2.1.1 Experience of Firm / Past Performance

Coastal Protection Engineering LLC (CPE) welcomes this opportunity to submit our enclosed qualifications for the subject Request for Qualifications (RFQ No. 2020-24) to provide professional Marine Resource Assessment and Monitoring Services to the Town of Palm Beach (Town). As a firm specializing in coastal protection, our multidisciplinary staff is comprised of industry leading professionals with strong credentials in marine biology, environmental permitting, geomatics, survey, GIS/CAD, and coastal engineering. Our wide breadth of expertise and knowledge of your marine resources and coastal program is further supported by the extensive depth of resources provided by Aptim Environmental & Infrastructure, LLC (APTIM) as our key subconsultant forming The CPE Team.

With APTIM as our exclusive subconsultant for this contract, The CPE Team draws upon more than a century of experience and the expertise of employees worldwide, bringing a wide range of services and financial stability. Both of our coastal offices are located in Boca Raton, Florida and are staffed by professionals dedicated to serving coastal communities, including the Town. We are one of the few teams that can proudly demonstrate a local presence in Palm Beach County and direct experience in the Town of Palm Beach. Members of our team have monitored your marine resources, including natural hardbottom, offshore reefs, and artificial reefs, surveyed your beaches, obtained permits for your shore protection projects, and generated National Environmental Policy Act (NEPA) documents to support those projects.

The CPE Team includes six (6) marine biologists who specialize in marine resource monitoring, coastal permitting, and mitigation planning for a wide range of projects throughout Florida. Our biologists are approved by the Florida Department of Environmental Protection (FDEP) to conduct biological monitoring for beach nourishment projects, and we are experienced in developing and implementing project-specific monitoring programs for our clients' unique marine resources. We routinely monitor hardbottom/reef habitats, artificial reefs, and seagrass throughout the state. Our biologists conduct surveys with a support staff of scientific divers including surveyors, geologists, and engineers. All of our divers on The CPE Team are members of the American Academy of Underwater Sciences (AAUS), which ensures that we adhere to the highest standard of diving and boating safety.

Understanding of the Town's Needs

Palm Beach is a unique coastal community with a dynamic and complex coastal environment that requires an in-depth understanding of the resources, challenges, and programs designed to protect it. As an island community downdrift of Lake Worth Inlet, the Town's beaches have experienced erosion due to the interruption of littoral transport, storm impacts, and armoring of portions of the coastline. The Town has developed a Comprehensive Coastal Management Program (CCMP) to address these challenges. Additionally, the Town entered into a Beach Management Agreement (BMA) with FDEP in order to take a regional and holistic approach to coastal management and marine resource monitoring. The CPE Team staff have worked on projects with the Town under the CCMP and the BMA. We understand the Town's goals and are ready to support these goals with the implementation of project permitting and marine resource monitoring.

The CPE Team has followed the progress and participated in the process of the BMA since its inception in 2012. We know the details of the BMA and have worked on several of the specific projects contained within, both before and after its implementation, including the Mid-Town Beach Project, Reach 7 Phipps

Ocean Park Nourishment, and the Town-Wide Groin Rehabilitation projects. We have also worked on projects that are not yet part of the BMA, including the Reach 8 Beach and Dune Restoration Project. Our biologists are not only prepared to monitor the marine resources by implementing the protocols outlined in Cell-Wide Monitoring & Mitigation Plans (Appendix B) of the BMA, but the benthic assessment method required by the BMA was developed, and has since been updated, by the staff of The CPE Team. We have been assessing nearshore hardbottom resources using the quadrat-based Benthic Ecological Assessment for Marginal Reefs (BEAMR) methodology since 2004, which provides a habitat-specific means for characterizing hardbottom/reef resources in south Florida. Our team is also experienced in delineating nearshore hardbottom resources using *in situ* diver mapping and aerial analysis.

Our scientific team benefits from the support of in-house staff and resources including AAUS divers, licensed boat captains, experienced marine technicians and surveyors, research vessels with state-of-the-art DGPS navigation systems, and underwater GPS-integrated video and photographic equipment. These resources will allow our team to successfully monitor the marine resources within the Town of Palm Beach. In addition to our marine assessment and monitoring capabilities, we have professionals who specialize in preparation of environmental permitting documents and regulatory coordination. We have had the opportunity to provide the Town with environmental services for nearly 20 years and propose to continue our integrated approach going forward. Additionally, we will provide cost-saving by our close proximity to the Town and our ability to mobilize quickly to meet the project-specific needs of the Town. The technical approach for each of the tasks outlined in the Request for Qualifications is summarized below.

1. General Monitoring

Our team has conducted numerous physical, biological, and environmental monitoring efforts to assess and monitor the coastal, nearshore, and offshore marine resources of south Florida, including those along the Town of Palm Beach. We strive to remain up-to-date on the latest scientific innovations and monitoring techniques, and maintain state-of-the-art equipment for implementing monitoring and assessment protocols. We are also well-versed in the monitoring and mitigation plans detailed in Appendix B of the BMA and can ensure adherence to these protocols.

The CPE Team biologists are industry leaders in biological monitoring protocols and are experts in South Florida benthic ecology, each with hundreds of dives conducting benthic assessments along the Florida coast. Our Senior Marine Biologists were invited as subject experts to participate in the development of FDEP's Standard Operating Procedures for Nearshore Hardbottom Monitoring of Beach Nourishment Projects, FDEP's Coastal and Benthic Uniform Mitigation Assessment Method (UMAM) Workgroup, the Southeast Florida Coral Reef Initiative (SEFCRI) Maritime Industry and Coastal Construction Impacts (MICCI) focus group, and most recently, have been requested to participate in a working group to discuss the FDEP Proposed Coral Reef Turbidity Criterion. Additionally, we are part of the team that developed the quadrat-based benthic assessment technique specified in the BMA. The BEAMR methodology was specifically designed for the marginal reefs that characterize the nearshore habitat in south Florida and is now an industry standard for detecting project-related impacts. We also employ several other techniques to assess the physical and biological conditions of the marine habitat as appropriate for the specific habitat and project.

Our team utilizes a streamlined approach to data management. A major innovation of the biological data collection methodologies we employ is the seamless integration of field data collection and data management using a customized MS Access database. The database includes built-in quality assurance utilities to reduce user error, provides for easy data extraction, and offers a structured data management tool for future data analysis. Our scientists routinely use parametric and non-parametric methods to statistically analyze data in order to detect change over time in marine habitats. A strong statistical analysis is a key component of the comprehensive monitoring reports that we routinely prepare in compliance with permit requirements for state and federal agencies. As project manager, Stacy Buck will manage data entry and report development for the Town's projects. All data and report deliverables will undergo a thorough and rigorous review by Lauren Floyd, QA/QC manager for biological monitoring under this contract, prior to submittal.

2. Project-Specific Monitoring Plans

We understand that each project requires attention to the specific details that characterize both the nature of the resources and the goals of the proposed project. Throughout south Florida, the nearshore hardbottom habitat varies greatly between cells and even within each cell, which are defined by the limits of our natural and manmade inlets. We have monitored these habitats from Indian River County through the Marquesas Islands and understand the need for project-specific monitoring plans throughout the region, as habitats can vary significantly. Even within the Town of Palm Beach, our biologists have observed firsthand that the hardbottom resources in Mid-Town provide a different habitat compared to the nearshore hardbottom in Reach 8. This concept is also applicable for mitigation monitoring plans, as differences in biogeographic characteristics guide how to appropriately define success criteria for associated mitigation. We will apply this knowledge and experience when designing biological monitoring programs specific to Town projects, taking into consideration the sediment dynamics and nature of the nearshore hardbottom habitat and the coral reef habitat farther offshore. Our familiarity with the BMA and understanding of the Town's project-specific goals will support our ability to implement project-specific strategies to achieve those goals.

3. In-Water Species and Habitat Assessments including Threatened and Endangered Species

We have conducted species and habitat-specific assessments throughout south Florida and the Town of Palm Beach. We routinely conduct benthic assessments applying a variety of quantitative and qualitative methodologies to detect changes in habitat over time and space. The quadrat-based BEAMR methodology allows us to specifically document changes in coral density and macroalgae cover. Macroalgae community is particularly important in this area since it is a foraging resource for threatened and endangered sea turtles. We have also conducted sea turtle enumeration assessments using opportunistic and diver-towed surveys. Staff from The CPE Team also developed a training program recognized

A green sea turtle observed during an in-water survey

by the Bureau of Ocean Energy Management (BOEM) to certify individuals as Protected Species Observers (PSO), which has also been recognized by National Marine Fisheries Service (NMFS). As PSOs, we have conducted observations during seismic surveys for marine mammals and sea turtles off the coasts of Florida, Louisiana, and Maryland.

Our team has a thorough knowledge of the surveying protocols required for state and federally listed threatened and endangered species and their critical habitat. In south Florida, we have conducted surveys for the seven threatened coral species, sea turtles, as well as the endangered dune plant *Jacquemontia reclinata*. We remain current on any new or updated listings on species or critical habitat and have been proactive in coordinating with NMFS to ensure that the methods we employ to assess habitats for the listed coral species meet their criteria.

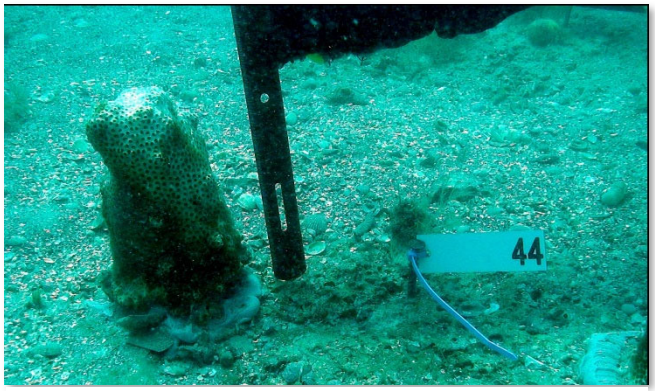
During the designation of critical habitat for *Acropora* spp., we generated a position paper for the Town of Palm Beach indicating why the nearshore habitat along the island should not constitute critical habitat. The paper was received and considered by NMFS during the designation process and critical habitat was revised to have a northern terminus at the South Lake Worth Inlet, thus eliminating critical habitat adjacent to the Town. We will continue to apply our knowledge and expertise regarding the life history and primary constituent elements when it comes to designation of listed species and critical habitat, as well as monitoring to assess these species and their habitat. Similarly, we are participating in a working group to discuss the recent FDEP Proposed Coral Reef Turbidity Criterion, which as proposed would result in much more stringent turbidity standards in all areas where hardbottom is present. Our biologists look forward to participating in discussion about the proposed rule change to ensure that decisions are made with sound scientific judgment and with consideration of the indirect and far reaching impacts this change may have on the ability of Florida's coastal communities to maintain their coastal protection programs.

4. Underwater Investigations

Our team of marine biologists and scientific divers is specifically trained in underwater investigations to assess and monitor marine and estuarine benthic resources, including seagrass and hardbottom. We routinely assess habitats to identify potential impacts related to coastal construction activities, ship groundings, cable installation, and boat anchoring. We are aware that the Town of Palm Beach is concerned with potentially unauthorized moorings within Lake Worth Lagoon and our team is ready to assist in evaluating the situation. Installation of mooring buoys is a permitted activity that involves local ordinance and authorization/review by, FDEP, Florida Fish & Wildlife Conservation Commission (FWC), U.S. Army Corps of Engineers (USACE), and the U.S. Coast Guard. Regulation of this activity is meant to protect benthic resources and other boats by limiting locations and facilitating proper installation. When a mooring is installed illegally, not only can it result in a safety issue, but it has the potential to adversely affect seagrass or other benthic resources adjacent to the mooring. Our knowledge of the Lake Worth Lagoon ecosystem, training in underwater investigations, and local presence will provide the Town with an easily accessible team ready to support this task quickly and efficiently. At the request of the Town, we can investigate moorings, document the conditions of each site with underwater photos and video, collect GPS coordinates for all sites investigated, and prepare observation reports and maps for the Town summarizing the survey results.

5. Coral Nursery Program

Our biologists have specific training from the Florida Keys National Marine Sanctuary and National Coral Reef Institute (NCRI) regarding coral restoration and transplantation techniques. We have been involved in large and small-scale restoration projects that require these skills, including transplantation to natural and artificial substrates. We were involved in several large-scale restoration projects that involved restoration of reef habitat in the Florida Keys and Puerto Rico due to ship groundings, so we understand the process and logistics required for an effort of such magnitude. On a smaller scale, we have conducted coral transplantations from project impact areas to mitigative artificial reef sites, as well as restoration of coral colonies back to natural substrate due to damage of unknown origin. On both natural and artificial reef substrates, we monitored the coral transplants to track success of our efforts and document successful restoration strategies. Our training has taught us the most effective methods for transplanting and reattaching stony corals, and we have worked to develop and refine innovative transplantation techniques for octocorals and sponges. One of our biologists also coordinated and managed the "Coral Nursery Project" (CNP), which is a collaborative effort between NCRI, Broward County, and the Ocean Watch Foundation. Since its initiation in 2001, the CNP has transplanted over 300 corals of opportunity to the nursery, which can provide healthy corals to address future restoration needs. Our training and experience on large- and small-scale restoration projects will lend itself to managing the Town's long-term coral nursery program since we have the skills to collect and transplant coral colonies and then monitor them for growth and survival.



A coral colony transplanted and monitored by CPE Team biologists

We have followed the process that the Town has undergone to permit your long-term coral nursery program, which will compensate for unanticipated temporary impacts to the nearshore hardbottom resources associated with the Mid-Town project. Our expertise in monitoring both natural and artificial substrates, along with our experience in coral transplantation techniques, will provide the capabilities you require to continue the coral nursery program. We also understand how to evaluate success criteria for such a program, which will be required for compliance tracking by regulatory agencies. Our local monitoring experience in the Town and the fact that our engineers designed (and our biologists have monitored) the 0.8-acre artificial reef, of which 0.68 acres are authorized as part of your coral nursery program, demonstrate our site-specific knowledge of the area.

6. NEPA Documentation

Our team has been professionally trained in the implementation of the National Environmental Policy Act (NEPA) and has prepared numerous Environmental Impact Statements (EIS) and Environmental Assessments (EA) for both the USACE and BOEM throughout Florida. We draw upon the standards required by NEPA, project-specific details, as well as the goals of our clients to prepare these comprehensive and concise documents. We also prepare supporting documents, such as Essential Fish Habitat (EFH) assessments, Biological Assessments (BA), and Cumulative Effects Assessments (CEA) in

order to facilitate coordination with NMFS and U.S. Fish and Wildlife Service (USFWS). Our close coordination and strong working relationships with these agencies provide a comfortable avenue of communication and understanding, which leads to more effective information gathering and preparation of these documents in a timely fashion.

Our work on the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project EIS, BA, and EFH assessment provided us with the opportunity to understand the Town's goals for the Reach 8 project. We also conducted an *in situ* assessment of the nearshore hardbottom in the project area in order to collect quantitative data for presentation in the EIS. This project provided us with an opportunity to work closely with Town staff to ensure the project goals were being met, while evaluating the proposed project alternatives. We will continue to communicate and coordinate with the Town on a regular basis to ensure this process remains uninterrupted.

7. Stormwater Discharge Assessments

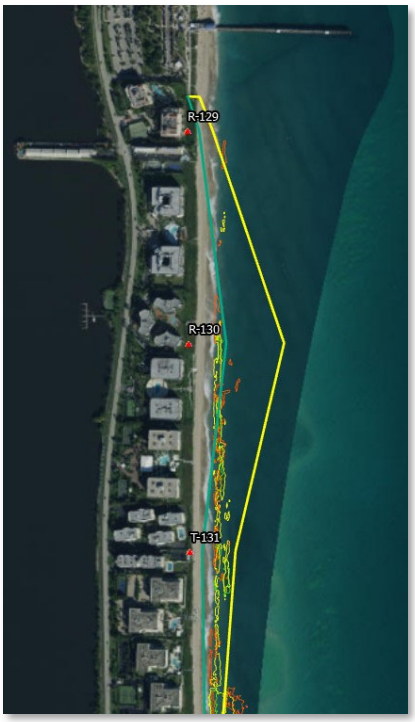
The Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) program allows permittees to discharge stormwater into state and/or federal waters. FDEP currently manages the MS4 programs in Florida and issued Palm Beach County's Cycle 4 permit (FLS000018) in 2016. The Town of Palm Beach is one of the 40 permittees on Palm Beach County's Cycle 4 MS4 permit. As a co-permittee, the Town carries out specific programs and is required to provide compliance documentation of those activities for submittal to FDEP. This may also include submittal of documentation for audit purposes. The CPE Team understands the Town is generally concerned with discharges into the Lake Worth Lagoon and how those discharges may affect water quality, including potential impacts to seagrass resources. We are familiar with the Palm Beach County MS4 NPDES permit and the Town's associated interlocal agreement, and we are prepared to support the Town as needed to ensure permit compliance.

8. Regulatory and Advisory Agency Coordination

We understand the importance of proactively communicating with the state and federal regulatory agencies (FDEP and USACE), as well as their associated advisory agencies (FWC, NMFS, and USFWS), throughout the permitting process. Our biologists and engineers have developed strong relationships with personnel from these agencies based on mutual respect and a continuous stream of communication. We take a proactive approach to permitting and strive to provide complete information to the agencies upfront to avoid unnecessary time delays throughout the process. We are confident that these professional relationships, in combination with our knowledge of Town's marine and estuarine ecosystems, will benefit the Town of Palm Beach's projects.

9. Mapping Analyses

Our biologists work very closely with our survey and GIS staff to provide geographic mapping surveys of natural resources. This ensures accurate location data representing specific habitat resources that can be transformed into high-quality mapping deliverables. In the field, a surveyor is always on site when collecting location data, including marine/estuarine resource (hardbottom, seagrass, wetlands, etc.) mapping and transect or sampling site coordinates, and this data is further verified by our in-house Professional Surveyor and Mappers. We utilize Real Time Kinematics (RTK) and Differential Geographic Positioning Systems (DGPS) integrated with Hypack navigational software to capture exact location data and ensure repeatable investigations. Our biological knowledge of these resources provides the details of these habitats that the agencies and our clients need to make informed decisions. Back in the office, our integrated team works together using geospatial features in GIS to produce mapping and interactive GIS deliverables for submittal. Our GIS/CAD staff provide state-of-the-art mapping services in compliance with Federal Geographic Data Committee (FGDC) standards, as well as local, state, and federal resource protection and management agency directives.



The north end of the Reach 8 project area

During desktop analyses (aerial or satellite imagery analysis), our biologists utilize GIS to delineate natural resources. These delineations then go through a QA/QC process by our geospatial experts before final production of high-quality mapping products for delivery to our clients and regulatory agencies. Our in-house geodatabase stores all biological monitoring data, offshore investigations, seismic studies, sand and reef maps, and engineering design drawings in a single platform, which allows data products associated with the Town's coastal program to be easily and efficiently integrated with the Town's existing GIS infrastructure.

10. Permitting

One of the major benefits of having a multidisciplinary team is that our engineers, biologists, and geotechnical staff regularly coordinate with state and federal regulatory staff on a variety of projects. Our team has been permitting coastal construction projects for over three decades, which have included efforts for the Town of Palm Beach.

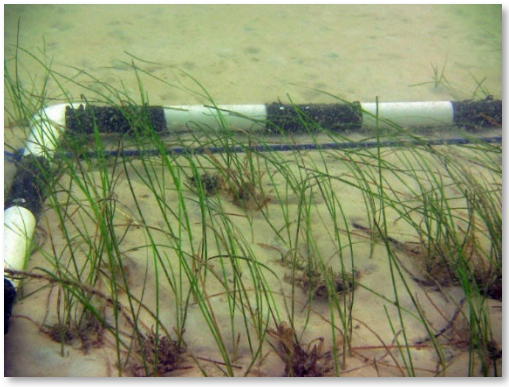
Our specialization in coastal projects with all the major professional disciplines participating in the process allows us to easily guide our clients through the joint-coastal permitting (JCP) process, in particular. Most recently, The CPE Team worked with the FDEP to authorize an extension for the Mid-Town Beach Nourishment project (May 2020) and expedited the permit modification for the Mid-Town Groin Project to ensure construction would not interfere with sea turtle nesting (May 2018). Additionally, initial authorization for the groin did not include consultation with NMFS for Endangered Species Act (ESA) Section 7 consultation since it was originally planned to be built on the newly nourished beach. Our lead

biologist and engineer coordinated on the project design so that construction of the groin would be built "in the dry", thereby avoiding lengthy consultation that would have delayed construction, but instead allowed for construction completion in May 2018. We also processed permits with FDEP for the Groin Rehabilitation Project under the BMA and obtained the USACE final permit. The CPE Team completed development of the EIS for Reach 8 and is coordinating Section 7 consultation with the USACE and NMFS. Previously, we successfully permitted the 2003 and 2006 Mid-Town Beach Renourishment Projects and the 2006 Reach 7 (Phipps) Project, as well as the 0.8-acre artificial reef that was required as additional mitigation by the USACE for the Reach 7 Project. Our understanding of current regulations and environmental resource concerns expressed by state and federal agency staff allows us to anticipate permit requirements and take a proactive approach during the application process. In addition to JCP and USACE permitting for beach nourishment and coastal structure projects, our biologists also have experience in obtaining environmental resource permits (ERP), giving us the flexibility to provide permitting services for a variety of projects.

We bring our diverse expertise to the Town of Palm Beach to lead the permitting efforts for any and all of your coastal and estuarine projects. From large-scale to small-scale projects including beach nourishment, mitigative artificial reefs, recreational artificial reefs, coral transplantation programs, coastal structures, inlet navigation dredging, mangrove and seagrass restoration, marina construction/expansion, and individual dock construction, we have the experience and multidisciplined expertise to lead the permitting process from permit application through construction completion.

With the signing of the BMA in September 2013 and authorization of several projects through the Individual Project Approval (IPA) process, the Town has shown the effectiveness of this regional approach to coastal cell management. If the need to construct an emergency project arises, we are prepared to assist the Town in obtaining emergency permits or permit modifications. Additionally, the Town may decide to pursue the use of inlet sand as an additional sand source for nourishment. Our team of biologists, engineers, and geologists can perform all of the services necessary to obtain the permits including marine resource assessment, project design, geotechnical analyses, bathymetric and topographic surveys, and agency coordination.

11. Estuarine Studies



Seagrass monitored by CPE Team

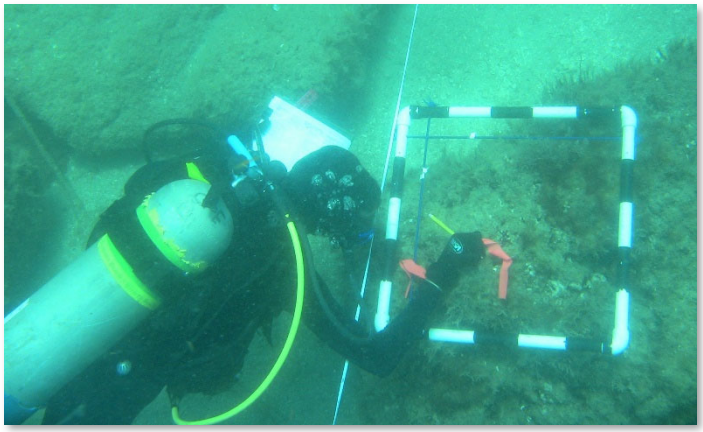
Our biologists are not only familiar with the coastal resources located on the beachside, but we have working knowledge of the estuarine community on the lakeside of the Town. Our historical knowledge of the Lake Worth Lagoon and the ecological changes it has undergone during the alteration of the system from a freshwater lake to a brackish water habitat provides a thorough understanding of this ecosystem. We have assessed and delineated seagrass and mangrove resources and understand the role that these resources play in the health of the estuarine ecosystem. We are currently working with Palm Beach County to modify existing permits to authorize an expansion to the sand trap at the South Lake Worth Inlet. This includes extensive seagrass monitoring and presentation of data to obtain the requested permit modification.

Additionally, we have closely followed the Lake Worth Lagoon Initiative (LWLI) and are well-versed on the local issues and projects that are currently underway. Our staff is local to Palm Beach County and has demonstrated their community involvement through volunteer work within the Lagoon, such as mangrove habitat restoration and oyster reef creation. Our historical and ecological knowledge of the Lake Worth Lagoon coupled with our experience monitoring estuarine habitats will support any lakeside activity that the Town wishes to implement.

12. Environmental Protection

While staying on top of the most current coastal environmental protection laws and regulations, our CPE Team biologists are informed and involved in innovative approaches to protecting shorelines while maintaining, restoring, or enhancing coastal resources. The concept of "living shorelines" is an example of a creative and proven approach to protecting tidal shorelines from erosion. This technique provides an alternative to using hardened structures for shoreline stabilization, offering instead a more natural stabilization approach using plants, sand, and stone and other structural or organic materials to provide shoreline protection and maintain valuable habitat. Our biologists have locally implemented the living shoreline approach in Palm Beach County, assisting in the restoration of mangrove habitat and creation of oyster reefs in the Lake Worth Lagoon to help improve water quality and create new estuarine habitat. Our staff also participates in and helps to organize local coastal and reef cleanup events, working alongside our neighbors and partners in Palm Beach County to protect the resources we all value. We are always seeking opportunities to assist environmental advocacy groups interested in conserving natural resources by sharing with them our expertise and experience in coastal protection.

13. Artificial Reef Construction and Mitigation Strategies



CPE Team biologist monitoring the Town's 0.8-acre artificial reef

Our engineers and biologists have coordinated closely to design numerous artificial reefs, primarily as mitigation, off the coasts of Florida. Due to our extensive and recent experience, we can provide the Town accurate cost estimates for artificial reef construction, plans and specification development, bidding assistance, pre-construction conferences, and construction management. Our team of biologists and engineers works together to develop mitigation strategies that meet the needs of our clients while addressing the environmental concerns for project-related impacts. Throughout this process, our biologists determine the biological functional needs of a mitigation plan to compensate appropriately for anticipated project effects. This information guides the engineering design to facilitate project goals. Our knowledge of the Uniform Mitigation Assessment Method (UMAM), how regulatory agencies apply this assessment and our continuous communication with the agencies ensures the efficiency of our efforts. Additionally, we have the capability to conduct seismic (sub-bottom) surveys to identify sites for artificial reef placement that meet regulatory agency

criteria (distance from shore, water depth, sand depth, etc.) and support a successful project. Our engineering staff routinely develops plans and specifications for artificial reefs and assists our clients by preparing cost-estimates for artificial reef construction. Our biologists and engineers then participate in pre-construction meetings with agency staff so that all steps and permit requirements are understood and met.

We have also been involved in mitigation strategies that go beyond the traditional realm of artificial reef construction. Our team has developed Active Management Strategies that focus on specific biotic assemblages within the marine ecosystem to determine ways to reduce the time lag for functional success of artificial reefs, including transplantation of stony corals, octocorals, macroalgae, and sea urchins. We have worked with FDEP as part of the UMAM coastal and benthic working group to refine this process with specific attention to seagrass, hardbottom, and coral reef resources. Our participation in this process, and in the current turbidity criteria rulemaking process, allows us to work even closer with the agencies to promote sound scientifically based changes while protecting the ability of coastal communities to maintain their critical coastal protection programs. Our team will bring this experience and expertise to the Town of Palm Beach to develop mitigation strategies that balance habitat protection with the best interests of the Town.

14. Shore Protection Board

We will continue to provide the Shore Protection Board the resources it needs to make informed decisions about coastal management. In recent years, we have prepared large-scale wall maps and interactive coastal atlases using GIS for use at the meetings. Our biologists will continue to draw from this experience to provide input regarding the Town's nearshore and offshore habitats. We specialize in monitoring and assessing coastal resources and each of our team members has unique expertise on a diversity of coastal projects to share with the Board. We frequently hold internal seminars on successful project strategies, innovations in coastal modeling, and the latest most effective technologies and designs. We would offer to provide presentations to the board or assist in the coordination of presentations by Town staff and academic, environmental, or policy experts.

15. Technical Peer Reviews

Our CPE Team biologists all hold advanced degrees in Marine Biology and Coastal Zone Management and have provided technical peer reviews during our academic and professional careers. We routinely prepare technical documents that undergo rigorous internal review prior to submittal. Several of our staff have also participated in the Southeast Florida Coral Reef Initiative (SEFCRI), which is a team of interagency and non-agency marine resource professionals, scientists, resource users and other stakeholders that collaborate to develop local action strategies targeting coral reefs in south Florida. As team members, we participated in focus groups to generate technical reports and peer review documents completed by other team members. We have also been asked to conduct peer-reviews of articles highlighting marine resource assessments that have been published in Shore & Beach, the Journal of the American Shore and Beach Preservation Association. We also assist the Florida Shore and Beach Preservation Association Executive Planning Committee in coordination of the annual technical conferences, serving as subject matter experts to help attract and coordinate presentations regarding biological monitoring results and innovative technologies used throughout the state. Members of The CPE Team also volunteer time as members of the Gumbo Limbo Research Grant Selection Committee, where they serve as subject matter

experts with the other committee members to review and recommend the top students whose research best supports and embodies Gumbo Limbo's mission and initiatives. We will bring this experience to the Town of Palm Beach and are prepared to conduct technical peer reviews of any environmental document within our realm of expertise.

16. Public Education

Members of The CPE Team have been involved in the community through public outreach and education programs. We have participated in events such as Meet the Reef in Manatee County, where we set up touch tanks and educational games to teach about the local coastal resources. Our staff has also presented to the public as part of FDEP's Coral Reef Conservation Program on the reef resources in south Florida and specifically offshore of Palm Beach County. Several members of our staff also have professional experience specifically in environmental education. Recently, CPE staff conducted public outreach events on the beach in Delray to engage and educate the public regarding sea turtle nesting and the City's beach nourishment program. Our commitment to and experience with public outreach will allow us to effortlessly develop public education programs specific to the Town of Palm Beach.

Public outreach event on sea turtle nesting and beach nourishment led by The CPE Team

17. Other Marine Resource Assessments and Monitoring as Requested

The CPE Team biologists and scientists are qualified and prepared to immediately perform marine resource assessment and monitoring services for the Town of Palm Beach. The majority of our staff reside in Palm Beach County and utilize the coastal resources within the Town of Palm Beach on a regular basis. This means that not only do we have a professional interest in your coastal resources, but we have a personal one as well. Additionally, our office is located just minutes away from your coast and we have the support staff and resources ready to respond quickly to your needs. For example, we were able to complete a benthic characterization for the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project within 24 hours of getting notice to proceed from the Town. Similarly, we could act quickly in response to an event such as a storm should immediate assessment of the marine resources be needed.

Company Credentials

Coastal Protection Engineering LLC (CPE) is a Boca Raton, Florida based coastal engineering firm founded in 2019 by well-established industry leading professionals with strong credentials and decades of experience in coastal programs from concept to construction. Our professionals have worked with the Town of Palm Beach (Town) consistently over the last 15 years, which has provided us with direct experience and in-depth knowledge of the unique needs of your marine resources and coastal program.

CPE operates with a clear and direct focus on providing local government clients with highly specialized consulting services in support of projects that restore, manage, and protect coastal resources and infrastructure. CPE differentiates itself through a steadfast commitment to our clients and an uncompromising focus on technical excellence. Delivery of high-quality work products specifically for beach restoration and related coastal projects is our mission.

CPE's wide breadth of expertise and knowledge of your coastal program is further supported by the extensive depth of resources provided by Aptim Environmental & Infrastructure, LLC (APTIM) as our key subconsultant. APTIM and its family of affiliate companies have more than 120 years of service to public and private clients. Having grown from a series of mergers and acquisitions over the last 30 years, APTIM is a large, multinational firm and highly respected provider of environmental solutions throughout the country and internationally. APTIM also includes the credentials of legacy firm Coastal Planning & Engineering, Inc., which has a long history of commitment to Florida's beaches and coastal communities throughout the state. With APTIM as our exclusive subconsultant for this contract, The CPE Team draws upon more than a century of experience and the expertise of employees worldwide, bringing a wide range of services and financial stability.

The CPE Team

The CPE Team brings together the two firms of CPE and APTIM to serve the Town under this contract and our proposal herein presents the credentials of the combined team. Our professionals consist of marine biologists, topographic and hydrographic surveyors, remote sensing and mapping scientists, coastal engineers, numerical modelers, coastal geologists, computer-aided design (CAD) and geographic information systems (GIS) specialists, and a wide array of support staff, including scientific divers. Our range of service offerings provide the full spectrum of expertise needed for assessment and monitoring of the Town's marine and estuarine resources including: biological monitoring, listed species assessments, coral relocation, NEPA documentation, state and federal permitting, GIS, mitigation planning, project bidding and construction oversight, public outreach, and participation in Shore Board meetings.

Our knowledge of the natural, ecological, and geological processes that shape Florida's changing coastal zones has enabled us to thoroughly assess environmental impacts of coastal construction projects, design and situate projects to minimize long-term impacts on the environment, develop mitigation programs, and reduce the cost of mitigation construction. We are uniquely positioned to provide marine resource assessment and monitoring services to the Town of Palm Beach due to our diverse array of in-house capabilities, extensive experience, and local knowledge of your marine resources.

The CPE Team has been honored to have served the Town for the last 15 years on multiple coastal projects. Our multidisciplinary approach is designed to handle all phases of coastal projects, with the depth and breadth of expertise to go from marine resource reconnaissance studies through feasibility and permitting to post-construction biological and physical monitoring. This foundation of engaging multiple scientific disciplines has delivered exceptional value to our clients through the entire process of project implementation.

Members of The CPE Team have provided professional coastal and marine engineering, hydrographic and geophysical surveys, and environmental services to Florida clients for decades. Over the years, we have earned an excellent reputation with local, state, and federal agencies responsible for permitting and overseeing marine and coastal programs. Our team's credentials include over 100 beach nourishment

projects and over 30 coastal structure projects for municipal, state, and federal clients throughout Florida, the Gulf coast, and up the Atlantic seaboard.

Along the southeast coast of Florida, our professionals have monitored marine and estuarine resources in the Town of Palm Beach, City of Delray Beach, City of Deerfield Beach, City of Boca Raton, Palm Beach County, Indian River County, Martin County, Broward County, and Miami-Dade County on numerous large and small scale shoreline stabilization and restoration projects. The breadth of experience gained from these projects has provided our team with the knowledge and expertise to monitor resources in wide-ranging habitats from the offshore reefs to the nearshore hardbottom to the inshore lagoon.

Local Government Experience

Our decades of experience collaborating with municipal and county governments has also instilled a responsibility to address each project with scientific expertise, technical excellence, environmental consciousness, and cost effectiveness. We pride ourselves on our proactive coordination with regulatory and resource agencies to facilitate a successful and timely permitting process. Our extensive experience permitting, designing, and implementing biological monitoring programs for coastal projects throughout Florida allows us to bring this expertise back to the Town so that you are always on the forefront of innovative protocols and techniques to assess marine habitats, especially associated with coastal construction projects.

Our multidisciplined technical staff is currently working with the Town of Palm Beach and has a great institutional knowledge of your coastal environment and experience with your Town government operations. Our team is based in Palm Beach County and organized to respond quickly to the Town's needs to address coastal service requests, which is a distinct advantage we commit to the Town. Our comprehensive, interdisciplinary approach facilitates project coordination with state and federal agencies and will help the Town manage the existing marine resource monitoring programs as well as develop new ones.

Our entire team is available to work immediately on your projects and the capabilities of each of our departments are continually refined with the latest technologies, procedures, and equipment. With a robust organization dedicated to coastal services and a well-documented history of responsiveness to the Town, we are confident that The CPE Team can meet or exceed all of the requirements of the RFQ. Key disciplines of The CPE Team are provided as follows.

Marine Biology

The CPE Team's staff of marine biologists are highly experienced in biological monitoring, environmental permitting, and habitat mapping in Florida. Our biologists have extensive experience monitoring nearshore hardbottom resources throughout Florida, including within the Town of Palm Beach. Each biologist has logged hundreds of scientific dives collecting benthic data for habitat assessments and mapping. This intensive experience has provided us with an understanding of the local ecology and effects of coastal projects. This knowledge is invaluable when permitting a project, as we can easily convey the information the regulatory agencies need to conduct their review during permitting.

Our biologists developed the BEAMR method, which is the FDEP preferred monitoring protocol for impact assessments of reef and nearshore hardbottom habitat. We are also experienced in the production of NEPA compliant documents, including Environmental Impact Statements (EIS) and Environmental Assessments (EA), as well as supporting documents including Biological Assessments (BA) and Essential Fish Habitat (EFH) Assessments.

The CPE Team recently completed the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project Environmental Impact Statement (EIS), which evaluated shoreline stabilization alternatives for the Reach 8 project area. Additionally, we completed federal permitting for the Town's Groin Rehabilitation project due our strong working relationships, comprehensive technical work products, and advanced and continuous coordination with the reviewing agencies.

Nearshore hardbottom resources in the Town

Our biologists, engineers, and geologists work together to guide our clients through the permitting process based on a thorough understanding of current regulations and environmental resource concerns. Our team routinely prepares joint-coastal permit (JCP) and environmental resource permit (ERP) applications, coordinating with state and federal agencies to obtain authorizations for a range of marine and coastal projects throughout Florida. Our professionals have the reputation and technical expertise to provide comprehensive and accurate information to the regulatory agencies in a timely fashion and are highly experienced with the issues of primary concern to regulators evaluating marine and coastal projects.

Survey & Mapping

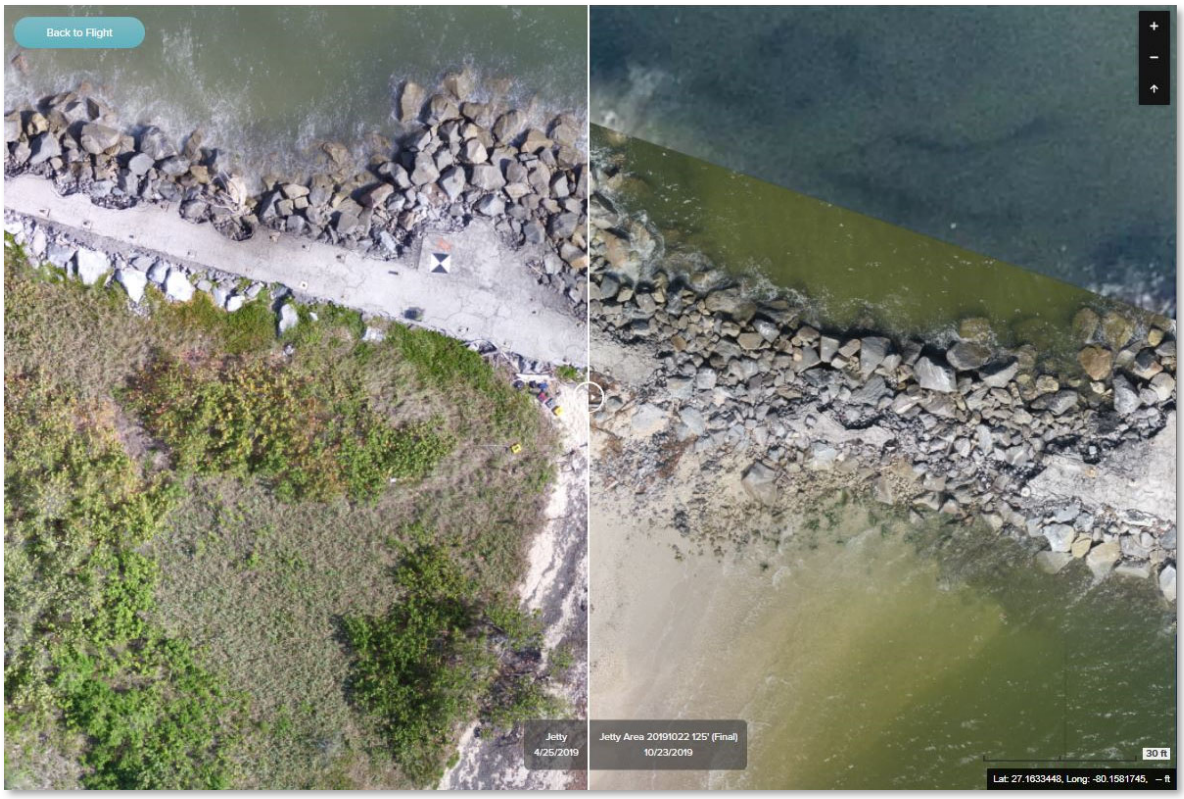
Our team of hydrographic surveyors and boat captains perform beach and hydrographic surveys that exceed the State requirements and provide higher levels of data accuracy. Using RTK GPS, both on the boat and land, we integrate the land and sea measurements using real-time tidal and elevation corrections to obtain a seamless beach profile for volumetric analysis and engineering design.

Hydrographic surveying

Our survey crews also work with our in-house geologists and geophysicists to map geologic features such as sediment deposits, hardbottom habitats, and buried rock foundations for artificial reef construction.

The CPE Team recently added advanced laser scanning technology and drone usage as part of our already expansive list of tools and services. Utilizing these new technologies coupled with surveyed ground control, we are able to deliver signed and sealed digital elevation models (DEMs) in addition to high resolution imagery. A prime example of applying drone technology to save time and money is in assessing

storm impacts of coastal structures. Once baseline conditions are established, our crew is able to re-shoot a structure post-storm with a small crew and deliver highly detailed side by side comparison photographs in web based platforms such as, SiteScan3DR, as well as a precise DEM that can be evaluated for storm impacts to individual stones.



Drone Imagery Slider Comparisons in SiteScan3DR

GIS/CAD

Our GIS/CAD specialists integrate data from all disciplines for comprehensive analysis, data retention, and retrieval. All offshore investigations, seismic studies, sand and reef maps, environmental transects and quadrats are stored in a single platform and preserved for future use. Data products associated with the Town's coastal program can be easily and efficiently integrated with the Town's existing GIS infrastructure, which has proven to be very useful for Town staff in the past by providing quick access to our vast GIS database and creating large format maps for meetings and display. We support our clients with the most current GIS technologies and capabilities. Our team also has extensive experience creating interactive online GIS applications. The team's areas of expertise include Python language and the .Net Framework, Microsoft SQL Server, SQL Server File Stream, Microsoft SQL Server Reporting Services, ESRI JavaScript API, and ESRI Python API.

Coastal Engineering

The combined experience of The CPE Team's engineers is unmatched in the field of coastal engineering. Our projects are developed by a team of experienced coastal engineers and coastal scientists who are strongly grounded in coastal processes theory and applications. In doing so, we review our designs in the

Mid-Town groin construction, 2018

context of overall project objectives and incorporate advanced numerical modeling analysis, where needed, as a tool to improve performance, cost-effectiveness, and longevity of projects. Our engineers have experience facilitating coordination between municipalities, local stakeholders, and the FDEP and USACE to obtain permits and funding for beach renourishment and coastal structures projects. We have assisted many of our clients with emergency storm damage response including rapid survey mobilization following a storm and coordination with FEMA, state, and federal agencies for emergency project authorization. Our team has also assisted some of our clients that have federal projects with development and coordination of language and funding requests for federal appropriation bills and legislation.

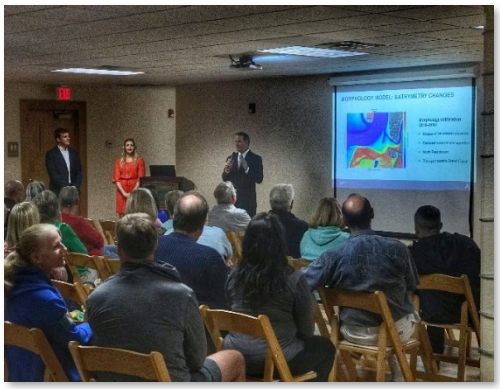
Our team has engineered a variety of solutions for preserving coastal environments and protecting coastal infrastructure. In locations where nearshore hardbottom resources are known to exist, including the Town of Palm Beach, beach nourishment may require advanced design techniques aided by numerical models to optimize performance. In such cases, we have been very successful in designing modified projects to provide upland structures a level of protection without hardbottom impacts. We have also designed and managed construction of numerous dune restoration projects as emergency response measures as these projects can be rapidly permitted and constructed. If maintained through regular replenishments, dune restoration can help improve the storm protection function of the beach.

Our engineers are responsible for the study, planning, and design of beach and shoreline projects that include shoreline stabilization, habitat restoration, artificial reef construction, inlet/canal management, and coastal structures. Our success in providing engineering solutions is driven by application of proven methodologies combined with innovative design. Our engineers work closely with our biologists to provide timely, cost-effective solutions that meet our client's project goals while protecting the natural resources of the coastal ecosystem.

Through our comprehensive coastal management planning process, projects are approached in a prioritized, logical fashion, taking into consideration not only design alternatives but also cumulative effects, funding options, and the potential for cost savings through coordination between multiple municipalities.

Numerical Modeling

For over a decade, The CPE Team has continuously upgraded our coastal modeling capabilities to include models such as DELFT3D, XBEACH, MIKE21, and the complete suite of USACE numerical models, including the Boussinesq wave model BOUSS-2D. As a result, our professionals have emerged as industry leaders in coastal applications of DELFT3D, the most advanced process-based model in the world, used to simulate coastal change. Besides using the DELFT3D model in coastal studies across Florida, the CPE Team recently applied the DELFT3D model in the evaluation of the Southern Palm Beach Island Comprehensive Shoreline Stabilization project EIS, which was reviewed, accepted, and published by USACE. This evaluation included the Town's Reach 8 Nourishment Project.

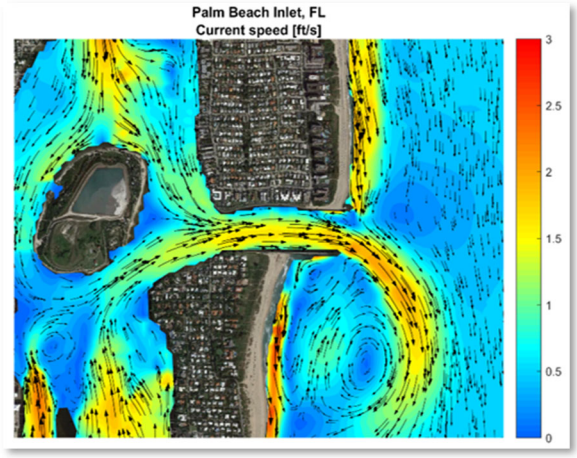


Presenting and discussing preliminary modeling results with stakeholders in Pinellas County

The CPE Team is on the forefront of coastal engineering numerical modeling and leads the industry in practical applications of advanced 3D morphology models. Our modeling studies are developed by coastal engineers and scientists who are strongly grounded in coastal process theory and applications.

We review our model results in the context of overall project goals and objectives and incorporate them into designs and analyses. We view these advanced models as tools to improve performance and longevity of the projects we design. The behavior of beaches, inlets, and intracoastal shorelines can be complex and dynamic. In order to overcome these complexities and test a wide range of solutions, we base each project design on proven engineering principles with the added benefit of state-of-the-art numerical models.

The CPE Team understands the value of communicating highly technical work, such as numerical modeling, in a manner that is understandable to the public. We have experience performing complex coastal studies with local stakeholder participation. Our team presents professionally at both large and small group public meetings where we have found stakeholder input enlightening and valuable to the successful development of the project.



Example of Lake Worth Inlet DELFT3D modeling

Geology

The CPE Team includes industry leaders in offshore marine sand search investigations and borrow area development for beach nourishment projects. Our coastal geologists have performed extensive mapping of your offshore environment and have located many sand deposits within the Town. Our offshore sand search study conducted for the Town years ago laid the groundwork for the high-quality sand used to construct the Phipps Ocean Park (Reach 7) Renourishment Project.

Delray Beach sand search, 2019

We combine state-of-the-art geomorphologic mapping with geophysical and geotechnical measurements to locate and define offshore beach-compatible sand deposits accurately and effectively. Our team has located billions of cubic yards of offshore sediments for coastal restoration projects throughout the nation. Our thorough understanding of the coastal environment and marine geology of the Atlantic Continental Shelf, combined with our extensive experience specific to sand source development, uniquely qualifies our team to perform marine sand searches for the Town. We own and operate the latest geophysical (sidescan sonar, interferometric sonar, seismic-reflection, magnetometer, single- and multibeam bathymetry surveys, 3D acoustic underwater inspection systems) and geotechnical (vibracore and benthic sediment samplers) equipment to map sediment resources, benthic habitat, and cultural resources.

In addition to our extensive experience in the Town of Palm Beach coastal area, our team members provided a technical review of the Southeast Florida Sediment Assessment and Needs Determination (SAND) Study Report developed by USACE's Jacksonville District to the Florida Department of Environmental Protection (FDEP). We also helped the State develop the "Reconnaissance Offshore Sand Search" (ROSS) database, which catalogs and makes publicly available all geophysical and geological data on potential sand resources within Florida waters in the Gulf of Mexico and Atlantic Ocean.

Town of Palm Beach Related / Relevant Projects

Presented below is a sampling of our team's variety of related coastal projects. With the experience our two firms have working together, we commit to providing cohesive service to the Town with CPE subject matter experts leading tasks supported by APTIM's depth of professional resources and coordinating closely with the Town. For example, The CPE Team is currently working together to conduct post-construction biological monitoring for the Indian River County Sector 5 project with responsibilities shared and communicated seamlessly among the team.

Town of Palm Beach Coastal Program

Mid-Town Groin Construction Project

Our team performed engineering, environmental permitting, and construction oversight of a new rubblemound groin within the Mid-Town beach project area. The Mid-Town Beach Nourishment Project was completed in 2015; however, the groin that was authorized for construction near R-99.3 was not constructed during the project. The initial authorization for the groin did not include consultation with NMFS for Endangered Species Act (ESA) Section 7 consultation since it was originally planned to be built on the newly nourished beach. Our lead biologist and engineer designed the project so that construction of the groin would be built "in the dry", thereby avoiding lengthy consultation that would have delayed construction, but instead allowed for construction completion in May 2018. Additionally, we worked closely with the Town's sea turtle monitoring permit holder, D.B. Ecological, to ensure project construction was in compliance with sea turtle protection conditions.

Mid-Town Beach Restoration Project

The Town of Palm Beach constructed the initial Mid-Town Beach Restoration Project in 1996 between R-95 and R-100. Following active hurricane seasons in 2004 and 2005, the 2006 Mid-Town Beach Renourishment and Expansion Project was constructed, with a modification to the 2003 construction template to exclude sections of beach between R-94 and R-95 to avoid potential impacts to the Breakers Rock Pile. The CPE Team monitored the nearshore hardbottom along the project area during pre- and post-construction, which included collection of sediment, benthic and fish data, and delineation of hardbottom using aerial photographs in GIS to determine sediment movement in the nearshore environment.

The USACE recently completed construction of the Town's Mid-Town project, to repair impacts from Hurricanes Matthew and Irma in 2016 and 2017, placing approximately 700,000 cy of sand and utilizing three hopper dredges and specialized screening equipment. In the past, the Town constructed the project, but this was the first time the project was built under the leadership of the federal government, marking the beginning of a 50-year partnership with the federal government to protect the Mid-Town beach area. The USACE is paying half the cost, with the Town, Palm Beach County and the state sharing the remainder.

The CPE Team worked closely with the Town in preparing for this project. During construction, our team provided environmental services including permit compliance, construction observations, and extensive project coordination with the Town, USACE, and another of the Town's coastal consultants (ATM) who had designed and permitted the sand source used in this project. Our biologists coordinated with FDEP to obtain a permit modification authorizing an extension of the construction window into May to facilitate demobilization.

Groin Rehabilitation Project

The CPE Team provided the Town of Palm Beach with a comprehensive plan to rehabilitate all of the coastal groins along the Town's shoreline. During this work, our team participated in a public workshop and attended multiple Shore Protection Board and Town Council meetings. During these meetings, project information was shared between stakeholders, elected officials, Town staff, the public, and engineers, which resulted in refining the groin rehabilitation plan for permitting. During permitting process, our lead biologist coordinated extensively with USACE and NMFS to complete ESA Section 7 consultation. We readily provided data and information to support consultation and our proactive approach to agency coordination ultimately resulted in consultation completion and issuance of the DA permit.

Reach 8 Nourishment Project

The CPE Team assisted the Town with NEPA documentation and agency coordination for the Reach 8 nourishment project. The Reach 8 project was evaluated with Palm Beach County's adjoining project in the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project Environmental Impact Statement, which was finalized in 2016. During production of the EIS, The CPE Team worked closely with the USACE, the Town of Palm Beach, and the County to provide a comprehensive assessment of project alternatives and potential project impacts. This effort included coordination of scoping, identification of feasible alternatives, numerical modeling, an *in situ* assessment of the nearshore hardbottom resources in the Study Area, quantification of potential impacts to nearshore hardbottom, determination of appropriate mitigation, and construction cost estimates.

Biological monitoring of hardbottom adjacent to the Reach 8 project area

After publication of the Final EIS in June 2016, the USACE requested additional information on the Reach 8 project to facilitate consultation under the Section 7 of the Endangered Species Act and the Magnuson-Stevens Fishery Conservation and Management Act. Our staff has promptly compiled data and responded to USACE and NMFS requests for information. We also provided the Town with an artificial reef design, including a 12-Point Mitigation Plan and Biological Monitoring Plan during this coordination.

Indian River County Beach Nourishment Program

Since 2012, The CPE Team's staff has been providing quality coastal engineering consulting services to Indian River County. During this time, we have successfully implemented major beach and dune management initiatives for the County. We provide comprehensive services to the County in support of their coastal program, including beach management, feasibility studies, design, engineering, permitting, construction management, biological monitoring, physical monitoring, grant writing assistance, and post-storm assessments.

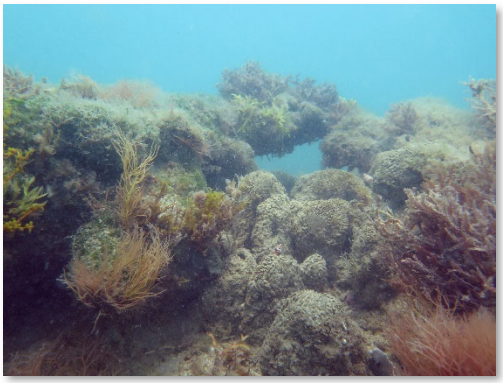
Sector 3 Beach and Dune Restoration Project

The initial Sector 3 Beach and Dune Restoration Project was completed in three phases between 2010 and 2012. The initial project was 6.6. miles long and spanned from R-20 to R-55. Following completion of the initial project, the effects of Hurricane Sandy passing off the coast of Florida in October 2012 resulted in significant dune erosion to the project area. Members from The CPE Team designed, permitted, managed construction, and monitored the 2014/15 Sector 3 Dune Repair Project. Instead of obtaining a new permit to address the damages, our staff was able to obtain an FDEP permit modification for a one-time truck haul sand placement project to quickly address this need. This provided a tremendous savings of time and money for the County.

The CPE Team recently designed the next Sector 3 Beach and Dune Nourishment Project with construction scheduled for 2020/21. Our biologists and engineers coordinated and compiled the environmental permit applications and included upland sand mines and offshore borrow areas to provide the County with flexibility in sand source for construction. Our team surveyed for hardbottom resources near the borrow area, within the proposed pipeline corridors, and along the nearshore edge using sidescan sonar and *in situ* diver verification. The data from these surveys were submitted to the regulatory agencies and used in development of the Sector 3 Biological Monitoring Plan (BMP). While the Department initially required that the BMP include extensive surveys of proposed pipeline corridors and a Coral Relocation Plan to transplant corals and octocorals out of the project area, we successfully negotiated with FDEP staff to minimize/eliminate these requirements due to the low density of coral in the project area. We were also able to reduce the length of the shore-perpendicular transects based on historical data, project design and anticipated impacts, which ultimately reduces the long-term effort of the BMP. Within 30 days of our RAI No. 1 Response, FDEP deemed the County's application complete and the permit has been issued. The CPE Team biologists are conducting the pre-construction biological monitoring of Sector 3 this summer.

Sector 5 Beach and Dune Restoration Project

The CPE Team designed and permitted the Sector 5 Beach and Dune Restoration Project, which extends for approximately 3.1 miles (R-70 to R-86), and mostly includes the City of Vero Beach. The Sector 5 project area had been managed with dune restoration projects to this point. The CPE Team developed a project feasibility study and compiled permit applications with the use of upland sand. Our biologists managed the permitting effort and proactively engaged the regulatory agencies in order to generate a comprehensive permit application. The FDEP JCP application was deemed complete in less than 6 months and DA permit issuance quickly followed, which was supported by an Environmental Assessment we generated in compliance with NEPA. During permitting, we developed a Biological Monitoring Plan (BMP) that includes nearshore hardbottom edge mapping and shore-perpendicular transects using BEAMR, sediment monitoring, and video documentation. Our team installed and monitored the transects during pre-construction in Summer 2019. Project construction began on November 4, 2019 and was completed in February 2020. Our biologists conducted the immediate post-construction biological monitoring this summer.



Hardbottom/wormrock in Sector 5

City of Delray Beach Coastal Program

Beach Nourishment Program

Since 1973, the City of Delray Beach has taken major strides to restore their eroded beach. Once at risk of being overtaken by the ocean, highway A1A and its neighboring properties have been protected by the wide beach and extensive dune system. To date, the City of Delray Beach (the City) has participated in eight beach nourishment projects.

Tara Brenner in Protecting Paradise segment

Our biologists have provided biological monitoring surveys for several of the City's nourishment projects over the year to detect potential impacts associated with construction. This has included infaunal sampling at the fill and borrow area sites, quadrat-based benthic assessments, sediment monitoring, mapping the western boundary of the offshore reef edge, and creating a DGPS-integrated video record of the reef. In support of the Fifth Periodic Renourishment, we mapped the reef edge and conducted a survey for the listed coral species *Acropora* spp. using the NMFS-recommended protocol. We also completed an Environmental Assessment in compliance with NEPA.

Most recently, The CPE Team assisted the City with the USACE's implementation of the 2020 FCCE Shore Protection Project Delray Beach Segment, which repaired impacts from Hurricane Irma. The project was constructed in February and March, placing 365,000 cy in the project area. Throughout construction, our staff provided daily construction observations and updates to the City, attended meetings, assisted with public outreach, and monitored permit compliance throughout construction.

CPE Team biologist conducting listed coral survey

The CPE Team is currently preparing for the City's Sixth Periodic Renourishment project. An offshore sand search investigation was completed earlier this year and the borrow area design has been drafted. Our biologists mapped the landward edge of the offshore reef and conducted a survey to identify ESA listed coral colonies along the reef edge. We developed the permit modification request to extend the borrow area and are currently responding the FDEP's RAI.

Sea Turtle Monitoring and Public Outreach

The City of Delray Beach has been conducting sea turtle monitoring along its beaches continuously since 1984. Immediately prior to the 2019 nesting season, the City expressed interest in conducting public outreach events to engage and educate the public regarding sea turtle nesting and the beach renourishment program. Tara Brenner and Stacy Buck managed this effort and contracted with Ecological Associates as the local permit holder to complete the sea turtle monitoring component. Ms. Brenner and Ms. Buck coordinated the public outreach events to include City educators and the public. The events included a brief history of the City's sea turtle and nourishment programs, followed by excavations of recently hatched nests. The public response to the outreach events was very positive. The CPE Team has aided the City Staff in educating the public about its coastal program in 2019 by hosting the Mayor at our offices, being interviewed and providing content for two segments of WPTV's 'Protecting Paradise' series, as well as developing FAQs and answers related to the upcoming beach renourishment events for use on the City's websites.

Delray public outreach event during the 2019 sea turtle nesting season

Palm Beach County Coastal & Inland Programs

Members of The CPE Team have worked with the County on many aspects of their coastal and inland projects, including environmental monitoring, permitting, project design, geotechnical investigations, and survey tasks for the projects described below.

Southern Palm Beach Island Comprehensive Shoreline Stabilization Project

The CPE Team designed a shoreline stabilization project for Palm Beach County along the Towns of South Palm Beach and Lantana that used beach nourishment and groins. Since the County's project abuts the Town of Palm Beach's Reach 8 project area to the north, the USACE determined that these two projects would be a "major federal action" and should be evaluated together in one EIS in compliance with the NEPA. Members of The CPE Team worked closely with the USACE, the Town of Palm Beach, and the County to provide a comprehensive assessment of potential project impacts in the Final EIS, which was published in June 2016.

The goal of the County's project was to provide storm protection to the park and upland infrastructure, a stretch of beach that has been classified as "critically eroded." The project includes beach nourishment using sand from an upland mine and seven low-profile groins. The king pile and panel adjustable groins were designed to be level with the berm with panels than can be inserted or removed as needed to achieve the desired function. The project also included design and siting of an artificial reef as mitigation for potential impacts. Our geologists conducted a seismic survey to determine sediment depths over underlying rock that would provide a suitable location for placement of the boulder reef. The dynamic nature of the nearshore habitat and ephemeral hardbottom in this area required an innovative approach to determine potential project-related impacts. Our biologists coordinated closely with FDEP to develop an impact and mitigation assessment to quantify resources and provide the Department with reasonable

assurance that the proposed artificial reef would mitigate for those impacts. Based on this coordination, the application was deemed complete and a draft permit was issued.

South Lake Worth Inlet Design and Permitting

Palm Beach County recently requested engineering and environmental services from The CPE Team to permit an expansion to the South Lake Worth Inlet (SLWI) sand trap and dredging in two additional areas within the Intracoastal Waterway. Hydrographic surveys and grab sampling were conducted throughout the three dredge sites and two disposal areas. Sieve analyses was performed within The CPE Team's CMEC accredited geotechnical laboratory. Engineering analyses is currently underway to determine dredge volumes, the expansion limits of the interior sand trap, and the disposal area capacities. We are currently compiling the permit modification requests for FDEP and USACE, which will include pre- and post-construction seagrass surveys in the project area. The biologists, engineers, surveyors, geologists, and CAD/GIS specialists of The CPE Team are working together to process this permit modification request and will prepare construction plans and technical specifications once complete. The team will support the County through bidding and receipt of Notice to Proceed from the permitting agencies.

Manatee County Coastal Management Program

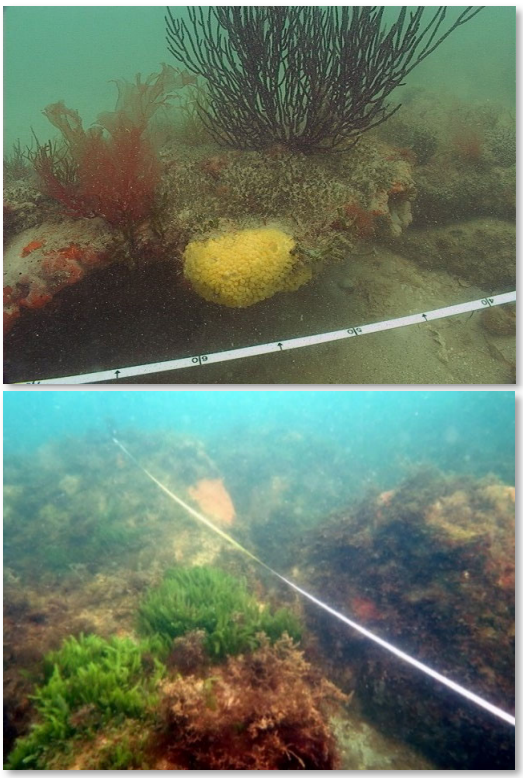
Since 1989, our team has been the coastal consultant to Manatee County. We have produced and maintained a comprehensive beach management plan for the County and have continually provided biological monitoring and engineering services for the County's coastal program on Anna Maria Island, including environmental studies, hardbottom monitoring, mitigation design, state and federal permitting, project design, geotechnical investigations, surveying services, and construction administration.

During the past three decades, our team assisted the County with beach renourishment projects in 1992-1993, 2002, 2005-2006, 2011, and 2014. We are currently preparing the Passage Key Inlet Management Study in support of borrow area design, permitting and implementation of future Anna Maria Island beach nourishment projects. We designed and oversaw construction of the Cortez Groin Replacement Project in 2016, which included a biological assessment of the derelict groins for benthic resources, specifically coral colonies. This project removed three derelict pier-type structures and replaced them with three Permeable Adjustable Groins (PAG) in order to maintain the stabilization of the shoreline. We are currently conducting a feasibility study to rehabilitate, remove and/or replace the Coquina Beach groins and evaluate alternative structural stabilization options to assist in reducing erosion on Coquina Beach.

We are currently assisting Manatee County during the construction of the Central Beach and Coquina Beach Nourishment Projects, providing construction administration, survey, public outreach, and permit compliance support. Our team is also coordinating with the County and FDEP staff regarding construction of additional mitigative, and possibly recreational, artificial reefs in the vicinity of Coquina Beach.

Hardbottom and Artificial Reef Monitoring

Due to the presence of nearshore hardbottom in the shallow waters adjacent to Anna Maria Island, mitigation and monitoring have been required to offset impacts to these resources. Our team assisted the County locating suitable sites for placement of the artificial reefs and obtaining state and federal permits for their construction. Our engineers designed and oversaw the construction of the 1993, 2005 and 2011 Artificial Reefs to ensure they were built in compliance with project permits. Following construction of the artificial reefs, our biologists conducted permit-required annual monitoring to document that the reefs succeed at mimicking the natural hardbottom which they are intended to mitigate. These surveys included benthic assessments, fish counts, relief measurements, reef delineation, and collection of photo and video documentation.



Natural hardbottom (top) and 2011 Coquina Artificial Reef (bottom)

In addition to monitoring the colonization and succession of the artificial reefs, our biologists monitor the natural nearshore hardbottom to document any potential unanticipated project impacts. We developed and updated the Biological Monitoring Plan for each project in close coordination with FDEP. During annual monitoring surveys, our biologists utilize quadrat-based benthic assessments, sediment measurements, and in situ resource mapping, supplemented by photo and video documentation. Data are analyzed to document any potential secondary impacts related to project construction, and reports are prepared and submitted to agencies as required by permit conditions. In preparation for this summer's construction of the County's federal Shore Protection Project, our biologists conducted a pre-construction monitoring event in May 2019. Following project completion, we will conduct annual post-construction monitoring to document any potential unanticipated project impacts. Also, in response to request by the County, our team is collecting additional data on hardbottom and artificial reefs during each monitoring event to document the impacts to, and subsequent recovery from, the severe and prolonged 2018 red tide event.

The CPE Team is currently assisting the County in locating a site for a new artificial reef that will provide mitigation for the federal and Coquina Beach projects, as well as excess mitigation to provide additional marine habitat and to use if continued hardbottom ever results in the requirement of additional mitigation. We are also working with the County to design and permit a recreational nearshore snorkel reef in the shallow nearshore waters adjacent to Coquina Beach.

Pompano Pier Replacement Project

The Pompano Pier Replacement Project included replacing the existing pier located between FDEP monuments R-33 and R-34 in Broward County. The construction involved minimal direct (removal and construction of pilings) and indirect (shading) impacts to 410 ft^2 of nearshore hardbottom. CPE Team

biologists conducted baseline surveys of the hardbottom in 2014 and 2015; however, due to delays in the over-water construction, the pre-construction survey was again conducted in 2017 to meet FDEP's two-year window between the pre-construction survey and the time of construction.

Based on these surveys, a Uniform Mitigation Assessment Method (UMAM) analysis determined that a minimum of 162 ft^2 of mitigation was required to offset anticipated project impacts. The CPE Team staff designed a limestone boulder artificial reef as mitigation, which was completed on October 25, 2018, with a net acreage of 527 ft^2 of boulder coverage.

Benthic resources on the hardbottom adjacent to the Pompano Pier

CPE Team biologists developed a Biological Monitoring Plan that included assessment of the natural hardbottom and the artificial reef. We monitored the nearshore hardbottom beneath and adjacent to the pier during pre-construction and post-construction and generated a report that presents the results of the immediate post-construction survey compared to the pre-construction surveys. The natural hardbottom was monitored one time during post-construction and the artificial reef will continued to be monitored for three (3) years post-construction to track benthic recruitment, succession (community development), and exposed area (gross and net acreage). CPE Team biologists are scheduled to monitor the artificial reef this summer.

Lee County Coastal Engineering Services

Our Team provides multidisciplined coastal services to Lee County, including environmental permitting and biological monitoring of hardbottom and seagrass resources. Recent projects completed for the County's Natural Resource Division and an ongoing project for their Facilities Construction and Management Division are described below.

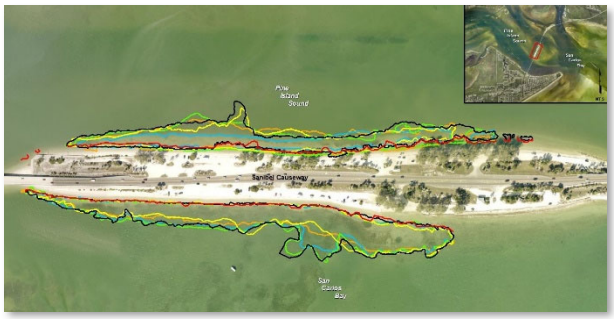
Gasparilla Island Shore Protection Project

The federally authorized Gasparilla Island Shore Protection Project includes multiple placements of beach quality sand along the shoreline of Gasparilla Island between FDEP reference monuments R-10.5 and R-24.5 on an as needed basis. Sand for each placement event will be dredged from the approved Gasparilla Ebb Shoal borrow area. CPE Team biologists assisted Lee County with the development and implementation of permit-required hardbottom monitoring for this project. In 2018, we coordinated with FDEP biologists to design a Biological Monitoring Plan for hardbottom and artificial reef resources. In 2018, we completed the baseline/pre-construction hardbottom survey and completed the initial post-construction monitoring event in August 2019 following construction of the Gasparilla Island project. The post-construction biological monitoring report was submitted in November 2019. Our team completed the one-year post-construction monitoring event this summer and is currently preparing the annual monitoring report.

Sanibel Causeway Shoreline Stabilization Project

The Sanibel Causeway is located in Lee County and connects the mainland to Sanibel Island in Fort Myers, providing the only access from the mainland to Sanibel and Captiva Islands. There are two islands along the causeway, Island A to the east and Island B to the west. Since 2017, CPE Team members have been assisting Lee County's Facilities Construction and Management Division with design, surveys, and

permitting for the Sanibel Causeway Shoreline Stabilization Project. The shoreline stabilization project aims to protect upland infrastructure by stabilizing the shoreline and addressing stormwater runoff, while considering the adjacent seagrass resources and the recreational uses by the public. CPE Team biologists completed a baseline seagrass mapping and characterization survey in summer 2017 along both shorelines of the Sanibel Causeway Island B. In addition to the seagrass field observation, biologists delineated aerials to determine the natural variability of the extent of seagrass in the project vicinity in San Carlos Bay and Pine Island Sound over time. Based on these results, a no-impact project design on both shorelines was developed and the FDEP, South Florida Water Management District, and Department of the Army permit applications were submitted. The CPE Team will conduct pre- and post-construction seagrass surveys to detect potential impacts from construction, which is scheduled to occur in winter 2020/2021.

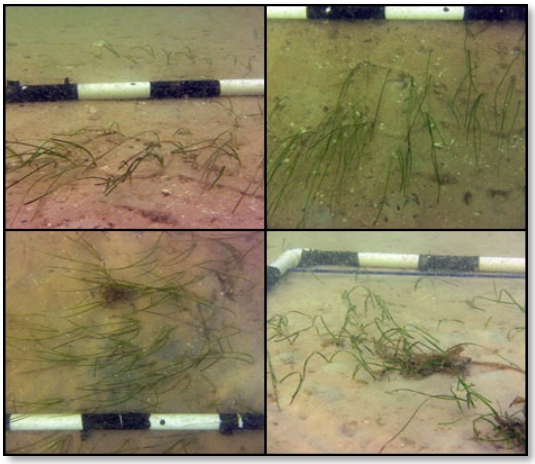


Delineation of historical seagrass.

Lido Key Hurricane and Storm Damage Reduction (HSDR) Project

Members from The CPE Team provided services that enabled the USACE to re-establish Lido Key as a federal project and to develop a federally authorized and funded shore protection project, which will include fill placement and coastal structures. We assisted the City with the environmental permitting and coordination for the federal Lido Key HSDR Project, which is utilizing a Big Sarasota Pass borrow source and will include construction of two groins at the south end of the island. As local sponsor for the project, the City assisted the USACE with engineering, geotechnical, benthic investigations and permit application services provided by The CPE Team. We are currently providing construction administration support to the City and assisting with USACE coordination throughout the project.

As part of the coordination and permitting for the Lido Key HSDR Project, our biologists performed a benthic resource investigation to map and characterize seagrass in the project vicinity. To efficiently investigate the large survey area, a combination of survey methods was employed, including towed video, towboard diver surveys, and diver verification. Survey results were used to support FDEP permitting and consultation with NMFS. CPE Team biologists utilized this data to prepare a UMAM evaluation and successfully negotiated with FDEP to determine an appropriate amount of mitigation to offset anticipated impacts to seagrass from the Lido Key HSDR Project. Our biologists worked closely with FDEP, FWC, USACE, NMFS, and USFWS to determine a suitable and feasible mitigation site, which will utilize habitat created as part of another project in Perico Preserve, Manatee County. We worked with FDEP biologists to finalize the seagrass mitigation and monitoring plan, and FDEP issued the permit for this project in June 2018. We

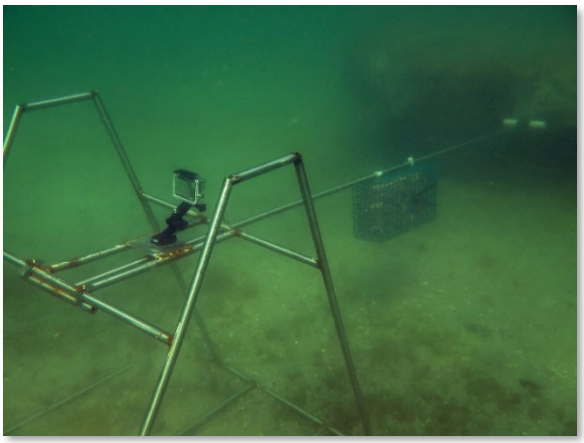


Seagrass surveys on the Big Sarasota Pass ebb shoal

are currently coordinating with the City of Sarasota, USACE, and Manatee County to implement the seagrass mitigation project, which is anticipated to be constructed in summer 2021.

Sarasota Bay Estuary Program Artificial Reef Monitoring

The CPE Team provided artificial reef monitoring services to the Sarasota Bay Estuary Program (SBEP) for surveys of three artificial reef installations located within Sarasota Bay and funded by an FWC grant. Our team conducted biological monitoring on the reef modules to assess fish population surveys at each artificial reef site by collecting both underwater visual census (UVC) data and using baited remote underwater video stations (BRUVS) for desktop analysis.



BRUV station used to monitor fish assemblages

The video and *in situ* data were analyzed provide a comparison of the fish populations between the reef sites taking into consideration the reef materials and locations. We generated a report that clearly presents the differences and similarities between and among sites and compared these data to other studies with recommendations for future studies and artificial reef programs.

Location of Company / Key Participants

The main office for our coastal service operations is located in Boca Raton. Key team members are located in the Boca Raton office, including the Principal Scientist (Lindino Benedet), Senior Project Manager (Tom Pierro), and Project Manager (Stacy Buck). We are prepared to meet the needs of the Town using local resources, our Boca Raton technical support staff, and our team of AAUS Scientific Divers.

CPE Main Office
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CPE North Carolina Office
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Phone: (910) 399-1905
Email: kwillson@coastalprotectioneng.com

APTIM Main Office
2481 N.W. Boca Raton Blvd.
Boca Raton, Florida 33431
Phone: (561) 391-8102
Fax: (561) 391-9116
Email: morjana.signorin@aptim.com

APTIM Tampa Bay Office
725 US Hwy 301 South
Tampa, FL 33619
Phone: (727) 374-2150
Email: beau.suthard@aptim.com

Schedule/Budget Compliance of Previous Work

Staff with The CPE Team have been providing marine resource monitoring services throughout Florida for decades, including within the Town of Palm Beach. Our history providing quality project deliverables on

schedule and on, or under, budget speaks for itself. Furthermore, as a local firm in Palm Beach County with staff fully dedicated to coastal protection, we are excited to demonstrate our ever-growing commitment to the needs of the Town. We have the ability to quickly mobilize, which can translate into significant schedule efficiencies and cost-savings to the Town. We also monitor weather and sea conditions to optimize survey windows and minimize wasted time on the water.

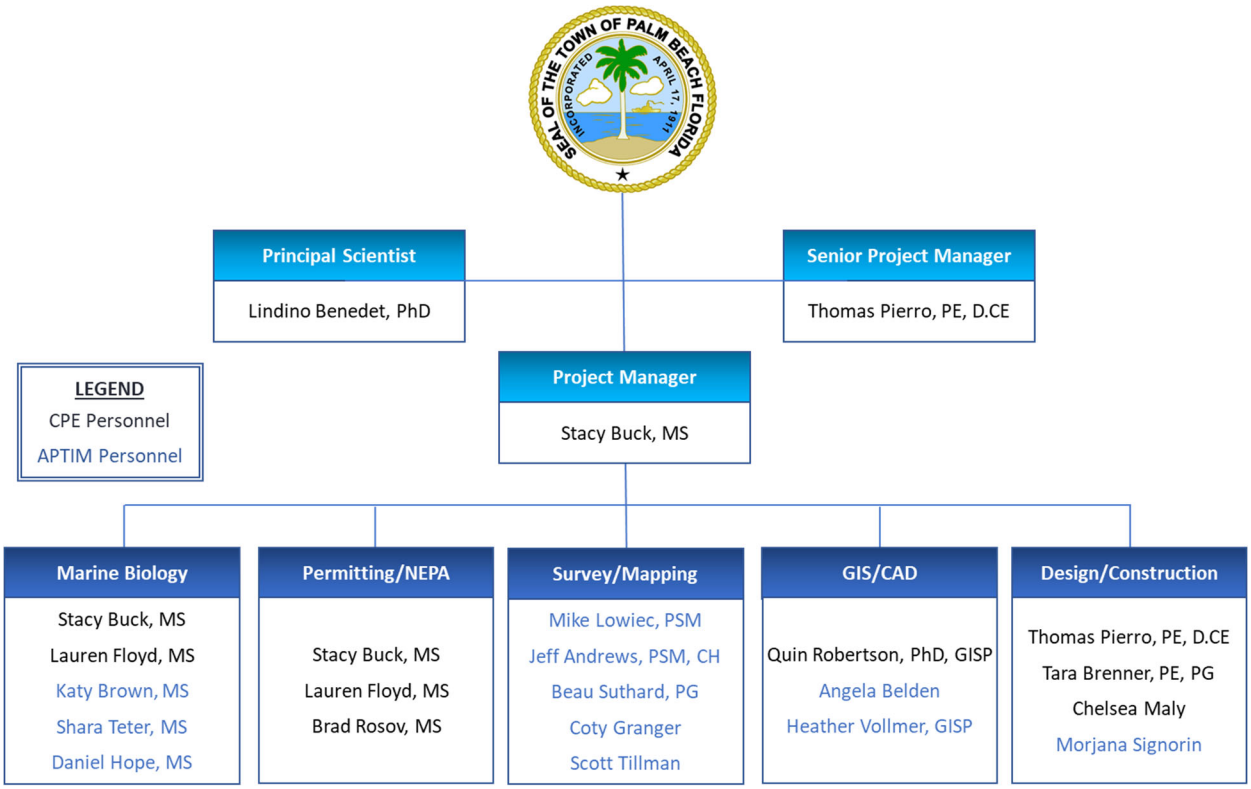
Our team is fully qualified to help the Town with optimizing costs for marine resource monitoring in compliance with the BMA and project-specific monitoring plans. We routinely work with regulatory agencies to develop new, or refine existing, biological monitoring programs to collect valuable data with a protocol that requires an effective and appropriate degree of effort. We understand that permit-required environmental minimization and monitoring conditions for projects with nearshore hardbottom can often be cost prohibitive to coastal communities. Our longstanding working relationships with regulatory agency staff has resulted in documented success in negotiating successful and cost-effective monitoring programs for our clients. We also bring a streamlined and cohesive team who is ready to perform the Town's monitoring. Our biologists and support field personnel have worked together for years and have established a very efficient and cooperative working environment. This means our team is ready to implement the Town's monitoring program on day one, without any wasted time and money.

2.1.2 Experience / Ability of Personnel

The CPE Team provides one of the most experienced, full-service workforces of coastal professionals in with a specific focus on local government programs in the State of Florida. For decades, we have been providing Florida's coastal communities with a complete spectrum of coastal services including marine resource assessments, biological monitoring, state and federal environmental permitting, preparation of NEPA documents, hydrographic and terrestrial surveying, coastal geology, GIS, numerical modeling, coastal engineering, funding program assistance, bidding assistance, construction oversight, and post-project physical monitoring. Our enclosed response further details how we are fully qualified and have the experience, credentials, understanding, and availability to assist the Town in achieving the goals of the Scope of Work.

The CPE Team is comprised of professionals that have direct experience and in-depth knowledge of the unique needs of the Town's coastal program. We have been monitoring your nearshore habitat over the past 15 years and have been involved in the Beach Management Agreement (BMA) since its inception in 2012. We have a thorough understanding of the BMA based on our experience obtaining an Individual Project Approval (IPA) for the Town-wide Groin Rehabilitation Project and IPA permit modifications for the Mid-Town groin and Mid-Town Beach Nourishment projects.

Organization Chart



Management's Credentials

The three professionals proposed to make up the management for this contract all live in and enjoy the beaches in Palm Beach County. We are local and can be on site in the Town of Palm Beach within a half hour.

Our management approach as shown in the organization chart is for **Stacy Buck** to be the Town's primary point of contact as Project Manager under this contract. Ms. Buck has over 20 years of experience in biological and environmental science, the last 16 years of which have focused on coastal and marine biology in south Florida. She has conducted over 1250 scientific dives in south Florida monitoring nearshore hardbottom, reef habitat (natural and artificial), and seagrass. This specialized and extensive field experience has provided Ms. Buck with a thorough understanding of south Florida's marine resources, their importance and sensitivity, and how they may be affected by construction activities. She applies this knowledge on a regular basis while working with state and federal regulatory agencies to develop biological monitoring plans, coral relocation plans, and mitigation plans during permitting of coastal construction projects. She maintains a positive working relationship with USACE and FDEP staff and was a main contributor during development of FDEP's Standard Operating Procedures for Nearshore Hardbottom Monitoring of Beach Nourishment Projects. Ms. Buck is also very familiar with the FDEP BMA and has been involved in obtaining several Individual Project Approvals (IPAs) since its implementation. She has worked on projects within the Town of Palm Beach for over 15 years and will continue to collaborate with Town staff to execute and deliver work products that meet the Town's high expectations for quality and responsiveness. Ms. Buck will receive direction from the Town and be responsible for communications with staff for development and execution of scopes of work. She will manage delegation of task orders and will provide overall and project-specific updates to the Town on a monthly basis, or more frequently as needed.

To further enhance our management credentials, Ms. Buck will be supported by **Lindino Benedet, PhD,** for task order development and execution. Dr. Benedet is the Principal Scientist and Authorized Member (AMBR) of CPE with more than 19 years of experience studying coastal dynamics. He has worked on hundreds of consulting projects and published dozens of scientific papers in international journals and conferences. His expertise includes process-based numerical modeling of coastal processes, marine met-ocean, navigation evaluations, port feasibility studies, dredging, beach nourishment, barrier island restoration, coastal structures, and marine sand searches. Dr. Benedet also holds master's degrees in marine geology and business administration and excels in project, budget, and business management.

Our management credentials are further supported by **Thomas Pierro, PE, D.CE,** our Senior Project Manager**.** Mr. Pierro has managed dozens of municipal contracts for coastal engineering services throughout the state of Florida and has worked on Town of Palm Beach projects for over 14 years. He has worked along every Reach of the Town's shoreline and has intimate knowledge of the Town's Comprehensive Coastal Management Program (CCMP) and the CCMP's goals. Mr. Pierro maintains a positive working relationship with Town staff and regularly facilitates collaboration among team members, regulatory agencies, and other Town consultants to ensure all aspects of a project are implemented with the highest level of service and expertise. Mr. Pierro has worked with Ms. Buck on coastal projects for over 14 years and will continue to support this contract with his knowledge of the Town's program.

Town of Palm Beach Related / Relevant Projects

Please see Section 2.1.1 for details on the specific projects that The CPE Team has worked on that are relevant to the Town of Palm Beach. In the resumes below, you will also find projects worked on by each of our staff members that are related or relevant to the Town of Palm Beach.

Project Personnel Credentials

We have assembled a team that can complete the full spectrum of coastal services including marine biological assessments and monitoring, environmental permitting, engineering, hydrographic and terrestrial surveying, numerical modeling, coastal geology, GIS, coastal engineering, funding program assistance, public outreach, bidding assistance, construction oversight, and post-project physical monitoring. The following resumes present the credentials of the individual project personnel from CPE and APTIM who will be assigned to the Town under this contract.

Stacy Buck, MS

PROJECT MANAGER & SENIOR MARINE BIOLOGIST

5301 N. Federal Highway, Suite 335, Boca Raton, FL 33487
sbuck@coastalprotectioneng.com; 561-632-1210

PROFESSIONAL QUALIFICATIONS

Stacy Buck is a Senior Marine Biologist with Coastal Protection Engineering (CPE) and will serve as Project Manager under this contract. She specializes in environmental permitting and biological monitoring for shoreline stabilization projects, providing both project management and technical services. She manages project budgets, coordinates workloads, directs field operations, and collaborates with clients and agencies on a regular basis. She is responsible for the complete coordination of the biological components of projects from pre-permit application coordination through final report deliverables. Ms. Buck manages our in-house database of biological data and is proficient in statistical analysis. She has generated numerous biological monitoring reports for long-term monitoring programs that involve complex data. As Project Manager for the Town under this contract, Ms. Buck will have the support of her discipline leads to address all marine resources assessment and monitoring services needed.

RELEVANT EXPERIENCE

Town of Palm Beach Coastal Program, West Palm Beach, FL
As lead biologist for the Town, Ms. Buck worked with the USACE and FDEP to expedite the permit modification for the Mid-Town Groin Project to ensure construction would not interfere with sea turtle nesting. Additionally, initial authorization did not include consultation with NMFS for Section 7 consultation since the groin was originally planned to be built on the newly nourished beach. Our Team designed the project so that construction of the groin would be built “in the dry”, otherwise consultation would have not made construction feasible for that season. The permit modification requests were submitted in late December 2017 and the project was deemed substantially complete in May 2018.

The Reach 8 project is the Town of Palm Beach’s component of the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project EIS. Ms. Buck led production of the EIS and is currently coordinating with the USACE to facilitate NMFS consultation for ESA Section 7 and under the Magnuson-Stevens Fishery and Conservation Act. When NMFS requested additional information, Ms. Buck coordinated with the project engineer to provide the Town with an artificial reef design in order to respond to the USACE and resource agencies. Consultation is ongoing.

Education

Master of Science, Coastal Zone Management, Nova Southeastern University, Dania Beach, Florida, 2007

Bachelor of Science, Marine Science, University of South Carolina, Columbia, South Carolina, 1999

Highlights

20 years of experience in biological sciences with the last 16 focused on coastal and marine resources in Florida

Registrations/Certifications

Divemaster, Dry Suit Specialty Diver, Rescue Diver, Enriched Air Nitrox Diver, Advanced Diver, Open Water Diver

Emergency First Responder (CPR, 1st Aid, AED), DAN O_2 Administration

BOEM and NMFS Protected Species Observer

Professional Affiliations

Member, Florida Shore and Beach Preservation Association (FSBPA)

Member, American Shore and Beach Preservation Association (ASBPA)

Member, American Academy of Underwater Sciences (AAUS)

Member, Divers Alert Network (DAN)

Employment History

CPE 2019 – Present

APTIM 2006 – 2019

Milian, Swain & Associates 2004 – 2006

MACTEC, Inc. 2003 – 2004

Environmental Research & Consulting 2000 – 2002

Sector 5 Beach and Dune Restoration, Indian River County, FL

Ms. Buck is the lead biologist on the Sector 5 project and facilitated the development of permit applications for state and federal permitting, including ESA Section 7 consultation and Essential Fish Habitat Assessment evaluation. She directed the development of an Environmental Assessment in compliance with NEPA to evaluate potential environmental impacts due to project construction. Ms. Buck coordinated extensively with state and federal regulatory agencies to develop a biological monitoring plan and contingency mitigation plan and managed the immediate post-construction biological monitoring completed earlier this summer.

Sector 3 Beach and Dune Restoration Project, Indian River County, FL

Ms. Buck is the lead marine biologist for the Sector 3 Beach and Dune Restoration Project and is currently managing the state and federal permitting. This includes coordinating with regulatory agencies and resource agencies, including NMFS and USFWS to facilitate ESA Section 7 consultation. Ms. Buck developed a Biological Monitoring Plan for pre- and post-construction biological monitoring of the nearshore hardbottom resources located immediately offshore the project area. The permit application was deemed completed in May 2020 and the final order has been issued. Ms. Buck is currently managing the pre-construction biological monitoring being conducted this summer.

Southern Palm Beach Island Comprehensive Shoreline Stabilization Project, Palm Beach County, FL

Palm Beach County and The Town of Palm Beach have adjacent project areas and were each seeking permits to allow for the implementation of two separate non-federal shoreline stabilization projects. Because the projects' similarities provide a basis for evaluating their environmental consequences together, the USACE exercised its discretion to evaluate the two projects in a single Environmental Impact Statement (EIS). Ms. Buck led the development of the EIS and worked closely with the Corps, the Town and the County to provide a comprehensive assessment of potential alternatives and their respective effects. She also led the *in situ* assessment of the benthic habitat to support the EIS and environmental permitting.

Ms. Buck led state and federal permitting the County's component of the project. Ms. Buck coordinated extensively with the project engineer, the County, FDEP and the USACE to develop an impacts assessment and mitigation plan that would satisfy comments and concerns received during the EIS process. The Notice of Intent to Issue was received from FDEP and coordination is ongoing with the USACE to complete NMFS consultation for ESA Section 7 and under the Magnuson-Stevens Act.

City of Deerfield Beach Coastal and Waterway Program, Deerfield Beach, FL

Ms. Buck led the permitting effort to construct a nearshore artificial reef along the City of Deerfield Beach's public beach to provide a recreational artificial reef within a swimmable distance from the beach. Ms. Buck worked with the project engineer to optimize the design and prepared permit applications. This effort included analysis of existing resource data to refine the artificial reef placement site followed by *in situ* investigations. Ms. Buck's team delineated the nearshore hardbottom, provided qualitative descriptions of the resources, and collected sediment depth data within the proposed placement area. Permits were granted by Broward County, FDEP and USACE in 2019.

Ms. Buck supported the permitting effort to install a vessel exclusion zone along the public beach of Deerfield Beach with the goal of creating a safe area for public swimming and snorkeling. This effort included continuous coordination with the FDEP, USACE and the Coast Guard to permit the buoys. Ms. Buck designed the biological assessment plan to map the nearshore hardbottom edge, document benthic conditions, and measure sediment depths to determine buoy foundation requirements. This effort was permitted and the buoys were installed in 2019.

Lindino Benedet, PhD

PRINCIPAL SCIENTIST

5301 N. Federal Highway, Suite 335, Boca Raton, FL 33487
lbenedet@coastalprotectioneng.com; 561-609-9144

PROFESSIONAL QUALIFICATIONS

Lindino Benedet has over 19 years professional experience dedicated to the coastal engineering practice performing numerical modeling of coastal processes, project management and technical/scientific research and other coastal-marine studies & investigations to support coastal engineering projects such as beach, dune and marsh restoration as well as coastal structures. Lindino obtained his undergraduate degree at UNIVALI in Brazil, where he majored in Physical Oceanography, received his master's degree at Florida Atlantic University in Marine Geology and obtained his Ph.D. at Delft Institute of Technology in Delft, Holland, with focus on Hydraulic Engineering where he worked closely with the Developers of the Delft3D model. He is an Associate Editor Shore & Beach and of the Journal of Coastal Research. Lindino has worked on hundreds of consulting projects and published dozens of scientific papers in international journals and conferences during his career and brings unique numerical modeling expertise to the project team. He will provide coastal processes and numerical modeling support to the City under this contract, as needed.

RELEVANT EXPERIENCE

Upham T-Head Groins Numerical Modeling, Pinellas County, FL
Dr. Benedet and his team performed Boussinesq Wave and Flow Modeling utilizing the USACE Bouss2D model to Evaluate the Effects of Proposed T-head groins and artificial reefs on recreational activities such as surfing.

Longboat Key Islander Permeable Adjustable Groins, Longboat Key, FL
Dr. Benedet led Delft3D numerical modeling activities and coastal processes analysis development to evaluate the effect of proposed permeable structures to manage an erosional hotspot on Longboat Key Florida. The project was constructed after the study and it performed very similar to model prediction.

Lead Numerical Modeler, Figure Eight Island Restoration and Inlet Realignment Project, Figure Eight Island, NC.
Dr. Benedet performed numerical modeling of waves, currents, sediment transport and beach-inlet morphology utilizing the numerical model Delft3D to evaluate performance of inlet re-location alternatives and terminal groins on the erosion of Figure Eight Island, NC.

Education

Doctor of Philosophy, Hydraulic Engineering, TU Delft, Delft, Holland, 2016

Master of Business Administration, Business Administration, Fundação Dom Cabral, Belo Horizonte, Brazil, 2014

Master of Science, Marine Geology, Florida Atlantic University, Boca Raton, Florida, 2001

Bachelor of Science, Oceanography, Universidade do Vale do Itajai, Itajai, Brazil, 2000

Highlights

20 years of experience in coastal processes, numerical modeling, marine geology, and coastal engineering

Recognized intentional expert in in the fields of coastal numerical modeling, coastal engineering, beach nourishment, marine sand investigations

Professional Affiliations

Associate Editor, Journal of Coastal Research, Journal of the Coastal Research and Education Foundation

Editorial Board Member, Shore & Beach, Journal of the American Shore & Beach Preservation Association

Associated Editor, Brazilian Journal of Aquatic Sciences

Member, Florida Shore and Beach Preservation Association (FSBPA)

Member, American Shore and Beach Preservation Association (ASBPA)

Employment History

CPE 2019 – Present

APTIM 2001 – 2019

Wiggins Pass Inlet Study, Collier County, FL
Dr. Benedet and his team performed numerical modeling of waves, currents, and sediment transport and beach-inlet morphology utilizing the DELFT3D model to evaluate inlet channel dredging strategies and the effect of inlet channel re-alignment alternatives on sedimentation rates and erosion of adjacent beaches.

Numerical Modeling QA/QC, New River Inlet, North Topsail Beach, NC. Dr. Benedet provided guidance for model setup and calibration, reviewed numerical modeling results, and model deliverables for this inlet and beach morphology modeling project conducted utilizing the numerical model Delft3D to evaluate performance of inlet re-location alternatives and terminal groins on the erosion of Figure Eight Island, NC.

Town of South Palm Beach Breakwaters, Palm Beach County, FL
Dr. Benedet and his team performed numerical modeling of waves, currents, alongshore sediment transport and beach morphology change utilizing the numerical model Delft3D to evaluate performance and impacts of proposed breakwaters along the Town of South Palm Beach.

Panama City Beach Erosion Control and Storm Damage Reduction Project, Bay County, FL
Dr. Benedet planned a wave and current data collection effort where two ADCPs were deployed near the project location to collect oceanographic data to calibrate the numerical model, and conducted numerical modeling of coastal processes (waves, currents, sediment transport, morphology) utilizing Delft3D to evaluate the impacts on Hurricane Ivan on Panama City Beach and evaluate a proposed maintenance nourishment project.

Barrier Island Restoration Projects, Louisiana Department of Natural Resources (DNR), LA
Dr. Benedet led numerical modeling activities to evaluate project performance and borrow area impacts of many Barrier Island Restoration projects along the Louisiana Coast including the Shell Island Sandy Point Borrow area, West Belle Pass Restoration Project and the Cheniere Ronquille Barrier Island Restoration project. These projects involved numerical modeling of waves, currents, alongshore sediment transport and beach morphology utilizing the Delft3D model, under average conditions, tropical storms and hurricanes, to evaluate performance of Barrier Island Restoration (beach, dune and marsh) over timescales of years to decades.

Louisiana Statewide Numerical Modeling as a Response to Deepwater Horizon, Louisiana Department of Natural Resources (DNR), LA
Dr. Benedet led a team of several numerical modelers that were tasked with developing a model that covers most of the Louisiana Coast and Marshes. The model was conducted to refine the design of proposed sand berms to contain oil from the Deepwater Horizon oil spill from contaminating marshes, and to evaluate the effect of the berms on water quality (residence time), marsh salinities, waves and currents. It was an ambitious 24/7 modeling effort performed in parallel by several numerical modelers under the direct supervision of Dr. Benedet, in order to be able to provide results in an expedited manner to be used to support decisions in the aftermath of the environmental disaster.

Thomas Pierro, PE, D.CE

SENIOR PROJECT MANAGER/ PRINCIPAL ENGINEER

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tpierro@coastalprotectioneng.com; 561-756-2535

PROFESSIONAL QUALIFICATIONS

Thomas Pierro, PE, D.CE, is the Principal Engineer for Coastal Protection Engineering (CPE) and will serve as Sr. Project Manager and Principal Engineer for this contract. Since 2001, he has designed, permitted, and supervised construction of numerous beach nourishment projects in Florida. He directs complex analysis of beach/inlet processes, designs programs that control high erosion near coastal inlets and passes and promotes forward thinking throughout his team to support sustainable coastal programs. In 2011, Mr. Pierro was awarded the Jim Purpura / T.Y. Chiu Award from the FSBPA for outstanding contribution to coastal engineering in the State of Florida. Mr. Pierro has supported the Town of Palm Beach on many components of their coastal program for over 14 years, which provides him with an in-depth understanding of the Town's project history and future project needs.

RELEVANT EXPERIENCE

Town of Palm Beach, Florida

Mr. Pierro has worked on many facets of the Town's coastal program since 2006 and communicates frequently with Town staff on various coastal issues and history. In the earlier years, Mr. Pierro performed permit required physical monitoring and Town-wide analyses including an updated sediment budget and littoral transport evaluation. He developed a comprehensive engineering report and artificial reef design in support of the Reach 8 project. Mr. Pierro designed the 0.8-acre limestone boulder artificial reef, developed plans and specifications, and managed construction in 2007. He performed a comprehensive coastal structures peer review and independent assessment for the Town's planned groin rehabilitations. He also provided technical and management oversight for the Southern Palm Beach Island Comprehensive Shoreline Stabilization EIS as Senior Project Manager under the direction of the USACE. He recently served as project manager for the Town's Mid-Town Beach Nourishment Project, which was constructed from March - May 2020.

Southern Palm Beach Island Comprehensive Shoreline Stabilization Project, Palm Beach County & Town of Palm Beach, Florida

The project addresses erosion concerns by providing additional storm protection to upland property while minimizing impacts to nearshore hardbottom. Due to the potential for adverse impacts to hardbottom

Education

Master of Science, Ocean Engineering, Florida Atlantic University, Boca Raton, Florida, 2001

Bachelor of Science, Ocean Engineering, Florida Atlantic University, Boca Raton, Florida, 1999

Highlights

Worked on many aspects of the Town's coastal program since 2006.

Recognized industry expert in Florida in the fields of coastal engineering, beach nourishment, coastal structures numerical modeling of coastal processes, and inlet management. Broad experience in project management, planning, design and permitting, engineering and modeling, plans and specifications, field investigation, construction oversight, and feasibility studies of coastal engineering projects.

Registrations/Certifications

Professional Engineer, Civil, Florida, License No. 64683, Active

Professional Engineer, Civil, New York, License No. 090464-1, Active

Diplomate, Coastal Engineering (ACOPNE), 2010, ASCE, Active, Nationwide

Professional Affiliations

Member, American Society of Civil Engineers (ASCE)

Member, Florida Shore and Beach Preservation Association (FSBPA)

Member, American Shore and Beach Preservation Association (ASBPA)

Employment History

CPE 2019 – Present

APTIM 2001 – 2019

resources, an Environmental Impact Statement has been developed by members of The CPE Team as required for permitting of the project, which includes advanced DELFT3D modeling. This requires close coordination with USACE, FDEP, Town and County to balance concerns and objectives. Mr. Pierro provided coastal engineering support and oversight in evaluating project alternatives, reviewing numerical modeling results, developing reports and permit documents, and coordinating with stakeholders. Mr. Pierro is also the Engineer of Record for the County's portion of this project and developed a unique way of assessing the potential for downdrift spreading, which may reduce the mitigation requirement.

Delray Beach Erosion Control Program, Delray Beach, FL
Mr. Pierro has assisted with Delray Beach's Federal Storm Damage Reduction Project since 2006. He served as Project Manager and Engineer of Record for the Fifth Periodic Beach Renourishment Project constructed in 2013. He managed the project design, permitting and construction on a reimbursable basis with USACE. Tasks included project administration, contractor selection, construction observation, verification of fill volume placement, compliance with project permit requirements and confirmed contractor requests for payment. He continues to oversee the management of City's program in close coordination with City, County, and USACE on storm repair projects and planning for the upcoming Sixth Periodic Beach Renourishment in 2021.

Boca Raton Comprehensive Erosion Control Program, City of Boca Raton, FL
Mr. Pierro was Senior Engineer on the three main coastal projects for the City (North, Central and South) from 2004 to 2009. He provided construction oversight during beach projects, and structural work on the Boca Inlet Weir Relocation and Central Boca Raton Groin constructed in 2004. The City recently re-selected the APTIM/CPE team with Mr. Pierro serving as a Sr. Project Manager and Principal.

Comprehensive Coastal Erosion Control Program, Manatee County, FL
Mr. Pierro directed the comprehensive feasibility study for Manatee County in 2007 to evaluate the cost and need for shore protection in areas outside the federal (USACE) project area. Based on the recommendations of the report, the County constructed the Coquina Beach Nourishment Project, which included construction of a 5-acre mitigative artificial reef in 2011, designed and permitted by Mr. Pierro. He designed and managed the installation of geotextile tubes to sand tighten the Longboat Pass Jetty to improve the performance of the beach nourishment project and subsequently completed a comprehensive modeling study of Longboat Pass resulting in an updated Inlet Management Plan. He also worked with the County to remove three derelict groins along Cortez Beach and replace them with Permeable Adjustable Groins, a project which was designed with use of the Delft3D numerical model. Mr. Pierro assisted the USACE in design and permitting of the Manatee County Shore Protection Project constructed in 2014 and continues to play a key role in the management of the County's island-wide shore protection program in implementing the federally authorized, FEMA supported, and county-managed projects. Current efforts include an ongoing Inlet Management Study for Passage Key Inlet, which is the primary sand source for the Anna Maria Island beach nourishment program and upcoming renourishment of the entire island under agreement with the USACE to repair storm damages.

Upham Beach Groin Stabilization Structures, Pinellas County, FL
Mr. Pierro worked with Pinellas County over the course of several years to evaluate options to install permanent groin stabilization structures to reduce erosion at Upham Beach. The project included development of engineering alternatives, advanced wave breaking modeling and permitting assistance. Additional efforts included project bidding and construction observations. The project construction was completed in 2018 with Mr. Pierro serving as Sr. Project Manager and the Engineer of Record.

Lauren Floyd, MS

SENIOR MARINE BIOLOGIST & QA/QC MANAGER

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PROFESSIONAL QUALIFICATIONS

Lauren Floyd is a Senior Marine Biologist with Coastal Protection Engineering (CPE) specializing in environmental permitting and monitoring for beach nourishment and coastal structure projects. Ms. Floyd manages environmental aspects of coastal projects and has overseen state and federal permitting, compliance tracking, biological monitoring programs, and mitigation assessments for coastal projects throughout Florida and U.S. Gulf and Atlantic states since 2006. Ms. Floyd will provide QA/QC review and for all biological data submittals and monitoring reports and will assist Ms. Buck with permitting for the Town under this contract.

Ms. Floyd regularly coordinates and develops environmental documents required in order to obtain state and federal permits for coastal projects. She is trained and experienced in NEPA documentation, including preparation of Environmental Assessments (EA) and Environmental Impact Statements (EIS). She routinely develops Biological Assessments (BA) in support of Endangered Species Act Section 7 Consultation with U.S. Fish and Wildlife Service and National Marine Fisheries Services and Essential Fish Habitat (EFH) Assessments in compliance with the Magnuson-Stevens Fishery Conservation and Management Act.

Ms. Floyd has extensive experience designing and implementing assessments and long-term monitoring programs for marine resources, including natural hardbottom, coral reefs, artificial reefs and seagrass. She has designed and led coral restoration and relocation projects, including managing a volunteer-based coral nursery program in Broward County. She provides public outreach for coastal projects and regularly presents at state and national scientific conferences. Ms. Floyd also volunteers as a subject expert on the Gumbo Limbo Research Grant Selection Committee.

RELEVANT EXPERIENCE

Comprehensive Erosion Control Program, Manatee County, Florida
Ms. Floyd manages all environmental permitting, compliance tracking, agency coordination, development of monitoring plans, survey coordination, data analysis and report preparation in support of beach nourishment and coastal structure projects on Anna Maria Island. Conducts annual biological surveys of natural hardbottom and artificial reef habitats including *in situ* identification and abundance of flora and fauna, protected species observation and enumeration. Provides public

Education

Master of Science, Marine Biology and Coastal Zone Management, Nova Southeastern University, Dania Beach, Florida, 2006

Bachelor of Science, Biology and Environmental Studies, Middlebury College, Middlebury, Vermont, 1997

Highlights

Over 16 years overseeing permitting and hardbottom monitoring for coastal projects throughout Florida

Registrations/Certifications

Dive master, Dry Suit Specialty Diver, Rescue Diver, Enriched Air Nitrox Diver, Advanced Diver, Open Water Diver

Emergency First Responder (CPR, 1st Aid, AED), DAN O2 Administration

BOEM and NMFS Protected Species Observer

Professional Affiliations

Member, Florida Shore and Beach Preservation Association (FSBPA)

Member, American Shore and Beach Preservation Association (ASBPA)

Member, Florida Association of Environmental Professionals (FAEP)

Member, National Association of Environmental Professionals (NAEP)

Member, American Academy of Underwater Sciences (AAUS)

Member, Divers Alert Network (DAN)

Employment History

CPE 2019 – Present

APTIM 2006 – 2019

NCRI 2001 – 2006

outreach on behalf of the County to support their coastal program and communicate project details and environmental monitoring results.

Lido Key Beach Nourishment Program, City of Sarasota, FL

Ms. Floyd is responsible for state and federal environmental permitting, agency coordination, development of environmental monitoring plans, and permit compliance tracking for beach nourishment projects on Lido Key. Ms. Floyd managed the seagrass mitigation coordination for the federal Lido Key Hurricane and Storm Damage Reduction Project (HSDR) Project, including overseeing a seagrass survey in Big Sarasota Pass and performing a Uniform Mitigation Assessment Method (UMAM) analysis to determine the appropriate amount of mitigation for impacts to the seagrass in the borrow areas. She coordinated with the City of Sarasota, USACE, FDEP, NMFS, and USFWS to evaluate and identify a suitable mitigation site, determining that Manatee County's Perico Preserve, located in the same watershed as the Lido Key HSDR Project, has the optimal conditions for harvesting and transplanting 2.9 acres of seagrass. She assisted the City of Sarasota and Manatee County in developing a Site Agreement for management of the mitigation area, coordinated a boundary delineation of the site, and assisted Manatee County in modifying their Perico Preserve state and federal permits to incorporate the Lido Key seagrass mitigation area. The seagrass transplantation is currently scheduled for summer 2020, and Ms. Floyd will oversee the pre- and post-construction mitigation surveys.

Panama City Beach Erosion Control and Storm Damage Reduction Project, Bay County, FL

Ms. Floyd oversees permitting and agency coordination for the beach nourishment projects in Panama City Beach. Obtained a flexible permit modification for the 2013/14 project, which provided Bay County the option to construct their project utilizing offshore dredged sand or upland truck hauled sand and assisted with permit compliance and lighting survey coordination. In support of permitting, she prepared a BA and EFH Assessment. She is currently supporting the County in planning and coordination with the USACE, USFWS, and NMFS for the upcoming federal beach nourishment project.

Captiva and Sanibel Islands Beach Nourishment, Lee County, FL

Ms. Floyd assists the Captiva Erosion Prevention District (CEPD) with state and federal permitting and agency coordination beach nourishment and dune projects for Captiva and Sanibel Islands. Ms. Floyd managed permitting and a hardbottom investigations in support of an expanded offshore borrow area for the 2013 Captiva and Sanibel Islands Project and is currently helping the CEPD with planning for their 2020/21 renourishment project.

Sectors 5 and 3 Beach and Dune Restoration Projects, Indian River County, FL

Ms. Floyd assisted with permitting and preparation of an Environmental Assessment and implements the hardbottom biological monitoring for the Sector 5 Beach and Dune Restoration Project. Ms. Floyd assisted with environmental permitting and hardbottom reconnaissance survey for Sector 3 and provided third party review and comment on the County's Uniform Mitigation Assessment Method (UMAM) analysis to assess any mitigation requirements.

Katy Brown
Marine Biologist

Aptim Environmental & Infrastructure, LLC
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kathryn.brown@aptim.com; 561.361.3181

Professional Qualifications

Katy Brown has applied experience in biological and environmental science since 2005, with experience in Florida since 2007. This experience includes marine habitat characterization of natural and artificial reef communities, coastal wetland biological surveys, and protected species surveys. She also assists with preparation of environmental documents required in order to obtain state and federal permits for coastal projects, including Environmental Assessments (EA), Environmental Impact Statements (EIS), Biological Assessments (BA) in support of ESA Section 7 Consultation and Essential Fish Habitat (EFH) assessments in support of the Magnuson-Stevens Fishery Conservation and Management Act. She routinely leads field survey operations as well as analyzes and prepares data for final reports and deliverables.

Sample Projects

Environmental Documentation & NEPA Compliance

Ms. Brown prepared environmental documents in support of National Environmental Policy Act, Endangered Species Act Section 7 Consultation, and Magnuson-Stevens Fishery Conservation and Management Act on the following projects:

- Southern Palm Beach Island Comprehensive Shore Stabilization Project Environmental Impact Statement, Biological Assessment and Essential Fish Habitat Assessment, Palm Beach County, Florida
- Environmental Assessment, Sector 5 Beach and Dune Restoration Project, Indian River County, Florida
- Environmental Assessment, Golden Triangle Marsh Creation Project, Louisiana

Biological Monitoring/Assessments

Ms. Brown performed biological monitoring/assessments including assessment of natural and artificial habitat function via *in situ* methodologies on the following projects:

- City of Deerfield Beach Recreational Artificial Reef Project
- City of Deerfield Beach Vessel Exclusion Buoys Project
- Hillsboro Blvd. Water Main Upgrade Project – Seagrass Survey
- Post-Hurricane Irma Structural Assessment of the International Fishing Pier

Education

Master of Science, Marine Biology, Nova Southeastern University, Fort Lauderdale, Florida, 2016

Bachelor of Science, Environmental Science, Fordham University, Bronx, New York, 2006

Highlights

More than 10 years of marine biology experience

Experience includes marine habitat characterization of natural and artificial reef communities, coastal wetland biological surveys, and protected species surveys

Registrations/Certifications

PADI Dive Master, 2008

AAUS Scientific Diver, 2008

Enriched Air Nitrox Diver, 2006

PADI Rescue Diver, 2007

PADI Advanced Diver, 2006

PADI Open Water Diver, 2005

Emergency First Responder, CPR, 1st Aid, AED

DAN O2 Administration

Divers Alert Network (DAN) Member, 2005

Professional Associations

AAUS Dive Control Board

Member, Ecological Society of America, 2016

Associate Sigma Xi Member, 2006

Member, Florida Shore and Beach Preservation Association

Member, American Shore and Beach Preservation Association

- Hillsboro/Deerfield Beach Nourishment Project – Immediate Post-Construction Nearshore Hardbottom Biological Monitoring
- Segment II Shore Protection Project, Broward County, Florida
- Southern Palm Beach Island Comprehensive Shoreline Stabilization Project, Town of Palm Beach, Florida
- Coquina Beach Restoration Project, Manatee County, Florida
- Collier County Beach Renourishment, Collier County, Florida
- Borrow Areas VI-E and III-B Hardbottom Investigation, Captiva and Sanibel Islands Beach Restoration Project, Lee County, Florida
- Sarasota Bay Estuary Program, Artificial Reef Monitoring Project
- Walton County NRDA Artificial Reef Monitoring, Walton County, Florida
- North Topsail Beach Shoreline Protection Project, North Topsail Beach, North Carolina
- Elder Point Marsh Restoration Project, Jamaica Bay Unit, Jamaica Bay, New York
- Golden Triangle Marsh Creation Project, Lake Borgne, Louisiana
- System Wide Assessment and Monitoring Program (SWAMP) Phase II, Coastal Louisiana
- Indian River County Sector 3 Beach and Dune Restoration Project, Biological Hardbottom Characterization
- Indian River County Sector 5 Beach and Dune Restoration Project, Biological Hardbottom Monitoring

Protected Species Observation/Enumeration Surveys

Ms. Brown has conducted Protected Species Surveys on the following projects:

- Pompano Pier Replacement Project, NMFS Recommended Survey Protocol of *Acropora* spp. and dune survey for the endangered plan Beach Jaquemontia, Broward County, Florida
- Bahia Icacos Waterway Barrier System, Former Vieques Naval Training Range, Vieques Island, Puerto Rico
- Delray Beach Sixth Periodic Renourishment Reef Mapping and Listed Coral Survey

Shara Teter
Marine Biologist

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Education

Master of Science, Marine Biology and Coastal Zone Management, Nova Southeastern University, Dania Beach, Florida

Bachelor of Science, Biology, Central Connecticut University, New Britain, Connecticut

Highlights

Specific experience in GIS, coastal, and marine biological surveying

Scuba diver

12 years of experience

Registrations/Certifications

PADI Divemaster, 2014

AAUS Scientific Diver, 2013

Enriched Air Nitrox Diver, 2009

PADI Rescue Diver, 2006

PADI Advanced Diver, 2005

PADI Open Water Diver, 2003

Emergency First Responder, CPR, 1st Aid, AED

DAN O2 Administration

Divers Alert Network (DAN) Member, 2003

Professional Qualifications

Shara Teter joined APTIM in February 2015, bringing with her extensive experience in marine and coastal biological surveying, scientific SCUBA diving, and Geographic Information Systems (GIS). Ms. Teter has 12 years of experience in marine and biological sciences, and her GIS experience spans over 10 years. She routinely conducts assessments in marine and estuarine habitats, including quantitative benthic assessments, fish census, habitat mapping using aerial imagery, *in situ* habitat mapping of resources, as well as statistical analysis and report production. Before working for APTIM, she worked as a GIS Technician for the Fort Indiantown Gap National Guard Training Center Engineering Department, and as a member of U.S. Environmental Protection Agency Region 3 GIS Team in the Environmental Assessment & Innovation Division. She also served as a marine biology research assistant for the Guy Harvey Research Institute where her main duties were performing GIS spatial data analysis, investigating the habitat use and spatial movement patterns of elasmobranchs, and conducting marine research in the field.

Sample Projects

Biological Monitoring/Assessments

Ms. Teter performed biological monitoring/assessments including assessment of natural and artificial habitat function via in situ methodologies on the following projects:

- City of Deerfield Beach Recreational Artificial Reef Project
- Hillsboro Blvd. Water Main Upgrade Project – Seagrass Survey
- Post-Hurricane Irma Structural Assessment of the International Fishing Pier
- Hillsboro/Deerfield Beach Nourishment Project – Immediate Post-Construction Nearshore Hardbottom Biological Monitoring
- Segment II Shore Protection Project, Broward County, Florida
- Southern Palm Beach Island Comprehensive Shoreline Stabilization Project, Town of Palm Beach, Florida
- Coquina Beach Restoration Project, Manatee County, Florida
- Collier County Beach Renourishment, Collier County, Florida
- Sarasota Bay Estuary Program, Artificial Reef Monitoring Project
- Walton County NRDA Artificial Reef Monitoring, Walton County, Florida

- Indian River County Sector 3 Beach and Dune Restoration Project, Biological Hardbottom Characterization
- Indian River County Sector 5 Beach and Dune Restoration Project, Biological Hardbottom Monitoring

Protected Species Observation/Enumeration Surveys

Ms. Teter has conducted Protected Species Surveys on the following projects:

- Pompano Pier Replacement Project, NMFS Recommended Survey Protocol of *Acropora* spp., Broward County, Florida
- Delray Beach Sixth Periodic Renourishment Reef Mapping and Listed Coral Survey

Daniel Hope
Marine Scientist

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Education

Master of Science, Biological Oceanography, Florida Institute of Technology, Melbourne, Florida, 2016

Bachelor of Science, Biology, Brigham Young University, Rexburg, Idaho 2013

Highlights

More than 6 years of experience in biological and environmental projects in south Florida

Registrations/Certifications

AAUS Scientific Diver

Advanced Diver

Enriched Air Nitrox Diver, 2017

PADI Open Water Diver, 2013

Emergency First Responder, CPR, 1st Aid, AED

DAN O2 Administration

Divers Alert Network (DAN) Member, 2003

Over 800 AAUS dives

Professional Qualifications

Daniel Hope is a Marine Scientist and has over 6 years of experience with biological and environmental projects in south Florida and recently joined APTIM.

Sample Projects

Biological Monitoring/Assessments

- Indian River County Sector 5 Beach and Dune Restoration Project

Experience prior to APTIM

Marine Scientist/Oceanographer Ocean Latitudes, Deerfield Beach, FL November 2019 –Present

- Ocean Latitudes functions as a contractor to help manage, plan, and conduct coastal and environmental projects
- Currently contracted by Environmental Tracing LLC to plan, manage and conduct a multi-million-dollar sediment transport project for the Army Corps of Engineers around four inlets of southeast Florida
- Boat Captain/Field Operations Manager for the project leading four other crew members
- Use ADCPs, ROVs, side scan sonars, bathymetry systems, navigation packages (Trimble, Hypack), tide and turbidity meters, and many sediment sampling tools to monitor sediment transport
- Build, deploy and service $100,000 worth of scientific instruments on 7 different steel bottom mounts (4x4x4 sq ft) off the coast of Florida.
- Perform statistical analyses and write technical reports

Environmental/Marine Consultant Coastal Eco-Group, Deerfield Beach, FL October 2016 –May 2020

- Professional consultant for 12+ simultaneous biological and environmental projects in southern Florida
- Conducted dozens of environmental assessments, mitigation designs, and remediation projects
- Projects range from coastal reef impact assessments to soil and water quality of coastal bays and lagoons to coastal protection and re-nourishments
- Over 800 AAUS dives and 1,000 Boat Hours
- Mapped 30+ miles of reef systems and 20+ miles of seagrass beds while snorkeling or diving
- Used Trimble units, Hypack and GIS to survey and map
- Acquire environmental permits from various government agencies
- Manage and write technical reports for governments and other clients and prepare and present findings in large venues

- Perform continuous statistical analysis on environmental data and create maps, graphics, and tables for visualization tools
- Manage and perform vigorous QA/QC process of project data

Oceanographer/Environmental Scientist Florida Tech, Melbourne, FL August 2014 – December 2016

- Managed and coordinated a long-term multi-million-dollar environmental assessment project for restoration purposes
- Results directly influenced a 0.5% county tax increase to raise $300M in 10 years (Brevard County, FL)
- Managed and conducted monthly soil and water quality assessments to evaluate human and natural pollutants in coastal lagoon
- Identified marine organisms in coastal systems
- Provided consulting involving organic materials in the soil and water and the effects on the environment
- Acquired environmental permits from various government agencies
- Involved in modeling water and sediment transport
- Built rapport with clients, government representatives, and private entities.
- Responsible for technical reports and provided consulting help
- Engaged in decision-making with county representatives and environmental engineers
- Was interviewed on numerous occasions and was quoted and pictured in Florida Today, Crimson Tide newspaper, a documentary, and company websites

Brad Rosov, MS

SENIOR MARINE BIOLOGIST

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PROFESSIONAL QUALIFICATIONS

Brad Rosov brings over 18 years of environmental permitting, documentation, and coastal fieldwork experience to the team. Mr. Rosov has developed a comprehensive understanding of the NEPA process and has developed strong skills in drafting NEPA compliant documents including Environmental Impact Statements (EIS), Environmental Assessments (EA), Essential Fish Habitat Assessments (EFH), Biological Assessments (BA), and Cumulative Effects Assessments (CEA) in support of various projects. Along with NEPA compliance, Mr. Rosov has worked extensively with USACE and the State of North Carolina through their permitting process to obtain the necessary permits to clients in a timely manner. Permits obtained from USACE include both Individual Permits and General Permits while the permits obtained from the State of North Carolina have been both Minor and Major CAMA permits. Permit modifications have been sought and subsequently issued for project circumstances that warrant such actions. Along with permits, Mr. Rosov has coordinated with other Federal and State agencies to obtain the required certifications and concurrences. Lease agreements with BOEM have also been obtained to allow for the use of offshore sand sources.

Mr. Rosov has also demonstrated the ability to design and conduct a wide array of field studies including water quality monitoring, salt marsh monitoring, hardbottom/coral reef assessments, submerged aquatic vegetation (SAV) monitoring, and shellfish assessments. As lead biologists for several coastal projects throughout North Carolina, Mr. Rosov has ensured the delivery of high-quality reports, NEPA documents, and permit applications in a timely manner while maintaining effective relationships with clients and agency personnel.

RELEVANT EXPERIENCE

Multi-Town Cooperative Beach Nourishment Project (Towns of Duck, Southern Shores, Kitty Hawk, and Kill Devil Hills), Dare County, North Carolina

Mr. Rosov lead the permitting and environmental documentation efforts on behalf of four different local governments as they collaborated with Dare County on the Multi-Town Cooperative Beach Nourishment Project. He oversaw the development of three separate Environmental Assessments (EAs), a "batched" BA, and EFH assessment in coordination

Education

M.S., Marine Biology, University of North Carolina at Wilmington, Wilmington, North Carolina 2001

B.S., Biology with a concentration in Neuroscience, University of Delaware, Newark, Delaware 1997

Highlights

Has led numerous permitting and environmental documentation efforts for clients throughout North Carolina and Florida

Experience with biological monitoring efforts associated with biota found in coastal North Carolina and Florida

Registrations/Certifications

BOEM Protected Species Observer

Professional Association of Diving Instructors (PADI) Enriched Air Nitrox Diver (IANTD/EANx)

Licensed FAA Part 107 Remote Pilot, Unmanned Aircraft System (sUAS), 2019, License No. 4247236

NC UAS Aviation Operators Certification

Professional Affiliations

Member, American Shore and Beach Preservation Association (ASBPA)

Member, North Carolina Beach, Inlet, and Waterway Association

Employment History

CPE 2020 – Present

APTIM 2007 – 2020

University of North Carolina at Wilmington 2005-2007

The Nature Conservancy 2001-2005

with four different federal agencies and in compliance with NEPA regulations. Due to the large-scale of this project, an abundance of biological, environmental, and information pertaining to human interest factors were included in these documents. Permit applications were assembled and submitted to North Carolina's Division of Coastal Management and USACE within a timely manner, such that the project could move towards construction as scheduled.

Shallowbag Bay Channel Maintenance Project, Dare County, North Carolina
Over recent years, the navigability within the Federal navigation channel spanning between the Town of Manteo and Shallowbag Bay has been compromised due to shoaling. As such, safe and reliable recreational boating opportunities have been limited within the area. In addition, this continued shoaling has prevented the Elizabeth II, a representative 16th century sailing ship, from navigating into Roanoke Sound from its home berth at Festival Park. Mr. Rosov has lead efforts associated with obtaining the necessary permits and authorizations to allow the County to perform the required maintenance dredging. Due to concerns over contaminants within the disposal material, he has coordinated extensively with numerous State and Federal agency personnel to determine the appropriate means of disposing of the material.

Permitting of a New Dredge to Maintain Oregon Inlet, Dare County, North Carolina
Dredging is necessary to maintain safe and reliable transportation routes through waterways. Oregon Inlet is no exception. Despite considerable efforts on the part of the USACE, State, and Dare County, shoaling continues to impede mariners and has resulted in the U.S. Coast Guard's inability to properly position navigation buoys within the channel. As a result, the risk of damage to vessels and injury to people continues. Due to a federal funding shortfall, the USACE has been unable to maintain navigation through the inlet. As such, Dare County is seeking to obtain permits to operate a new privately-owned dredge that will operate within Oregon Inlet. Mr. Rosov also drafted an Environmental Assessment and other NEPA documents to support this effort. He submitted a Coastal Area Management Act (CAMA) major permit application to the State and an Individual Permit application to the USACE- both permits have been obtained by Dare County.

New Hanover County Water Quality Monitoring Program, Wilmington, North Carolina
Since 2007, Mr. Rosov has managed a long-term water quality monitoring within a network of nineteen monitoring stations within seven tidal creeks within New Hanover County. Physical, chemical, and biological data obtained on a monthly basis have been used to determine trends inform County managers on ways to help improve the water quality within these creeks. Mr. Rosov compiles and analyzes this data in order to prepare annual reports.

Ocean Isle Beach 30-Year Island-Wide Shoreline Management Plan, Ocean Isle Beach, North Carolina
The Town of Ocean Isle Beach proactively sought permits allowing for beach nourishment along the entirety of the Town's 5.1-mile long oceanfront shoreline which would serve as protection from erosion caused by chronic and storm-induced erosion. Mr. Rosov lead the permitting and environmental documentation effort by coordinating with numerous state and federal agencies and drafting an Environmental Assessment, a Biological Assessment, and an Essential Fish Habitat assessment.

Ocean Isle Beach Shoreline Protection Project, Ocean Isle Beach, North Carolina
Mr. Rosov led the effort to develop an EIS, BA, and EFH for the Town's terminal groin project. Early in the process, he helped convene interagency meetings and a public hearing. He coordinates with engineering and geotechnical staff to ensure that the project design will be permittable through the NEPA process.

Michael Lowiec, PSM
Project Surveyor & Geomatics Manager

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Professional Qualifications

Michael Lowiec is a registered Florida Professional Surveyor and Mapper in technical charge of field and office operations for our Geomatics Department. He is responsible for the design of field phases of all surveys and reviewing all topographic and hydrographic survey data including multi-beam and single beam sounder surveys, beach profiles, inlet and shoal surveys, borrow area surveys, port and harbor surveys, and coastal structure surveys. Mr. Lowiec prepares permit required physical monitoring survey reports, private and public sovereign submerged land leases and easements, certified survey maps and drawings. He oversees land-based survey tasks including boundary surveys, right of way verification, mean high water surveys and is involved with the platting of erosion control lines. Mr. Lowiec has extensive knowledge of conventional and GPS-based survey methods and is trained and approved to use the National Geodetic Survey OPUS-Projects for establishment of GPS networks and control monuments.

Education

Bachelor of Science, Marine Science, Coastal Carolina University, Conway, South Carolina, 2002

Highlights

16 years of mapping and surveying experience

Registrations/Certifications

Professional Surveyor and Mapper, Florida, License No. #6846

National Geodetic Survey Opus-Project Manager

Hypack Certified

Professional Associations

Member, Florida Surveying and Mapping Society

Member, National Society of Professional Surveyors

Member, Hydrographic Society of America (south Florida regional contact)

Sample Projects

Surveyor, City of Deerfield Beach, Canal Hydrographic Survey, Broward County, Florida
Mr. Lowiec was the surveyor of record and in technical charge of the hydrographic survey of approximately 3.5 linear miles of 16 canals in the City of Deerfield Beach. Five longitudinal transects were surveyed through each of the canals and depth were collected at 5-foot intervals. Data was analyzed and presented to the City.

Surveyor of Record, Indian River County Multibeam Survey
APTIM was contracted by Indian River County to conduct a hydrographic survey of the south borrow area using a Reson Seabat 7125 SV2 multibeam system. The survey was conducted aboard APTIM's 24-foot Privateer survey vessel. An Applanix POS MV aided by Real Time Kinematic Global Positioning System (RTK GPS) was used for position and tide corrections.

Lead Surveyor, Collier County Beach Profile and Inlet Surveys
Mr. Lowiec served as the lead surveyor in technical charge of all field and office operations for beach profile and inlet surveys conducted for Collier County from 2007 to 2010. Survey work included topographic and hydrographic beach profiles for FDEP-required physical monitoring of County beaches from Delnor-Wiggins State Park to South Marco Island. The work also included hydrographic surveys of Doctors Pass, Wiggins Pass, and Clam Pass. All work resulted in certified survey reports and maps submitted to FDEP.

Project Manager/Surveyor of Record, Broward County Beach Profile Surveys, Mean High Water Survey and Erosion Control Line Establishment

Mr. Lowiec served as the surveyor of record and was in technical charge of field and office operations for the Broward County Beach Profile and Mean High-Water Line survey for the establishment of an Erosion Control Line. Beach profiles were collected throughout the entire county as well as a Mean High-Water survey in the area of the Segment II project area. Mr. Lowiec coordinated with the relevant state agencies and performed the work in compliance with Chapter 161.141 of the Florida Statutes. A final certified map was produced and delivered to the Florida Department of Environmental Protection and the Division of State Lands. APTIM has also provided permit required annual monitoring from 2015 to 2020 consisting of topographic and hydrographic beach profiles from FDEP monument R-25-R-85.

Project Manager, Miami Dade County-Krome Detention Center Topographic and Boundary Survey

Mr. Lowiec was the surveyor of record and Project Manager for a topographic and boundary survey for the Miami-Dade County Krome Detention Center expansion project. This survey was conducted for a 114-acre parcel according to the American Land Title Association Standards.

Surveyor of Record, 2016 Captiva and Sanibel Annual Monitoring Surveys, Lee County, Florida

Mr. Lowiec was the surveyor of record and in technical charge of the 2016 topographic and hydrographic monitoring surveys of the beach and offshore areas for the Captiva and Sanibel Nourishment project. The monitoring data is necessary in order for both the CEPD and the FDEP to continually observe and assess beach conditions. Monitoring surveys are further needed to continually observe the performance of the nourishment project and to assess effects of the project on adjacent shorelines.

Additional Project Experience

- One-Year Post Construction Topographic and Hydrographic Monitoring Survey and Report, Delray Beach, Florida
- Right-of-Way Verification and Topographic Survey for Miami-Dade Public Works, NE 16th Avenue Corridor Project
- Jupiter/Carlin Pre-Construction Topographic and Hydrographic Survey and Report
- A1A Beach Repair Project Topographic and Hydrographic Survey and Report, Fort Lauderdale, Florida
- Topographic Monitoring Project 24-Month Survey, The Breakers Hotel, Florida
- Monitoring Project and Report, Siesta Key, Florida
- Pre-Construction Topographic and Hydrographic Survey and Report, Delray Beach, Florida
- Post-Construction Topographic and Hydrographic Survey and Report, Delray Beach, Florida
- Wide Topographic and Hydrographic Monitoring Surveys and Report, Miami-Dade County, Florida
- Physical Monitoring Survey and Report, Lido Key, Florida
- Multi-Beam Survey, Port of Miami, Florida
- Hardbottom Edge Multi-beam Survey, Broward County, Florida
- Physical Monitoring, Captiva and Sanibel Island, Florida
- Pre- and Post-Construction Surveys and Report, Lido Key, Florida

Jeffrey L. Andrews, PSM, CH
Director of Operations, Coastal and Marine Science

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Education

Master of Science, Ocean Studies, Nova Southeastern, University, Davie, Florida, 1995

Bachelor of Science, Marine Science, University of North Carolina, Wilmington, North Carolina, 1979

Highlights

Over 36 years of experience in hydrographic surveying

Well versed in undertaking surveys in offshore and navigable channel environments using the latest state-of-the art equipment

Registrations/Certifications

Certified Inshore Hydrographer, License No. #104, 1998

Professional Surveyor and Mapper, Florida, License No. LS5805, 1998

Professional Associations

Member, The Hydrographic Society of America

Member, National Society of Professional Surveyors

Member, Florida Society of Professional Surveyors

Professional Qualifications

Jeffrey Andrews is a Director of Operations for APTIM and oversees the coastal and marine aspects of all projects. He has extensive experience in hydrographic and land surveying. He is well versed in undertaking surveys in a variety of environments using the latest state-of-the art equipment. He has conducted hundreds of marine investigations and mapped more than 100 million cubic yards of beach compatible sand on the continental shelf. Mr. Andrews has directed hydrographic and land surveys in Florida, Georgia, North Carolina, Virginia, New Jersey, New York, Massachusetts, Alabama, Louisiana, Texas, Alaska, Puerto Rico, Brazil and the Bahamas. He prepared hydrographic and topographic survey reports, including technical writing and supervision of data analysis. With over 36 years of experience, he continues to manage and direct hydrographic, topographic and geophysical data collection along the Gulf and Atlantic coasts. Mr. Andrews was awarded FSBPA's Per Brunn Distinguished Service Award in recognition of his role as an industry leader and innovator of methods and standards to locate and deliver the highest quality of sand for Florida's beaches.

Sample Projects

Hydrographic Surveyor, City of Deerfield Beach, Canal Hydrographic Survey, Broward County, Florida
Mr. Andrews oversaw the hydrographic survey of approximately 3.5 linear miles of 16 canals in the City of Deerfield Beach. Five longitudinal transects were surveyed through each of the canals and depth were collected at 5-foot intervals. Data was analyzed and presented to the City.

Surveyor of Record, Physical Monitoring & Permit Compliance Services, Anna Maria Island, Manatee County, Florida, 2017
The annual physical monitoring services include the permit required survey data and aerial photography collection and preparation of the survey report and engineering monitoring report submittals for the projects on Anna Maria Island, including the Central Beach Project (2014), Coquina Beach Project (2014), the Longboat Pass Geotextile Tube Project (2012), and the Cortez Groins Project (2016).

Surveyor of Record, Captiva and Sanibel Annual Monitoring Surveys, Lee County, Florida, 2017
Mr. Andrews directed the 2017 topographic and hydrographic monitoring surveys for the Captiva and Sanibel Nourishment project. The physical monitoring of Captiva and Sanibel Islands included topographic and hydrographic surveys of the beach and offshore areas. The monitoring data is necessary for both the CEPD and FDEP to continually observe and assess beach conditions. Monitoring surveys are further needed to continually observe the performance of the nourishment project as well as assess effects of the project on adjacent shorelines.

Surveyor of Record, Long Key State Park Topographic Survey, Long Key, Florida, 2017
Mr. Andrews was the surveyor of record and in charge of all field and office operations for the Long Key Topographic Survey. The survey included a mean high-water survey, location of improvements within the campsites, topography of the beach, and location of subsurface utility designations.

Project Director, Barataria Basin Bathymetry, CPRA, Barataria Basin, Louisiana
As part of the System Wide Assessment and Monitoring Program (SWAMP) implementation in Barataria Basin, APTIM provided hydrographic and geophysical survey services within selected coastal lakes and bays. A full suite of hydrographic and geophysical instrumentation was deployed, including sub-bottom, sidescan sonar, magnetometer and single beam sounder. Data was collected within Barataria Bay, Little Lake, Lake Salvador Lac des Allemands, The Pen, Lake Cataouache, Bayou Perot and Rigolettes and other major hydrographic pathways. Mr. Andrews served as the principal representative responsible for all matters pertaining to the project and project execution in accordance with the contract and the project's HSE, project security, quality, schedule and financial goals. Project challenges included collecting hydrographic and geophysical data in South Louisiana shallow bays, lakes and bayous to map oyster reef and potential sand deposits.

Additional Project Experience

- Delray Beach, Florida, Pre-Construction Hydrographic Survey (2013-2016)
- Manatee County, Florida, Beach Survey (2013, 2014, 2016)
- Captiva Island, Beach and Offshore Surveys 2016
- Lido Key, Florida, Beach and Offshore Survey (2009, 2015)
- Manatee County Port Dolphin Pipeline, Florida, Offshore Survey (2010)
- Captiva and Sanibel Islands, Florida, Beach Survey (2014, 2015, 2016)
- Redfish Pass and Blind Pass Bathymetric Surveys (2015)
- Cameron Meadows, Louisiana, Sand Resource Investigations (2015)
- BOEM, Louisiana, CR at Significant Sand Extraction Areas (2015)
- Panama City Beach, Florida, Beach and Offshore Survey (1998, 2009)
- Anna Maria Island Offshore Survey (1998)
- Captiva Island Borrow Area Bathymetric Survey (2005, 2008)
- Dade County, Florida, Erosion Monitoring Hydrographic and Topographic Survey (2013)
- Port of Miami, Florida, Side Scan Sonar Survey and Multibeam Survey (2012)
- Atchafalaya River, Louisiana, Multibeam Survey (2011-2012)
- Shell Island, Louisiana, Borrow Area Bathymetric Survey (2011)
- Longboat Key, Florida, Beach and Offshore Survey (2010)

Beau Suthard, PG
Geophysicist

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Professional Qualifications

Beau Suthard manages APTIM's coastal and marine geophysical and geotechnical services from our Tampa office. Mr. Suthard has over 18 years of experience in marine geosciences. He has conducted dozens of marine investigations and mapped hundreds of millions of cubic yards of beach compatible sand on the Atlantic and Gulf of Mexico continental shelves. Mr. Suthard recently completed a large-scale sand resource inventory mapping project for BOEM offshore of the Atlantic Coast of the United States from Massachusetts to Florida. This project has resulted in the identification of over 250 million cubic yards of beach compatible restoration materials for various coastal communities along the Atlantic seaboard.

Sample Projects

Project/Technical Manager, Geophysical and Geological Data Acquisition: Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources, the Atlantic Sand Assessment Project. Atlantic Outer Continental Shelf (OCS) – United States Bureau of Ocean Energy Management

Suthard served as both the Project Manager and Technical Manager for the Atlantic Sand Assessment Project (ASAP) to coordinate stakeholder and project needs and acquire geophysical and geological data, over three years along the east coast of the United States from Florida to Maine to support identification, characterization, and delineation of OCS aggregate mineral resources for use by coastal communities in future coastal restoration efforts. This project consisted of the collection of 7,089 km of new geophysical data, 340 new vibracores, and 100 surface grab samples over the course of two years.

Marine Geophysicist, Florida Department of Environmental Protection, US Bureau of Ocean Energy Management (BOEM) Atlantic Sand Assessment Project (ASAP) Reconnaissance Data Processing and Interpretation

Mr. Suthard processed and interpreted the geophysical and geotechnical data collected offshore Florida during the 2015 BOEM ASAP reconnaissance survey. APTIM was tasked with delineating preliminary borrow areas in six counties (eight study areas) that met a minimum cut thickness of 3 feet after applying a 2-foot buffer over

incompatible material. APTIM processed and interpreted all chirp sub-bottom data to determine potential sand thicknesses and output of

Education

Master of Science, Geological Oceanography, University of South Florida College of Marine Science, St. Petersburg, Florida, 2005

Bachelor of Science, Marine Science (Geology Track), Eckerd College, St. Petersburg, Florida, 1997

Highlights

Over the last 18 years assisted in the identification of tens of millions of yards of beach-compatible sand resources.

Registrations/Certifications

Professional Geologist, Florida, License No. 2615, Active

Professional Geologist, Virginia, License No. 2801001948, Active

Professional Geologist, Delaware, License No. S4-0001296, Active

Professional Geoscientist, Louisiana, License No. 746, Active

Professional Geoscientist, Texas, License No. 12902, Active

Professional Affiliations

Member, Florida Shore and Beach Preservation Association (FSBPA)

Member, American Shore and Beach Preservation Association (ASBPA)

Member, Society of Exploration Geophysics (SEG)

Member, Geological Society of America (GSA)

Member, American Geophysical Union (AGU)

interpreted thickness for each area. Sidescan sonar and magnetometer data were processed to identify and avoid any potential hazards or protected resources. Out of the eight study areas offshore six Florida counties, APTIM was able to delineate 16 preliminary borrow areas consisting 54,477,396 cubic yards of potentially beach-compatible sand resources. Each preliminary borrow area was reviewed and classified as a "Potential" or "Unverified" sand resource in accordance with the Southeast Florida Assessment and Needs Determination (SAND) study conducted by the USACE and FDEP.

Marine Geophysicist, Anna Maria Island Shore Protection Program, Manatee County, Florida
Mr. Suthard served as a Marine Geophysicist for a series of full geologic mapping studies, including both field operations and office-based data processing and interpretation. The goal of this project was to identify and define offshore borrow areas of beach-compatible sand in support of the Anna Maria Island Central Beach Storm Damage Repair Project, the City of Anna Maria and Coquina Beach Nourishment Projects and the Central Anna Maria Beach Renourishment Project. Mr. Suthard assisted with investigations to map and identify potential mitigative artificial reef construction sites. He also conducted mapping, planning, and regulatory and client coordination to determine the potential impact of a proposed natural gas submarine pipeline to Manatee County's offshore sand resources.

Program/Project Manager, Town of Longboat Key Comprehensive Beach Management Program, Florida
Mr. Suthard has served as the Program and Project Manager of APTIM's coastal projects with the Town's Comprehensive Beach Management Program since 2010. His responsibilities included managing project proposals, budgets, and execution management with APTIM's teams of engineers, geologists and biologists. In his Program Management role, Mr. Suthard assisted the Town in many ways, including representing the Town at meetings with regulatory agencies and presenting project details to the Town Commission and at public workshops. He has specifically managed the Town's Phase I, II, and III offshore sand searches in support of state and federal permitting for beach restoration projects. Mr. Suthard also assisted the Town with review, comment and negotiation of impact solutions from a potential offshore infrastructure project (Port Dolphin) being developed through beach compatible sand resources identified by the Town. This resulted in an agreement allowing the Town time to dredge these resources prior to the project's implementation with cost sharing funds from the developer.

Program/Project Manager, Pinellas County Coastal Management Program, Florida
Mr. Suthard has been the Program and Project Manager of APTIM's coastal projects with the Pinellas County Coastal Management Program since 2007. His duties include project and client management for all aspects of the County's coastal management programs, including project proposals, budgets, and project implementation with APTIM's multidisciplinary staff of engineers, geologists and biologists as needed. He has managed the design and implementation of both a reconnaissance-level sand search and a design-level sand search to locate and permit sand resources for the Sand Key Shore Protection Project. Mr. Suthard also managed and assisted with the development of a comprehensive Summary Planning Document, which described every one of the County's coastal program elements in terms of their history, current status and potential future needs as well as Capital Improvement budget predictions for each element through 2020.

Coty Granger
Survey Chief/Technician

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Professional Qualifications

Mr. Granger joined APTIM in 2014 and has a background in topographic survey utilizing RTK GPS, and hydrographic survey collecting offshore bathymetric data with single beam sonar systems. Mr. Granger has experience leading land and small vessel surveys, and he also has experience in data reduction and interpretation. Lastly, Mr. Granger has experience in the collection and registration of 3D terrestrial laser scanning.

Sample Projects

Survey Chief, City of Delray Beach Seawall Vulnerability Study, City of Delray Beach, Florida, 2017-2019
APTIM was contracted by the City of Delray Beach to perform a citywide intracoastal Waterway seawall and stormwater outfall inspection, which included 1000 seawalls and 100 stormwater outfalls. Mr. Granger was responsible for leading the survey crew in the field.

Survey Chief, San Remo Bulkhead and Dock Replacement, San Remo Condominium, Boca Raton, Florida, 2018-2020
Mr. Granger was responsible for leading the survey crew in the field to replace the aging bulkhead along the Intracoastal Waterway and interior boat basin.

Field Chief, Indian River County, FL Multibeam Survey, Vero Beach, Florida 2019
APTIM was contracted by Indian River County to conduct a hydrographic survey of the south borrow area using a Reson Seabat 7125 multibeam system. The survey was conducted aboard APTIM's 24-foot Privateer survey vessel. An Applanix POS MV aided by Real Time Kinematic Global Positioning System (RTK GPS) was used for position and tide corrections.

Survey Technician, Lewis Creek Spillway Vulnerability 3D Laser Scan and Topographic Survey, Willis, Texas, 2016-2017
Mr. Granger was responsible for the data collection and field operations in an effort to calculate the movement and displacement of a failing dam used to drain the Lewis Creek Spillway in Willis, Texas. Data Collection included a 3D laser scan as well as topographic data in and around the spillway. Survey control was established, and the 3D scan data was georeferenced with RTK GPS.

Education

Associate of Arts and Sciences, Niagara County Community College, 2012

Highlights

6 years of surveying and mapping experience

Proficient with RTK GPS

Proficient with 3d laser scanning

Registrations/Certifications

Class A CDL Driver's License

Analytical Techniques/ Equipment Proficiency

Real-Time Kinematic (RTK) GPS systems

Odom Hydrotrac single beam sonar

Faro 3d X330 laser scanner

Vibracore and bottom sample collection and processing

YSI Sonde 6600

Survey Technician, Krome Detention Center Topographic Survey, Miami, Florida, 2016
Mr. Granger was responsible for survey data collection during the Krome Detention Center Topographic and Boundary Survey in Miami, Florida. The work included the location and verification of existing parcel boundaries as well as location of all improvements, overhead utilities, and location, inverts, and material for storm and sanitary sewers. APTIM delivered a final signed and sealed survey map to the client to aid in planning and construction efforts. This survey met the minimal technical standards for the American Land Title Association.

Survey Technician, Broward County Mean High Water Survey and Erosion Control Line Establishment, Broward County, Florida, 2015
Mr. Granger was responsible for the field operations and data collection for the Broward County Mean High Water Line to establish the Erosion Control Line for the FDEP and the Division of State Lands.

Scott Tillman
Captain/Technician

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Highlights

More than 13 years of surveying and mapping experience

Proficient with RTK GPS

Registrations/Certifications

Class A CDL Driver's License

Analytical Techniques/ Equipment Proficiency

Real-Time Kinematic (RTK) GPS systems

Odom Hydrotrac single beam sonar

Faro 3d X330 laser scanner

Vibracore and bottom sample collection and processing

YSI Sonde 6600

Professional Qualifications

Scott Tillman is a Boat Captain and Survey Technician for APTIM. Mr. Tillman has experience in many coastal and marine applications including, offshore profile lines, nearshore profile lines, inlet bathymetric survey, dive tender & radio operator, ADCP deployment /retrieval, core collection, rod & level profile line survey, control recon survey, upland profile line surveys, dune and vegetation mapping, locate control points, checking and setting of control points, and sand sampling and analysis.

Sample Projects

Survey Technician, Miami-Dade Annual Beach Profile Survey, Miami-Dade County, Miami-Dade, Florida

APTIM is a pre-qualified survey and engineering firm with Miami-Dade County, and has performed Beach Profile surveys on all of the County Beaches since 2004. APTIM has performed the permit required survey several times during our time under contract with the County. APTIM utilizes state-of-the-art survey technology to perform all tasks including Real Time Kinematic Global Positioning Systems, dynamic motion compensators, and highly accurate digital sounders to ensure a top quality product for the County. APTIM has always performed the tasks within the allotted schedule and within budget. APTIM completed this survey again in April 2014. A total of 154 profiles stations were surveyed. All work was conducted underneath the direct supervision of a Florida Registered Surveyor and Mapper. Mr. Tillman was responsible for hydrographic survey data acquisition.

Survey Technician, Port of Miami Hydrographic Survey, Miami, Florida

The Port of Miami contracted APTIM to provide hydrographic survey services in support of current port expansion and improvement projects. Surveys included a detailed single beam and multi-beam hydrographic survey, a sidescan sonar survey, and a Coda Echoschope survey of several areas of the port. RTK GPS was utilized for positioning and on the fly tide corrections of the data. Mr. Tillman was responsible for navigation and safety of the survey vessel as well as the set-up of the RTK GPS and tide measurements.

Quin Robertson, PhD, GISP

SENIOR SCIENTIST

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PROFESSIONAL QUALIFICATIONS

Dr. Robertson's research focuses on using conventional survey and remote sensing data to quantify change in coastal morphology and develop models from these results using GIS to aid in coastal mitigation. Since 2010, Dr. Robertson has been advising the Fire Island communities, the City of Long Beach and Texas General Land Office on beach nourishment and coastal engineering efforts. Dr. Robertson has several projects with the US Army Corps of Engineers conducting studies, compiling and disseminating online geodatabases, and creating tools for analyzing LiDAR data sets for both storm induced and long-term applications along with multiple projects with the Environmental Protection Agency (EPA) in applying SLOSH modeling to predict storm surge. Dr. Robertson utilizes his coastal geologic expertise to manage and supervise multiple sand search projects from New York to Texas. Dr. Robertson will lead all sand search and geophysical/ geotechnical investigations under this contract.

RELEVANT EXPERIENCE

Regional Sediment Management, Nationwide
Dr. Robertson is currently Project Manager of an online GIS database developed for USACE's Regional Sediment Management (RSM) program. RSM placement is quantified (beneficial use vs. disposal) under multiple categories. Tools were developed to improve use of sediments and identify RSM opportunities to compare sediment characteristics of channel and beach disposal areas. These tools were written to ingest USACE nationwide and District data, identify and standardize project names, assign disposal codes and quantify sediment placement metrics.

LiDAR Elevation Change Analysis, Gulf of Mexico and East US Coastline
Dr. Robertson was Project Manager for a Florida Gulf of Mexico to Maine LiDAR elevation change analysis for USACE's Joint Airborne LIDAR Bathymetry Technical Center of Expertise (JALBTCX). The project quantified coastal change from more than 2,000 LiDAR data sets on 3,290 km of Gulf of Mexico and east US coastline utilizing a grid-based approach to measure shoreline and volume differences within GIS using a custom Python-coded system. Volume change was quantified by bins along the coastline and summarized in terms of the total positive, negative, net and normalized volume change. The final products were a geodatabase that contained the extracted metrics along with the series of tools that

Education

Doctor of Philosophy, Geosciences, Florida International University, Miami, Florida, 2007

Certificate, Geographic Information Systems, Florida International University, Miami, Florida, 2004

Master of Science, Geology, Florida International University, Miami, Florida, 2002

Bachelor of Arts, Geology, Skidmore College, Saratoga Springs, New York, 1997

Highlights

Over 20 years of project management, GIS, sand search, remote sensing and conventional survey experience

Registrations/Certifications

Professional Geologist, NY, 1213

Geographic Information Systems Professional, Nationwide, 45100

Professional Affiliations

Member, AGU

Member, ASBPA

Member, FSBPA

Member, American Society for Photogrammetry & Remote Sensing

Member, Coastal Education & Research Foundation

Member, Surfrider Foundation

Employment History

CPE 2019 – Present

APTIM 2007 – 2019

International Hurricane Research Center 1999 – 2007

Woods Hole Oceanographic Institution 1997 – 1999

executed the quantifications to enable further scientific and engineering research.

Southwest Florida ROSSI Borrow Area Update, FL
Dr. Robertson was Project Manager for updating FDEP's Regional Offshore Sand Source Inventory (ROSSI) database for southwest Florida. Assessed the sediment needs for several counties in southwest Florida. Historic bathymetric, seismic and geotechnical data were evaluated and used to identify offshore sand sources that meet predetermined sediment characteristics. Sediment sources were assigned categories and volumes for each source were calculated.

Hurricane Irma Emergency Coding, Southeast US
Dr. Robertson was Project Manager for coordination with JALBTCX on required edits to existing Python code. Edits included streamlining the existing code to initially process difference grids, add additional capability to process surfaces in tile or mosaic format, streamline MHW volumes by reducing steps, reduce hands-on time, and add capability to report metrics in multiple units.

Panama City Beach, FL
Dr. Robertson has participated in multiple projects for Panama City beaches. The most recent project involved utilizing existing LiDAR data to generate DEMs and contours of the beach and surrounding dunes. This required application of various types of custom filters to ensure that the beach morphology was preserved while non ground objects were removed. The bare earth contours were used to help design locations for dune planting and fence installation. Other projects include geophysical and geotechnical data collection, analysis, borrow area design and reporting.

Delray Beach, FL
Dr. Robertson generated bathymetric DEMs from existing LiDAR and bathymetry data sets for input into morphologic models, to determine locations of previous dredging, and aid in planning future nourishment projects. He collected, processed and displayed high-resolution multi-beam data to detect the edge and height of reefs. Dr. Robertson has supervised the 2019 geophysical and geotechnical borrow area data collection, along with the forthcoming borrow area permitting and design.

Broward County, FL
Dr. Robertson managed the 2008 LiDAR bathymetric data collection offshore of Broward County. More than 13 million points were used to generate a DEM illustrating the offshore geomorphic and benthic features. Bottom reflectance data were converted to grids that identified variations in sea bottom characteristics that aided benthic habitat classification.

Habitat Mapping, Marquesas, FL
Dr. Robertson was project manager of a benthic habitat mapping project interpreted from satellite imagery in the Marquesas and Quicksands area offshore of the Florida Keys. More than 1,300 km^2 of benthic habitats that are essential for developing management strategies that balance the protection of these habitats with their use were mapped. Image enhancement techniques like color band subtraction and application of various filters were applied to the images that significantly increase areas that could be mapped, especially in deeper environments. Habitats were mapped using "heads-up" digitizing of pan-sharpened color IKONOS satellite imagery by identifying color and texture patterns and confirmed in the field using georeferenced drop and dive supported cameras. Map interpretations were based on NOAA's classification scheme for mapping shallow-water coral ecosystems of southern Florida. Deliverables included benthic habitat maps, metadata, and all ground validation imagery.

Angela Belden, FAA Drone Pilot
GIS/CAD Director

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Professional Qualifications

Angela Belden has over 30 years of experience working with various GIS, CAD and engineering programs. She directs all GIS operations for APTIM's coastal restoration offices, and is responsible for the management of personnel, software, and resources that provide GIS and Computer Aided Engineering/Drafting (CAE/CAD) service and product support to all of our regional offices and clients. She advises the groups Remote Sensing and Spectral Analysis Applications, including geoprocessing, archival in spatial databases and the creation of maps and visualizations. Ms. Belden has served as a Project Manager for many 3D scanning/BIM efforts where responsibilities included proposal preparation, scope of work development, level-of-effort and pricing determination, scheduling, BIM execution plans, and product development.

Ms. Belden possesses a broad range of experience with geospatial technologies ranging from database design, integration, data validation and integrity, specializing in complex GIS file translations between widespread digital formats. She also directs all CAD documentation development and software applications. She has successful project and resource management experience and has provided both geospatial and information management technical support on numerous projects.

Ms. Belden has served as a Project Manager for GIS-oriented projects where responsibilities included proposal preparation, scope of work development, level-of-effort and pricing determination, and scheduling and budget oversight. She has authored and presented papers at multiple GIS conferences.

Ms. Belden is experienced in a variety of information technologies, from ESRI's suite of GIS products to graphic design packages such as Adobe Illustrator and Photoshop. In 2000, her project management experience began with environmental resource mapping in Broward County, and has extended to more than 17 GIS benthic habitat mapping projects from Texas to North Carolina. Ms. Belden specializes in customized GIS products that clients require for public distribution.

Education

Associate of Science, Business Management, New Hampshire Technical Institute, 1985

Highlights

Over 30 years of experience working with various GIS, CAD and engineering programs

Registrations/Certifications

AutoCAD 2013 Certified Professional

AutoCAD 2011 Civil 3d Certified Associate

Certification in Metadata for Geospatial and Biological Metadata-USGS 2002

FAA Part 107 sUAS Airman Remote Pilot, 2016

Training

ESRI Enterprise Dbase Development and Management, 2007

Certified Autodesk Civil 3-D Training, 2006

USGS Metadata for Geospatial & Biological Data Training, 2002

ESRI GIS Training; University of Florida, 1995 1996, 2000

Certified Autodesk Training, 1995, 2000, 2001, 2006

Certified Eaglepoint Survey Software Training, 1994, 2000

Certified Microstation Training, 1993

Heather Vollmer, GISP
GIS Analyst

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Professional Qualifications

Heather Vollmer is a GIS analyst with over 17 years of experience in GIS data creation, maintenance, data mining, remote sensing, spatial analysis, and GPS ground truthing. Since joining APTIM in 2006, Ms. Vollmer has been involved with the preparation of benthic and geologic resource mapping for numerous permit applications for beach nourishment projects along the coasts of Florida, North Carolina, Louisiana, New York, and Alabama.

Sample Projects

Ms. Vollmer is responsible for all GIS spatial analysis, data creation, maintenance, and QA/QC, supporting report documentation (figures, tables, technical write-ups). A selected listing of Ms. Vollmer's project experience is provided below:

- City of Delray Beach Fifth Periodic Renourishment, Florida
- Broward County Segments II and III Shore Protection Projects, Florida
- Reach 7, Phipps Ocean Park Mitigative Reef Monitoring Project, Town of Palm Beach, Florida
- Ocean Ridge Shore Protection Project, Palm Beach County, Florida
- Southern Palm Beach Island Comprehensive Shoreline Stabilization Project, Town of Palm Beach, Florida
- Anna Maria Island Shore Protection Project, Manatee County, Florida
- Town of Longboat Key Beach Renourishment Project, Florida
- Town of Longboat Key North End Renourishment and Structural Stabilization Project, Florida
- Town of Longboat Key Breakwater Project, Florida
- South Siesta Key Beach Renourishment Project, Sarasota County, Florida
- City of Sarasota 10th St. Boat Basin Maintenance Dredging and Seawall Replacement Project, Sarasota County, Florida
- Lido Key HSDR Project, Sarasota County, Florida
- Coquina Beach Restoration Project, Manatee County, Florida
- Collier County Beach Nourishment Project, Collier County, Florida
- Captiva and Sanibel Islands Beach Restoration Project, Captiva Island, Lee County, Florida
- Wiggins Pass Maintenance Dredging and Navigation Improvement Project, Collier County, Florida

Education

Master of Science, Environmental Studies, Florida International University, Miami, Florida 2010

Bachelor of Science, Environmental Studies, Stockton University, Galloway, New Jersey 2003

Highlights

17+ years of GIS data creation, maintenance, remote sensing analysis, ground truthing, and field experience

More than 10 years of experience in ocean/coastal GIS in Florida

7 GIS scientific/technical publications

Registrations/Certifications

GIS Professional (GISP), GIS Certification Institute, Des Plaines, IL, 2011

Florida Master Naturalist-University of Florida IFAS

Certificate of Geographic Information Systems, Stockton University, Galloway, New Jersey, 2003

Training

ESRI ArcGIS/ 3.2-10.4, ArcPublisher 9.1-10.4, ESRI ArcGIS Enterprise Server, 3D Analyst Extension, Spatial Analyst Extension, 9.1-10.4

ERDAS - IMAGINE

USGS Digital Shoreline Analysts overSystem (DSAS)

Microsoft Access

IDRISI-Taiga

AutoCAD 2012

GIS Analyst, Interactive GIS Database, Town of Palm Beach, Florida
The goal of the Town of Palm Beach's interactive GIS database was to provide a functional tool to explore the data that pertained to the Town's coastal projects. Ms. Vollmer was in charge of creating the interactive interface, creating database structure, QA/QC the database, writing FGDC compliant metadata, performing data analysis for impacts and persistence of hardbottom resources.

GIS Analyst, Marquesas Benthic Habitat Mapping, Florida Keys National Marine Sanctuary, Florida Keys
This project used remote sensing techniques to map large areas of the Florida Keys National Marine Sanctuary from Key West to the Marquesas/Quicksands area. Ms. Vollmer's main role was to digitize interpreted habitats from IKONOS satellite imagery. She created codes for complex units, allowing end users to display units in their entirety or as simplified units. By utilizing additional remote sensing software, she was able to improve the interpretation of offshore reef benthic features within the imagery. She also assisted in processing in-situ video collection for verification of mapping units.

GIS Analyst, Coastal Vulnerability Geodatabase, International Hurricane Research Center, Miami, Florida
Ms. Vollmer researched how to utilize GIS methodologies to validate the many different types of storm surge models. By utilizing field data and the model outputs in reference to in-situ debris lines and high-water marks, she was able to show how each model performed in determining historical storm events.

Coastal Resource Database Librarian, Coastal Resource Database, Data Structure and Management, APTIM, Boca Raton, Florida
Ms. Vollmer is APTIM's coastal resource database librarian. She reformats and performs all QA/QC for database uploads as well as data mining for additional beneficial database information. She researches new technology and suggests future database management direction. She provides all in-house training and assists with the development of user documentation.

Tara Brenner, PG, PE

SENIOR COASTAL ENGINEER

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PROFESSIONAL QUALIFICATIONS

Tara Brenner, PG, PE, is a Senior Coastal Engineer for Coastal Protection Engineering (CPE). Since 2007, she has performed a variety of engineering services in support of beach nourishment projects throughout Florida, including permitting, engineering analysis, development of construction plans and specifications, construction observations, post-construction monitoring calculations, and report preparation. Ms. Brenner also has extensive experience with the incorporation of remote sensing and GIS tools into the geotechnical and environmental aspects of projects.

Ms. Brenner regularly presents at industry conferences, and public meetings in both formal and informal settings. As Project Manager, she works with clients to ensure project objectives and timelines are met, and that work products are of the highest quality.

Ms. Brenner also has experience with the application of drone and laser scanning technologies to supplement or replace *in situ* observations, where it can save time or money, and delivers cutting-edge interactive visual work products. Ms. Brenner has assisted with vibracore collection, hydrographic surveying, seismic data interpretation, and environmental monitoring for coastal projects. She has been responsible for data analysis, incorporating geotechnical requirements for state and federal permitting, and supporting borrow area design and project construction for a number of projects.

RELEVANT EXPERIENCE

Mid-Town Beach Nourishment Project, Town of Palm Beach, FL
Ms. Brenner performed construction observations on behalf of the Town during construction of the 2020 federal Mid-Town beach nourishment project. The project placed 700,000 cy of sand utilizing hopper dredges and screened the dredged material using the inline FRS Extractor-3300.

Sector 5 Beach and Dune Restoration Project, Indian River County, FL
Ms. Brenner performed construction observations and attended progress meetings as a Senior Coastal Engineer during the 2019 truck haul renourishment. Approximately 171,400 cy of sand from an upland mine were placed within the berm and dune using truck haul methods and Ms. Brenner observed material quality and placement activities.

Education

Master of Science, Civil Engineering, Florida Atlantic University, Boca Raton, Florida, 2012

Bachelor of Science, Environmental Geosciences, University of Notre Dame, South Bend, Indiana, 2007

Highlights

More than 12 years of coastal engineering and geology experience

Regularly works on Florida coastal projects from feasibility through construction, including field investigations, engineering design and permitting

Registrations/Certifications

Professional Engineer, Florida License No. 82305, Active

Professional Geologist, Florida, License No. PG2828, Active

BOEM and NMFS Protected Species Observer

PADI Open Water Diver, 2008

PADI Enriched Air Nitrox Diver, 2009

Professional Affiliations

Member, Florida Shore and Beach Preservation Association (FSBPA)

Member, American Shore and Beach Preservation Association (ASBPA)

Member, American Public Works Association – Gold Coast

Member, Divers Alert Network (DAN)

Member, University of Notre Dame Alumni Club – Boca Raton

Employment History

CPE 2019 – Present

APTIM 2007 – 2019

Delray Beach Coastal Program, City of Delray Beach, FL
As Project Manager for the City, Ms. Brenner is performing a variety of coastal consulting tasks to support Delray's Beach Nourishment Program including: public outreach events, assisting in securing state and federal project funding, annual physical monitoring surveys and engineering analyses, coordination with USACE regarding Hurricane Irma repairs, a sand search investigation, and preparing for the City's 6th Periodic Beach Renourishment in 2021, which is presently in the permitting stage to add a new sand source for the project. Ms. Brenner supported the recent FCCE Shore Protection Project, which repaired impacts from Hurricane Irma. The project was constructed February to March 2020, placing 365,000 cy in the project area. Throughout construction, she provided construction observations and updates to the City, attended meetings, assisted with public outreach, and monitored permit compliance throughout construction.

Atlantic Dunes Park Improvements (East), City of Delray Beach, FL
In ongoing work, Ms. Brenner is leading a multidisciplinary team to design and permit extensive improvements at Atlantic Dunes Park east of A1A including removal of exotic species, reconfiguration of the parking lot, bathhouse upgrades, a nature boardwalk, and playground. Ms. Brenner coordinates tasks among a team including: surveyors, coastal engineers, architects, landscape architects, civil engineers, electrical engineers, and playground designers. She communicates progress and acquires City feedback.

2019 Renourishments: Clam Pass Park, North Park Shore and Park Shore, Collier County, FL
Ms. Brenner served as Project Manager for Collier County's 2019 Renourishments: Clam Pass Park, North Park Shore and Park Shore. Park Shore beaches were nourished with sand from an upland mine, delivered via truck haul and conveyor methods. Ms. Brenner prepared construction plans and technical specifications for the County to bid the project, and supported the County through construction with permit compliance, reviewed contractor submittals and pay applications, participated in weekly progress meetings, and certified the project.

Panama City Beach Erosion Control and Storm Damage Reduction Project, Bay County, FL
Ms. Brenner supported the Bay County TDC as Project Manager for the beach nourishment projects in Panama City Beach. For the 2017 project, she assisted with hot-spot identification and development of project scope. She then conducted coastal engineering design in development of the construction plans and technical specifications. She led pre-bid, pre-construction and all during-construction progress and manages engineering analysis for post-construction annual monitoring. Ms. Brenner is currently assisting the TDC with planning and coordination with the USACE for a federal 1.5 MCY repair project.

South Lake Worth Inlet Dredging Design and Permitting, Palm Beach County, FL
Ms. Brenner is leading a team to design and permit a multipart dredge and disposal project for the County that will increase the capacity of their sand trap and perform maintenance dredging of the ICW and an adjacent boat channel. The team collected bathymetry and grab samples in 2019 and is performing engineering analyses on 3 dredge areas to determine what material will be placed in each of 3 disposal areas. The team will submit a permit modification request to state and federal agencies and also perform pre-, during-, and post-construction seagrass monitoring surveys.

St. Lucie South Jetty Assessment, Martin County, Florida
Ms. Brenner managed surveying, engineering, and biological observations of the South Jetty. This work compared traditional survey methods with 3D laser scan and drone photogrammetry. The assessment deliverables included engineering assessment report, drone video, georeferenced drone imagery, survey data, and georeferenced point cloud in an online platform. Having this baseline assessment, allowed for investigation of Hurricane Dorian impacts to the structure using post-storm drone imagery.

Chelsea Maly

JUNIOR COASTAL ENGINEER

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cmaly@coastalprotectioneng.com; 954-41-3909

PROFESSIONAL QUALIFICATIONS

Chelsea Maly earned a Bachelor of Engineering in Civil Engineering and is pursuing a Master of Engineering degree from the University of Florida in the field of Coastal and Oceanographic Engineering. Previously, she has worked in the field of Civil Engineering as an engineering intern. Throughout her school career, she has been heavily involved with the American Society of Civil Engineers, where she served as professional relations chair, community service chair, and treasurer. This involvement included planning educational outreach events with the community, coordinating with local professionals to host information sessions, and establishing a budget for the organization.

Ms. Maly has gained AutoCAD and ArcGIS experience through her participation in various projects and internships.

RELEVANT PROJECT EXPERIENCE

Hurricane Dorian Damage Report for the Town of Duck, Kitty Hawk and Kill Devil Hills, North Carolina
Ms. Maly performed engineering analyses to assist in the completion of the Post-Dorian Report for the Town of Duck, the Town of Kitty Hawk, and the Town of Kill Devil Hills. She gathered information from survey reports and calculated volumetric changes in order to provide details on the damages sustained by the Erosion and Shoreline Management Project from Hurricane Dorian.

PREVIOUS WORK EXPERIENCE

Duke Energy, Rock Hill, South Carolina
As a nuclear engineering civil design intern, Ms. Maly evaluated buried storm drainage systems and provided recommendation for remediation and repairs. She tested flow pumps to ensure proper drainage of reactor coolant and attended field meetings and inspected conditions of future improvement areas.

RS&H, Fort Lauderdale, Florida
During her internship, Ms. Maly reviewed plans and specifications for projects involving airport security and runway pavement design. She performed calculations to determine the most efficient materials for concrete repairs and designed project details within AutoCAD based on engineer descriptions and hand drawn sketches.

Education

Expected December 2020:
Master of Engineering, Coastal and Oceanographic Engineering, University of Florida, Gainesville, Florida

Bachelor of Science, Civil Engineering, University of Florida, Gainesville, Florida, 2019

Highlights

Relevant coursework experience in coastal processes, coastal engineering, and global sea level.

Passed Florida FE Exam September 2019

Registrations/Certifications

PADI Open Water Diver

Professional Affiliations

Member, American Society of Civil Engineers (ASCE) Student Chapter

Member, Divers Alert Network (DAN)

Employment History

CPE May 2020 – Present

Morjana Signorin
Numerical Modeler

Aptim Environmental & Infrastructure, LLC
2481 NW Boca Raton Blvd., Boca Raton, FL 33431
morjana.signorin@aptim.com; 561.361.3194

Education

Master of Science, Ocean Engineering, Florida Atlantic University, Ongoing

Master of Business Administration, Project Management, University of Itajaí Valley (UNIVALI), Brazil, 2013

Bachelor of Science, Oceanography, University of Itajaí Valley (UNIVALI), Brazil, 2010

Highlights

Over 10 years of experience in coastal modeling and data analysis of meteoceanographic data

Worked on over 30 numerical modeling projects in her career in Brazil and the United States

Advanced programming, GIS and meteoceanographic data collection and processing knowledge

Computational Skills

Delft3D, SWAN, SBEACH, UNIBEST, CL+, SWASH, Matlab, ArcGIS

Professional Qualifications

Morjana Signorin graduated in Oceanography in 2010, and in 2013 obtained her MBA in Project Management. She is currently pursuing a Master's degree in Ocean Engineering at FAU. Ms. Signorin has over 10 years of experience and has worked on over 30 projects focused on riverine and complex coastal systems. Along her career she has led several numerical modeling projects, which included engineering data analysis and in-depth analysis of coastal processes. She has conducted numerical modeling of currents, water levels, waves, storm surge, sediment transport, and morphology in several locations along the Gulf and East Coast of the United States. Ms. Signorin also has extensive experience in the application of GIS tools and meteoceanographic data collection. She has been involved in several coastal engineering projects where she provided engineering analysis support, performed construction observations, and preparation of technical reports. She regularly performs technical presentations at industry and academic conferences. Ms. Signorin will serve as Deputy Project Manager under this contract, communicating regularly with Ms. Brenner to coordinate services by APTIM for the City's projects.

Sample Projects

Mid-Town Beach Nourishment Project, Town of Palm Beach, FL

Ms. Signorin performed site visits and construction observations on behalf of the Town during construction of the 2020 federal Mid-Town beach nourishment project. She participated in project related meeting, working together with CPE (Tom Pierro) and providing assistance with coordination with the Army Corps and other agencies.

Southern Palm Beach Island Comprehensive Shoreline Stabilization Project – Environmental Impact Study, Town of Palm Beach, FL

Ms. Signorin performed numerical modeling of flow, waves, sediment transport, and morphology changes performed with Delft3D to evaluate the proposed beach management alternatives, including beach fill and groins, to access the potential hardbottom impact.

Beach Comprehensive Beach Management Plan, City of Deerfield, Florida

Ms. Signorin worked on the Beach Management Plan for the City of Deerfield Beach. She performed engineering calculations, assisted on the development of management alternatives, performed SBEACH vulnerability and resiliency analysis, performed and analyzed the beachgoers surveys to determine to determine the recreational value of the beach. Ms. Signorin was responsible for assisting in the writing of the plan and its accompanying appendices and performed throughout review of the documents.

Passage Key Inlet Management Study, Manatee County, Florida, ongoing
Ms. Signorin worked on the development of the sediment budget and is currently leading the setup, calibration, and application of the Delft3D numerical model developed for Tampa Bay region and specifically for the Passage Key Inlet and adjacent Anna Maria Island beach. The wave, flow, sediment transport and morphology models will be applied to evaluate effects of dredging potential sand borrow areas on the Passage Key ebb shoal. Combined with the developed sediment budget and the sediment properties database, model results will be used to evaluate the technical and environmental feasibility of borrow areas alternatives and support the permitting process.

Golden Triangle Marsh Creation Project, Coastal Protection & Restoration Authority, Orleans Parish, Louisiana, May 2017 – 2019
Ms. Signorin was the lead of the numerical modeling team on a project located in East Lake Borgne, LA, that aimed aim to evaluate the effects of the creation of a marsh area on the adjacent marshes and coastal system and the effects of the borrow area on the adjacent coastline. Delft3D model was used to simulate currents, waves, sediment transport, morphological changes, residence time and water quality.

Inlet Management Study of Redfish Pass and Adjacent Beaches, Captiva Erosion and Prevention District, Captiva, Florida, October 2016 – 2019
Ms. Signorin was the numerical modeler lead on the study that focused on study focused on the management strategy of striving to balance the sediment budget with sediment bypassing and evaluated the utilization of Redfish Pass as a supplemental sand source for Captiva Island. A comprehensive historical analysis of the area was performed, along with shoreline and volumetric changes analysis and the update of the sediment budget. The numerical modeling included borrow area alternatives analysis and to evaluate the technical and environmental feasibility of borrow areas alternatives and support the permitting process.

Hydrodynamics to Assess Circulation and Residence (Flushing) Time, Robinson Preserve, Manatee County, Florida, 2015
Assisted in the development of the Delft3D model to assess circulation and residence (flushing) time for the existing conditions and proposed design and sediment mobility analysis in the flushing channels.

Impacts on Design of Coastal Protection Structures, Thompson Engineering, Gulf State Park, Alabama, 2015
Ms. Signorin performed Delft3D, SBEACH and XBEACH numerical modeling of flow, waves and morphological changes to evaluate the impacts of extreme events to support the design of the coastal protection structures in Gulf State Park, Alabama.

Cameron Meadows Marsh Creation and Terracing, Borrow Area Development, Coastal Protection and Restoration Authority, Louisiana, 2015
Ms. Signorin performed Delft3D SWAN wave transformation numerical modeling developed to evaluate wave-driven erosion pattern along the beaches and shorelines north of the proposed borrow area.

Coastal Master Plan: Barrier Island Model Development (BIMODE), The Water Institute of the Gulf, Coastal Louisiana, 2015
Ms. Signorin performed SBEACH numerical modeling to evaluate cross-shore sediment transport along several profiles in Louisiana coast to determine critical thresholds of minimum barrier island widths and heights, as part of the development of a barrier shoreline model.

Staff Size of Key Participants

The key participants in this proposal are CPE and APTM, whose staff include coastal professionals and technical staff from multiple disciplines, including biology, survey, GIS/CAD, geology, and engineering. The specific personnel proposed to work on the Town's projects under this contract are shown on the organization chart at the beginning of this section; however, the Town has access to the full capabilities and staff at each firm as needed. A summary of CPE and APTIM coastal staff organized by discipline is provided in the table below.

No. of Individuals by Discipline	CPE	APTIM
Science/Biology	5	3
Survey, Mapping, GIS/CAD	2	6
Geology	1*	9
Engineering	10	9

*Tara Brenner holds a P.E. and a P.G. but is only counted as an engineer in this table. Quin Robertson also holds a P.G. but is counted as a GIS Professional in this table.

High Quality Level of Service to be Provided to the Town

Coastal Protection Engineering LLC (CPE) was founded in 2019 for the specific purpose of serving coastal communities with beach restoration and coastal protection expertise, including marine resource and assessment services. The firm is comprised of industry leading experts with decades of experience in Florida coastal programs and a deliberate focus on providing governmental clients with highly specialized consulting services in support of projects that restore, manage, and protect coastal resources and coastal infrastructure. CPE differentiates itself through a steadfast commitment to coastal communities and an uncompromising focus on technical excellence and consistent delivery of high-quality work products valued by our clients.

Having worked with the Town of Palm Beach under multiple previous Professional Service Agreement (PSA) contracts that include marine resource assessments and environmental permitting through APTIM and its legacy companies, our staff has developed a deep understanding and respect for the need to deliver a high-quality level of services to the Town. We know that Town staff operates in a dynamic environment responding to requests and concerns of the Shore Protection Board (SPB), Town Council, and the Town's residents and visitors alike. Over the years, we have been inspired by your staff's dedication to this high level of public service for which we support, appreciate, and reflect in our own responsiveness.

As an example of our commitment, our staff attends SPB and Council meetings on a regular basis at our own discretion to remain up to speed on current issues affecting the Town. Likewise, we have been available to assist with preparation of back-up for technical agenda items and related support whenever needed. We also remain on call for service, often responding in the moment of need, for knowledgebase support, technical advice, task order execution, and proactive planning needs. We appreciate this opportunity to further demonstrate our ever-growing commitment to the needs of the Town and commit to continuing to support your coastal program with the utmost attention and excellence.

2.1.3 Workload and Scheduling

Overall Workload

The CPE Team is committed to supporting the Town of Palm Beach to address all of your marine resource assessment and monitoring needs. We have the experience to develop achievable project timelines and to actively manage staff workloads to best serve the Town. Under the direction of our Principal Scientist, Lindino Benedet, our team will prioritize workloads accordingly to accommodate all components of your program. Our team is structured in a way that provides coastal professional expertise from our CPE office in Boca Raton and access to additional support from other CPE and APTIM coastal offices, as needed. As a small business locally established in Boca Raton with the backing of a large multinational corporation, we can address the City's project needs in a flexible and timely manner and can respond to sudden increases in workload due to unexpected events, such as an extreme storm, without disruption or delay.

We evaluated the current and projected workload of the personnel identified for this proposal and we are confident that there is sufficient capacity to meet the needs of the Town for the duration of the contract. This evaluation was based on workload forecasts and employee utilization rates. CPE project managers use a customized work management software, Scoro, that allows us to monitor workloads in real-time. We also project workloads quarterly (a year in advance) as a matter of internal business protocols, which allows us to accurately forecast project schedules and workloads of our team. This data allows managers to quantitatively determine appropriate staffing levels within the firm and allocate resources and personnel as needed. We foresee no time in the future where we would be unable to meet the Town's needs. Furthermore, as a new firm located in Palm Beach County with staff fully dedicated to coastal services, we are excited to demonstrate our ever-growing commitment to the needs of the Town.

Project Scheduling Ability / Timely Completion of Work

At the onset of each new work order, The CPE Team will work with the Town to develop a detailed, realistic work plan that meets the Town's project needs and fits within your budget. We will start by developing a schedule that identifies when the most critical elements are required for each phase of the work and schedule all associated tasks accordingly. This procedure ensures adequate lead-time for proper coordination, development of scopes of work, Town approvals, contracting, and scheduling of field equipment and personnel, which ultimately results in timely completion of our work. We routinely conduct biological monitoring for coastal projects throughout Florida and understand that state and federal permits typically require specific monitoring periods for each resource: hardbottom surveys are typically required to be conducted between May and September and seagrass surveys should be conducted during the growing season from June to September. Ideally, annual monitoring should be repeated as close to the same time each year for best comparison of results. Recognizing the importance of these permit requirements, we will also work with the Town to identify your preferred survey periods and will prioritize and accommodate those requests in our team's summer survey schedule. We will also ensure that deliverables such as raw data and monitoring reports are submitted to the Town and to regulatory agencies within the required submittal timeframes.

Schedule will Accommodate this Project

The CPE Team commits to meeting the Town's schedules and deadlines for requested services. We take pride in our proven success of completing our clients' projects on time and within budget. Project communication is a priority for our project managers and technical staff. We work with our clients to develop a detailed project schedule and track progress performance along the way, adjusting the overall schedule to accommodate any new developments as the project proceeds. The key to keeping a project on budget and on time is a detailed, realistic work plan that clearly identifies deliverables and key milestones. Our Project Manager, Stacy Buck, will provide the Town with monthly progress updates integrated with billing details as requested. Monthly reporting can also summarize the anticipated progress for the following month, as well as any critical issues that may affect the project schedule and budget. As in the past, The CPE Team will maintain open and timely communication and consult with Town staff, provide documents and recommendations for review, solicit feedback, and provide the services for communicating with agencies, stakeholders and the public.

Applicability of the Services Offered

Based on the comprehensive services detailed in the Scope of Work provided by the Town within this RFQ, we are confident that our team can successfully implement each task of your coastal program. The items in this solicitation are, in fact, the core services that The CPE Team expertly provides to our clients. Our team is comprised of a full staff of qualified marine and coastal professionals and scientists, including biologists, certified hydrographers, geophysicists, geologists, engineers, and computer-aided design (CAD) and GIS specialists. These professionals handle all phases of coastal projects from marine resource reconnaissance through design and permitting to construction management and post-construction monitoring. This foundation of engaging multiple scientific disciplines has delivered exceptional value to our clients through the entire process of project implementation. In particular, our marine biologists have extensive experience with all aspects of biological monitoring and have each conducted hundreds of scientific dives investigating marine resources in south Florida, including in the Town. Our biologists are FDEP-approved to conduct permit-required biological monitoring in Florida. We know the resources, are familiar with the BMA, understand the Town's monitoring program, and are prepared to implement all the items presented in the Scope of Work.

Meeting the Town's Operation and Administrative Requirements

As a longstanding professional service provider to the Town, The CPE Team understands the Town's operation and administrative requirements for working with consultants. We are currently contracted with the Town under an existing Professional Services Agreement, which allows us to quickly respond to a Town request for a proposal for a variety of services, including those requested by the Shore Protection Board. Once received, the proposal must be approved by the Town Council prior to processing as a purchase order (PO). As required by Town procurement, we will not commence work until the PO is issued.

Our team's local presence and experience working with Town staff over the past 15 years has provided us with an in-depth knowledge of the unique needs of your coastal program and the sensitive marine resources that characterize the nearshore and offshore marine habitat along the Town of Palm Beach. We understand the goals of the Comprehensive Coastal Management Plan (CCMP), which has been adapted over decades to address the objectives of the Town Council and recommendations of the Shore Protection

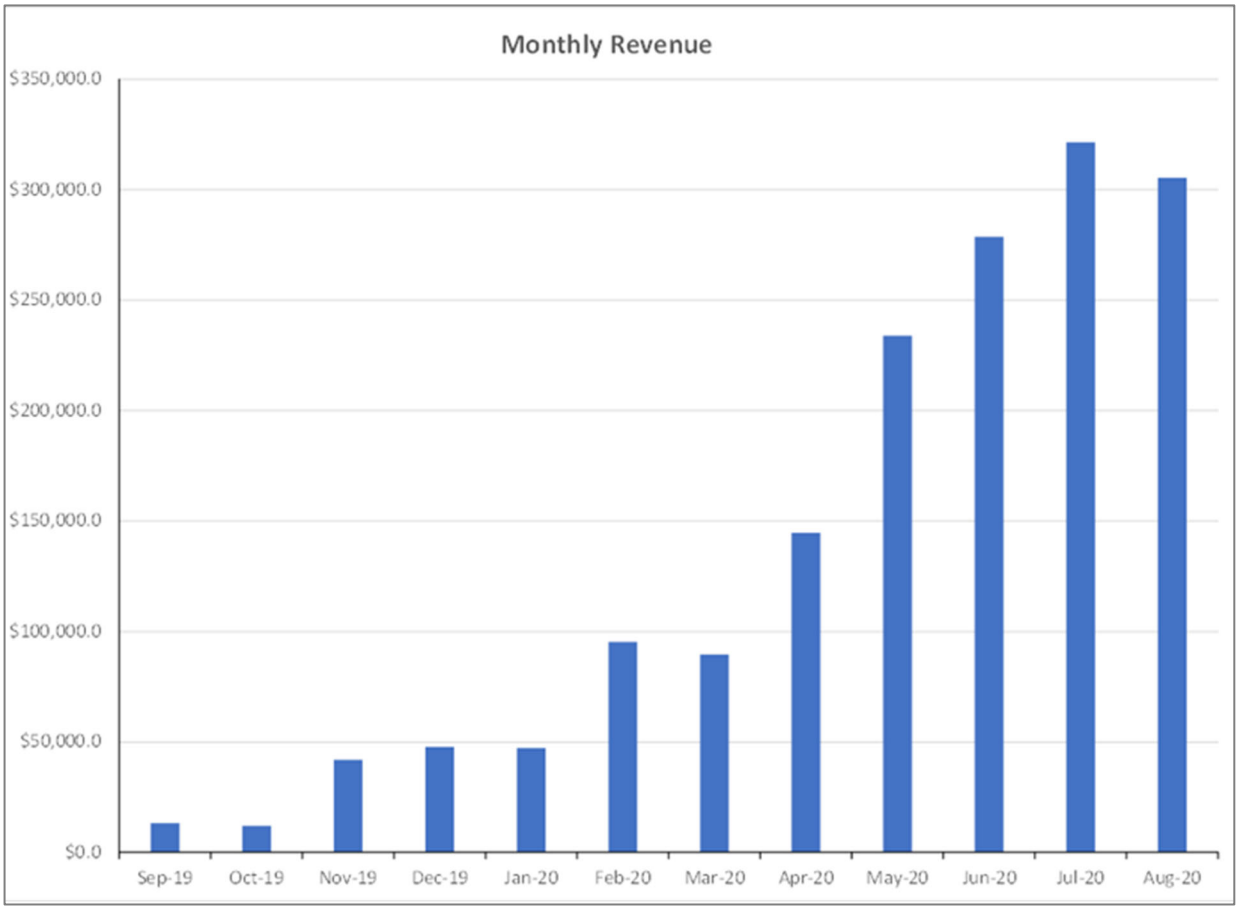
Board in an ever-changing regulatory climate. Town staff have maintained the integrity of the program over time by clearly defining its projects, providing independent peer reviews, including stakeholder input, and coordinating with agencies and neighboring communities. This steadfast approach has been further strengthened by the Town's integral role in the development of the BMA, which guides the Town's marine resource monitoring program. The CPE Team has been part of the BMA from its inception and worked with FDEP to obtain an Individual Project Authorization (IPA) for the Town-wide Groin Rehabilitation Project and IPA permit modifications for the Mid-Town groin and the Mid-Town Beach Nourishment projects. We also completed preparation of the Draft and Final Environmental Impact Statement (EIS) for the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project, paving the way for a stabilization solution for the Reach 8 shoreline.

With a robust organization dedicated to coastal services and a well-documented history of responsiveness to the Town, we fully understand the Town's operation and administrative requirements and we are confident that we can meet or exceed all of the requirements of the work that may result from this Request for Qualifications (RFQ). Having worked with your staff on virtually every aspect of your coastal program over the years, we have extensive experience and knowledge of your past, ongoing, and planned coastal projects and we are in positioned and prepared to help you continue to successfully monitor your marine resources.

2.1.4 Financial Information

CPE is registered with DUN & Bradstreet under the DUNS #117214443 and with the Federal Government under the CAGE #8F2E5. As a business formed in the middle of 2019, CPE does not have a full calendar year of financial information available; however, we are confident in the firm's ability to service the City if awarded a contract under this solicitation. The firm was initially funded by its three founding members and does not carry any debt from financial institutions or outside investors. As a result, we maintain the financial resources internally to fund the business with operating capital supported by cashflow for our staff of 19 employees, including 13 full time and 6 part time, for the foreseeable future and have no concerns with satisfying the requirements of the subject RFQ in serving the Town of Palm Beach.

CPE utilizes "Scoro" for our project management and project accounting system, which is a fully integrated, cloud-based, end-to-end business management software for professional services that streamlines our project workflow with live online updates of labor charges (timekeeping) and project accounts such as project expenses and subconsultant invoices. As further proof of the stability of the firm, the chart below evidences our revenue for the last several months, direct from Scoro to substantiate our finances. Despite recent challenges with the Covid-19 crisis, our small business continues to grow and, in addition to having no outside debt, our monthly revenue is consistently higher than our monthly operational cost. A full income statement for the most recent month/quarter can be provided to the Town upon request.



We have further strengthened our financial stability for this opportunity by adding APTIM as our key subconsultant, a large multinational corporation with thousands of employees and total revenue in excess of $1B. APTIM is a current City vendor and provides its own financial strength to The CPE Team.

APTIM's accounting system, Oracle's JD Edwards Enterprise One®, is an integrated software solution designed to provide internal accounting controls. APTIM has worked with Oracle to customize Enterprise One to deliver integrated data across payroll, accounts payable, billings, procurement, and job cost into one platform of accurate and timely financial data. These customizations also allow APTIM to produce client-specific tools and reports to enhance program management and provide full visibility.

2.1.5 Other

Overall Completeness, Clarity and Quality of Proposal

We understand the importance of providing a high-quality proposal that clearly outlines our experience, financial stability, technical resources, and approach. We take great pride in providing a comprehensive proposal that clearly demonstrates our understanding of your coastal program, addresses your needs, and elucidates the breadth and depth of our capabilities. We are confident that the Town will recognize the effort we put forth to generate a complete proposal that is clear and concise.

Accessibility of Firm

The coastal engineering headquarters of both CPE and APTIM are located in Boca Raton, Florida where our offices are staffed by professionals dedicated solely to coastal services. As a result, we are one of the few teams that can proudly demonstrate a local presence in Palm Beach County and direct experience with your program. Our personnel are available on a full-time basis in Palm Beach County to respond rapidly to the Town's needs. We are also available on an emergency basis, and we understand the importance of having surveys conducted before and immediately after storms to determine damages and secure state and federal funding for storm repairs.

Insurance Capacity / Capability

CPE holds all the required insurances to operate a professional services firm as an engineering business in the State of Florida. As proof of the firm's insurance capability, we have provided our insurance certificates under Section 1.1.3, identifying the Town of Palm Beach as the certificate holder for:

- Comprehensive General Liability, with limits of liability not less than $1,000,000 per occurrence.
- Professional Liability, with limits of liability not less than $1,000,000 per occurrence and 2,000,000 in general aggregate.
- Business Auto Liability, with limits of 1,000,000 per occurrence and 2,000,000 in general aggregate.
- Workers compensation/employer liability with limits of $1,000,000 for each accident, $1,000,000 disease and $1,000,000 (disease (policy limit), which exceeds the Town's requirements of $100,000 for each accident, $100,000 disease and $500,000 (disease (policy limit)

APTIM also has the ability to meet the insurance requirements of the RFP, which is demonstrated by their active contract with the Town.

Present and Future Litigation or Dispute and Resolutions

CPE has no ongoing litigation or dispute and resolutions.

As a major international construction and engineering company with operations around the world, APTIM, as a normal course of business, is engaged in legal actions in connection with engineering and construction projects, technology licenses, and other matters. These claims include employment-related claims and contractual disputes or claims for personal injury or property damage, which occur in connection with services performed relating to project or construction sites. APTIM does not currently believe that

pending contractual, employment-related personal injury or property damage claims will have a material adverse effect on our earnings or liquidity or ability to execute your project.

License Sanctions

Not applicable. CPE does not have any license sanctions.

Lost Accounts and / or Cancelled Accounts, Contract Denial

CPE has not lost or had any accounts cancelled. Nor have we had any contracts denied.