US Army Corps of Engineers®
Engineer Research and Development Center

Coastal Inlets Research Program

Coastal Navigation Portfolio Management

Description

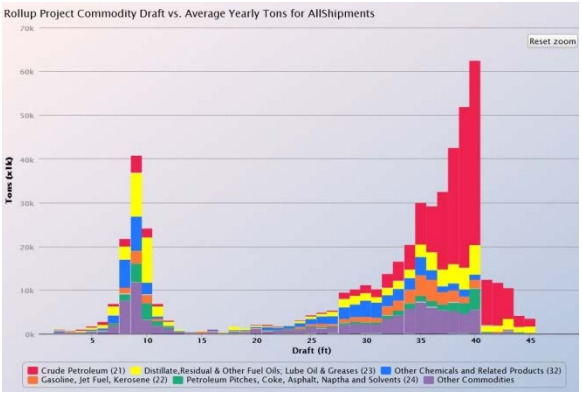
The Coastal Navigatoin Portfolio Management work unit leverages existing data with emerging technologies and advanced analytical approaches to develop objective, consistent methods for resource allocation across the vast coastal navigation portfolio of projects.

Issue Addressed

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 needs to be able to direct resources at the navigation projects that are most critical to overall marine transportation system performance and well-being. The highest levels of Corps Leadership consistently stress the importance of getting the most "bang for the buck" when describing the future of the Civil Works business area. Many of the efforts of this work unit are conducted in tandem with reimbursable work for the Corps' Asset Management initiative, specifically the deep-draft channels PDT and the coastal structures PDT.

Products

The **Channel Portfolio Tool** (CPT) is a web-based decision-support package for determining the extent to which Corps-maintained navigation channel depths are utilized by commercial shipping. CPT uses the proprietary, dock-level tonnage database maintained by the Corps' Waterborne Commerce Statistics Center (WCSC) to provide an objective, consistent basis by which channels may be quickly compared to others for prioritization of limited Operation & Maintenance (O&M) funding. This capability provides Corps navigation managers and project engineers with improved justification for annual O&M dredging budget requests. Since its inception in 2008, CPT has evolved from a proof-of-concept tool covering only a few deep-draft ports into a mature, robust analysis package covering the entire navigation portfolio of projects, both inland and coastal.



The **Coastal Structures Management, Analysis, and Ranking Tool** (CSMART) is a web-based application for prioritization of coastal jetties and breakwaters in O&M budget development. CSMART accesses a variety of data sets that provide indicators of coastal structure significance. For example, metrics for economic activity supported by coastal structures include commercial tonnage in associated channels, nearby commercial fish landings, and associated cruise and ferry passenger statistics. These and other selected metrics are analyzed to produce customized rankings of coastal structures according to user-specified filters and search criteria. The final rankings can be exported and saved for

later viewing, or used to generate Google Earth™ overlays for visualizations. CSMART is designed for use by personnel at the District, Division, and HQ levels of Corps management. CSMART continues to support multiple USACE initiatives, including the Coastal Asset Management group covering coastal structures, as well as several Strategic Navigation Initiatives such as the Low-Use Navigation Project PDT.

The **Automatic Identification System Analysis Package** (AISAP) is a software application that processes archival vessel position reports data obtained via the US Coast Guard's National Automatic Identification System (NAIS). AISAP allows the user to efficiently process large amounts (upwards of two gigabytes) of historic data, making possible navigation systems analyses across very large spatial and temporal domains. Features such as heat maps showing vessel traffic densities, graphing capabilities of average vessel speeds and trip counts, and travel and dwell time analyses provide a range of options for studying Corps navigation project performance across time and space. Though a web-enabled version is in development, at present AISAP is still functionally a desktop application. Future plans call for migration of the full suite of analysis capabilities to be migrated to the web-based platform.

Figure 1. Include some example figures.

Application of Products

Decision makers at all levels within the Corps, from project managers and field office personnel all the way up to the Navigation business line and Civil Works leads at USACE-HQ need the sorts of objective, quantitative insights this work unit provides. Other efforts underway within the Corps, specifically the Asset Management initiative and the new 3x3x3 paradigm for Planning studies (per the Civil Works Transformation Plan), demand ready access to rational, transparent measures of navigation project performance.

Projected Benefits

The scope of benefits from this project is quite broad, providing improved knowledge and understanding for many aspects of the navigation program at a variety of spatial and temporal scales. For example, CPT can be used to quickly compile national and regional trends in waterborne commerce covering nearly a decade, while AIS archival data can be queried to obtain very localized, detailed information concerning vessel handling characteristics in a single reach within a navigation channel. Other AIS examples include the extent to which vessels time their transits of entrance channels with tidal elevations can be quantified, and vessel speeds can be represented statistically for inclusion in numerical models for ship-induced erosion studies.

Documentation

CPT: https://cpt.usace.army.mil
CSMART: https://cpt.usace.army.mil/Silverlight/CSMART

Points of Contact

Kenneth Ned Mitchell, Kenneth.N.Mitchell@usace.army.mil

CIRP Website

- Please see the CIRP website to download documentation: http://www.erdc.usace.army.mil/Missions/WaterResources/CIRP/Publications.aspx
- View archived webinars: http://www.erdc.usace.army.mil/Missions/WaterResources/CIRP/TechTransfer.aspx and
- Review guidance documented on the CIRP wiki: http://cirpwiki.info/wiki/Main_Page .