USACE Integration of Metrics

CMANC Annual Fall Meeting

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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)

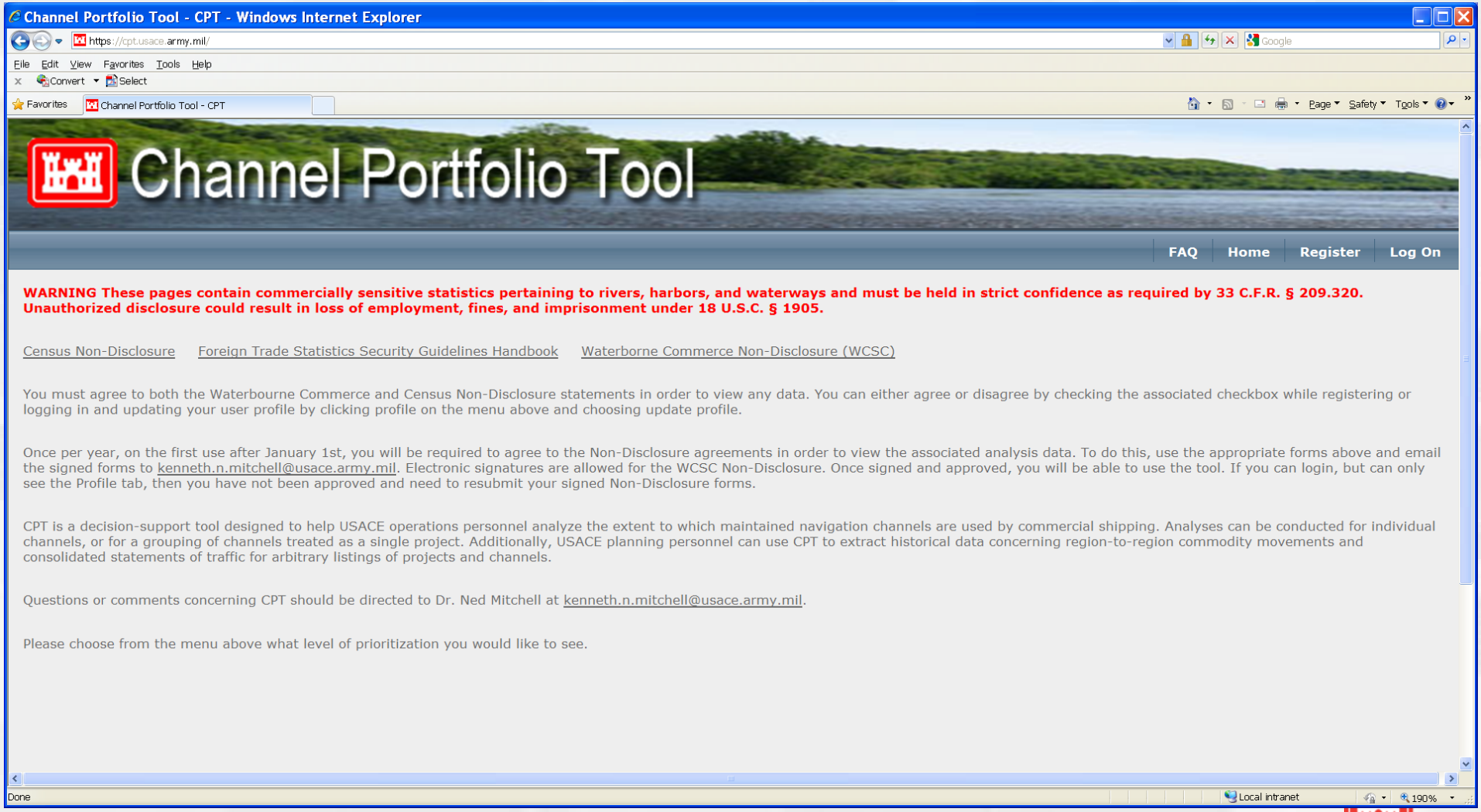
- (106-111) Channel Portfolio Tool (5 Yr Average Tonnage & Cargo Value at risk for deepest 5 feet)

Channel Portfolio Tool (CPT) Background

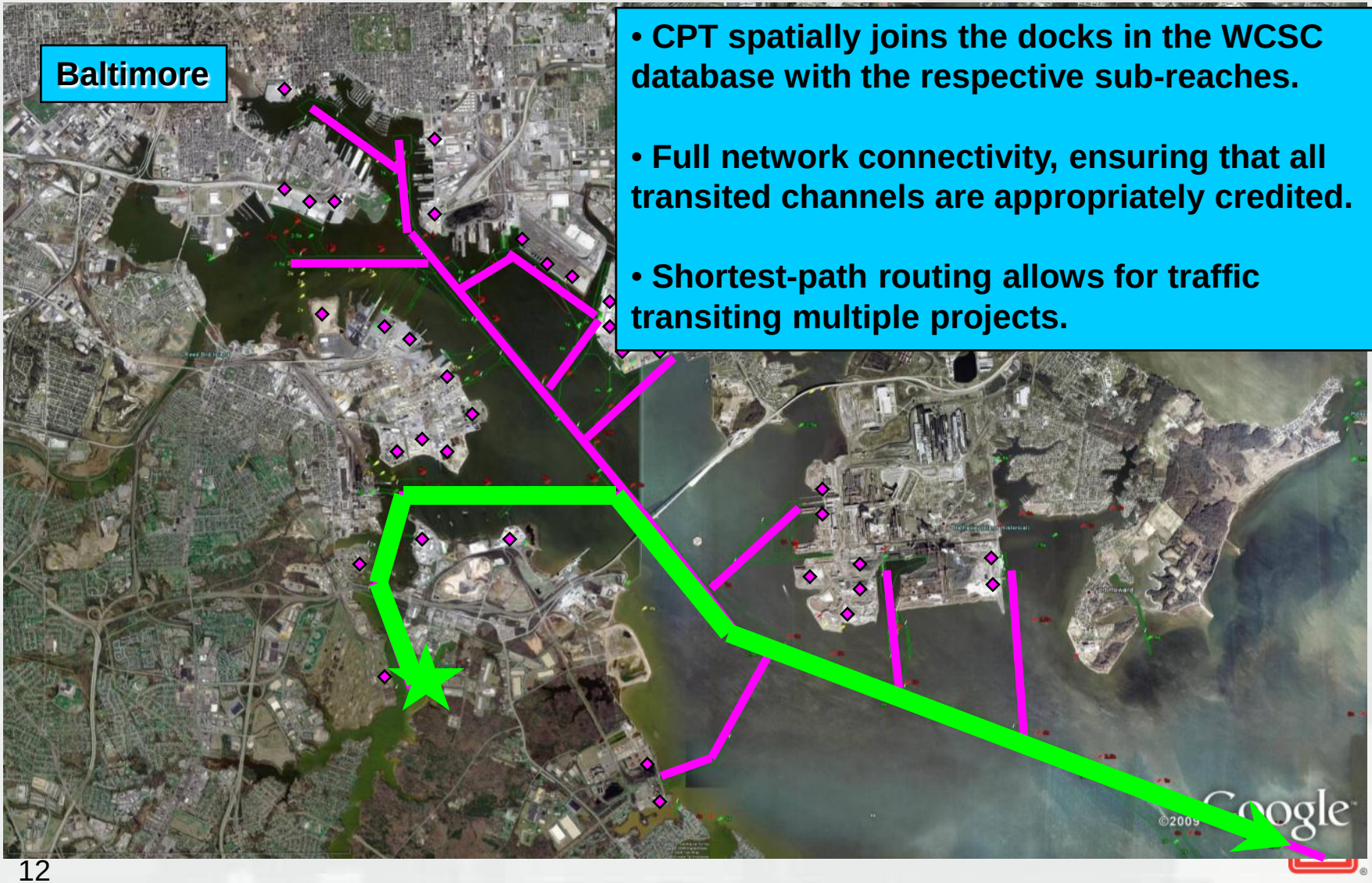
- **CPT is a web-based decision-support tool which helps convey the importance of Corps dredging activities to the efficient movement of maritime commerce.**

- **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)



Spatial Join to Waterway Network

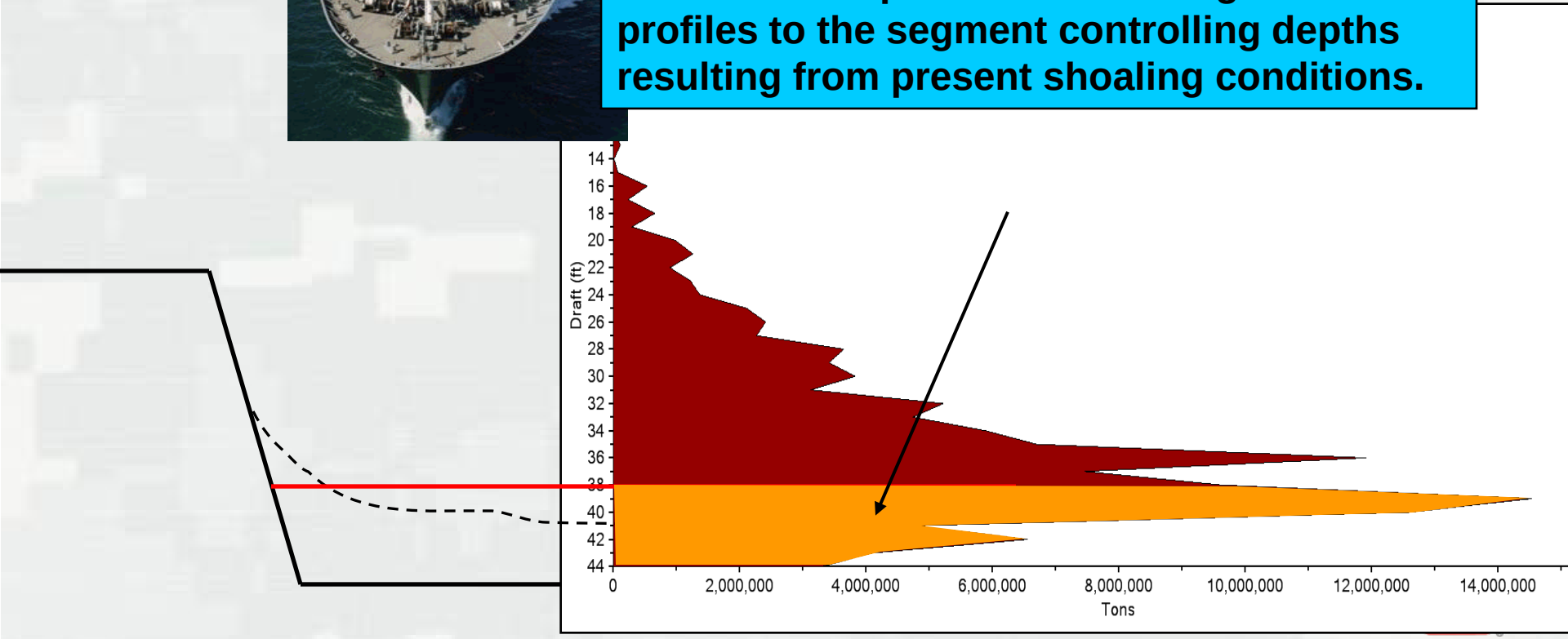


- CPT spatially joins the docks in the WCSC database with the respective sub-reaches.
- Full network connectivity, ensuring that all transited channels are appropriately credited.
- Shortest-path routing allows for traffic transiting multiple projects.

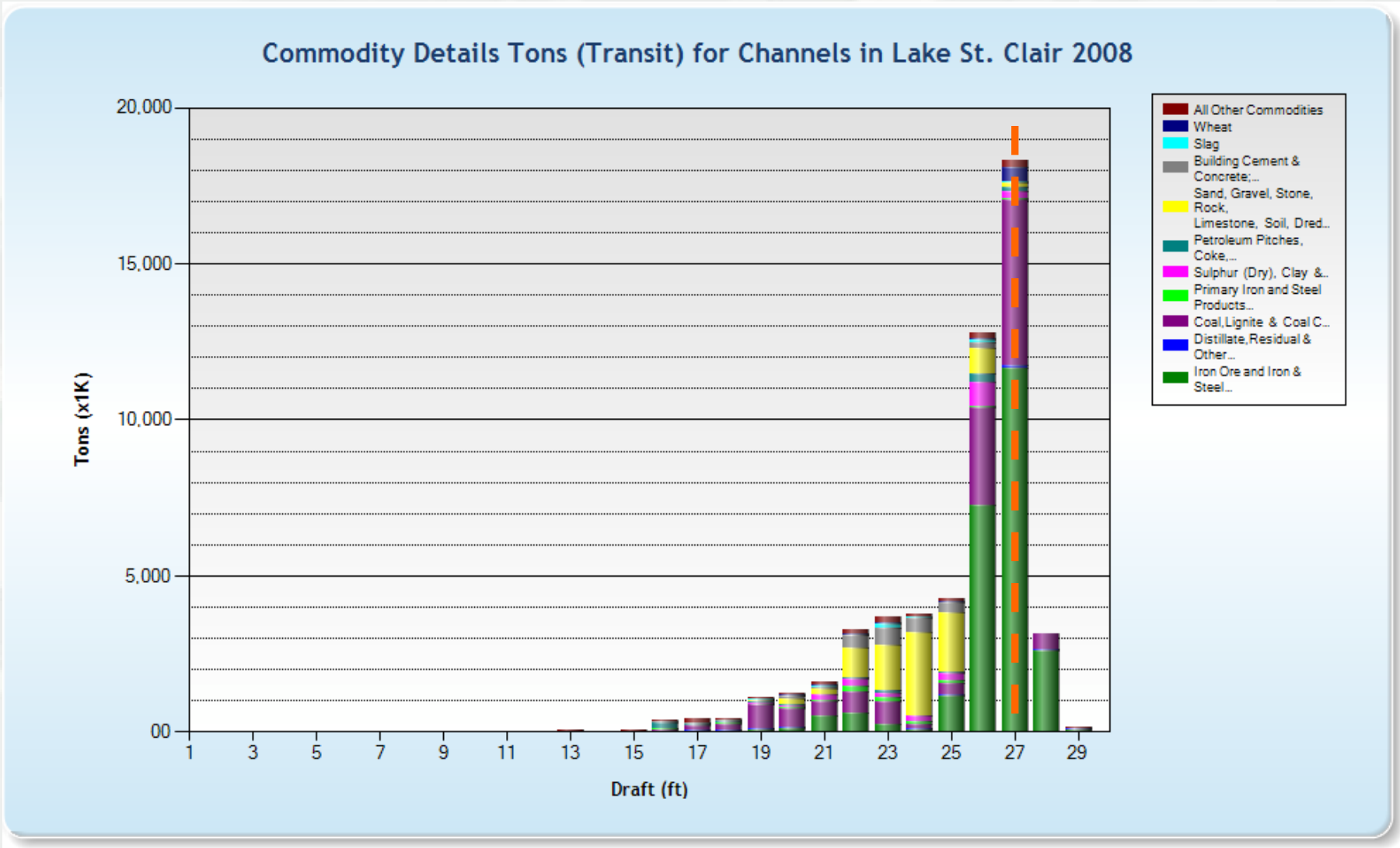
Depth-Utilization Analysis

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.



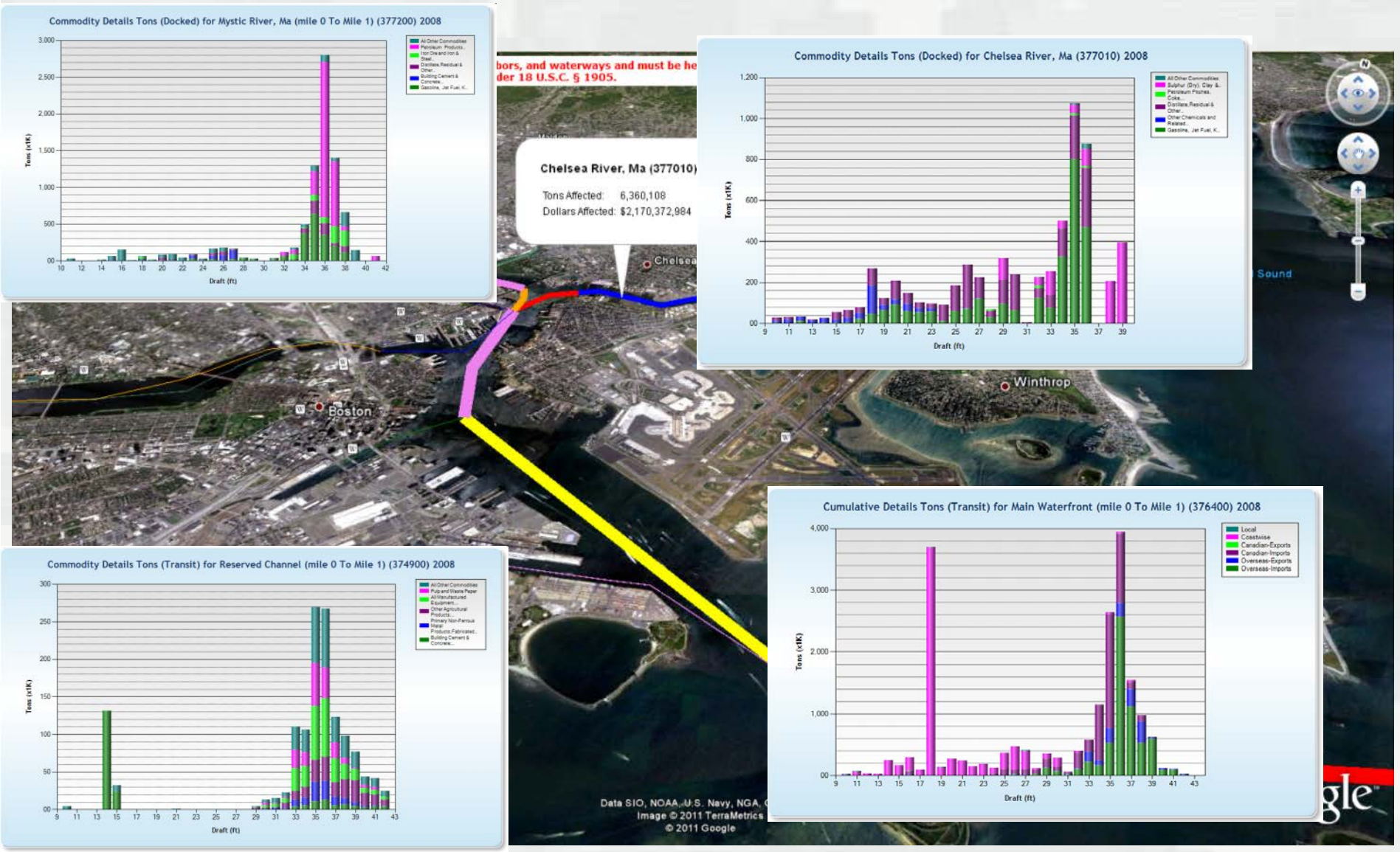
Focus on Shoal-vulnerable Cargo



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.

Visualizing Project Utilization



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.

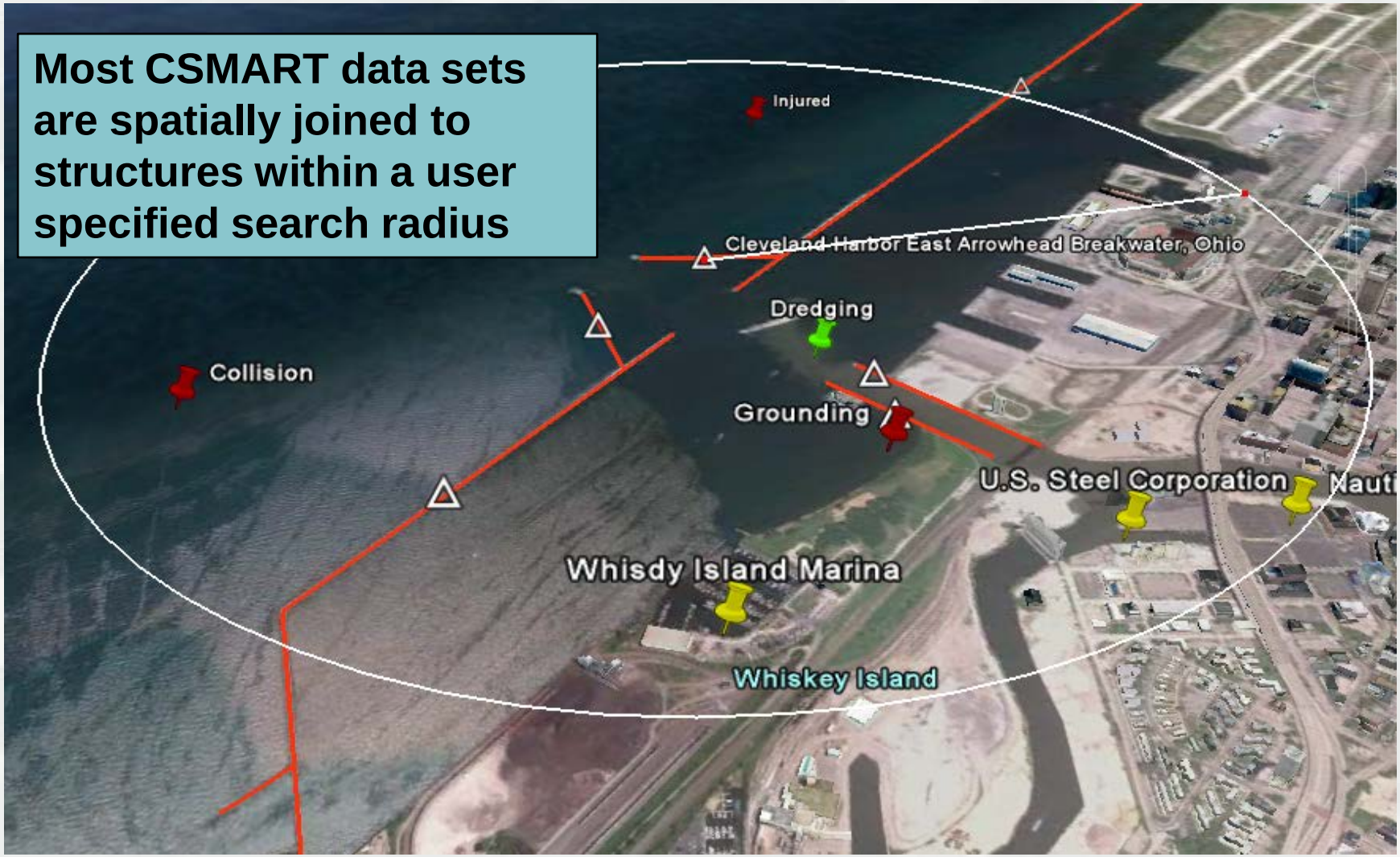
- For FY14 – Tool for HQ AM to prioritize CNS OCA's/ORA's only.

•Rank the CNS in terms of those with the greatest risk.

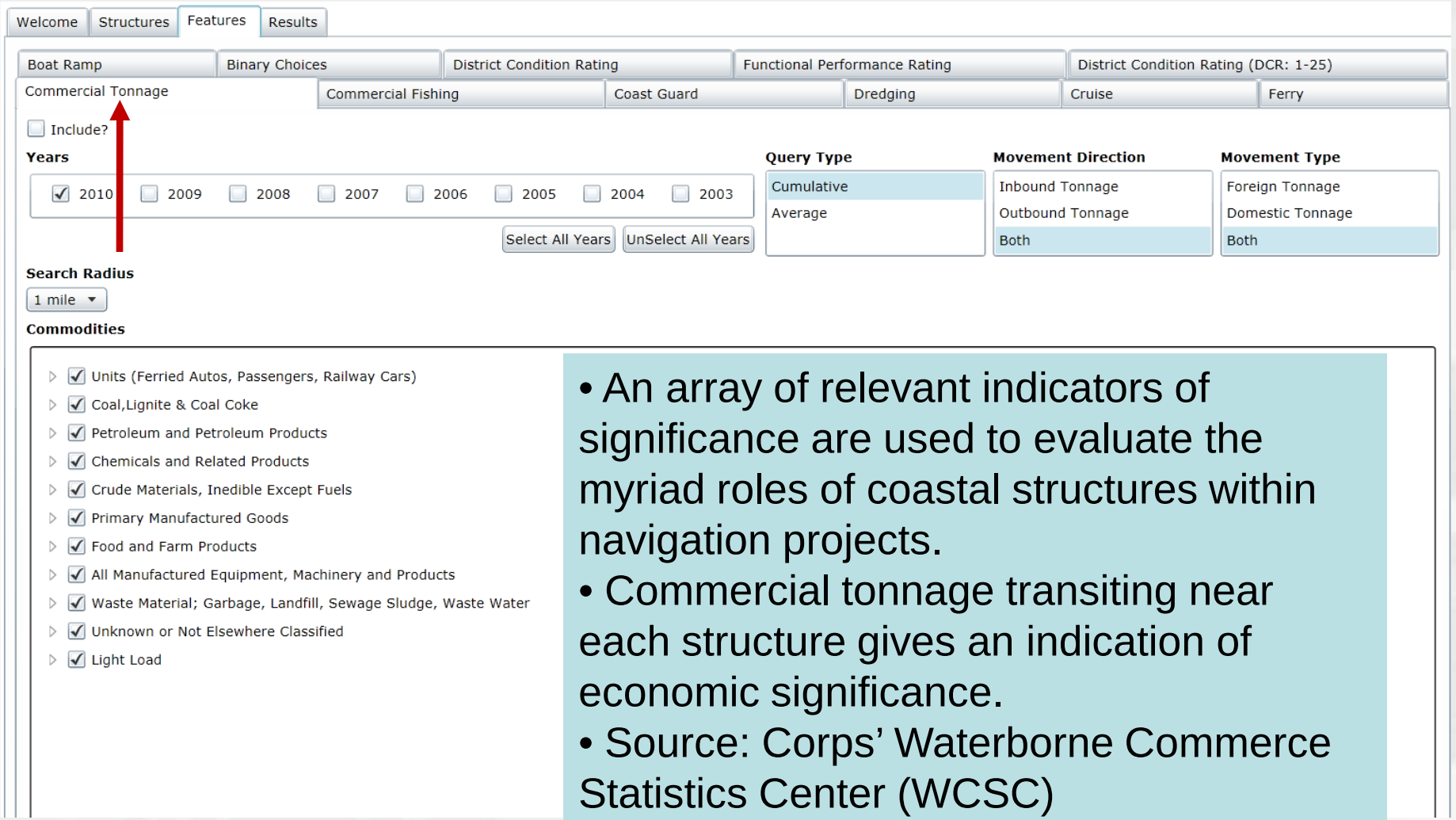
•Metrics in CSMART include (but are not limited to):

- 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



CSMART Features



- 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) Breakwa	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?