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ENGINEER RESEARCH & DEVELOPMENT CENTER

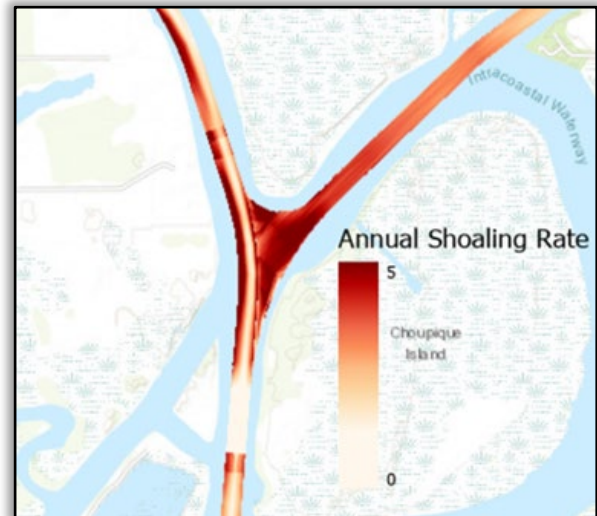
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CSAT Integration and eHydro Data Analytics (FY21)

Background: The USACE requires objective quantification metrics to identify the most critical dredging needs in the vast infrastructure portfolio of deep-draft coastal entrance channels. Questions from the USACE decision makers that may be answered using the hydrographic surveys through analysis of channel condition surveys include, *“What are the historic channel infilling rates in the channels? What are expected dredging volumes for any given channel reach? What is the current channel availability across the USACE portfolio?”*

Approach: Results from the CSAT shoaling forecast are required in the Dredging Optimization workflow. As additional hydrographic surveys are uploaded through eHydro, the CSAT must be run on a regularly recurring basis to provide updated shoaling rates and dredging volume estimates based on the most recent data. Improvements to the workflow need to account for the continuous upload of new surveys. In addition, the hydrographic surveys available from the districts uploaded through eHydro are uniquely available for decision support to the Navigation Mission.



Technical Advancements:

- Further development of shoaling forecasting methods will extend the current capabilities of predicting future sediment shoaling best suited to the channel conditions.
- Extending shoaling forecast analysis capabilities beyond the limits of the National Channel Framework.
- Development of CSAT utilities for improving output products through new visualizations. These utilities will be in the form of Jupyter Notebooks that guide users through the process of performing the shoaling analysis using CSAT, exploring the geographic distribution of shoaling rates using interactive maps, and interrogating the CSAT output products using time series of the source bathymetry data.

Payoff: Tools from this work unit support of the development of the Navigation Operation and Maintenance budget development process and informs nearly \$1B annually in O&M funds dispersed to USACE districts with Navigation components. The combined capability provided by these tools allows navigation managers to more accurately match required dredging estimates to the actual needs of transiting vessels. This helps ensure that maintained channels support shipping interests and identifies maintenance dredging needs if dredging is deferred until future budget cycles.

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