Coastal Navigation Portfolio Management

Advance objective, quantitative, and systems-based approaches to management of the Corps’ large coastal navigation portfolio of projects.

- Statements of Need:
  - 2017-N-52 Further Development of CPT and AIS software products
  - 2016-N-14 Long-term modeling of coastal structure functionality
  - 2015-N-15 - Integration of national and local monitoring datasets to support navigation and operations projects
  - 2015-N-34 - Incorporating methods to evaluate length of navigation channel required for safe and efficient travel of two way traffic in ship simulations
  - 2015-N-38 - AIS investigation of Dredge Behavior
  - 2015-N-40 - Reducing the need for dredging
Overview of FY18 Products

- Updates to CPT interface - [https://cpt.usace.army.mil](https://cpt.usace.army.mil)
- Assessing Structure Sheltering via Statistical Analysis of AIS Data, Young, D. & Scully, B., Mar 12, 2018, ASCE Journal of Waterway, Port, Coastal, and Ocean Engineering
- Assessing Jetty Effectiveness via Statistical Analysis of AIS Data, Young, D. & Scully, B., ERDC/CHL TN (in review)
- Corps Shoaling Analysis Tool: Predicting Channel Shoaling, Dunkin, L.M., Coe, L., ERDC/CHL TR (with editor)
- AISAP webinars – USCG Navigation Center and District 1
- CPT webinar - SPN
- CSAT webinars – SAC, SAS, SWG, NAO, NAE
- CSAT executable and documents added to CIRP page
- Poster at Super RARG

CPT/AISAP Hosting Support and Development

- Channel Portfolio Tool - CPT
  - 2017 Waterborne Commerce data loaded
  - CPT interface updates –
    - spatial map (leveraged with NavSys)
    - hover text added for user support and help
  - 200+ registered users across ALL Districts containing Navigation projects
  - Users at other Federal agencies
- Automatic Identification System Analysis Package – AISAP
  - AISAP registered users – 150; 5000 unique requests (2014-2018)
  - Migration to cloud
- FY 18 funding and leverage support
  - OP-J - $135K
  - ERDC CHL- $50K
  - ERDC ITL - $75K
  - NavSys and Asset Management support leveraged to complete hosting and development tasks
Innovative solutions for a safer, better world

Channel Portfolio Tool

- CPT – linked with CSAT - SoN 2013-N-22; SoN 2017-N-52
- Interface improvements include access to datasets from CSAT for the shoaling rates and eHydro to include the latest channel conditions.

Corps Shoaling Analysis Tool

- Spatial viewer – includes data layers for National Channel Framework and shoaling rates from CSAT
- Available for download and viewing: https://arcgis/094Lur
- Executable available for Districts
- ‘Live’ in December – 580 views to site
- Rest services created for CSAT output files
  - Volume tables linked within CPT

Dredge Cut (ft)

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Distributed AIS-derived Inlet Structure Metrics

- Research aims to augment subjective, qualitative structure performance metric (OCA), and proxy project maintenance prioritization metrics (tonnage, value).
- Structure design/performance metrics typically exceed vessel operating conditions.
- AIS-derived spatio-temporal characteristics quantitatively relate vessels to structures.
- A meaningful management approach requires portfolio-wide treatment.
- The scale of vessel time history (6 years) and structure portfolio (~1,200) dictate a parallel approach to analyzing vessel behaviors near structures to achieve.

Overview of FY19 R&D and SoNs

- Coupling of CPT, AISAP, and CSAT with other navigation related tools/datasets
  - provide enterprise capability for research aimed at understanding and quantifying channel optimization, jetty functional performance metrics, and other opportunities to connect within CIRP models/tools.
  - 2017-N-52 interface enhancements and improved capabilities for both CPT and AISAP
    - #1 ranked submittal for inland and coastal groups
- AIS on HPC
  - AIS data on the HPC
  - 2016-N-14 Long-term modeling of coastal structure functionality
- Integration for the CNPM tools
  - Modularized component of each tool linked with a spatial map
  - Improvement to the CSAT codes and new user interface
  - Functionality restored to CSMART data
CNPM Tool/Data Integration

- Integration and Support of CPT/CSMART/AISAP/CSAT (SoN 2017-N-52)
- Long term goal for full data/tool integration

Warm colors – higher shoaling rates
Cool colors – lower shoaling rates

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CSAT

- user interface on a web-based platform to run CSAT and allow district functionality to support specific shoaling questions - SoN 2017-N-52
- FY 19 Goal
CSMART

- Web-based application to support prioritization of coastal jetties and breakwaters in O&M budget development - SoN 2017-N-52
- Data migrated to supported platform (include in CPT)
- Link to other datasets (vessel counts from AIS, aerial imagery, lidar grids, census figures)

Distributed AIS-derived Inlet Structure Metrics

- Working at scale strategically positions CNPM to explore other AIS-derived portfolio-wide metrics
  - 4-D around-ship clearance – FY 19 goal
  - Vessel-based infrastructure classification
Reimbursable Studies utilizing w.u. technology

- **Asset Management – FY 18 - $175K**
  - ERDC support for CPT and CSAT development
  - OP-J support for integration of CSAT within CPT and eHydro workflow
- **USCG District 1- AISAP outputs to support an existing USCG study on a section of the Hudson River. Kress**
- **SWG – CSAT – shoaling analysis to support DMMP for HSC, MSC & Corpus Christi. Dunkin**
- **DOTS requests:**
  - DOTS – SWG (CSAT support). Dunkin

Collaborations

- AISAP development is leveraged with Navigation Systems research program.
- CPT development leveraged with Navigation Systems research program and Asset Management program.
- CSAT work is being leveraged with Asset Management program.
Conclusion

FY 18

- Tech Transfer: JP, TR, TN, presentations/webinars (USCG, SWG, SAS, SAC, NAO, SPN) and DOTS request
- CPT-AISAP in-person workshop
- CSAT web map and data accessibility
  - Rest Services linking data to CPT
  - Data accessible via AGOL (https://arcg.is/1z9P9G)
- AISAP
  - Cloud-based environment

FY 19

- Improvements to the CPT and AISAP interface and underlying data structures
  - Spatial map viewer with shoaling rates and volume tables
  - Migration of AIS data to HPC for more robust, nation-wide research of structures and channel evaluation
- Improved access to CNPM tools/data
  - Coupled, web-based access to tools and data
  - CSMART – data migrated to new interface