



Daniel I. Duval, M.S.
Coastal Scientist

Expertise

Expertise and research interests in coastal processes and sediment transport. Application of field and laboratory research to resolve and evaluate hydrodynamic and geologic processes within coastal and estuarine environments. Deploy and maintain instrumentation, land-based or shipboard operations. Data processing utilizing Matlab, including time-series and quantitative analyses.

Oceanographic data collection systems. Coastal mooring system instrumentation and deployment techniques. Field operations logistics, efficiency, safety, and shipboard deck operations. Programming, deployment, and data analysis of oceanographic instruments including the ADCP, ADV, and CTD. Water and sediment processing for gamma spectroscopy.

Relevant Experience

Monitoring of water circulation and sediment transport for the marsh restoration project at the Prime Hook National Wildlife Refuge, Delaware. Deployed ADCPs and automated water samplers to quantify circulation and sediment transport patterns before, during, and after restoration. Analyzed data using Matlab to quantify the net transport of sediment from the marsh.

Research on the effect of tropical cyclones on sediment transport in the Delaware River, Estuary, and Bay; work utilized ADCP data and discrete water samples.

Analyzed CTD data in Matlab to determine the physical mechanisms controlling temperature in Great South Bay, NY. Quantified heat transfer in the bay from both atmospheric and oceanic forcing.

Work Experience

2016-Present	Woods Hole Group, Inc. (Coastal Scientist)
2014-2016	University of Delaware (Limited Term Researcher)
2010-2013	University of Delaware (Research Assistant)
2006-2008	Stony Brook University (Research Assistant)

Education

- M.S., Marine Studies – Oceanography 2013 Univ. of Delaware
- M.S., Marine Studies – Oceanography 2008 Stony Brook Univ.
- B.S., Marine Science – 2006 Univ. of South Carolina

Qualification Summary

- 10 years of experience
- Experienced in the deployment/recovery of coastal instrumentation and data processing
- Use of ADCPs for temporal (moorings) and spatial (vessel surveys) oceanographic studies
- Extensive field/shipboard operations and logistics management of geologic and water sampling
- Small and large water processing for SSC and LOI analysis, and gamma spectroscopy
- Sediment core collection and characterization
- Specializes in coastal data collection program management and operational logistics for both surface and subsurface systems.

Key Projects

Marsh Restoration Project, Prime Hook National Wildlife Refuge, Delaware. U.S. Fish and Wildlife and Delaware Department of Natural Resources and Environmental Control. 2014-2016.

U.S. Fish and Wildlife is leading the restoration of Prime Hook Marsh after storms created breaches in the barrier beach. Previously managed as a combination of natural salt marsh and man-made freshwater marsh, the breaches caused saltwater buildup within the interior of the marsh with limited drainage. The goal of restoration is to return the marsh to a full salt water marsh. This includes: 1) filling in the breaches in the barrier island, 2) dredging over 20 miles of channels to allow tides to propagate through the marsh, and 3) removal of water control structures that block tidal flow.

As part of the restoration process, a monitoring plan was developed to envelop the entire marsh restoration. One year of data was collected prior to restoration and will continue for one year after construction is complete. Monitoring includes the deployment of five ADCPs and automated water samplers (ISCOs) at the major waterways of the marsh. This data is used to characterize the circulation at all phases of restoration, as well as quantify the sediment transport in the marsh. By doing so, it can be determined whether or not the marsh receives enough sediment to accrete naturally, or if it will require further assistance.

Scusset and Town Neck Beaches, Town Neck, Massachusetts. Town of Sandwich. 2016.

Town Neck beach has experienced significant erosion due to the presence of the Cape Cod Canal. Sand that would normally be transported to it from the north becomes trapped in the Canal. Currently, it is proposed to dredge sand from Scusset Beach, north of the Canal, to renourish Town Neck Beach. In order to answer concerns of wildlife habitat, topographical surveys were conducted using a Trimble R8 RTK GPS. The purpose of the surveys was to 1) determine potential nesting grounds for piping plover, 2) identify rocky intertidal and eelgrass zones, and 3) help estimate the volume for sand available for removal. Surveys were compared to previous LIDAR elevation data, as well as Mass DEP surveys for rocky intertidal and eelgrass zones, and will assist in future spreading analysis.

Callahan Mine, Goose Pond Estuary, Brooksville, Maine. AMEC Foster Wheeler Environment & Infrastructure, Inc. 2016.

AMEC Foster has hired The Woods Hole Group to support the remediation and restoration of Callahan Mine. One task performed was to perform side-scan sonar and bathymetric surveys in and outside the Goose Pond Estuary. Side-scan sonar data was collected using a Klein System 3900 towfish and topside unit. The Klein 3900 is an extremely high-resolution dual frequency (445 and 900 kHz) digital sonar for excellent characterization of identified targets. Surveys were conducted along proposed silt curtains locations to assist in anchor design. Bathymetric data was collected using a Sontek M9 Hydrosurveyor interfaced with a Trimble R8 RTK GPS and a PC running the survey software HYPACK 2016. The M9 includes full water column velocity mapping capabilities, as well as five beam depth sounding. The M9 switches between one and three MHz transducers depending on the depth. In locations that are too shallow for the M9 (<1.2 feet depth), elevation data will be collected using the RTK GPS along transects plotted in Hypack to ensure proper spatial distribution of data. Finally, vertical profiles of density, temperature, and salinity were taken using a Sontek Castaway CTD. These profiles will be used to validate seasonal conditions for modeling purposes.