

Discipline/Specialty

- Project Management and Principal Engineer for Large Scale Multi-Disciplinary Coastal Restoration Projects
- Coastal Engineering Services, Coastal Structures, Planning and Design and Engineering
- Federal and State Permitting
- Sediment QA/QC Plans and Sediment Management
- Construction Contracting, and Construction Administration Services
- Sediment Budget Analysis, and Project Financing, and Public Education and Information Programs

Years of Experience

- 28 Years

Education

- M.E. 1984 University of Florida (Coastal Engineering)
- B.S. 1977 Florida Institute of Technology (Environmental Engineering)

**Awards/Committees/
Affiliations**

- Recipient, 2005 John G. Moffatt-Frank E. Nichol Harbor & Coastal Engineering Award (ASCE) Annual Award of Excellence
- President, Civil Engineering Certification Board, American Society of Civil Engineers

Registrations

- Professional Engineering Licenses: FL, NC, SC, AL & LA
- Minority Business Enterprise, State of Florida
- Small Business Enterprise (SBE), South Florida Water Management District

Employment History

- Erickson Consulting Engineers, Inc. (2000-2009)
- Applied Technology Management (1986-2002)
- Reynolds, Smith & Hills, ECE (1983-1986)

Summary of Qualifications

Karyn M. Erickson, P.E. is the President of Erickson Consulting Engineers, Inc. located in Sarasota, Florida. Ms. Erickson has 28 years of experience in applied coastal and estuarine engineering with a focus on solving coastal problems. She has successfully completed many large scale coastal construction projects including the Mason Inlet Relocation Project, the 10-Mile Longboat Key Beach Restoration Project, the Emerald Beach Restoration and the East Grace Bay and Pelican Point Breakwater and Beach Nourishment Projects in Providenciales and the Town of Palm Beach Nourishment Project. She was responsible for conducting all design and permitting work to reopen Midnight Pass for Sarasota County and the recently completed the planning, design and permitting for the Blind Pass Channel Maintenance Project. She has also completed many coastal engineering projects in the Turks & Caicos Islands over the past 22 years including a sand mapping and mining study for the country in 2007-08.

Detailed Discipline/Specialty**Coastal Structures****Bloody Point, Daufuskie Island, South Carolina**

Engineer of Record (EOR) for design, permitting, and engineering of 2 T-head groin structures (125 ft and 180 ft) located on Daufuskie Island, South Carolina. Construction administration services for the 125 ft sheetpile and rock T-head groin on the Atlantic Ocean was completed in 2007 with the 180 ft T-head structure planned for construction in 2010. As the EOR, Ms. Erickson provided all planning, design and engineering, permitting and construction administration services. Permits were obtained from the US Army Corps of Engineers and the South Carolina Office of Coastal Resources (OCRM). These structures were built to prevent the loss of a beach nourishment project constructed in 1999. The structure was built in 2007 to capture sand and protect expensive upland development. ECE has conducted 2 post-construction performance studies including sediment budgets, surveys and analysis of their development's 2 mile shoreline updrift of these structures.

Pelican Point Breakwater and Groyne and Sand Placement

As the Engineer of Record, conducted all work to design, plan and permit this granite stone structure including developing the project's design basis, storm erosion modeling, wave/scour analysis, structure toe depths/elevations and stone size requirements, schedule of quantities, cost analysis for a combination of a 160 ft groin and 168 ft breakwater constructed of granite with a stone tensor mattress to prevent subsidence. The structure was backfilled with 68,000 CY of beach quality sediment and completed in 2007. Alternative materials were considered and assessed to determine the final recommended design for the structure. Two post-construction monitoring surveys and analyses were conducted in 2007 and 2008 following the direct impacts of Hurricane Ike (Category 4).

East Grace Bay 160 ft T-Head Groin and Beach Nourishment

Engineer of Record for the design, plan and permit this structure including developing the project's design basis, shoreline modeling to assess sand movement in response to the structure, and wave and scour analysis were conducted to develop the recommended design. The final stone depths/elevations and stone size requirements, schedule of quantities, cost analysis for a combination of a 165 ft groin and 175 ft breakwater constructed of limestone with a stone tensor mattress to prevent subsidence. The structure was backfilled with 200,000 CY of beach quality sediment and completed in 2007. Alternative materials were considered and assessed to determine the final recommended design for the structure. Three post-construction monitoring surveys and analyses were conducted in 2007, and in 2008 to



assess the impacts of Hurricane Ike (Category 4) on the beach and structure, with the 2009 performance survey, analysis and report due for completion in December.

478 Foot Casey Key Steel Sheetpile Seawall, Casey Key, Florida

Coastal/civil engineer responsible for all planning and design, permitting, engineering and construction administration services for a 478 ft sheetpile seawall located on Casey Key. Developed design basis, alternative design levels based storm erosion analysis and modeling, wave/scour analysis, structure toe depths/elevations and set-backs to comply with County and State permit regulations. Hurricane storm characteristics and wave computations were performed to evaluate the cost and engineering requirements for varying site conditions and storm conditions to determine and recommend the optimal design for the structure. Wave forces and scour at the toe of the seawall structure during 15- and 25-year return period storm events were determined to develop the final recommended design for the seawall including construction materials and methods (push-in system vs vibratory). All County and State permits were acquired and construction commenced in 2009.

Bay Island Seawall Replacement, Siesta Key, Florida

EOR responsible for planning, design and permitting, construction documents and drawings for the removal and replacement of a deteriorated a 100+ft concrete seawall including design of pile cap, tie-backs, foundation soils and drainage. Upland drainage pipeline from an adjacent stormwater retention pond was also replaced and improved (construction to be complete by Dec 2009). Assessment of alternative improvements to existing 600 ft concrete seawall contiguous to the replacement section was completed with replacement planning, design and permitting services pending client decision to proceed (Sarasota County, Capital Improvements).

North Casey Key Sheetpile Seawall, Casey Key, Florida

Coastal/civil engineer responsible for all planning and design, permitting, engineering and construction administration services for a 300 ft sheetpile seawall located on north Casey Key. Developed design basis, alternative design levels based storm erosion analysis and modeling, wave/scour analysis, structure toe depths/elevations and set-backs to comply with County and State permit regulations. Wave forces and scour at the toe of the seawall structure during 15- and 25-year return period storm events were determined to develop the final recommended design. Several alternative seawall design configurations and materials were considered and evaluated.

Craven Seawall, North Captiva, Florida

Coastal/civil engineer responsible for design and permitting 150 ft sheetpile seawall located on North Captiva Island. Developed design basis, alternative design levels based storm erosion analysis and modeling, wave/scour analysis, structure toe depths/elevations and set-backs to comply with County and State permit regulations. Wave forces and scour at the toe of the seawall structure during 15-year return period storm condition were determined the optimal design level for the residence considering property value, low elevation and slab type foundation. The owner elected to relocate the residence landward and elevate the livable floors in 2009.

Third Turtle T-Head Groin and Terminal Groin with Beach Restoration, Turks and Caicos Islands

Project Director responsible for all coastal engineering services for the development of a marina bulkhead (sheetpile and rock) and oceanfront beach development on Providenciales. Project planning, design, permitting (including EIS) and design of a channel and bayside bulkhead, and a T-head limestone groin and beach nourishment project for the development. Permits and construction of the bulkhead sheetpile shoreline stabilization structure, terminal groin and T-head groin was recently completed. Channel dredging provides periodic sand quantities for placement onto the beachfront.

Casey Key Geotextile Container System Core Structure and Dune, Casey Key, Florida

Coastal/civil engineer responsible for all planning and design, permitting, engineering and construction administration services to construct a 850 ft geotextile container system within a constructed dune features and located on Casey Key. This is a highly unique structure that is 25 feet wide, 8 feet high and 850 ft in length and situated within the dune. Design was based on storm erosion analysis and modeling, wave/scour analysis, structure toe depths/elevations and set-backs to comply with County and State permit regulations. Wave forces and scour at the toe of the structure during 15- and 25-year return period storm events were determined to develop the final recommended design.



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Terminal Groin Extension Design at New Pass, Longboat Key, Florida

Ms. Erickson served as the EOR for the planning and design of an extension to a rock terminal groin structure constructed in 1997 at New Pass to protect upland property and beaches. Performed analysis and as studies to determine inlet channel dredging impacts and predominant coastal processes on the adjacent beaches in developing the design for an approx. 100 ft extension and rehab of the existing rubble mound structure (1992-95).

CR707 Vertical Seawall, Town of Jupiter Island, Florida

Project Engineer of Record responsible for managing all design, permitting, engineering, and bid and contract documents (general, technical and environmental specifications and construction drawings) and providing construction administration of a 550-ft vertical oceanfront sheetpile wall with a rock toe scour apron. This project was constructed for Martin County, Florida to protect a hurricane evacuation route and County road fronting on the Atlantic Ocean. Hurricane storm characteristics and wave computations were performed to evaluate the cost and engineering requirements for varying site conditions and storm conditions to determine and recommend the optimal design for the structure.

Vertical Concrete Seawall, Cedar Cove Townhomes, Cedar Key, Florida

Engineer-of-Record for the design of a gravity-type vertical concrete seawall fronting a pile-supported condominium development severely damaged by Hurricane Elena. An analysis of site-specific storm characteristics and associated wave forces was used to determine wave forces, scour at the toe of the seawall structure and rock stability during 15- and 25-year return period storm events. Several alternative seawall/revetment design configurations were considered and evaluated in developing the final design and engineering plans and specifications.

Siesta Key Beach Offshore Stormwater Discharge Pipeline, Sarasota, FL

Conduct all planning, design, permitting and engineering services for the directional drilling, diffuser and anchoring system for a new 3500 ft pipeline that will re-route the existing stormwater discharge to a deep water location. Project will alleviate County's problems with periodic water quality violations at a widely regarded top Florida tourist beach on Siesta Key. Work includes design changes to retention pond, pump station, discharge filtering and UV treatment system.

Offshore Pipeline Design for Industrial Distillery Discharge, Technical Consultants Group, Puerto Rico

Hurricane storm characteristics and wave computations were performed to determine the maximum hurricane induced wave conditions during several return interval storms. Responsible for analysis and determination of probabilities of recurrence for drag and lift forces on an offshore discharge pipeline. Located along the southern Puerto Rico coastline, design specifications were recommended for 25, 50, and 100-year return period storm events.

Expert Witness Testimony, Daufuskie Island, South Carolina, Confidential Clients

Performed site erosion and channel migration analysis along the inlet and beaches at Daufuskie Island, and prepared design drawings for a coastal structure to provide erosion control for the imminently threatened properties. Ms. Erickson provided expert witness testimony at 2 circuit court hearing in Beaufort County, SC (2002 and 2004) to support construction of a vertical seawall and 2 groins. This hearing requested temporary relief from severe inlet related erosion and challenged the State's establishment of the coastal setback lines. The Court found in favor of the plaintiff's and provided for the construction of a vertical seawall, with a subsequent hearing resulting in a negotiated settlement with the State agreeing to allow the owners 2 groins.

LaVelle Resort and Country Club Development, Reverse Osmosis Plant Discharge Pipeline, St. Kitts

Located along the northwest coastline of St. Kitts Island, design and final engineering specifications were developed in consideration of alternative storm design levels including a 25, 50 and 100-year return period storm event to establish the design basis of a discharge pipeline to an R/O Plant. Additionally, offshore marine habitats and shoreline conditions were mapped to develop the outfall pipeline positioning. Hurricane storm characteristics and wave computations were performed to evaluate the costs and engineering requirements for varying site conditions and probabilities of recurrence for drag and lift forces on the pipeline to recommend the final design for the pipeline. Responsible for final design, engineering and the construction plans and specifications.



Coastal Construction Control Line Permitting, City of Bradenton Beach, FL

Coastal engineering consultants to City of Bradenton Beach (2005 - 2007) responsible for evaluation of proposed developments located within the CCCL. Services required determination of design deficiencies and compliance to City's Coastal Development Codes. Recommendations for approval or denial of permit applications and providing expert witness services at Hearings related to consistency review also provided.

Commercial Docks and Marine Development Projects

Water Cay Construction Barge Landing and Jetty (Steel Sheetpile Wall and Fender System) EOR responsible for the planning, design, permitting, construction drawings and documents and contractor bidding and negotiations of a barge landing facility located at Water Cay in the Turks and Caicos Islands. A steel pile wall and fender system was designed to accommodate 5,000 ton barges and to provide for offloading and materials storage to support the construction of a crane system and offloading dock for a 600 acre resort development.

Cooper Jack Marina Plans, Permitting and Design, Providenciales, Turks and Caicos Islands, B.W.I

Project Manager for planning, design and engineering of an interior harbor and marina basin (8 acres), including a concrete wall fronting a 35 acre commercial-condominium development on Providenciales, BWI. This project included field studies, numerical modeling of flushing to design the basin, shoreline stabilization alternatives analysis, basin entrance channel design and permit drawings and environmental assessment documents for acquisition of permits. The project was constructed with ECE providing contract administration services related to the basin design in 2004.

Texaco Fuel Transfer Facility, Texaco Bahamas, Inc, Providenciales, BWI

Responsible for conducting Environmental Impact Studies to support construction and operation of a fuel transfer facility on a three acre site located east of "South Dock" on the island of Providenciales, BWI. The proposed facility includes six 25,000 gallon tanks for storage of gasoline, aviation and diesel fuel. Conducted design studies to evaluate the potential environmental effects of a spill of petroleum product from moored and/or docked vessels during the off-loading process, and an assessment of the impact of a spill on high risk areas/key ecosystems.

Marsh Landing Marina, Fletcher Development, Ponte Verde, Florida Provided design and planning services for a marina and resort development in Ponte Vedre including design and permitting. Design tasks included: evaluating alternative shoreline stabilization/protection measures, basin entrance channel stabilization, hydrodynamic modeling to assess water quality and effects of differing basin configurations for a 175-slip marina and an assessment of long-term dredging requirements for the Intracoastal Waterway adjacent to the project site.

Beach Nourishment

East Grace Bay Beach Restoration, Providenciales, Turks and Caicos Islands

Engineer of Record responsible for the planning, design and engineering for 4 T-head groins and beach restoration project fronting 5,000 feet of oceanfront shoreline. Project fronted an extensive coral reef system and sand resources are in limited supply. The project components of the shoreline restoration plan included: 4 limestone T-head groins (160 ft to 95 ft) and a 350,000 CY of sand dredged from an offshore sand source. Analysis using numerical modeling to predict shoreline adjustment after construction, alternative sand placement and groin configurations formed the basis for the final design. Biological mapping and sand source surveys and an evaluation of potential impacts of the proposed erosion control structures on adjacent shorelines was conducted. Sand source studies resulted in 2 borrow sites with final design and permitting (EIA) completed in 2006. Construction of the structures will be in 2 phases, phase 1 was constructed in 2007 and phase 2 is planned for 2011 based upon the findings of the monitoring studies.

Blind Pass Channel Reopening and Beach Nourishment Project, Lee County, Florida

Project engineer for the Blind Pass Project including conducting all channel excavation designs, and beach placement design. ECE prepared the JCP permit applications and final permit drawings and provided support services during the permitting phase. Ms. Erickson prepared the "Design Report" based upon the coastal engineering and design studies to



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determine the geometry for a new channel to restore flushing and tidal flows to Clam Bayou and Pine Island Sound estuarine complex. ECE developed a large scale circulation model of the Charlotte Harbor to San Carlos Bay entrance to evaluate alternative channel configurations and channel stability.

Mason Inlet Relocation and Beach Nourishment Project, New Hanover County, North Carolina

Project Director responsible for Project planning and design including the acquisition of all federal and state permits, pre-construction monitoring, long-range maintenance agreements and construction administration services for the relocation of Mason Inlet. This project excavated 900,000 CY of sediment to move Mason Inlet 3,000 feet north, closed the existing inlet and nourished 10,000 ft of beaches. Sediment management and Sediment QA/QC Plans were developed including containment areas for the treatment of unsuitable sediment (rock and fines). A hydrodynamic model was developed to assess potential impacts of the design channel configuration, depths and widths. A comprehensive Environmental Decision Document (EA) was prepared to the State of North Carolina and the U.S. Army Corps of Engineers for Project permit approvals. Ms. Erickson provided community outreach and developed a special assessment based financing plan to distribute the costs of the Project.

Casey Key Emergency Dune Construction, Nokomis, FL

Principal Engineer responsible for identification of sand sources to restore a severely eroded beach on Casey Key. As the Engineer of Record, design engineer responsible for analysis of alternative sediments, planning, design and permitting and construction phase services including dune restoration which was completed in a 5 month time frame.

Indian River County Beach Nourishment Program, Vero Beach, Florida

Ms. Erickson served as the Project Director from 1998-2002, for this Beach Nourishment Program to restore 8.3 miles of eroded beaches by placing 2.5 MCY of high-quality sand. This project obtained final permits and preparing construction contract documents for the Beach Nourishment: Project Sector 1 & 2 (Ambersand Beach) which was constructed in 2002-03. The final Project design was based on minimizing adverse environmental impacts to the extensive nearshore reef communities and maximizing project benefits and performance.

Water Cay Beach Nourishment and Groin Project, Water Cay, TCI

Responsible for the planning, design and permitting of East and West Beach Nourishment Projects. East Beach is a 6,000 ft long beach nourishment project with 3-T-head groins and West Beach is a 3,500 ft beach nourishment project with an array of T-Head composite geotextile and stone groins. This is a highly erosional beach surrounded by nearshore reefs and the structures are required to protect the coral patch reefs and slow sand losses. Responsible for the site investigations, numerical modeling, and sand source investigations and borrow site designs to provide high quality sand. West beach will be constructed in fall 2009 (Phase 1) and 2011 (Phase 2) including 2-T head groins (175 ft) and one 350 ft curved stone structure with bypassing weir to maintain bypassing to the adjacent widely regarded Half Moon Bay public beach. Project is designed to protect the extensive coral hardbottom areas that surround the site and maintain sand flows. Responsible for the numerical modeling, design, permitting, engineering and preparation of construction contract bid documents.

Dellis Cay Beach Nourishment Project, Dellis Cay, Turks and Caicos Islands

Principal Engineer for coastal engineering and environmental permitting and monitoring (pre-construction to post-construction) to develop a 10,000 ft beach nourishment project in 2006-07 using sand from an updrift inlet channel. These services include coastal engineering planning, design, permitting (including EIS) and engineering and construction contract administration services. Project Engineer of Record for the Beachfill project completed in 2006.

Beach Nourishment, Atlantic Beach Management, Ltd., Turks and Caicos Islands

Project Manager and Engineer of Record responsible for design, permit acquisition and construction of Beach Nourishment Project and Inlet Channel Dredging Project. The total sand quantity placed was 400,000 cubic yards over a 3 month construction period. This project was constructed in 2004 and widened these severely eroded beached by 200 ft providing protection during the 2004 hurricanes that impacted this shoreline adjacent to an inlet. Sediment analysis and management was required to minimize the placement of large quantities of shell and conch which were buried in the channel excavation areas. Monitoring of the shoreline, borrow site and adjacent beaches will continue over a two year period, prior to and following construction.



Half Moon Bay Dunes and Beach Enhancement Project, Water Cay, TCI

Coastal engineering consultant responsible for a one mile oceanfront embayment where terraced areas were developed using sediments after treatment and separation of sediments excavated from a 3,500 ft channel, services required sand compatibility analysis and geotechnical analysis for design of the excavation areas, project design to protect seagrass beds and permitting and performance monitoring. Ms Erickson was responsible for acquiring all necessary construction permits, environmental and engineering and preparing contract documents for construction.

Holden Beach Nourishment Project, Holden Beach, NC

Project Director for a phased beach nourishment project to restore 2.5 miles of shoreline at Holden Beach and to enhance the USACE Section 933 Project constructed during the winter of 2002. The initial phase of this Project is a truck haul project with the second phase planned for construction in 2002-03. An Environmental Assessment was prepared and all NC DCM and USACE permits were acquired to authorize this Project.

Beach Restoration, Design and Implementation, Town of Palm Beach, Florida

Project Director for this Beach Nourishment Project to restore the one-mile Mid-Town Beach area. The Project design was developed based on analysis of coastal survey data, coastal processes modeling, and geotechnical investigations. A 900,000 cubic yard beach nourishment project in conjunction with a field of 11 groins was designed, permitted, and constructed to reinforce the beachfill. Ms. Erickson was responsible for final design specifications, obtaining all federal and state permits, bid documents, contractor selection and contract award. As the Engineer of Record, Ms. Erickson was responsible for construction administrative services for work completed in March 1996.

Indian River County Beach Nourishment Program, Vero Beach, Florida

Ms. Erickson, while working at Applied Technology and Management, served as the Project Director from 2000-2001, for this Beach Nourishment Program to restore 8.3 miles of eroded beaches by placing 2.5 MCY of high-quality sand. This project is currently in the process of obtaining final permits and preparing construction contract documents for the Beach Nourishment: Project Sector 1 & 2 (Ambersand Beach). The final Project design was based minimizing adverse environmental impacts to the extensive nearshore reef communities and maximizing project benefits and performance. Ms. Erickson's previous work for the County included formulation of a 30-Year Beach Restoration Project Financing Plan that was adopted by the county in 1999. The plan was developed based on analysis of coastal survey data and coastal processes, economic analysis, and geotechnical investigations. A 2.5-MCY beach nourishment project is currently being designed to restore the county's eroded beaches.

Martin County 4-Mile Beach Restoration Project, Stuart, Florida

Local Project Sponsor's coastal engineering consultant responsible for coordination with U. S. Army Corps of Engineers in the development of a 4-Mile Beach Restoration Project design and engineering, sand compatibility analysis and geotechnical analysis for design of the borrow area, economic analysis of project benefit, and refinement of U. S. Army Corps of Engineers project design to protect environmental resources. As Project Director, Ms Erickson was responsible for acquiring all necessary construction permits and performed all environmental and engineering studies for the November 1995 construction start.

Beach Nourishment Project Design, Town of Longboat Key, Longboat Key, Florida

Project Manager and Engineer-of-Record for the design, engineering and financing project elements of 10-mile beach nourishment project at Longboat Key, Florida (1993). Ms. Erickson was responsible for design and engineering, evaluation of beach nourishment design alternatives; economic analyses and project funds acquisition, permitting, preparation of contract documents and construction management services. The final construction project placed 3.2 million cubic yards of beachfill along 9.2 miles of shoreline and removed 8,000 tons of derelict concrete piles and rock rubble with placement of 3,300 tons of piles to create two nearshore artificial reef structures.

Captiva Erosion Prevention District, Captiva, Florida

Engineer-of-Record for the development of a Comprehensive Beach and Shore Preservation Plan for Captiva, Florida (1987). Ms. Erickson prepared project design plans and specifications and the attendant cost estimations for a terminal rock rubble groin structure and a 1.2 million cubic yard beach nourishment project. Project design and funding program development for a 4.8-mile beach restoration project was completed in 9 months with formal approval by 87 percent of the voters.



Emerald Beach Improvement Project, Turks and Caicos Islands,

Project Manager responsible for design and construction of T-Head groynes constructed using large geotextile containers and sand placement to backfill these structures. The purpose of this project was to provide interim (approximately 7 years) of protection for upland homes, prior implementing a large-scale dredging project planned in 2004. The interim project provided temporary protection for a severely damaged segment of shoreline adjacent to an existing rock groin and failing bulkhead. Twelve 70-inch-diameter geotextile tubes with innovative foundation components were placed to reduce incoming wave energy and retain sand in front of an existing seawall.

Sand Source Investigations and Sand Mapping for the Turks and Caicos Islands, Department of the Environment and Coastal Resources, Turks and Caicos Islands, BWI

Project Director for the identification and mapping of sand sources to provide sediments for upland development, beach replenishment and storm impact response and mitigation for the Department of Environment and Coastal Resources, Turks and Caicos Government. Work included analysis of sand resource needs, economic analysis of present and future sand needs, extensive core borings over the archipelago of the islands, sediment testing, design of borrow areas and dredge sites over a 2 year investigation.

Emergency Beach Nourishment, Garden City Beach, Horry County, South Carolina

Project Manager for the design and construction management of the Emergency Beach Nourishment Project resulting from Hurricane Hugo's beach and upland property damage. Ms. Erickson also participated in the coordination of bid submittals and selection of contractors.

Emergency Beach Nourishment Project, Town of Surfside Beach, South Carolina

Project Manager for design and construction management of 70,000 cubic yard Beach Nourishment project resulting from Hurricane Hugo's beach and upland property damage. Ms. Erickson worked closely with funding agencies to modify the D.S.R. and secure additional FEMA funds.

Inlet Improvement Projects

Midnight Pass Reopening Project and Beach Nourishment Project, Sarasota County, Florida

Principal Engineer for the reopening of Midnight Pass in Sarasota, Florida. Services include extensive geotechnical and biotic investigations, hydrodynamic modeling, water quality data collection, wetland resource mapping, channel and beach nourishment (10,000 ft) design development, permit applications and processing, Environmental Impact Assessment, and the development and implementation of a community involvement program and web site (www.midnightpass-reopening.org).

Mason Inlet Post-Construction Bathymetric and Hydrodynamic Monitoring, USACE-Coastal and Hydraulics Laboratory, Vicksburg, MS

Responsible for monitoring the development of the new inlet shoal, abandonment of the old inlet ebb tidal shoal and collection and analysis of water level and acoustic Doppler current measurements within the tidal channels surrounding the new Mason Inlet. This unique research and data collection effort will be used to evaluate the performance of the new inlet and surrounding tidal channels and to evaluate future channel maintenance.

Assessment of Feasibility to Restore Midnight Pass Project, Sarasota County, Florida

Principal investigator of a recently completed feasibility study to review and determine the feasibility of restoring Midnight Pass without the use of shoreline hardening. The work included a summary of key environmental issues, special technical and environmental concerns, and cost predictions for permitting, design and construction based on meetings with state and federal agencies representatives.

St. Lucie Inlet Management Plan, Martin County, Florida

Project Manager responsible for the formulation of a workable and economically viable Inlet Management Plan at St. Lucie Inlet. Plan development focused on an optimization of alternate improvement measures in order to reinstate sand transfer across the inlet onto Jupiter Island, to mitigate for historic deficits in sand transfer and to reduce sand shoaling within the inlet and estuary. The plan was adopted by the State of Florida in September 1995, making this the first such plan to be adopted by the state.



New Pass Inlet Management and Sand Allocation Plan, Longboat Key, Florida

Performed analysis and evaluation of coastal processes information and data at New Pass Inlet in order to develop a sand allocation plan for the Town of Longboat Key and the City of Sarasota. An interlocal agreement was formulated and signed by the two municipalities and a formal resolution adopted by Sarasota County Commissioners to establish the sand allocation for adjacent shorelines. These agreements were accepted by the U. S. Army Corps of Engineers and Florida Department of Natural Resources for the 1990 maintenance dredging of New Pass.

Longboat Pass Inlet Management Plan, Longboat Pass, Longboat Key, Florida

Project director responsible for the formulation of an Inlet Management Plan at Longboat Pass. Plan development focused on improvements to reinstate sand bypassing across the inlet and downdrift shoreline stabilization.

Donna Cut and Leeward Pass Monitoring and Channel Stabilization Project, Providenciales, Turks and Caicos Islands, British West Indies

Ms. Erickson performed analysis and evaluation of coastal processes information and data at Donna Cut and Leeward Going Through Pass. Studies were conducted to monitor the natural closing of Donna Cut and to develop improvements to the adjacent, downdrift shoreline to reinstate sand bypassing across the inlet and onto the downdrift beaches. The original studies commenced in 1987 with Donna Cut closure occurring in 1997.

Tubbs Inlet Channel Stabilization and Old Sound Creek Dredging Project, Ocean Isles, NC

Engineer of Record for a Project to stabilize the shoreline and inlet channel at Tubbs Inlet located at the west end of Ocean Isles Beach. This project will re-establish flow through a tidal channel that has become shoaled over the past 15 years and contributed to the easterly migration of Tubbs Inlet. An Environmental Assessment was developed and, with all regulatory permit documents, was submitted to NC DCM and USACE for authorization.

Flood and Wave Impact Studies

Dellis Cay, Flood and Wave Impact Analysis, Turks and Caicos Islands

Determination of storm-induced storm surge and waves impacts for varying storm levels to determine design requirements for all infrastructure, jetties, marina and upland areas of a 300+ acre destination resort development.

Water Cay, Flood and Wave Impact Analysis, Water Cay, Turks and Caicos Islands

Determination of storm-induced storm surge and waves impacts for varying storm levels to determine design requirements for all infrastructure, jetties, marina and upland areas of a 1200 acre destination resort development.

Shoreline Stability Study at New Pass, Longboat key Township, Longboat Key, Florida

Conducted all analyses and engineering studies to evaluate long and short-term shoreline profile changes along the north and south bank of New Pass Inlet as a result of the US Federally maintained New Pass inlet channel maintenance project. Evaluated proposed site plans for a residential development located on a low-lying exposed land form within New Pass and recommended a shoreline restoration and improvement plan, including prediction of shoreline changes.

New Pass Inlet Sand Allocation Plan, Longboat Key, Florida

Conducted analysis and evaluation of coastal processes information and data at New Pass Inlet in order to develop a sand allocation plan for the Town of Longboat Key and the City of Sarasota. An interlocal agreement was formulated and signed by the two municipalities and a formal resolution adopted by the Sarasota County Commissioners to establish the sand allocation for adjacent shorelines. These agreements were accepted by the USACOE and FDNR for the 1990 maintenance dredging of New Pass.

Coastal Construction Control Line Study Along Inlets, Sarasota County Natural Resources Management Department, Sarasota County, Florida

Studies and model development for the FDEP to assess coastline stability for Sarasota County and identify zones of impact of a 100-year hurricane event along the inlet areas and interior bays were conducted by Ms Erickson. Responsibilities included the development a hydrodynamic model to simulate flooding of barrier islands and interior bay regions from hurricane storm surge at New Pass, Big Pass and Midnight Pass. Responsible for computing inland wave propagation of waves/surge elevations to establish a CCCL along these inlet shorelines for Sarasota County.



Funding Plans and Public Information Programs

National Oceanographic and Atmospheric Administration (NOAA), Coastal Services Center, Charleston, South Carolina

Project Manager working with Parsons Engineering Science, Inc., responsible for the development of Geology, Coastal Engineering and Socioeconomic information to assist governmental decision makers to better understand key topics and issues pertaining to beach nourishment. This user friendly information resource is available at www.csc.noaa.beachnourishment on a NOAA maintained website with information on such topics as: the geographic distribution of historical, current and planned beach nourishment projects; legal environment affecting policy, permitting and funding; and the social, demographic and environmental factors that affect beach nourishment decisions. Ms. Erickson was a principal author and editor in the development of this series of more than 30 major and minor papers containing interactive graphics, animations and glossaries for NOAA's first Issue Based Characterization of Beach Nourishment (website).

Beach Preservation Plan, Economic Analysis, Indian River County, Florida

Project Manager responsible for the formulation of a financing plan to pay the costs for restoration of five beach segments (8.3 miles) in Indian River County. Analyses of the economic benefits associated with storm and land loss prevention and recreational benefits were performed by the project team to determine the total project-related benefits. A project cost allocation plan was developed in accordance with benefits received by each sector. A recommended financing plan was submitted with cost apportionment and funding source allocation plan.

Mason Inlet Relocation Project Financing Plan, Mason Inlet Preservation Group and New Hanover Co., N.C.

Performed economic studies and analysis of the benefits associated with the Mason Inlet Relocation Project and developed a final recommended financing plan to allocate the costs of the Project to individual property owners. The final project costs, estimated at \$5.3 million, will be assessed according to the cost distribution plan developed for the County upon completion of the Project. An assessment role for affected properties was submitted to the Tax Collector for Public Hearings and subsequently approved by the County Board of Commissioners.

Beach Nourishment Project Economic Analysis and Financing Plan, Town of Longboat Key, Longboat Key, Florida

Engineer-of-Record for financing elements the Town's 10-mile beach nourishment project at Longboat Key, Florida. Ms. Erickson was responsible for formulation of financing alternatives; economic analyses methodology and evaluation of funding source alternatives; and implementation of a community information program. She was responsible for lobbying the State Legislature's for funding representing the Town before the Governor and Cabinet, State agencies, special districts, and County Commissions. She participated in numerous public hearings on the financing program and provided expert witness testimony in Circuit Court.

Town of Palm Beach Nourishment Project Economic Analysis and Financing Study, Town of Palm Beach, Florida

Responsible for technical analyses and preparation of attendant cost estimations for beach restoration projects extending along 13 miles of shoreline on Palm Beach Island. Economic analyses of hurricane and storm damage prevention were performed for alternative project design levels. Analyses of the economic benefits associated with storm and land loss prevention and preliminary recreational benefits were performed to determine the distribution of the benefits to different sectors of the communities.

Lee County Funding Program, Lee County, Florida

Project Manager responsible for development of a financing program that provided the future funding of the Estero Island Beach Erosion Control Project. Tasks included working closely with staff, the Town of Fort Myers Beach and other affected beneficiary groups and interests; review of beach nourishment plans for Estero Beach; data collection and compilation of available related economic and physical data and information for the shoreline area of Estero Island extending from Bowditch Point Regional Park south to Carlos Point.

Project Economic Analyses and Financial Analyses for a 4-Mile Beach Restoration in Martin County, Stuart, Florida

Engineer of Record responsible for economic analysis of project benefit and refinement of USACOE project design. The project included: economic benefits analyses, alternative financing methods, state funding assistance, and preparation of a financing plan with support and presentation at County Commission meetings and public hearings.



Captiva Erosion Prevention District Project Cost Apportionment Plan, Captiva, Florida

Responsible for technical analyses and preparation of attendant cost estimations for a 4.8-mile beach restoration project. Conducted an economic analysis of hurricane and storm damage risk for alternative project design levels and participated in public hearings for the project cost-financing program. Prepared applications and conducted lobbying for state funding of the project as well as filing of a cost apportionment plan for the District. This financing program received 86% voter approval in a referendum vote.

Economic Analysis, Sebastian Inlet Tax District, Florida

Responsibilities included compilation of baseline economic data that would show consequences of linking current navigational channel with the intracoastal waterway. Ms. Erickson developed data regarding future state participation in district projects and reviewed the 5-year Comprehensive Master Plan for the district and the economic analysis of alternatives and costs associated with implementing the plan.

Daufuskie Island Beach Nourishment Project Financing Plan, Melrose, Daufuskie Island, South Carolina

Project Manager responsible for the formulation of a financing plan for a beach nourishment project at Daufuskie Island. Analyses of the economic benefits associated with storm and land loss prevention and recreational benefits were performed to determine the distribution of the benefits to different sectors of the communities. A recommended plan to apportion the project costs according to benefits received will provide the basis to finance future project nourishment costs.

Habitat Restoration Projects

Spoil Island Restoration Planning, Design and Permitting, New Hanover County, Wilmington, NC

Engineer of record for a project to restore a 10.7 acre island located along the ICW in New Hanover County, NC including the restoration of wetlands for mitigation associated with the relocation of Mason Inlet. Alternative areas were identified for restoration within the estuary. An abandoned spoil island site was selected for in-depth investigations (cores, surveys, flushing analysis/modeling) and alternative designs were developed to determine the optimal design for the restored habitat. Working with the marine biologists, design of the site required detailed information on the stockpiled sediments to determine the optimal configuration to provide upland habitat for avifauna, wetlands and intertidal channels for wading birds in concert with removal of approximately 100,000 CY of sediments. Sediment management included determining which sediments were suitable for beach placement and where creation of interior flushing channels would enhance flushing while resulting in sediment for reuse to control costs. Sub-areas that contained a mix of sand and finer sediments were moved to create uplands to eliminate offsite disposal. Wetland habitats also included oyster shell shoals, bare sand for foraging birds and tidal channels designed to create intertidal habitat including plantings of spartina marsh. Permits were obtained from the US Army Corps of Engineers and the state of North Carolina.

Resort Development Projects

Dellis Cay Beach Nourishment Project and Masterplan Development, Dellis Cay, Turks and Caicos Islands

Principal Engineer for coastal engineering and environmental design services to develop a 200 acre island development project. Work includes coordination and contracting site investigations (ADCP gauge, marine and terrestrial biotic, topographic and hydrographic, geohydrology) necessary for the planning and design development phases of beaches, groyne stabilization structures, interior lakes and flushing channels. Conducted analyses of low frequency storm impacts, wave loads on pile supported overwater and waterfront villas and construction administration services for the West Beaches.

Environmental Assessment and Design of a 175-acre Inland Canal System, Provident Ltd., Providenciales, Turks and Caicos Islands

Engineer of Record and Project Manager responsible for all environmental analyses and assessments for the design and permitting and construction contract documents for a large inland canal system in a large development on Providenciales in the Turks and Caicos Islands. Work included field studies and numerical modeling and analysis of water quality impacts from upland development and boats in the canals. Coastal studies were performed to design and engineer shoreline stabilization measures along the canal and open coast shoreline areas.

New Pass Inlet Management and Sand Allocation Plan, Longboat Key, Florida

Performed analysis and evaluation of sediments and coastal processes data at New Pass Inlet in order to develop a sand allocation plan for the Town of Longboat Key and the City of Sarasota. An interlocal agreement was formulated and signed by the two municipalities and a formal resolution adopted by Sarasota County Commissioners to establish the sand allocation for adjacent shorelines. These agreements were accepted by the U. S. Army Corps of Engineers and Florida Department of Natural Resources for the 1990 maintenance dredging of New Pass.

Oceanographic Studies

Southwest Florida Outer Continental Shelf Physical Oceanographic Study, U.S. Department of the Interior, Gulf of Mexico OCS Regional Office

Project Manager for data analysis on a comprehensive \$1.8 million oceanographic study to investigate the physical and ecological processes and interrelationships in the Gulf of Mexico off southwest Florida. Physical oceanographic data were analyzed using array-mounted instrumentation to continuously monitor near bottom currents, temperature, waves, tides and suspended sediments for 2 years at five sites. Detailed data reduction consisted of time series statistical analysis including joint frequency, spectral analysis, coherence and variance using several types of numerical filters. The results of the physical dynamics were used to assess potential impacts of offshore oil development.

North Aleutian Shelf Physical Oceanographic Study, Alaska Peninsula, Alaska, NOAA

Study to evaluate the physical processes occurring on the North Aleutian Shelf, Alaska. Ms. Erickson was responsible for the analysis and evaluation of hydrographic data such as currents, tides, and drogoue studies including recent physical oceanographic data from outside sources. Ms. Erickson was responsible for the synthesis and interpretation of the physical and meteorological oceanographic data and the preparation of the final report.

Sediment Transport Study, SOHIO Endicott Project, North Slope, Alaska

An environmental monitoring program to assess the impacts of SOHIO's 4-mile-long offshore causeway on marine ecology, water circulation and sediment transport. Ms. Erickson was responsible for the analyses of sediment and bathymetric survey data for the study.

Publications

Erickson, K.M., Kraus, N.C., and Carr, E.C. 2003 "*Circulation Change and Ebb Shoal Development Following Relocation of Mason Inlet, North Carolina,*" The Coastal Sediments 2003 Conference.

Erickson, K.M. 1998. "*The Shell Island Resort Erosion Control Project, Wrightsville Beach, North Carolina,*" Bi-Annual Conference on Sand Rights.

Erickson, K.M. 1996. "*The Mid-Town Beach Restoration Project: A Managed Systems Approach,*" 25th International Coastal Engineering Conference

Erickson, K.M. 1993. "*Restoring the Beach at Longboat Key,*" The Annual Florida Shore and Beach Preservation Association Meeting.

Erickson, K.M. 1990. "*Economic Analysis Methodology for Computing Benefits of a Beach Nourishment Project,*" The National Conference on Beach Preservation Technology

Erickson, K.M. 1989. "*Financing for Beach Nourishment: Funding Formulae and Revenue Sources for the Local Cost Share,*" The Annual Florida Shore and Beach Preservation Association Meeting

Dean, R.G. and Erickson, K.M. 1984. *"Methodology and Results: Recommended Coastal Construction Control Line Along Inlet Margins in Unincorporated Areas of Sarasota County,"* Coastal Engineering Archives, University of Florida

M.S. Thesis. *"A Method to Determine Flood Return Frequencies Along Inlet Margins and Within Bays"*

Published Technical Reports (Selected List)

"Martin County Coastal Engineering and Environmental Studies, 4-Mile Beach Restoration Project, Martin County, Florida", Prepared for the Martin county Board of County Commissioners, Stuart, Florida

"Longboat Key Restoration Plan, Project Plans, Specifications and Estimated Costs", Town of Longboat Key, Longboat Key, Florida, October 1989

"Geotechnical and Sand Source Investigation, Longboat Key", Town of Longboat Key, Longboat Key, Florida, October 1989

"Longboat Key Beach Nourishment Project, Wave Refraction Studies at New Pass and Longboat Pass", Town of Longboat Key, Longboat Key, Florida, October 1991

"Longboat Key Beach Nourishment Project, Longshore Sediment Transport", Town of Longboat Key, Longboat Key, Florida, November 1991

"Sebastian Inlet Tax District Economic Analysis of Project Benefits, Comprehensive Master Plan", Prepared for Sebastian Inlet Tax District Commission, Indian River County, Florida, February 1993

"Engineering Analysis of Shoreline Changes and Groin Improvements at New Pass", Town of Longboat Key, Longboat Key, Florida, October 1993

"Town of Longboat Key Restoration Project, 6-Month Monitoring Report", Town of Longboat Key, Longboat Key, Florida, May 1994

"St. Lucie Inlet Management Plan, Martin County, Florida", Martin County Board of County Commissioners, Stuart, Florida and the Department of Environmental Protection, January 1995

"Town of Longboat Key Restoration Project 1-Year Monitoring Report", Town of Longboat Key, Longboat Key, Florida, February 1995

"Interim Maintenance Project Design Memorandum", Town of Longboat Key, Longboat Key, Florida, February 27, 1995

"Mid-Town Beach Restoration Project Design Memorandum", Town of Palm Beach, FL, July 1995

"Borrow Site and Beachfill Material Investigation", Town of Palm Beach, FL, July 1995

"Environmental Assessment - Mason Inlet Relocation Project", New Hanover County, North Carolina and the State of North Carolina, August 2000



Karyn M. Erickson, P.E.
President/Principal Engineer

"Environmental Assessment - Old Sound Creek Dredging Project", Tubbs Inlet Preservation Group and the State of North Carolina, August, 2001

"Environmental Assessment - Holden Beach Nourishment Project", Town of Holden Beach, NC and the State of North Carolina, September, 2001

"Cap Juluca Beach Management Plan and Shoreline Stabilization Design", Cap Juluca Resort, Anguilles, BWI, 1998.