



US Army Corps
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Engineer Research and
Development Center

Coastal Inlets Research Program

Coastal Navigation Portfolio Management:



Coastal Systems Performance Evaluation – Channel Shoaling Analysis Tool (CSAT)

Need The USACE maintains a vast infrastructure portfolio of deep-draft coastal entrance channels. Due to limited budgetary outlooks for maintenance dredging, objective, consistent data analytics for the Corps’ coastal navigation infrastructure portfolio will help ensure that limited resources are rationally allocated across portions of the system with the greatest need.

- Approach**
- CSAT estimates shoaling rates using hydrographic surveys within the boundary of the National Channel Framework.
 - CSAT uses the historical shoaling rates to predict future dredging volumes at various channel depth intervals.
 - CSAT shoaling rate grids can be used to identify hot spots or areas of increased sedimentation.
 - Improving district access of the CSAT output data files (shoaling rate grids as well as data tables showing the dredge volume requirements at various points out into the future) will allow districts to analyze shoaling questions for specific regions of interest.

Technical Advancements This work aims to improve district access and spatial views of the CSAT output data files that include shoaling rates as well as data tables showing the dredge volume requirements at various points out into the future. In addition, creation of a user interface on a web-based platform to run CSAT and allow district functionality to support specific shoaling questions is needed to ensure the efficient management and access of these large spatial datasets.

Leveraging Opportunities CSAT leverages the eHydro tool that districts use to process and upload hydrographic surveys for navigation channels. Additionally, this research leverages and informs work being done to support the Asset Management dredge project selection optimization that uses current hydrographic surveys obtained through eHydro, shoaling rate predictions from CSAT, and disrupted vessel tonnage obtained from the Channel Portfolio Tool (CPT) that uses the Waterborne Commerce Statistics for each navigation channel.

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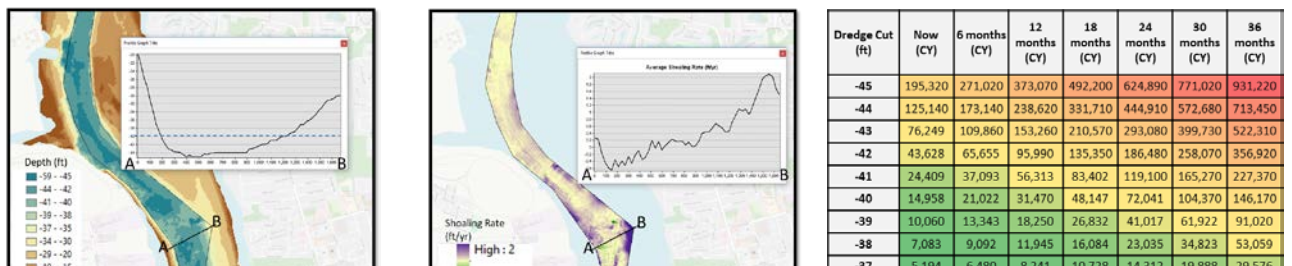


Figure 1. Hydrographic Survey for a reach in Jacksonville Harbor (left) and the shoaling rates for this reach (center) with areas of higher shoaling (purple) and less shoaling (green). Example volume table showing quantity of sediment to remove at the various depth and time increments (right).

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