

USACE Integration of Metrics

CMANC Annual Fall Meeting

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11 October 2012



®

US Army Corps of Engineers
BUILDING STRONG®



CORNERSTONE OF THE SOUTHWEST!

Corps Navigation Mission

Provide safe, reliable, efficient, effective and environmentally sustainable waterborne transportation systems for movement of commerce, national security needs, and recreation.



SPD Background

- 27 Ports and Harbors
 - 5 Major Commercial Ports with depth <40'
 - 7 Minor Commercial Ports with depths between 20-40'
 - 15 Small Craft Harbors
- Ports are #1 in US for Value Shipped
- Ports are #3 in US for Tonnage
- > 429 Miles of Navigation Channels
- 35 Miles of Navigation Structures
- Dredge ~10-15 million Cubic Yards / Year
- High Rate of Return: \$40-60 million in Dredging yields \$192 billion in commerce.



Navigation Program Challenges

- Constrained federal budget.
- Several years of flat / reduced funding.
- Rapidly increasing cost of dredging:
 - Ocean disposal
 - Beneficial re-use
 - Environmental monitoring and compliance
- In FY12, 50% reduction in low use navigation projects program.
- Need for nationally consistent, transparent, repeatable metrics (data availability).



FY12 O&M Budget Coastal Navigation

Category	Inventory	Commerce	FY12 O&M Projects	FY12 O&M Funds	FY11 O&M Proj.	FY11 O&M Funds
High Use	59	90%	54	62%		62%
Moderate Use	100	9%	61	25%	120*	21%
Low Use	908	1%	41	6%	124	10%
Other				7%		7%
Total	1067	100%	156	100%	244	100%

- Prior to FY12 we adjusted to budget decreases by minor reductions at almost all nav projects.
- The low use category was proposed as a program for 50% reduction in the FY12 budget development; This was a 50% dollar reduction, not a 50% projects reduction
- 'Other' includes Nav R&D, Project Condition Surveys, Remaining Items, etc.
- IMPACT: Risk of navigation related incidents and fatalities increase at non-dredged projects.
- *High and moderate use were not separately identified in FY11



Budget Metrics

- Performance based approach – Safety, Critical Harbors of Refuge, National Security, Coast Guard Presence, Subsistence, Major transportation hubs (ferry).
- Focuses funding on the highest priority capital investments and maintenance activities.
- Use of Risk and Reliability factors
 - Relative Risk Ranking (5x5 Matrix)
 - Channel Portfolio Tool (CPT)
 - Coastal Structures Management, Analysis, and Ranking Tool (CSMART)



OMBIL Navigation Linkages

<http://www.ndc.iwr.usace.army.mil>

- **WCSC – Waterborne Commerce Statistics Center**
 - Domestic and Foreign [tonnage / ton-miles](#) & trips by commodity for major ports and waterways
 - Dock-level, origin-to-destination routing (Corps-use only)
 - Aggregated data already published at the project level
- **DIS – Dredging Information System**
 - Dredging activity from pre-bid through completion
 - Includes location, quantity, type of dredge, responsible District
 - List dates of bid advertisement, bid opening, contract award, and small business set-aside restrictions
 - Reports gov't estimate, all contractor bids, winning bidder, and upon completion actual costs and dredge quantity
- **LPMS – Lock Performance Monitoring System**



Budget Worksheet

Table F-14: 111 Columns Overall

(not all columns applicable to all projects)

- (64) Harbor/Waterway Type – High/Mod/Low Use; Deep/Shallow, etc.
- (76) Commercial Tonnage (OMBIL)
- (77) 5-Year Average Commercial Tonnage (OMBIL)
- (82) 5-Year Avg total O&M costs/ 5-Year Avg Annual Commercial Tonnage
- (83) Total Value of Foreign Cargo (OMBIL)
- (84) Value of Export Cargo (OMBIL)



Budget Worksheet

Table F-14 continued:

- Several columns related to Benefit-Cost Ratios
- (97) Consequences: penalty if not funded (text)
- (98/99) Remarks: District's may reference CA Dept of Fish and Game or NOAA Fisheries Commercial Fishery Landing Data; Other related Federal Initiatives (DOT, etc); Environmental Benefits; etc. (text)
- (106-111) Channel Portfolio Tool (5 Yr Average Tonnage & Cargo Value at risk for deepest 5 feet)



Channel Portfolio Tool (CPT) Background

- **CPT is a web-based decision-support tool which helps convey the importance of Corps dredging activities to the efficient movement of maritime commerce.**
- **Developed with two primary objectives in mind:**
 - **Consistent, objective allocation of Harbor Maintenance Trust Fund (HMTF) outlays for Operations and Maintenance (O&M)**
 - **Improved access to and understanding of the data provided by the Waterborne Commerce Statistics Center (WCSC)**



Channel Portfolio Tool (CPT)

Channel Portfolio Tool - CPT - Windows Internet Explorer

https://cpt.usace.army.mil/

File Edit View Favorites Tools Help

x Convert Select

Favorites Channel Portfolio Tool - CPT

Channel Portfolio Tool

FAQ Home Register Log On

WARNING These pages contain commercially sensitive statistics pertaining to rivers, harbors, and waterways and must be held in strict confidence as required by 33 C.F.R. § 209.320. Unauthorized disclosure could result in loss of employment, fines, and imprisonment under 18 U.S.C. § 1905.

[Census Non-Disclosure](#) [Foreign Trade Statistics Security Guidelines Handbook](#) [Waterborne Commerce Non-Disclosure \(WCSC\)](#)

You must agree to both the Waterbourne Commerce and Census Non-Disclosure statements in order to view any data. You can either agree or disagree by checking the associated checkbox while registering or logging in and updating your user profile by clicking profile on the menu above and choosing update profile.

Once per year, on the first use after January 1st, you will be required to agree to the Non-Disclosure agreements in order to view the associated analysis data. To do this, use the appropriate forms above and email the signed forms to kenneth.n.mitchell@usace.army.mil. Electronic signatures are allowed for the WCSC Non-Disclosure. Once signed and approved, you will be able to use the tool. If you can login, but can only see the Profile tab, then you have not been approved and need to resubmit your signed Non-Disclosure forms.

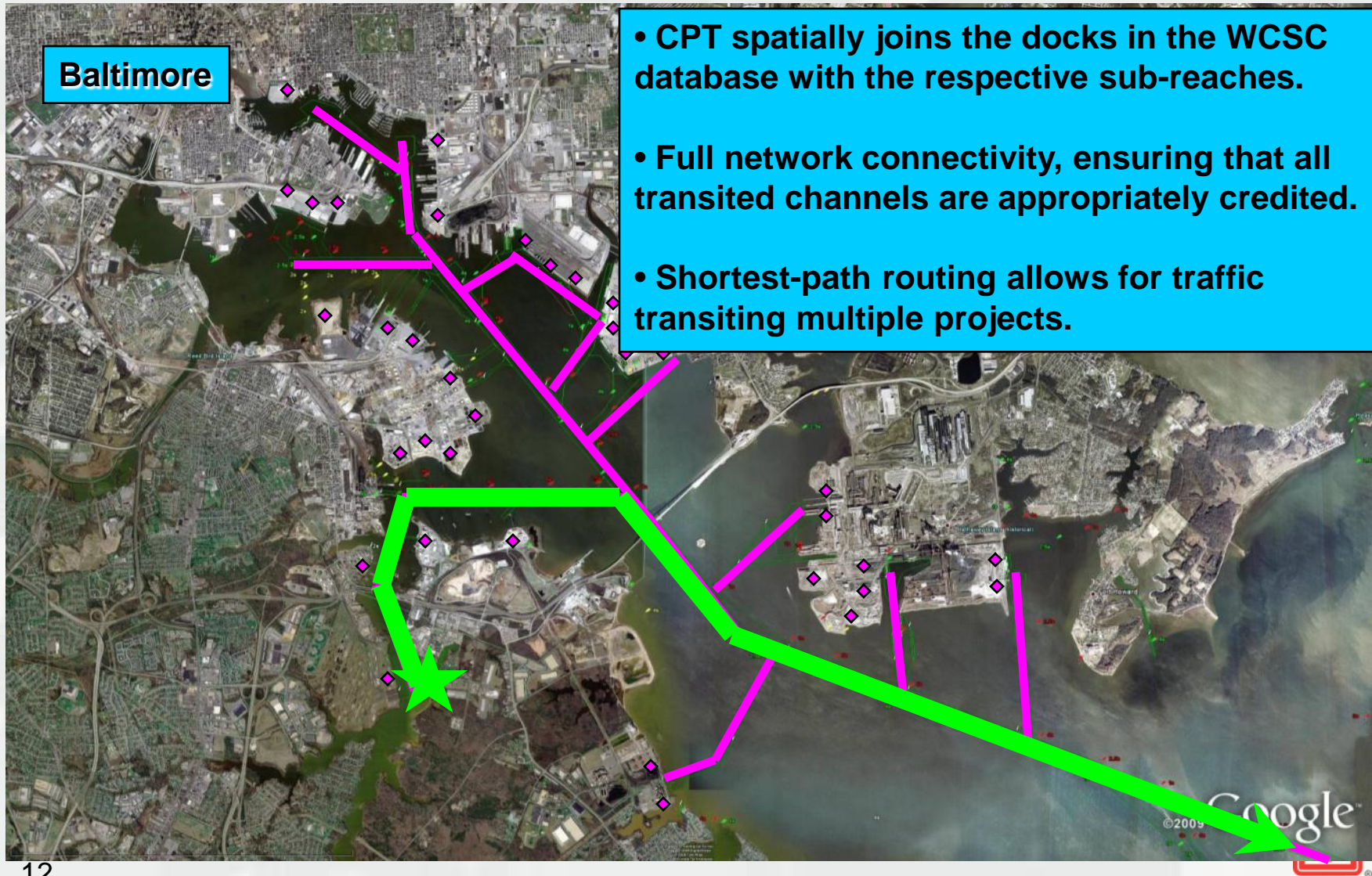
CPT is a decision-support tool designed to help USACE operations personnel analyze the extent to which maintained navigation channels are used by commercial shipping. Analyses can be conducted for individual channels, or for a grouping of channels treated as a single project. Additionally, USACE planning personnel can use CPT to extract historical data concerning region-to-region commodity movements and consolidated statements of traffic for arbitrary listings of projects and channels.

Questions or comments concerning CPT should be directed to Dr. Ned Mitchell at kenneth.n.mitchell@usace.army.mil.

Please choose from the menu above what level of prioritization you would like to see.

Done Local intranet 190%

Spatial Join to Waterway Network

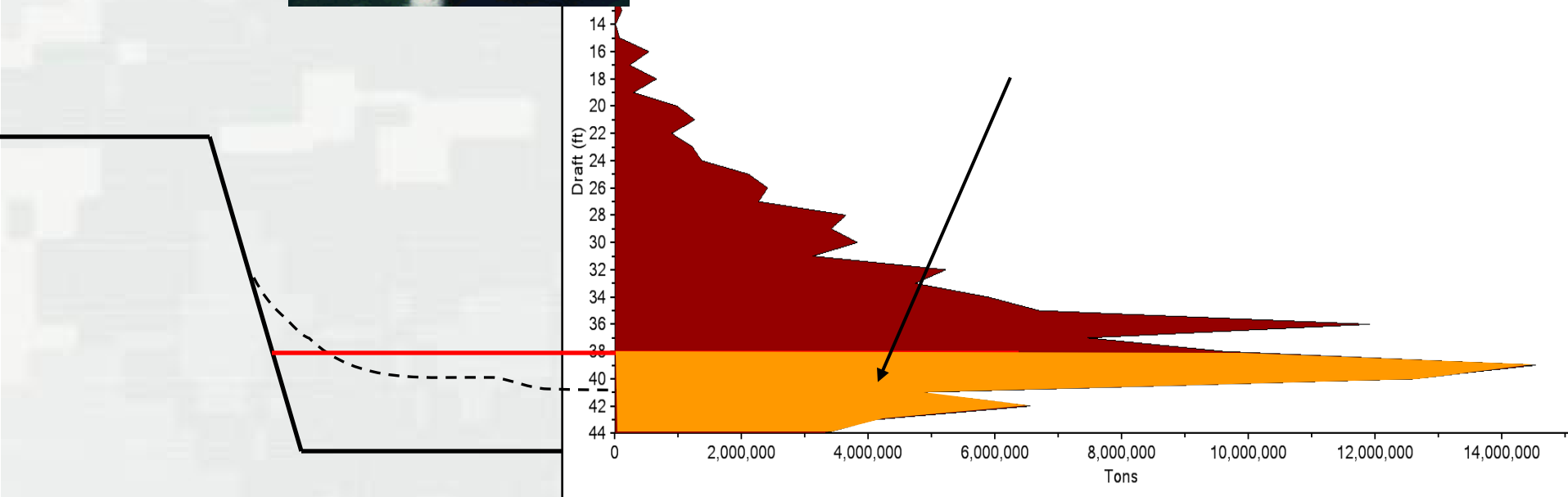


Depth-Utilization Analysis



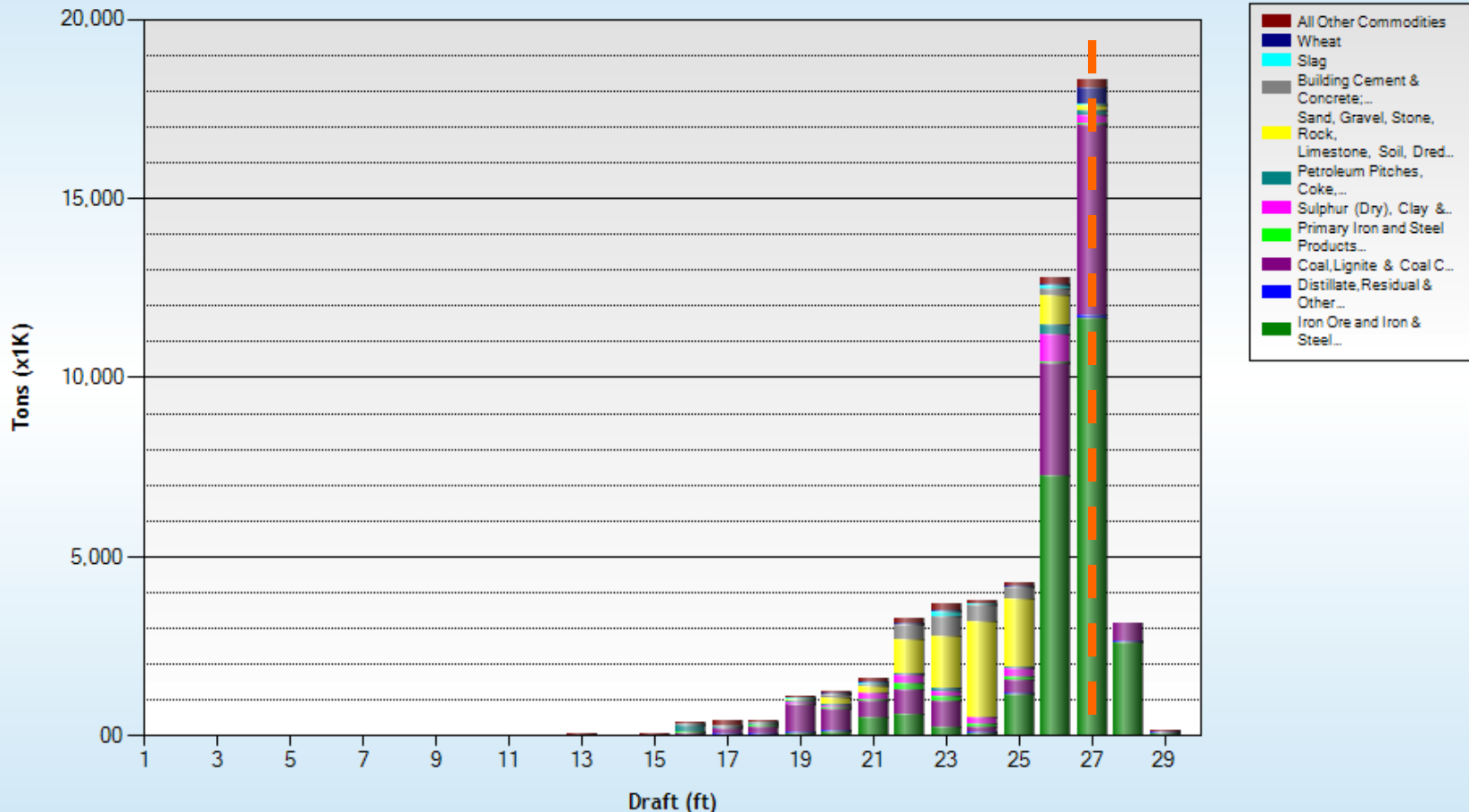
CPT can generate depth-utilization profiles showing the distribution of cargo across the range of maintained depths for any system of navigation channels.

CPT then compares these tonnage-draft profiles to the segment controlling depths resulting from present shoaling conditions.



Focus on Shoal-vulnerable Cargo

Commodity Details Tons (Transit) for Channels in Lake St. Clair 2008



Navigation Systems Defined

- CPT provides a flexible, accessible means of defining **systems** of maintained channels.
- Corps decision makers can now see the extent to which these **navigation systems** are utilized by commercial shipping.

The screenshot shows the Channel Portfolio Tool (CPT) web application. The header includes the US Army Corps of Engineers logo and the title "Channel Portfolio Tool (CPT)". A warning message is displayed: "WARNING This page contains commercially sensitive statistics pertaining to rivers, harbors, and waterways and must be held in strict confidence as required by 33 C.F.R. § 209.320. Unauthorized disclosure could result in loss of employment, fines, and imprisonment under 18 U.S.C. § 1905." Below the warning are links for "Census Non-Disclosure" and "Waterborne Commerce Non-Disclosure". The main navigation bar includes tabs for "Division", "District", "Project", "Reach", "Coastal Structures", "Session File", "Help", and "Home". The "Reach" tab is selected. Below the navigation bar are sub-tabs for "Reach Selection", "Preferences", "Rankings", "Flow", and "Rollup". The "Reach Selection" sub-tab is active. On the left, there is a tree view under "Update Selections" showing a hierarchy of reaches, with "NAB - Baltimore" selected. On the right, there is a "Download Excel Template" section with a "Load File" button and a "Browse..." button. Below this is a table titled "User Defined Values - Click Item to Update". The table has columns for "Reach", "AuthorizedDepth", "ShoalingRate", and "LimitingDe". The table lists several reaches, including "Annapolis Harbor, Md (442200)", "Baltimore Harbor, Md (440206)", "Chesapeake Bay, Md-nab (mile 181 To Mile 182) (437600)", "Potomac River Below Washington, Dc (mile 000 To Mile 002) (454)", "Potomac River Below Washington, Dc (mile 003 To Mile 005) (508)", and "Potomac River, Virginia Channel, Dc (515700)". The "Reach" column is highlighted. At the bottom of the table, there is a pagination bar showing "Page 1 of 1" and "View 1 - 7 of 7".

Channel Portfolio Tool (CPT)

US Army Corps of Engineers

WARNING This page contains commercially sensitive statistics pertaining to rivers, harbors, and waterways and must be held in strict confidence as required by 33 C.F.R. § 209.320. Unauthorized disclosure could result in loss of employment, fines, and imprisonment under 18 U.S.C. § 1905.

[Census Non-Disclosure](#) [Waterborne Commerce Non-Disclosure](#)

Division District Project **Reach** Coastal Structures Session File Help Home

Reach Selection Preferences Rankings Flow Rollup

Update Selections Export Entire Network KML Download Excel Template

Load File Browse...

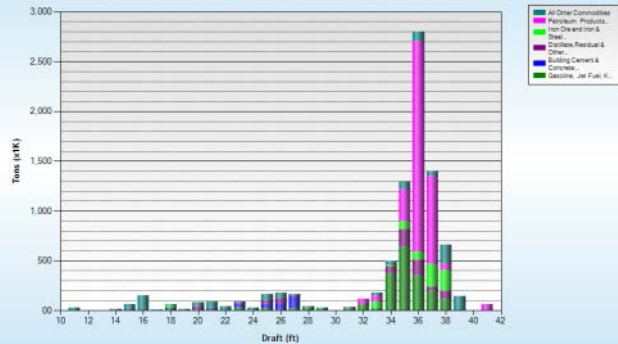
User Defined Values - Click Item to Update

Reach	AuthorizedDepth	ShoalingRate	LimitingDe
Annapolis Harbor, Md (442200)			
Baltimore Harbor, Md (440206)			
Chesapeake Bay, Md-nab (mile 181 To Mile 182) (437600)			
Potomac River Below Washington, Dc (mile 000 To Mile 002) (454)			
Potomac River Below Washington, Dc (mile 003 To Mile 005) (508)			
Potomac River, Virginia Channel, Dc (515700)			

Page 1 of 1 10 View 1 - 7 of 7

Visualizing Project Utilization

Commodity Details Tons (Docked) for Mystic River, Ma (mile 0 To Mile 1) (377200) 2008

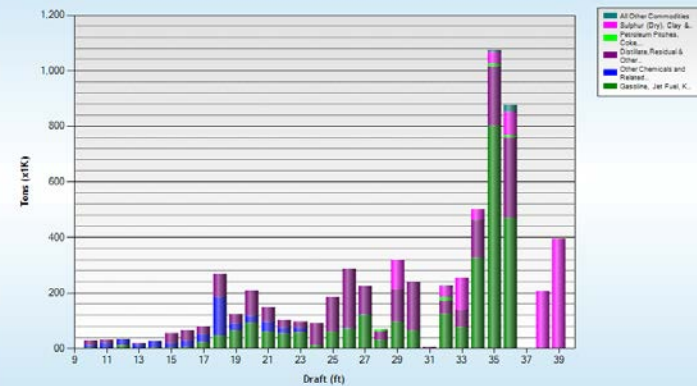


bors, and waterways and must be under 18 U.S.C. § 1905.

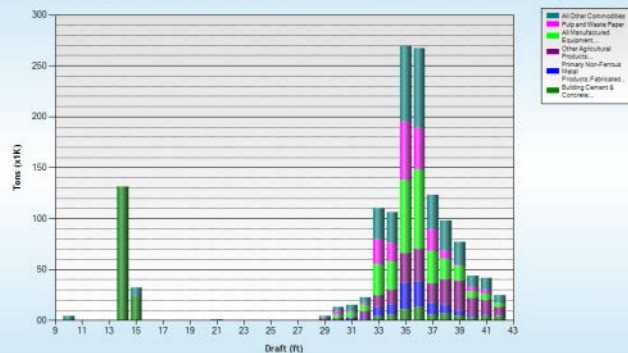
Chelsea River, Ma (377010)

Tons Affected: 6,360,108
Dollars Affected: \$2,170,372,984

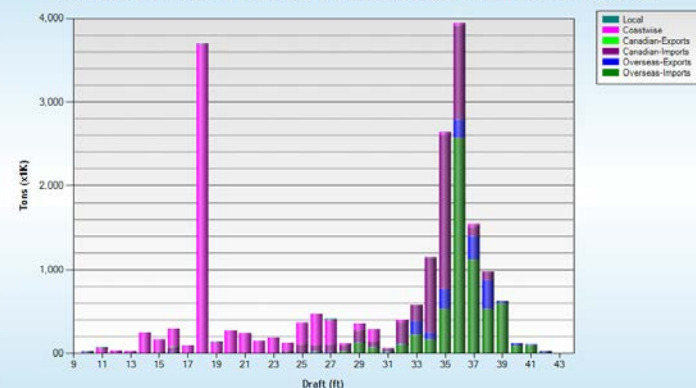
Commodity Details Tons (Docked) for Chelsea River, Ma (377010) 2008



Commodity Details Tons (Transit) for Reserved Channel (mile 0 To Mile 1) (374900) 2008



Cumulative Details Tons (Transit) for Main Waterfront (mile 0 To Mile 1) (376400) 2008



Data SIO, NOAA, U.S. Navy, NGA, Image © 2011 TerraMetrics
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CSMART

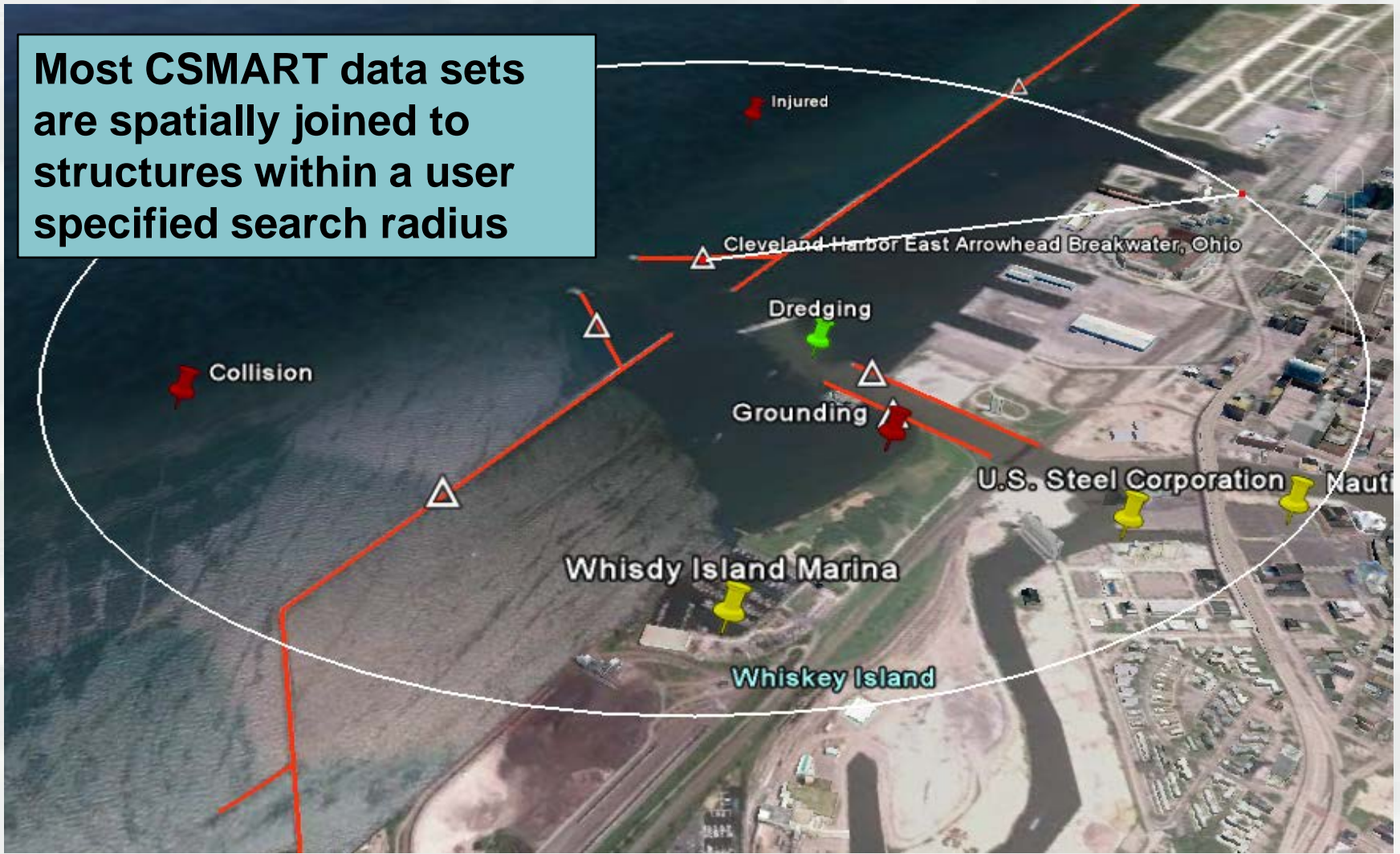
Coastal Structures Management, Analysis, and Ranking Tool

- Developed as part of the Coastal Inlets Research Program (CIRP)
- **Vision:** *Optimally prioritize O&M funding such that benefits to the Nation are maximized and decisions can be defended.*
 - For FY14 – Tool for HQ AM to prioritize CNS OCA's/ORAs only.
- Rank the CNS in terms of those with the greatest risk.
- Metrics in CSMART include (but are not limited to):
 - District Condition Rating (DCR)
 - Total annual commercial tonnage supported (NDC)
 - Annual commercial fish landings supported (NOAA-NMFS)
 - Cruise and ferry passengers supported (USDOT)
 - Coast Guard Incident reports
 - Project classifications such as Harbor of Refuge and Subsistence Harbor.



CSMART Background

Most CSMART data sets are spatially joined to structures within a user specified search radius



CSMART Features

Welcome Structures **Features** Results

Boat Ramp Binary Choices District Condition Rating Functional Performance Rating District Condition Rating (DCR: 1-25)

Commercial Tonnage Commercial Fishing Coast Guard Dredging Cruise Ferry

☐ Include?

Years

☒ 2010 ☐ 2009 ☐ 2008 ☐ 2007 ☐ 2006 ☐ 2005 ☐ 2004 ☐ 2003

Select All Years UnSelect All Years

Search Radius

1 mile

Commodities

- ☒ Units (Ferried Autos, Passengers, Railway Cars)
- ☒ Coal, Lignite & Coal Coke
- ☒ Petroleum and Petroleum Products
- ☒ Chemicals and Related Products
- ☒ Crude Materials, Inedible Except Fuels
- ☒ Primary Manufactured Goods
- ☒ Food and Farm Products
- ☒ All Manufactured Equipment, Machinery and Products
- ☒ Waste Material; Garbage, Landfill, Sewage Sludge, Waste Water
- ☒ Unknown or Not Elsewhere Classified
- ☒ Light Load

Query Type

Cumulative
Average

Movement Direction

Inbound Tonnage
Outbound Tonnage
Both

Movement Type

Foreign Tonnage
Domestic Tonnage
Both

- An array of relevant indicators of significance are used to evaluate the myriad roles of coastal structures within navigation projects.
- Commercial tonnage transiting near each structure gives an indication of economic significance.
- Source: Corps' Waterborne Commerce Statistics Center (WCSC)



CSMART Rankings

Commercial Tonnage Commercial Fishing District Condition Rating (DCR: 1-25) Global Rankings									
Metrics									
Weightings and Ranking Methods									
Structure Rank	Structure Score	District	Project	Structure	Commercial Tonnage (2)	Commercial Tonnage Rank	Commercial Fishing Dollars (1)	Commercial Fishing Rank	District Con
1	0.88231	Portland	Columbia River at Mouth	MCR Jetty A	44,745,096	23	\$15,860,000	77	7
2	0.87498	Portland	Columbia River	West Channel Pile Dikes (4), Columbia River	44,745,096	23	\$15,860,000	77	10
3	0.87498	Portland	Columbia River	Chinook and Sand Island Pile Dikes (5), Columb	44,745,096	23	\$15,860,000	77	10
4	0.86749	New England	Portland Hbr, ME	Portland Hbr, ME - Inner Harbor (North) Breakw	21,677,258	40	\$25,160,000	56	14
5	0.75899	Portland	Coos Bay	Coos Bay North Jetty, Oregon	1,586,404	141	\$20,400,000	72	7
6	0.75804	Seattle	Grays Harbor/Markham	Gray's Harbor South Jetty, Washington	1,679,991	133	\$33,820,000	27	15
7	0.74703	Jacksonville	Jacksonville Harbor	Jacksonville Harbor North Jetty, Florida	18,588,288	44	\$11,040,000	86	21
8	0.74703	Jacksonville	Jacksonville Harbor	Jacksonville Harbor South Jetty, Florida	18,588,288	44	\$11,040,000	86	21
9	0.74571	Seattle	Westhaven Cove	Westhaven Cove Small-Boat Basin Breakwater A	1,679,991	133	\$33,820,000	27	19
10	0.74571	Seattle	Westhaven Cove	Westhaven Cove Revetment, Washington	1,679,991	133	\$33,820,000	27	19
11	0.74145	Galveston	Galveston Harbor	Galveston Harbor South Jetty, Texas	218,858,528	2	\$0	206	10
12	0.74111	Galveston	Sabine Pass	Sabine Pass East Jetty, Texas	78,634,070	9	\$0	206	7
13	0.74111	Galveston	Sabine Pass	Sabine Pass West Jetty, Texas	78,634,070	9	\$0	206	7
14	0.73759	New England	Portland Hbr, ME	Portland Hbr, ME - Spring Point (South) Breakw	21,677,438	39	\$25,160,000	56	24
15	0.72712	Galveston	Galveston Harbor	Galveston Harbor North Jetty, Texas	218,858,528	2	\$0	206	14
16	0.72709	Portland	Columbia River at Mouth	MCR North Jetty, Oregon and Washington	44,745,096	23	\$0	206	3
17	0.72576	Portland	Columbia River at Mouth	MCR South Jetty, Oregon and Washington	44,745,096	23	\$0	206	7
18	0.71648	Detroit	Milwaukee Harbor	North Breakwater	2,495,851	110	\$203,548	129	10
19	0.6982							111	24
20	0.6982							111	24
21	0.6982							111	24

• Selected metrics are then assigned linear weightings by the user to reflect decision maker priorities and rolled-up into an overall Structure Score for ranking structures for O&M outlays.



The Future

- Continuing to partner with our sponsors and interest groups to solve dredging and placement issues with the goal of realizing cost savings and improved efficiencies.
- Continue to develop and refine Asset Management methods for ranking existing projects.
- Goal: Deliver reliable infrastructure using a risk-informed asset management strategy
- President's Initiative: Double exports in next 5 years
- Improve development of the “Compelling Case”
 - Beneficial Use of Dredge Material
 - More granularity
 - Cargo Value
 - Life Safety factors



Discussion & Questions?

