

NEARSHORE NOURISHMENT – SUCCESS METRICS

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1.5

Bed Stress [Pa

0.5

 $= -d_{50} = 0.1 \text{ mm}, \tau_{cr} = 0.14 \text{ Pa}, f_{M} = 77.5 \%$ $= -d_{50} = 0.2 \text{ mm}, \tau_{cr} = 0.17 \text{ Pa}, f_{M} = 71.9 \%$ $= -d_{50} = 0.3 \text{ mm}, \tau_{cr} = 0.20 \text{ Pa}, f_{M} = 69.4 \%$ $= -d_{50} = 0.4 \text{ mm}, \tau_{cr} = 0.23 \text{ Pa}, f_{M} = 66.1 \%$ $= -d_{50} = 0.5 \text{ mm}, \tau_{cr} = 0.26 \text{ Pa}, f_{M} = 66.2 \%$

2.5

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Background RB LRC NAE All 21 USACE Coastal & Lakes Districts were called LRE to discuss nearshore nourishment projects: NAN **Construction Techniques Regulations** NAO SPN **Placements Outside Surfzone** SAW **Monitoring** NWF **Placements Near Coastal Structures** SAM **Metrics of Success** NWS SAS SAJ Engineer Research and Development Center • US Army Corps of Engineers •

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NAP

NAB

SAC

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Goals

- Provide practical metrics of success
- Clearly defined goals and performance metrics will
 - Set clear expectations
 - Lead to long-term project support



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Introduction

Federal Standard:

"the least costly dredged material disposal or placement alternative identified by USACE that is consistent with <i>sound engineering practices and meets all federal environmental requirements, *including those established under the Clean Water Act (CWA) and the Marine Protection, Research, and Sanctuaries Act (MPRSA) (33 CFR 335.7, 53 FR 14902)"*

- Success Metrics are Not Universal
- Metrics are Critical for Cost-Sharing Partners
- Success Metrics Can Provide a Useful Track Record & Keep Talking Points Consistent



Categories for Success Metrics

Project Design

Construction

Post-Construction

> Adaptive Management

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Project Design Metrics

- Littoral zone
- Hydrodynamic conditions
- Expected sediment transport direction
- Sediment Budget
- Sediment characteristics of dredged material and the placement area

- Metrics required for 401 Clean Water Certificate
- Is nearshore placement the least cost alternative?
- Is there a long-term strategy for adaptive management?



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Project Design

To Be Included in SMT: (*Example at South Padre Island*)



Legend:



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% Difference from Outer DOC Limit

Construction Metrics

- Was the sediment placed in the planned location?
- How thick was the placement and what was the shape?
- Were waves seen breaking over the placed sediment during construction?



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Post-Construction Metrics

- No harm
- Placed sediment moved (or did not move)
- Shoreline or profile changed
- Life safety of contractors & public recreation

Minimal Effort Techniques

- Google Earth or aerial imagery to show shoreline response
- Annual topographic and bathymetric surveys
- Strong oyster/crab/lobster/fishing harvest subsequent year

Larger Effort Techniques

- Shoreline tracking
- Bathymetric inversion monitoring
- Sediment tracer or geo-tracer monitoring



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Shoreline Change



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Nov. 2010

10

Dec. 2009

Shoreline Tracking



Shoreline change 1969 to 2014 near the Port of Indiana (Arnold et al., 2018)

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Adaptive Management

- Did the sediment move at the expected rate?
- Did the nearshore nourishment positively impact the shoreline?

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• Were there any complaints about the project?



Summary

"Clear goals, consistent communication, and managing project expectations will position projects for success."

Thank You!

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