

GUILLERMO SIMON, PE, CFM

Director of Water Resources

EDUCATION

MS, Coastal & Oceanographic Engineering, University of Florida

BS, Civil Engineering, National Autonomous University of Mexico

REGISTRATIONS

Professional Engineer:
FL #64644

Certified Floodplain Manager
#US-05-01518

PROFESSIONAL ORGANIZATIONS

City of Jacksonville — Special Committee on Resilience, Environmental Planning Subcommittee, Subject Matter Expert (7/2020 – ongoing)

American Society of Civil Engineers Member - Sea Level Change Subcommittee Member

Florida Engineering Society Member

Florida Stormwater Association Member

Association of State Floodplain Managers

Florida Floodplain Managers Association

Guillermo Simon has more than 20 years of experience in the fields of coastal engineering and surface hydrology and hydraulics. His background includes a wide variety of projects, ranging from single lots to multi-county and basin-wide projects — from scoping to completion and quality control. His experience includes engineering analyses, modeling, and design. He routinely leads multidisciplinary production teams in the development of projects for a wide range of clients and stakeholders and enjoys mentoring young staff. With his diverse skillset in coastal and water resource engineering and project management, he serves as Halff's Director of Water Resources in Florida.

PROJECT EXPERIENCE**Don CeSar Neighborhood Sea Level Rise Adaptation Alternatives • St. Pete Beach, FL**

Senior Coastal Engineer for the development of sea level rise adaptation measures for the Don CeSar Peninsula in St. Pete Beach, FL. Study tasks include sea level rise and king tide flooding assessment; short- and long-term alternatives to mitigate tidal flooding; interior flooding assessment and stormwater adaptation alternatives; and, implementation costs.

Texas Water Development Board 2D Base Level Engineering Analysis • Various Texas Watersheds

Senior Engineer for the development of base level engineering (BLE), two-dimensional modeling of the Aransas Bay Hydrologic Unit. The study includes HEC-RAS rain-on-grid modeling for a watershed with tidal effects; development of breaklines to define flow paths; flow verification using USGS gauges; and delineation of flood hazards. Results will become part of the USGS' BLE repository, which provides basic flood hazard information in areas lacking flood data.

Texas Water Development Board, Flood Planning Guidance • Texas

Senior engineer for the development of Flood Planning Guidance documentation for the state of Texas. Work includes development and review of a stakeholder survey regarding needs, issues, tools, and resources; develop recommendations for TWDB staff to develop guidance for the application of hydrology, hydraulic, coastal, and other modeling tools.

COMPASS PTS Coastal Engineering Subject Matter Expert, Gulf of Mexico, Mid-Atlantic, and South Atlantic Coasts, and Deputy Coastal Control Account Manager

Coastal engineering Subject Matter Expert for the Compass Production Technical Services team that services FEMA. As senior coastal engineer, he provides overarching support regarding coastal flood hazards for the Gulf of Mexico, Mid-Atlantic, and South Atlantic coasts. As Deputy Coastal Control Account Manager (CAM), he provides support to the Compass PTS team in its mission to support FEMA.

Private Client, Design of Dune Core for Coastal Storm Protection • St. Johns County, FL

Senior Engineer for the design of a dune core structure to protect property in St. Johns County, Florida. The design included placement of buried geotubes in dunes located in front of property at risk of severe damage from beach and dune erosion, and tie-ins with neighboring dunes and seawall structures.

Suwannee River Water Management District, Development of a Homeowners' Shoreline Erosion Control Manual • North Florida Region

Project Manager for the development of an erosion control manual for waterfront property owners within SRWMD lands. The manual helped homeowners implement proven, cost-effective erosion control solutions that do not require detailed engineering analyses and helped the SRWMD staff to streamline the permit application process. The manual described advantages and installation technique of about 10 alternatives that ranged from re-vegetation and erosion control blankets, to minor rigid structural solutions.

Flood Hazard Calculations for The Reserve at St. Charles Bay • Rockport, TX

Project manager for the development of a two-dimensional coastal hydraulics model for simulation of 1-PCT annual chance storm surge under pre- and post-development conditions. Study also included overland wave height calculations, wave runup and wave overtopping, and report preparation in support to a FEMA letter of map revision (LOMR) application.

Tillamook Jetties Repair Design • Tillamook Bay, OR

Project manager for the development of wave modeling and stone size design for the jetties repair. Lead the development of a civil engineering project for the construction of the jetties on existing relic stone. Project items included pre- and post-construction conditions wave modeling; sea level rise estimation based on USACE and NOAA guidelines; jetty cross section design based on Hudson and Van Gent formulae for stone size calculation; conceptual material offload facility project; analysis of stone transportation and placement alternatives; and volume calculations.

FEMA Coastal Study Appeals • Orange County, TX

Project manager and lead engineer to support FEMA Region VI's multi-year effort to resolve appeals and comments for Orange County's revised coastal flood hazards. Services included technical review of each appeal or comment, including engineering analyses and mapping, preparation of draft resolution, development of revised DFIRM maps and other Flood Insurance Study materials. The study applied results from ERDC's Sabine to Galveston Bay Coastal Storm Risk Management (CSRM) study to understand and delineate coastal flood risks from Lake Sabine in Orange County.

Letter of Map Revision for Joe DiMaggio Children's Hospital • Broward County, FL

Project manager and lead engineer for the hydrologic and hydraulic modeling of an enclosed basin using HEC-RAS' 2D module to determine base flood elevation changes, map revised flood hazard boundaries, and prepare MT-2 documentation in support of the hospital's LOMR application.

Floodway No-Rise Certification Review • Middleburg, FL

Senior engineer for providing expert opinion and a case-by-case review of no-rise submittals. Review of no-rise applications include narrative and model. Provided report to Clay County regarding the adequacy of the submittal.

Jupiter Inlet Sand Trap Dredging • Palm Beach County, FL

Project manager for the preparation of construction plans, specifications and contract documents; assisted with bid administration and provided construction observation and administration services to the Jupiter Inlet District for the annual Jupiter inlet sand trap dredging and beach nourishment project.

Hurricane Harvey Flood Analyses Technical Support • Various Coastal Counties, TX

In support of the Compass PTS team, performed a detailed technical review of the team's assessment of Hurricane Harvey's coastal effects.

Coastal Flood Risk Analysis • NY and NJ

In support of FEMA Region II's New York/New Jersey FIRMS appeal resolution, acted as project manager and lead engineer for the development of new FIRM panels. The study included overland wave analyses, wave runup and overtopping, mapping of flood hazards, development of new FIRM databases, and community outreach support for two New Jersey counties.

Letter of Map Revision (LOMR) for Beachfront Residence Improvements • Ponte Vedra Beach, FL

As senior engineer, performed dune erosion, wave height, and wave runup analyses in support of a homeowner's FEMA LOMR application.

FEMA Calculation of Combined Rate of Return Values and Mapping • West Florida Counties

Project manager and lead engineer of team of engineers and GIS scientists for the calculation of combined (coastal and riverine) rate of return water surface elevation values and mapping in eight West Florida counties (including Citrus, Hernando, Pasco, Pinellas, Hillsborough, Manatee, Sarasota, and De Soto). Calculations applied FEMA's revised coastal flood levels and multiple riverine models, including HEC-RAS, SWMM, and ICPR. As part of this effort, he worked with GIS staff to develop tools that perform the calculations quickly and efficiently.

Risk MAP Regional Production and Mapping Program Support • FEMA Regions Nationwide, U.S.

As senior engineer, helped develop guidance to perform two-dimensional hydraulic analyses for Base Level Engineering (BLE) in FEMA Region VI. For FEMA Headquarters, he also helped develop and review the Wave Determination Guidance for Mapping Partners. FEMA guidance documents seek to assist Mapping Partners in the development of flood hazard data, without prescribing methodologies.

Taylor Creek Reservoir Yield Analysis • Osceola County, FL

Project manager and lead engineer for the application of SJRWMD's spreadsheet model to quantify reservoir water yields under current and proposed consumptive use permit withdrawal allowances. The study included minimum flow compliance estimates.

Coastal and Environmental Services • Walton County, FL

Senior engineer to provide support for on-call coastal and environmental services to Walton County, including feasibility studies, project development and oversight, permitting assistance, construction observation, meeting attendance, and presentations.

Developed a Coastal Storm Response Plan intended to help the county maintain its beach resources in the event of a large erosion event.

FEMA Coastal Study Appeals, Phases I, II, and III • Galveston County, TX

Project manager and lead engineer providing continuing support to FEMA Region VI in resolving coastal appeals and comments. Services included technical review of each appeal or comment, including engineering analyses and mapping, preparation of draft resolution, development of revised DFIRM databases and other Flood Insurance Study materials.

Coordinated Needs and Management Strategy (CNMS) and Risk MAP Project • Various Counties, FL

Client service representative and project manager for the Suwannee River Water Management District. Provided technical oversight and coordinated a team of engineers in the completion of a newly implemented FEMA CNMS database for 15 counties in north central Florida for SRWMD, a FEMA cooperating technical partner. Additionally, acted as project manager for the Econfina-Steinhatchee Basin Risk MAP project. The Risk MAP project included redelineation of up to 70 miles of streams, including new detailed hydrology and hydraulics, intended to produce up to 150 FIRM panels, including the Big Bend coastal area (studied by FEMA Region IV). With FEMA's flood mitigation and resilience goals in mind, the project also produced Risk MAP products and included enhanced outreach activities with communities.

Economic and Natural Resource Benefit Study • Various Locations, TX

Client Senior engineer for the development of benefit-cost evaluations to assess and quantify benefits associated with Texas General Land Office coastal shoreline protection and natural resource protection, enhancement, and restoration projects. Tasks included storm-based and long-term coastal erosion estimation; calculation of storm damage reduction benefits; beach visitation; out-of-state spending; and, recreation benefits.

HSPF Model Update for Lower St. Johns River, FL • St. Johns River, FL

Project manager and lead engineer for the update and calibration of the USACE's HSPF model for the Lower St. Johns River and Lake George sub-watersheds. Major project tasks included replacing rainfall gauge data with NEXRAD data; extending evapotranspiration; updating 1995 land use/land cover with 2009 values, including riparian and non-riparian wetlands; modifying existing HSPF basins to include new stream gauges; supervising model calibration at multiple gauges using PEST; updating HSPF's User Control Interface (UCI) files for each sub-watershed; and performing baseline simulations for 117 sub-watersheds (14 Planning Units).

Jupiter Inlet Sand Trap Dredging • Palm Beach County, FL

Project manager in the preparation of construction drawings and technical specifications, and construction phase services for the dredging and beach placement of material permitted for removal from the Jupiter Inlet sand trap.

Review of Floodway No-Rise Analysis • Clay County, FL

Senior engineer to provided Clay County with expert review of a no-rise analysis for a residential property on South Fork Black Creek related to a county code violation. Attended and presented at a Special Magistrate's hearing.

Review of FEMA Preliminary Maps and Base Flood Elevations • Town of South Bethany, DE

Project manager for the limited review of FEMA documentation, including correspondence, preliminary maps and base flood elevations for the town which resulted in the preparation of letter report with findings and recommendations.

FEMA Region IV Flood Insurance Study Post-Preliminary Support • Various Counties, FL

Provided senior technical support during the post-preliminary phase for the counties of Martin, Okeechobee, Palm Beach, and Hendry. Support covered the areas of dam break inundation mapping and coastal redelineation.

FEMA Flood Insurance Studies • Volusia, Clay, Putnam, Marion, and Lake Counties, FL

Project manager and lead engineer for overland wave modeling and floodplain mapping of the 1- and 0.2% annual chance flood. Project work included wave statistics; application of wave setup; application of ADCIRC/SWAN/JPM-OS storm surge results; analysis of wave propagation with WHAFIS 4 model in open waters, estuarine and inland bays, and overland areas; calculation of the primary frontal dune erosion volumes; calculation of wave runup and overtopping; calculation of combined rate of return values; delineation of the LIMWA (limit of moderate wave action) zone; customization of GIS tools for coastal analyses enhancements; development of a coastal TSDN; quality assurance and quality control; and application of DCS and FEMA standards.

FEMA Region IV Coastal Integrated Program Team • Various Locations, U.S.

Aided FEMA in achieving increased consistency and quality for coastal flood hazard studies throughout the southeast. Participated as a member of the beach nourishment subgroup that reviewed FEMA's criteria on how to use beach nourishment project information in flood insurance studies.

Florida Department of Transportation (FDOT) District 2 Unknown Foundations Evaluation, FL

Senior engineer for the study of hydrodynamics under bridges with unknown foundations throughout FDOT District 2. Developed dynamic HEC-RAS 4.1 models to simulate tidal flow during extreme conditions at several FDOT bridges in estuarine areas. Project tasks included site reconnaissance; topographic data development; compilation and review of previous studies; flow estimation using regression equations; determination of boundary conditions in tidally-influenced areas; simulation of hydraulic velocities and stages on bridge piers and abutments; and estimation of local, abutment, contraction, and long-term scour.

Economic and Natural Resource Benefits Study (Cycles 6 and 7) • Various Counties, TX

Senior engineer for economic and natural resource benefits analyses for several Texas General Land Office coastal protection projects in Cameron, Brazoria, and Galveston counties. Project work included modeling of storm-based cross-shore coastal erosion. Performed economic analyses that included calculation of damage cumulative probability curves; storm damage reduction benefits; beach visitation; out-of-state spending and recreation benefits (due to the projects under analysis); and overall project benefit-cost ratios.

North Beach Road Shoreline Protection Study • Siesta Key, FL

Lead engineer in the development of a feasibility study to provide shoreline stabilization to the north end of North Beach Road on Siesta Key, Florida. Collected basic coastal data and performed site reconnaissance to assess potential stabilization solutions. Developed four alternatives to stabilize the damaged road and shoreline and compared the potential solutions with a no-action case. Also led a team of engineers to develop drainage solutions and preliminary unit costs.

Region IV Mapping Around Lake Okeechobee, FL

Provided technical leadership for riverine, coastal, and lake mapping efforts for FEMA flood insurance studies in Hendry, Okeechobee, and Martin counties in Florida. This work combined new riverine hydrologic and hydraulic analyses via HEC-HMS, HEC-RAS, and MIKE modeling systems, and review of other stormwater models that use ICPR; redelineation of existing riverine base flood elevations; digital conversion of existing coastal zones; and updating approximate zones. This study incorporated state-of-the-art 2-D modeling and statistical analyses results from the Herbert Hoover Dike dam break analysis to determine the 1% annual chance flood rate in protected areas (first one of its kind performed in FEMA's National Flood Insurance Program). Lead floodplain mapping engineer and provided technical oversight during the statistical analyses of flood inundation in areas downstream of Herbert Hoover Dike, which included the review of stage-frequency curves, dike fragility curves, and failure rates.

East Central Florida Services, Inc. Taylor Creek Reservoir Water Supply Permitting Project • Osceola County, FL

Project manager and lead engineer for the study of the effects of proposed changes to the operation of SJRWMD's Taylor Creek Reservoir. Operation changes included different water management strategies, withdrawal allocations, and ecology-protective flows. The study included long-term simulation of daily surface water yields using the USACE's HEC-ResSim 3.0, and the SJRWMD's Upper St. Johns River Basin Hydrology Model to obtain minimum flows and levels. At a later phase, Mr. Simon applied the SJRWMD's spreadsheet model to quantify reservoir water yield under current and proposed consumptive use permit water withdrawal allowances. The study included minimum flow compliance estimates.

FEMA Flood Insurance Study (FIS) and Coastal Disaster Response • Galveston County, TX

Project manager and lead engineer for coastal modeling and DFIRM mapping of the 1- and 0.2% annual chance flood, as well as FIS production. Project work included redelineation of approximately 90 miles of effective detail-studied streams; wave statistics; calculation and application of wave setup (radiation stress); application of ADCIRC/STWAVE/JPM-OS storm surge results; analysis of wave propagation with WHAFIS 4 model in open waters, estuarine and inland bays, and overland areas; calculation of the primary frontal dune erosion volumes; calculation of wave runup and overtopping; calculation of combined rate of return values; delineation of the LiMWA (limit of moderate wave action) zone; customization of GIS tools for coastal analyses enhancements; development of DFIRM, TSDN, and FIS text; quality assurance and quality control; application of DCS and FEMA standards.

FEMA Flood Insurance Studies • Aransas, Calhoun, Jackson, Matagorda, Refugio, and Victoria Counties, TX

Project manager and lead engineer for coastal modeling and DFIRM mapping of the 1- and 0.2% annual chance flood. Project work included wave statistics; calculation and application of wave setup; application of ADCIRC/STWAVE/JPM-OS storm surge results; analysis of wave propagation with WHAFIS 4 model in open waters, estuarine and inland bays, and overland areas; calculation of the primary frontal dune erosion volumes; calculation of wave runup and overtopping; calculation of combined rate of return values; delineation of the LiMWA (limit of moderate wave action) zone; customization of GIS tools for coastal analyses enhancements; development of a coastal TSDN; quality assurance and quality control; application of DCS and FEMA standards.

FEMA Region IV Flood Insurance Study • Martin County, TX

Lead engineer for redelineation of coastal flood hazards. The coastal mapping effort included delineation of all coastal flood hazard zones based on conversion to the NAVD 88 vertical datum and the presence of primary frontal dunes as identified in

effective WHAFIS models and LiDAR. The study included coastal redelineation of approximately 22 miles of open coast shoreline, 18 miles of inland bays, and 11 miles of Lake Okeechobee shoreline. Study features also included review of effective EROSION, WHAFIS, and RUNUP analyses, TSDN development, and application of FEMA's guidelines and specifications.

FEMA Flood Insurance Study • St. Mary's Parish, LA

Project manager and lead engineer for coastal modeling and DFIRM mapping of the 1- and 0.2% annual chance flood, as well as FIS production. Project work included redelineation of up to 56 miles of effective detail-studied streams; wave statistics and attenuation due to cohesive sediments; calculation of wave setup; application of ADCIRC/STWAVE/JPM-OS storm surge results; analysis of wave propagation applying WHAFIS 3.0 model; customization of GIS tools for coastal analyses enhancements; development of TSDN and FIS text; quality assurance and quality control; and application of DCS and FEMA standards.

East Central Florida Services, Inc. Wolf-Pennywash Reservoir Water Supply Project • Osceola County, FL

Project manager and lead engineer for the development of a regional water supply study located in Osceola County and portions of Orange and Brevard counties. The study provided the necessary hydrologic, hydraulic, and water supply analyses for consumptive use and environmental resource permitting with the St. Johns River Water Management District (SJRWMD) and the U.S. Army Corps of Engineers. The project studied water supply alternatives while safeguarding delicate wetland ecology. Role included storm runoff modeling for emergency spillway design; incorporation of SJRWMD's long-term HSPF base flow data; analysis of ecology-protective flows (aimed at proposing MFLs) downstream of the proposed reservoir; dynamic modeling of Wolf Creek and Pennywash Creek flows to develop rating curves; use of existing and development of new HEC-ResSim modeling for reservoir operation and surface water yield.

Forked Island E. Broussard School Campus Flood Protection Embankment • Vermillion Parish, LA

Project manager and lead engineer for the calculation of the necessary crest elevation of a flood risk reduction structure for the Forked Island E. Broussard School in Vermilion Parish, Louisiana. The study included wave modeling using WHAFIS, and wave runoff analyses using TAW and ACES software.

FEMA Flood Insurance Study • Iberia Parish, LA

Project manager and lead engineer for hydraulic modeling, coastal modeling, and DFIRM mapping of the 1- and 0.2% annual chance flood, as well as FIS production. Project work included: model upgrade of up to 22 streams consisting in model georeferencing and incorporation of LiDAR data to overbank areas in HEC-RAS 3.1.3; computation of floodways; redelineation of effective detail-studied streams; wave statistics and attenuation due to cohesive sediments; calculation of wave setup; application of ADCIRC/STWAVE/JPM-OS storm surge results; analysis of wave propagation applying WHAFIS 3.0 model; customization of GIS tools for coastal analyses enhancements; development of TSDN and FIS text; quality assurance and quality control; and application of DCS and FEMA standards.

Flood Insurance Study • West Baton Rouge Parish, LA

Project manager and lead engineer for hydrologic modeling (HEC-HMS), hydraulic modeling (HEC-RAS), and DFIRM mapping of the 1% and 0.2% annual chance floods along approximately 380 stream miles. Modeling of approximately 200 stream miles includes steady, dynamic, and enhanced approximate approaches. Project work included LiDAR Data/Digital Terrain Models (DTM), GIS automation for model setup and mapping, TSDNs, FIS text development, GPS data including georeferenced channel and structure surveys, digital orthophotography, model calibration to gaged data and regression analyses, DFIRM mapping and database, creation of preliminary maps in complete DFIRM format.

FEMA Letter of Map Revision (LOMR) • Saratoga Springs, Clay County, FL

Project manager and lead engineer for the preparation of a LOMR for the Saratoga Springs development in Clay County, Florida. The study included detailed hydrologic and hydraulic modeling of Peters Creek and UNT to Peters Creek, a dam located at the middle of the stream reach. Modeling of UNT to Peters Creek's upper reach applied ICPR to link the multiple lakes and stream reaches of the area and to perform flow routing around the dam. Modeling of UNT to Peters Creek's lower reach and Peters Creek included the application of HEC-RAS 3.1.3. The study incorporated pre- and post-proposed conditions for the Saratoga Springs development and the incorporation of new drainage features.

Society Hill Riverside Park Base Flood Elevation Determination and Conditional Letter of Map Amendment • Darlington County, SC

Lead engineer for applying a dynamic HEC-RAS model to determine base flood elevations for the Pee Dee River in the vicinity of the U.S. Highway 15/401 Bridge, near Society Hill. Project also included the detailed representation of the U.S. Highway 15/401 Bridge and the park's new boat ramp in the hydraulic model and completion and submittal of a conditional letter of map amendment application to FEMA.

Limited Coastal Engineering Analyses for Levee Certification • St. Tammany Parish, LA

Lead engineer calculated wave heights, wave crest elevations, and wave runup, and applied FEMA's certification requirements for accreditation in the National Flood Insurance Program (NFIP). Wave analyses included set up and application of up to five WHAFIS transects (FEMA's 1-D wave model); wave runup calculations included application of ACES software and the "TAW" methodology. Calculated necessary design levee crest elevations for certification and accreditation in the NFIP.

Scour Reevaluation Study and FEMA Floodway No-Rise Analysis, S.R. 482 Bridge Over Shingle Creek • Orange County, FL

As project manager, led a team of engineers in the scour evaluation of the piers for the proposed S.R. 482 Bridge over Shingle Creek. The study applied FDOT scour equations and guidelines to determine local, contraction, abutment, and long-term scour calculations. Services included stream-gage analysis to calculate 100- and 500-year flows across the bridge; HEC-RAS and WSPRO modeling; Bridge Hydraulic Recommendation Sheet (BHRS) tables; and reporting. The study included a FEMA floodway no-rise analysis that evaluated the proposed bridge's impact on FEMA's regulatory floodway.

Coastal Disaster Response for the Parishes of Calcasieu, Cameron, Iberia, St. Mary, Tangipahoa, and Vermilion, LA

Project manager and lead engineer for coastal modeling and workmap development for approximately 264 miles of equivalent coastline. Project work included topographic data development for coastal analyses and mapping detailed floodplain boundaries; redelineation of effective streams and conversion to NAVD88 vertical datum; collection of field data to assess vegetation parameters; calculation of wave statistics and wave height reduction due to cohesive sediment bottoms; calculation of wave setup; application of USACE's ADCIRC/STWAVE/ JPM-OS results to incorporate 2-D storm surge values; application of FEMA-accepted models such as WHAFIS, and RUNUP to determine coastal flood elevations; development of GIS-Automated tools to enhance coastal analyses and coastal mapping; development of coastal transect profiles to illustrate water surface elevations from coastal sources; application of combined probability analysis to merge with riverine water surface elevations; internal and independent QA/QC.

U.S. Army Corps of Engineers Jacksonville District, Lake Okeechobee Flood Protection System, Herbert Hoover Dike Limited Engineering Analysis

As project engineer, Mr. Simón developed alternative solutions for the Lake Okeechobee flood protection system and examined potential modifications to the Lake Okeechobee system that would reduce flood stages for events in excess of the Standard Project Flood (SPF). Mr. Simón's role in the development of these solutions included the conceptual idea, solution layout, basic hydrologic and hydraulic calculations, construction volumes and costs, ranking of alternatives based on cost and benefits. Conceptual solutions include dredging, levees, flow ways, hydraulic control structures, diversion canals and storage basins, and aquifer storage and recovery systems (ASRs).

Suwannee River Floodway No-Rise Studies • Suwannee, Lafayette, Madison, and Hamilton Counties, FL

Lead engineer for HEC-RAS floodway modeling for the analysis of floodway no-rise conditions resulting from proposed campsites located within the Suwannee River's FEMA effective model. Mr. Simón applied the updated effective HEC-RAS model to reflect proposed structures at three campsites and determined the maximum reduction in hydraulic area that would not cause a rise in FEMA's floodway.

South Florida Water Management District, G-160 Hydraulic Modeling • Palm Beach County, FL

Developed a hydraulic model to assess the impacts of the G-160 structure on the Loxahatchee Slough. Developed the model within the unsteady module of HEC-RAS 3.1. The G-160 structure is an essential component of the Comprehensive Everglades Restoration Plan, which enhances the Loxahatchee Slough's hydroperiod in North Palm Beach County. Mr. Simón performed numerous hydraulic simulations that included storm events as well as hydroperiod simulations for wet, average, and dry conditions. Simulations also included different gate operation criteria throughout the Loxahatchee system.

South Florida Water Management District, G-160 Structure Operational Protocol • Palm Beach County, FL

Developed a hydraulic model to evaluate the impact of the G-160 structure on the Loxahatchee Slough system in North Palm Beach County, and developed an operational protocol. Through the application of HEC-RAS 3.1 unsteady flow option, Mr. Simón performed numerous simulations of hydroperiod to evaluate the operation of the G-160 structure.

Design of Hydraulic Structures for an Interstate Highway • Oaxaca, Mexico

Calculated the hydraulic parameters and designed several roadside hydraulic structures. Proposed the implementation of remedial measures aimed at improving highway drainage conditions.

Technical and Economic Feasibility Study to Extend the East Jetty at the Port of Puerto Madero (now, Puerto Chiapas) • Chiapas, Mexico

Project Manager and Lead Engineer for basic coastal engineering analyses to calculate design wave heights, and determination of longshore sediment transport rates based on historical data. Estimated the cost of different alternatives for the extension of the

East Jetty. As part of the port's maintenance program, applied value engineering to estimate the optimum jetty length based on construction and 30-yr dredging costs. Completed the executive project, which included the use of rock and Core-loc armor units.

Review of the Design Project for the Cruise Ship Berth Facility in Veracruz Port • Veracruz, Mexico

Mr. Simón reviewed and calculated the overall structural safety of the berthing facility in the port of Veracruz, Mexico. Calculated pressure on the sheet piling, overturning moments, and stresses due to wave action inside the harbor and due to pulling/pushing from docked ships.

Review of the Engineering Bid Documents for the Oil, Commercial, and Industrial Port of Dos Bocas • Tabasco, Mexico

Reviewed the design project of the East Jetty and the West Groin of the port. Modeled the littoral transport in the area and the life of the West Groin for littoral drift protection. Calculated dredging volumes for the design channel using Civil Softdesk software. Selected and designed several disposal sites for the dredged material.

Coordination, Planning, and Supervision of the Ship Maneuvering Study to Generate a Maritime Operations Manual for the Port of Coatzacoalcas • Veracruz, Mexico

Provided technical coordination and management between the Port Authority of Coatzacoalcas and the simulation center (the STAR Center, located in Dania, FL). Compiled and analyzed the most important physical conditions influencing the maneuverability of the ship in the Coatzacoalcas River such as channel dimensions, wind, and currents. Planned the simulation scenarios based on the port's Master Development Plan, including the selection of the ships. Analyzed the results from the simulation and provided recommendations to generate a Port Operations Manual.

Coordination, Planning, and Supervision of the Ship Maneuvering Study to Generate a Maritime Operations Manual for the Port of Tuxpan • Veracruz, Mexico

Provided technical coordination and project management between the Port Authority of Tuxpan and the Danish Maritime Institute (DMI) in Copenhagen, Denmark. Planned and supervised the real-time, complete-mission simulations with harbor pilots. Compiled and analyzed the physical conditions of the Tuxpan River such as channel dimensions, wind, and currents. Planned the simulation scenarios based on the port's Master Development Plan, including ship selection. Analyzed the results from the simulation and provided recommendations to generate a Port Operations Manual.

Design of a Dolphin Structure to Extend the Docking Facility of TMM's International Cruise Ship Terminal in Cozumel • Quintana Roo, Mexico

Reviewed the overall structural safety of an innovative, gravity-type design at the International Cruise ship terminal in Cozumel, Mexico. Mr. Simón calculated wave-induced pressure on the caisson-type and push and pull from a cruise ship, as well as overturning moments and stresses at the toe of the structure. Mr. Simón also reviewed the construction procedure.

Feasibility Study and Executive Project to Extend the Jetties at the Port of Altamira • Tamaulipas, Mexico

Project Manager and Lead Engineer for basic coastal engineering analyses to calculate design wave heights, and determination of longshore sediment transport rates based on historical data. Estimated the cost of different alternatives for the extension of the north jetty. As part of the port's maintenance program, Mr. Simón applied value engineering to estimate the optimum jetty length based on construction and 30-yr dredging costs. Completed the executive project, which included the use of rock and Core-loc armor units over more than 700 m of jetty extension. This project was built shortly after its completion.

Technical and Economic Feasibility Study to Extend the Jetties at the Port of Tuxpan • Veracruz, Mexico

Project Manager and Lead Engineer for basic coastal engineering analyses to calculate design wave heights, and determination of longshore sediment transport rates based on historical data. Estimated the cost of different alternatives for the extension of the north and south jetties. As part of the port's maintenance program, Mr. Simón applied value engineering to estimate the optimum jetty length based on construction and 30-yr dredging costs. Completed the executive project, which included the use of rock and Core-loc armor units over more than 300 m of jetty extension. This project was built a few months after its completion.

Erosional Hot Spots at Delray Beach, FL: Mechanisms and Probable Causes

As part of research work at the University of Florida, studied the beach nourishment at Delray Beach, FL, to determine the existence of erosional hot spots (areas of considerably larger erosional rates than the average of the project). Used DNRBSM model, developed originally for the Department of Natural Resources by the University of Florida's Coastal and Oceanographic Eng. Dept. to predict shoreline changes. Developed a criteria based on the standard deviation of different parameters to evaluate the overall performance of the project. The project was part of thesis work in which Dr. Robert G. Dean acted as advisor.

Hydrodynamic Modeling of the Acapulco-Papagayo Marina Resort

Participated in field data collection and processing which included tides, salinity levels, currents, and water levels both in the ocean and inside the Tres Palos Lagoon. Applied model TRANQUAL to predict new hydraulic patterns due to the construction of a Marina. Analyzed the spill of pollutants within the marina and suggested improvements to the design for better flushing.

Technical Feasibility Study and Executive Project of West Stormwater Interceptor, Including the Crest Level Increase of Ignacio Ramirez Dam, Mexico

Calculated rainfall parameters and obtained hydraulic and hydrologic characteristics of the different watersheds and rivers. Automated the calculation of dredging and construction volumes of the stormwater interceptor or channel and analyzed the construction volume requirements to raise the dam's height.

Restoration Project of Nine Fishing Ports in the Yucatan Peninsula and Campeche, Mexico

As Staff Engineer, participated in the repairs design and cost estimating of nine fishing ports. Developed executive projects, including drawings, and construction volumes, and construction plans for each repair design.

Design of a Seawall for Coastal Protection for an Exclusive Resort in Cancun, Mexico

Compiled basic coastal data such as waves, tides, hurricane paths and winds, and beach nearshore bathymetry and sediment data. Determined the seawall's crest elevation and foundation depth by applying SBEACH model to estimate erosion rates at the toe of the structure and determined the required foundation depth.

Physical Modeling of Spillway Velocities and Scour Effects for the La Angostura Dam and Huites Dam, Mexico

As an undergraduate research Assistant at UNAM's Engineering Institute, Mr. Simón used hydraulic instrumentation to measure and develop velocity profiles and velocity contours along different sections of the La Angostura Dam spillway structure in Chiapas, Mexico. Mr. Simón also measured modeled scour caused by the discharge of a ski jump-type spillway at Huites Dam, in Sinaloa, Mexico