



Port Huron Unmanned Aircraft System Data Collection and Technology Demonstration

ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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Response Summary:

Nick Spore and Alex Renaud of the Coastal and Hydraulics Laboratory's (CHL) Coastal Observation and Analysis Branch (COAB) traveled to Detroit District (LRE) to demonstrate Unmanned Aircraft System (UAS) concept of operations (CONOPs) and potential for conducting coastal survey capabilities. The team collected data in Port Huron where Lake Huron enters the St. Clair River, demonstrating procedures and discussing data collection strategies to District personnel there. The goal of this effort was to identify ways in which UAS data could help better understand sediment movement within the area.



Following data collection, the team visited the Detroit area office for further discussion on establishing and developing UAS capabilities for improved coastal management and other potential district applications. Spore and Renaud then worked with Drs. Kate Brodie and Brittany Bruder to generate and analyze topographic and bathymetric digital surface models, including assessing the performance of bathymetry inversion algorithms for the first time in an inland water system, which measure wave speed from pixel-timestacks and estimates bathymetry.



Period of Performance:

FY18 Quarter 4. LRE Visit: August 7-8, with follow-up data processing/analysis

Benefits of the Response to the USACE Dredging/Navigation Program:

This technology demonstration better informed Detroit District personnel of the potential for UAS to support mapping and monitoring of USACE projects and Great Lakes sediment evolution. By collecting data from a LRE point of interest, the CHL team was able to work with real data that could help the district better understand sediment transport in the St. Clair river entrance area. The data should support a more quantitative survey of the shoreline immediately to the river entrance's northwest while the cBathy UAS hover data should better define the nearshore bathymetry there (and suggests a way to quickly collect this type of data in these unique nearshore environments). In return the CHL team was able to better assess the performance of UAS capabilities and better refine their CONOPs to better evaluate different Dredging/Navigation programs as part of a larger effort to develop UAS support to coastal Management.

Deliverable:

This response provided: a day long technology demonstration (in the field and at the Detroit area office) of UAS coastal data collection capabilities, UAS generated point clouds, DEM, and orthomosaic imagery of the shoreline to the northwest of the St. Clair River Entrance, and UAS generated bathymetry of the nearshore environment.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers
Operations and Maintenance navigation and dredging missions

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