Alex J. Shaw, M.S., B.S.
Coastal Engineer

EXPERTISE

Hydrodynamic modeling using numerical and analytical models on coastal and estuarine systems using both structured and unstructured grids. Validation of models based on observed data and analytical methods. The use of SMS, ArcGIS, MATLAB and other programs to visualize and process model inputs and outputs.

QUALIFICATION SUMMARY

- Coastal numerical modeling experience with ADCIRC, WHAFIS, SLOSH, STWAVE, EFDC, ACES, CMS flow, and SWAN.
- Programming experience with MATLAB
- Laboratory and numerical model assessment of storm surge flooding and the effects of dredging
- Strong written and verbal communication skills
- Strong data processing and analysis skills

WORK EXPERIENCE

2016-Present	Coastal Engineer, Woods Hole Group
2014-2016	Teaching/Research Assistant, University of Rhode Island
2013	Intern, Applied Science Associates (RPSASA)
2012	Intern Office of Marine Programs

Education
2016 – M.S.
Ocean Engineering
University of Rhode Island
2014 – B.S.
Ocean Engineering
University of Rhode Island

Licenses and Registrations
Advanced SCUBA certification
HAZWOPER Certification

Professional Affiliations
- Member; Coasts, Oceans, Ports and Rivers Institute (COPRI)
- Member; Order of the Engineer
- Tau Beta Pi Engineering Honor Society
- Omega Epsilon Ocean Engineering Honor Society

Publications & Presentations
2

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KEY PROJECTS

Eagle Neck Creek Restoration Project – Engineer/Modeler
Used a combination of EFDC and a MATLAB hypsometric model to determine the culvert dimensions for the culvert under Old County Road in Truro, MA. This was done to enhance the marsh in Eagle neck Creek and allow transparent tidal flow.

**Assessing the Vulnerability of MassDOT's Coastal Transportation Systems –
Engineer/Modeler**
Helped develop a coupled ADCIRC SWAN mesh to for the southern half of Massachusetts to be modeled with hurricanes and extra tropical events. Also developed an overtopping analysis for the coastal structures using CMS FLOW and Overtopping formulas.

**Remediation at Callahan Mine Superfund Site in Brookville, Maine –
Engineer/Modeler**
Worked on the development of an EFDC model to determine the flow around the Callahan Mine in Brookville, Maine. The model was used to determine the spread of toxic materials at the bottom of the mine in the water column.

Maidford, Rhode Island Marsh Restoration Project – Engineer/Modeler
Worked on the development of a hydrodynamic model for Maidford River, Rhode Island. The model used was EFDC. The model was used to determine best location for the river inlet to best restore the marsh plane. Used CMS FLOW and SWAN to determine the flow and wave climatology on Third Beach.

Mayo Creek Wetland Restoration Project – Engineer/Modeler
Modified an existing hypsometric MATLAB model to determine the correct culvert design. The parameters were constricted to maintaining mean tide level (MTL) to maintain the ground water level around the nearby houses. The final design was a 6 x 6-foot culvert with a combination tide and sluice gate to limit flow. This increased the wetted area of the marsh without affecting the surrounding houses.

**Woods Hole Oceanographic Institute (WHOI) Flood Insurance Revision –
Engineer/Modeler**
Accessed the current conditions of for flood insurance from the Federal Emergency Management Agency (FEMA). Recreated FEMA transects in the area with modified topography, water, and wave conditions using ACES, CHAMP, and SWAN 1D. The reassessment lowered the BFE for WHOI and the surrounding area.

Swampscott Overtopping and Runup Analysis – Engineer/Modeler
Different properties in Swampscott, Massachusetts were accessed for their vulnerability to runup and overtopping. Using equations from the Coastal Engineering Manual (CEM), the topography of the area, and probability curve for water levels the overtopping rate and runup elevation were calculated for each site. Design alternatives for reduced runup and overtopping were accessed to determine effectiveness.

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KEY PROJECTS (CONTINUED)

**Narrow River Dredging Project for the CRMC and Fish and Wildlife Service –
Engineer/Modeler**
Created a hydrodynamic model using ADCIRC to assess the impact of multiple dredging scenarios on the Narrow River flushing times and tide ranges. The dredging scenarios considered included dredging to 1, 1.4, 2, and 3 meters in the narrows of the river to increase flow and decrease flushing time. Both tidal and surge cases were evaluated. The work was completed ahead of schedule and is being considered by the CRMC and other agencies.

**Effect of Erosion on Storm Surge Flooding: Case Study of Coastal Ponds in
Rhode Island – Engineer/Modeler**
Developed and validated high resolution model of the south coast of Rhode Island. Erosion was estimated for 25 years and after a storm event where the dunes have been eroded. Two storms, Hurricane Bob and a synthetic 100-year recurrence event, were simulated both with and without erosion. The erosion of the shoreline was shown to have negligible effects on flooding extents, while dune erosion produced a dramatic increase in flooding along the coastline for smaller scale events.

PUBLICATIONS & PRESENTATIONS

Hashemi, M. Reza, Malcolm L. Spaulding, Alex Shaw, Hamed Farhadi and Matt Lewis. 2016. "An efficient artificial intelligence model for prediction of tropical storm surge." Natural Hazards 82.1 (2016): 471-491.

Shaw, Alex, Mohammad Reza Hashemi, Malcolm Spaulding, Bryan Oakley and Chris Baxter. 2016. "Effect of Coastal Erosion on Storm Surge: A Case Study in the Southern Coast of Rhode Island." *Journal of Marine Science and Engineering* 4.4 (2016): 85.

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