



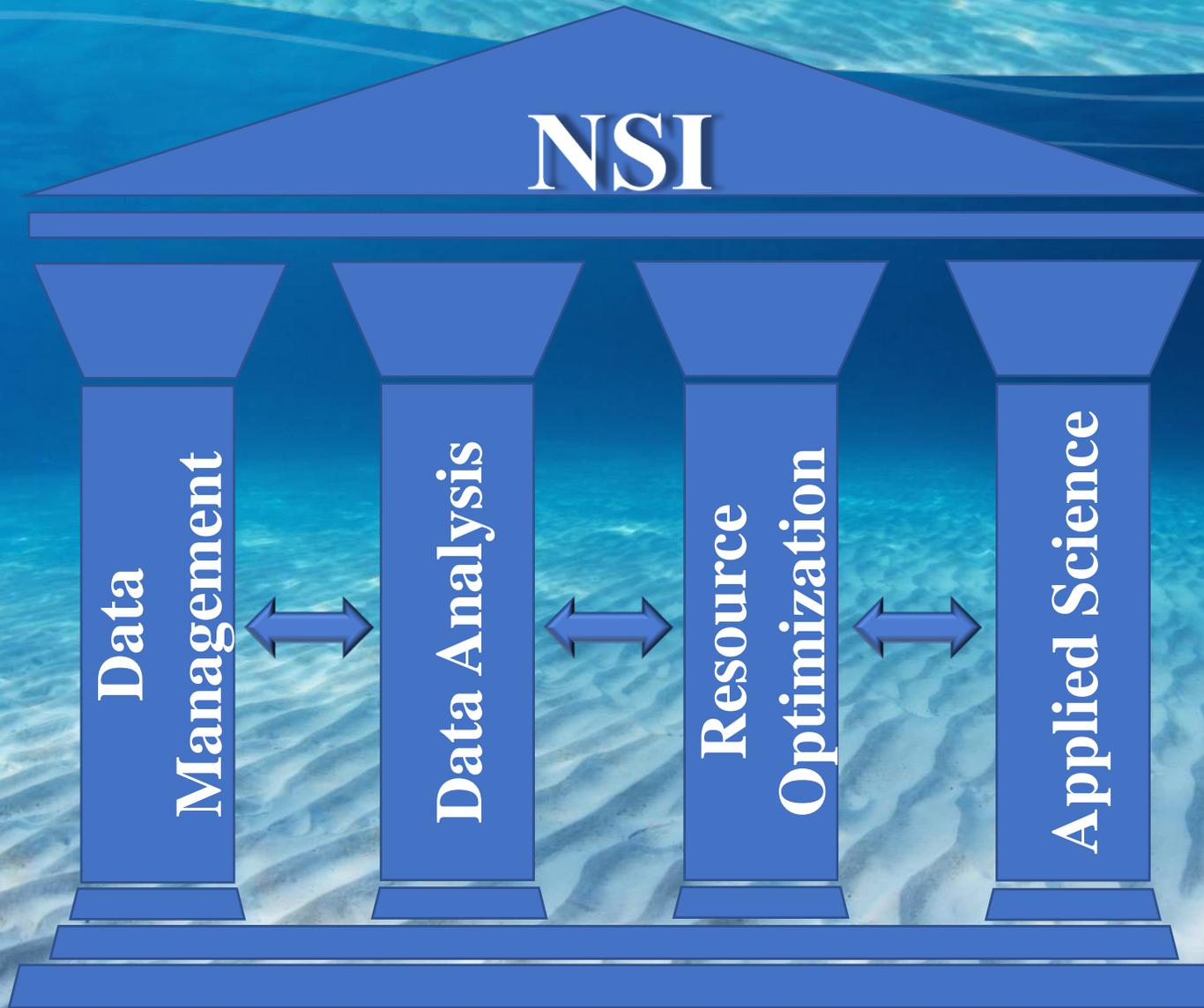
Restoring and Protecting Our Nation's Coasts through Stewardship of OCS Sediment

NCBIWA 2019 Annual Spring Local Governments Meeting
30 April 2019

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So....What Does That Mean for You?



Need to Know What We have to Manage the Resource Successfully

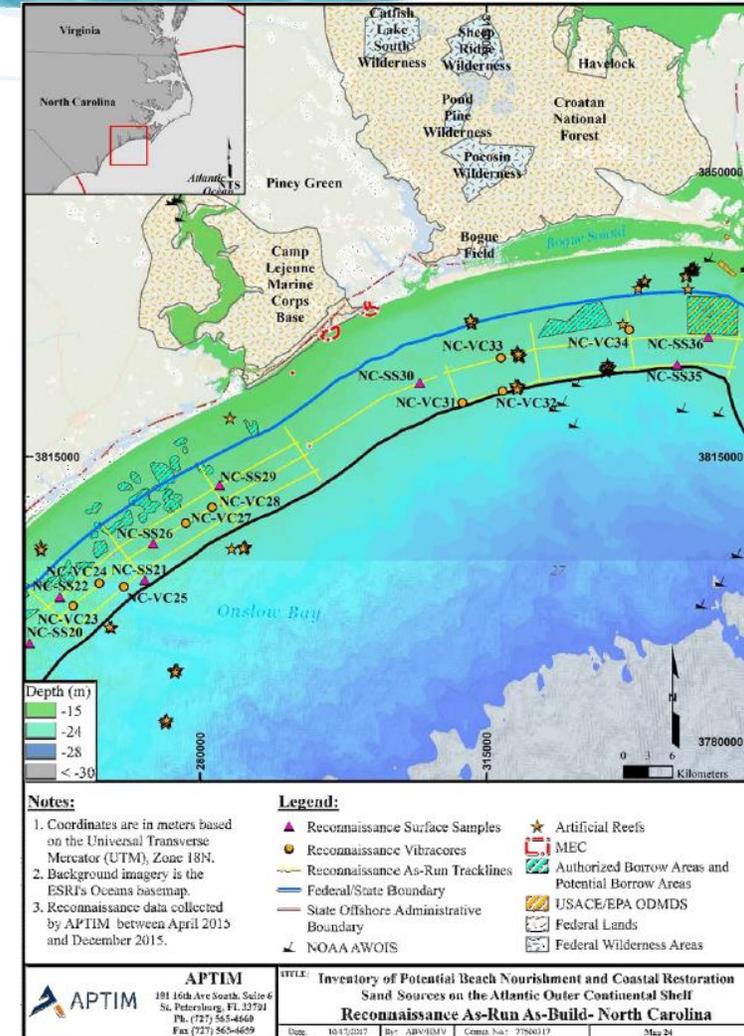
National Sand Inventory (NSI)

- **BOEM Priority:**

- State Cooperative Agreements (n=17)
- Partnerships (e.g., USACE)
- Historic data
- New data acquisition (e.g., SAND)

- **Supports Stewardship Role:**

- Facilitate proactive planning
- Identify gaps/priorities/constraints
- Borrow area alternatives / optimization
- Tradeoff analyses

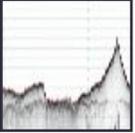
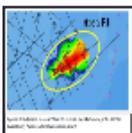
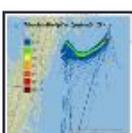


Data Management - MMIS

Bathymetry & Backscatter

Data Development

Collaboration with our Partners

	Analyzed Geotechnical / Geophysical Source Data
Digital data from physical core samples	
	Digital derived data from external drives, CD's, paper sources
Cooperative Agreements	
	Leasing data
Dredge data	
	Research / Environmental Studies Data

Enterprise Relational Database

MMIS

Environmental Data

Bottom Characteristics

Leasing / Planning/Construction



- Lease Areas
- Dredge Areas
- Beach Placement Areas
- Outer Continental Shelf Study Area
- Beach Study Areas
- Avoidance Areas
- Sand Resources

Discover

Analysis

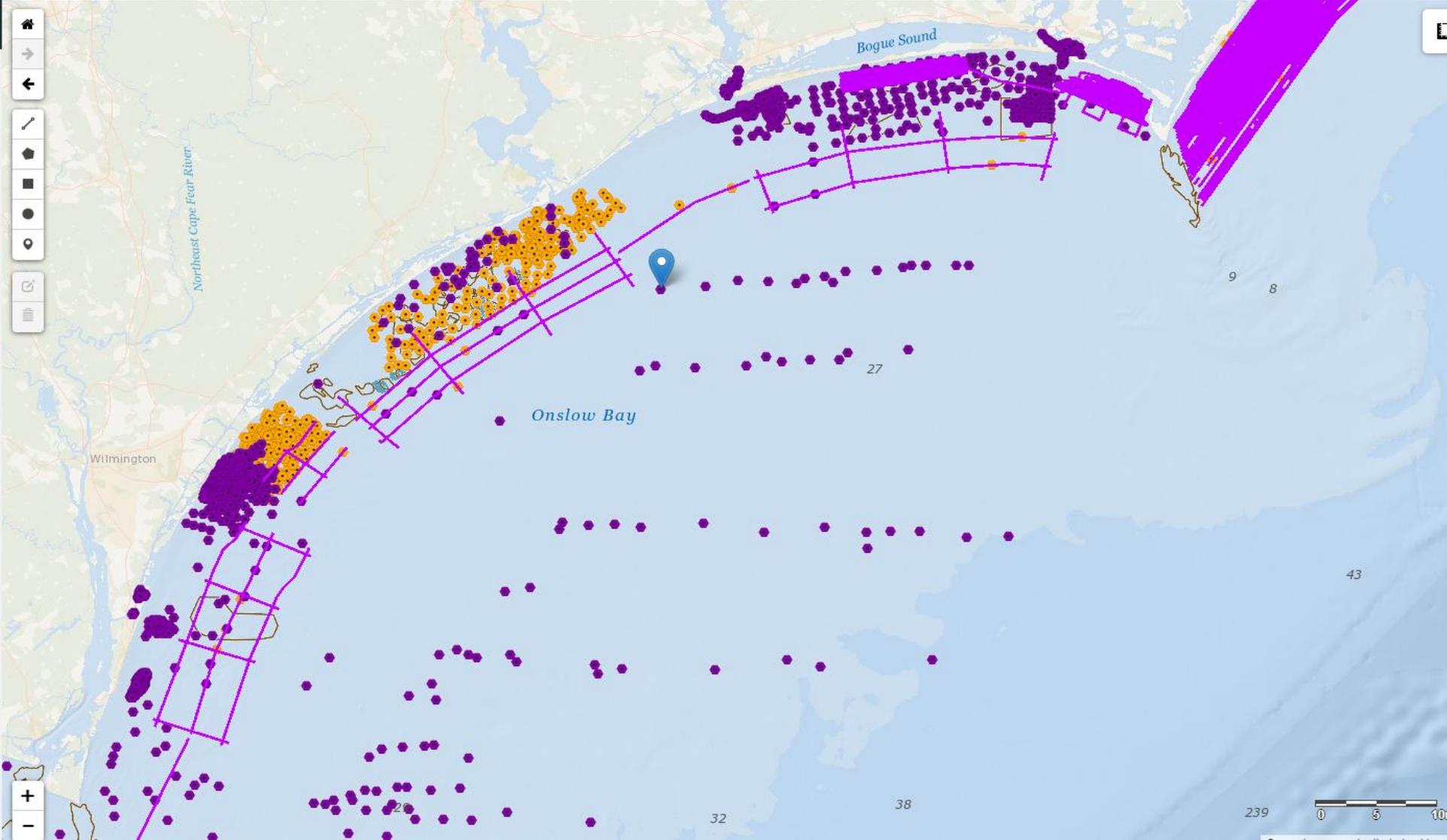
Id Gaps

MMIS Public Data Viewer

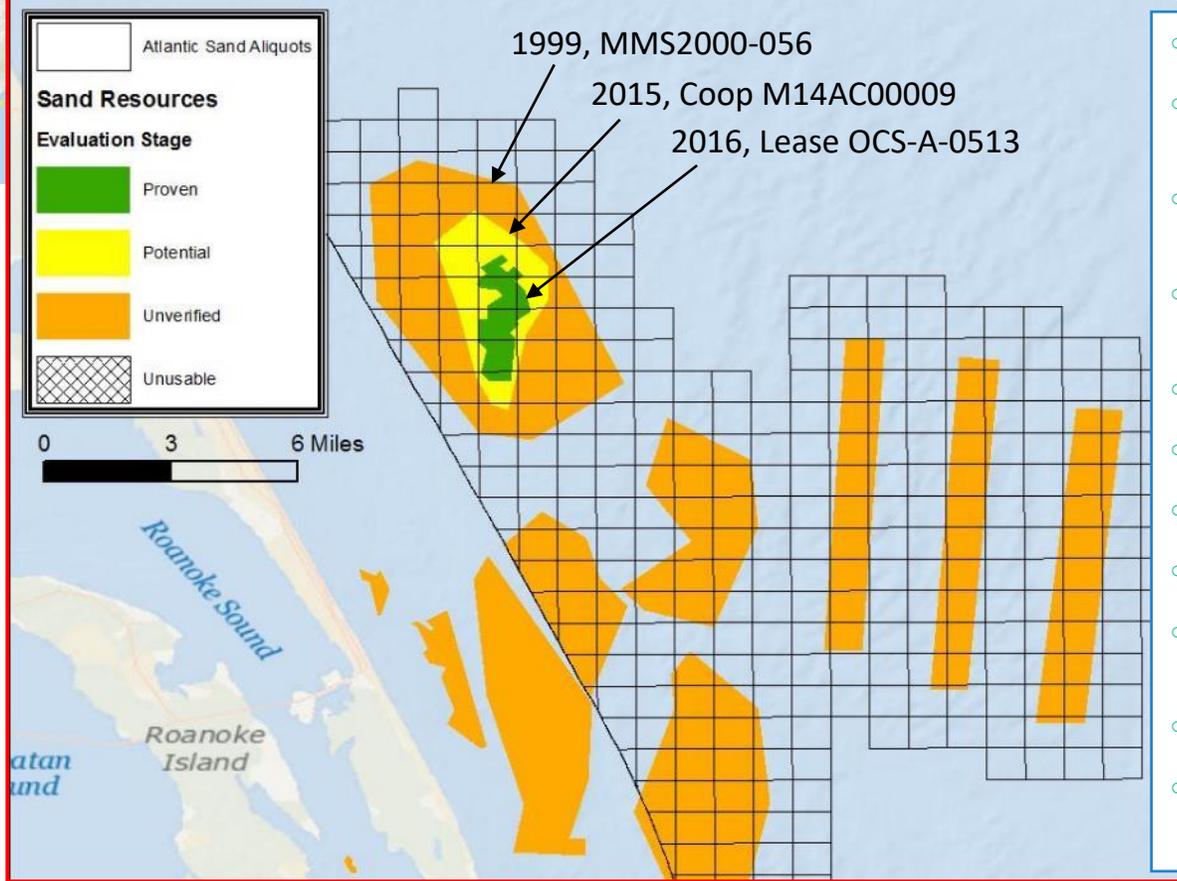
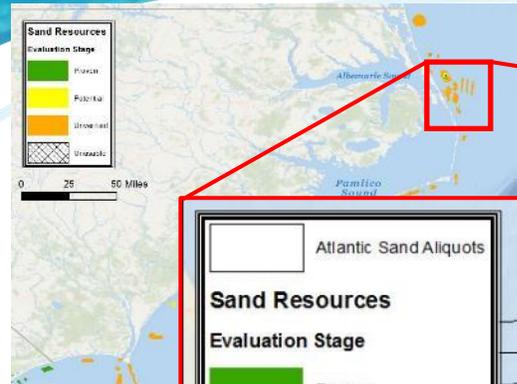
<https://mmis.doi.gov/boemmmis/>

Layers Identify Download

- Administrative & Planning
 - Marine Minerals Offshore Study Areas
 - Marine Minerals Lease Areas
 - Dredge Areas
 - Beach Placement Areas
 - Marine Minerals Beach Study Areas
 - Sand Resources
 - Atlantic OCS Aliquots with Sand Resources
 - Gulf of Mexico OCS Blocks with Significant Sediment Resources
- Samples
 - Core Samples
 - Grab Samples
 - Sediment Profile Image Samples
 - Camera Stations
 - Water Samples
- Geological
 - Surficial Sediment
 - Isopachs (ft)
 - % Carbonate Contours
 - Paleochannel Polygons
 - Paleochannel Lines
- Geophysical
 - Survey Tracklines



Data Analysis – Sand Resource Evaluation

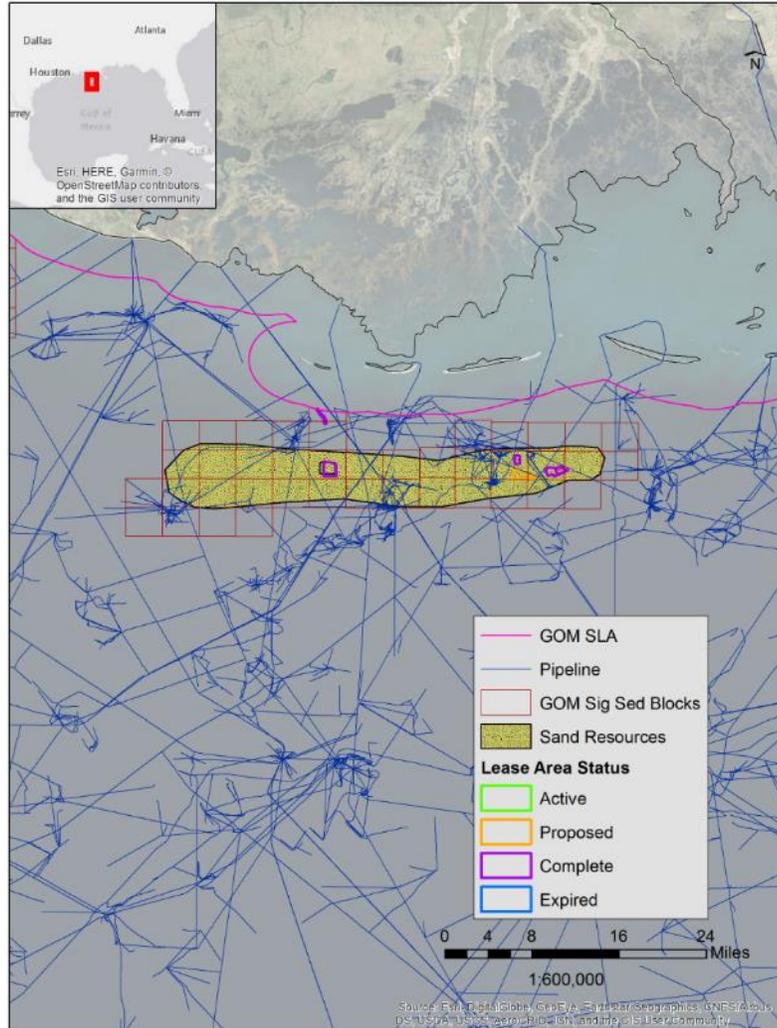


- State
- Year (of delineation)
- Mean grain size (phi)
- % sand, gravel, and fines
- % carbonate
- Resource Area ID
- Study ID
- Evaluation stage
- Sand body thickness
- Area
- Volume

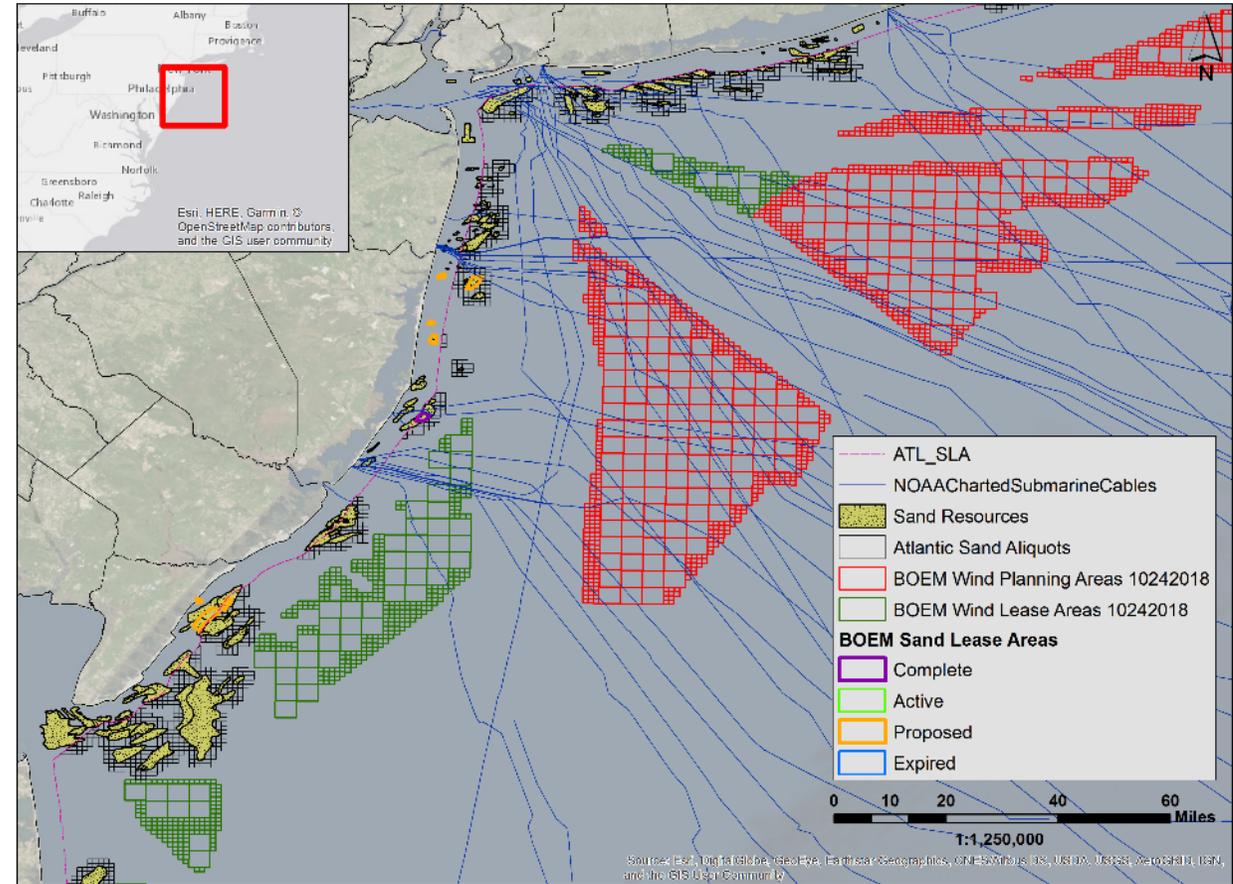
Evaluation Stage	Description
Proven	Resource areas whose thickness and lateral extent have been fully determined through design-level geotechnical and seismic coverage. Generally reserved for (but not limited to) areas that have already been authorized as part of a lease.
Potential	Resource areas whose existence has been verified through sufficient geotechnical and geophysical data. Thickness and/or lateral extent has not been fully determined. All areas have some combination of geotechnical and geophysical datasets (vibracore, bathymetry, sidescan, and seismic).
Unverified	Resource areas hypothesized to exist on the basis of indirect evidence (seismic profiles, bathymetry, or sidescan sonar). Inferred sediment types, unit thicknesses and lateral extents have not been confirmed through direct sampling methods.
Unusable	Resource areas that as a result of additional surveys, prior dredging activity, or infrastructure development are not (or no longer) suitable for future dredging; this designation should not be considered terminal and is subject to change.

Data Analysis - Managing Multiple Uses of the OCS

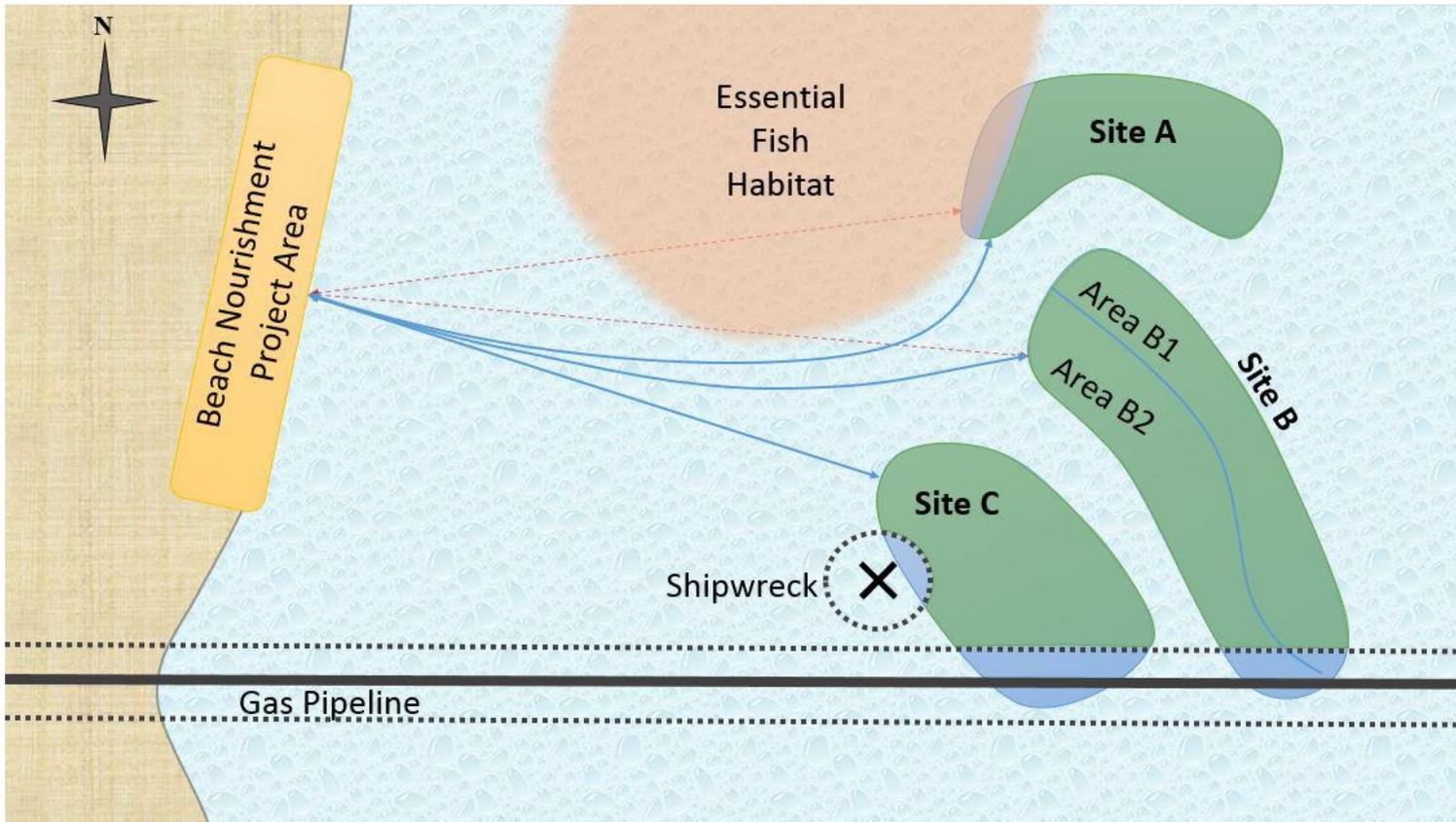
Oil & Gas Infrastructure - Gulf of Mexico



Submarine Cables – North Atlantic



Resource Optimization



- **Borrow Design Parameters:**

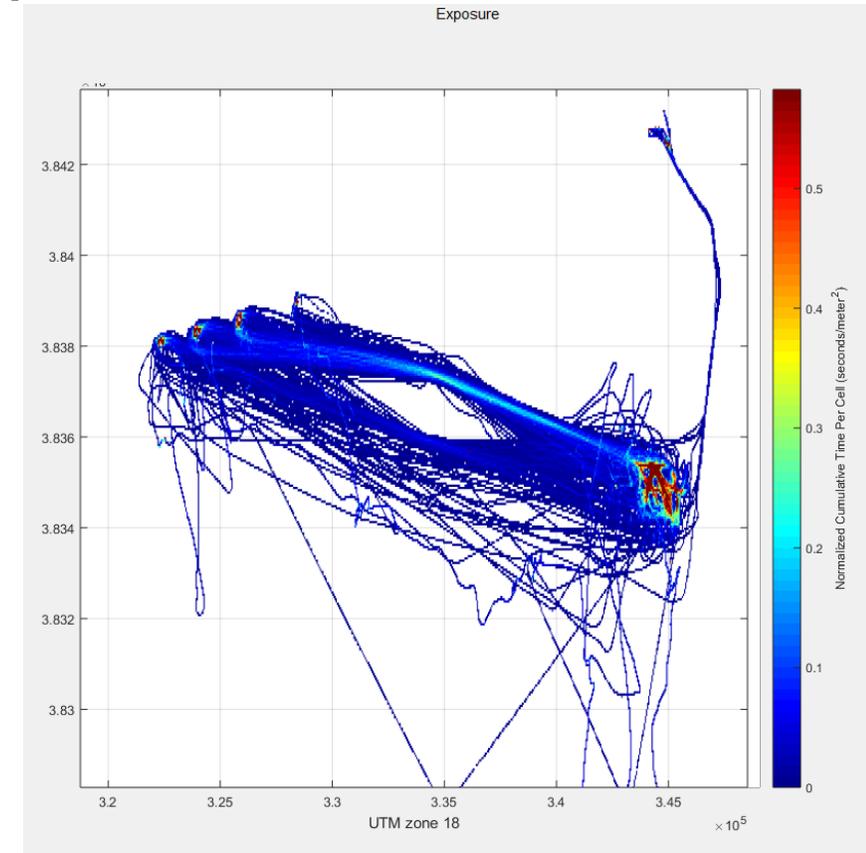
- Is distance the limiting factor?
- Are long term cost implications considered?

- **Borrow Optimization:**

- Dredging productivity
- Borrow footprint and design
- Use Conflict Management (e.g. Frying Pan Shoals)

Applied Science

- Analyzing Sea Turtle Entrainment Risk (ASTER)
- Separation of Fines during Hopper Dredging (i.e., Sediment Sorting)
- Dredging Intensity and Exposure Calculation Algorithm (IECA)





ASTER

Analyzing Sea Turtle Entrainment Risk

Decision Support Tool

Analyzing Sea Turtle Entrainment Risk New Report

Map Layers

- Number of Trawl Encounters
- Number of Turtle Records
- Loggerhead Atlantic Distribution Density
- Loggerhead GoM Distribution Density
- USGS East Coast Sediment Texture Database
- Seagrasses
 - Patchy
 - Continuous
- Loggerhead Critical Habitat
 - Breeding
 - Constricted Migratory
 - Nearshore Reproductive
 - Sargassum
 - Winter
- Hard Bottom
- Marine Minerals Lease Areas

Organize Data By: Seasons Redraw AOI

Marine Mineral: 1,001 Areas 2

Low: 0 - 1,001 Med: 1,001 - 2 High: 2 - 2

Marine Minerals Resource Areas Low

Number of Trawl Encounters 0

Low: 0 - 20 Med: 0 - 20 High: 0 - 20

Number of Dredge Entrainments 0

Low: 0 - 20 Med: 0 - 20 High: 0 - 20

Number of Turtle Records: 16 16

Low: 1 - 16 Med: 16 - 16 High: 16 - 16

Loggerhead Critical Habitat Presence

Loggerhead Distribution Density: 0.018 0.018

Low: 0.017 - 0.018 Med: 0.018 - 0.018 High: 0.017 - 0.018

USGS East Coast Sediment Texture Database Risk if Sand is Present

Seagrasses Low

NAMERA Benthic Habitat Risk if Hard Bottom is Present

NOAA Benthic Habitat Risk if Hard Bottom is Present

US Navy Bottom Type Risk if Hard Bottom is Present

SEAMAP South Atlantic Bottom Type Risk if Hard Bottom is Present

Bathymetry (meters) Risk if Hard Bottom is Present

MMIS Standup
23 10:30am - 11am
calendar.google.com

- Standardize geographic and temporal decision support tool
- Analyzes up to 21 biological and environmental parameters to inform entrainment risk
- **Publication:** <https://marinecadastre.gov/espis/#/search/study/100095>

BOEM Bureau of Ocean Energy Management

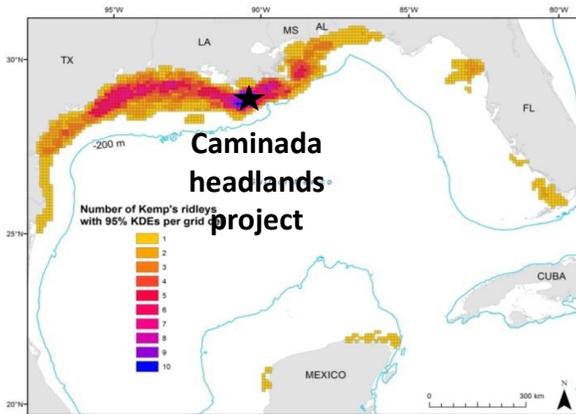


ASTER

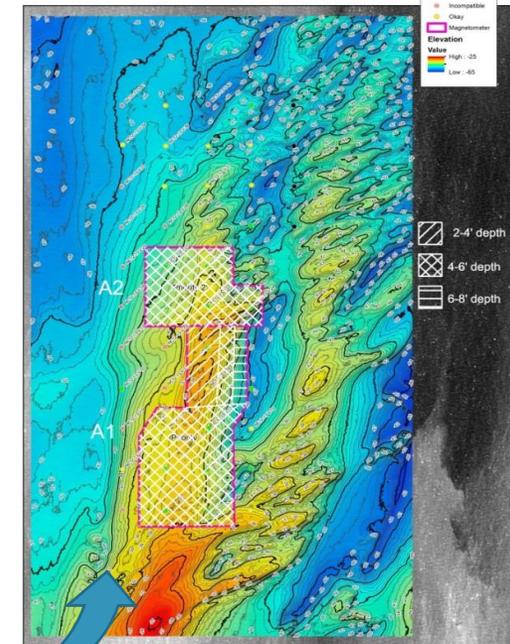
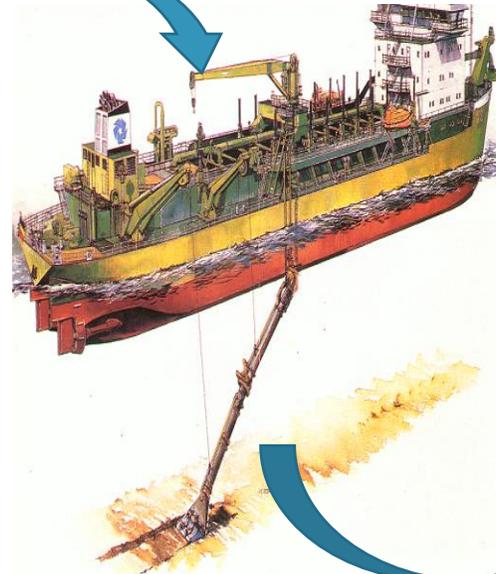
Analyzing Sea Turtle Entrainment Risk

Objectives

- Identify risk factors and authoritative data sources for tool development
 - Temporal and spatial relationship of sea turtle behavior
 - Borrow area design relative to efficacy of existing mitigation



Source: Hart et. al. 2018



Source: USACE Wilmington District

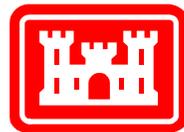


ASTER

Analyzing Sea Turtle Entrainment Risk

Collaboration

- **Dredging Industry**
 - Variables affecting dredging efficiency
- **Sea Turtle Scientists**
 - Variables affecting sea turtle distribution/behavior

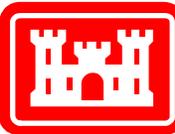


Separation of Fines During Hopper Dredging



- **Publication:** https://epis.boem.gov/final%20reports/BOEM_2010-010.pdf and https://epis.boem.gov/technical%20summaries/BOEM_2010-010.pdf;

BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT



Separation of Fines During Hopper Dredging

○ Why Initiate Study:

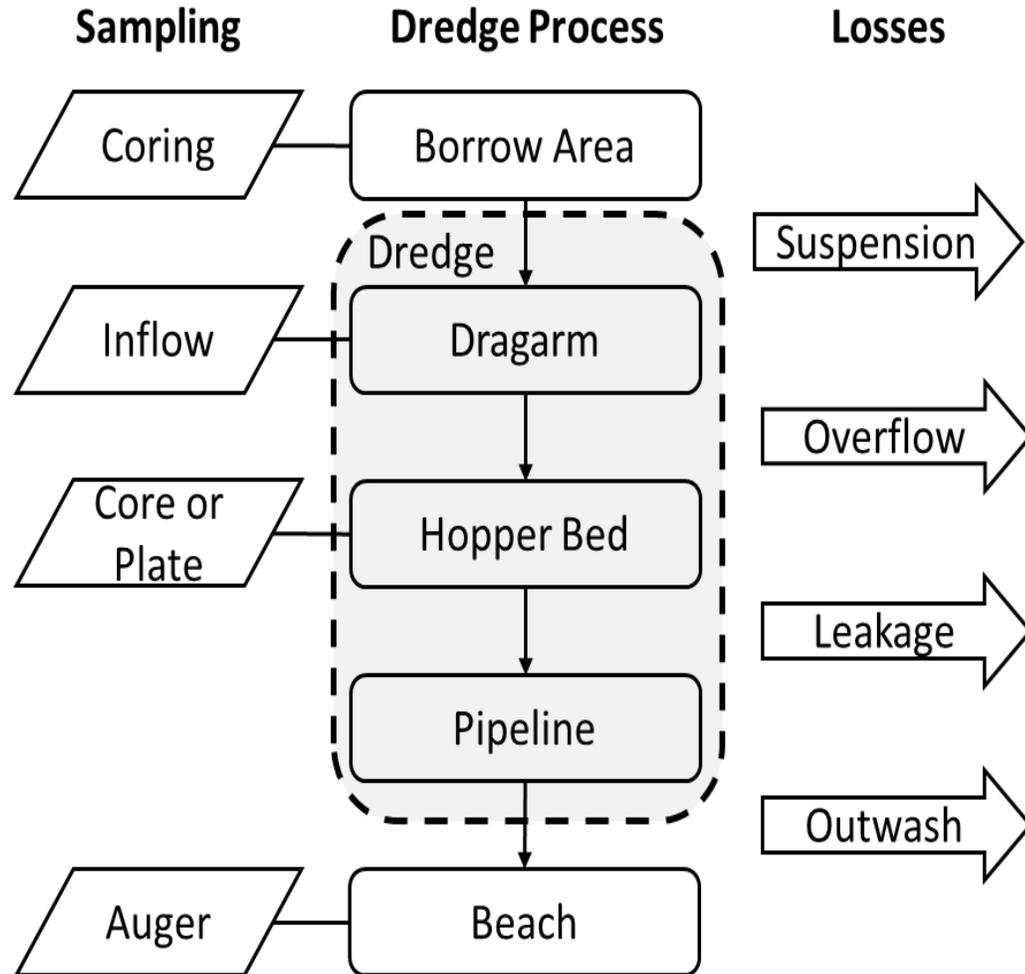
- Beach quality sand is a limited resource with increasing demand
- Opportunity to identify additional quality sand and inform environmental risk tradeoffs
- Building from prior efforts

○ Study Implications:

- Potentially revisit in situ borrow fine content regulations
- Increase availability of offshore sand

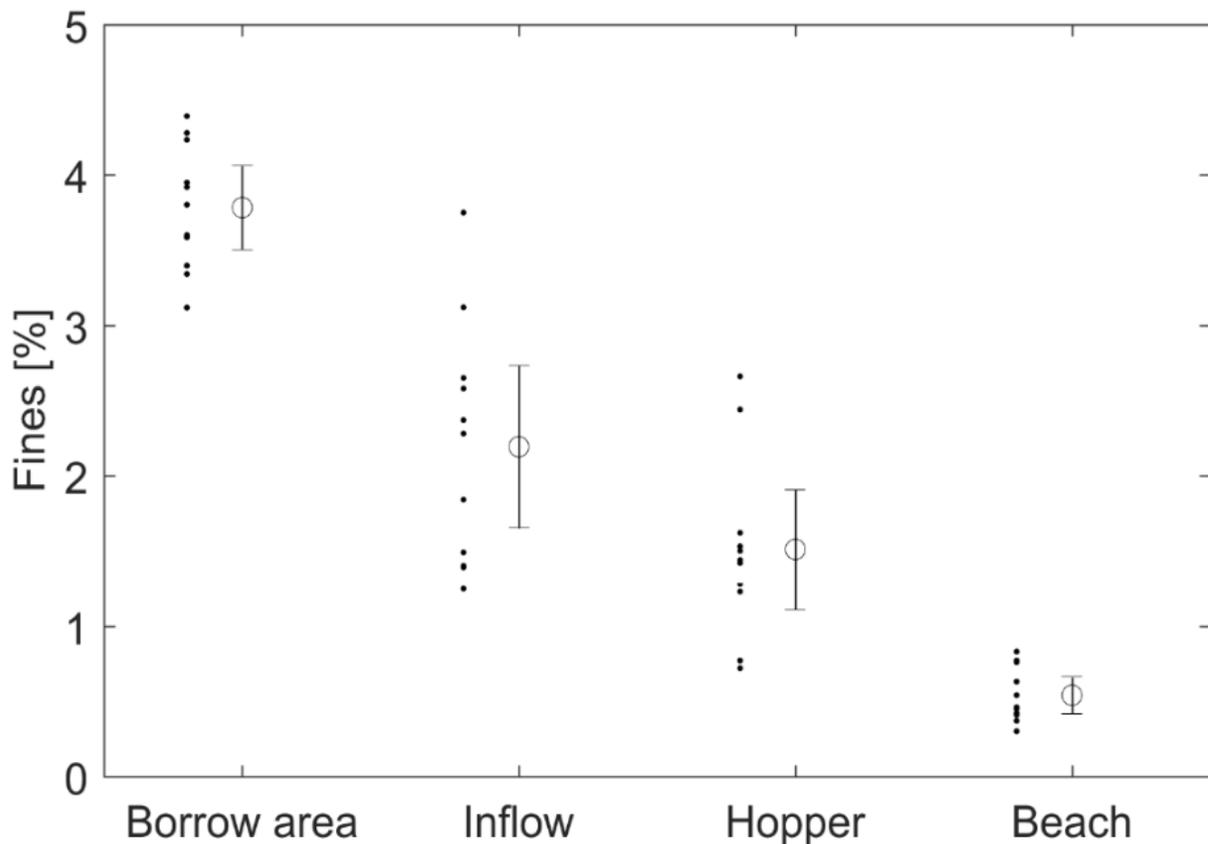


FOCUS: Changes in Sediment Characteristics at Loss Points



- **Borrow Sampling:**
 - 20' cores spaced 150-600
 - Average fines: 4.4%
- **Dredge Sampling:**
 - Inflow Box
 - Hopper Load
- **Beach Sampling:**
 - Hand auger
 - Samples collected prior to grading

Separation of Fines During Hopper Dredging – Results



- **Fines reduced sequentially**
 - Overflow - **61%** of the borrow area fine sediment mass
 - Beach outwash - **67%** of the hopper fine sediment mass
- **Combined removal of 87% of the borrow area fines**
 - Overflow - 70%
 - Outwash - 30%

Separation of Fines During Hopper Dredging

- **Conclusion:** Loss of fines can be scientifically quantified at loss points
- **Next Steps:** Collaborative Phase II USACE-BOEM-FDEP Effort
 - Florida borrow area with higher fines content (>5%)
 - Consider area previously screened out
 - Add analysis of fate and transport of fine material at loss points
 - Extensive coordination with FDEP
 - Future application in North Carolina



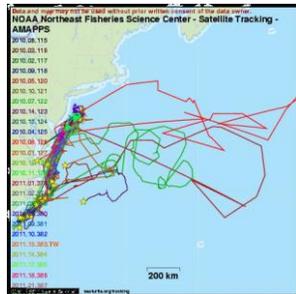
Building Research



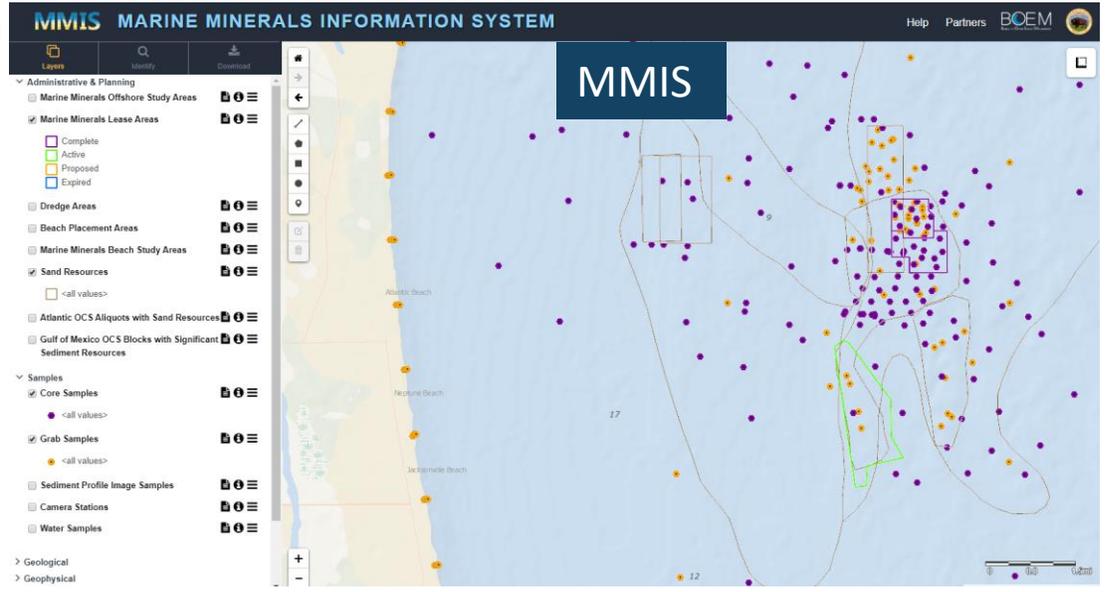
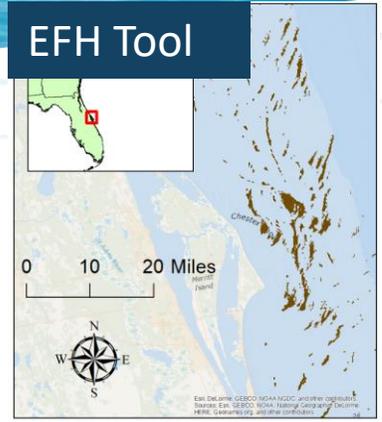
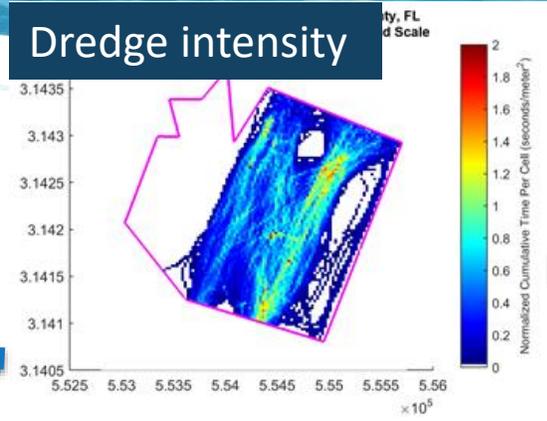
Ship Shoal



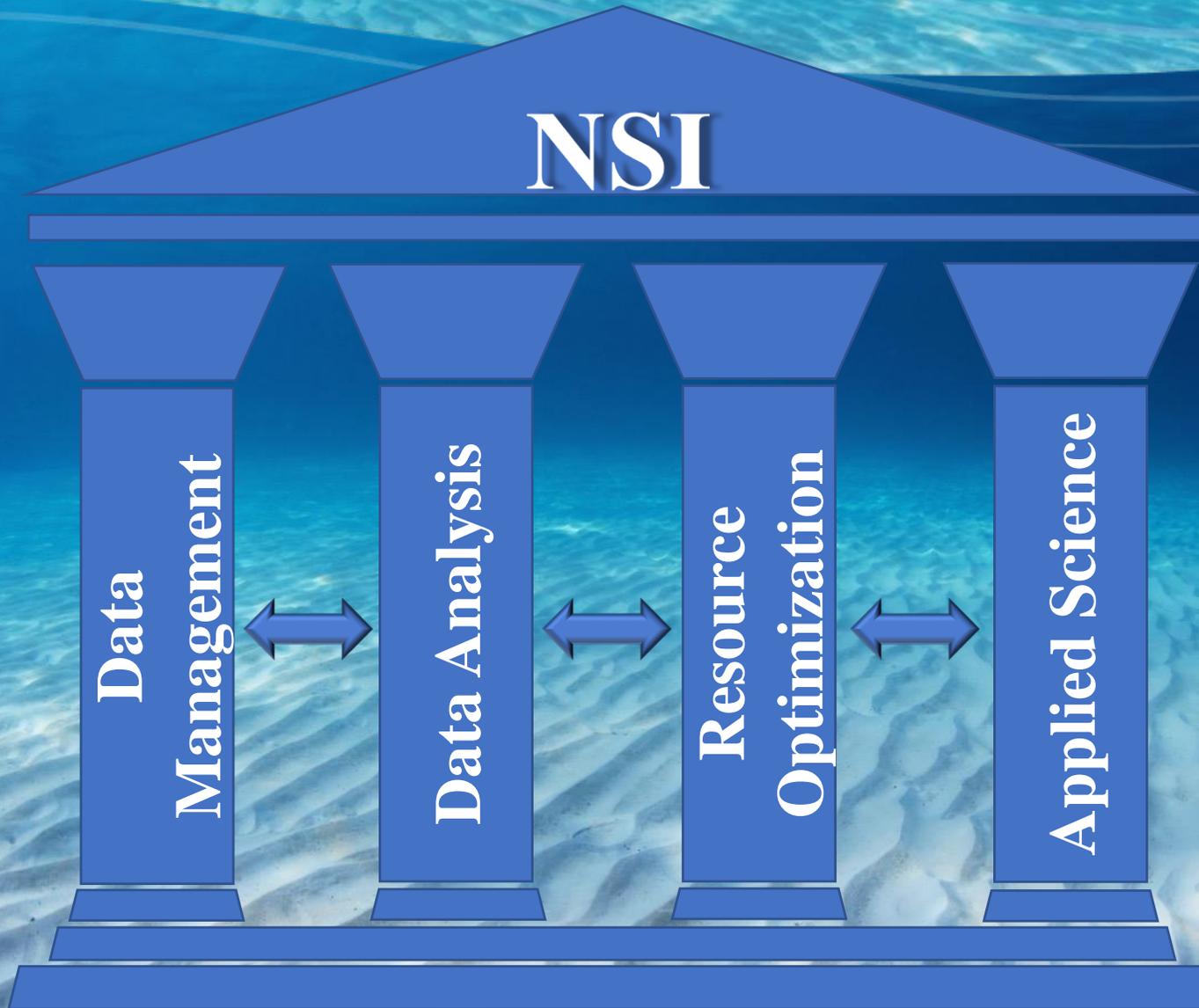
AMAPPS



Canaveral Shoals



And....Why Do You Care Again?



Need to Know What We have to Manage the Resource Successfully

BOEM

Bureau of Ocean Energy
Management

BOEM.gov



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