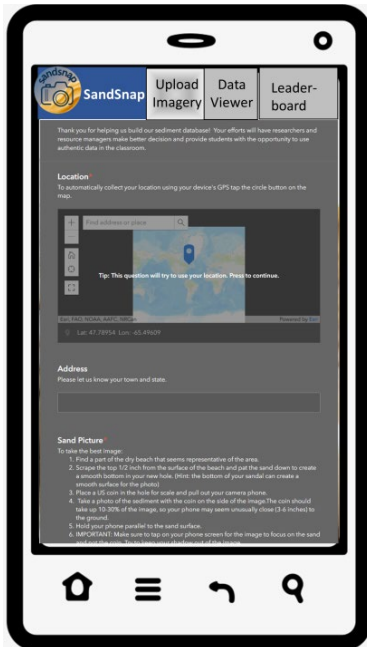


Building Strong®

DISCOVER | DEVELOP | DELIVER



SandSnap (FY21)

Background: There is no comprehensive beach sediment size database to improve the understanding of beach composition and thus sediment mobility. Sediment size is a critical factor in all nearshore morphology models, including those widely implemented as decision tools across the USACE. Unfortunately, it is entirely unfeasible to collect beach grain size data over a large geographical area with traditional methods (e.g., sample collection and sieve analysis). Consequently, this critical parameter often has the largest uncertainty in sediment transport modeling (Soulsby, 1997) and this deficiency critically limits USACE morphology modeling capability.

Approach: This project will directly address the need for a comprehensive beach sediment size database for the coastal United States. This project will build a web-based platform for the nationwide database of high-fidelity beach grain size data generated by analyzing sediment imagery obtained from cell-phone equipped citizen scientists.

Technical Advancements:

- Develop and deploy SandSnap interactive web application under development in partnership with the CESAM Spatial Data Branch (OP-J).
- Migrate neural network prediction model to USACE cloud resources (Azure) to facilitate analysis of images obtained through the web-application.
- Migrate neural network training to USACE High-Performance Computing Environment.

Payoff: Crowdsourcing the data collection with citizen scientists provides a cost-effective way to engage the public and garner public support for USACE projects, while capturing the critical spatial and temporal variations in the beach sediment grain size. This will improve project uncertainty analysis and potentially make more dredged sediment compatible for beneficial use on beaches. Additionally, this database will massively improve USACE morphology modeling capabilities both in preliminary studies where traditional grain size data is not yet available and in large-scale morphology modeling with large spatial variability in grain size. District Engineers and Scientists will also have access to the database for planning and feasibility studies that require sediment size information. This database will directly support Navigation, Flood Risk Management, and Ecosystem business lines.

ERDC Points of Contact:

Brian McFall, Principle Investigator

Tanya M. Beck, Program Manager

CIRP@usace.army.mil

Coastal Inlets Research Program

<https://cirp.usace.army.mil>



The U.S. Army Engineer Research and Development Center (ERDC) solves the nation's toughest engineering and environmental challenges. ERDC develops innovative solutions in civil and military engineering, geospatial sciences, water resources, and environmental sciences for the Army, DOD, civilian agencies, and our Nation's public good. Find out more on our website: www.erdcd.usace.army.mil. Approved for public release; distribution is unlimited. June 2018.