JohnathanWoodruff

Coastal Hazards Engineer

PhD Candidate in Coastal Engineering
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Mentoring

- Advised and mentored three undergraduate researchers

Leadership

- President - Coasts, Oceans, Ports, and Rivers Institute at NC State
- Student Chair - EWC Research Symposium

Certifications

- Engineer in Training (EIT) Certification
- Open water diving certification

Honors

- NSF International Research Experiences for Students
- Thomas Griffin Graduate Award
- 3rd place EWC Symposium Presentation
- 1st place EWC Symposium Presentation
- Student Educational Award - ASBPA
- Summa Cum Laude - University of Florida

Scientific Writing

- Contributed to several scientific papers including 1st authorship on one paper

Education

Doctor of Philosophy in Civil Engineering — Dec 2022
North Carolina State University, Raleigh, NC

Master of Science in Civil Engineering — May 2018
Georgia Institute of Technology, Atlanta, GA

Bachelor of Science in Agricultural and Biological Engineering — May 2016
University of Florida, Gainesville, FL

Areas of Expertise

Coastal and Hydrodynamic Modeling

- Numerical modeling and development of the ADvanced CIRCulation (ADCIRC) model.
- High Performance Computing (HPC) system usage in large-scale storm surge modeling.
- Development of regional and ocean-scale numerical meshes.
- Theoretical development of subgrid corrections in a finite element framework.

Geospatial Modeling

- Development and automation of geospatial models (ArcGIS, GRASS GIS) using Python.
- Manipulation and down-scaling of geospatial data.

Scientific Programming

- Statistical analysis of model and observation results using Python.
- Batch processing of large datasets using Python.

Experience

Research Scientist — June 2018 - Present
North Carolina State University — Raleigh, NC

Water Resources Engineer — June 2017 - September 2017
Collective Water Resources — West Palm Beach, FL

Engineering Intern — June 2015 - August 2015
Atkins Global — Tallahassee, FL

Projects

Storm Surge Forecasting of the South Atlantic Bight | DHS CRCoE — January 2022 - Present

- Development and testing of ocean-scale numerical meshes for use in forecasting hurricane storm surge along the South Atlantic Bight.
- Validation of model results using observational data and statistical analysis.
- Collaboration with storm surge experts and interested parties to produce highly accurate and efficient flooding predictions.

Increasing the Accuracy and Efficiency of Storm Surge Models | NSF — June 2018 - Present

- Multi-institutional project that aims to improve the accuracy and efficiency of storm surge modeling by leveraging high-resolution bathymetric and land-cover data.
- Theoretical development and application of subgrid correction factors in the continuous-Galerkin, finite-element, ADvanced CIRCulation (ADCIRC) model.
- Hindecast storm surge forecasting for testing and validation.

Programming Python ●●●●● FORTRAN ●●● MATLAB ●●● C ●● Linux ●●

Models ADCIRC ●●●●● Delft3D FM ●●● XBeach ●● ArcGIS ●●●● QGIS ●●●● GRASS GIS ●●●● HEC-RAS ●●