



US Army Corps  
of Engineers  
Engineer Research and  
Development Center

# Coastal Inlets Research Program

## Coastal Navigation Portfolio Management:



### *Coastal Systems Performance Evaluation - Development of coastal navigation analysis methodologies via AIS data*

**Need** The USACE maintains a vast infrastructure portfolio of deep-draft coastal entrance channels and aging rubble-mound jetties and breakwaters. Due to limited budgetary outlooks for maintenance dredging and repair of coastal structures, the Corps must be able to objectively identify the most actively used structures in the portfolio so that resources may be directed at the navigation structures that are most critical to overall marine transportation system.

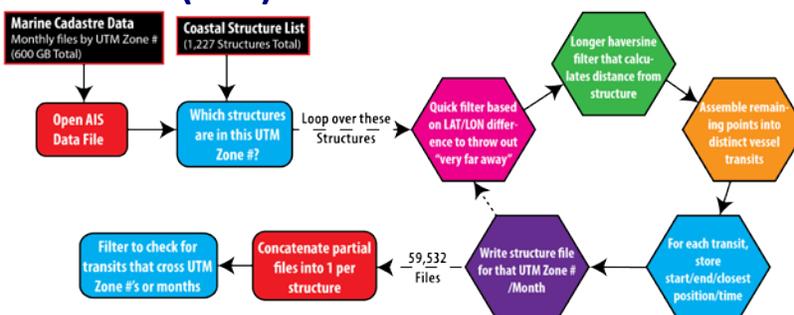
- Approach**
- Identify metrics that can be mined from shipborne Automatic Identification System (AIS) data that provide quantitative profiles of vessels operating in proximity to coastal navigation structures.
  - Develop computational methods to mine relevant metrics at the portfolio scale in a high performance computing environment, allowing for nationwide analysis of vessel-structure interaction.
  - Apply developed methods to multi-year nationwide record of vessel activity in context with coastal structures and assess the results as a method for comparative analysis of structures in terms of quantified user profiles.
  - Further develop methods and relevant metrics into an operational tool for providing objective performance metrics for coastal structures.

**Technical Advancements** This work aims to develop and test methods to quantify performance of coastal structures for the purpose of comparative analysis across the structure portfolio. Given the size of the portfolio and the number of users, a distributed parallel computational approach provides results in a time-frame that makes informing managerial decisions feasible, while providing unprecedented insight into the domain of users interacting with coastal structures.

**Leveraging Opportunities** Creating a distributed network covering USACE infrastructure and vessel data provides the foundation for future research and the development of solutions to problems that occur at their intersection. Additionally, this research leverages and informs work being done by the Dredging Innovations Group (DIG) program to optimize dredging project selection.

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U.S. Army Engineer Research and Development Center  
October 2018

Coastal Inlets Research Program – Navigation RDT&E  
<http://cirp.usace.army.mil>