Philadelphia District
Quantitative Sediment Transport and RSM Strategies for DE & MD Coasts

Jeffrey Gebert, Jesse Hayden, Eve Eisemann, Monica Chasten

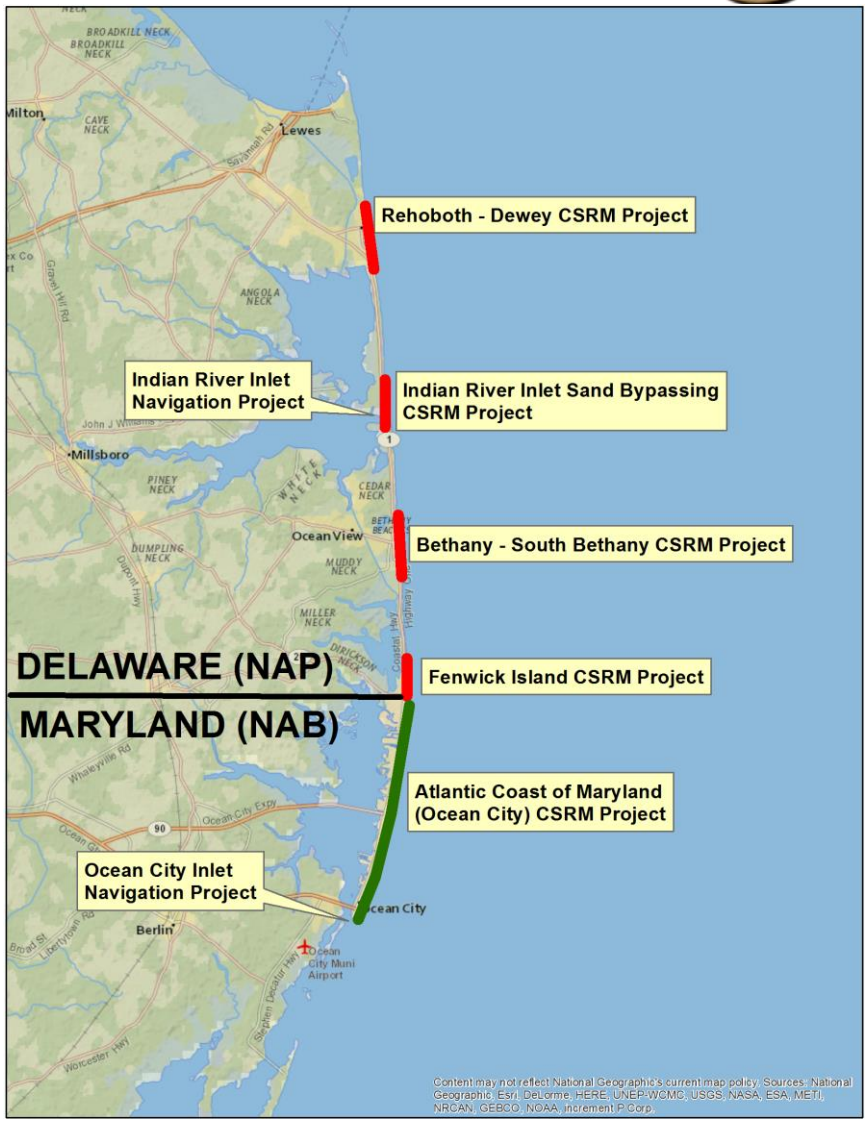
BLUF: Project will quantify sediment transport pathways and fluxes for the Atlantic Coast of Delaware and Maryland. Recommendations will be made for improved management of sediment at CSRM and navigation projects in the region.

Challenge/Objectives

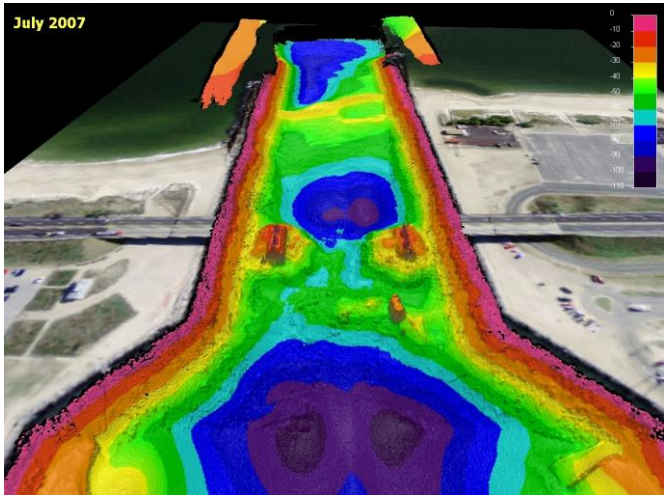
- Integrate USACE and DNREC beach profile monitoring programs and data
- Locate 6 MCY of CSRM project sand (out of 10 MCY placed since 2005) not within project limits
- Limited sand to bypass across Indian River Inlet
- Can Indian River Inlet ebb shoal be dredged for beachfill? What about flood shoal?

Approach (Tools/Models/Data Used)

- 30+ yrs NAP and DNREC beach profile monitoring Data managed in BMAP
- 13 yrs of USACE CSRM beachfill placement on DE coast
- 28 yrs sand bypassing at Indian River Inlet
- SBAS/ArcMap
- GenCade

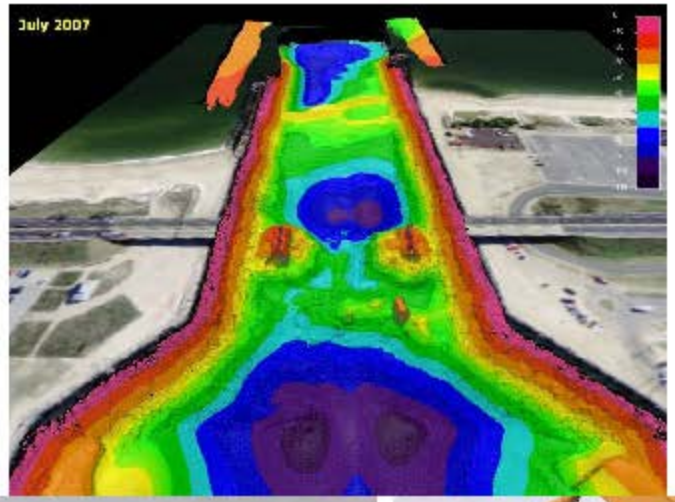


Indian River Inlet DE Navigation Project & Sand Bypass Plant



Indian River Inlet Jetties & Sand Bypass Plant

Indian River Inlet North Jetty Sand Tightening, 2013



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District/Other USACE PDT Members

Monica Chasten, CENAP-OP
Jeff Gebert, CENAP-PL
Mike Hart, CENAP-DP
Randy Wise, CENAP-EC-EH

Ian Delwiche, CENAB-ENC-E
Tom Laczo, CENAB-PL
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Larry Cocchieri, CENAD
Donald Cresitello, CENAD
Doug Stamper, CENAD

Eve Eisemann, CEERD
Rusty Permenter, CEERD
Katherine Brutsche, CEERD
Linda Lillycrop, CEERD
Tanya Beck, CEERD

Stakeholders/Partners

Jesse Hayden & Tony Pratt, DE DNREC
Jack Puleo & students, University of Delaware
Indian River Inlet Working Group

Leveraging & Outreach

Collaboration between NAP, DNREC, UD and NAB will leverage the considerable research performed to date and integrate projects.

Opportunities with USFWS, USCG, NOAA?

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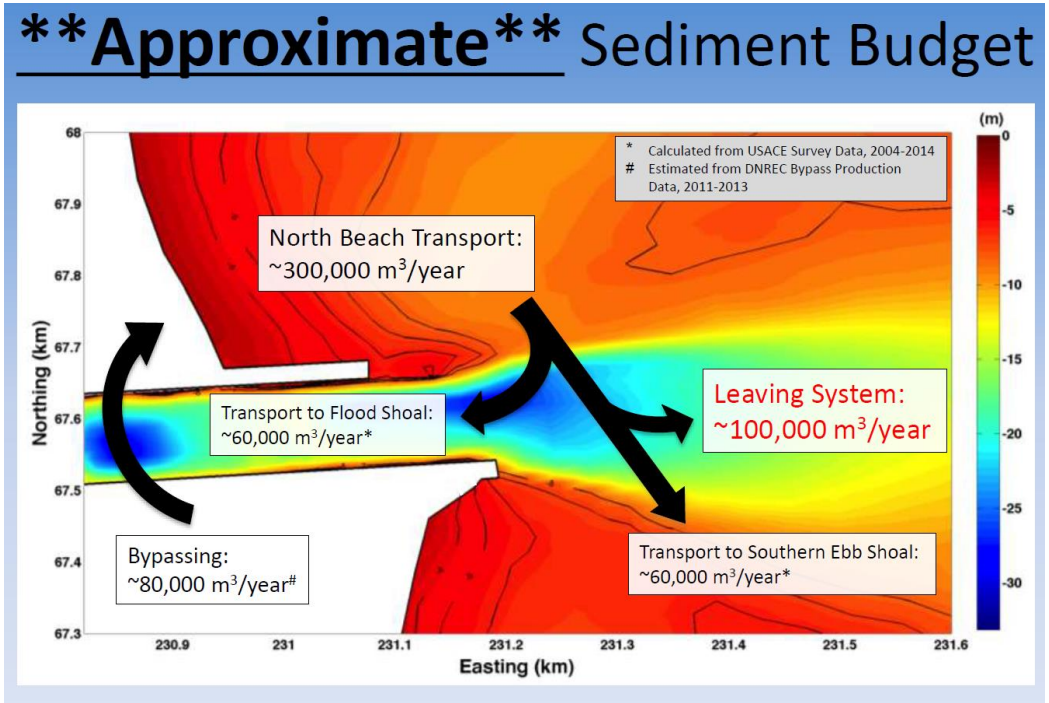
Accomplishments/Deliverables
Lessons Learned

- Consolidated NAP CSRM project monitoring data with DNREC LRP monitoring data (BMAP)
- Initial establishment of 9 littoral cells along 25 miles of DE coast
- 4 cells at USACE projects, 5 cells between and beyond USACE projects
- 2005 – 2016 sediment volume changes at all cells
- Installed SBAS to ArcMap late February 2018
- JALBTCX efforts?



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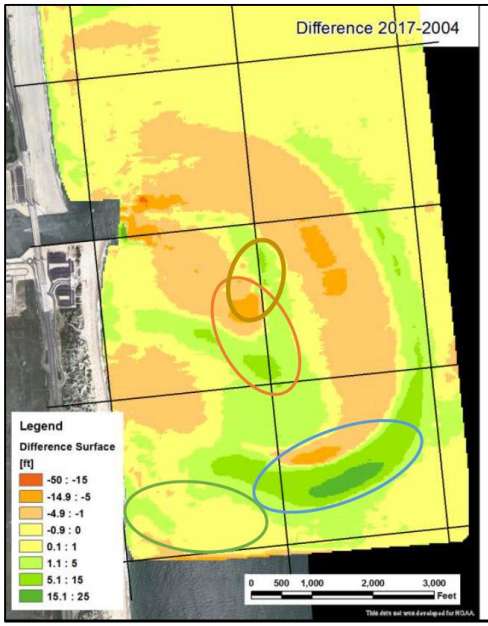
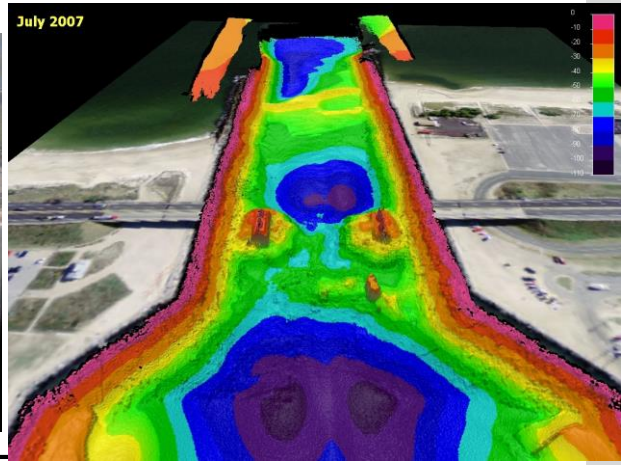
Challenges & Forward Progress

- Evaluate impacts of using IRI ebb shoal as sand source for CSRM projects
- Evaluate long-term supply and demand for sand from offshore borrow areas in DE and MD
- Reevaluate effectiveness of IRI sand bypass plant under recent sediment transport regime
- Indian River Inlet Navigation Project



Total changes between 2017 and 2004

- Southeast migration of inner bar
- Slump of material towards channel from inner bar
- Southeast migration of outer bar
- Slight nearshore **accretion** in general southwest of the outer bar



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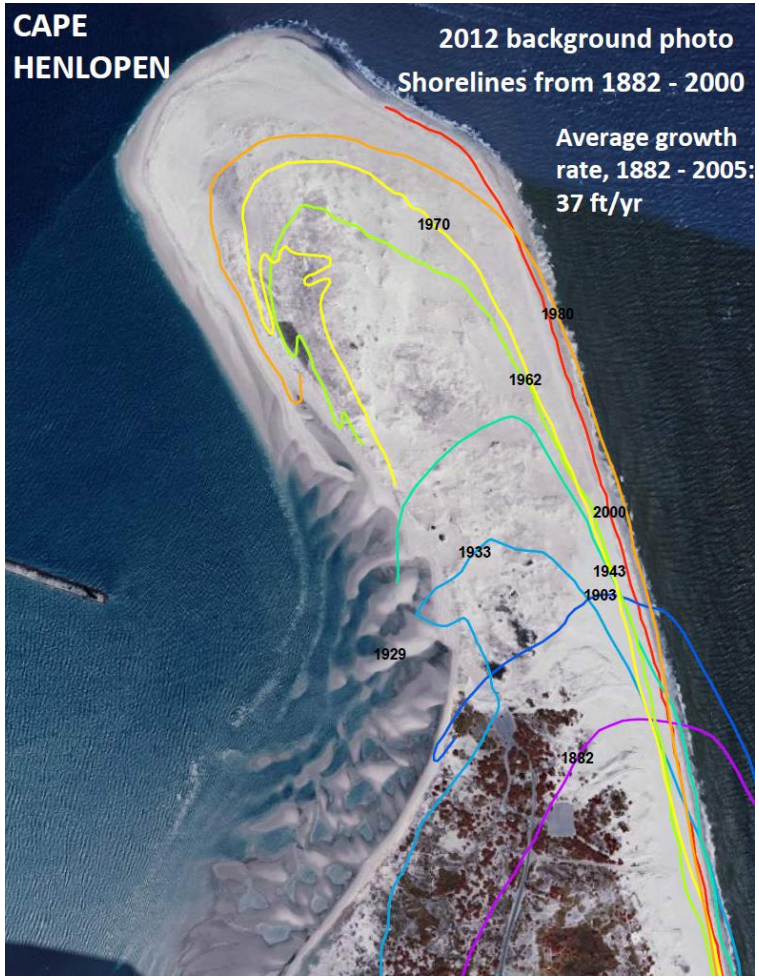
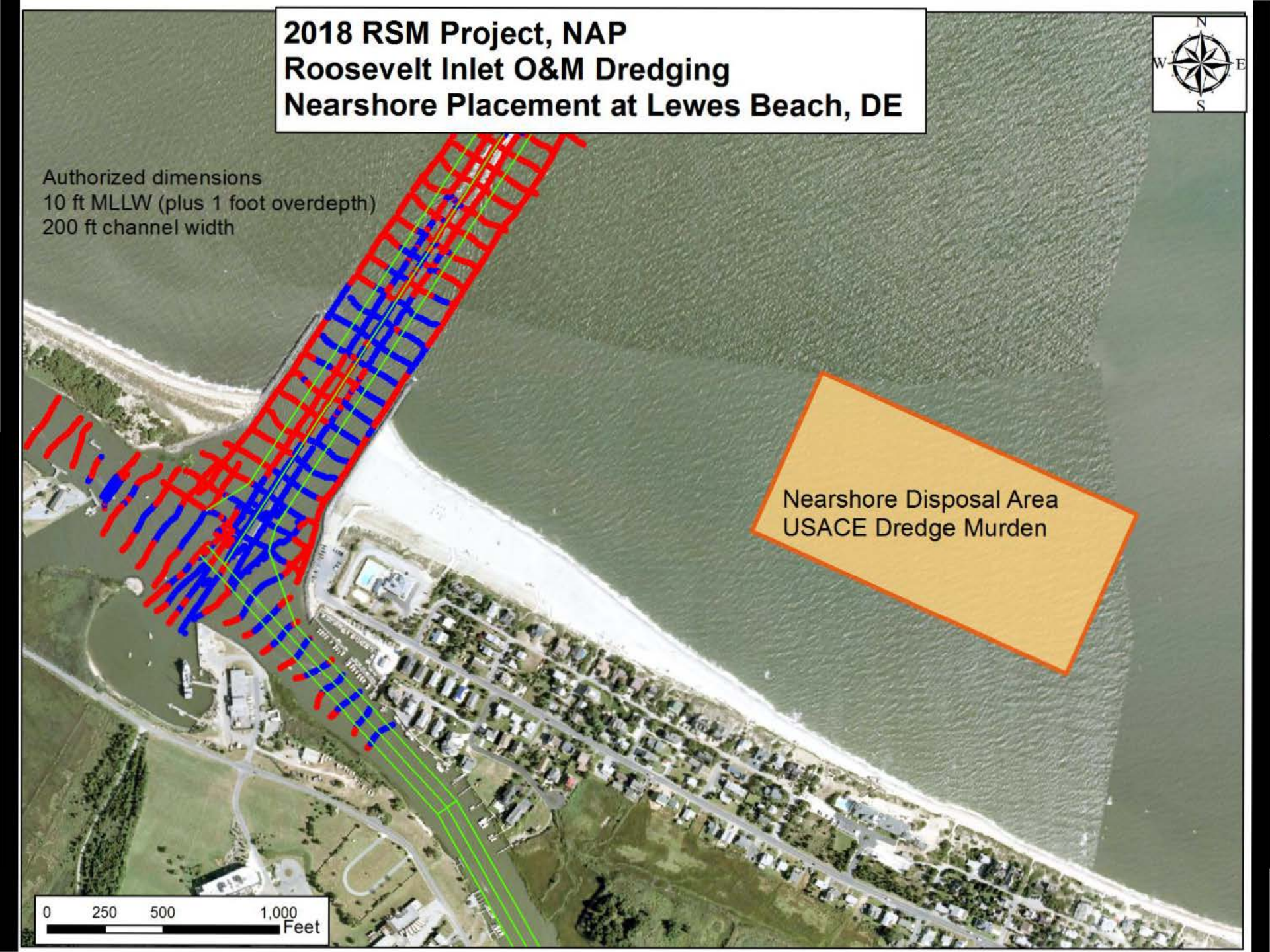
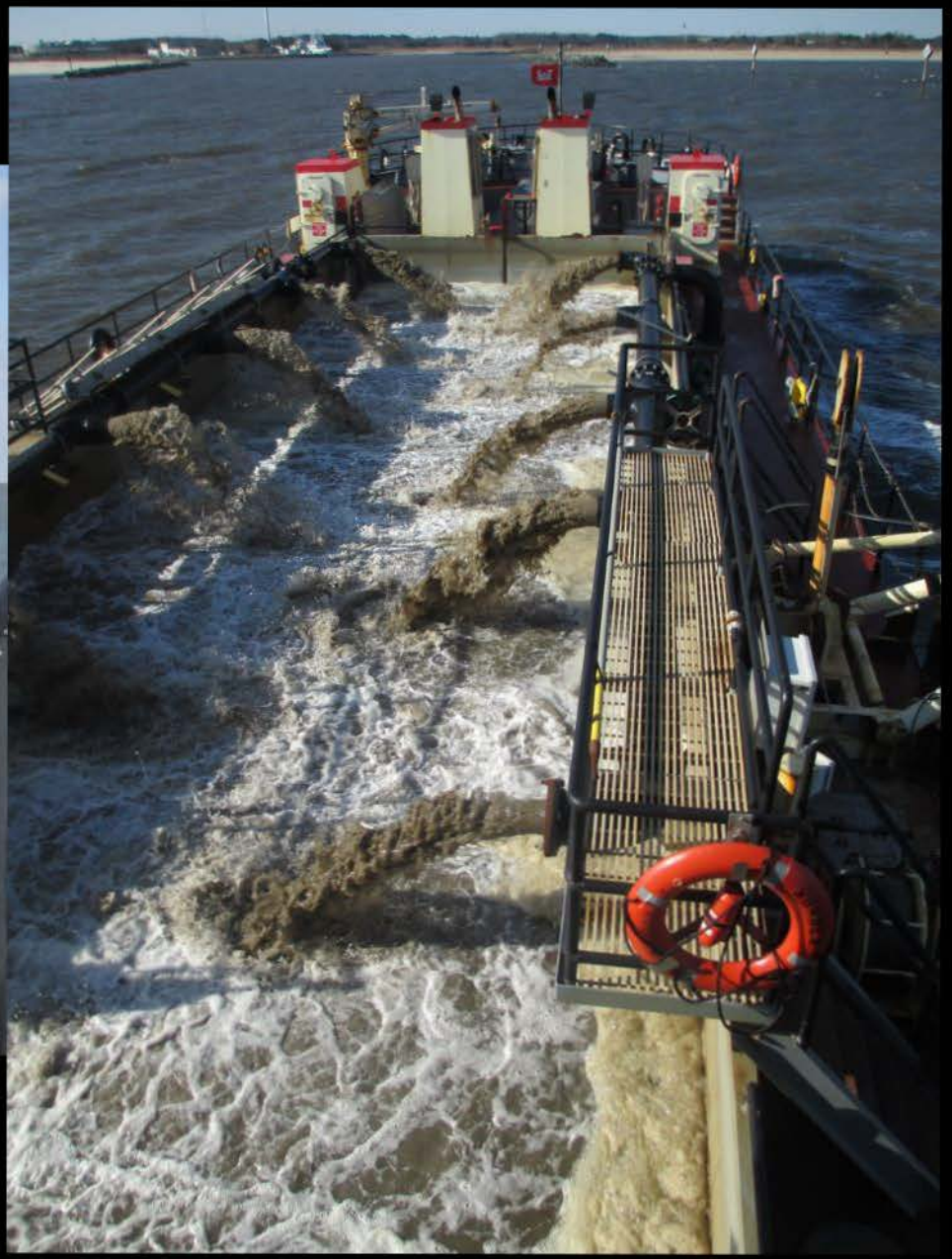
- Fed and Non-Fed CSRM projects
  - Invested $113M in DE since 2005
  - Placed 10.5 MCY
- Where is the 6 MCY that is not within authorized projects limits? Is this sand providing any uncounted benefits and can we quantify them?
- *Can two states and two USACE Districts manage adjoining CSRM projects more cost effectively together than separately?*
- Can sediment from the IRI navigation project be utilized to nourish nearby CSRM projects?
- Benefiting USACE and the Nation via use of tools, collaborative efforts and lessons learned from this systems approach

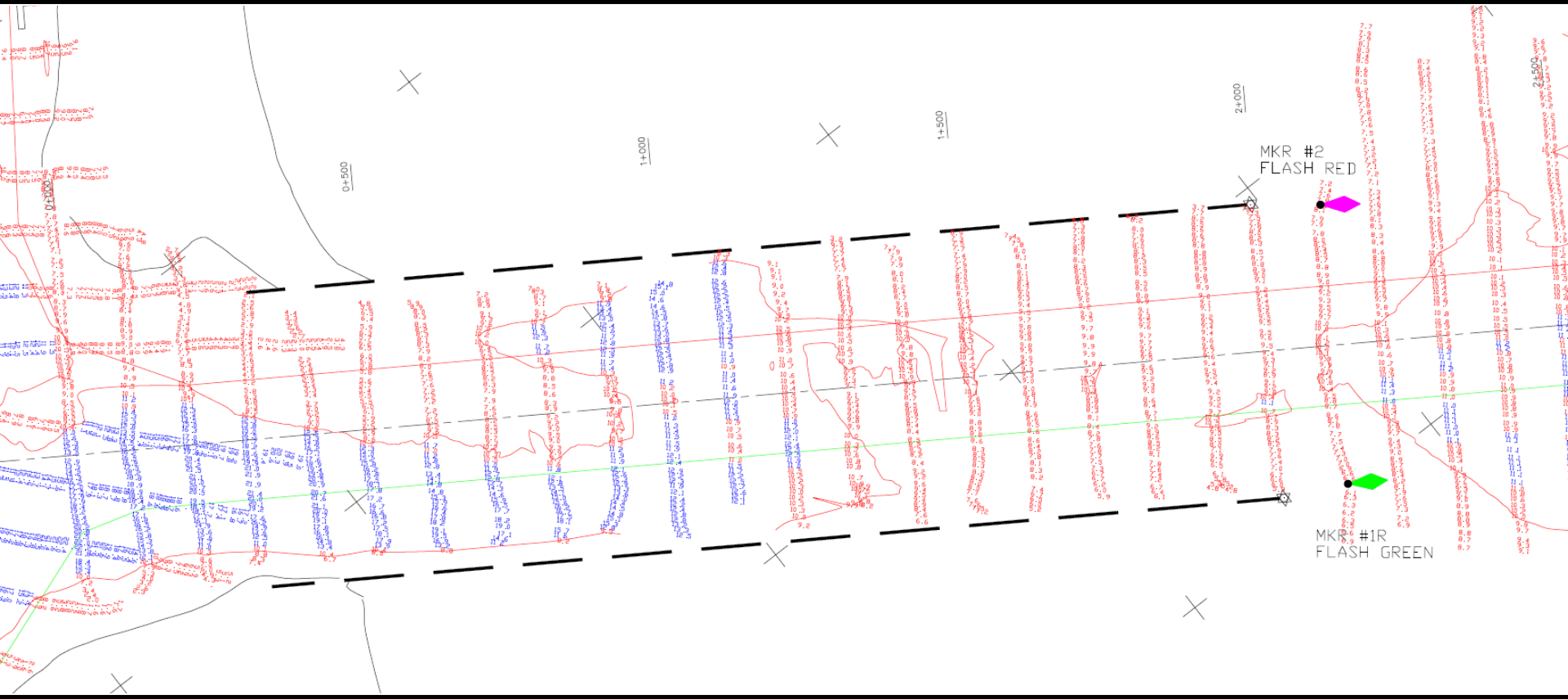



2018 RSM Project, NAP
Roosevelt Inlet O&M Dredging
Nearshore Placement at Lewes Beach, DE
N
W
E
S
Authorized dimensions
10 ft MLLW (plus 1 foot overdepth)
200 ft channel width
Nearshore Disposal Area
USACE Dredge Murden
0
250
500
1,000
Feet

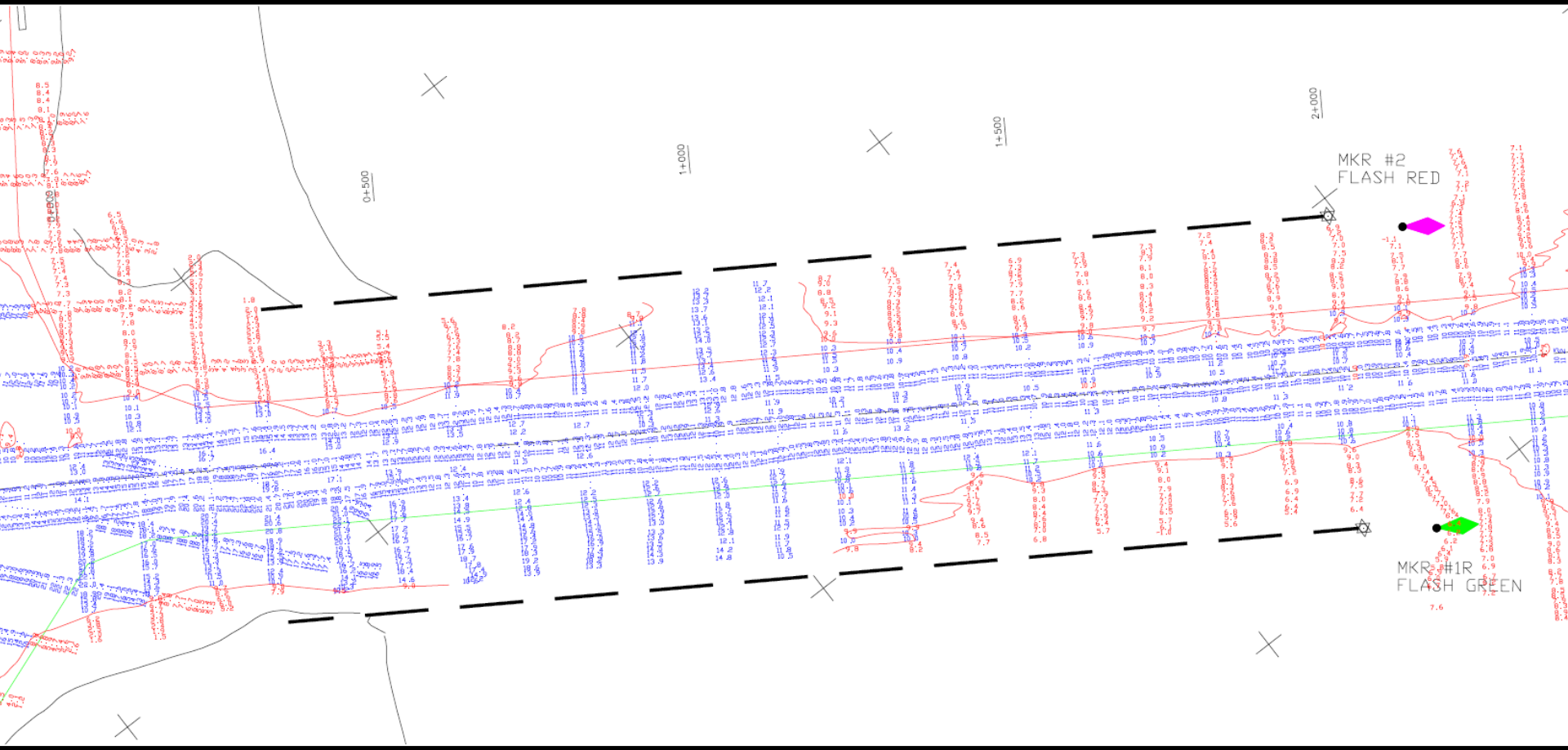

DANGER
NO TRESPASSING
U.S. GOVERNMENT PROPERTY
MURDEN



Roosevelt Inlet Before Dredging Survey, 28 February 2018



Roosevelt Inlet After Dredging Survey, 24 March 2018



Summary of 2018 Murden deployment to Roosevelt Inlet

On site 8 days
Dredged 7 days
89 loads
33,770 cy total dredged

Averaged 379 CY per load
Averaged 4,824 CY per dredging day

8 days X $28,000/day divided by 33,770 CY = $6.63/ CY

RSM in Action by working with stakeholders to improve cost efficiency and integrating projects!