NEARSHORE NOURISHMENT ADVANCEMENTS

INLET GEOMORPHOLOGY

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COASTAL INLETS RESEARCH PROGRAM

FY20 IN PROGRESS REVIEW

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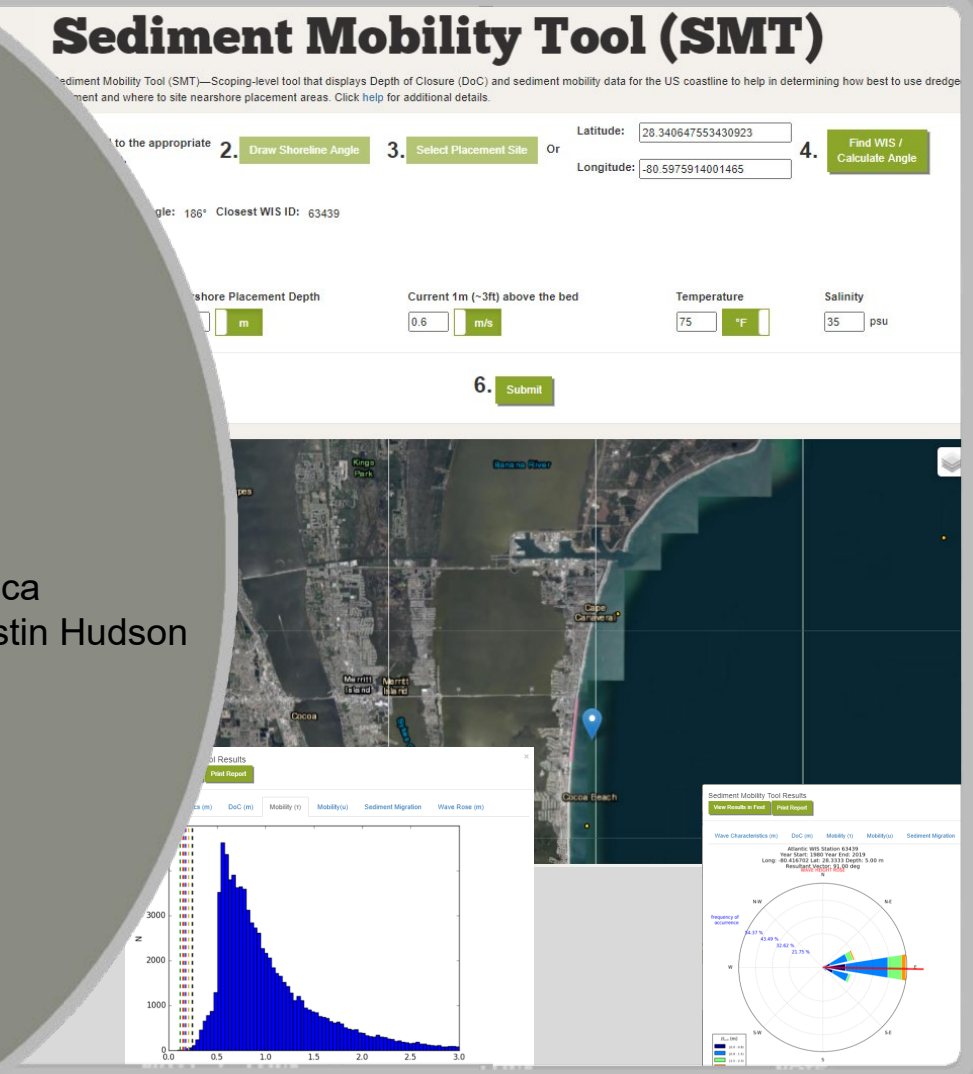
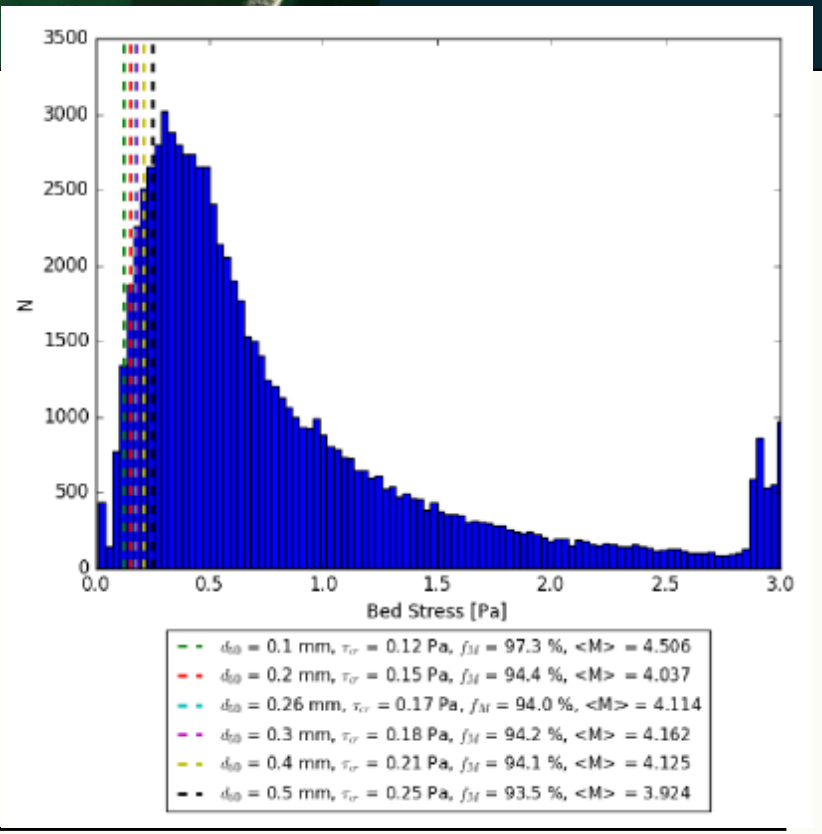


Problem Statement

- Nearshore nourishments are an important method to beneficially use dredged sediment in support of coastal resilience. Scoping level tools such as the Sediment Mobility Tool remain an important part of the planning process. As users continue to apply the SMT, potential areas for improvement have come up.

- As sediment is increasingly beneficially used in nearshore placements, the potential to learn from similar placements also increases. Nearshore placement adjacent to coastal structures is an important strategy which limited information has been compiled about.

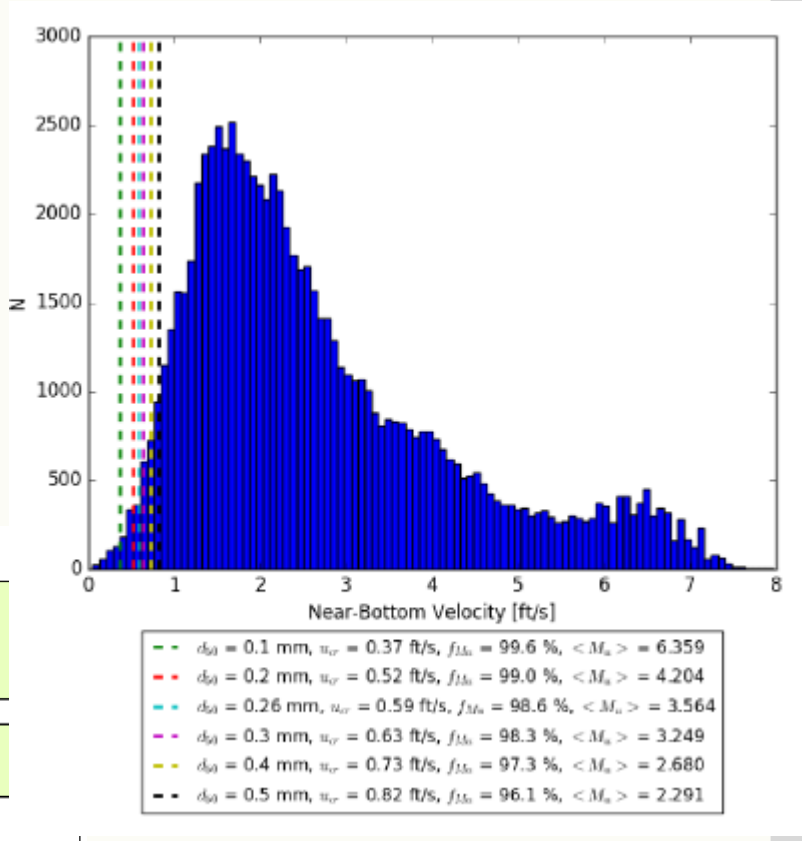


SONs

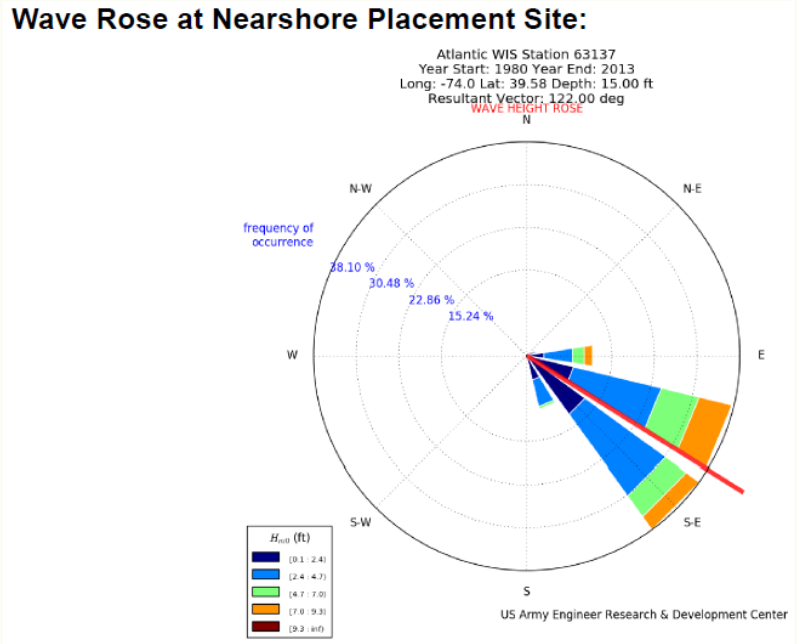
- 2016-N-04 Quantifying wave and current driven sediment transport at nearshore dredge disposal sites
- 2017-N-69 Cross-shore Sediment Sorting of Mixed-sediment Nearshore Placements
- 2017-N-70 Analysis of Shoreline Response to Nearshore Placement Geometry
- 2019-N-1386 Strategic Nearshore Placement of Dredged Material to Sustain Coastal Beach & Dune Resilience
- 2020-N-1564: Increasing Beach Nourishment Lifespan with Nearshore Nourishments
- 2020-N-1481: Improving scoping level estimates of the lifespans and deflation rates of nearshore nourishments

Capability and Strategic Impact Statement

- **Updates and improvements to the Sediment Mobility Tool help users better address key scoping level questions.**
- **Nearshore placements adjacent to coastal structures can optimize sediment impact on erosive areas and transport distance.**



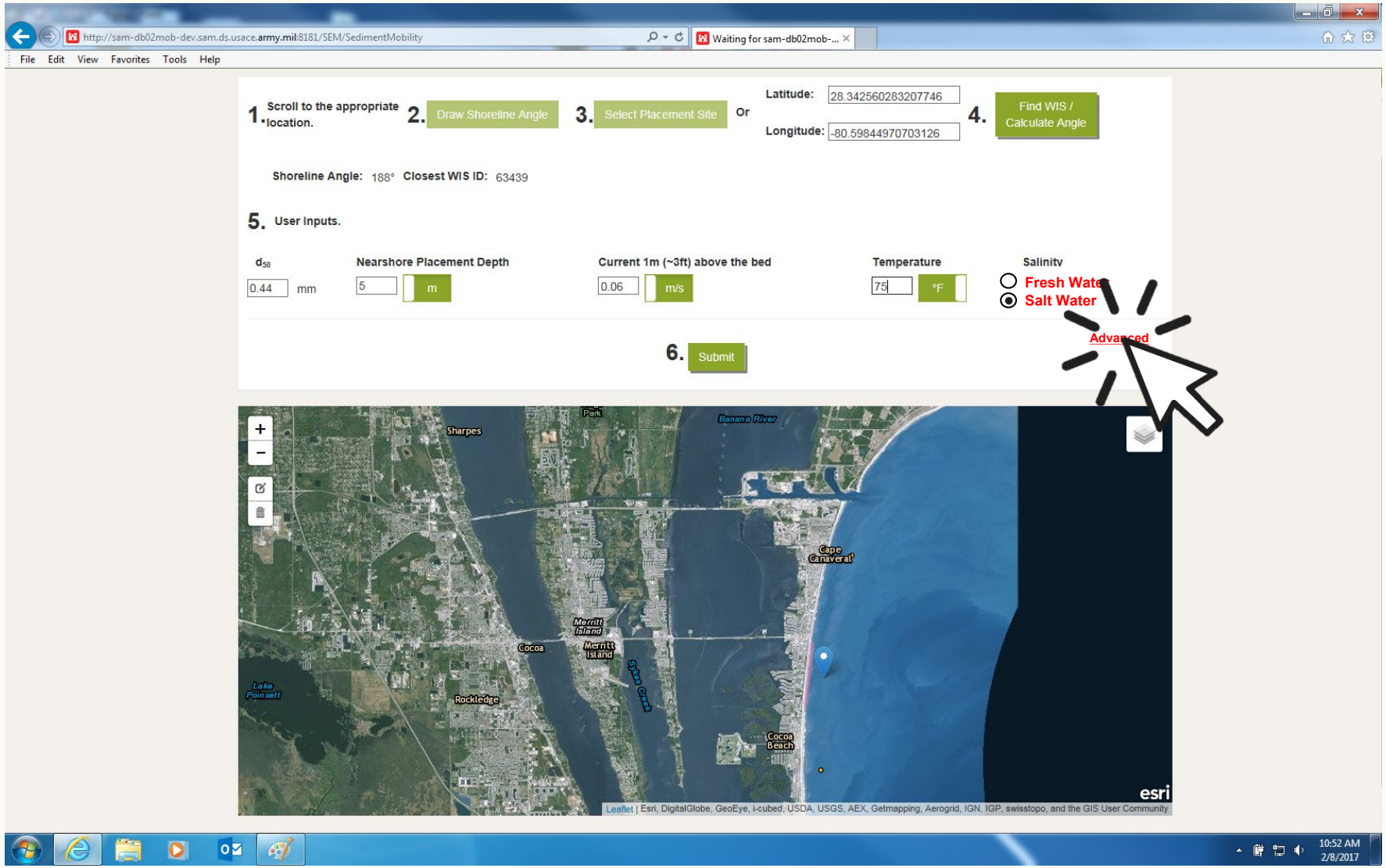
Wave Rose at Nearshore Placement Site:



Calculated Depth of Closure:

Depth of Closure (1980 - 2013) WIS Station 63137, 209° Shoreline Angle, Nearshore Placement Depth: 15.00 ft	
Hallermeier Inner (ft)	20.28
Hallermeier Inner Simplified (ft)	30.55
Hallermeier Outer (ft)	71.94
Birkemeier (ft)	15.51
Birkemeier Simplified (ft)	14.45

SMT ADVANCED DEMONSTRATION



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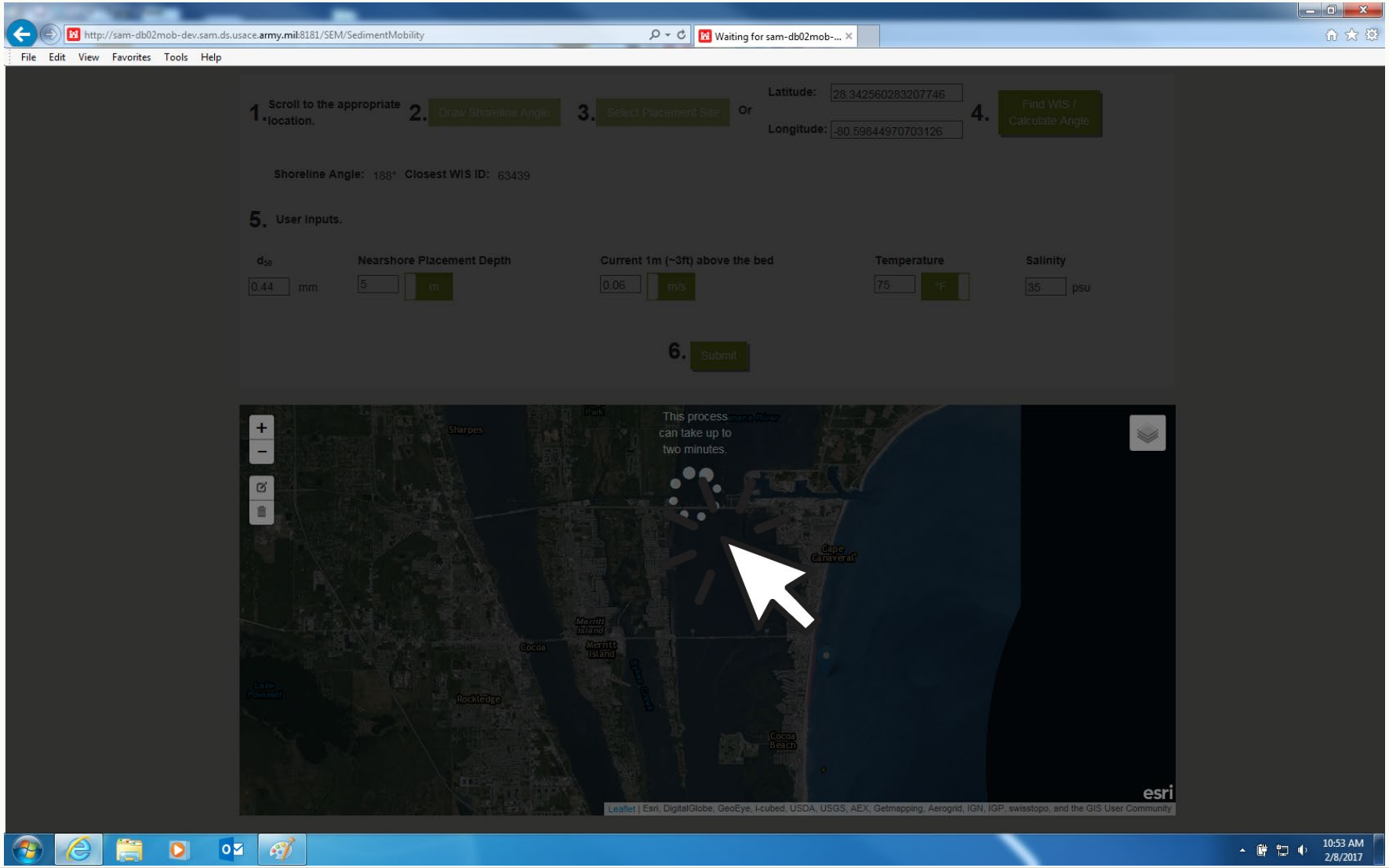

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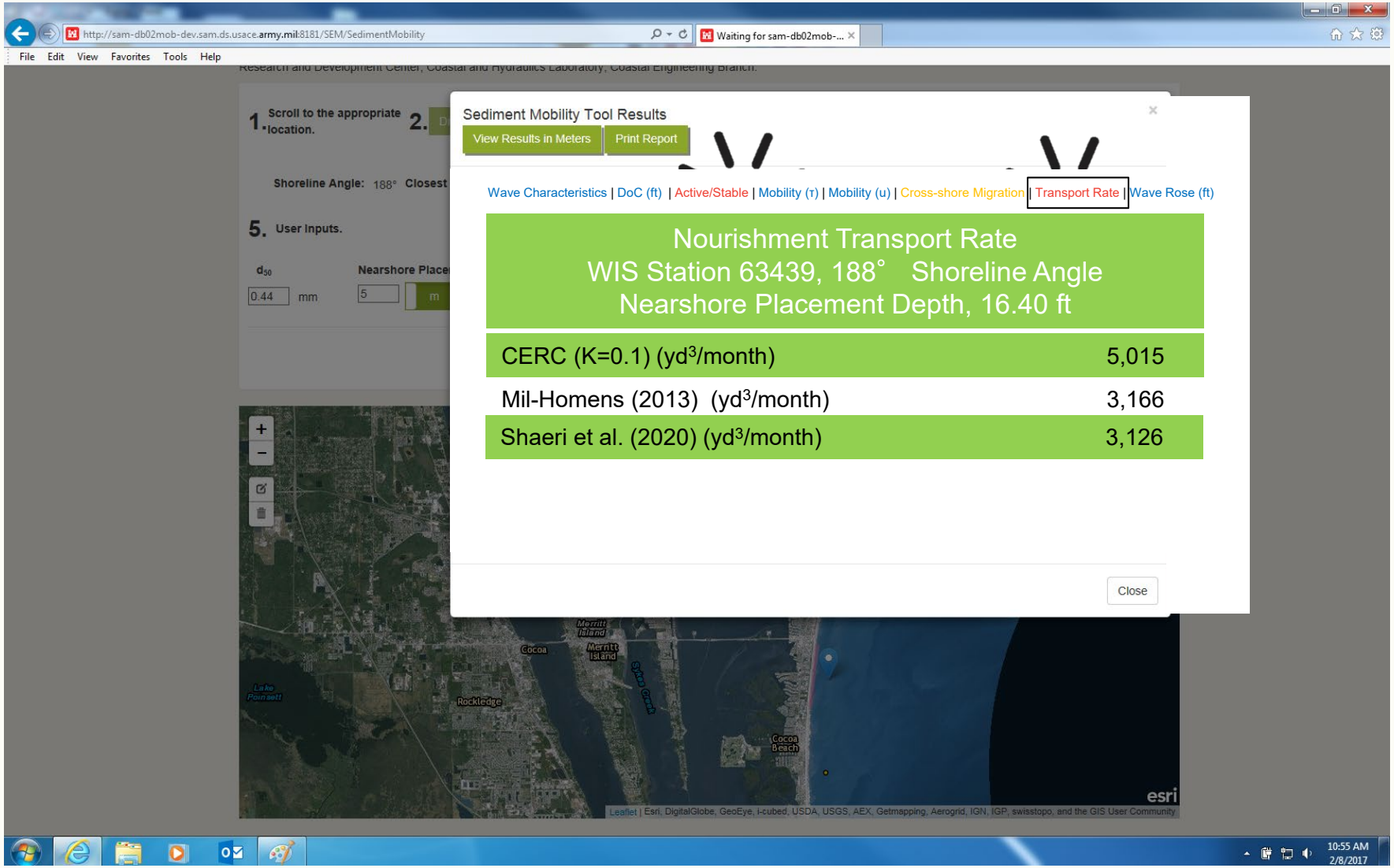

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Nearshore Placement Practices Teleconferences

District Teleconferences

- LRC, LRE, LRB, NAE, NAP, NAB, NAO, SAW, SAC, SAS, SAJ, SAM, MVN, SWG, SPL, SPN, NWP, NWS, POA, POH

Discussion Topics

- Nearshore nourishment construction techniques
- Regulations
- Placements outside the surf zone
- Monitoring
- Placements near coastal structures
- Performance metric ideas
- Research suggestions

https://cirpwiki.info/index.php?curid=2385

Nearshore Placements Near Coastal Structures

Placements immediately adjacent to coastal structures

- Several examples from NAO, NWP, and NWS of placements in erosive areas around coastal structures (e.g. jetty tip, jetty toe)
- An example from MVN about nearshore placements contributing to the connection between the jetty and beach
- NAP is moving away from placing sediment immediately adjacent to coastal structures over possible infilling concerns

Placements in the vicinity of coastal structures

- Several examples from LRC, LRE, NAB, NAO, NWP, and NWS of placements often within several thousand feet downdrift of jetties, generally to align with erosive areas
- NWP point about placing sediment to nourish the overall sediment system around coastal structures

Balance between sediment needs near coastal structures, optimizing transport distances, operational considerations, and potential channel infilling

Summary

FY20 Major Advances in Capability

- Permit users to select specific months for SMT estimates
- Updated Hands and Allison (1991) Chart comparison
- Apply alongshore transport equations to estimate nearshore berm deflation rate following Bain et al. (in prep)

FY20 Major Products & Collaborations

- SMT code update
- Collaboration with OPJ on bringing new features and updates to the SMT
- Teleconferences on nearshore placement practices with each of the 21 Coastal and Lake USACE Districts
- LR on nearshore placements near coastal structures

FY21 Products/Advances

- Continued work with OPJ to convert code updates to python and implement in the NAV Portal setting
- SMT Journal Paper
- Profile modeling of nearshore placements adjacent to beach nourishments and estimates of lifespan increases