Remediation Performance and Injection Strategies* team (2018 to 2020)

Montclair Planning Board, Vice Chair (2017 to present), Class IV Member (2015 to present)

Montclair Environmental Commission, Commissioner (2015 to present), Alternate Commissioner (2013 to 2015)

National Society of Professional Engineers (2011 to present)

Urban Land Institute: NYC Infrastructure Product Council (2018 to present); Mentor (2018 to present); Redevelopment and Reuse Product Council (2012 to 2015); New York District Council, Mentoring Co-Chair (2013 to 2016); NY Mentor Program Chair (2011 to 2013)

# Patrick L. Friend, Ph.D., P.G.
***Project Lead | Strategic Advisor***

### *Education and Credentials*

Ph.D., Sediment Dynamics, University of Southampton, National Oceanography Centre, UK, 2001

B.Sc. (Hons)., Oceanography with Geology, University of Southampton, National Oceanography Centre, UK, 1998

Professional Geologist, Texas (License No. 12981)

### *Professional Affiliations*

Estuarine Coastal Sciences Association

American Shore and Beach Preservation Association

Texas Board of Professional Geoscientists

International Association of Sedimentologists

Society for Underwater Technology

Houston Geological Society

Society for Sedimentary Geology

American Association of Petroleum Geologists

### *Achievements and Awards*

*Continental Shelf Research* (Elsevier) most cited paper 2003–2007 award

## Professional Profile

Dr. Patrick Friend is an international coastal and marine scientist, with more than 20 years of industry and academic experience in project delivery, project management and data collection/survey for both governmental and private sectors. His primary areas of scientific expertise are sediment transport, coastal erosion, and coastal geomorphology. Dr. Friend's expertise as an economic geologist encompasses opportunity screening, strategic planning, probabilistic risk assessment, asset evaluations and acquisitions, quality assurance, and due diligence.

Dr. Friend has consulted extensively for port and harbor authorities, and both public and private coastal stakeholders. He spent 8 years as a Research Fellow at the University of Southampton's world-renowned National Oceanography Centre, UK, where he was Project Lead on three large, multidisciplinary European Union projects. He spent 10 years in the global offshore energy industry, working in multiple countries as a Senior Geologist and Senior Basin Analyst. He is presently managing and developing coastal resiliency projects in West Africa, the Gulf of Mexico and elsewhere in the U.S. Dr. Friend was Project Manager for the successful Nearshore Berm Sediment Transport study for the City of South Padre Island, completed in 2019. All projects that Dr. Friend has led or managed have been carried out with full legal, regulatory and permitting compliance.

Dr. Friend has authored numerous scientific reports and papers, and has published on topics ranging from sediment transport pathways in dredged estuaries to the erodibility of beaches and saltmarshes in the coastal zone. He is a licensed Professional Geologist in the State of Texas: License No. 12981, expiration date Sept. 30 2021 (see copy of license, attached to this proposal).

## Relevant Experience

### Coastal and Marine Science

***Beneficial Use Dredge Material (BUDM) for Nearshore Berm Construction, South Padre Island, Gulf of Mexico, Texas—***
Dr. Friend was **Project Manager** for this successful project that employed tracers to examine the effectiveness of using a nearshore berm constructed from dredge material deposited in a licensed

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placement area to supply sand to the South Padre Island beach. He presented the results at the American Shore and Beach Preservation Association's national annual meeting in 2019. The client was the City of South Padre Island; other partners were USACE (Galveston), USGS, and Texas A&M. The project consisted of placing a dual signature (fluorescent and magnetic) tracer on the newly constructed berm half a mile offshore, just outside closure depth. Sixty offshore and 50 onshore (beach) sediment samples were collected at fixed locations and varying time intervals up to 15 months after tracer deployment. In total, more than 900 sediment samples were collected and analyzed for the presence of tracer. An upward looking acoustic Doppler current profiler (ADCP) was deployed continuously for 1 year near the berm, and regular bathymetric surveys of the berm were conducted. From the sample analyses, it was possible to calculate longshore and cross-shore sediment transport rates, directions, and fluxes. The results of this project will be used to calibrate the USACE sediment transport model for the area and will be published in due course. The Final Report was delivered to the City of South Padre Island in 2020, on time and within budget.

***Trend Vector Modeling of Sediment Transport Pathways Offshore of a Gulf Coast Barrier Island, South Padre Island, Texas***—Dr. Friend developed and was **Project Lead** for a trend vector modeling study for the City of South Padre Island, who were interested in understanding large-scale sediment transport processes offshore. He leveraged an archived data set of surface sediment grab samples collected by the Texas Bureau of Economic Geology in the late 1970s to produce a trend vector analysis of sediment transport pathways for a 50-mile section of the Gulf of Mexico coastline to a distance of 10 miles offshore. The project is unique in that it uses a geostatistical (semi-variogram) method to define the spatial scale at which trend vectors are calculated. The resultant model defines a unique snapshot of sediment transport on the inner continental shelf immediately prior to the grab sample survey. It is not understood whether the same general transport pathways exist today; however, it is particularly interesting to note that modern pathways identified during the BUDM project (see above) are similar. Furthermore, the model clearly identifies an area of divergence where a hinge point exists today. The results were presented as a poster at an American Shore and Beach Preservation Association (ASBPA) meeting at the Harte Research Institute, Corpus Christi, TX.

***Erosion Rates, Erosion Thresholds, and Settling Velocities of Cohesive Sediments in the Humber Estuary, England***—Dr. Friend was **Project Lead** for the *in situ* measurement of erosional and depositional parameters used for calibrating a hydrodynamic model of the Humber Estuary for a large UK port authority. Rapid and safe data collection using *in situ* instrumentation was possible by use of a hovercraft to traverse dangerous intertidal muds and sands safely, and to cover large distances quickly in this highly dynamic estuary. The data were collected as part of a managed retreat project designed to examine the effects on estuarine circulation of allowing the sea to flood farmland adjacent to the estuary during exceptional high tides. Managed retreat is often the most cost effective option in the United Kingdom to adapt to the effects of sea level rise and climate change, and is especially useful in non-residential, low-grade farmland areas. The results of this project are published in a National Oceanography Centre Southampton, UK, Research and Consultancy Report.

***Hydrodynamic Model Calibration for MOSE Flood Protection Project, Venice, Italy***—Dr. Friend was **Project Lead** for the collection of current velocity and bottom shear stress data to calibrate the hydrodynamic model for Venice Lagoon as part of the high profile MOSE flood barrier scheme designed to protect Venice from high water events due to a combination of natural and anthropogenic causes. He worked closely with modelers from Italy's Institute of Marine Science (ISMAR) during the model construction and testing phases to ensure correct application of the data. The model enabled examination of the effects on circulation and flushing times within the lagoon of opening and closing the proposed MOSE flood barrier. The project was funded by a consortium of public and private companies responsible for the construction and implementation of the MOSE flood barrier. The results were published in the book *Scientific Research and Safeguarding of Venice* (P. Campostrini, ed., CORILA, pub.).

***Transport Pathways of Sediment in a Dredged Estuarine System, Southwest England***—Dr. Friend designed and was **Project Lead** for a ground-breaking study for the Fowey port authority into the sediment transport pathways and fate of dredged material placed in a disposal area outside the harbor entrance. He used an integrated approach comprising new data collection (offshore and riverine grab samples) combined with archived data to describe long-term (100-year) morphological and bathymetric changes to the inner continental shelf and deep water harbor, the latter dredged for more than 120 years. Dr. Friend described sediment dispersal patterns from the dredge spoil placement area using grain size trend analysis, the first time this approach had been used in the world. The project concluded that the dredging of the estuary had altered its morphology in such a way that it acted as a highly effective trap for riverine sediment eroded from its upper reaches and for sediment, including previously dredged sediment, entering from offshore. Results are published in the journal *Estuarine, Coastal and Shelf Science*.

***Demonstration of a New Tool for the Rapid, In Situ Mapping of Contaminated Sediments, Washington, DC***—Dr. Friend developed, implemented, and is currently **Project Manager** for a major U.S. Department of Defense Environmental Security Technology Certification Program (ESTCP) project that demonstrates the use of an aquatic gamma spectrometer for the *in situ* mapping of contaminated sediments in riverine, lacustrine, and estuarine environments. *In situ* gamma spectroscopy has been successfully used in Europe for the rapid mapping of sediments contaminated with PCBs, PAHs, and heavy metals, but has not yet been demonstrated in the U.S. The technology takes advantage of the adsorption properties of clay minerals and the naturally occurring presence of radionuclides in the clay minerals. The method is particularly useful during the screening phase to identify hotspots for further investigation. The results will be disseminated through presentations at ESTCP symposia, reports, and publication in international journals.

***Bio-dependent Bed Parameters as a Proxy for Saltmarsh Sediment Stability, Ria Formosa, Portugal***—Dr. Friend planned and was **Project Lead** for a study that examined the stability of saltmarsh sediments affected by sea level rise and habitat loss due to propeller wash as part of the EU's Feedback of Estuarine Circulation and Transport of Sediments on phytobenthos (FECTS) program. He measured erosional shear stress in the field, using a CSM Mk III field erosion device. Other parameters measured were chlorophyll *-a*, colloidal carbohydrate, sediment water and organic contents, and bed elevation. He examined interdependent relationships using multiple

regression and principal components analysis, and he collaborated closely with scientists from the University of Ferrara, Italy, communicating results through international conference presentations and journal publication. The results of this project are being used today by coastal engineers and scientists working with nature to construct artificial saltmarshes, and in thin layer placement applications using dredged sediments. The results of this project were reported in a publication that won the most cited paper award 2003–2007 for the international journal *Continental Shelf Research* (Elsevier).

## Selected Publications

Amos, C.L., H. Kassem, P.L. Friend. 2019. Ripple Marks. In: *Encyclopedia of Coastal Science*. C.W. Finkl, and C. Makowski (eds). https://doi.org/10.1007/978-3-319-48657-4_262-2

Friend, P.L., B. Hill, and J.M. Aguillar. 2018. Grain size trend analysis (GSTA) on the inner continental shelf, South Padre Island, Texas. Texas Chapter ASBPA meeting, January 17, 2018, Harte Institute, Corpus Christi, TX.

Buls, T., K. Anderskouv, P.L. Friend, C.E.L. Thompson, and L. Stemmerik. 2017. Physical behaviour of Cretaceous calcareous nannofossil ooze: Insight from flume studies of disaggregated chalk. *Sedimentology* 64:478–507.

Friend, P.L., C.H. Lucas, P.M. Holligan, and M.B. Collins. 2008. Microalgal mediation of ripple mobility. *Geobiology* 6:70–82.

Friend, P.L. and C.L. Amos. 2007. Natural coastal mechanisms—flume and field experiments on links between biology, sediments and flow. *Cont. Shelf Res.* 27:1017–1019.

Friend, P.L., A.F. Velegrakis, P.D. Weatherston, and M.B. Collins. 2006. Sediment transport pathways in a dredged ria system, south-west England. *Estuar. Coast. Shelf S.* 67:491–502.

Amos, C.L. and P.L. Friend. 2005. Ripple marks. In Schwartz, M.L. (Ed.) Encyclopedia of Coastal Science (Encyclopedia of Earth Sciences Series). Springer, Netherlands. 813-815.

Amos, C.L., G. Umgiesser, R. Helsby, P.L. Friend. 2005. Final Report – CORILA 3.2. – Hydrodynamics and Morphology of Venice Lagoon (VELMA). 49p.

Friend, P.L., C.L. Amos, C. Liquete, P. Arnau, M. Canals, A. Correggiari, G. Maillet, A. Monaco, and N. Panin. 2004. Covariance of oceanographic, river and atmospheric time series; correlation of storm parameters with river plume character. Southampton Oceanography Centre Research and Consultancy Report No. 92, September 2004. 40 pp.

Friend, P.L., 2002. Erosion thresholds of intertidal sediments near the mouth of the River Mersey, UK. Southampton Oceanography Centre Research and Consultancy report No. 67, August 2002.

# Cheryl J. Hapke, Ph.D.

## *Coastal Resiliency Lead | Senior Consultant*

### *Education and Credentials*

Ph.D., Coastal Geology, University of California Santa Cruz, Santa Cruz, California, 2002

M.S., Geology, University of Maryland, College Park, Maryland, 1994

B.S., Geology, University of Pittsburgh, Pittsburgh, Pennsylvania, 1985

### *Continuing Education and Training*

Leadership 201, USGS-Nominated Leadership Training Course, 1-week (2019)

Leadership 101, USGS-Nominated Leadership Training Course, 1-week (2016)

First Aid and CPR Certified (2018)

### *Professional Affiliations*

American Geophysical Union

American Shore and Beach Preservation Association

Association of Environmental and Engineering Geologists

### *Achievements and Awards*

2020 Invited Reviewer, UN World Ocean Assessment II, Erosion and Sedimentation

2020 Jahns Distinguished Lecturer for Excellence in Applied Environmental Science

## Professional Profile

Dr. Cheryl Hapke is a Coastal Geologist and Senior Consultant with more than 20 years of experience in coastal evolution and coastal change processes in a variety of geomorphic settings including barrier islands and rocky and reef-fringed coasts. Her work focuses on morphodynamics of coastal systems on various time scales from storms to multiple decades, with application towards solving societal problems such as sea level rise through adaptation planning. Dr. Hapke's studies have scaled from large regional assessments of historical coastal change, to barrier island response to extreme storm events, to forecasts of future behavior using statistical models. She has extensive experience overseeing and managing large projects and coordinating across diverse groups of stakeholders and partners. She has also served as a technical advisor on coastal change hazards to state and federal agencies and international groups and authored numerous peer-reviewed journal articles. Dr. Hapke's research has been influential in moving the field of coastal evolution and hazards forward and has a high degree of societal relevance.

## Relevant Experience

### Coastal Resiliency

***Model-Based Decision Support Framework for Sea Level Rise Adaptation, Captiva Island, Florida***—As **Project Lead**, Dr. Hapke formulated the initial concept to bring Bayesian statistical modeling into the realm of sea level rise adaptation planning by creating a decision support tool for communities such as Captiva Island, a barrier island in the eastern Gulf of Mexico. The effort utilizes standard guidelines for community sea level rise adaptation such as vulnerability and hazard assessments, and includes an additional phase wherein Bayesian networks are used to model probabilistic outcomes of adaptation strategies to evaluate trade-offs and unintended consequences, as well as to develop adaptation pathways. Dr. Hapke works closely with the community-based sea level rise committee in Captiva Island, Florida, and she has built statewide support for this approach via numerous workshops and webinars.

***Coastal Vulnerability and Processes, Fire Island, New York***—As **Project Lead**, Dr. Hapke coordinated the work of both USGS

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scientists and external collaborators on a project showcasing the importance of a systematic approach towards understanding how the morphology of the inner shelf, the antecedent geology, variations in local sediment supply, hydrodynamics, and human activities combine to shape the subaerial portion of barrier islands and play an integral role in the long-term behavior of the beach and dune system. Dr. Hapke was responsible for the project design and research goals, budgeting and proposal writing, field planning and data acquisition, developing collaborations and partnerships, and writing publications. She also developed and maintained solid partnerships with federal and state agencies, and developed cooperative agreements and collaboration with academic researchers at several universities.

***Morphodynamics of Tidal Inlet Evolution, Fire Island, New York***—Dr. Hapke was **Principal Investigator** for a study examining breach evolution during Hurricane Sandy in 2012, when a tidal inlet was cut through Fire Island in a portion of the island deemed a National Wilderness Area. Wherein the U.S. Army Corps of Engineers (USACE) closed breaches on other New York and New Jersey barrier islands, the "Wilderness Breach" was left open, providing a unique opportunity to study and model the breach evolution. The project involved extensive field operations, collecting bathymetric data and monitoring shoreline change. In collaboration with Deltares, a new hybrid Delft3D/XBeach model was developed that was able to recreate the morphology and evolution of the inlet and lead to new understandings of how these systems evolve. Dr. Hapke worked in close conjunction with the National Park Service and USACE.

***National Assessment of Coastal Change Hazards, East and West Coasts, U.S.***—Dr. Hapke was **Lead Investigator** for 9 years carrying out three comprehensive studies including California Long-term Shoreline Change, California Historical Cliff Retreat, and the New England and the Mid-Atlantic Long-Term Shoreline Change Assessment. The research, data, and products generated in association with this project increased the knowledge of coastal behavior on a variety of time and spatial scales and addressed some of the most pressing coastal issues of present-day society. The objectives of the long-term shoreline change assessment effort included determining long-term coastal change and identifying vulnerabilities along all open-ocean coasts of the U.S., developing methods that can be applied nationwide, combining historical and modern data types, and communicating results to a broad range of coastal managers, planners, and other users. These efforts provided first-of-a-kind data and interpretation that allow for significant advancement in our understanding of regional trends of coastal change along two margins of the U.S. The reports and data generated by this effort are widely requested and used extensively in coastal management, planning, project design, and climate change vulnerability studies.

## Select Publications

Brenner, O.T., E.E. Lentz, C.J. Hapke, R.E. Henderson, K.E. Wilson, and T.R. Nelson. 2018. Characterizing storm response and recovery using the beach change envelope: Fire Island, New York. *Geomorphology* 300:189–202.

Hapke, C.J., N.G. Plant, R.E. Henderson, W.C. Schwab, and T.R. Nelson. 2016. Decoupling processes and scales of shoreline morphodynamics. *Marine Geology* 381:42-53.

Wilson, K.E., P.N. Adams, C.J. Hapke, E.E. Lentz, and O. Brenner. 2015. Application of Bayesian networks to hindcast barrier island morphodynamics. *Coastal Engineering* 102:30–43.

Nelson, T.R., and C.J. Hapke. 2015. Shoreface response and recovery to Hurricane Sandy: Fire Island, NY. *Proceedings of Coastal Sediments 2015*, San Diego, CA. doi: 10.1142/9789814689977_0012. World Scientific Publishing Co. Pte. Ltd.

Hapke, C.J., O. Brenner, and R. Henderson. 2015. Quantifying the geomorphic resiliency of barrier island beaches. *Proceedings of Coastal Sediments 2015*, San Diego, CA. doi.org/10.1142/9789814689977_0249. World Scientific Publishing Co. Pte. Ltd.

Hapke, C.J., O. Brenner, R. Hehre, and B.J. Reynolds. 2013. Coastal change from Hurricane Sandy and the 2012–13 winter storm season—Fire Island, New York. U.S. Geological Survey Open-File Report 2013–1231. 37 pp.

Lentz, E.E., C.J. Hapke, H.F. Stockdon, and R.E. Hehre. 2013. Improving understanding of near-term barrier island evolution through multi-decadal assessment of morphologic change. *Marine Geology* 337:125–139.

Lentz, E.E., and C.J. Hapke. 2011. Geologic framework influences on the geomorphology of an anthropogenically modified Barrier Island: Fire Island, New York. *Geomorphology* 126:82–96.

# David L. Revell, Ph.D.
## *Coastal Modeling Lead | Principal*

### *Education and Credentials*

Ph.D., Earth Sciences, University of California, Santa Cruz, 2007

M.S., Oceanography and Marine Resource Management, Oregon State University, Corvallis, Oregon, 2000

B.A., Geography, and B.A. Environmental Studies, University of California, Santa Barbara, California, 1998 and 1996

### *Continuing Education and Training*

Postdoctoral Research, Institute of Marine Sciences, University of California, Santa Barbara, April 2007–April 2008.

## Professional Profile

Dr. David Revell is a coastal geomorphologist and modeler with more than 25 years of experience as a consultant and academic studying marine, coastal, and estuarine processes, working to integrate science and management of coastal processes and climate change. He has served as a technical advisor and facilitator to multiple federal, state, and local jurisdictions related to ocean and coastal management. He has been involved in a wide variety of community stakeholder processes ranging from evaluating erosion hazard alternatives to sea level rise and climate change vulnerability impacts to lagoon management, water quality, and marine spatial planning. Dr. Revell currently advises multiple local jurisdictions and government agencies on dune and sediment management, climate change, estuary processes, inlet management, and local coastal program updates.

## Relevant Experience

### Coastal Resiliency

***Erosion, Transportation and Recreation Adaptation and Management Plan, City of Santa Cruz, California***—Dr. Revell recently developed a neighborhood-scale transportation adaptation plan for the City of Santa Cruz, CA, balancing coastal erosion, with transportation, recreation, and community-visioning requirements. His specific work tasks included hazard modeling, local coastal program policy development, and social vulnerability, economic and engineering analyses. Substantial public outreach included a technical advisory committee, focus groups, and other local stakeholders to identify the most effective adaptation pathways through time and to develop land use policies to integrate into local coastal and city planning documents. As **Modeling and Project Lead**, Dr. Revell led a diverse team of geologists, engineers, economists, ecologists, and transportation planners on the project.

### Coastal Erosion Mitigation Projects

***Goleta Beach Erosion Projects, County of Santa Barbara, California***—Dr. Revell assisted the County of Santa Barbara, CA, in multiple stakeholder processes and technical studies related to the substantial erosion to Goleta Beach County Park, catalyzed by the 1997–1998 El Niño erosion wave. Dr. Revell peer-reviewed the available scientific research and technical studies on various

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adaptation strategies that recommended several different beach reconfigurations and beach management options. He also peer-reviewed other technical modeling and was **Coastal Modeling and Project Lead** for a team to conduct wave run-up and climate change modeling to support the Environmental Impact Report on a managed-retreat strategy. Throughout the process, Dr. Revell presented the research results as regular updates to the stakeholder groups.

***Neskowin Shoreline Assessment, Neskowin, Tillamook County, Oregon***—In response to high rates of erosion and sea level rise that have diminished the beaches and now threaten homes and roads in Neskowin, Oregon, Dr. Revell analyzed the viability of various coastal erosion mitigation strategies on an eroding shore for the local stakeholder. He applied his extensive experience completing assessments for similar high-energy wave-exposed coastal areas. He performed modeling to evaluate physical changes from various adaptation strategies, and he provided conceptual level engineering cost estimates for each strategy to inform community decision-making. Dr. Revell's project added considerable value to the local community by striving to find a balance between private property protection and maintenance of a sandy beach to support the tourist economy.

## Infrastructure Vulnerability Assessment

***Natural Gas and Electricity Infrastructure Vulnerability Assessment, San Diego Region, California*** – Dr. Revell was **Project Lead**, as part of the 4th California Climate Assessment, for the coastal hazard and sea level rise assessment for the SoCal Natural Gas and San Diego Gas and Electric Utility infrastructure. His work included evaluation of the COSMOS 3.0 model, the U.S. Department of Defense's hazard model, and integration of all modeling initiatives into the vulnerability assessment by filling data gaps and interpreting the modeling results.

## Coastal Hazards Modeling

***The Nature Conservancy's Coastal Resilience Program, Ventura County, California***—Working through an interactive stakeholder process with multiple federal and state agencies, local government representatives, and several nonprofit organizations, Dr. Revell was **Project Lead** for a technical team that modeled present and potential future coastal and fluvial hazards for a variety of climate change scenarios, representing sea level rise and changes to rainfall and sediment delivery, for the Ventura County coastline. He applied a habitat evolution model (Sea Level Affecting Marsh Migration, SLAMM) to predict sea level rise effects, and to identify areas of ecological vulnerability based on potential adaptation strategies.

***Coastal Resiliency: Phases 1 and 2, Santa Barbara, California***—Funded by the California Coastal Commission and the Ocean Protection Council, Dr. Revell modeled projected coastal hazards exacerbated by sea level rise for the Santa Barbara County coast at a scale suitable for planning purposes. Deliverables included projected future coastal hazards, which incorporated a new and innovative integrated approach for 'stepping through time' eroding the coast and flooding newly eroded areas through hydraulic connectivity.

## Select Publications / Presentations

Garner, K.L., M.Y. Chang, M.T. Fulda, J.A. Berlin, R.E. Freed, M.M. Soo-Hoo, D.L. Revell, M. Ikegami, L.E. Flint, A.L. Flint, and B.E. Kendall. 2015. Impacts of sea level rise and climate change on coastal plant species: A case study in the central California coast. *PeerJ Prints* 3:e958. https://doi:10.7717/peerj.958.

Revell, D.L., R. Battalio, B. Spear, P. Ruggiero, and J. Vandever. 2011. A methodology for predicting future coastal hazards due to sea-level rise on the California coast. *Climatic Change* 109(1):251–276.

Orme, A.R., G.B. Griggs, D.L. Revell, J.G. Zoulas, C. Chenault, and H. Koo. 2011. Beach changes along the southern California coast during the twentieth century: A comparison of natural and human forcing factors. *Shore and Beach* 79(4):38–50.

Revell, D.L., J.E. Dugan, and D.M. Hubbard. 2011. Physical and ecological responses of sandy beaches to the 1997-98 ENSO. *Journal of Coastal Research* 27(4):718–730.

Barnard, P.L., D.L. Revell, D. Hoover, J. Warrick, J. Brocatus, A.E. Draut, P. Dartnell, E. Elias, N. Mustain, P.E. Hart, and H.F. Ryan. 2009. Coastal processes study of Santa Barbara and Ventura Counties, CA. U.S. Geological Survey Open-File Report 2009-1029. U.S. Geological Survey, Reston, VA. http://pubs.usgs.gov/of/2009/1029/.

Dugan, J.E., D.M. Hubbard, I. Rodil, and D.L. Revell. 2008. Ecological effects of coastal armoring on sandy beaches. *Marine Ecology* 29:160–170.

Revell, D.L., J.J. Marra, and G.B. Griggs. 2007. Sandshed management. Special issue of *Journal of Coastal Research*—Proceedings from International Coastal Symposium 2007, Gold Coast, Australia.

Revell, D.L., and G.B. Griggs. 2006. Beach width and climate oscillations along Isla Vista, Santa Barbara, California. *Shore and Beach* 74(3):8–16.

## Matthew E. Chastain, PWS, Senior Coastal Ecologist

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With more than 13 years of experience in natural resource consulting industry, Mr. Chastain has managed and conducted a diverse array of natural resources fieldwork along the Texas and Louisiana coast. He has supervised and participated in the development and design of mitigation and restoration areas, coastal dune swale communities, and estuarine wetlands within Texas and Louisiana, as well as supervised and assisted in the survey and collection of detailed baseline information of marine resource and ecological communities. Mr. Chastain has also utilized his extensive knowledge of coastal dune/swales and estuarine systems, vegetation, estuarine and marine resources (tidal/mud flats, dune systems, reefs, seagrass beds, etc.) sediment type, turbidity, salinity, pH, conductivity measurements, temperature variations, and hydraulics to determine the placement, depth, and frequency of wetland and dune creation. He has implemented both planned and "flexible" design plans based on existing or unknown field conditions. Mr. Chastain has managed and participated in multiple restoration and creation projects including design and oversight, harvesting and planting, invasive species control, site maintenance, and adaptive management.

Outside of natural resource investigations, mitigation, and design, Mr. Chastain has performed hundreds of waters of the United States, including wetlands, delineations/jurisdictional determinations throughout coastal and plains regions of Texas, Louisiana, and Mississippi. He has utilized GPS and GIS technologies for mapping significant natural resources. Mr. Chastain performed habitat and wildlife assessments, endangered and threatened species assessments, U.S. Army Corps of Engineers (USACE) and state environmental permitting for impacts to waters and wetlands, wetland mitigation creation and monitoring, and habitat restoration. He holds an MNRD in natural resource development and a BS in renewable natural resources, both from Texas A&M University. He is also accredited as a Professional Wetland Scientist, License Number 2281, renewal date 10/30/2022.

## BIO-WEST PROJECT WORK

### Beneficial Use and Mitigation Monitoring Program - LNG Dock Facility ♦ Senior Project Manager/Coastal Ecologist

Mr. Chastain currently manages and oversees the dredge material management plan and associated beneficial use and mitigation monitoring program, developed between 2008 and 2012, for a large-scale, public liquefied natural gas company that operates two marine dock facilities along the Sabine-Neches River in Sabine Pass, LA. To comply with various federal, state, and regional laws and regulations, the company maintains and oversees multiple mitigation areas, including sand dune, freshwater, estuarine, and saltmarsh creation, enhancement, and restoration efforts on various properties adjacent to and downstream of the main operation. Mr. Chastain currently manages all aspects of this project, including mitigation area elevation mapping and surveys through cross-sectional analysis,

## EXPERIENCE

- wetland and waters of the U.S. investigations/identification
- wetland and coastal dune mitigation, design, implementation, and evaluation
- TES species and habitat surveys
- NEPA documentation
- environmental and due-diligence permitting
- Phase I and II environmental site assessments

## SKILLS

- multidisciplinary team leadership
- problem solving

## SPECIAL TRAINING AND CERTIFICATION

- 2013: FERC Consultation Training
- 2012: Professional Wetland Scientist, Society of Wetland Scientists
- 2011: Field Indicators of Hydric Soils, Wetland Training Institute
- 2008: Wetland Delineation Training Course, Wetland Training Institute
- 2008: Great Plains Regional Supplement, Wetland Training Institute
- 2007 ASTM Phase I/II Environmental Site Assessments Training

## EDUCATION

- 2012: MNRD natural resource development, Texas A&M University, College Station
- 2007: BS renewable natural resources, Texas A&M University, College Station

quadrat and line transect vegetation sampling, small mammal trapping, aerial photograph interpretation, and comparison and analysis of monitoring efforts to established success criteria to demonstrate compliance with the USACE, Environmental Protection Agency, and Louisiana Department of Natural Resources. To date, the project's mitigation project have met or exceeded all agency requirements. 2016-present.

**Dredge Material Placement Area Design, Permitting, and Monitoring - Port Bolivar, Galveston County, Texas ♦ Senior Project Manager/Coastal Ecologist**

In response to the forthcoming USACE Coastal Texas Protection and Restoration Project commonly referred to as the "Ike Dike", a private developer on the Bolivar Peninsula retained Mr. Chastain to evaluate, survey, and permit a 450-acre parcel of land with the potential to either contain a portion of the Ike Dike project or provide material and sand source for the construction of a coastal barrier system. Under this contract, Mr. Chastain oversaw baseline field surveys, including delineations and assessments for all natural resources such as wetlands, coastal dune/swale communities, and marshlands. Mr. Chastain currently manages and oversees the permitting portion of this project, navigating the USACE Regulatory program to determine the best course of action. As part of the coordination and permitting strategy, Mr. Chastain oversaw the production of reports and analysis concerning potential impacts and effects to the coastal ecosystems, as well as development of wetland and dune system management and restoration plans. These draft plans include design, management, monitoring, and long-term maintenance components to establish success criteria and demonstrate compliance with the USACE, EPA, and the GLO. 2019-present

**Marine Resource Investigation and Substrate Characterization ♦ Senior Ecologist/Hydrographer**

Mr. Chastain oversaw and participated in field efforts for a reef assessment and substrate characterization on approximately 500 acres of oyster leases in and around Christmas Bay, St. Bernard's Parish, Louisiana for a confidential legal action following a potential vessel strike on reefs within an approved The Louisiana Department of Wildlife & Fisheries lease tract. As part of the expert witness team for the defense, Mr. Chastain oversaw field investigation efforts and surveys, including personally operating the side-scan sonar, single beam echo sounder, and sub-bottom profiler, as well as oversaw field staff who hand poled, physically examined dredge substrate, and recorded data. The overall effort was undertaken to determine the potential extent of impact, structure, and composition of the lease following the vessel strike on the reef. 2018.

**Cedar Bayou Barge Terminal and Fleeting Area Environmental Permitting ♦ Senior Project Manager**

A coastal commercial marine construction company proposed to expand their marina and barge dock to accommodate increasing market demand for their services. Mr. Chastain, as BIO-WEST's project manager, led the permitting effort, including project kickoff, oversight of all fieldwork and surveys, compilation of permit applications and submittals, and agency coordination. His Texas-based team performed or oversaw all fieldwork for this project, including a waters of the U.S. delineation, threatened and endangered species assessment, and cultural resource survey. BIO-WEST biologists compiled all pertinent reports and permitting documents per USACE–Galveston District standards and are in the process of submitting an letter of permission permit application for approval. Mr. Chastain and his team are also navigating the permit application through the USACE process, working with the project team on a compensatory mitigation plan, and coordinating with the USACE on responses to agency inquiries and public comments, as well as a final decision document. 2016–present.

**James M. Naismith, RPLS, LSLS**
**Lead Professional - Survey**

**Education**
Master of Science, Civil Engineering, 1998
Bachelor of Science, Civil Engineering, 1995

**Professional Licenses**
Registered Professional Land Surveyor, Texas #4828
Licensed State Land Surveyor, Texas
Engineer in Training, Texas

**Years of Experience:** 30

**Professional Qualifications**
Jim Naismith has more than 30 years of experience in all aspects of land and hydrographic surveying. Along the Texas Gulf Coast, Jim has completed numerous dock conditions surveys; surveys for dredging and marine construction; lost item and clearance surveys; magnetometer; and shallow seismic surveys. Hurricane and disaster response experience includes debris mapping/identification, debris removal, navigation hazard location/removal, submerged vessel location/marking, shoal detection, and post-hurricane channel clearance.

**Project Experience**
**Dock Surveys and Soundings, Port of Brownsville, 2011 - 2019 –** Professional Land Surveyor and Hydrographic Surveyor. The Port of Brownsville and associated industry routinely obtains regular bathymetric surveys on its docks and waterways to ensure that current and accurate data is maintained on water depths. This project consists of multibeam echo sounder surveys, single-beam echo sounder surveys, wading, conventional bulkhead, and shoreline surveys. Jim was responsible for the collection and QA / QC of survey data. He also completed the bathymetric processing and oversaw the drawing and report preparations before certifying final survey deliverables.

**Design Survey, Tompkins Channel, South Padre Island, 2016 –** Professional Land Surveyor and Hydrographic Surveyor. Maintenance dredging and marina dredging for a section of Tompkins Channel. This project consists of single-beam echo sounder surveys, wading and upland dock surveys. Jim was responsible for the QA / QC of survey data. He also completed the bathymetric processing, drawing, and report preparations before certifying final survey deliverables.

**South Padre Island Beach Profile Surveys, Texas, 2008 – 2020** – Professional Land Surveyor and Hydrographic Surveyor. This project is in support of the beach nourishment and monitoring along South Padre Island. Detailed cross-section surveys were completed from the dune line to the depth-of-closure offshore. The upland portion of the survey is completed with GPS-RTK; the surf zone completed with GPS-RTK on a sled; and the hydrographic survey is completed with a dual frequency single-beam echo sounder. Approximately 40 sediment grab samples were obtained during one survey. Jim was responsible for the QA / QC of survey data. He also completed the bathymetric processing and oversaw the drawing and report preparations before certifying final survey deliverables.

**Bahia Grande, Cameron County, Texas, 2008 - 2019** – Professional Land Surveyor and Hydrographic Surveyor. This project is part of an ongoing effort to restore the Bahia Grande Wetlands. The upland portion of the survey was completed with GPS-RTK; the hydrographic survey was completed with a single-beam echo sounder. Jim was responsible for the collection and QA / QC of survey data. Jim also oversaw the bathymetric processing, drawing, and report preparations before certifying final survey deliverables.

**Benjamin "Seth" Gambill**
**Senior Project Manager**

**Education**
Bachelor of Arts, General Studies, 2009

**Years of Experience:** 18

**Professional Qualifications**
Seth Gambill has more than 18 years of experience in environmental consulting, U.S. Army Corps of Engineers (USACE) permitting, resource agency consultation and coordination, sensitive resource surveying and mapping, wetland and oyster reef creation and restoration, remote sensing surveys and general project management.

Seth has managed project support for hundreds of USACE permits for projects along the Texas Gulf Coast. Successfully permitted activities include industrial facilities, oil and gas wells, platforms and pipelines, residential developments, shoreline stabilization projects and dredging projects. He has also conducted oyster and seagrass surveys and wetland delineations in support of USACE permitting.

Along the entire Texas Gulf Coast, Seth has completed oyster and seagrass surveys, bathymetric surveys, wetland delineations, remote sensing surveys utilizing side scan sonar, magnetometer and echo sounder equipment, bathymetric surveys, avian surveys, collection of in-situ dredge material for contaminant testing, habitat mapping and endangered species surveys.

Coastal development projects present unique challenges. Seth has overseen hundreds of these projects from a planning and permitting perspective from start to finish.

**Project Experience**
**Dock Surveys and Soundings, Port of Brownsville, 2011 - 2019 –** Field Surveyor. The Port of Brownsville and associated industry routinely obtains regular bathymetric surveys on its docks and waterways to ensure that current and accurate data is maintained on water depths. This project consists of multibeam echo sounder surveys, single-beam echo sounder surveys, wading, conventional bulkhead, and shoreline surveys.

**Design Survey, Tompkins Channel, South Padre Island, 2016 –** Field Surveyor. Maintenance dredging and marina dredging for a section of Tompkins Channel. This project consists of single-beam echo sounder surveys, wading and upland dock surveys.

**South Padre Island Beach Profile Surveys, Texas, 2013 – 2020 –** Field Surveyor. This project is in support of the beach nourishment and monitoring along South Padre Island. Detailed cross-section surveys were completed from the dune line to the depth-of-closure offshore. The upland portion of the survey is completed with GPS-RTK; the surf zone completed with GPS-RTK on a sled; and the hydrographic survey is completed with a dual frequency single-beam echo sounder. Approximately 40 sediment grab samples were obtained during one survey.

**Bahia Grande, Cameron County, Texas, 2006 - 2019 –** Environmental Consultant and Field Surveyor. This project is part of an ongoing effort to restore the Bahia Grande Wetlands. The upland portion of the survey was completed with GPS-RTK; the hydrographic survey was completed with a single-beam echo sounder.

# Statement of Qualifications

## CITY OF SOUTH PADRE ISLAND

**Assessment and Investigation of the Beach and Dune Conditions at South Padre Island**

## RFQ 2020-SL02

SEPTEMBER 11, 2020

LJA ENGINEERING

5350 South Staples Street, Suite 425, Corpus Christi, Texas 78411
t 361.991.8550 f 281.933.7569 LJA.com TBPE F-1386 TBPLS 10110501

**POINT-OF-CONTACT**

Doug Dusini, PE
Project Manager
713.953.5282
ddusini@lja.com

September 11, 2020

City of South Padre Island
ATTN: City Secretary
4601 Padre Blvd.
South Padre Island, TX 78597

Re: RFQ 2020-SL02 | Assessment and Investigation of the Beach and Dune Conditions at South Padre Island

Dear Members of the Selection Committee:

LJA Engineering, Inc., (LJA) is pleased to submit our Statement of Qualifications to provide required professional services for the project noted in the referenced RFQ. LJA is uniquely qualified and has gathered an unparalleled team to meet the needs of the City of South Padre Island (City) moving forward on this project.

Headquartered in Houston with offices in Corpus Christi, Austin, and Galveston to name a few, LJA has worked in SPI and surrounding areas for decades. Our regional presence is backed by over 1,000 professionals, many of whom have relevant experience to this project. LJA has successfully helped numerous Texas municipalities, counties and other local entities develop and implement beach/dune assessment projects in compliance with state and federal regulatory requirements for beach maintenance and monitoring.

The LJA Team is intimately familiar with beachfront and bay shoreline issues in SPI. Team member experience includes the City's Erosion Response Plan in 2012 (as LEAP Engineering) as well as completion of the Cameron County Erosion Response Plan, the Cameron County Beach Maintenance Plan, and Beach Maintenance Plans for several surrounding counties & municipalities.

We have a deep understanding of the unique physical characteristics of local beaches and bay shorelines, as well as the coastal species, habitats, and special conditions/constraints that may be imposed by Federal and State regulatory authorities.

The LJA Team is committed to serving the best interests of the City. LJA is not under contract to the USACE-Galveston District or the Texas General Land Office for related work, so there is no conflict of interest. Our key staff members are supported by hundreds of professionals to help assure project timelines are met. We offer a professional, efficient, and cost effective management approach to completing the scoping, estimating, design, and permitting for projects assigned to the firm. We commit to provide quality assessments, investigations, surveying and coastal engineering services to the City of South Padre Island, and we look forward to your favorable consideration. Doug Dusini, PE, will be your main point of contact and can be reached at 713-953-5282. Please call if you have any questions concerning our submittal.

Sincerely,

Jeff Coym, PE, Vice President
LJA Engineering, Inc.

# TABLE OF CONTENTS

# A FIRM INTRODUCTION

## COMPANY INFO, BACKGROUND & HISTORY

LJA Engineering, Inc. (LJA) is a corporation founded in Texas in 1972 when John "Dutch" Lichliter established The Lichliter Company. In 1976, Bill Jameson joined as president, and the firm was renamed Lichliter/Jameson & Associates. The firm has evolved over the past 48 years into LJA Engineering, Inc. as it is known today.

## COMPANY OWNERSHIP STRUCTURE

LJA Engineering, Inc. was incorporated in Texas on June 13, 1997. LJA is an employee-owned, Houston-based corporation, offering full-service planning, engineering, surveying, and construction management to public and private sector clients.

## OFFICE LOCATIONS

With over 1,200 employees in 36 offices across Texas, Oklahoma, and Florida, we are organized around nine comprehensive sectors:

- Public Infrastructure
- Land Development
- Energy Services
- Flood Control and Drainage
- Transportation
- Environmental & Coastal
- Surveying
- Rail Services
- CEI

This allows us to best leverage our resources across our company, deliver expertise-driven teams, increase responsiveness to your specific needs, and individualize project solutions.

Our depth of services is comprehensive, our breadth of knowledge leads the industry, and our regional influence continues to positively impact our personal and professional communities.

The following table lists our headquarters and the primary offices that will service any contract resulting from this RFQ.

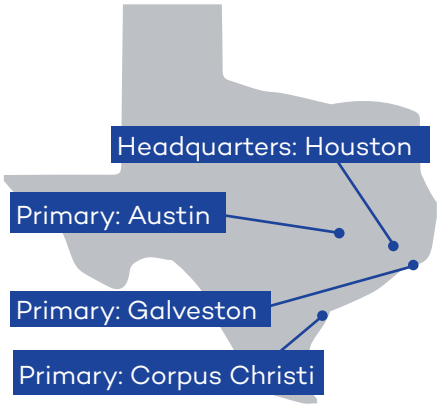
| CITY, STATE | TELEPHONE | EMAIL | # IN OFFICE |
|---|---|---|---|
| Houston, TX (HQ) | 713.953.5200 | ddusini@lja.com | 393 |
| Corpus Christi, TX | 361.360.2138 | jgardner@lja.com | 22 |
| Austin, TX | 512.767.7358 | pravella@lja.com | 74 |
| Galveston, TX | 409.291.5346 | vjones@lja.com | 2 |

**48**
YEARS IN BUSINESS

**1,200**
EMPLOYEE OWNERS

**36**
OFFICES

**9**
SECTORS




**10**
SUBSIDIARIES

# B COMPETENCE & QUALIFICATIONS OF THE RESPONSIBLE INDIVIDUAL

## A. PROJECT MANAGER'S EXPERTISE

Doug Dusini, PE, Sr. Coastal Project Manager, will serve as Project Manager. Mr. Dusini is a licensed Professional Engineer in Texas, Florida, and North Carolina, with over 15 years of professional experience in the practice of coastal engineering, shore protection and sediment transport. Mr. Dusini has directed work spanning the southeastern Atlantic and Texas Gulf Coast including navigation channels, rivers, bays/ estuaries, and Gulf of Mexico beaches.

Mr. Dusini's work includes shoreline protection and beach re-nourishment, inlet stabilization and relocation, assessment of potential storm damage to residential structures, design of coastal protection structures, navigational and recreational area dredging, and coastal hydraulics modeling.

Mr. Dusini has evaluated storm damage to structures and shorelines in South Carolina, North Carolina, and Florida. His experience has spanned from Hurricane Ophelia at North Carolina and continued to Matthew at Florida, and included several tropical storms. Mr. Dusini's diverse experience includes Federal and State disaster recovery projects. In addition, Mr Dusini holds a FEMA public trust security clearance.

Mr. Dusini will ensure project objectives are met on time and within budget. He will coordinate with City staff to develop project goals and criteria. Status updates will be provided to the City and any stakeholders as necessary. Mr. Dusini will manage inter-jurisdictional coordination, public comment, and communications between the City and federal and state agencies, as needed. He will coordinate with interdisciplinary team members to ensure successful delivery of projects.

## B. SIMILAR PROJECT EXPERIENCE

Coordinated and completed investigations and assessments, design, and construction oversight for beach and dune restoration, beneficial dredge use, and shore protection projects. Coordinated and completed dredging and dredge placement plans, and regulatory requirements, for federal channel expansion.

## C. EDUCATIONAL BACKGROUND

Please refer to the resumes following Section C.

## D. LICENSE STATUS

Please refer to the resumes following Section C.

## E. TRAINING AND CERTIFICATIONS

All team members are current in their license status and continuing education requirements.

## F. TECHNICAL PUBLICATIONS

# C TECHNICAL ADEQUACY OF THE PERSONNEL AND SUBS

LJA employs diverse competencies of staff with adequate resources of over 1,100 personnel, and includes all investigations & assessments, engineering, design, and support personnel necessary for performing the scope of services required by the City of South Padre Island. Along with our subcontractor, our Team is capable of meeting the City's objectives with an efficient, knowledgeable and responsive team. Resumes for key personnel designated for this project are provided on the following pages. All our professional engineers are registered and in good standing with the Texas Professional Board of Engineers.

## A. PERSONNEL ASSIGNMENTS

**JEFF COYM, PE,** will serve as Principal in Charge of the proposed project. He has experience leading multi-discipline team assignments for various clients as well as managing local government projects.

**PETER RAVELLA**, Director of Coastal Resilience, will serve as QA/QC manager. He will ensure all assessments, investigations, environmental and regulatory, and monitoring and planning submittals and designs to the City are in compliance with the contract, stakeholder requests, and agency regulations.

**DOUG DUSINI, PE,** Sr. Project Manager of Coastal Engineering, will serve as Project Manager. He is a licensed Professional Engineer in Texas, Florida, and North Carolina, with over 15 years of professional experience in the practice of coastal engineering, dune and beach assessments, shore protection and sediment transport. Mr. Dusini has directed work spanning the southern Atlantic, Caribbean, and Gulf Coasts including navigation channels, bays/estuaries, and Gulf of Mexico beaches.

**JAY GARDNER** will serve as Assistant Project Manager for required environmental studies, assessments and investigations, and future beach maintenance plan drafting.

**DOUG DUSINI, PE and ROBIN WARRICK, PE,** will have primary technical responsibility and oversight of designs and plans related to coastal engineering and planning and sign/seal engineering work products.

**JAY GARDNER and Peter Ravella** will serve as the project regulatory and environmental managers along with Victoria Jones for required environmental studies, assessments, planning, and investigations required for any design, monitoring, planning, and permitting.

**RANDY TAILLON and GEORGE CULVER** will serve as lead survey managers for aerial, boundary, topographic, LiDAR, GIS and/or other survey requirements for site investigations, assessments, and planning.

**SUBCONSULTANT NAISMITH MARINE SERVICES, INC.,** a T. Baker Smith company, has been a thriving hydrographic surveying business for the past 12 years, bearing an exceptional reputation serving coastal, ports, industry, university, state and area-county clients through their innovative, efficient approach to problem solving. In addition, they have **provided the City of South Padre Island with beach/dune surveys for nourishment and monitoring since 2008.** LJA has utilized their hydrographic, LSLS and coastal surveying expertise in previous, successful projects and is confident in their proven experience.

## RESPONSIBILITY AND COORDINATION

The key personnel above are supported by a staff of engineers and technicians with years of practical experience assessing, designing, and providing bid and construction services for similar projects. Additional responsibility and coordination of The LJA Team utilizes personnel with engineering, regulatory and environmental, and surveying and planning experience in South Padre Island and the south Texas region.

The LJA Team is poised to provide comprehensive services to the City of South Padre Island necessary to complete the Beach and Dune Investigation and Assessment project and provide planning for future beach maintenance, monitoring, and permitting.

***Individual Team Member resumes follow.***

## B. SIMILAR PROJECT EXPERIENCE
Please refer to the resumes of the proposed project team on the following pages.

## C. EDUCATIONAL BACKGROUND
Please refer to the resumes of the proposed project team on the following pages.

## D. LICENSE STATUS
All team members are current in their license status and continuing education requirements.

## E. TECHNICAL PUBLICATIONS
N/A

*We build civilization.*
*We believe in relationships for life.*

# JEFF COYM, PE

## PRINCIPAL IN CHARGE

LJA ENGINEERING

EDUCATION
2002, BS, Civil Engineering, Texas Tech University

PROFESSIONAL LICENSE
2008, Registered Professional Engineer, Texas #101983

PROFESSIONAL MEMBERSHIP
American Council of Engineering Companies (ACEC)
American Society of Civil Engineers (ASCE)

## SUMMARY OF QUALIFICATIONS

Mr. Coym has 16 years of experience in municipal infrastructure design and project management. He is responsible for directing efforts of project teams, including the surveying and mapping and CADD technicians, to successfully complete specific projects. Jeff's experience includes projects carried from preliminary investigations through design and construction phases to final job acceptance. He is also in charge of day-to-day operations for LJA's Corpus Christi office.

## PROJECT EXPERIENCE

**City of Corpus Christi, Bear Lane from SPID to Old Brownsville Road, Corpus Christi, TX** – Project engineer for this $6.26M project, including reconstruction and widening of an existing 2-lane rural section roadway with drainage ditches to a 3-lane curb and gutter section with storm sewer and drainage outfall. Project included significant waterline and sewer line replacement/rehabilitation. Work on the project included surveying and mapping, preliminary engineering, final design, bidding, and construction phase services.

**City of Corpus Christi Rodd Field Road Expansion, Saratoga Blvd. to Yorktown Blvd., Corpus Christi, TX** – Project engineer for this $15.2M project. The scope of this project is to reconstruct 9,000 LF of City Arterial Street along with replacement of all pertinent utilities. This project is currently in the early stages of construction.

**City of Corpus Christi Whitecap Wastewater Treatment Plant Emissions/Odor Control and Bulkhead Rehabilitation Project, Corpus Christi, TX** – Scope of this project is to remove and replace an existing, non-functioning odor control system with a new odor control system as well as repair damaged areas of bulk heading along the perimeter of the Whitecap WWTP. This project is in the design phase.

**City of Corpus Christi Sanitary Sewer Overflow Initiative Program (SSOI) Amendment No. 3 City Wide Hydraulic Model, Allison, Greenwood and Broadway Service Areas, Corpus Christi, TX** – Principal–in-charge and project director for performing a dynamic hydraulic model analysis on one-half of the complete wastewater collection system of the City of Corpus Christi. LJA's portion included 500 miles of sewer lines, 50 lift stations and three wastewater treatment plants. LJA submitted the first draft to the City in May 2014. LJA's project fee at this stage is approximately $600,000. LJA worked as a subconsultant under Pipeline Analysis, LLC and alongside LNV, Inc., which performed the hydraulic modeling analysis for the other half of the City's wastewater collection system.

**City of Corpus Christi City-Wide Collection System Replacement and Rehabilitation Indefinite Delivery/Indefinite Quantity Program, Corpus Christi, TX** – This project consists of Wastewater Collection System Improvements in two of the six wastewater plant service basins, Laguna and Whitecap. The scope of work included, but was not limited to: rehabilitation and/or replacement of manholes, rehabilitation and/or replacement of gravity collection lines and/or force mains by pipe bursting, cured-in-place pipe, and/or open-cut method for lines up to 36" in diameter, gravity line point repairs, dewatering through well pointing, control of wastewater flows through bypass pumping, cleaning and televised inspection of conduits, as needed SWPPP/permit compliance, and temporary traffic controls. All work for this project was executed with multiple indefinite quantity delivery orders.

**City of Corpus Christi Greenwood Wastewater Treatment Plant Emissions and Odor Control Improvements, Corpus Christi, TX** – Project consisted of sampling and analyzing multiple sources of odor at the Greenwood WWTP to determine and design the best method of treating these odors. The target areas were the influent lift station, the parshall flume and aerated grit chamber. From these three areas, odors were drawn into a Bioair Biotrickling filter odor control system. To date, the Biotrickling filter is achieving 99% H2S removal from the areas it is pulling odors from. This project also inspected odors at the Influent Structure, Grit Chamber, Flume Channel, Dissolved Air Floatation Thickener (DAFT) and Digester Cover.

**City of Corpus Christi McBride Lift Station and Force Main Improvements, Corpus Christi, TX** – Project scope involves demolition and rehabilitation of the existing McBride Lift Station as well as the installation of an 18" force main under IH-37 by method directional drilling construction.

**City of Portland Phase 9 Seal Coats, Overlays and Rehabilitation Project, Portland, TX** – LJA, formerly CRG, worked in conjunction with Fugro, Inc. to utilize Fugro's automated pavement survey vehicle to prepare a database of all roadways within the City of Portland (Length was 70 miles). Utilizing the PCI data, CRG, Fugro and the City of Portland mapped out a paving program for three alternating year's program (Phases 9, 10 & 11 totaling $18M) for seal coating, mill and HMAC overlay and full depth reconstruction. The seal coat portion of Phase 9 was completed in October 2015. The mill and overlay and full depth reconstruction portion was bid and awarded in November – December 2015 and the notice to proceed was issued in January 2016. Construction was completed in September 2016.

**Large Diameter Sanitary Sewer Cleaning and Inspection Program, Corpus Christi, TX** – This project involved the preparation and development of the necessary technical specification and procurement documents for the City's large diameter (18" and above) sanitary sewer cleaning and inspection program. It provided for the issuance of service orders for inspection and cleaning of the sanitary sewers. Service orders included developing the required scope, review of closed circuit (CCTV) inspection of the lines, construction exhibits, cost estimates and performing construction administration for service order execution. Coym, Rehmet and Gutierrez Engineering, L.P. issued service orders upon the City's request and on an as-need basis for approximately $2M per annum, cleaning and inspection services over the life of the three-year base contract.

**Wastewater Collection System for Four Colonias, San Diego, TX** – Design engineer for this $2.5M project to furnish sanitary sewer to four previously–unserved Colonias, adjacent to San Diego, Duval County, TX. Project included 18,800 L.F. 6" and 8" gravity sanitary sewer, 146 house laterals and connections, four new lift stations, 8,440 L.F. force main, rehabilitation of a major existing lift station, all appurtenances and associated improvements.

# DOUG S. DUSINI, PE

**PROJECT MANAGER/ENGINEERING & DESIGN**

LJA ENGINEERING

## EDUCATION

2005, MS, Civil Engineering, Ohio State University
2001, BS, Civil Engineering, Ohio State University

## PROFESSIONAL LICENSE

Professional Engineer: 2010, North Carolina #036593;
2010, Florida #71756; 2017, Texas #127813

## PROFESSIONAL MEMBERSHIPS

American Shore & Beach Preservation Association (ASBPA)
American Society of Civil Engineers (ASCE)

## SUMMARY OF QUALIFICATIONS

Mr. Dusini graduated from Ohio State University, where he studied coastal hydraulics for his MS in civil engineering and environmental engineering for his BS in civil engineering. He is a licensed Professional Engineer in Texas, South Carolina, North Carolina, and Florida. During his 12 years of coastal engineering practice, he has designed and managed projects along the southeastern Atlantic coast of the United States, the Florida Gulf coast, Bermuda and at several locations in the Caribbean.

His work includes shoreline protection and beach renourishment, inlet stabilization and relocation, navigational and recreational area dredging, FEMA flood map revisions, assessment of storm damage to residential and other coastal structures, coastal hydraulics modeling, and construction project inspection. Mr. Dusini has evaluated storm damage to structures and shorelines in South Carolina, North Carolina, and Florida. His experience has spanned from Hurricane Ophelia at North Carolina and continued to Matthew at Florida, and included several tropical storms. He has FEMA public trust security clearance. His Department of Homeland Security badge expires August 2021.

## PROJECT EXPERIENCE

**Sienna Plantation Levee Improvement District, Steep Bank Creek Bank Stabilization, Fort Bend County, TX** – Frequent flooding of the Brazos River has exacerbated bank failure along the tributary Steep Bank Creek. The failure of the bank along the south end of the earthen levee threatens the levee and the Sienna Plantation residential community. In 2019, Mr. Dusini managed the analysis of the bank failure and the design of a gabion structure along a 220' section of the bank. The design includes granular fill between the gabion structure and the channel bank and preserves the curvature of the inside bend of the meander. The gabion structure is designed to direct flood level creek flow away from the bank.

**Sabine River Authority, Lake Tawakoni Spillway Channel Bank Stabilization, Rains County, TX** – The dam outfall at the south end of Lake Tawakoni has shown increased scour and bluff retreat that threatens the buildings and other infrastructure on the east side of the outfall channel. In 2019, Mr. Dusini managed the assessment of the design of the bluff protection, which consists of a steel sheetpile and pipe pile retaining wall along 415' of channel bank. The retaining wall uses helical anchor piles for stabilization. Riprap is placed for toe protection. The property above the retaining wall is regraded and drainage is improved with surface water inlets and groundwater drains that discharge through ports to the channel side of the retaining wall.

**Lynchburg Ferry Emergency Repairs, Houston, TX** – In 2017, Mr. Dusini assessed the conditions of the existing breakwater that provides wave protection for ferries while in berth at the north landing. He conducted an analysis of typical as well as extreme waves and currents at the site. He designed the rubble-mound breakwater to tie into the existing riprap revetment, provide adequate clearance for the ferry hulls at extreme low-water conditions, and provide overtopping protection for a 50-year sea level rise. Mr. Dusini also optimized the length of the breakwater to be able to replace a derelict breakwater structure near the entrance to the berthing area.

**Beach Nourishment at McFaddin National Wildlife Refuge** – This Southeast Texas refuge suffers from chronic Gulf of Mexico Shoreline retreat that has already consumed over 20 miles of State Highway 87. Mr. Dusini provided quality control for construction phase document submittals for the beach nourishment project to manage retreat and restore wildlife habitats.

**River Bank Erosion Protection, Port Neches, TX** – Acting as a team coastal engineer, Mr. Dusini provides construction monitoring of the three-phase project to protect the City's riverfront shoreline from large vessel wakes and tidal currents, including improvements to the historic waterfront with public amenities (future boardwalk, amphitheater, etc.), demolition of relict industrial pier structures, and current design of a shore protection breakwater and living shoreline.

**The Atriums Condominiums, Palm Beach, Florida** – In 2014, The Atriums property had experienced dune and bluff recession due to seasonal and tropical storms. The seawalls protecting the buildings had been buried by several feet of sand cover during past beach and dune redevelopments. Mr. Dusini, acting as project engineer and assistant project manager, assessed the site conditions, managed the excavation of the seawalls, and designed the elevation of the seawalls' revised elevation for continuing protection of the condominium structures.

**Pelican Island Bridge Foundation Rehabilitation, Galveston, TX** – In 2018, Mr. Dusini performed the assessment of the hydraulic conditions at the trestle bents of the bridge foundation and designed the riprap protection plan for each of the affected trestles.

**Velasco Drainage District Levee Certifications, TX** – In 2018, Mr. Dusini prepared the analyses of the hydraulic forces affecting the levee at its pump stations, levee gates, intake structures, floodwalls, and other structural elements.

**Bogue Banks Beach Reconstruction, North Carolina** – Mr. Dusini was the project engineer responsible for the design of beach profiles and plan template to place over 1.1 million CY of sand along over five miles of beach. The beach reconstruction project included replacement of sand recently eroded by Hurricane Ophelia. Mr. Dusini coordinated with officials from each of the four affected towns, the county, and the state to assess conditions for meeting eligibility requirements for FEMA Category G assistance.

# PETER A. RAVELLA, JD

## QA/QC & REGULATORY

LJA ENGINEERING

### EDUCATION

1983, BS, Marine Biology, Honors, Texas A&M University, with honors
1986, JD, Environmental Law Certificate, Cornelius Honor Society, Northwestern School of Law, Lewis and Clark College

### PROFESSIONAL MEMBERSHIPS

American Shore and Beach Preservation Association
Texas Shore and Beach Preservation Association Board
Washington State Bar Association, 1988
Oregon State Bar Association, 1987

### SELECT PUBLICATIONS

Texas Coastal Management Program, Final Environmental Impact Statement, Co-Author
Texas Coastwide Erosion Response Plan – A report to the 75th Texas Legislature, Co-Author
ASBPA White Paper, Coastal Funding for Local Projects, An Overview of Considerations, Policies and Practices, Local Funding Workgroup Chair and Co-Author
South Padre Island and Cameron County Erosion Response Plans, Co-Author

### SUMMARY OF QUALIFICATIONS

Mr. Ravella is a coastal consultant with expertise in a broad range of services for public and private sector clients along the coast, working primarily in Texas, North Carolina, and Florida. He is the Publisher of Coastal News Today and the American Shoreline Podcast Network and Co-host of the American Shoreline Podcast.

For more than two decades, Mr. Ravella has collaborated with project engineers, planners, architects, local elected officials, and government staff to plan, fund and execute coastal plans and projects. Mr. Ravella has extensive experience in shoreline management planning and coastal project development, permitting and implementation. He is an experienced project team leader proficient in coastal land planning, coastal land use policies and regulations, CEPRA erosion response planning, beach and dune restoration, federal and state permitting, beach access planning, state and federal agency coordination, community engagement, grant acquisition and project financing. Mr. Ravella is highly skilled in public communication, outreach and stakeholder engagement.

Mr. Ravella's focus is the integration of regulatory compliance, community perspectives, and project funding into the planning and design processes to ensure that coastal projects are not only technically sound but affordable, meet the needs of the community, and satisfy the requirements of regulatory agencies. Since 2000, Mr. Ravella has developed and put in place more than $250 million in project funding using a wide array of financing tools such as grants, bonds, hotel occupancy and sales tax revenues, ad valorem taxes, and creation of special tax districts in a variety of forms. His moto: Understand the Problem, Find the Solution.

## PROJECT EXPERIENCE

***Shoreline Planning & Permitting Experience:***

- Cameron County Erosion Response Plan (2017-18)
- South Padre Island, North Shore Study, Texas General Land Office (2015-16)
- City of South Padre Island Erosion Response Plan (2012-13)
- Jamaica Beach Erosion Response Plan (2007-08)
- Cameron County Isla Blanca Park, Site Planning, Beach Access & Dune Mitigation Permit (2017-18)
- Cameron County E.K Atwood, Site Planning, Beach Access & Dune Mitigation Permit (2016-17)
- Cameron County Andy Bowie Park Site Planning & Permitting (2016-17)
- Hilton Garden Inn, South Padre Island, Beach Access & Dune Permit (2010-11)
- Shores Subdivision, South Padre Island, Beach Access Plan & Beach/Dune Permit (2008-09)
- Ocean Tower, South Padre Island, Beach/Dune Permit Construction & Demolition (2006-07)
- La Quinta Hotel, South Padre Island, Dune Restoration Plan, Beach Access & Dune Permit (2005)
- Centex Destination Resorts, Point San Luis Development, Galveston, Beach Access & Dune Permit
- Matagorda County Nature Park & Preserve, Matagorda County, Beach Access & Dune Permit

***Project Planning & Financing Experience***

- Charlotte County, FL Shoreline Management Plan and Financing Strategy (2017-19)
- SPI Restore Act Grant Applications (2015-2016)
- Palacios Pavilion Financing Plan, Palacios, Texas (2014)
- Lake Nasworthy Redevelopment and Land Use Plan, San Angelo, Texas (2013-2014)
- Terminal Groin Financing Plan, Village of Bald Head Island, NC (2014)
- Lasara Community Trail Project Financing & Grant Management, Lasara, Texas (2014)
- Beach Restoration Project Financing Plan, Town of Surf City, NC (2013)
- Coastal Project Funding, Hotel Occupancy Tax Restructuring, South Padre Island (2013)
- Beach Restoration Project Financing Plan, Town of North Topsail Beach, NC (2013)
- Beach Restoration Project Financing Plan, Town of Topsail Beach, NC (2010)
- Willacy County, CIAP Grant Administration and Planning (2010-14)
- Laguna Point Recreation Area, Planning and Financing, Port Mansfield, Texas (2012-15)
- Coastal Lands Resources Center, Planning and Financing, Port Mansfield, Texas (2013-15)
- Harbor Boat Ramp Rehabilitation, Grant Acquisition & Planning, Port Mansfield, Texas (2013-14)
- Southern Small Craft Boat Launch, Grant Acquisition & Planning, Port Mansfield, Texas (2012-14)

## PAST WORK EXPERIENCE

- Founder/Publisher, Coastal News Today and the American Shoreline Podcast Network(2018-present)
- Founder/President, PAR Consulting, LLC., (2008-2020)
- Coastal Management Director, Coastal Technology Corp., Austin, Texas (2000-2007)
- Coastal Division Director, Texas General Land Office, Austin, Texas (1993-1999)
- Legislative Analyst Energy & Environment, Cong. Ron Wyden, Washington DC (1991-1993)

# JAY GARDNER

## ASSISTANT PROJECT MANAGER

LJA ENVIRONMENTAL SERVICES

### EDUCATION

2000, BS, Biology, Texas A&M University – Corpus Christi

### PROFESSIONAL REGISTRATIONS

OSHA HAZWOPER
Wetland Delineation
MOCC Boat Certification, USFWS/DOI
CPR and First Aid Certification

### PROFESSIONAL AFFILIATIONS

- Wetland Training Institute (3/2006)
- Vice President, Coastal Conservation Association, Corpus Christi Chapter
- Chair, Habitat Today/Fish for Tomorrow Committee
- CCA-Texas and State Board Member
- Chair, Island Strategic Action Committee (ISAC) for the Corpus Christi City Council
- Previous Co-Chair, Watershore and Beach Advisory Committee for the Corpus Christi City Council

### SUMMARY OF BEACH & SHORELINE ENVIRONMENTAL/PERMITTING QUALIFICATIONS

Mr. Gardner has been involved with beach and dune permitting, restoration, and mitigation for fifteen years. Projects have included developments, walkovers, and dune restoration on Padre and Mustang Island, South Padre, Cameron County beaches and Matagorda Island, as well as permitting and compliance monitoring for USACE permits regarding beach maintenance. He is very knowledgeable of local beach/dune rules, Texas Administrative Code Chapter 15, The Open Beaches Act and Chapters 61-63 of the Natural Resources Codes dealing with beach access, rights, and dune protection. Mr. Gardner has spent many volunteer hours drafting and revising Beach Management Plans with the City of Corpus Christi, Nueces County, Cameron County, and the TGLO.

Mr. Gardner has worked with a variety of coastal governments, UTBEG, the TGLO, citizen committees and task forces regarding beach and dune mapping, management, and protection. Mr. Gardner has also served to review proposed projects from local governments, engineers and scientists. His staunch review of projects typically results in additional protection or improvement of projects and our natural resources, that typically result in cost savings through efficiency.

### PROJECT EXPERIENCE

**Representative Beach/Dune Projects**

- Cameron County Beach Maintenance Permit (USACE) and monitoring
- Bob Hall Pier Expansion
- Nueces County Beach Maintenance Permit and monitoring
- Nueces County Coastal Parks Master Plan
- Port Royal Walkover
- Island Park Estates subdivision and walkover
- Beachview Estates subdivision and walkover

- Lost Colony Dune Restoration
- Sunrise Shores subdivision and walkover
- James Worth Utilities Port Aransas Dune Permit
- Cabela's Beach Houses subdivision and new beach access road
- Jim Williams Beach access road and development
- La Concha (various lots, DPP/BCC) subdivision and walkover
- Bella Vista subdivision
- BriteStar subdivision and walkover
- Padre Balli Park Improvements

**Shoreline Protection Projects**

- Laguna Point Recreational Area – City of Port Mansfield
- Fulton Beach Road – City of Rockport/Fulton
- Little Bay Oyster Restoration Project -
- Packery Channel Park – Nueces County
- PJ's Marina
- JFK Boat Ramps and Bulkhead
- Tortuga Harbor
- Barney Davis/Talen Energy intake channel repair
- Environmental Assessments and Other Regulatory Experience

**Sample Innovative Projects**

- **Tortuga Dunes** – Forestar Group, Inc. is a large scale residential development that required approximately 100,000 C.Y. of mitigation to be accomplished (one of the largest private projects on the Texas coast). This project included construction of a dune structure three football fields in size, 24 feet tall, as well as protracted mitigation efforts to stabilize the area and promote native vegetative growth. The mitigation dune was so sizable, that the FEMA elevation designation was able to be amended, and the flood zone designation was changed. In addition, several walkovers were able to be combined through creative engineering and permitting, which reduced the proliferation of walkovers in the area.
- **Gulf Shores** – Bella Vista LLC.: As a result of an adjacent project needing mitigation, this project provided an opportunity to improve a historically disturbed area seaward of a local condominium. The dunes in front of the condo were repaired using imported material, and live plant material was used to stabilize the repaired sand dunes. Due to proper planning and timing, the repaired dunes revegetated in substantially less time than is required. These engineered dunes have held up through the recent storms.
- **Beachwalk II Walkover** – Beachwalk II HOA: An existing walkover was re-designed and re-constructed to improve access. The previous walkover was not ADA compliant due to variations in the existing dune structure. Engineering and permitting was accomplished that used the existing walkover to access the site (prevented temporary impacts), the walkover was raised allowing for dune migration, and the new walkover incorporates a new design that will be more conducive to storm and seasonal fluctuating line of vegetation movements.

**Additional Experience**

He is civically active, spending time Chairing several Corpus Christi City Council committees, works with the City Parks Board, and the Beach Management Advisory Committee. He chairs the CCA-Texas Habitat Today/ Fish for Tomorrow committee that has partnered with a variety of stakeholders and has helped coordinate more than $8 million in coastal and nearshore habitat restoration and enhancement projects, including the Rio Grande Valley Reef (Friends of RGV Reef). He was part of a team that received an award from Texan by Nature, presented for former first Lady Laura Bush.

# ROBIN C. WARRICK, PE, SIT

ENGINEERING & DESIGN

LJA ENGINEERING

## EDUCATION

2007, BS, Civil Engineering, Lamar University

## PROFESSIONAL LICENSE

2011, Professional Engineer, Texas #110393
New Mexico, Oklahoma, Iowa, Pennsylvania, Louisiana, Colorado

## SUMMARY OF QUALIFICATIONS

Mr. Warrick is a structural engineer and project manager in LJA's Marine Facilities Group and has been with LJA since 2012. He has over 10 years of experience designing bulkheads, bridges, docks, fender systems, structural inspections and piping and industrial structures. Mr. Warrick's responsibilities have included project management, design supervision, structural design, civil design, cost estimating, scheduling and specification development.

## PROJECT EXPERIENCE

**Slope Protection, LCRA, Garwood, TX** – Design of slope protection for LCRA intake pump station. Tasks included design of 120 LF of sheet pile toe wall along with required slope protection. Additional tasks included permitting support, hydraulic analysis, construction cost estimating, bidding, and construction support.

**Bulkhead, Port of Texas City, Texas City, TX** – Lead structural engineer and project manager for design of a deep water helical anchored, bulkhead at the Port of Texas City. Tasks for this project included developing a bulkhead to be installed around existing structures to increase land use for a maintenance yard, and provide shoreline stabilization. Special consideration was given to the wall alignment and anchor system to reduce the required excavation as well as allow for the installation of the anchors through a network of existing piles parallel the new bulkhead. Additional tasks included development of construction cost estimate and construction management support.

**Oyster Creek Bulkhead, Imperial Market, Sugarland, TX** – Lead structural engineering for approximately 1,150 linear feet of bulkhead design. Design covered roughly 300 LF of bulkhead repair which included assessing the existing bulkhead for the new landside use and developing a sequence to test the capacity of the existing anchor system. Additional tasks included bulkhead alignment, anchor system layout to avoid interferences and construction cost estimate.

**Bulkhead Repair, PRSI, Pasadena, TX** – Lead structural designer for the alternative repair or replacement analysis and design of the PRSI existing 260 foot bulkhead. Responsibilities included evaluation of existing condition to determine the best means of repair or replacement. Design of the new bulk head included a tie system that would tie the new sheet piles and wale into the existing wale and ties. Special consideration was taken for the installation method due to the underwater tunnel in the near vicinity.

**Dock Inspections, Port of Texas City (POTC), Texas City, TX** – Lead engineering for the dock inspections at the POTC. Tasks include inspection and condition assessment of 13 liquid transfer docks and the associated shore protection within the port. Additional tasks include making repair recommendations including location needing repair, repair method and urgency.

**SPPA Pier, Sabine Pass Port Authority, Sabine Pass, TX** – Assistant Project Manager and lead structural designer for a concrete pier replacement. The replacement pier has roughly 600 LF of dock frontage with six boat slips and is designed with precast elements primarily. The concrete piles, pile caps and slab beams are all precast with a cast in place topping slab. Tasks included a mooring and berthing analysis to determine design loads for the pier, bulkhead repair design, construction cost estimate, drawing production management, and contract and specification preparation.

**Confidential Client, TX Oxy, Ingleside, TX** – Project manager for structural inspection and dock capacity analysis. Tasks included a partial structural health inspection concrete connections, assessment of dock to increase berthing capacity for larger and deeper vessels, recommend modifications for dock upgrade, and project scheduling.

**Lynchburg Ferry Landing, Emergency Repair, Harris County, Baytown, TX** – Project coordinator for design of the berthing and mooring system. Tasks included leading the design effort of the structural marine systems, project scheduling, and cost estimating.

**Velasco Drainage District Levee Inspection/FEMA Certification, Brazoria County, TX** – Lead structural engineer, inspector and assistant project manager for inspection of the 66 structure on Velasco Drainage District's (VDD) federal levee. Tasks for this project included inspecting and assessing the current structural integrity and performing a design checks of the levee structures for compliance with FEMA and USACE regulations. Additional tasks included making repair recommendations to bring deficient structures up to an acceptable rating for VDD to obtain a levee certification.

**Dock 42/43 FEED Study, Port of Texas City, Texas City, TX** – Lead structural engineer and project manager for a feed study for a proposed liquids loading terminal at the Port of Texas City. Tasks for this project included evaluating the proposed location for functional placement of the dock to berth Aframax class vessels, conducting a mooring and berthing analysis, coordinate with local ship pilot to conduct operational simulations, develop a conceptual mechanical layout to the estimated piping and loading equipment, coordinate with USACE to obtain required dredge permits, Assumption of Maintenance, and channel realignment.

**USACE SELA-7B, TRS, Conti, Jefferson Parish, LA** – Project Manager and lead structural designer of the temporary retaining structure allowing the installation of 3 - 84" diameter discharge pipes as part of the Southeast Louisiana Urban Flood Control Project. Tasks included full sheet pile retaining wall design with wales and struts in accordance with USACE project specifications for roughly 1 mile of trenching activity.

**CLCND Flume, Chamber and Liberty County Navigation District, Chambers County, TX** – Lead structural designer for an 80 foot tied arch aqueduct crossing Double Bayou and canal diversion. Responsibilities include shoring and abutment design, structural steel design, prestressed concrete deck design and cost estimating. Design of the aqueduct included consideration of combined axial and flexural loads acting on sheet piles used for both abutment support and soil retention, a hydraulic study to determine pre and post construction flood elevations, analysis of the tied arch and prestressed slab design for the aqueduct. Cost estimating was performed to ensure the designed structure could be constructed within the designated budget.

**Crude Transfer Terminal, GT Logistics, Jefferson County, TX** – Lead structural designer for the development of a 1,100 acre industrial storage and crude transfer facility. The facility will operate as a rail switch yard and be set up to pump crude oil from rail cars to load on a barge 1 mile away. Responsibilities have included as built bridge analysis of existing timber and steel bridges, rail and truck bridge design, foundation design, pipe rack design, equipment layout, loading dock design, project coordination and scheduling.

# VICTORIA L. JONES, EIT

**ENGINEERING & DESIGN/ REGULATORY**

LJA ENGINEERING

## EDUCATION

1994, MS, Coastal and Oceanographic Engineering, University of Florida
1991, BS, Maritime Systems Engineering, Texas A&M University

## PROFESSIONAL LICENSE

1996/2013, Engineer-In-Training, Texas #25485

## PROFESSIONAL CERTIFICATION

Wetland Delineation (Wetland Training Institute, 2014)

## PROFESSIONAL MEMBERSHIPS

American Shore and Beach Preservation Association (ASBPA)

## SUMMARY OF QUALIFICATIONS

Ms. Jones is Project Coordinator for LJA's Coastal Division. She has over 25 years of experience in coastal engineering with a variety of design, research, and academic practice including assessments and investigations of cross-shore systems, shoreline process analysis, coastal protection, structures and restoration, shallow water hydrodynamics, ocean measurements, and geotechnical engineering.

Ms. Jones is knowledgeable in physical and numerical modeling for shoreline change analysis, proficient in beach profile surveying and analysis, and experienced in sediment analysis and selection based on long- and cross-shore transport, for coastal projects. She has over 20 years of field data collection and processing experience and assessments and analysis of coastal processes including wind/wave forces, along shore and cross shore littoral sediment transport and shoreline evolution.

Ms. Jones is experienced in NEPA and ESA compliance documentation, FEMA-HUD Texas Disaster Recovery documentation, environmental assessments, Federal and State permitting and certifications, and Regulatory coordination.

## PROJECT EXPERIENCE

**McFaddin National Wildlife Refuge Beach Ridge Restoration** – As Project Coordinator, Ms. Jones co-authored the Environmental Assessment and NEPA compliance (resulting in a FONSI) for 19.7 mile dune restoration and beach nourishment project. Additional duties included the determination of nourishment profiles, construction feasibility analysis, and alternatives analysis. She led regulatory coordination with public agencies and stakeholders, and the development of permit documents and drawings. Ms. Jones co-authored several RFP's for special project monitoring and surveying, corresponded with potential bidders and stakeholders, and oversaw monitoring coordination and practices during initial phase construction for environmental and archeological requirements. As a Graduate Engineer, Ms. Jones designed initial beach fill and cross-shore nourishment sections and was part of the beach surveying/field data collection team. She assisted in final design/construction drawings, project specifications, and bid phase services. She also assisted in construction oversight and closeout.

**Federal Channel Dredging and Dock Construction, Port of Texas City** – As Project Coordinator Ms. Jones assists in the effort to obtain Section 408 (Federal Real Estate) and Section 10/404 (Navigation and Clean Water Act) clearance to deepen and widen the Federal Industrial Canal and construct new docks adjacent to the canal within the Port of Texas City. She also led the effort to obtain State clearance for dredge placement in an adjacent DMPA on state-owned land. Additional duties include exhibit preparation, report modifications, and design plan updates.

**TX State Highway 87 Protection, Bolivar Peninsula, TX –** As Project Coordinator, Ms. Jones was part of a team for beach survey data collection and analysis for the assessment of roadway protection for a length of highway frequently inundated by tidewater and storm surge. As Graduate Engineer, she assisted in revetment design for beachside roadway protection within ROW, document and drawing preparation, regulatory support, and coordination with USFWS - Anahuac National Wildlife Refuge landowner.

**Neches Riverfront Erosion Response, City of Port Neches** – As Project Coordinator, Ms. Jones leads the regulatory coordination with public agencies and stakeholders, and the development of permit documents and drawings for offshore breakwater design and living shoreline creation, derelict structure removal, and City riverfront boardwalk design. As a Graduate Engineer, she assists with final design drawings, project specifications, and bid phase documentation.

**Seawall Repair, Sabine Pass, TX** – Ms. Jones leads the Federal and State regulatory effort for the rehabilitation and repair of the seawall and component structures at the Sabine Pass Battleground State Historic Site. This project is part of the Hurricane Harvey emergency response effort and is partially funded via FEMA.

**McFaddin National Wildlife Refuge Overwash Protection Berm** – As a Graduate Engineer, Ms. Jones conducted analysis of wave runup and overtopping on a clay core berm, and conducted volumetric impoundment and sheet and stream flow analysis of drainage times following inundation due to extreme events. She also designed impoundment relief channels. As Project Coordinator, she conducted FEMA-HUD Texas Disaster Recovery process documentation, publications, and comments; and, assisted in the development of permitting, NEPA, and ESA documents. Ms. Jones also led construction oversight.

**Levee Toe Protection, Brazos River, Fort Bend County MUD 121** – As Project Coordinator, Ms. Jones led environmental and regulatory efforts (i.e. wetland delineation, federal and state regulations, etc.) to protect the riverbank and flood protection levee from further erosion. She assisted with feasibility study, conceptual and final design of shore-perpendicular gravity structures designed to withstand hydrodynamic forces as well as retained-earth pressures to reduce future bank erosion rates. Additional duties included project specifications, and construction plans review.

**Post Harvey Bank Repair, Garwood River Plant, Lower Colorado River Authority** – Ms. Jones assists with analysis and design of riverbank protection for the Garwood facility riverbank which suffered extreme damage due to flooding caused by Hurricane Harvey. Design includes bulkhead protection, upper bank protection, and increased protection from scour adjacent to Plant intake structures. Additional duties include project specifications, construction plans review, and regulatory support to LCRA staff.

**Indianola/Magnolia Beach Shoreline Stabilization** – Design consultant who conducted beach surveys, sediment analysis, and selection of nourishment material for shoreline stabilization including beach nourishment and groin installation. She also conducted analysis of wave climate for storm severity and frequency. Ms. Jones completed numerical modeling of project life study to determine monitoring and maintenance requirements.

# RANDY TAILLON

SITE INVESTIGATION

## PROFESSIONAL LICENSE

Active registrations/Certifications: FAA UAS 107 Pilot

## SUMMARY OF QUALIFICATIONS

Randy has over five years of experience in the burgeoning UAS industry, 10 years in IT and 35 years in the automotive industry. He is a Co-founder of Precision Aerial Compliance Solutions, LLC, (PACS) an industry leader and innovator with multiple industry firsts and successful proof of concepts for municipal, city and state entities. PACS was one of the first four companies to be credentialed by the National UAS Credentialing Program, a rigorous and comprehensive vetting program developed by Texas A&M, TEEX, Lonestar Center For Excellence and the FAA. PACS is the most qualified and experienced service provider in the engineering and survey space in Texas with 1000's of hours of LiDAR and Photogrammetry contracts successfully completed.

Randy was previously employed by Rice University as their Data Center Operations Systems Support Specialist II and more specifically, wrote a database for them which would allow staff at any location on campus to locate any server, switch or other peripheral device down to it's building, rack, rack location, what network port it was connected to and on what switch. He also built, installed and configured the Linux server that houses this database. Randy's main responsibility was to support the research department's IT needs installing, configuring networking and maintaining all of it's research hardware.

Randy also performs at expert level or above on multiple software platforms. Randy maintains an Adobe Creative Cloud membership and is proficient in Photoshop, Lightroom, Illustrator, InDesign and Acrobat.

## PROJECT EXPERIENCE

**ExxonMobil Beaumont Heavy Lift**– Project Manager. Captured video and still images that PACS used to produce high quality marketing products for the client.

**ExxonMobil Beaumont Levee Survey** – Project Manager. Lidar survey of all the levees at the plant.

**Raito Inc.** – Project Manager. Provided LiDAR data client used to model a section of river bank that was encroaching on a neighborhood levee.

**WCRC White River Conservation Project** – Project Manager. Provided LiDAR data to client so they could restore area to pre-flood conditions.

**Sienna Plantation, Sugar Land, TX** – Project Manager. Provided LiDAR surveying services for the 2,370-acre Development.

# GEORGE C. CULVER

## GIS DATA COLLECTION/ANALYSIS

LJA ENGINEERING

### EDUCATION

1996, Bachelor of Science, Cartography and Remote Sensing, Southwest Texas State University

### PROFESSIONAL MEMBERSHIP

Fort Bend County GIS Consortium
HGAC – Geographic Data Committee
Houston Community College GIS Advisory Board

### SUMMARY OF QUALIFICATIONS

Mr. Culver has over 18 years of experience working with Geographical Information Systems. His experience includes Project Information and Asset Management, storm event analyses, economic development applications, feasibility studies, and mapping support for the Water Resources, Surveying and Land Development divisions. George also has four years of training experience in the use of CADD software including AutoCad and MicroStation, two years of experience in the seismic data collection industry and two years working with satellite imagery and aerial interpretation.

### PROJECT EXPERIENCE

**The Greater Fort Bend Economic Development Council GIS Project** – Continual development of a land, commercial and retail GIS system, receiving two national awards: National Council for Public-Private Partnerships and CORE-Net Global Innovators Awards. In addition to Commercial, Retail and Office Availability, the project focuses on Transportation (existing, planned & proposed road networks), Cities, ETJ's, County Districts, Utilities, population of existing and planned communities, growth trends and environmental issues as they pertain to Economic Development within Fort Bend County. The Project evolved into the central location of Fort Bend County for country-wide geospatial data sets. The EDC currently houses over 50 layers of information and is on an annual update for aerial photography. Continual roles include data update, retrieval and creation, in addition to maintaining Metadata for document sourcing, validation and update sequences.

**Geographical Information System (GIS) Services, Damage Assessment Survey, Promovita, LLC, Houston, TX** – Managed the GIS services to assist in the Damage Assessment Survey (DAS) for Promovita, LLC and The Disaster Housing Assistance Program (DHAP) after Hurricane IKE. LJA provided Web Development and GIS consulting services assisting the program with residential home inspections (routing and cataloging), data dissemination (pre and post storm) and report generation.

**The Greater Houston Partnership GIS Project** – LJA's GIS Department worked with the Greater Houston Partnership, the primary advocate of Houston's business community, to design and launch a region-wide, GIS tool to assist site consultants and relocation professionals. LJA is involved with the development, deployment, administration and support of the Partnership's GIS capabilities. The 10-county project was deployed internally with customized desktop applications, and externally to key stakeholders with a responsive Web GIS application. The GIS project supplied the Partnership with additional research tools and information to enhance their current process in responding to regional prospects. The developed tools allows several paths (reporting and mapping) to interact with and deliver isolated components of their geographic data layers. Both the reporting and mapping components of the project are developed upon a base of data layers sourced from varied national, state and local agencies.

By creating a visual or "spatial" relationship within the data, the Partnership can evaluate the area of interest with respect to geography and neighboring features. Services provided will include performing in-depth demographic analysis of a site and the surrounding area; identifying available site locations that meet personal criteria; and evaluation of possible sites with respect to geography and surrounding geographic features.

**City of League City GIS Project** – LJA was selected to assist the City of League City in the implementation of a traffic asset collection system. Project Manager for design of a GIS database to characterize the unique values for both sign and traffic signal infrastructure. The sign data design included sign identification, location and condition value. The traffic signal data design included the complex nature of signal components and photography. The City implemented in field data collection devices to ease these collection processes. The devices interacted directly with the city GIS creating a centralized process to manage existing assets as well as projecting future needs and budgets. LJA is currently working with the City of League City towards the completion of this project.

**Texas Medical Center Campus GIS, Houston, TX** – Project Manager responsible for the inventory of existing and proposed infrastructure within the Texas Medical Center campus, one of densest developments in the region. The infrastructure project included a complete recordation of wet and dry utilities ranging from drainage infrastructure to irrigation control valves to lighting locations and lighting components. The project delivers desktop GIS applications for office procedures combined with in-field, web based, GIS applications. Utilizing the ArcGIS Server environment, the data collection and inventory aspect of the project is distributed to various Medical Center departments for review and approval. This centralized database collection is accessible across the Medical Center Campus for inventory, data collection, data editing and incorporation within work flow.

**Regional Facility Planning, Quail Valley Utility District (QVUD), Fort Bend County, TX** – Project Manager for regional study analyzing the current utility infrastructure and its current capabilities to support future growth and expansion. This regional project incorporates a total of eight MUD districts (5,000 acres) collectively serving 12,000 connections, 35,000 residents and hundreds of commercial and business customers. The water system consists of 11 water supply plants, 13 wells, and one elevated storage tank. Wastewater treatment services are provided by three wastewater treatment plants and 38 lift stations. Both infrastructure systems were mapped in their entirety within the GIS environment serving the tools and data structure necessary to perform in depth analysis to model designed flow and capacities compared to the actual demand placed on the facilities.

**"My Neighborhood Site," City of Sugar Land, Sugar Land, TX** – Project Manager for developing the City of Sugar Land's "My Neighborhood Website." – The web based GIS application is designed to personally navigate the City of Sugar Land's official website solely on the user's home address. By entering an address the GIS application reports back direct links to city offices and services that pertain to that specific location. City of Sugar Land residents can retrieve their personal trash pick-up dates, mosquito spray schedules, city representatives and police beat information by simply entering their home address. In addition to city services available to residents, the GIS program also retrieves local parks, city facilities and Capital Improvement Projects within one mile of entered address.

**Newland Communities Property Control GIS** – Project Manager for internal GIS built to integrate with existing Newland Communities data and workflows. An existing property control database was used to collect information on lot and section management, contracts, and builder assignments. The database is shared between corporate offices and on-site sales centers for enterprise data access. A GIS was designed to join the existing property control database to geographic features. Incorporating a geographic component provides new opportunities for visualization, mapping, and spatially enabled queries.

# JAMES M. NAISMITH, RPLS, LSLS

## HYDROGRAPHIC SURVEYING

### EDUCATION

1998, MS, Civil Engineering
1995, BS, Civil Engineering

### PROFESSIONAL LICENSE

Registered Professional Land Surveyor, Texas #4828
Licensed State Land Surveyor, Texas
Engineer in Training, Texas

### SUMMARY OF QUALIFICATIONS

Jim Naismith has more than 30 years of experience in all aspects of land and hydrographic surveying. Along the Texas Gulf Coast, Jim has completed numerous dock conditions surveys; surveys for dredging and marine construction; lost item and clearance surveys; magnetometer; and shallow seismic surveys. Hurricane and disaster response experience includes debris mapping/identification, debris removal, navigation hazard location/removal, submerged vessel location/marking, shoal detection, and post-hurricane channel clearance.

### PROJECT EXPERIENCE

**South Padre Island Beach Profile Surveys, Texas, 2008-2020** – Professional Land Surveyor and Hydrographic Surveyor. This project is in support of the beach nourishment and monitoring along South Padre Island. Detailed cross-section surveys were completed from the dune line to the depth-of-closure offshore. The upland portion of the survey is completed with GPS-RTK; the surf zone completed with GPS-RTK on a sled; and the hydrographic survey is completed with a dual frequency single-beam echo sounder. Approximately 40 sediment grab samples were obtained during one survey. Jim was responsible for the QA / QC of survey data. He also completed the bathymetric processing and oversaw the drawing and report preparations before certifying final survey deliverables.

**Dock Surveys and Soundings, Port of Brownsville, 2011-2019** – Professional Land Surveyor and Hydrographic Surveyor. The Port of Brownsville and associated industry routinely obtains regular bathymetric surveys on its docks and waterways to ensure that current and accurate data is maintained on water depths. This project consists of multibeam echo sounder surveys, single-beam echo sounder surveys, wading, conventional bulkhead, and shoreline surveys. Jim was responsible for the collection and QA / QC of survey data. He also completed the bathymetric processing and oversaw the drawing and report preparations before certifying final survey deliverables.

**Design Survey, Tompkins Channel, South Padre Island, 2016** – Professional Land Surveyor and Hydrographic Surveyor. Maintenance dredging and marina dredging for a section of Tompkins Channel. This project consists of single-beam echo sounder surveys, wading and upland dock surveys. Jim was responsible for the QA / QC of survey data. He also completed the bathymetric processing, drawing, and report preparations before certifying final survey deliverables.

**Bahia Grande, Cameron County, Texas, 2008-2019** – Professional Land Surveyor and Hydrographic Surveyor. Responsible for the collection and QA / QC of survey data. Also oversaw the bathymetric processing, drawing, and report preparations before certifying final survey deliverables. The upland portion of the survey was completed with GPS-RTK; the hydrographic survey was completed with a single-beam echo sounder.

# BEACH MAINTENANCE PERMIT/USACE

## Cameron County, Texas

**CLIENT NAME**
Cameron County, TX

**CLIENT CONTACT**
Joe Vega
Cameron County Parks Director
956.761.3700
JEVega@co.cameron.tx.us

**TEAM LEADER NAME**
Jay Gardner

**FIRM'S ROLE**
Site assessments and surveys; Permit Application materials compilation and submittal; analysis of future conditions

**PROJECT DATE**
2015

**PROJECT VALUE**
$89,000

**NUMBER OF CHANGE ORDERS**
None

**COST SAVING SOLUTIONS**
Process streamlined based on previous experience with similar projects

**CONTINUED INVOLVEMENT**
LJA team members continue to advise Cameron County on environmental and regulatory issues.

Cameron County was required by the USACE to attain a beach maintenance permit based on their beach management strategies. The plan creates a scientific framework for prioritizing restoration actions, project implementation, monitoring, data synthesis, and applied studies to expand the knowledge of ongoing physical and ecological processes onsite.

The permit enables necessary beach maintenance activities while continually improving policies and procedures to minimize environmental impacts.

LJA evaluated the existing beach and dune environment for necessary federal permitting of beach maintenance activities. Piping Plover and shorebird surveys were completed, along with the management of beach surveys and data collection. Section 7 Formal Consultation with the USFWS was completed, and all permit application materials were compiled and submitted to the USACE. Permit authorized.

**Services include:**

- Perform initial site assessment
- Completed Piping Plover and shorebird surveys
- Formal Consultation with USFWS, Section 7
- Survey Management
- Data Collection Management
- USACE Permit Application Completion and Submittal

# EROSION RESPONSE PLAN

## Cameron County, Texas

**CLIENT NAME**
Cameron County, TX

**CLIENT CONTACT**
Joe Vega
Cameron County Parks Director
956.761.3700
JEVega@co.cameron.tx.us

**TEAM LEADER NAME**
Peter Ravella

**FIRM'S ROLE**
Comprehensive shoreline risk assessment; Update current conditions; Identify & quantify weaknesses; Develop response strategies

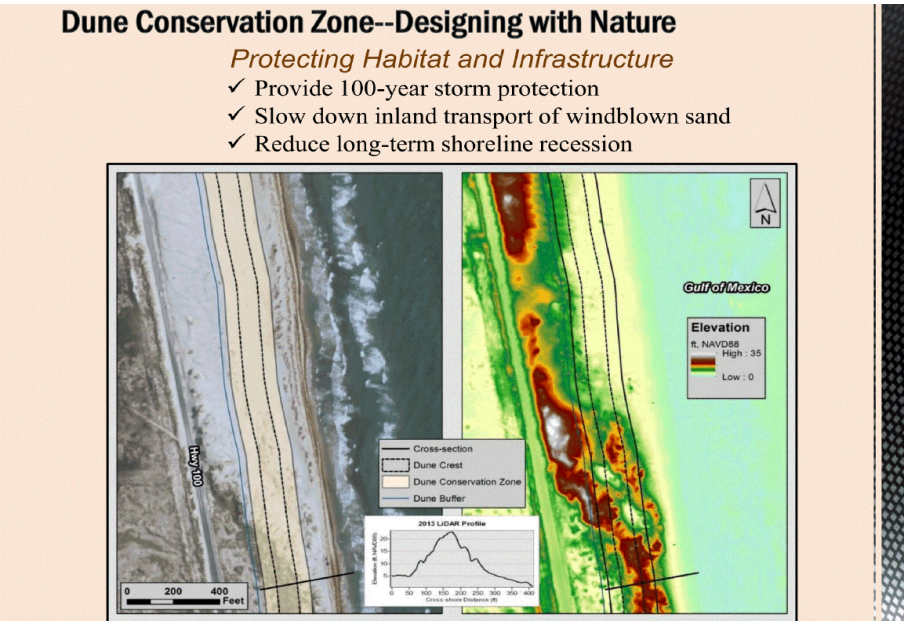
**PROJECT DATE**
2017-2018

**PROJECT VALUE**
$160,000

**NUMBER OF CHANGE ORDERS**
None

**COST SAVING SOLUTIONS**
Aggressive & ongoing public engagement to identify and resolve local issues; Early & ongoing Agency coordination; Developed dedicated ERP website for communication & plan sharing; Close coordination w/ client and stakeholders

**CONTINUED INVOLVEMENT**
Provide on-going consultation services throughout GLO review and certification process




In compliance with GLO rules and procedures, the project team prepared an Erosion Response Plan for Cameron County Texas for formal review and certification by the GLO. Team members conducted comprehensive shoreline risk assessment; documented shoreline conditions; updated shoreline change rates and dune conditions; identified and quantified dune weaknesses, dune gaps, and blowouts; developed dune enhancement and improvement strategy and dune design for 100-year storm level protection; engaged community leaders and stakeholders; developed erosion response strategies; drafted Beach Access & Dune Protection Plan Amendments; developed and draft nearshore construction and permitting standards; coordinated with General Land Office; and supported County ERP adoption and certification of the plan by GLO.

**Services include:**

- Extensive analysis of shoreline and dune conditions, nearshore transport & erosion rates
- Dune gap analysis & strategy for future enhancement (100-yr storm level protection)
- Assess & inventory all beach access and facilities
- Develop post-storm monitoring protocols
- Develop construction/shoreline management priorities:
  - Establish building setback line
  - Preserve, expand, & enhance dune system
  - Facilitate more appropriate development via beach-dune permitting standards
  - Assess/evaluate possible relocation of Park Rd 100
  - Address/improve public beach use (vehicular impacts reduction)

# BEACH MAINTENANCE MONITORING PROGRAM

## Cameron County, Texas

**CLIENT NAME**
Cameron County, TX

**CLIENT CONTACT**
Joe Vega
Cameron County Parks Director
956.761.3700
JEVega@co.cameron.tx.us

**TEAM LEADER NAME**
Jay Gardner

**FIRM'S ROLE**
Site assessments and surveys; Agency coordination for monitoring protocols; quarterly monitoring; yearly report submittals

**PROJECT DATE**
2015-2019

**PROJECT VALUE**
$195,775

**NUMBER OF CHANGE ORDERS**
None

**COST SAVING SOLUTIONS**
Concurrent coordination with USFWS on other projects resulted in cost savings of approximately 10%

**CONTINUED INVOLVEMENT**
LJA team members continue to assist Cameron County with various maintenance, monitoring, environmental, and regulatory projects.

LJA personnel established a monitoring program required by conditions of the USACE Beach Maintenance Permit. Monitoring protocols were coordinated with the USACE and the US Fish and Wildlife Service (USFWS) to meet the permit requirements.

Quarterly monitoring efforts were required along with yearly reports submitted to the USACE and USFWS. In addition, coordination with the Padre Island National Seashore and Sea Turtle Inc was required for sea turtle nesting programs and nesting efforts.

A five year monitoring program was established; and, the end result was LJA successfully negotiated with USFWS to discontinue monitoring - a cost savings of approximately $100,000 per year.

**Services include:**

- Quarterly monitoring efforts for:
  - beach elevations
  - shorebirds
  - sargassum volumes
  - sea turtle nesting
- Yearly report completion and submittal

# EROSION RESPONSE PLAN

## South Padre Island, Texas

**CLIENT NAME**
City of South Padre Island

**CLIENT CONTACT**
Kristina Boburka
Shoreline Director
956.761.3837
kboburka@myspi.org

**TEAM LEADER NAME**
Peter Ravella

**FIRM'S ROLE**
Site assessments and surveys; analysis of future conditions

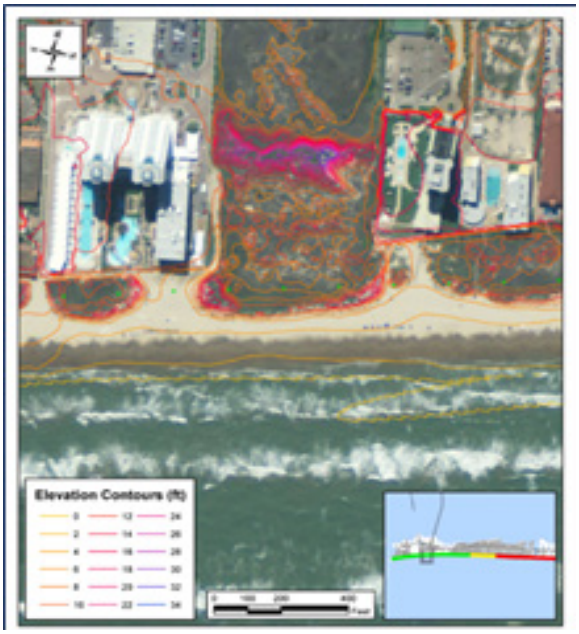
**PROJECT DATE**
2011-12

**PROJECT VALUE**
$20,300

**NUMBER OF CHANGE ORDERS**
None

**COST SAVING SOLUTIONS**
Planning level cost savings estimates included

**CONTINUED INVOLVEMENT**
LJA team members continue to assist the City of South Padre Island and Cameron County, upon request, with various maintenance, monitoring, environmental, and regulatory projects.




In accordance with state law, the City of South Padre Island elected to prepare an Erosion Response Plan. In general, the purpose of this plan was to explore means and methods to reduce the public expenditures due to damage to property and infrastructure that can result from shoreline change, erosion, and storm conditions.

LJA (as LEAP Engineering) evaluated shoreline change rates, beach profiles, and projected shoreline positions obtained from the UT-BEG. From the GLO, the City obtained the 2009 Texas Coastwide Erosion Response Plan, which includes substantial data and information necessary for the local plan, LIDAR elevation data, and updated aerial photography of the City's shoreline. Finally, the City compiled data on previous beneficial use projects, updated shoreline profiles, dune enhancement projects, and cost estimates for various shoreline management activities.

**Services include:**

- Perform initial site assessment
- Compilation of practices for:
  - Beneficial use
  - Updated shoreline profiles
  - Shoreline rates of change
  - Dune enhancement/planting
  - Shoreline management/desired conditions
  - Construction setbacks
  - Cost estimates for shoreline management

# EROSION ANALYSIS

## Cameron County, Texas

**CLIENT NAME**
Cameron County

**TEAM LEADER NAME**
Peter Ravella

**FIRM'S ROLE**
Site assessment; benefit/ consequence analysis of alternative beachfront development; technical and policy analysis report

**NUMBER OF CHANGE ORDERS**
None

**COST SAVINGS SOLUTIONS:**
Planning level cost savings estimates included

**CONTINUED INVOLVEMENT**
LJA continues to assist client as requested to ensure mutual benefits continue for municipalities, county residents and beach users.

LJA completes a technical and policy analysis report entitled "Cameron County Erosion Analysis: Study of Future Shoreline Change and Public Cost Implications of Beachfront Development" under contract to TGLO. The intent of the analysis was to demonstrate, using existing and new data, the likely extent of recession of the Gulf of Mexico shoreline location in coming years and decades, the potential intervention costs of slowing the recession, and the technical and policy implications and tradeoffs of a range of beachfront development/land use choices that will be made in the near future. Results were presented to Cameron County Commissioner's Court and to the South Padre Island City Council.

**Services include:**

- Shoreline movement, process, and time scale
- Analyzed benefits and consequences of alternative beachfront development practices from perspective of:
  – Property owners; Local government; public and private stakeholders
  – The natural resource
- Shoreline management program funding
- Policy implications of shoreline change

# BEACH AND DUNE RIDGE RESTORATION

## Jefferson County, Texas

**CLIENT NAME**
Jefferson County

**TEAM LEADER NAME**
Doug Dusini, PE

**FIRM'S ROLE**
Site assessment; preliminary and final design; environmental and regulatory coordination; bid and construction oversight

**NUMBER OF CHANGE ORDERS**
Two (Client requested)

**COST SAVINGS SOLUTIONS:**
Design and Value engineering solutions resulting in construction cost savings and future maintenance cost savings by creation of a self-mitigating project.

**CONTINUED INVOLVEMENT**
LJA continues to work with the client as well as Refuge managers and other stakeholders for protection of freshwater marshes in the regional ecosystem.

LJA performed a detailed analysis of the existing state of the dune-berm-chenier-nearshore zones of McFaddin NWR in response to the destruction of the beach ridge due to Hurricane Ike. Dune ridge restoration work included unique design and construction of a clay core berm to prevent seawater inundation of the freshwater marshes. Beach ridge restoration included beach and dune nourishment utilizing dredged material from an offshore borrow site. LJA conducted wave and storm analysis and modeling for longshore transport rates, wave refraction and possible erosional hotspots, nourishment lifespan, and modeling of offshore dredging borrow area changes. In addition, dredge volumes, transport alternatives, and placement templates were analyzed.

Initial and final design of required dune line and beach face dimensions and volumes were conducted. In addition, LJA prepared construction contract documents including drawings, technical specifications, and bidding documents. LJA also co-authored an Environmental Assessment, and NEPA and ESA documentation for habitat creation, acquired necessary regulatory Federal and State permits, and oversaw environmental and archeological monitoring.

**Services include:**

- Onshore and offshore site assessments and surveys
- Metocean and shoreline change analyses
- Design of clay core berm and onshore borrow sites for self-mitigation and creation of emergent freshwater wetlands
- Design of dredge plans for appropriate volumes, maximum BUDM use, and transport analysis; beach and dune template design
- Final Design Plans, Specifications and Cost Estimates
- Federal and State regulatory permitting
- NEPA and ESA Compliance
- Bid and construction oversight

# COMPREHENSIVE COASTAL PLANNING SERVICES

## Willacy County, Texas

**CLIENT NAME**
Willacy County, Texas

**TEAM LEADER NAME**
Peter Ravella

**FIRM'S ROLE**
Project planning, design and permitting; State & Federal agency coordination; Grant acquisition & management services; Wetland conservation easement development

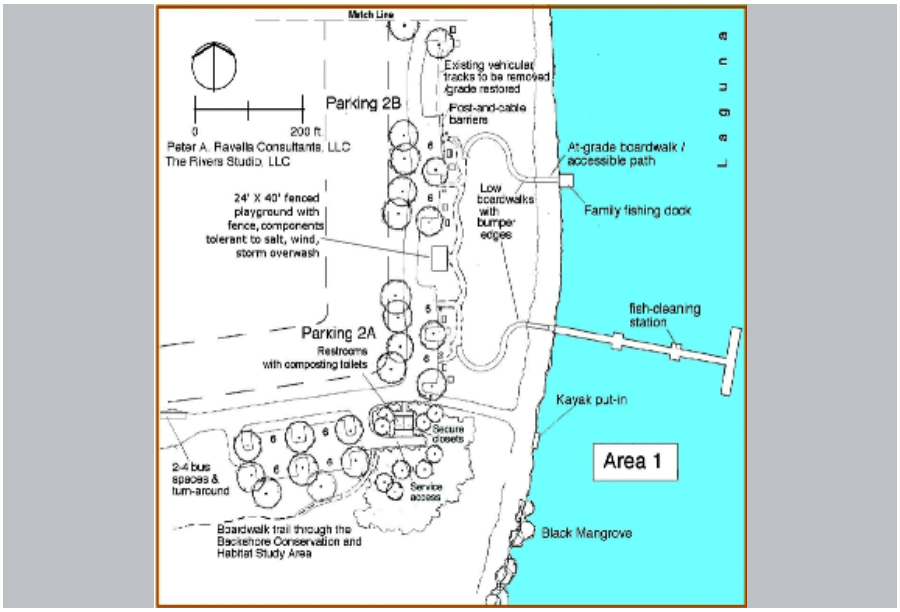
**NUMBER OF CHANGE ORDERS**
Four

**COST SAVINGS SOLUTIONS**
Revised utility and road/access plan to reduce costs;

Innovative grant matching strategies;

Close coordination with Client, local government and businesses, public, and other stakeholders

**CONTINUED INVOLVEMENT**
Provide construction oversight and full grant management administration until closeout




LJA personnel, working as part of a larger, multi-company project team, led the effort to identify, design, permit and construct more than $1.5 million in coastal improvements in Port Mansfield supported by a comprehensive and integrated financial plan. More than 40 acres of jurisdictional wetlands were set aside under a conservation easement and roads and other human impacts to wetlands were addressed and repaired while ensuring long-term public access to the Laguna Madre shoreline.

Projects developed and constructed: (1) the Coastal Lands Resources Center; (2) Laguna Point Recreation Area w/ extensive Wetlands Conservation components; (3) Shoreline Access Improvements; and (4) Youth Environmental Education Program. Project planning, design and permitting, state and federal agency coordination, grant acquisition and management services, and development of conservation easements for wetland areas were included. All projects were successfully permitted and constructed within budget over a period of four years.

**Services include:**

- Conceptual and Final Project Plans
- Innovative park design: fishing pier, bird watching stations, learning center, playground, picnic areas and restrooms
- Negotiation water, sewer and power utility line extensions to service new facilities
- Successfully developed, executed and integrated, multi-agency financial plan resulting in full funding of improvements with little out-of-pocket contribution to the county.

# F ABILITY TO PERFORM WITHIN BUDGET CONSTRAINTS

## ABILITY TO ADMINISTER PLAN TASKS ON TIME, ON SCHEDULE, AND WITHIN BUDGET

The LJA Team is well versed in working within set budget constraints for planning, design, and implementation of projects. Project Manager, Doug Dusini, spends a significant amount of time at the beginning of a project investigating known potential issues that could affect progress. This will include analysis of the City's stated schedule, scope and budget. Doug evaluates the stated parameters against existing conditions and identifies possible issues. He performs an evaluation of the anticipated project phasing and costs to see if the budgets are accurate. Finally, Doug presents the City with an assessment of the project schedule, scope and budget and suggested revisions based upon the findings. He performs all of this work prior to contract negotiations on the AE Agreement with the City. By doing so, LJA and the City have a good understanding of the project requirements at the time that the AE Agreement is executed and each party is in agreement on schedule, scope and budget.

## ABILITY TO MAINTAIN COST CONTROLS TO ACHIEVE THE MOST COST EFFECTIVE SOLUTIONS WITHIN ORIGINAL BUDGETS

During the Preliminary Phase, LJA works closely with City staff to define a detailed project scope and estimate of probable costs to accomplish the project scope. Probable costs are identified in a Technical Planning Memorandum. If probable costs per this Report exceeds original budgets, LJA suggests reductions in scope and/or cost saving measures to reduce costs. At that time, staff makes a final decision on scope and cost; either to reduce scope and cost or increase the budget per the probable cost estimate. Staff then authorizes LJA to proceed with preparation of design documents per the final scope and budget. By approaching each Project in this manner, the LJA team ensures the City is fully aware of the probable costs of the requested Project at each step of the design submittal process before proceeding to final design and bidding.

## EXAMPLES OF SUCCESSFUL PAST PROJECT DELIVERY

**Project Name:** Dune Ridge Restoration, McFaddin National Wildlife Refuge
**Estimated Cost:** $7.1 Million
**Bid Range:** $7.1 – 13 Million
**Actual Cost:** $6.9 Million;
**Summary:** Cost savings based on refined engineering templates for maximum benefit and reduced environmental impacts (creating a self-mitigating project).

**Project Name:** Beach Maintenance Monitoring Program
**Estimated Cost:** $100,000 per year
**Bid Range:** N/A
**Actual Cost:** $0.00
**Summary:** Successful negotiation w/ oversight agency resulting in dismissal of further activities

**Project Name:** Comprehensive Coastal Planning Services
**Estimated Cost:** $1.025 Million
**Bid Range:** Unknown
**Actual Cost:** $1.5 Million
**Summary:** Innovative grant matching strategies including dedication of parkland, use of conservation easements and integration and quantification of in-kind services, resulting in minimal Client out-of-pocket expenses.

# G WORKLOAD CAPACITY AND WORK WITHIN SCHEDULE

## A. CAPABILITY TO HANDLE MULTIPLE PROJECTS

Tasks are distributed and progress tracked across all members of the project team to ensure successful completion. The flexibility and internal capacity of the project team allows additional resources to be allocated as necessary should project needs and critical tasks shift during the project. The project manager tracks the usage of budget dollars and resource hours to ensure the significant resources of the project delivery team are being directed in the most productive manner. Owner consultations at multiple stages of the process as well as a rigorous QA/QC process ensure the end result will exceed client quality standards.

LJA team members are accustomed to working on multiple projects at varying stages of planning, design, permitting, and construction. Team leaders may move members between projects, or assign new team members, to ensure effective communication and understanding of all aspects of each project and to maintain project schedules and budgets.

## B. ABILITY TO DELIVER PROJECTS WITHIN A SPECIFIED SCHEDULE

LJA places great importance on the quality, accuracy and value of its work product to ensure the delivery of a timely, cost-effective project. LJA's in-house procedures provide for project kickoff meetings, which include both office and field staff, to effectively communicate project goals, schedules and assignments. The kickoff meetings will ensure specific work tasks are processed as quickly as possible while facilitating their completeness and quality. Regular team meetings are held on a weekly basis to track and schedule ongoing work assignments, as well as to discuss any opportunities/challenges relating to the work. Progress meetings on an agreed-upon schedule would be held with City staff to provide updates on the status of the project. Upon completion and before delivery, all deliverables will be checked for technical accuracy and content.

The LJA team takes great pride in completing projects on time and within budget. Each of the projects/tasks listed in Tab D (i.e. Cameron Co. Beach Maintenance Plan, South Padre Island and Cameron Co. Erosion Response Plans, and Cameron County Beach Maintenance Monitoring Program) has been completed within budget and within the time frame specified, save any change orders requested by the client.

## C. ABILITY TO SUSTAIN A LOSS OF A KEY TEAM MEMBER

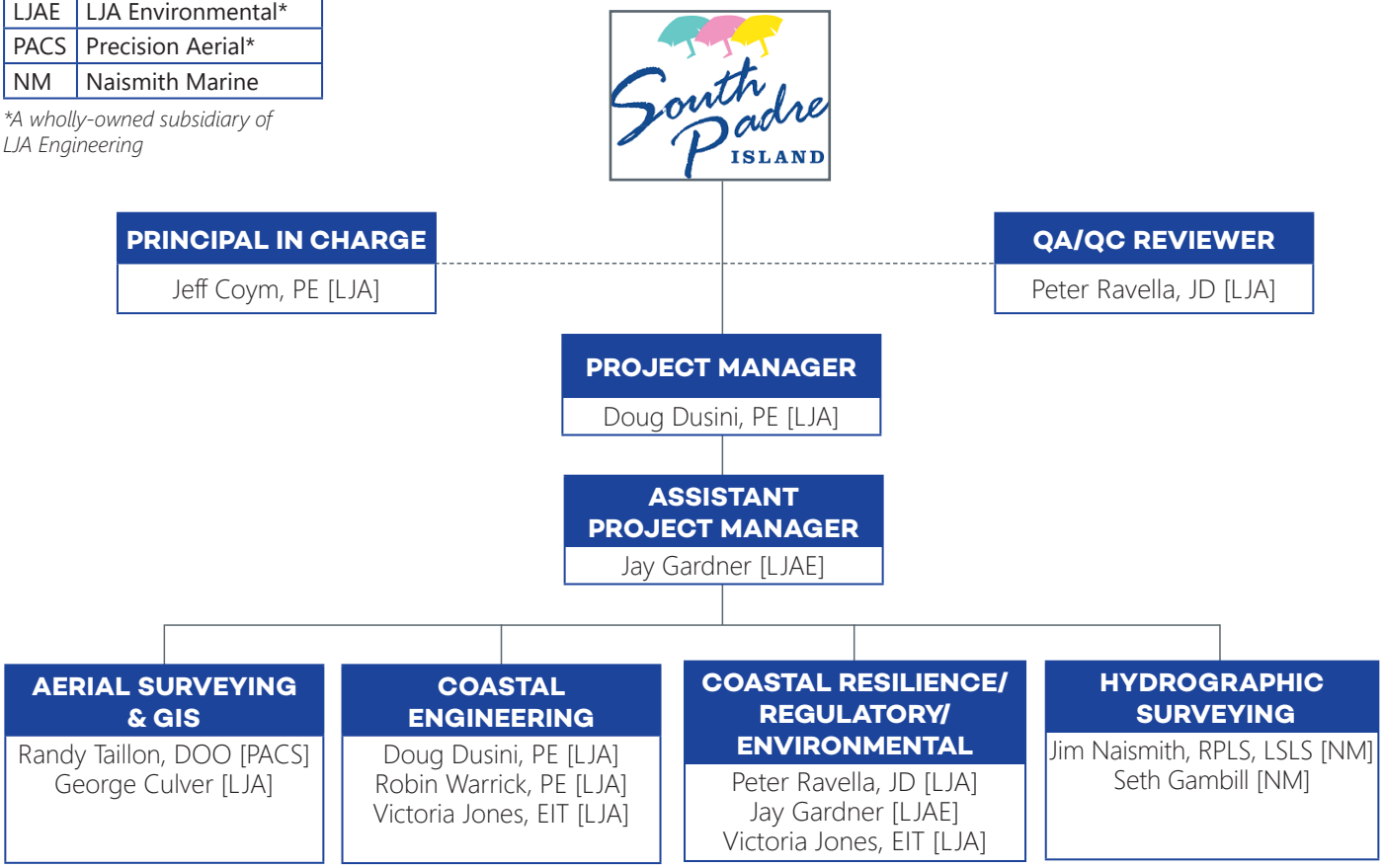
Key project staff noted in the organization chart are supported by hundreds of engineers, scientists, technicians, and other professionals. Key team members regularly specify one or more assistant task managers with the understanding "change is inevitable" and redundancy may be necessary to ensure project completion. Team leaders may move members between tasks, or assign new team members, to ensure effective communication and understanding of all aspects of each task and to maintain project schedules and budgets. This ensures no stoppages of task work in the event a key team member is reassigned.

# H PROPOSED APPROACH FOR THE DESIGN PROJECT

## A. ORGANIZATION AND STRUCTURE OF THE PROJECT TEAM

| TEAM MEMBERS | |
|---|---|
| LJA | LJA Engineering |
| LJAE | LJA Environmental* |
| PACS | Precision Aerial* |
| NM | Naismith Marine |

**A wholly-owned subsidiary of LJA Engineering*




***We anticipate 10% of work proposed will be performed by sub-consultants.***

## B. DETAILED APPROACH FOR ACCOMPLISHMENT OF PROJECT

### PROJECT PLANNING AND MANAGEMENT

LJA project management standards ensure that by working closely with clients and approaching the project in an all-inclusive manner, accurate timelines and budgets are generated to guide the process through the conception-assessment-investigation-planning process. The LJA team will work closely with City staff at the start of the project to develop a comprehensive scope and list of deliverables while identifying specific tasks and resource usage for timeline development and project budget estimation. Schedulers, in consultation with the Project Manager, identify critical-path elements to anticipate and avoid potential bottlenecks and externalities that may influence timely project execution, and work proactively to minimize any effect.

Our proven project management plan has consistently delivered solid performances as a result of the following key elements:

- Streamlined, centralized, efficient program management functions
- Local/regional project management and execution with experienced personnel from local offices
- Deep bench of technical specialists armed with the most current experience on key technical and regulatory challenges
- Program management infrastructure for efficient schedule/cost management, cost reporting, QA/QC, health and safety contracts/procurement, and regulatory support
- Consistent project execution, reporting, and deliverable preparation
- Established project planning/execution process

Tasks are distributed and progress tracked across all members of the project team to ensure successful completion. The project manager tracks the usage of budget dollars and resource hours to ensure the significant resources of the project delivery team are being directed in the most productive manner. Owner consultations at multiple stages of the process as well as a rigorous QA/QC process ensure the end result will exceed client quality standards.

## C. APPROACH TO PROJECT MANAGEMENT / OVERVIEW OF PROJECT APPROACH

### PHASE I - ASSESSMENTS AND INVESTIGATIONS

#### PROJECT MANAGEMENT

- Confirm project objectives as identified by the City (Owner)
- Coordinate with Federal, State and Local jurisdictions/agencies, public, and other stakeholders
- Public and stakeholder engagement, as appropriate

**Typical milestone activities/work products include:**

- Kickoff meeting/notes and site visit
- Develop project goals and performance criteria/Memo of Project Understanding
- Project management/monthly activity summary/schedule updates
- Conference call participation/notes

#### SURVEYS AND DATA COLLECTION

- Confirm project objectives as identified by the Owner and Shoreline Task Force
- Perform historical review and assess current maintenance practices
- Complete assessments, investigations, and surveys, as required. These may include:
  a. Dune and beach surveys
  b. Aerial Surveys/LiDAR
  c. Boundary survey (LSLS)/ jurisdictional surveys/mapping

**Typical milestone activities/work products include:**

- Planning/reconnaissance survey plan
- Geophysical surveys plan
- Topo/Hydro surveys plan

#### DATA ANALYSIS AND REPORTING

- Confirm project objectives as identified by the Owner and Shoreline Task Force
- Select Criteria for Phase II requirements
- Shoreline Vulnerability/Dune Resiliency Assessment
- Topo/bathy survey analysis
- LiDAR data analysis

- GIS analysis
- Select and optimize preferred Phase II alternatives with Owner/Stakeholder input

**Typical milestone activities/work products include:**
- Historical data-reference synthesis/summary memo
- Topological/Hydrological data analysis/tech memo, if needed
- LiDAR summary memo
- LSLS summary memo, if needed
- GIS summary memo
- Client meeting to present results

## PHASE II - ADAPTIVE MANAGEMENT PLAN/BEACH MAINTENANCE PLAN

### PROJECT MANAGEMENT
- Confirm project objectives as identified by the City (Owner) and Shoreline Task Force
- Coordinate with Federal, State and Local jurisdictions/agencies and other stakeholders
- Assist Owner with exploring funding opportunities for Beach Maintenance Permitting (Phase III)

**Typical milestone activities/work products include:**
- Kickoff meeting/notes and site visit
- Develop project goals and performance criteria/Memo of Project Understanding
- Project management/monthly activity summary/schedule updates
- Conference call participation/notes

### REGULATORY & STAKEHOLDER COORDINATION
- Confirm project objectives as identified by the Owner and Shoreline Task Force
- Integrate the Shoreline Management portion of the Erosion Response Plan, Shoreline Master Plan, and Beach Maintenance Guidelines
- Draft, revise, and coordinate with the Shoreline Task Force and TGLO
- Obtain Owner/stakeholder approval of plans

**Typical milestone activities/work products include:**
- Attendance at agency & stakeholder meetings
- Stakeholder input/meeting notes

## PHASE III - BEACH MAINTENANCE PERMIT REGULATORY AND ENVIRONMENTAL SUPPORT (AS BUDGET DICTATES)

### PROJECT MANAGEMENT
- Confirm project objectives as identified by the City (Owner)
- Coordinate with Federal, State and Local jurisdictions/agencies and other stakeholders

**Typical milestone activities/work products include:**
- Kickoff meeting/notes and site visit
- Develop project goals and performance criteria/Memo of Project Understanding
- Project management/monthly activity summary/schedule updates
- Conference call participation/notes

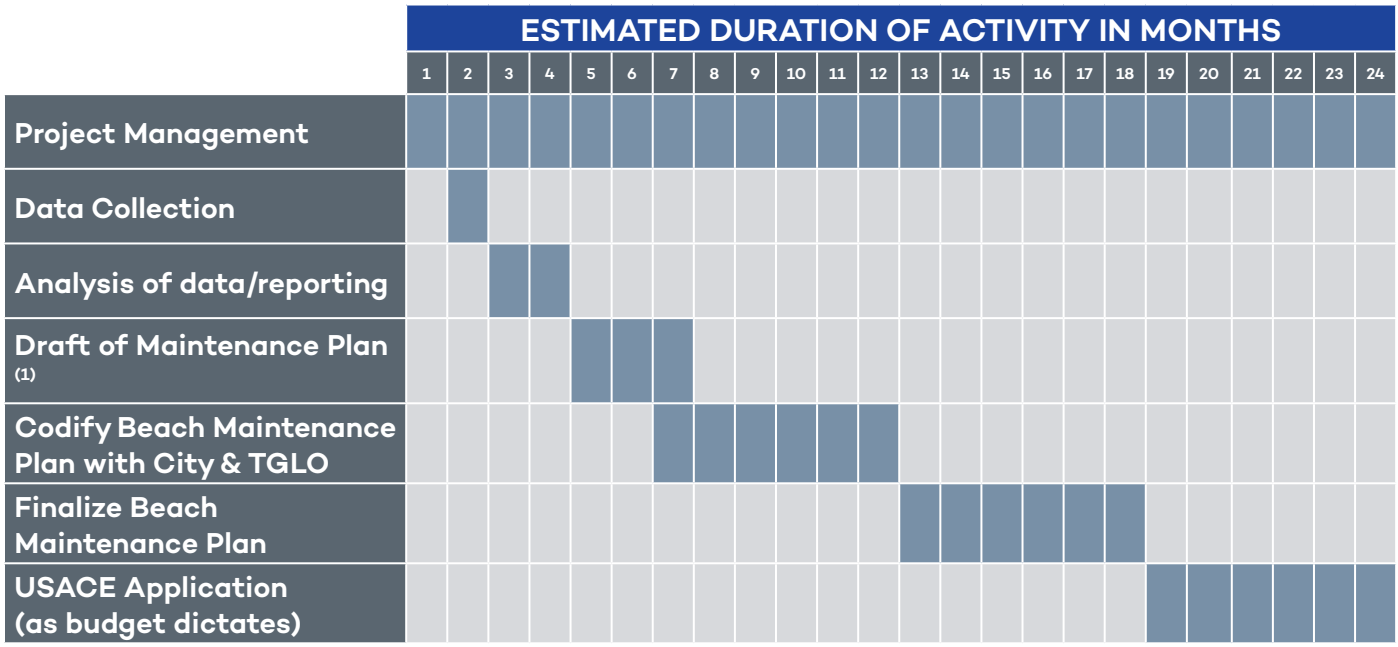
### DRAFT BEACH MAINTENANCE PERMIT
- Confirm project objectives as identified by the Owner
- Engage USACE, GLO, TCEQ, THC, and stakeholders in identified project, as required

- Assist Owner with determining appropriate permit strategy
- Perform field visit(s) for site assessment and data collection as needed (e.g. MHW/OHWM, sargassum and piping plover surveys, etc.)
- Prepare supplementary materials for permit applications
- Engage Shoreline Task Force, Beach Maintenance Staff, and stakeholders in identified project, as required
- Submit Federal and State required permit packages, if desired

**Typical milestone activities/work products include:**

- Field work (e.g. MHW/OHWM delineation, sargassum & piping plover surveys, cultural resources, etc.)
- Exhibits (e.g. drawings, maps, figures, etc. for permit applications)
- Biological Assessment/Biological Opinion
- Formal Section 7 consultation
- Submittals as Client's Agent, if desired
- Response to Agencies/revisions
- Public Process/Response to comments, if needed
- Revision assistance based on reviews
- Permit Authorization

## D. PROPOSED PROJECT SCHEDULE




Note (1): Includes Interviews/workshop with Shoreline Director, beach crews
Workshop with Council/Public, as/if needed
Coordination with General Land Office

# I COMMENTS/CHANGE REQUESTS TO STANDARD FORM OF AGREEMENT

**1. Please modify Section 7 – Indemnity as follows:**
Indemnity. To the fullest extent permitted by law, the Consultant agrees to indemnify, defend, and hold harmless the City, Consultant agrees to indemnify and hold harmless the City, its Council members, officers, agents, employees and volunteers (separately and collectively referred to in this paragraph as "Indemnitee") from and against all claims, damages, losses and expenses including but not limited to reasonable attorneys' fees arising out of or resulting from any negligent act, error, omission, intentional tort or willful misconduct, intellectual property infringement or including failure to pay a subconsultant, subcontractor, or supplier pursuant to the agreement by Consultant, its employees, subcontractors, subconsultants, or others for whom Consultant may be legally liable ("Consultant Parties"), but only to the extent caused in whole or in part by the Consultant Parties. The defense obligation does not apply to professional liability or workers' compensation claims. As it relates to such claims, Consultant shall be liable for reasonable defense costs incurred by City, but only after final adjudication and only to the extent that Consultant is found at fault. IF THE CLAIMS, ETC. ARE CAUSE IN PART BY CONSULTANT PARTIES, AND ALSO IN PART BY THE NEGLIGENCE OR WILLFUL MISCONDUCT OF ANY OR ALL OF THE INDEMNITEES OR ANY OTHER THIRD PARTY, THEN CONSULTANT SHALL ONLY INDEMNIFY ON A COMPARITIVE BASES, AND ONLY FOR THE AMOUNT FOR WHICH THE CONSULTANT PARTIES ARE FOUND LIABLE AND NOT FOR ANY AMOUNT FOR WHICH ANY OR ALL INDEMNITEES OR OTHER THIRD PARTIES ARE LIABLE.

*Explanation: (1) The Texas Civil Practice And Remedies Code provides for the recovery of reasonable attorney's fees for rendered services. (2) LJAES' professional liability and workers comp policies provide no defense of third parties, and therefore, regardless of whether Consultant is required to defend the City for professional negligence claims, we are not insured to provide such a defense. However, we can be liable for (and reimburse) those defense costs to the extent that we are liable.*

**2. Please modify Section 10.06 – Release by Consultant as follows:**
Release. The Consultant releases, relinquishes, and discharges the City, its Council members, officials, officers, agents, employees and volunteers from all claims, demands, and causes of action of every kind and character, including the cost of defense thereof, for any injury to, sickness or death of the Consultant or its employees and any loss of or damage to any property of the Consultant or its employees to the extent ~~that is~~ caused by or ~~alleged to be caused by, arises~~ arising out of, or is in connection with the Consultant's work to be performed hereunder. Both the City and the Consultant expressly intend that this release shall apply regardless of whether said claims, demands, and causes of action are covered, in whole or in part, by insurance and in the event of injury, sickness, death, loss, or damage suffered by the Consultant or its employees, but not otherwise, this release shall apply regardless of whether such loss, damage, injury, or death was caused in whole or in part by the City, any other party released hereunder, the Consultant, or any third party.

*Explanation: We are insured to be responsible for negligent acts or omissions to the extent of our fault in accordance with the law and the text should clearly identify that the release pertains to the Consultant's services. The original text would have LJAES release the client for the client's own negligence. Such provisions are void and unenforceable under State law.*

**3. Please modify Exhibit C – Insurance Requirements, Section III, subpart D as follows:**
Coverage shall not be ~~suspended, voided,~~ canceled, or **not renewed** ~~reduced in coverage or in limits~~ except after thirty (30) calendar days prior written notice has been given to the City of South Padre Island.

*Explanation: The certificate can be endorsed to provide notice of cancellation or non-renewal. There is no such notice of suspension, voidance, or reduction in limits.*

**4. Please modify Exhibit C – Insurance Requirements, Section VIII, subpart B as follows:**
Minimum of $1,000,000 per claim and $2,000,000 aggregate, with a maximum deductible of **$150,000.00** ~~100,000.00~~.

*Explanation: LJAES' professional liability policy deductible is $150,000, which is the industry norm for firms of our size.*

# CERTIFICATION and ACKNOWLEDGMENT

The undersigned affirms that they are duly authorized to submit this Proposal, that this Proposal has not been prepared in collusion with any other Respondent, and that the contents of this Proposal have not been communicated to any other Respondent prior to the official opening. To the extent this Contract is considered a Contract for goods or services subject to § 2270.002 Texas Government Code, Respondent certifies that it: i) does not boycott Israel; and ii) will not boycott Israel during the term of the Agreement.

Signed By: _____ Title: Vice President

Typed Name: Jeff Coym, PE Company Name: LJA Engineering, Inc.

Phone No.: 361.360.2140 Fax No.: 361.993.7569

Email: jcoym@lja.com

Bid Address: 5350 South Staples Street, Suite 425 Corpus Christi TX 78411
P.O. Box or Street City State Zip

Order Address: 5350 South Staples Street, Suite 425 Corpus Christi TX 78411
P.O. Box or Street City State Zip

Remit Address: 5350 South Staples Street, Suite 425 Corpus Christi TX 78411
P.O. Box or Street City State Zip

Federal Tax ID No.: 76-0540328

DUNS No.: 025475513

Date: 09/10/2020

**CITY OF SOUTH PADRE ISLAND**
**SHORELINE TASK FORCE**
**AGENDA REQUEST FORM**

**MEETING DATE:** October 13, 2020

**NAME & TITLE:** Kristina Boburka, Shoreline Director

**DEPARTMENT:** Shoreline Department

**ITEM**
Update and discussion on department projects: (Boburka, Hughston)
-Dune Educational Median
-TX Urban Forestry Grant
-RESTORE Act

**ITEM BACKGROUND**
Update on the following shoreline projects: Dune Educational Median, TX Urban Forestry Grant, and the RESTORE Act.

**BUDGET/FINANCIAL SUMMARY**
N/A

**COMPREHENSIVE PLAN GOAL**
Chapter III. Parks and Resources
GOAL 1: The City shall ensure protection and conservation of natural resources, such as beaches, dunes, wetlands, Laguna Madre waterfront and native flora and fauna, allowing for their sustainable use and enjoyment by future generations.
Objective 1.1 Beach and dunes shall be protected from both natural and artificial erosion.

**LEGAL REVIEW**
Sent to Legal:
Approved by Legal:

**RECOMMENDATIONS/COMMENTS:**