NORTH CAROLINA
Department of Transportation

NC Dredge Studies

- Study of the Use and Efficiency of the Dredge Manteo
- Study of Acquisition of Dedicated Dredging Capacity
- Study of Dredging Services Cost-Benefit Analysis

Sterling Baker, P.E. – NCDOT
James Gregson – NCDEQ

April 5, 2018

NCDOT NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

STUDY OF THE USE AND EFFICIENCY OF THE DREDGE MANTEO

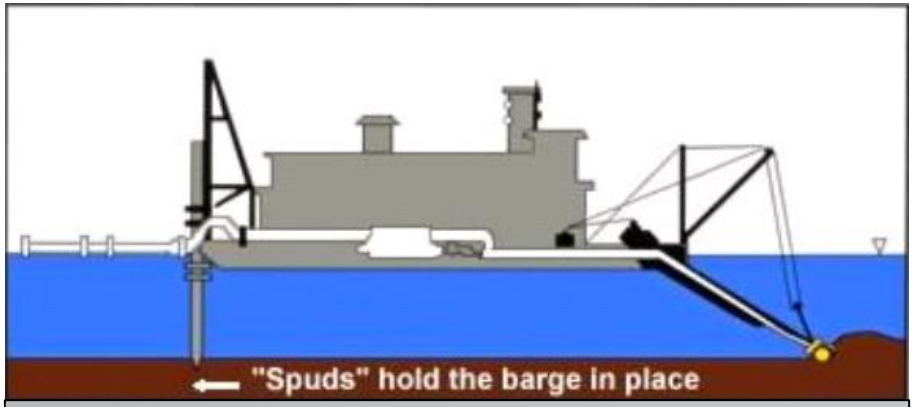
APRIL 2018

Study Purpose

- Identify annual operating costs of Dredge Manteo based on FY16/17 projects
- Evaluate current operating characteristics of Dredge Manteo using the USACE CEDEP program
- Assess improvements to increase Dredge Manteo production and cost effectiveness
- Identify current and future Ferry Division needs
- Determine excess capacity of Dredge Manteo to assist state dredge needs
- Discuss competitiveness of Dredge Manteo with private contractors

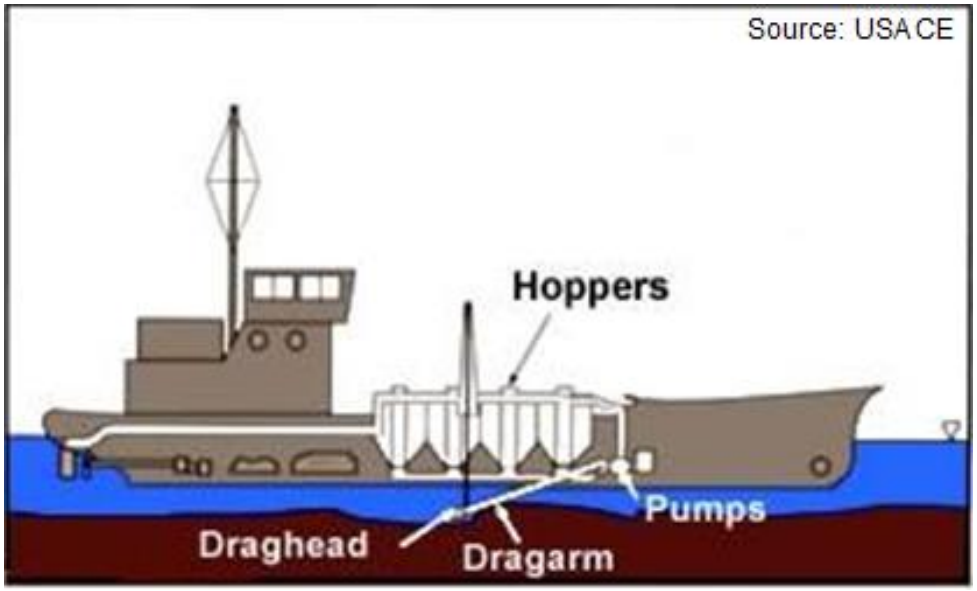
Dredge Types

- Cutterhead Pipeline Hydraulic Dredge



Dredge Types

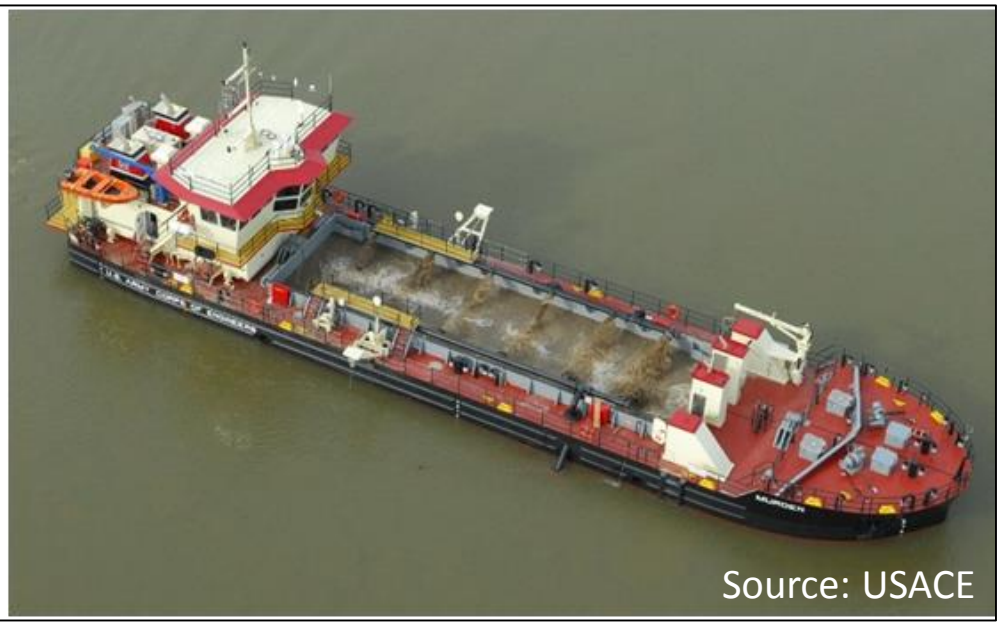
- Hopper Dredge



Dredge Types

- Special Purpose Hopper Dredge

Source: USACE


Source: USACE

Dredge Types

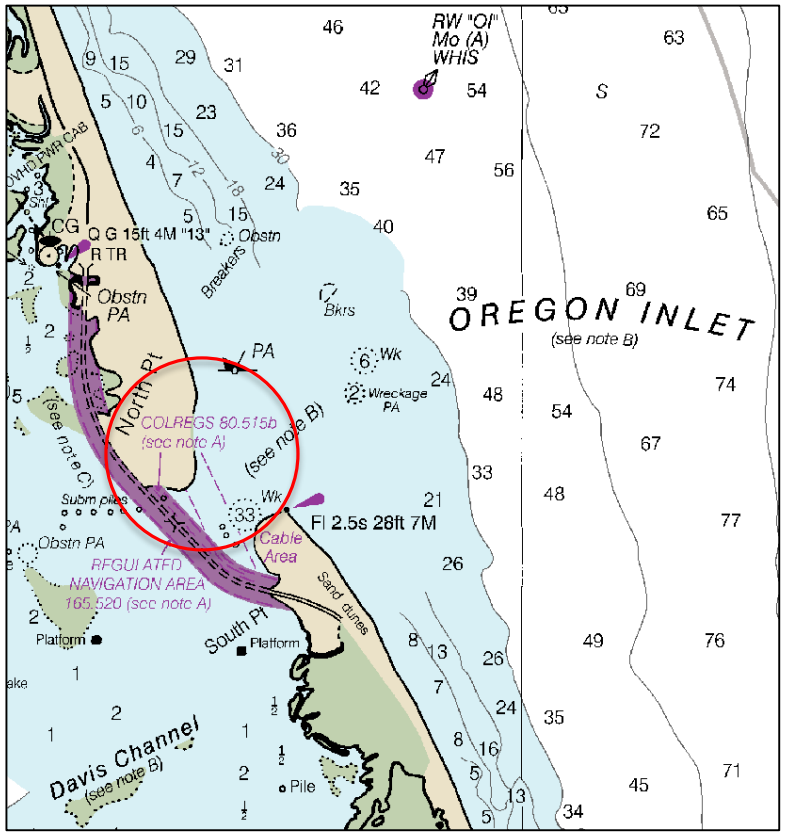
- Sidecast Dredge

Dredge Types

- Booster Barge

COLREGS Line

- Demarcation line defines where inland and international navigation regulations apply
- Ocean certified dredges required
- Shallow Draft Inlet projects performed outside the COLREGS line

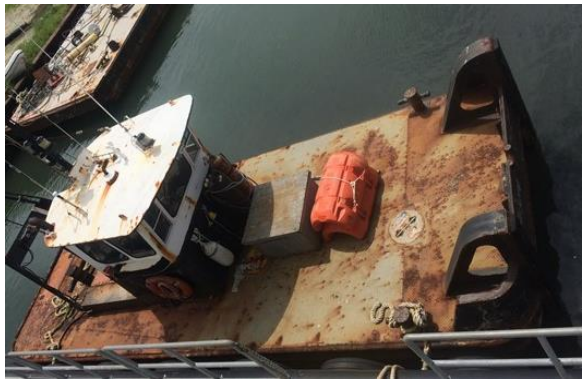
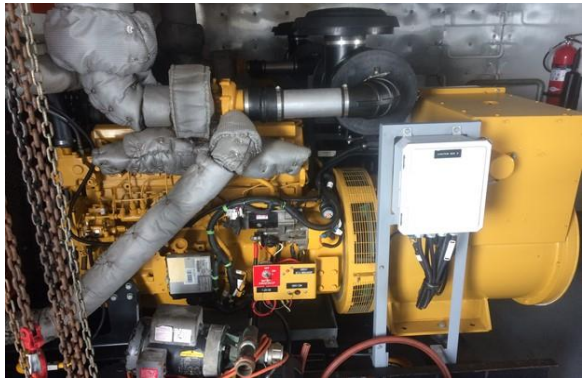


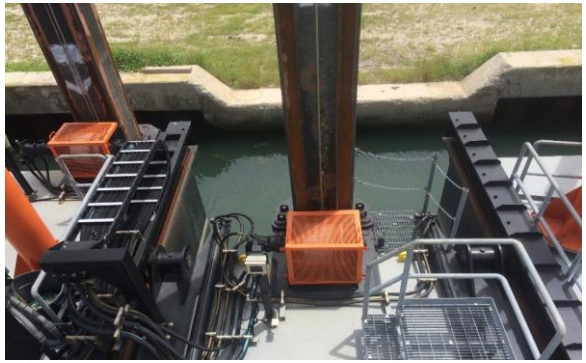
Equipment and Operations

- Current Dredge Equipment
  - 14-inch cutterhead pipeline dredge with 12-inch discharge end
  - 4 Barges, 3 Tugs, 2 boosters, & 10,000 ft of 12-inch dia. discharge pipe
  - Use other NCDOT equipment. Charged as rental cost
- Current Operations
  - Two crews of 7 to 9 personal, working 12 hr/day for 7 days
  - Crews also support maintenance of waterside infrastructure and upland disposal sites

Equipment – Dredge Manteo

Equipment – Other

Existing Workload and Costs

- Maintain channels/basins for 12 ferry terminals, 1 emergency route, and 1 maintenance facility
- 1-Year of Operational Data Available (FY16/17) - Dredge Manteo

Project	Dates	Project Days[2]	Volume Removed (cy)	Aggregate Cost[3]
South Dock Basin[1]	10/16/16 – 11/15/16	31	11,470	$93,881
Fort Fisher - Southport	12/7/16 – 1/13/17	38	30,343	$220,264
South Dock Basin	1/18/17 – 2/21/17	32	6,709	$128,476
South Dock Basin	5/10/17 – 5/21/17	12	2,666	$26,152
Total		**113**	**51,188**	**$468,773**
Total Days Worked		**113**		
Total Days Dredged[4]		**51.5**		
Total Volume Removed (cy)		**51,188**		
Total Cost Recorded[1,3]		**$468,773**		
Average Production Rate (cy/day)		**994**		
Cost/cy		**$9.16**		
Cost/Project Day		**$4,148**		

1. Maintenance event as a result of Hurricane Matthew. Costs were reimbursed by FEMA.
2. Project days include all time spent on project, inclusive of mobilization/demobilization and site preparation efforts.
3. Aggregate costs do not include depreciation estimates for equipment owned by NC Ferry Division
4. Data provided and/or confirmed by NCDOT Ferry Division.

Existing Workload and Costs

- Annual operating costs include fixed and variable components
  - Labor cost (full time crew)
  - Ownership cost (initial capital and replacement costs)
  - Maintenance (fixed and variable)
  - Rentals (variable)
- Aggregated Annual Operating Cost (FY16/17)

Annual Cost Description	FY2016/2017 (113 Project Days)
Annual Operating Cost	$1,667,100
Estimated Production Potential	51,188 cy
Cost ($/cy)	**$32.57**

Existing Workload and Costs

- Use Cost Engineering Dredge Estimating Program (CEDEP) to evaluate production improvements

- Calibrate CEDEP to best project (Southport)
  - ~52% Downtime

Calibrated - Southport December 2016 - January 2017	
Annual Operating Cost	$1,586,100
Estimated Production Potential	69,260 cy
Cost ($/cy)	**$22.90**

Future Workload and Costs

- NC Ferry Division Projected Costs to FY36
  - Based on Average Annual Costs ($650,000), Manteo Expected to Dredge on Average:
    - ~ 71 days/year
    - ~ 70,620 cy/year

<u>Maximum Expectancy:</u>

- $1,050,000 Annual Cost
- 115 days/year

<u>Minimum Expectancy:</u>

- $200,000 Annual Cost
- 22 days/year
- 21,800 cy/year

Annual Costs and Production

- Production Improvements
  - 24hr/day, 7 days a week
  - Increase discharge pipe size to 14-inch diameter
  - Optimize programmed work during dredge window
  - Increase disposal site capacity
  - Dedicated staff

Annual Costs and Production

- Annual cost and production volumes for 24hr/day operation

	November - March Environmental Window		October - April Environmental Window		Year Round	
	12 hr/day	24 hr/day	12 hr/day	24 hr/day	12 hr/day	24 hr/day
Annual Labor	1,396,474	2,142,211	1,396,474	2,142,211	1,396,474	2,142,211
Annual Equipment Ownership	$949,933	$949,933	$949,933	$949,933	$949,933	$949,933
Annual Operational Cost	$536,470	$916,820	$751,058	$1,283,548	$1,287,528	$2,200,368
Annual Survey Costs	$83,965	$83,965	$117,551	$117,551	$201,516	$201,516
Total Annual Cost	2,966,843	$4,092,930	$3,215,017	$4,493,244	$3,835,452	$5,494,029
Estimated Annual Production	99,165 CY	169,450 CY	138,831 CY	237,230 CY	237,996 CY	406,980 CY
Cost ($/CY)	**$29.92**	**$24.15**	**$23.16**	**$18.94**	**$16.12**	**$13.50**

- If 24hr/day operation implemented, Dredge Manteo would have min 85,000 cy capacity for other work
- Annual cost would increase by $2.5 million
- Average Unit Cost is $21.55/cy
- NC small pipeline is $12 to $16/cy

Annual Costs and Production

- Annual cost and production volumes for 24hr/day operation and increase to 14-inch discharge pipe

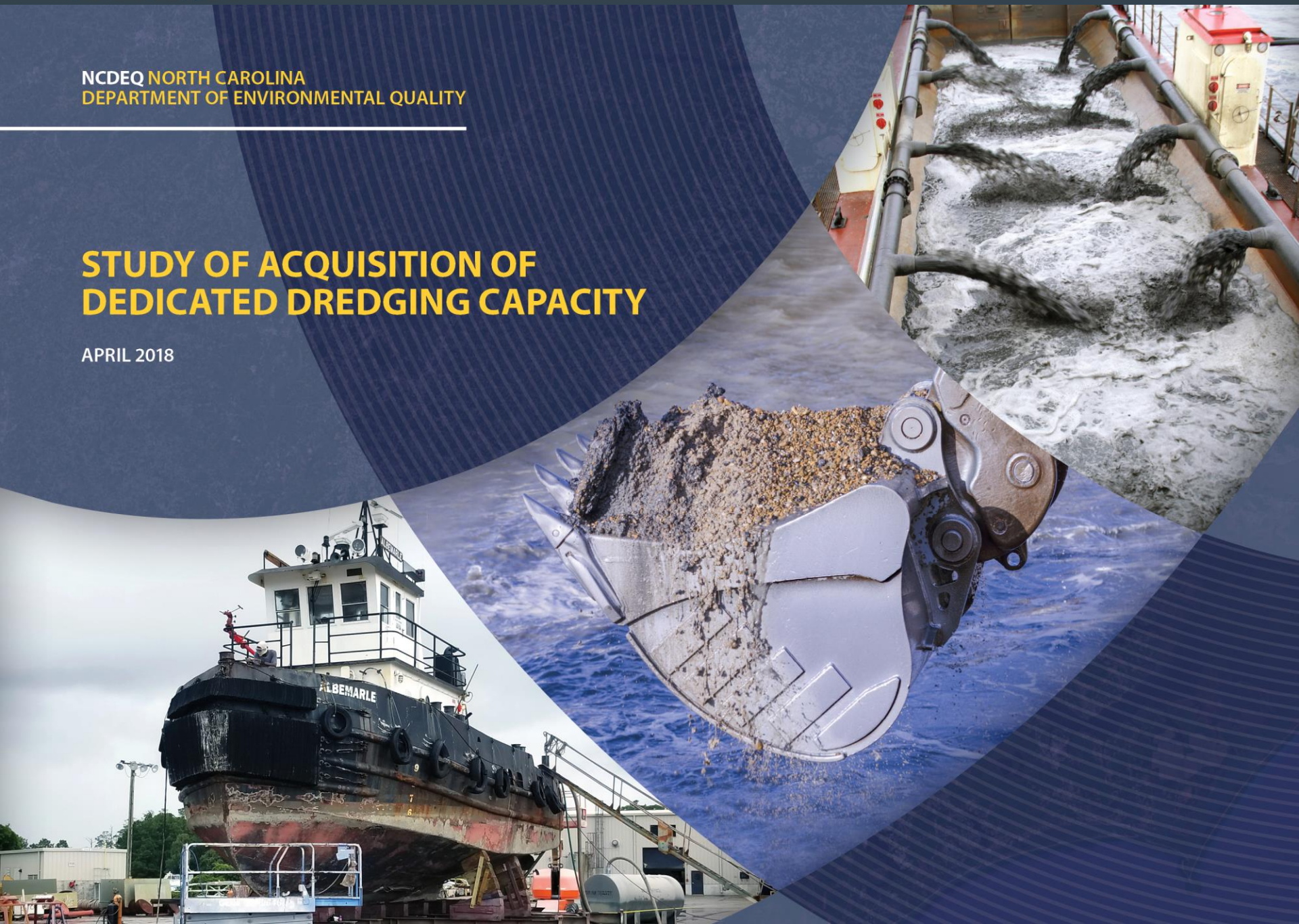
	November - March Environmental Window		October - April Environmental Window		Year Round	
	12 hr/day	24 hr/day	12 hr/day	24 hr/day	12 hr/day	24 hr/day
Annual Labor	1,396,474	2,142,211	$1,396,474	$2,142,211	$1,396,474	$2,142,211
Annual Equipment Ownership	$969,933	$969,933	$969,933	$969,933	$969,933	$969,933
Annual Operational Cost	$536,470	$916,820	$751,058	$1,283,548	$1,287,528	$2,200,368
Annual Survey Costs	$83,965	$83,965	$117,551	$117,551	$201,516	$201,516
Total Annual Cost	$2,986,843	$4,112,930	$3,235,017	$4,513,244	$3,855,452	$5,514,029
Estimated Annual Production	134,975 CY	230,640 CY	188,964 CY	322,896 CY	323,939 CY	553,945 CY
Cost ($/CY)	**$22.13**	**$17.83**	**$17.12**	**$13.98**	**$11.90**	**$9.95**

- If 24hr/day operation implemented, Dredge Manteo would have min 160,000 cy capacity for other work
- Annual cost would increase by $2.5 million – total of $4.3 million
- Average Unit Cost is $15.90/cy
- NC small pipeline is $12 to $16/cy

NCDEQ NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY

STUDY OF ACQUISITION OF DEDICATED DREDGING CAPACITY

APRIL 2018



Study Purpose

- Determine projected dredging demand

  [NC (includes local/municipal), Ferry Division, Other States]
- Assess production potential of dredge plants (types & sizes)
- Identify capital and operation/maintenance (O&M) costs for dredge plants
- Identify potential funding mechanism for capital acquisition and cost sharing of O&M

North Carolina Waterways

- Shallow Draft Waterways
  - Shallow Draft Inlets (Oregon, Hatteras, Bogue, etc.)
  - Atlantic Intracoastal Waterway (AIWW) and AIWW Crossings
  - Inland Channels (Shallotte River, Mile Hammock, etc.)

- Deep Draft Waterways (>15 feet)
  - Cape Fear River (Wilmington Harbor)
  - Morehead City Harbor (Including Beaufort Inlet)

<u>Dredging outside COLREGS line requires certified vessels</u>

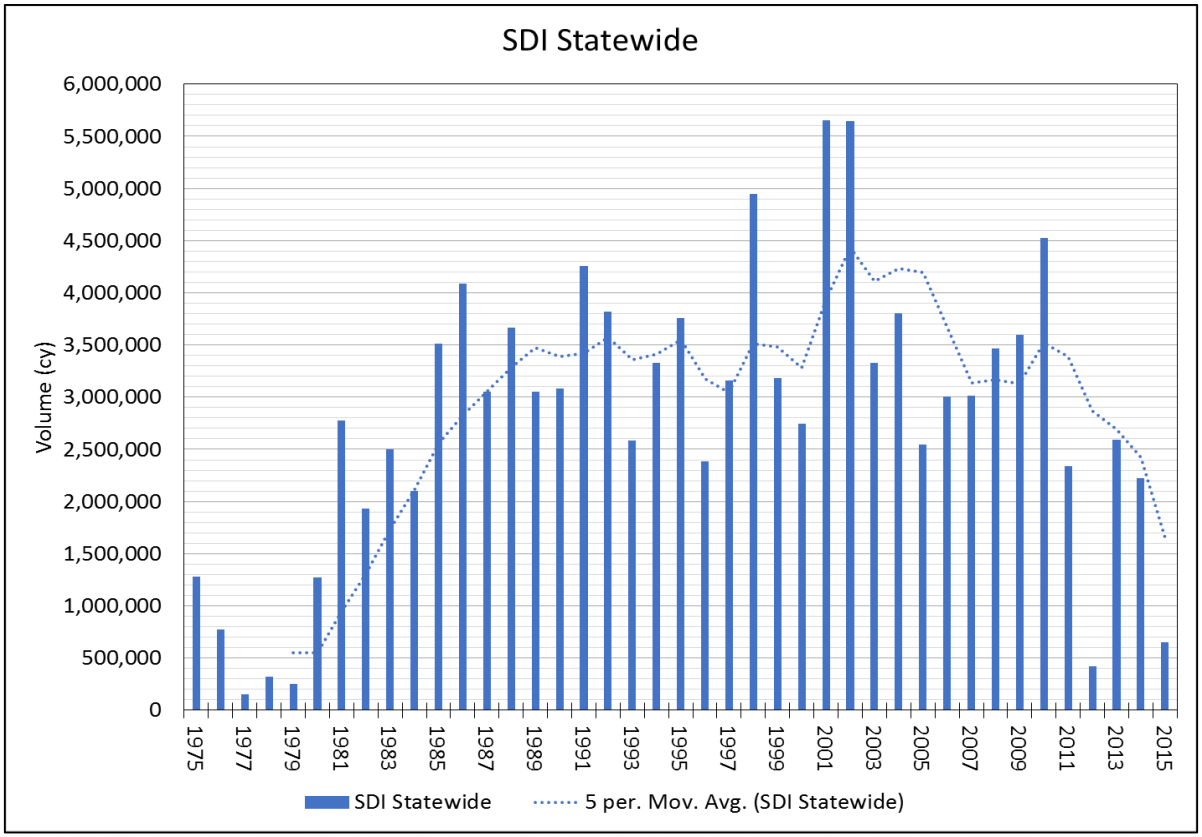
Evaluate Historic and Future Dredging Demand

- Average and Peak Demand
- NCDOT Ferry Division needs
- Other State Agencies
- Out of State

Shallow Draft Inlet Demand

(Including Oregon Inlet)

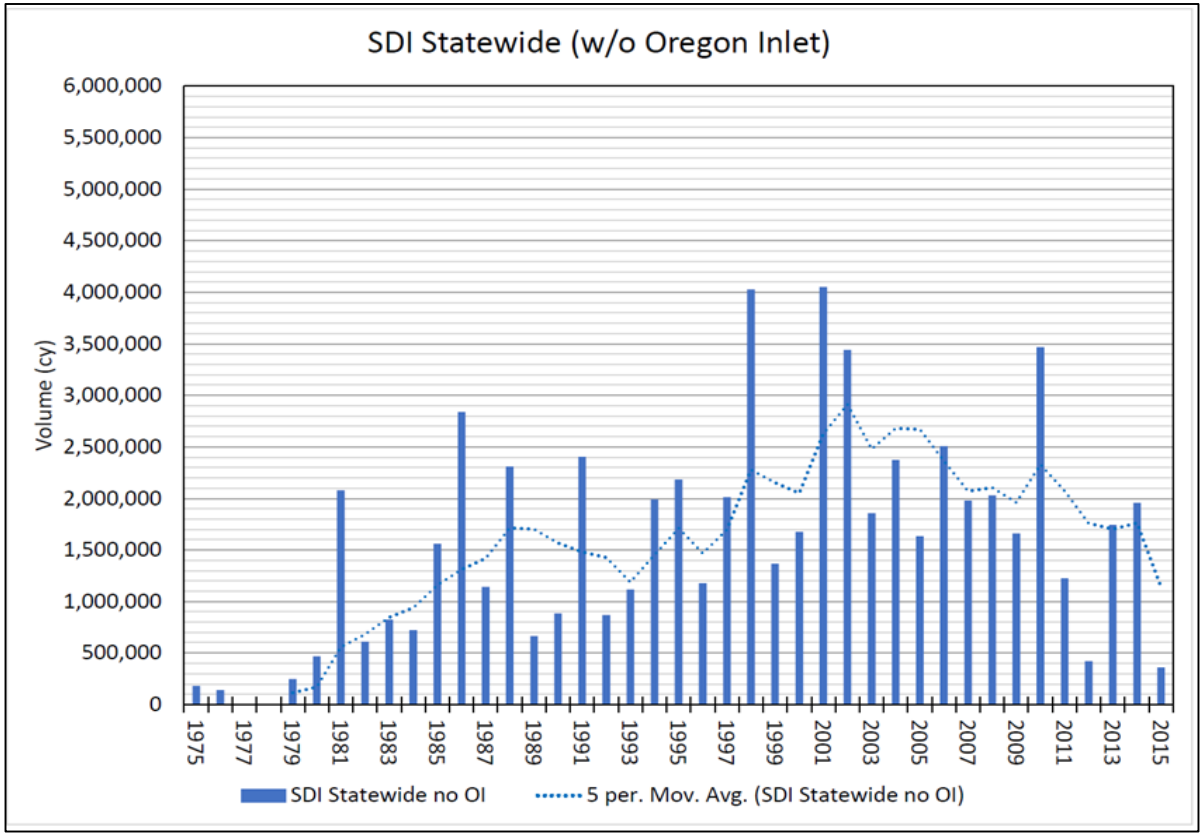
- Average Demand is 3.0 to 3.5 Mcy/yr
- Peak Demand is additional 1 Mcy/yr



Shallow Draft Inlet Demand

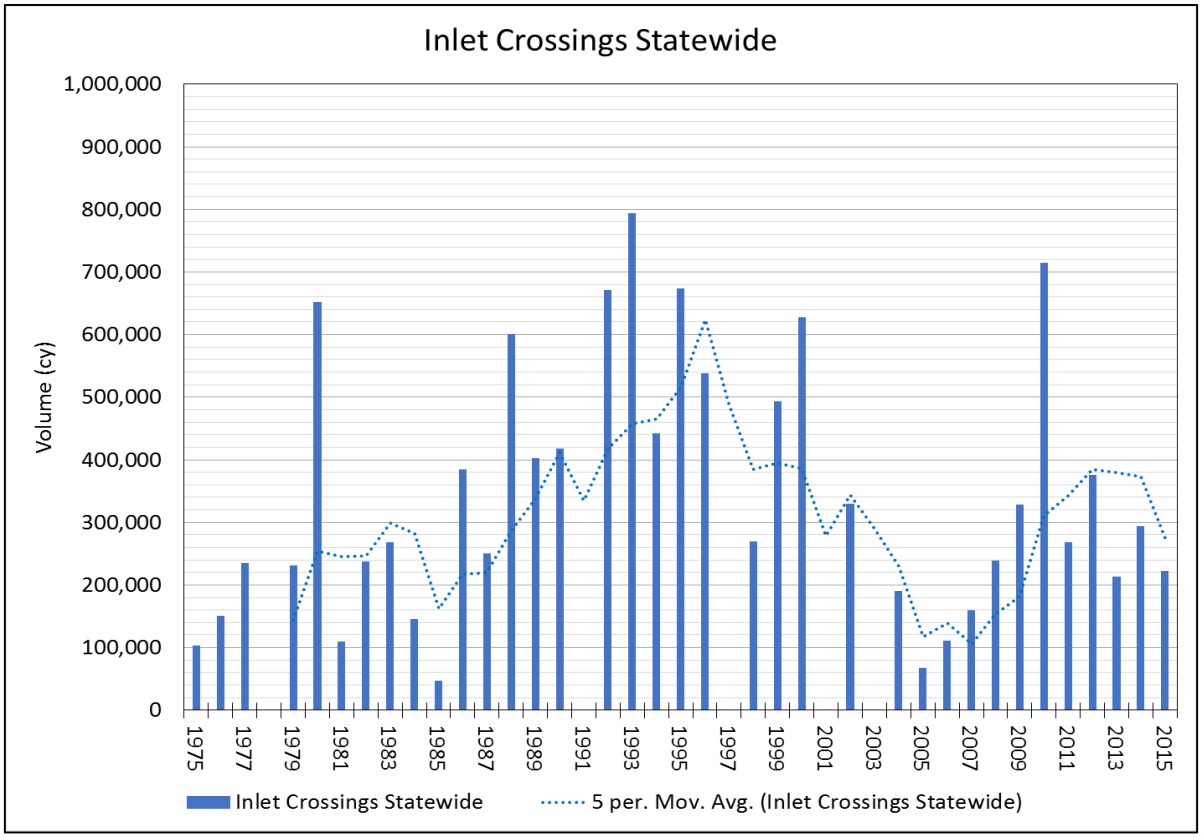
(Without Oregon Inlet)

- Oregon Inlet demand is ~1 Mcy/yr



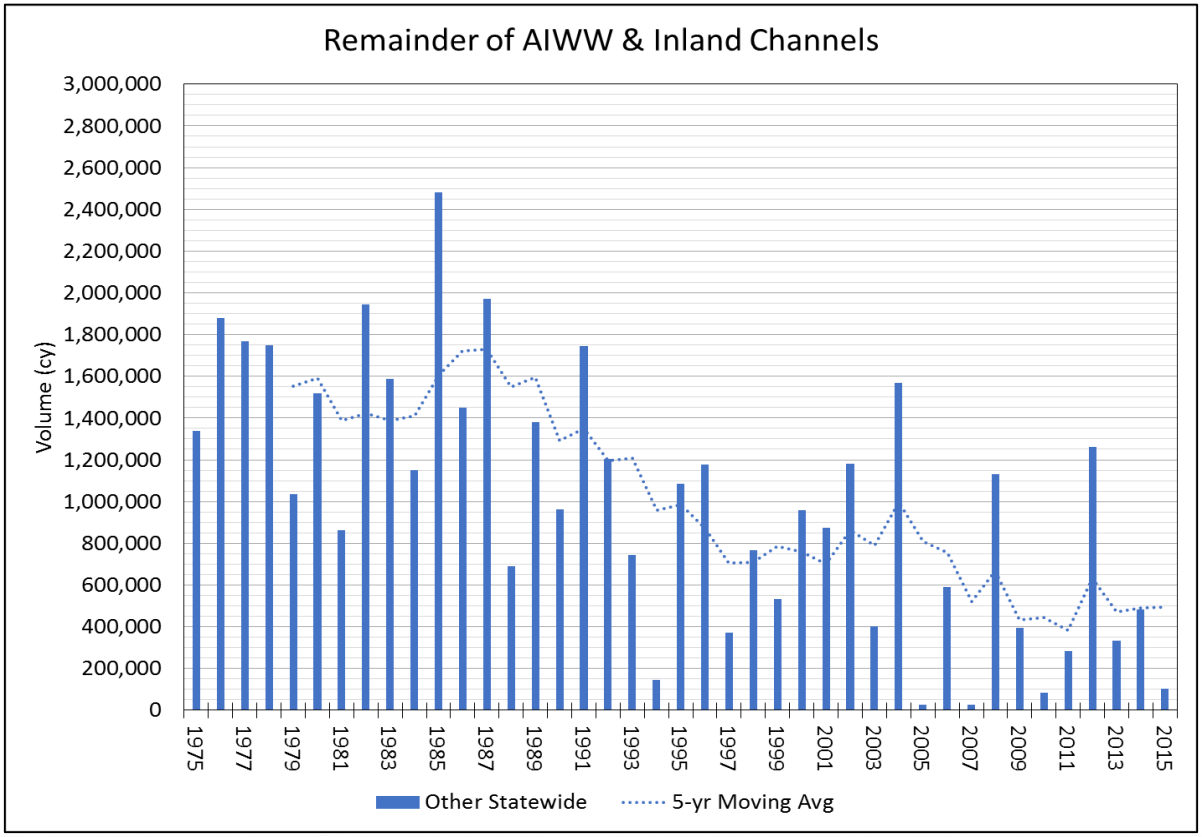
AIWW Crossings Demand

- Average Demand 200,000 to 400,000 cy/yr
- Peak Demand is 600,000 cy/yr



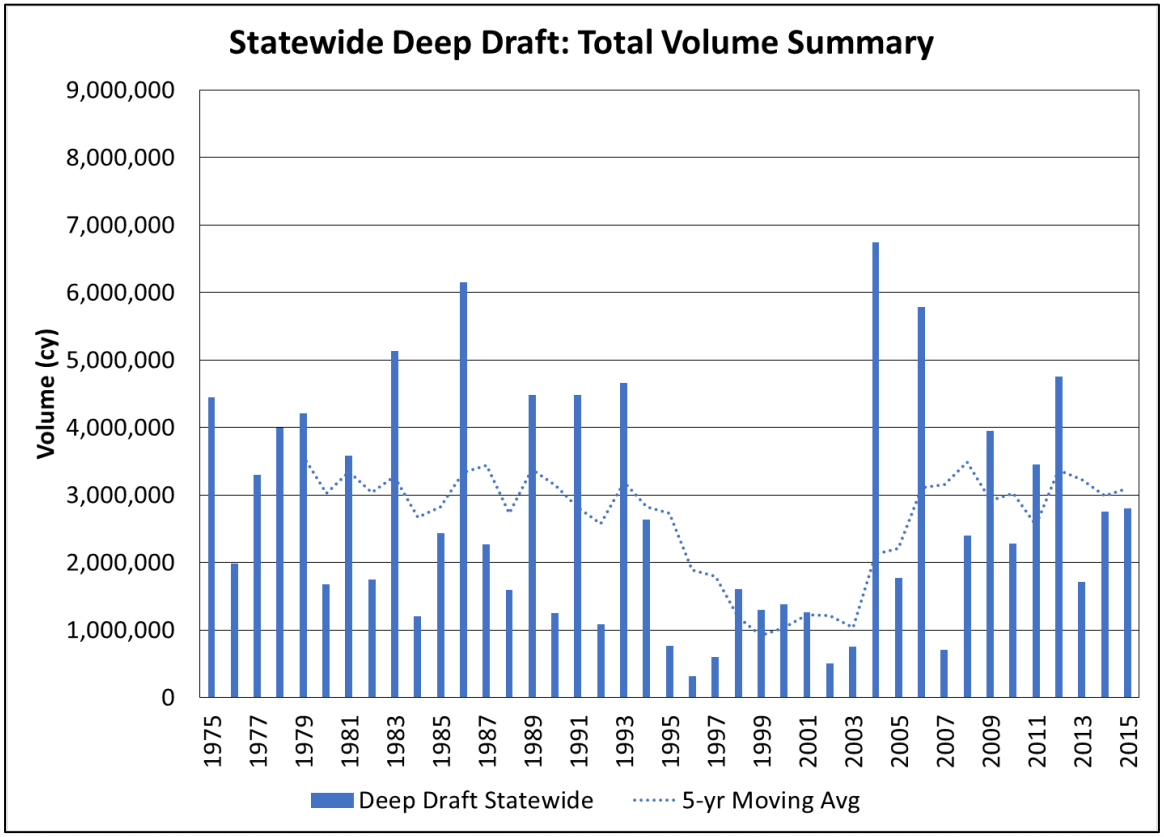
AIWW/Inland Waterways Demand

- Average Demand 600,000 cy/yr to 1 Mcy/yr
- Peak Demand is 1.5 Mcy/yr



Deep Draft Waterway Demand

- Average Demand is 3 Mcy/yr
- Peak Demand is 4 Mcy/yr



Other Demand

- NCDOT Ferry Division demand is constant and scheduled
- NCWRC has ~ 5,000 cy/yr demand
- Commonwealth of Virginia has shallow draft dredging needs but funding constrained.
- State of South Carolina has no defined need
- State of Georgia has need but no funding

Expansion of Dredge Fleet

- Identify dredge plants, compute production potential, and annual operating and unit costs
- Shallow Draft Inlets (ocean certification required)
  - 20- and 24-inch pipeline dredge
  - Special purpose hopper dredge
- AIWW Crossing and AIWW/Inland Waterways
  - 14-inch pipeline dredge (similar to Dredge Manteo)
  - 20-inch pipeline dredge
  - Potential sidecast dredge
- Deep Draft Waterway
  - 30-inch pipeline dredge
  - Medium Capacity Hopper Dredge

Expansion of Dredge Fleet

- Dredge capacity required for minimum, average, and peak demand scenarios in addition to Dredge Manteo

Type of Dredge	Production (cy/yr)		State of North Carolina Waterways											
			Shallow Draft Inlets (Including Oregon Inlet)			AIWW Crossings & AIWW/Inland Waterways			Deep Draft Waterways			Shallow Draft Inlets, AIWW Crossings, AIWW/Inland Waterways, and Deep		
	Avg. Dredge Window	Year Round	Min	Avg	Peak	Min	Avg	Peak	Min	Avg	Peak	Min	Avg	Peak
			2.0 Mcy/yr	3.0 Mcy/yr	4.0 Mcy/yr	0.7 Mcy/yr	1.4 Mcy/yr	2.1 Mcy/yr	3 Mcy/yr	3 Mcy/yr	4 Mcy/yr	5.7 Mcy/yr	7.4 Mcy/yr	10.1 Mcy/yr
14-inch Pipeline Dredge	276,800	NA	-	-	-	1	1	1	-	-	-	1	1	1
20-inch Pipeline Dredge	989,400	NA	1	-	-	-	1	2	-	-	-	1	1	2
24-inch Pipeline Dredge	1,986,000	NA	-	1	1	-	-	-	-	-	-	-	1	1
30-inch Pipeline Dredge	2,812,500	NA	-	-	-	-	-	-	1	1	1	1	1	1
Sidecast Dredge	NA	1,689,200	-	-	1*	-	-	-	-	-	-	-	-	-
Special Purpose Hopper Dredge	NA	1,199,200	1	1	2*	-	-	-	-	-	-	1	1	2
Medium (3,500 cy Capacity) Hopper Dredge	1,316,200	NA	-	-	-	-	-	-	-	-	1	-	-	1
Total Need			2	2	3*	1	2	3	1	1	2	4	5	8

*Peak need can be met by adding one of these two dredges, 1 Sidecast Dredge or 1 Special Purpose Hopper, for a total of 3 dredges

Capital Costs – Minimum Need

- Capital cost required for minimum demand scenario in addition to Dredge Manteo

Capital Cost Summary - Minimum Need						
Type of Dredge	Shallow Draft		Deep Draft		Total	
	# of Dredges	Capital Cost	# of Dredges	Capital Cost	# of Dredges	Capital Cost
14-inch Pipeline Dredge	1	$ 21,850,000	0	$ -	1	$ 21,850,000
20-inch Pipeline Dredge	1	$ 34,600,000	0	$ -	1	$ 34,600,000
24-inch Pipeline Dredge	0	$ -	0	$ -	0	$ -
30-inch Pipeline Dredge	0	$ -	1	$ 77,500,000	1	$ 77,500,000
Sidecast Dredge	0	$ -	0	$ -	0	$ -
Special Purpose Hopper Dredge	1	$ 25,000,000	0	$ -	1	$ 25,000,000
Medium (3,500 cy Capacity) Hopper Dredge	0	$ -	0	$ -	0	$ -
TOTAL	**3**	**$ 81,450,000**	**1**	**$ 77,500,000**	**4**	**$158,950,000**

Capital Costs – Average Need

- Capital cost required for average demand scenario in addition to Dredge Manteo

Capital Cost Summary - Average Need						
Type of Dredge	Shallow Draft		Deep Draft		Total	
	# of Dredges	Capital Cost	# of Dredges	Capital Cost	# of Dredges	Capital Cost
14-inch Pipeline Dredge	1	$ 21,850,000	0	$ -	1	$ 21,850,000
20-inch Pipeline Dredge	1	$ 34,600,000	0	$ -	1	$ 34,600,000
24-inch Pipeline Dredge	1	$ 56,800,000	0	$ -	1	$ 56,800,000
30-inch Pipeline Dredge	0	$ -	1	$ 77,500,000	1	$ 77,500,000
Sidecast Dredge	0	$ -	0	$ -	0	$ -
Special Purpose Hopper Dredge	1	$ 25,000,000	0	$ -	1	$ 25,000,000
Medium (3,500 cy Capacity) Hopper Dredge	0	$ -	0	$ -	0	$ -
TOTAL	**4**	**$138,250,000**	**1**	**$ 77,500,000**	**5**	**$215,750,000**

Capital Costs – Peak Need

- Capital cost required for peak demand scenario in addition to Dredge Manteo

Capital Cost Summary - Peak Need						
Type of Dredge	Shallow Draft		Deep Draft		Total	
	# of Dredges	Capital Cost	# of Dredges	Capital Cost	# of Dredges	Capital Cost
14-inch Pipeline Dredge	1	$ 21,850,000	0	$ -	1	$ 21,850,000
20-inch Pipeline Dredge	2	$ 69,200,000	0	$ -	2	$ 69,200,000
24-inch Pipeline Dredge	1	$ 56,800,000	0	$ -	1	$ 56,800,000
30-inch Pipeline Dredge	0	$ -	1	$ 77,500,000	1	$ 77,500,000
Sidecast Dredge	0	$ -	0	$ -	0	$ -
Special Purpose Hopper Dredge	2	$ 50,000,000	0	$ -	2	$ 50,000,000
Medium (3,500 cy Capacity) Hopper Dredge	0	$ -	1	$ 67,000,000	1	$ 67,000,000
TOTAL	**6**	**$197,850,000**	**2**	**$144,500,000**	**8**	**$342,350,000**

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DEPARTMENT OF TRANSPORTATION

NCDEQ NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY

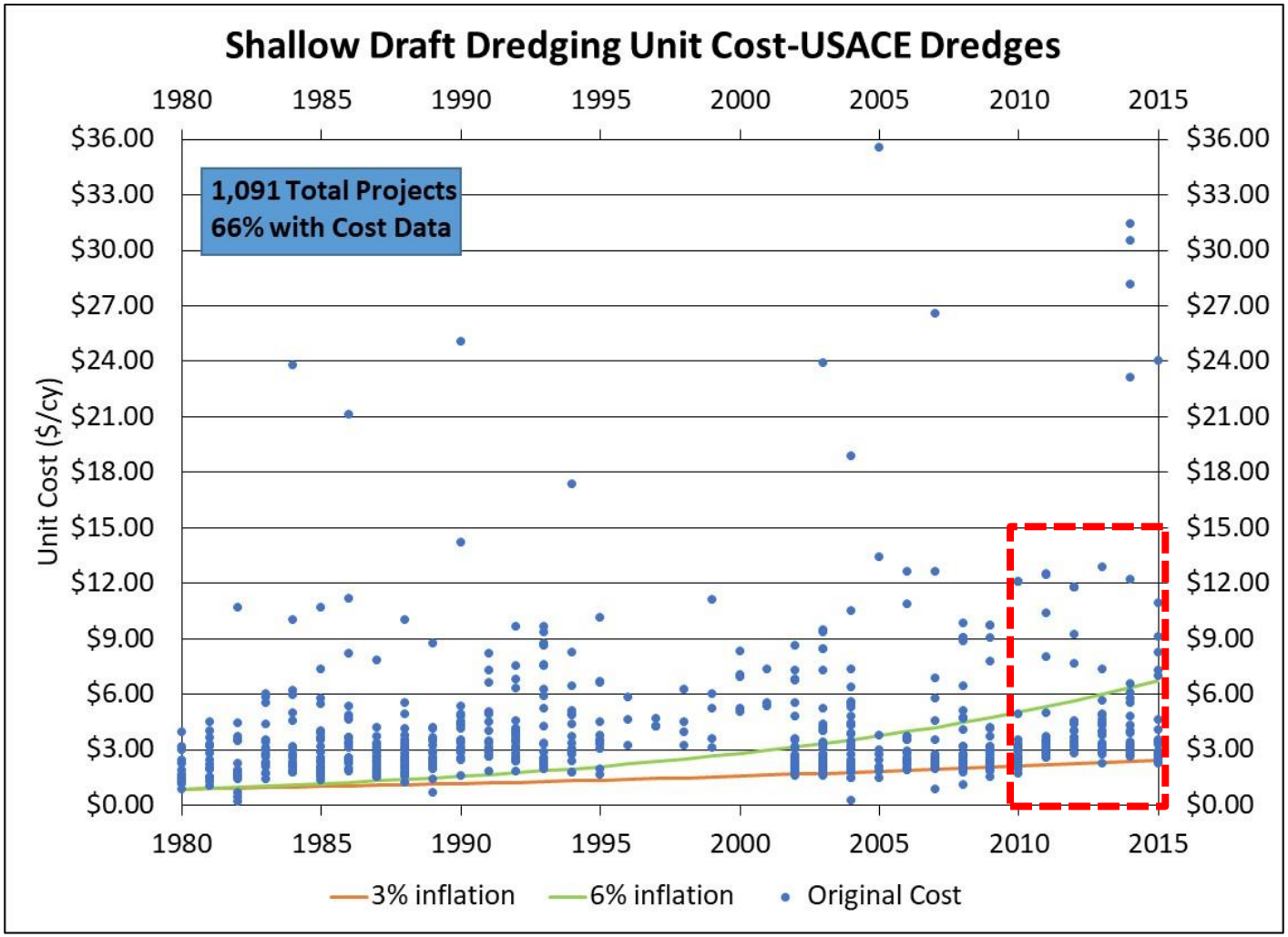
STUDY OF DREDGING SERVICES COST-BENEFIT ANALYSIS

APRIL 2018

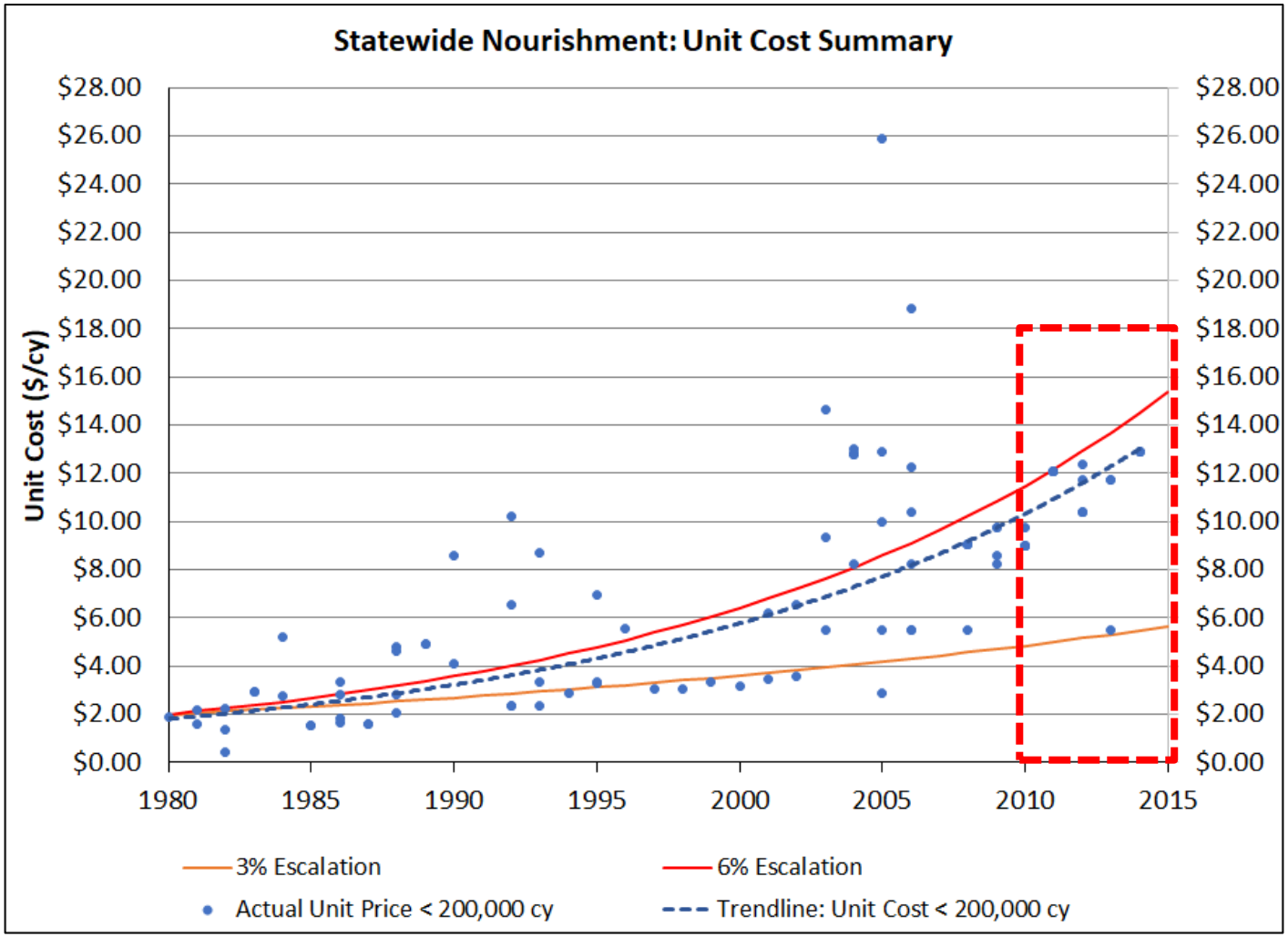
Study Purpose

- Define dredge ownership costs and factors that influence them
- Case examples of public agencies outside NC that own and operate dredges
- Conduct interview with USACE and private dredge contractors
- Develop initial capital, annual operating, and unit pricing costs for several dredge demand scenarios
- Identify contractual opportunity/constraints that affect private contractor delivery
- Compare estimated state dredge plant costs to USACE/private contractors

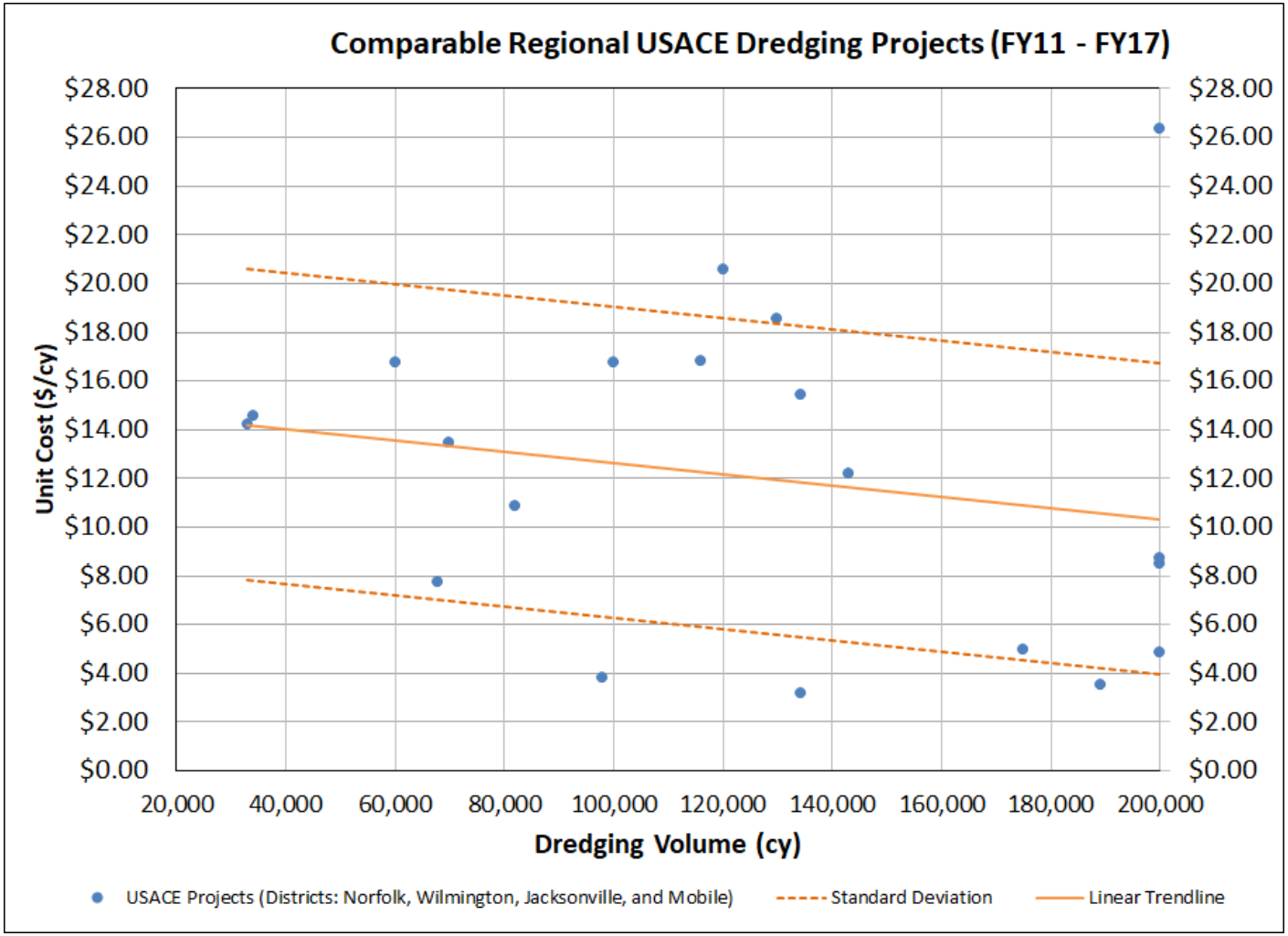
USACE Dredges – Sidecast/Special Purpose



Private Contractors – NC Small Pipeline with Placement



Small Regional USACE Private Contractor Projects (Pipeline)



Annual, Capital, & Unit Costs

- Shallow Draft Waterways
  - Average Demand

	Initial Cost	# of Dredges	Total Initial Cost	Production Rate (CY/YR)	Total Annual Cost	Unit Cost	Historical Unit Cost USACE Special Purpose/Sidecast	Historical Unit Cost Private Contract Small Pipeline/Hopper
Initial Cost of Special Purpose (Murden) Dredge	$25,000,000	1	$25,000,000	1,200,000	$12,206,868	$10.2	$8.00 to $14.00	$0
Initial Cost of Equipment for Special Purpose (Murden) Dredge	$0							
Initial Cost of 14" Pipeline Dredge	$10,000,000	1	$21,850,000	275,000	$4,313,087	$15.7	$0	$12.00 to $16.00
Initial Cost of Equipment for 14" Pipeline Dredge	$11,850,000							
Initial Cost of 20" Pipeline Dredge	$20,000,000	1	$34,600,000	1,000,000	$9,132,408	$9.1	$0	$10.00 to $14.00
Initial Cost of Equipment for 20" Pipeline Dredge	$14,600,000							
Initial Cost of 24" Pipeline Dredge	$37,800,000	1	$56,800,000	2,000,000	$14,044,056	$7.0	$0	$8.00 to $12.00
Initial Cost of Equipment for 24" Pipeline Dredge	$19,000,000							
TOTAL		**4**	**$138,250,000**	**4,475,000**	**$39,696,419**			

Annual, Capital, & Unit Costs

- Shallow Draft Waterways
  - Peak Demand

	Initial Cost	# of Dredges	Total Initial Cost	Production Rate (CY/YR)	Total Annual Cost	Unit Cost	Historical Unit Cost USACE Special Purpose/Sidecast	Historical Unit Cost Private Contract Small Pipeline/Hopper
Initial Cost of Special Purpose (Murden) Dredge	$25,000,000	2	$50,000,000	2,400,000	$24,413,736	$10.2	$8.00 to $14.00	$0
Initial Cost of Equipment for Special Purpose (Murden) Dredge	$0							
Initial Cost of 14" Pipeline Dredge	$10,000,000	1	$21,850,000	275,000	$4,313,087	$15.7	$0	$12.00 to $16.00
Initial Cost of Equipment for 14" Pipeline Dredge	$11,850,000							
Initial Cost of 20" Pipeline Dredge	$20,000,000	2	$69,200,000	2,000,000	$18,264,816	$9.1	$0	$10.00 to $14.00
Initial Cost of Equipment for 20" Pipeline Dredge	$14,600,000							
Initial Cost of 24" Pipeline Dredge	$37,800,000	1	$56,800,000	2,000,000	$14,044,056	$7.0	$0	$8.00 to $12.00
Initial Cost of Equipment for 24" Pipeline Dredge	$19,000,000							
TOTAL		**6**	**$197,850,000**	**6,675,000**	**$61,035,695**			

Annual, Capital, & Unit Costs

- Shallow/Deep Draft Waterways
  - Average Demand (Pipeline Dredge Option)

	Initial Cost	# of Dredges	Total Initial Cost	Production Rate (CY/YR)	Total Annual Cost	Unit Cost	Historical Unit Cost USACE Special Purpose/Sidecast	Historical Unit Cost Private Contract Pipeline/Hopper
Initial Cost of Special Purpose (Murden) Dredge	$25,000,000	1	$25,000,000	1,200,000	$12,206,868	$10.2	$8.00 to $14.00	NA
Initial Cost of Equipment for Special Purpose (Murden) Dredge	$0							
Initial Cost of 14" Pipeline Dredge	$10,000,000	1	$21,850,000	275,000	$4,313,087	$15.7	NA	$12.00 to $16.00
Initial Cost of Equipment for 14" Pipeline Dredge	$11,850,000							
Initial Cost of 20" Pipeline Dredge	$20,000,000	1	$34,600,000	1,000,000	$9,132,408	$9.1	NA	$10.00 to $14.00
Initial Cost of Equipment for 20" Pipeline Dredge	$14,600,000							
Initial Cost of 24" Pipeline Dredge	$37,800,000	1	$56,800,000	2,000,000	$14,044,056	$7.0	NA	$8.00 to $12.00
Initial Cost of Equipment for 24" Pipeline Dredge	$19,000,000							
Initial Cost of 30" Pipeline Dredge	$51,000,000	1	$77,500,000	2,800,000	$18,710,161	$6.7	NA	$8.50 to $10.50
Initial Cost of Equipment for 30" Pipeline Dredge	$26,500,000							
TOTAL		**5**	**$215,750,000**	**7,275,000**	**$58,406,579**			

Annual, Capital, & Unit Costs

- Shallow/Deep Draft Waterways
  - Peak Demand (Pipeline Dredge Option)

	Initial Cost	# of Dredges	Total Initial Cost	Production Rate (CY/YR)	Total Annual Cost	Unit Cost	Historical Unit Cost USACE Special Purpose/Sidecast	Historical Unit Cost Private Contract Pipeline/Hopper
Initial Cost of Special Purpose (Murden) Dredge	$25,000,000	2	$50,000,000	2,400,000	$24,413,736	$10.2	$8.00 to $14.00	NA
Initial Cost of Equipment for Special Purpose (Murden) Dredge	$0							
Initial Cost of 14" Pipeline Dredge	$10,000,000	1	$21,850,000	275,000	$4,313,087	$15.7	NA	$12.00 to $16.00
Initial Cost of Equipment for 14" Pipeline Dredge	$11,850,000							
Initial Cost of 20" Pipeline Dredge	$20,000,000	2	$69,200,000	2,000,000	$18,264,816	$9.1	NA	$10.00 to $14.00
Initial Cost of Equipment for 20" Pipeline Dredge	$14,600,000							
Initial Cost of 24" Pipeline Dredge	$37,800,000	1	$56,800,000	2,000,000	$14,044,056	$7.0	NA	$8.00 to $12.00
Initial Cost of Equipment for 24" Pipeline Dredge	$19,000,000							
Initial Cost of 30" Pipeline Dredge	$51,000,000	1	$77,500,000	2,800,000	$18,710,161	$6.7	NA	$8.50 to $10.50
Initial Cost of Equipment for 30" Pipeline Dredge	$26,500,000							
Initial Cost of Medium Hopper (3,500 CY Capacity) Dredge	$50,000,000	1	$67,000,000	1,300,000	$15,375,972	$11.8	NA	$12.00 to $16.00
Initial Cost of Equipment for Medium Hopper (3,500 CY Capacity) Dredge	$17,000,000							
TOTAL		**8**	**$342,350,000**	**10,775,000**	**$95,121,827**			

Annual, Capital, & Unit Costs

- Shallow Draft Waterways
  - Current Funding Source
    - Shallow Draft Navigation Channel and Aquatic Weed Fund
    - $19 million (State) + $4.75-6.25M (Local Sponsor)

	Initial Cost	# of Dredges	Total Initial Cost	Production Rate (CY/YR)	Total Annual Cost	Unit Cost	Historical Unit Cost USACE Special Purpose/Sidecast	Historical Unit Cost Private Contract Small Pipeline/Hopper
Initial Cost of Special Purpose (Murden) Dredge	$25,000,000	1	$25,000,000	1,200,000	$12,206,868	$10.2	$8.00 to $14.00	$0
Initial Cost of Equipment for Special Purpose (Murden) Dredge	$0							
Initial Cost of 24" Pipeline Dredge	$37,800,000	1	$56,800,000	2,000,000	$14,044,056	$7.0	$0	$8.00 to $12.00
Initial Cost of Equipment for 24" Pipeline Dredge	$19,000,000							
TOTAL		**2**	**$81,800,000**	**3,200,000**	**$26,250,924**			

Annual, Capital, & Unit Costs

- Shallow Draft Waterways – Phased Approach
  - Phase 1: Special Purpose Dredge
    - Allows for year round use
    - No additional support equipment (tugs, boosters, etc.)
    - Only utilizes $12.2 million/yr of current funding source allowing for continued USACE and local efforts

	# of Dredges	Total Initial Cost	Production Rate (CY/YR)	Total Annual Cost	Unit Cost	Historical Unit Cost USACE Special Purpose/Sidecast	Historical Unit Cost Private Contract Pipeline/Hopper
Initial Cost of Special Purpose (Murden) Dredge	1	$25,000,000	1,200,000	$12,206,868	$10.2	$8.00 to $14.00	$0
Initial Cost of Equipment for Special Purpose (Murden) Dredge							
TOTAL	**1**	**$25,000,000**	**1,200,000**	**$12,206,868**			

Annual, Capital, & Unit Costs

- Shallow Draft Waterways – Phased Approach
  - Phase 2: 24-inch Pipeline Dredge
    - Dredging within the environmental windows of shallow draft inlets, AIWW, and inland waterways
    - Additional support equipment necessary (tugs, boosters, etc.)
    - Permitting of projects may be more streamlined

	# of Dredges	Total Initial Cost	Production Rate (CY/YR)	Total Annual Cost	Unit Cost	Historical Unit Cost USACE Special Purpose/Sidecast	Historical Unit Cost Private Contract Pipeline/Hopper
Initial Cost of 24" Pipeline Dredge Initial Cost of Equipment for 24" Pipeline Dredge	1	$56,800,000	2,000,000	$14,044,056	$7.0	$0	$8.00 to $12.00
TOTAL	**1**	**$56,800,000**	**2,000,000**	**$14,044,056**			

Capability of Other Interests to Support State Dredging Needs

- USACE
  - Operates 2 special purpose and 1 sidecast dredge
  - Indicates sufficient capacity to meet state's needs unless state wants to expand beneficial reuse
  - Better equipped to support state if proactive planning/funding of projects are performed vs "reactionary" response.
  - Cost sharing or leasing state-owned dredge is not feasible due to current appropriation mechanisms, maintenance, and workload priorities
  - Risks of state owned dredges: Acquiring ocean certification, managing permits/ disposal areas and expanding maintenance

Capability of Other Interests to Support State Dredging Needs

- Private Contractors
  - Operate 10-to 30-inch pipeline and medium/large hopper dredges
  - Indicates sufficient capacity to meet state's needs
  - Generally, only larger dredge contractors were interested in work outside COLREGS line
  - Recommend better planning/funding of projects
  - Small firms favored multi-year/multi-site contracts with up to 10% potential savings
  - Larger firms wanted relaxation of small business set asides.
  - Risks of state owned dredges: 24/7 operations, retaining crew, and large capital investment

Opportunities/Constraints of Dredge Ownership

- Considerations
  - Flexibility in scheduling work – minimizing time delays
  - Encourage beneficial reuse of material
  - Substantial Long term investment
  - Need to consistently fund, permit, and execute work in efficient manner to make it cost effective
  - Existing funding mechanism may not be guaranteed nor continued support from local sponsor
  - Crew retention and use outside of dredge window

Question - Comments