A Web-Based Platform for Visualization and Analysis of Coastal Geomorphology Data

Authors: Nathan Vinhateiro (nathan.vinhateiro@rpsgroup.com), Paul Hall, Kelly Knee, Andrew Bird, Robert Fratantonio

RPS ASA, 55 Village Square Drive, South Kingstown, RI 02879

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Here we present a web-based platform developed to allow interactive exploration and analysis of coastal geomorphology data and in facilitate comparison with contemporaneous oceanographic data (e.g., ocean waves). The CHL Data Portal was developed in partnership with the U.S. Army Corps of Engineers Coastal and Hydraulics Laboratory (USACE CHL) and includes a data management system and a front-end web portal featuring a suite of visualization and analysis tools. The portal was developed to allow real-time oceanographic and hazard detection analysis and user-defined threshold datasets developed at FRF (e.g., beach profile models, mobile labs). The interface was built using RPS ASA’s OceanMap framework (Java/web, HTML, CSS) and a Python backend for the web services and querying. All projects leverage Geoserver.

Geomorphology Tools

Storm-induced erosion

Changes to the beach profile following the passage of Hurricane Sandy (29 October 2012) are evident. Field observations documented a significant change in the beach profile at the site over the nearly 40-year history of the FRF Data File. The new profile is similar to the one recorded in 2003 after Hurricane Isabel. The changes in the profile are evident in both the imagery and the measured elevation data.

USACE Field Research Facility (FRF)

Located on the Outer Banks, near the town of Duck, NC, the Field Research Facility (FRF) is a premier coastal science laboratory that was established in 1977 to support the U.S. Army Corps of Engineers (USACE) coastal engineering mission. The facility is situated on 155 acres of land bordering the Atlantic Ocean. It includes a 105-foot ocean observatory tower, a steel and concrete wave basin with a 560-foot concrete breakwater, and a 200-foot-long beach. The FRF is staffed by a small dedicated team of marine scientists and engineers that collect oceanographic data and conduct research as a wide range of coastal processes including waves, coastal depositional and erosional processes, and marine and estuarine ecosystems.

CHL Data Portal

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Navigation

Data Exploration and Plotting

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