

Performance-based Budgeting via the Channel Portfolio Tool (CPT)



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DMMP Workshop
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US Army Corps of Engineers
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Motivation



- **Fiscal realities are forcing the Corps to make difficult decisions concerning O&M of the Nation's waterway infrastructure**

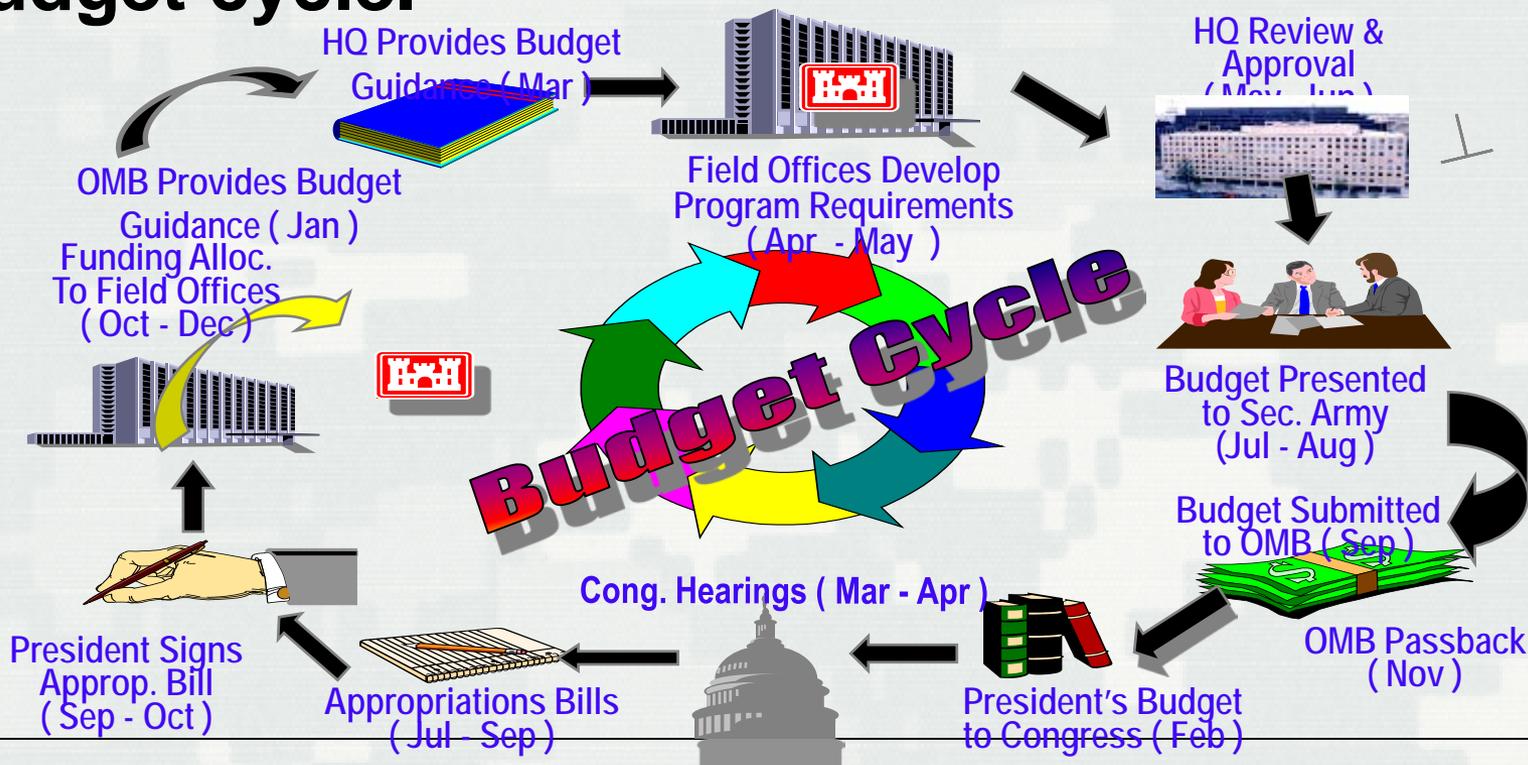




USACE Navigation Portfolio



- 700+ navigation projects are actively maintained; wide variation in spatial extent and level of use.
- Centralized budgeting process and a rolling budget cycle.





Annual O&M Budgeting



- Projects are grouped based on total annual tonnage:

Annual Total Tonnage (Avg. 2004-2008)	Total O&M Dredging \$, FY10 (Millions of \$)	% of Total
59 projects > 10M tons	\$431.0	58.4%
10M tons > 97 Projects > 1M tons	\$173.2	23.5%
1M tons > 210 Projects	\$133.4	18.1%

- But there still is no systematic, comprehensive framework for distributing O&M funding...



Annual O&M Budgeting



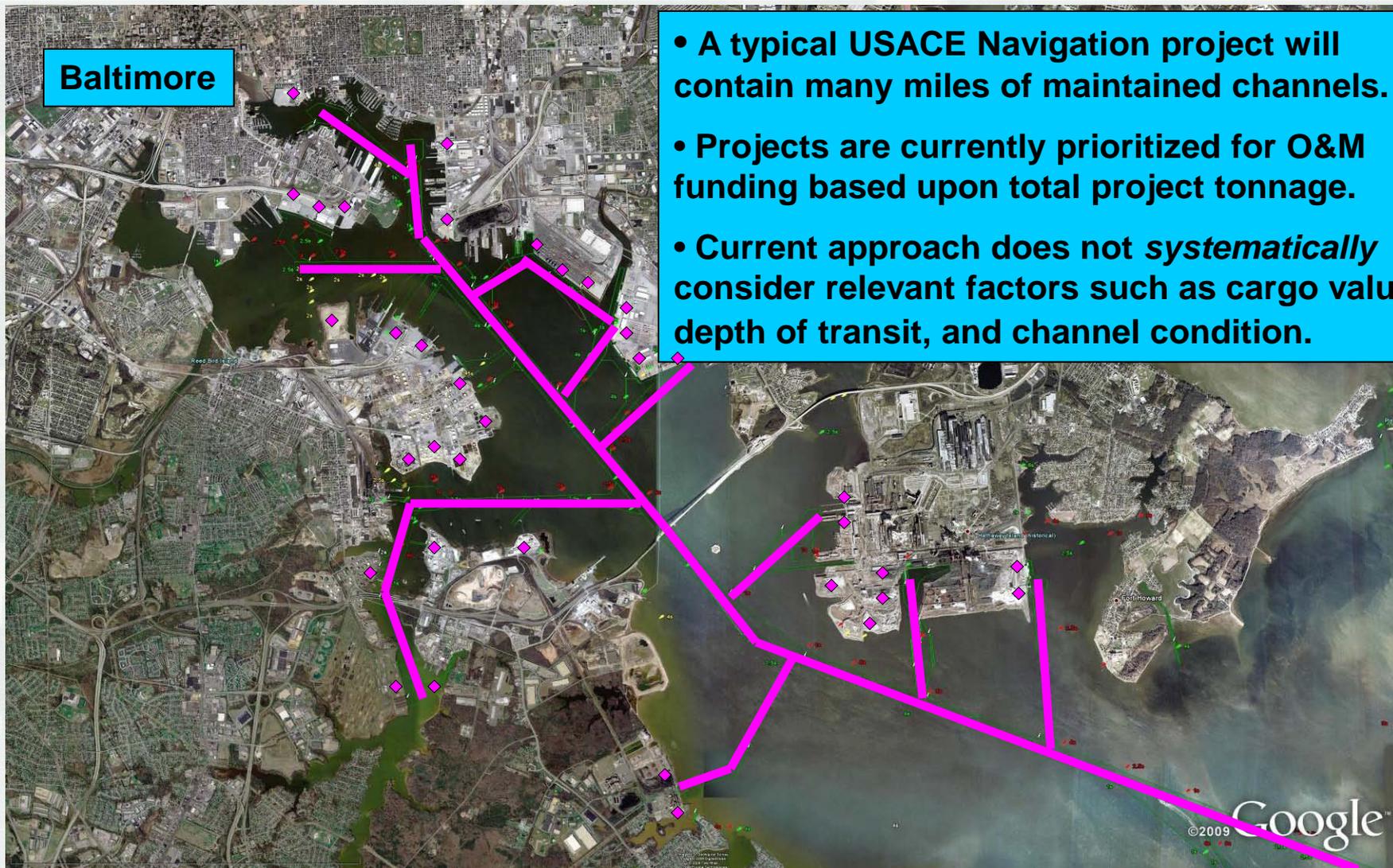
- Resulting decision-making process is *ad hoc* and difficult to defend.
- OMB has indicated that improved O&M justification is a precondition for increased outlays from the Harbor Maintenance Trust Fund (HMTF).
- Push within USACE is towards system-level analysis and performance evaluation.





®

Annual O&M Budgeting





Waterborne Commerce Data



- The Corps' Waterborne Commerce Statistics Center (WCSC) collects and maintains data concerning commercial use of US waterways.
 - ▶ Dock-level detail
 - ▶ Includes tons, commodity types, vessel draft
 - ▶ Aggregated data published at project level (OMBIL)
 - ▶ Corps planning community has used WCSC data to support harbor deepening projects

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

- Corps Operations personnel have heretofore lacked the time and resources to fully utilize WCSC data for informing O&M budget decisions



Channel Portfolio Tool (CPT)



Channel Portfolio Tool - CPT - Mozilla Firefox

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<https://itlgis01.usace.army.mil/CPTWeb/> Google

Channel Portfolio Tool - CPT



Channel Portfolio Tool (CPT)

US Army Corps of Engineers

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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.



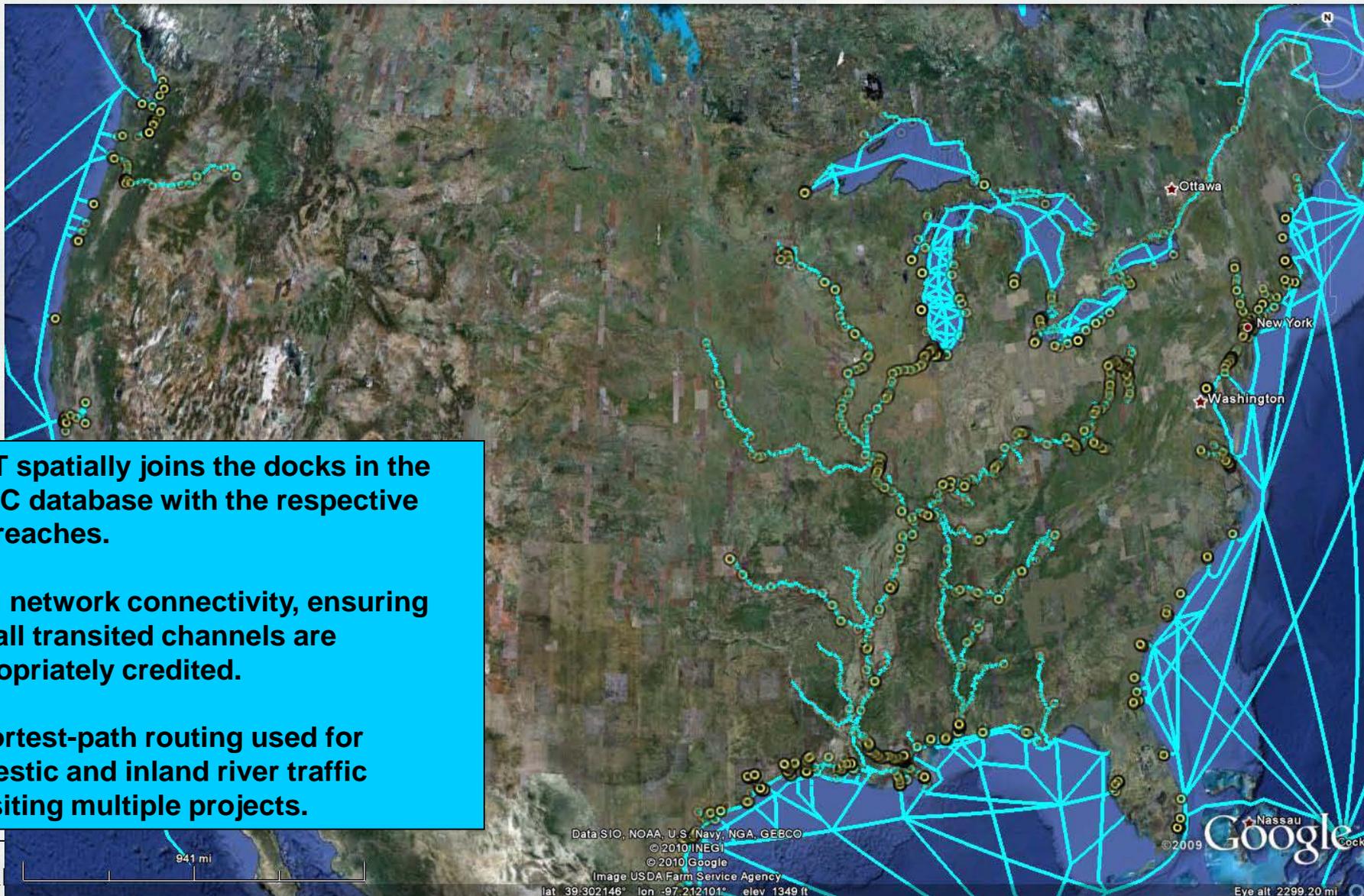
Channel Portfolio Tool (CPT)



- CPT uses this dock-level, Corps-use-only tonnage database from WCSC to analyze the extent to which commercial traffic utilizes maintained channel depths.
- Present and anticipated channel limiting depths can be compared directly to the historical distribution of commercial cargo across the maintained depths.
- Navigation channels can then be ranked in terms of tons and \$-value of cargo transiting at depths that are most vulnerable to shoaling.



Spatial Join to Waterway Network



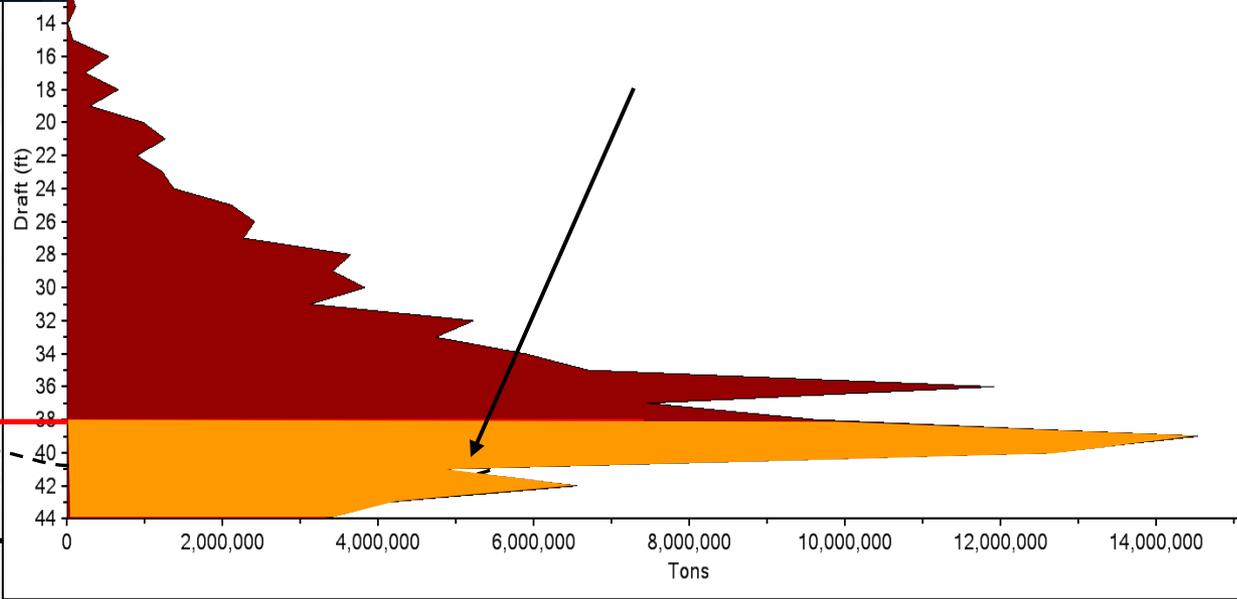
- CPT spatially joins the docks in the WCSC database with the respective sub-reaches.
- Full network connectivity, ensuring that all transited channels are appropriately credited.
- Shortest-path routing used for domestic and inland river traffic transiting multiple projects.



Depth Utilization Analysis



- With all shipments routed through the network of channels, usage profiles showing the distribution of tonnage across the range of maintained depths can be generated for any given segment.
- CPT compares these tonnage-draft profiles to the segment limiting depths resulting from present shoaling conditions.

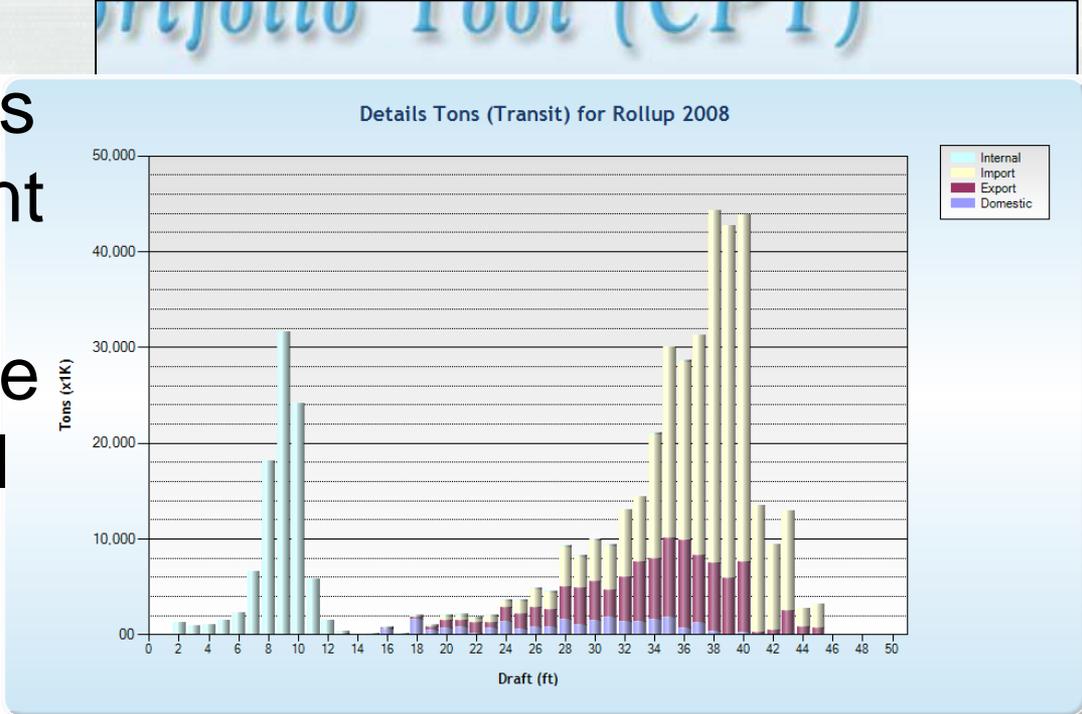




Navigation Systems Defined



- 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.



Ranking System Components



Channel Portfolio Tool (CPT)



Division District **Project** Reach Coastal Struc

Project Selection Preferences **Rankings** Rollup

Components of larger system can be compared to one another.

Ranked Projects

	District	Name	Tons ↕	Dollars	Trips	Ton-Miles
Details	Galveston	Houston Ship Channel	257,315,186	\$207,140,073,953	201,635	7,692,759,404
Details	Galveston	Galveston Harbor and Channel	225,776,277	\$176,865,771,661	123,211	249,461,575
Details	Galveston	Sabine-Neches Waterway	129,618,517	\$75,222,086,030	68,848	3,508,379,315
Details	Galveston	Corpus Christi Ship Channel	79,439,272	\$47,005,049,864	226,632	1,549,144,095
Details	Galveston	GIWW - SWG	56,820,967	\$38,005,655,745	94,352	6,020,824,700
Details	Galveston	Texas City Channel	52,572,752	\$30,244,018,044	13,433	334,416,723
Details	Galveston	Freeport Harbor	29,857,177	\$18,260,836,363	10,271	77,709,772
Details	Galveston	Matagorda Ship Channel	10,334,084	\$2,179,467,490	6,254	195,940,630
Details	Galveston	Brownsville	5,669,496	\$7,269,814,058	2,855	89,878,494
Details	Galveston	Chocolate Bayou	3,084,937	\$2,687,018,095	4,035	28,158,669
Details	Galveston	Channel to Victoria	2,863,904	\$1,576,685,358	4,157	80,848,660
Details	Galveston	Port Isabel	1,467,912	\$1,052,510,245	2,229	1,908,301
Details	Galveston	Cedar Bayou	1,454,954	\$1,155,494,828	2,617	8,290,004
Details	Galveston	Tributary Arroyo Colorado	703,704	\$292,183,879	775	17,499,670
Details	Galveston	Dickinson Bayou	593,138	\$16,599,288	1,943	1,436,235
Details	Galveston	San Bernard River	588,725	\$392,203,517	455	14,894,743
Details	Galveston	Colorado River and Flood discharge Channels	464,318	\$383,373,549	1,009	7,110,982
Details	Galveston	Channel to Palacios	15,883	\$321,432	12	235,068



Ranking System Components



Channel Portfolio Tool (CPT)

US Army Corps of Engineers

Division District **Project** Reach Coas

Project Selection Preferences Rankings **Rollup**

Ranked Projects Rollup Traffic Rollup

Year	Traffic	Tons	Dollars	Ton-Miles	Dollar-Miles
2008	All Traffic	498,581,604	\$337,082,232,276	19,878,967,993	13,966,331,869,83
2008	Overseas-Imports	259,446,117	\$175,591,187,614	6,802,636,146	4,803,947,753,39
2008	Internal	97,790,471	\$50,252,256,429	9,293,674,527	5,906,264,778,4
2008	Overseas-Exports	90,491,405	\$85,670,427,030	2,867,948,095	2,786,743,377,10
2008	Coastwise	24,486,572	\$10,694,517,102	724,127,821	330,656,859,512
2008	Local	23,688,003	\$12,193,932,587	122,313,208	79,457,795,202
2008	Canadian-Exports	1,463,071	\$1,638,896,646	27,837,248	26,178,855,531
2008	Canadian-Imports	1,215,965	\$1,041,014,868	40,430,947	33,082,450,721

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They can also be consolidated to see overall system performance.

Ranked Projects Rollup

Year	Commodity	Traffic	Tons	Dollars	Ton-Miles
2008	All Commodities	All Traffic	498,581,604	\$337,082,232,276	19,878,967,993
2008	Crude Petroleum	Overseas-Imports	182,287,496	\$106,840,740,514	4,489,334,890
2008	Distillate,Residual & Other Fuel Oils; Lube Oil & Greases	Internal	24,887,551	\$15,539,263,950	3,186,706,965
2008	Other Chemicals and Related Products	Overseas-Exports	22,479,606	\$25,499,646,242	613,993,163
2008	Units (Ferried Autos, Passengers, Railway Cars)	Internal	21,033,751	\$0	44,683,429
2008	Other Chemicals and Related Products	Internal	19,095,179	\$18,113,017,255	2,220,305,465
2008	Distillate,Residual & Other Fuel Oils; Lube Oil & Greases	Overseas-Exports	18,400,584	\$9,537,904,679	629,645,503

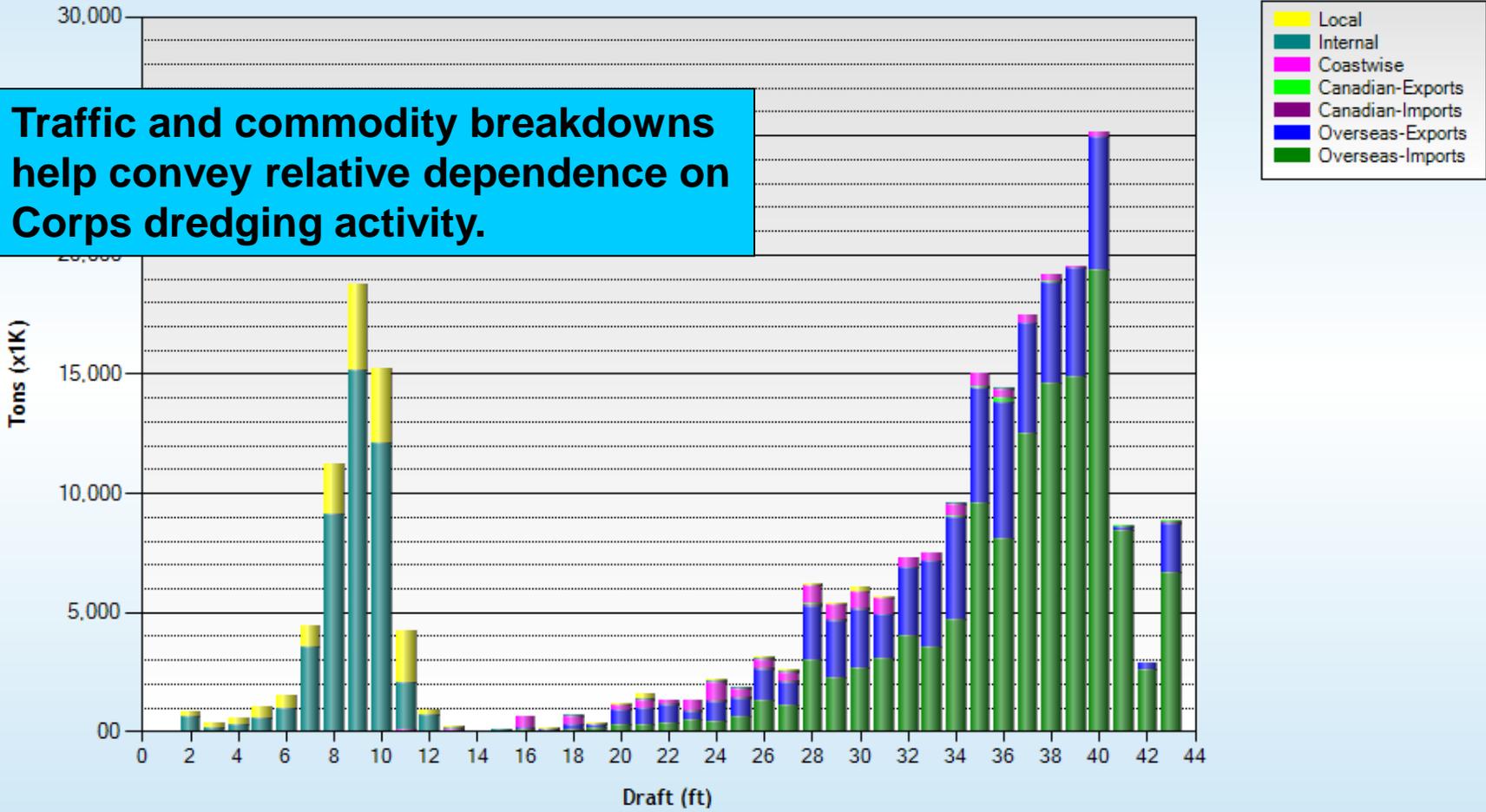


Visualizing Channel Utilization



Cumulative Details Tons (Transit) for Houston Ship Channel 2008

Traffic and commodity breakdowns help convey relative dependence on Corps dredging activity.



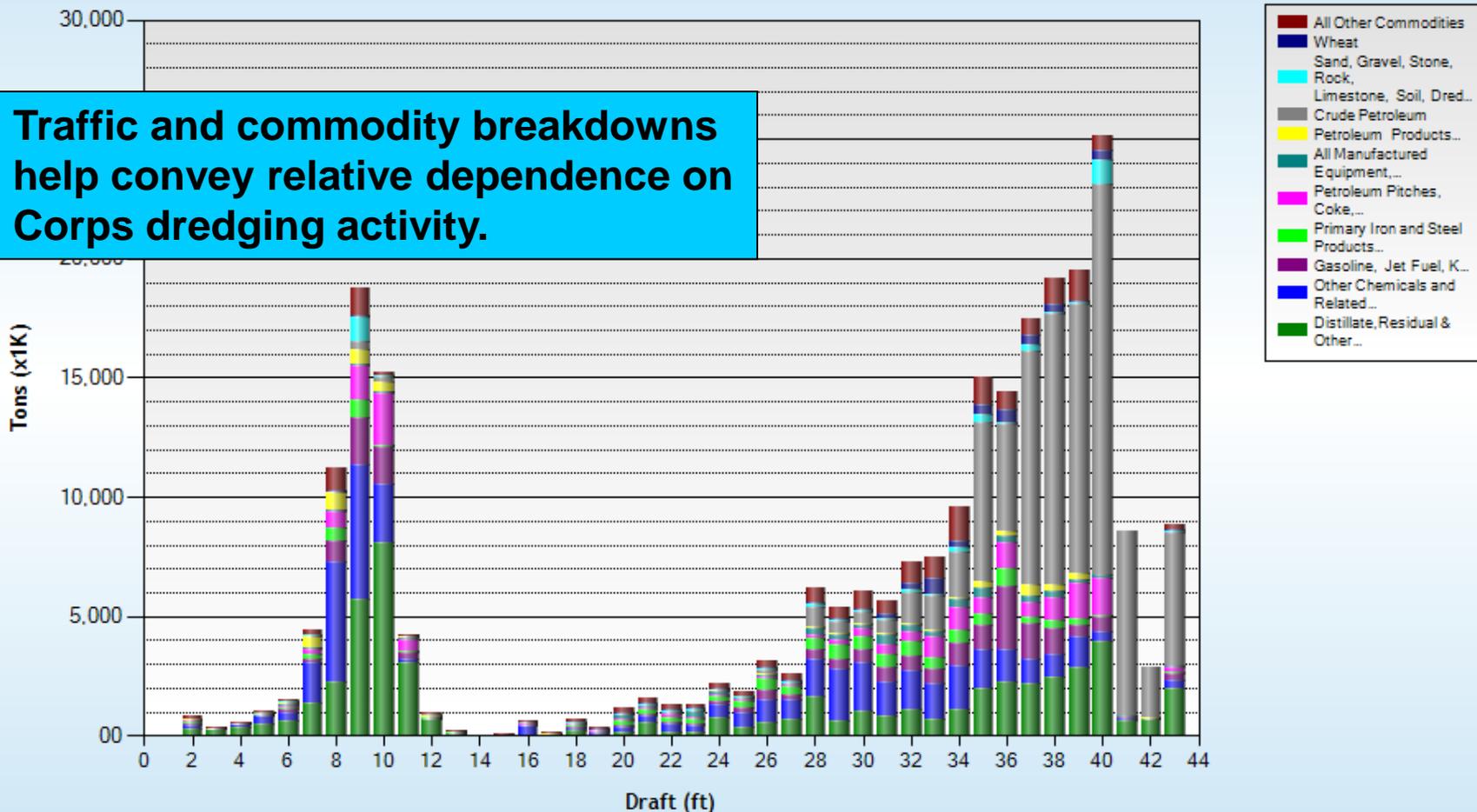


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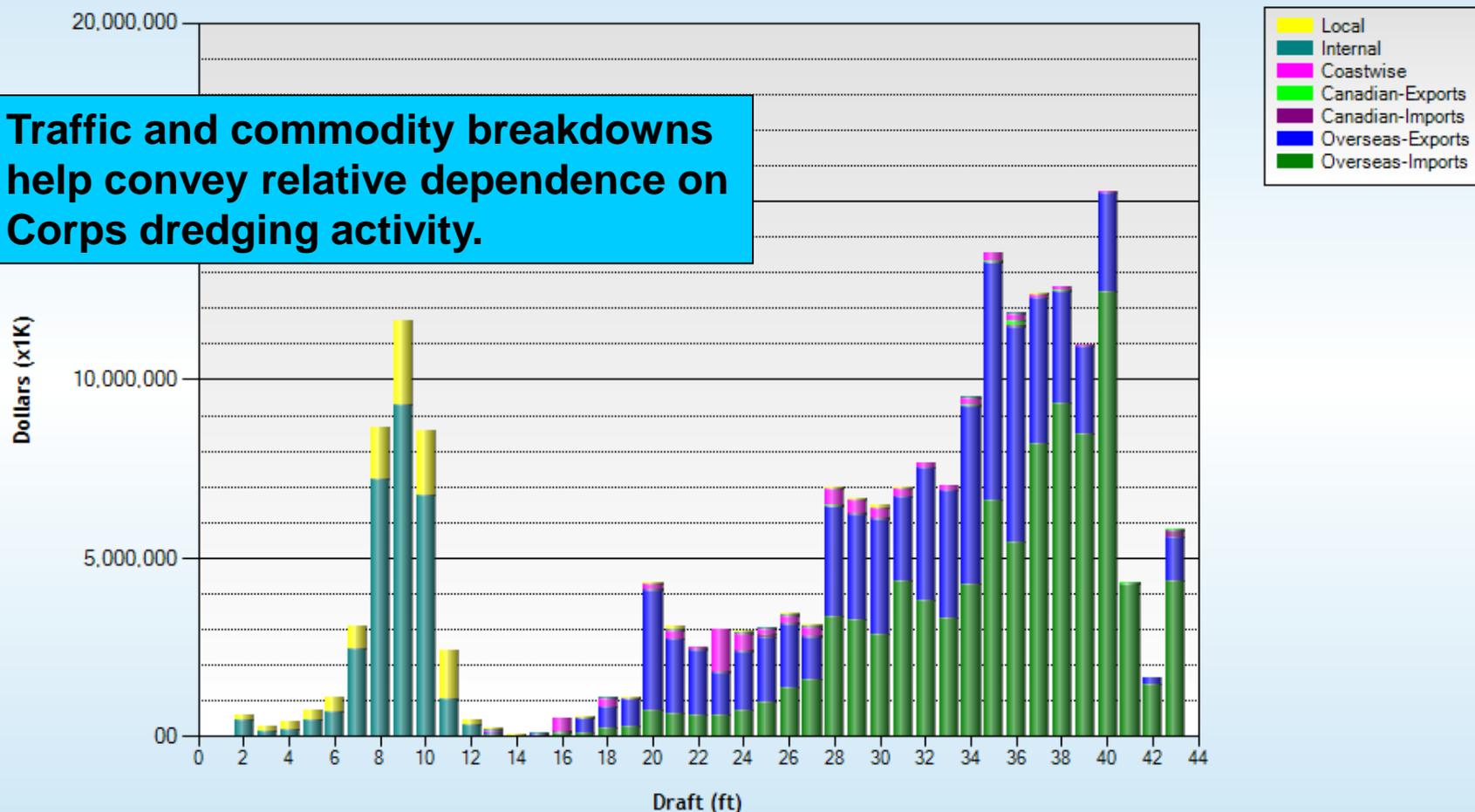


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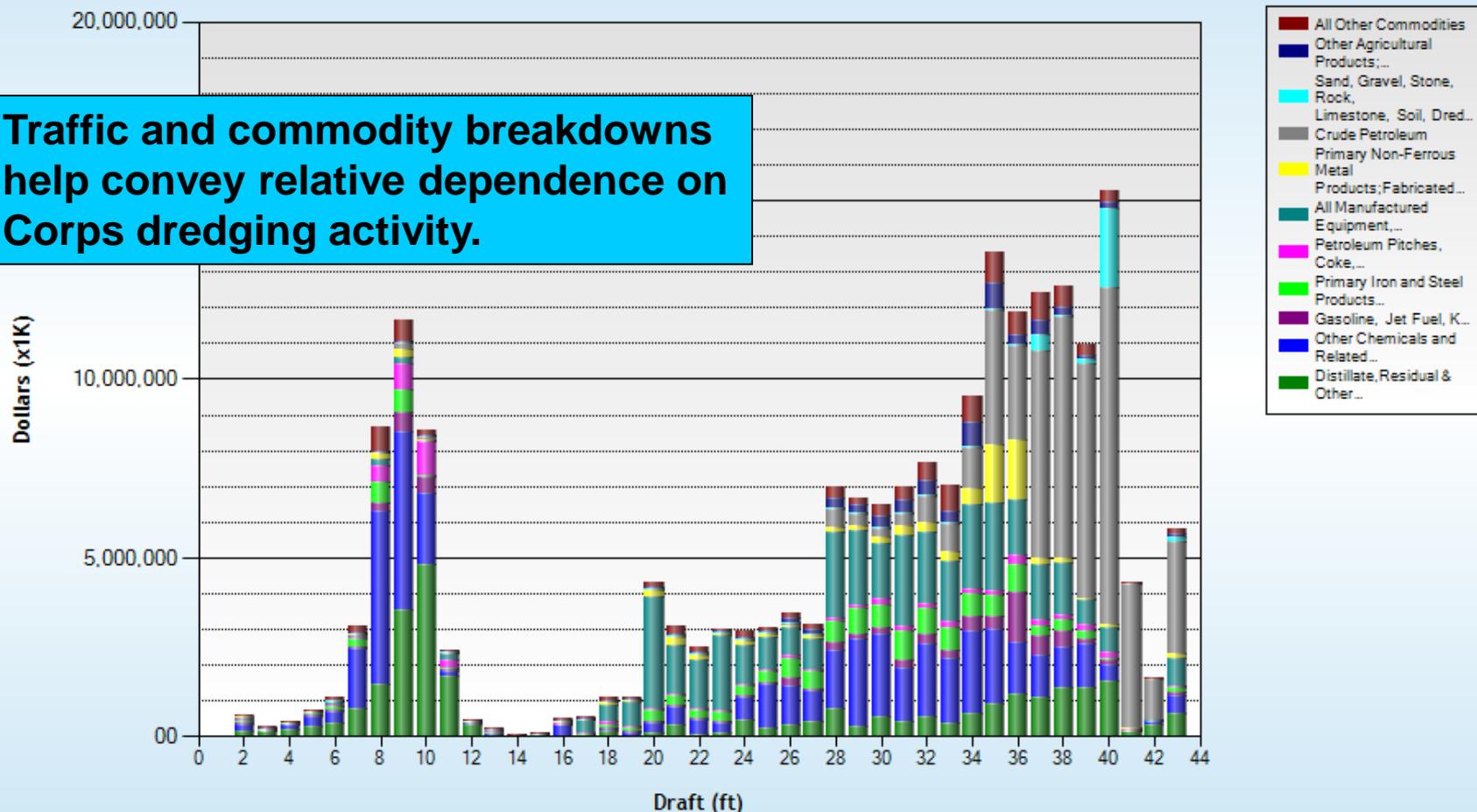


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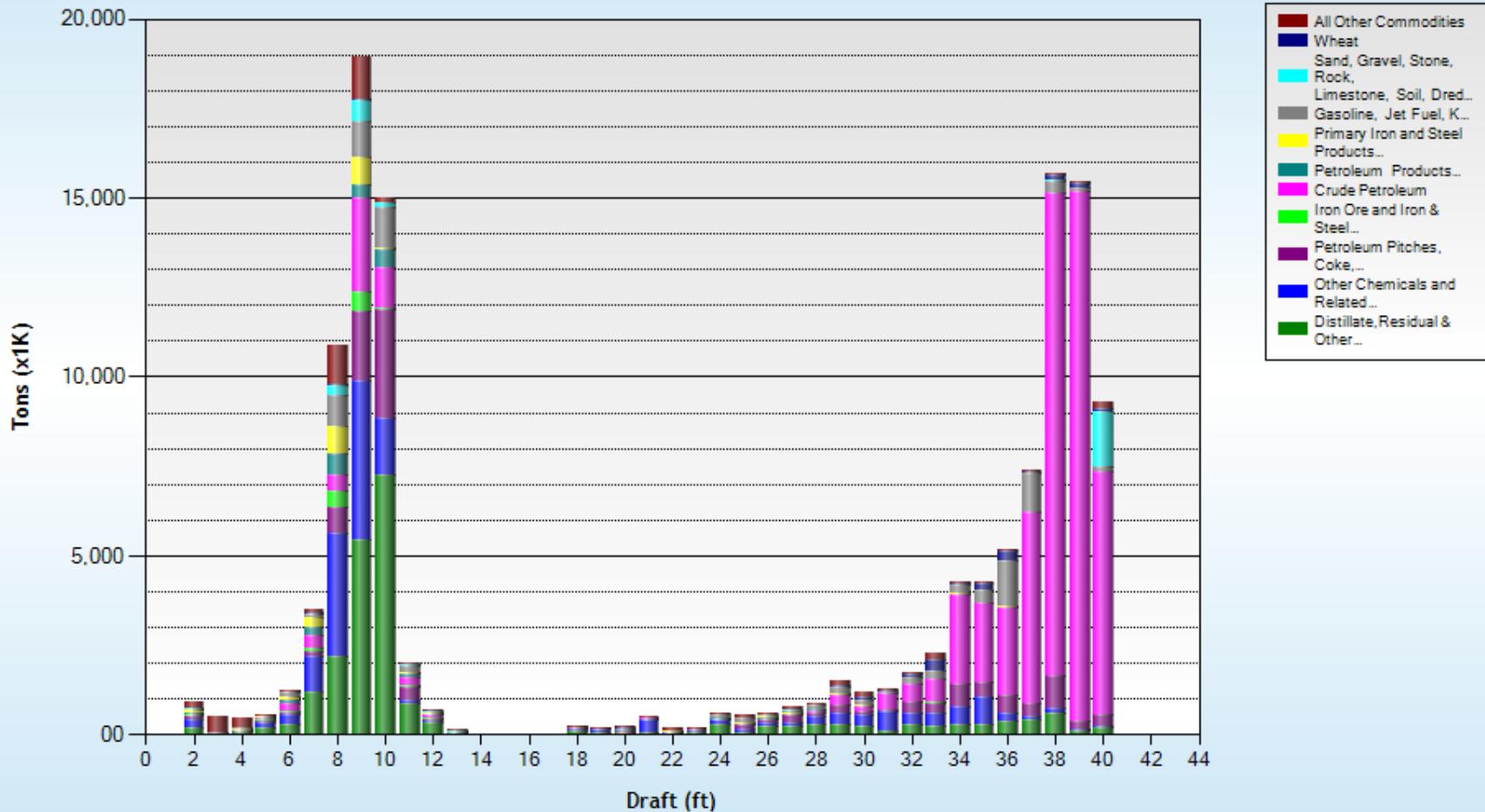




Visualizing Channel Utilization



Commodity Details Tons (Transit) for Sabine-Neches Waterway 2008



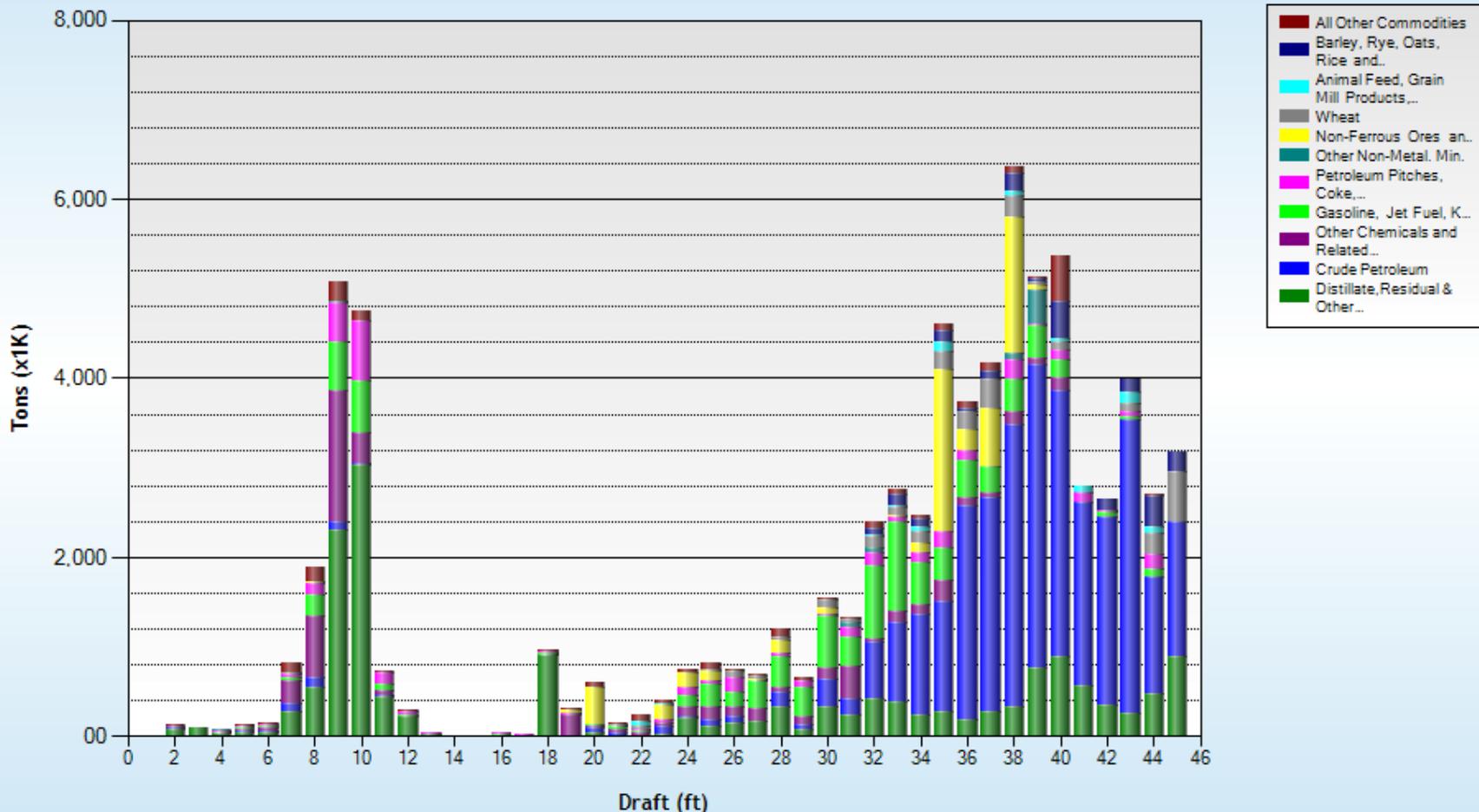


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Visualizing Channel Utilization

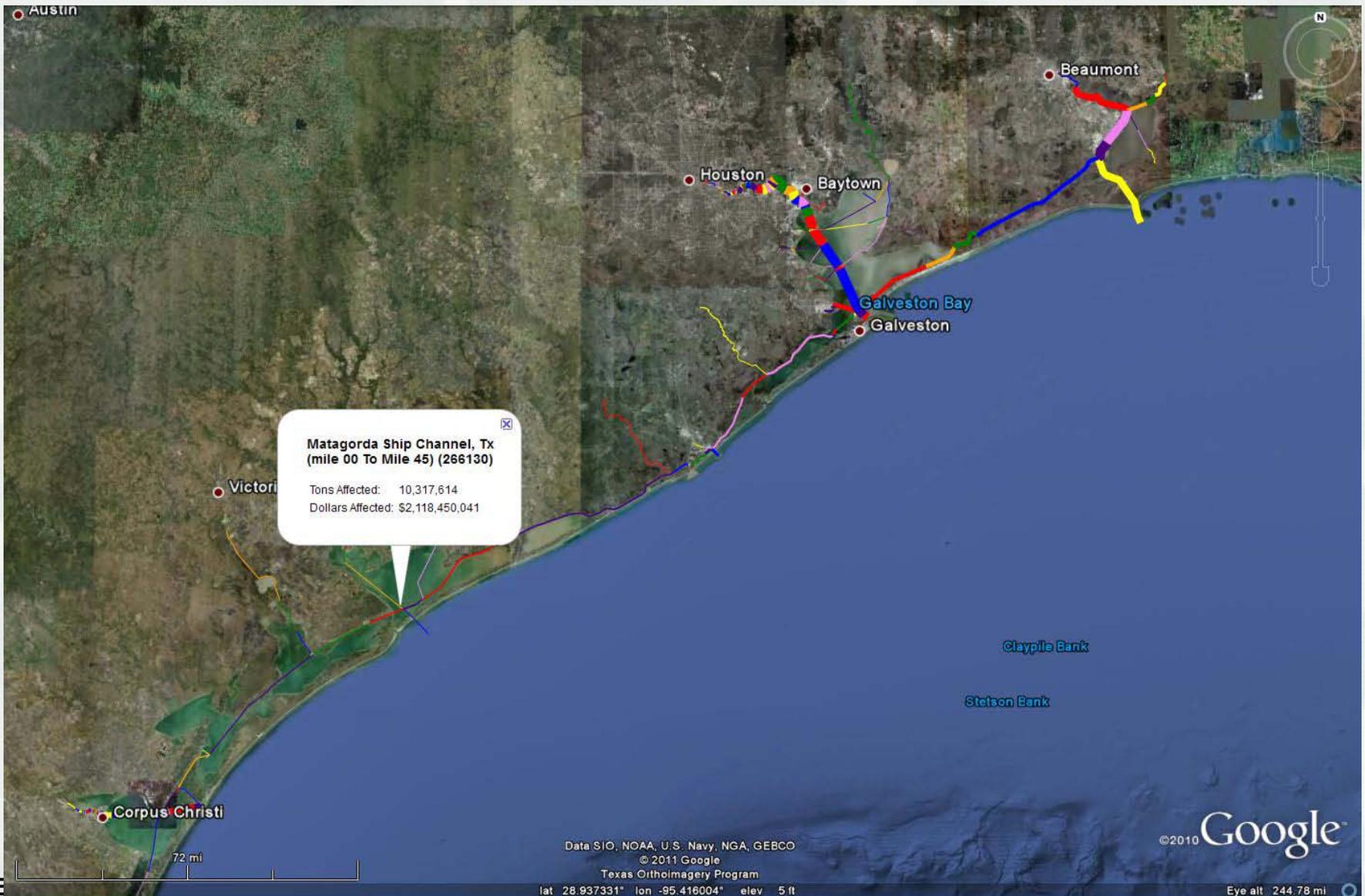


Commodity Details Tons (Transit) for Corpus Christi Ship Channel 2008



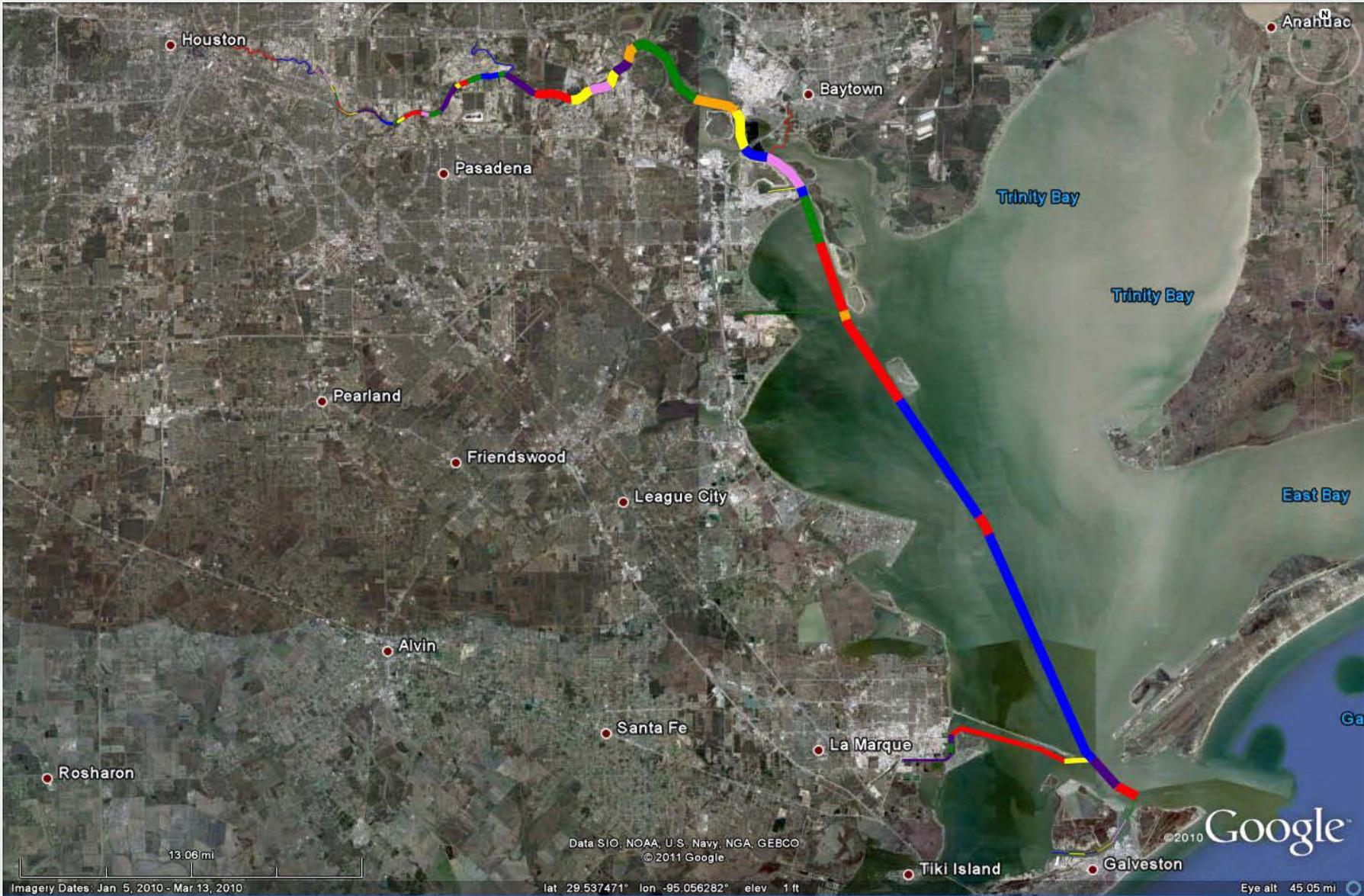


Visualizing Project Utilization





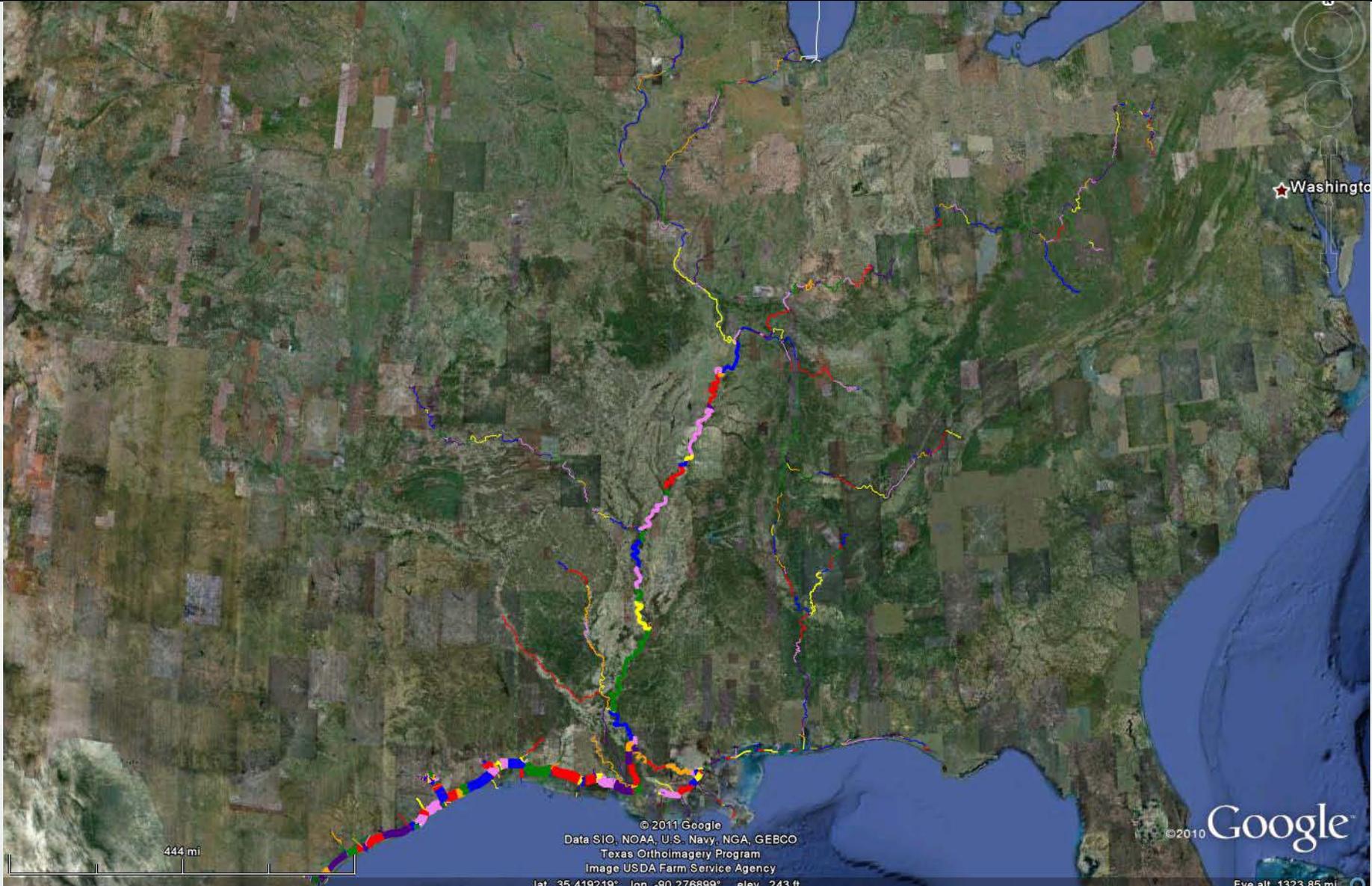
Visualizing Project Utilization





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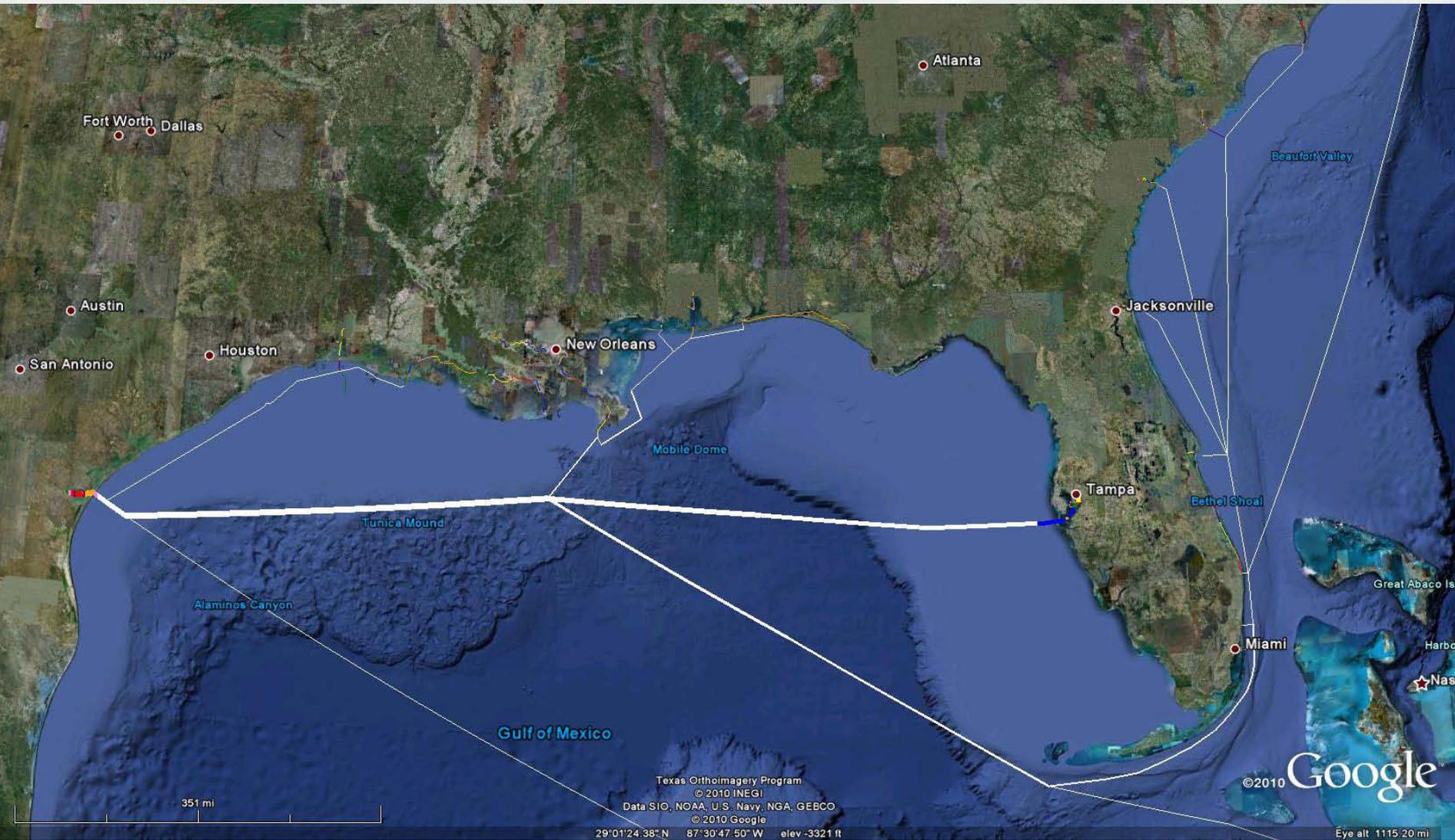
CPT Commodity Flow Feature





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CPT Commodity Flow Feature

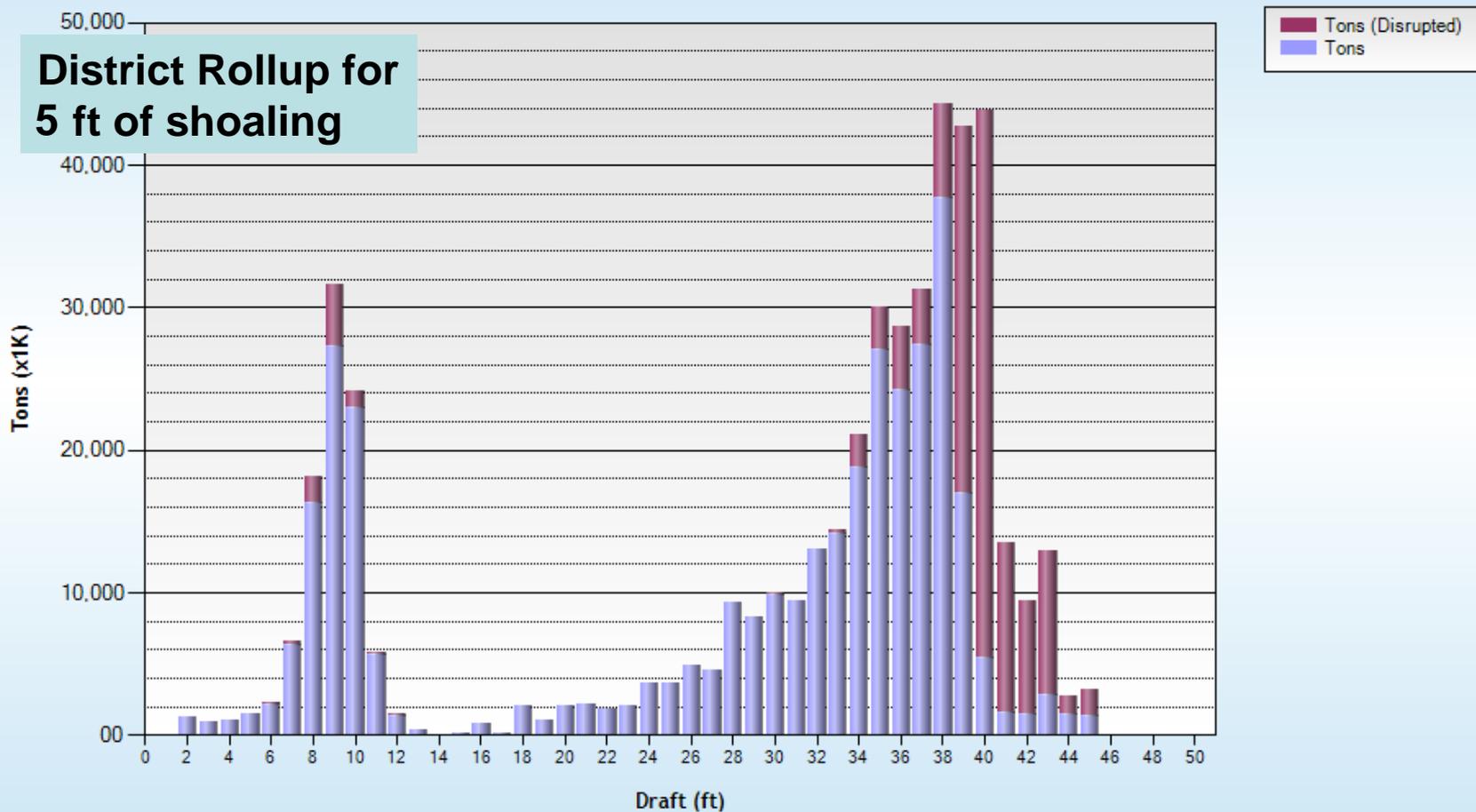




Inclusion of Shoaling Effects



Details Tons (Transit) for Rollup 2008





CPT for Budget Development



Next steps:

- CPT has not yet been included in the Budget EC, so there is an opportunity to help craft future guidance.
- For FY13 budget development, CPT can already help inform discussions and provide decision support for setting dredge-to depths and work package budget requests.
- Consensus is needed on suitable prioritization metrics for budget development in the future, e.g. tonnage using deepest n -ft of channel depth.
- CPT allows for improved understanding and analysis of navigation systems; challenge becomes transferring this increased knowledge into future budgets.



Performance-based Budgeting via the Channel Portfolio Tool (CPT)



Questions?

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