Arden T. Herrin, M.S.C.O.E., B.S.C.E.
Coastal Engineer

EXPERTISE

Coastal engineering design of structures and design of beach nourishment projects. Scour analysis of tidally influenced systems and structures. Modeling of hydrodynamics in littoral, estuarine, and groundwater systems using numerical and analytical models. Validation of models based on observed data, and experience in interpreting model output. Using MATLAB and other tools to analyze and visualize data and model results. Statistical and extremal analysis of coastal events, and resulting coastal conditions.

QUALIFICATION SUMMARY

- Modeling experience with ADCIRC, CORMIX, EFDC, HEC-RAS, MODFLOW, MT3DMS, RMA2, SEAWAT, SBEACH, STWAVE, and SWAN.
- Programming experience with R, FORTRAN, LABVIEW, MATHCAD, and MATLAB
- Laboratory and numerical model assessment of bridge scour in riverine and tidally influenced environments.
- Strong written and verbal communication skills
- Strong data processing and analysis skills

WORK EXPERIENCE

2012-Present	Coastal Engineer, Woods Hole Group
2012	Engineer Intern, Ocean Engineering Associates, Inc.
2008-2011	Teaching/Research Assistant, University of Florida
2008	Technical Intern, Energy Conservation Strategies Commission (ECSC)
1998-2007	Administrative Manager, Lowes Home Centers

Education
2012 – M.S.
Coastal and Oceanographic Engineering
University of Florida
2010 – B.S.
Civil Engineering
University of Florida

Licenses and Registrations
- Engineer In Training (EIT)
- FDOT Roadway Plans Reading Certification

Professional Affiliations
- Associate Member; American Society of Civil Engineers (ASCE)
- Member; Coasts, Oceans, Ports and Rivers Institute (COPRI)
- Member; Order of the Engineer
- Member; Tau Beta Pi Engineering Honor Society
- Member; Chi Epsilon Civil Engineering Honor Society

Publications & Presentations
1

KEY PROJECTS

Technical Evaluation of Preliminary 2013 FEMA FIRMs for the Towns of Scituate, Marshfield, and Duxbury, MA- Coastal Engineer
Performed coastal hydrologic and hydraulic evaluations of preliminary FEMA FIRMs released in May 2013. The work included assessment of 100-yr stillwater elevations, offshore wave conditions, and wave setup criterion utilized by FEMA in the coastal modeling. Conducted detailed evaluation using FEMA's models and methods for erosion, overland wave transformation, wave runup, and overtopping of specific transects. Results from the analyses were used to update the flood zone and BFE mapping shown on the preliminary FIRMs. The work was performed on an accelerated schedule and resulted in an appeal to FEMA for revisions to the FIRMs. The appeal is currently under review by FEMA.

Hydrodynamic and Water Quality Modeling at Fort Point Channel in Boston, MA-Coastal Engineer/Modeler
Using bathymetric data collected in support of the modeling effort, developed a three dimensional Environmental Fluid Dynamics Code (EFDC) model of the Fort Point Channel estuarine system. Conducted multiple scenarios of both dry weather and storm events to assess contaminant loadings and residence times within the system in support of remediation efforts by the Massachusetts Water Resources Authority.

Greater New Orleans Hurricane Storm Damage Risk Reduction System Notice of Construction Completion Checks by Non-Federal Sponsor-Coastal Engineer
Provided the Louisiana Department of Natural Resources Coastal Protection and Restoration Authority (CPRA) with technical assistance in their construction completion checks for the Hurricane Storm Damage Risk Reduction System (HSDRRS), Performed comprehensive review of the JPM-OS statistical methodology used to determine the design still water levels and wave conditions. Conducted technical review of the HSDRRS, and the Greater New Orleans Levee Armoring Research and Recommendations Report (LARR).

Shoreline Mapping and Sediment Transport Potential Update, Saco Bay, ME- Coastal Engineer/Modeler
Using the most recent LIDAR and digital elevation model data, refined and updated the regional STWAVE model for Saco Bay, Maine in support of the United States Army Corps of Engineers (USACE)regional sediment management (RSM) program. Using the wave heights and radiation stresses to determine sediment fluxes for each grid cell in surf zone. Compared the results of the regional sediment flux with GIS based shoreline change information.

Town of Palm Beach Technical Review of Proposed Coastal Management Program, Palm Beach, FL- Coastal Engineer
Analyzed WIS data and developed wave input for use in determining longshore diffusivity and closure depths along Palm Beach. Based upon the possible sources of sediment available for nourishment projects, examined the effects of grain size upon project performance. Utilized one-line models to provide initial analyses of beach nourishment performance. Investigated potential effects of combining and/or lengthening beach nourishment scenarios for the varying sediment sources.

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KEY PROJECTS (CONTINUED)

Cost Benefit Analysis for Erosion Stabilization Activities at Chapin Beach and Corporation Beach, Dennis, MA-Coastal Engineer
Analyzed WIS data and performed extremal analysis on the wave data to provide input conditions for determining storm response for multiple scenarios at Chapin Beach. Transformed beach profiles using long term shoreline change rates in conjunction with multiple SBEACH model scenarios to determine scenario longevity and storm response of various alternatives. Performed engineering stability analysis of existing revetments to calculate level of design and expected performance. Initial conceptual design of a coir envelope shoreline stabilization.

Chilmark Township Cobble Berm, Chilmark, MA-Coastal Engineer/Designer
Conducted literature review to establish design parameters to design a cobble berm (dynamic revetment). Used the defined parameters to design a dynamic revetment for the 25 year recurrence storm surge and wave event.

Reserve Environmental Services, Ashtabula, OH– Coastal Engineer/Modeler
Modeling effluent discharge plume of a multiport diffuser with CORMIX for wastewater discharge permitting. Assisted in the design of data acquisition using multiple sensor arrays to measure Total Dissolved Solids (TDS) and ambient current in Lake Erie.

Regional Sediment Management Plan for the New Jersey Coast, Philadelphia, PA- Coastal Engineer
Analyzed historical shoreline trend data to analyze and develop cost saving strategies for the New Jersey coastline for the Philadelphia District of the United States Army Corps of Engineers (USACE). Utilized one-line models to provide initial analyses of beach nourishment performance. Investigated potential effects of coastal structures and structure design variations.

Florida Department of Transportation (FDOT) Unknown Foundations Phase II Bridge Scour Analysis; Districts 1 and 4, Bartow, FL and Fort Lauderdale, FL– Engineer Intern
Used model results from existing RMA2 models to develop equilibrium bridge scour depths for both 100 year and 500 year events. Modified and refined existing RMA2 models to generate flow depths and velocities for scour analysis. Created models to predict scour depths at tidally influenced water bodies at multiple locations on the Florida Gulf Coast.

Soil Erosion Rate Flume (SERF) and Rotating Erosion Testing Apparatus (RETA), Gainesville, FL– Research Assistant
Engineered cohesive sediment samples for Triaxial and SERF testing to investigate the correlation between shear strength and erosion rate. Analyzed erosion rates of erodible rock samples in the FDOT RETA to assist in the development of empirical formulae to estimate erosion rates.

PUBLICATIONS & PRESENTATIONS

Jacobsen, R., N. Dill, A. Herrin, & M. Beck. 2015. Hurricane Surge Hazard Uncertainty in Coastal Flood Protection Design. *The Journal of Dam Safety*, 21-39.

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