BOEM

Bureau of Ocean Energy Management

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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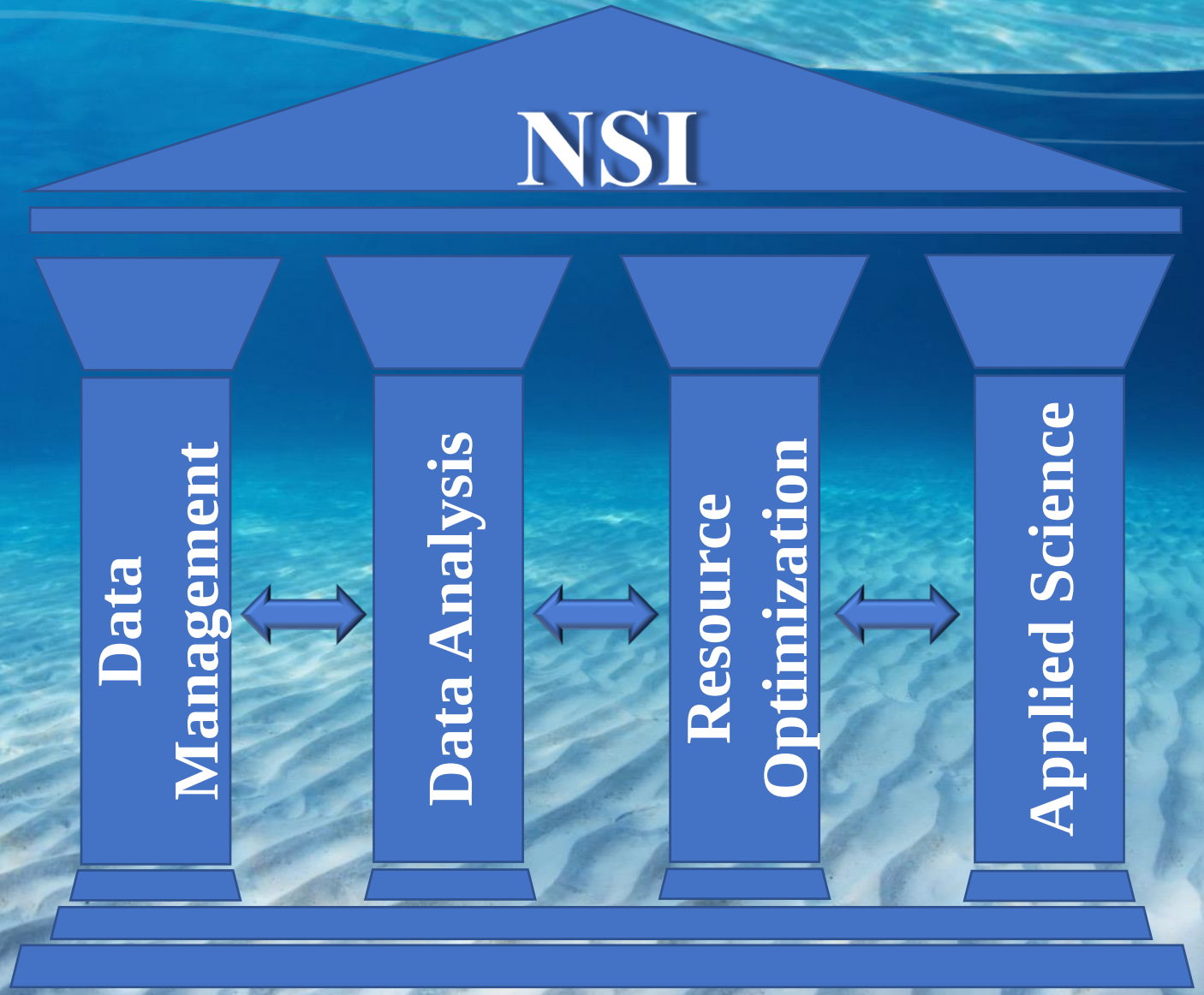
So….What Does That Mean for You?

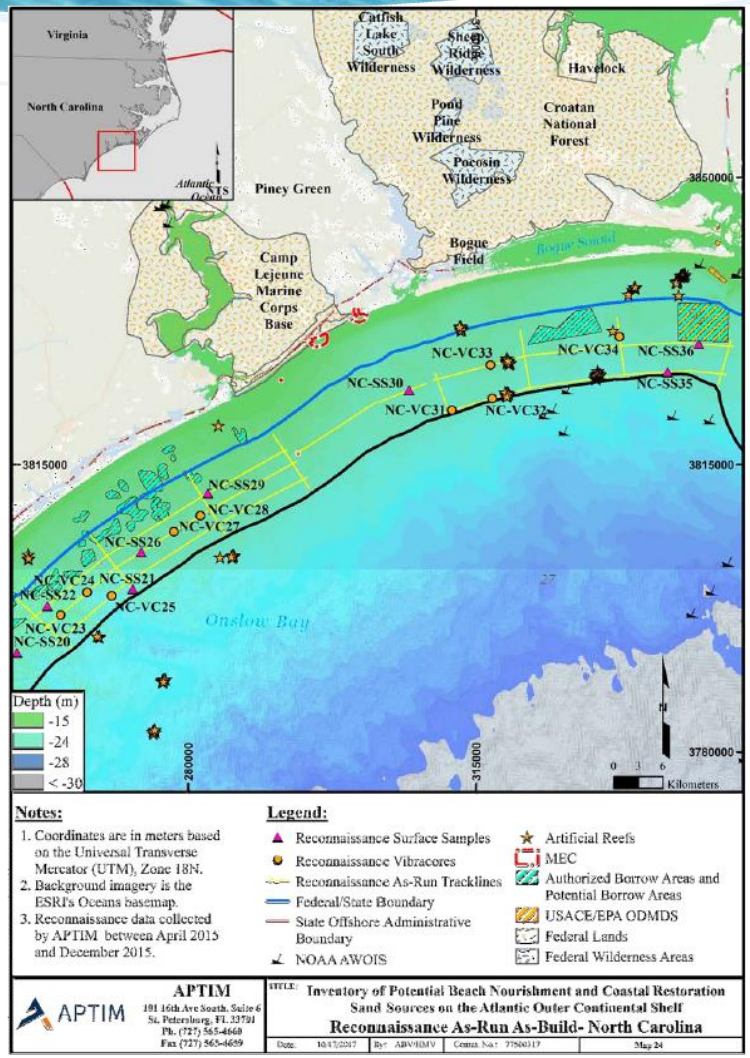


Need to Know What We have to Manage the Resource Successfully

National Sand Inventory (NSI)

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

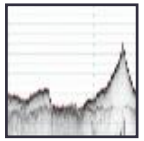
- **Supports Stewardship Role:**
  - Facilitate proactive planning
  - Identify gaps/priorities/constraints
  - Borrow area alternatives / optimization
  - Tradeoff analyses



Data Management - MMIS

Data Development

Collaboration with our Partners

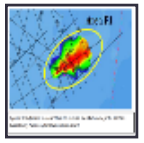


Analyzed Geotechnical / Geophysical Source Data

Digital data from physical core samples

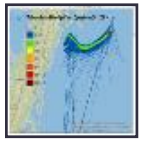
Digital derived data from external drives, CD's, paper sources

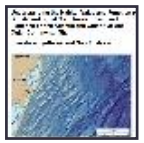
Cooperative Agreements



Leasing data

Dredge data





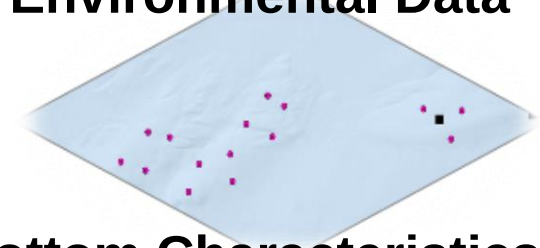
Research / Environmental Studies Data

Enterprise Relational Database

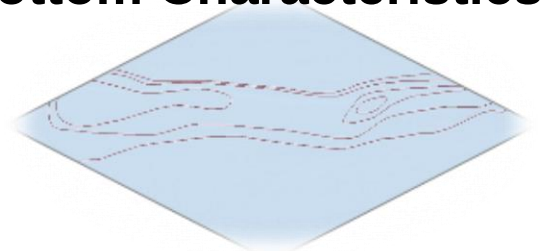
M M I S

Bathymetry & Backscatter

Environmental Data



Bottom Characteristics



Leasing / Planning/Construction

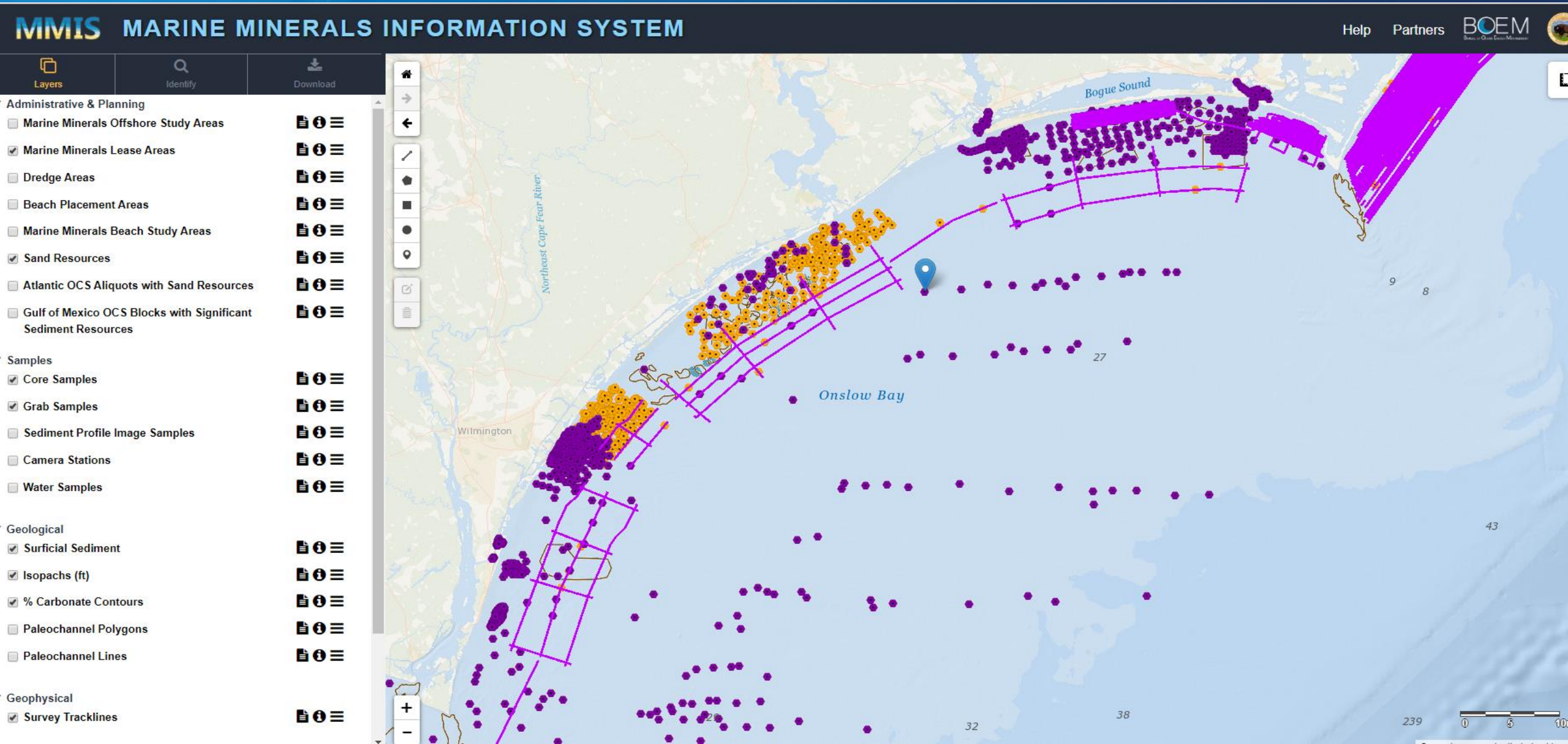
Discover

Analysis

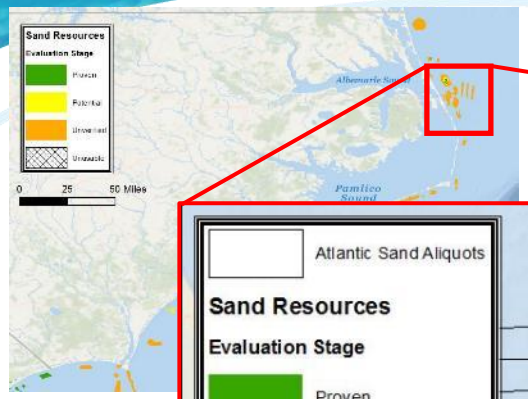
Id Gaps

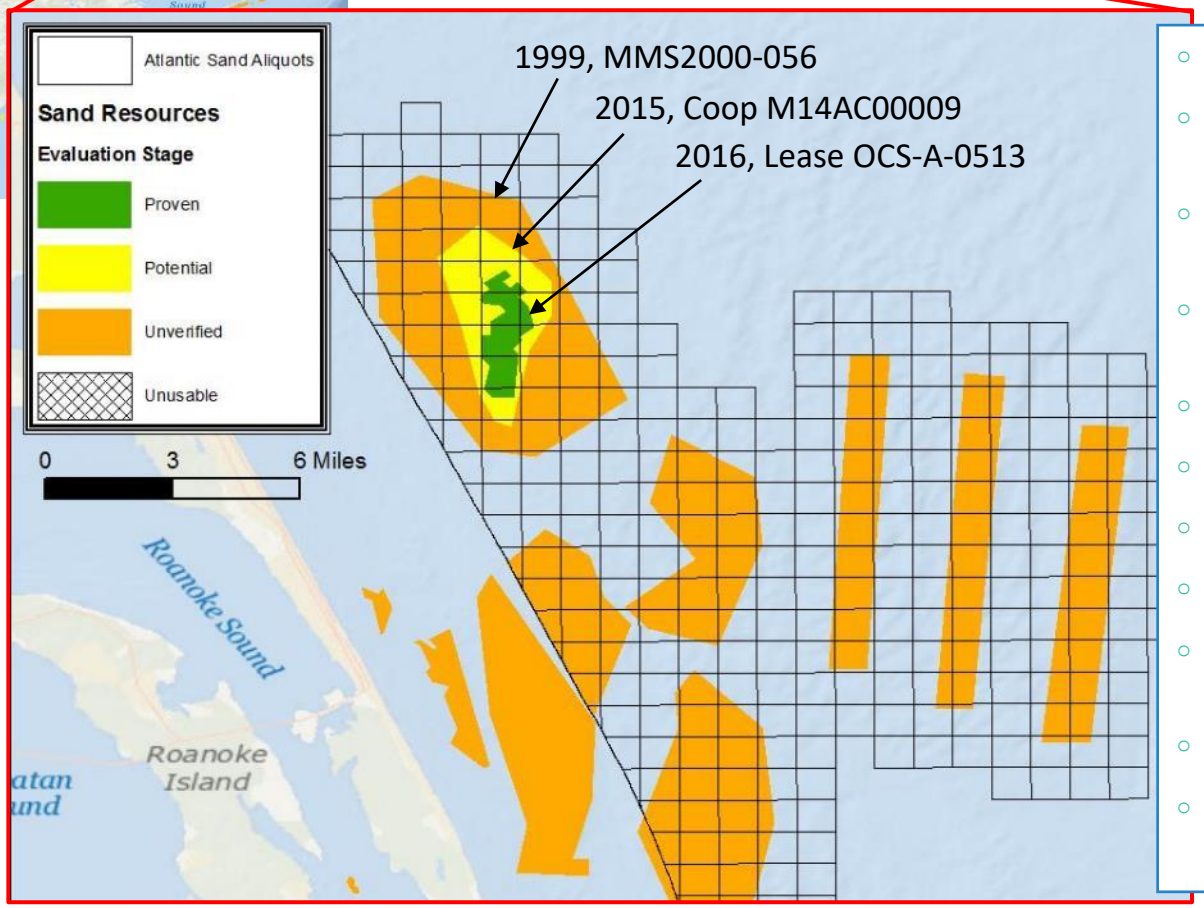
MMIS Public Data Viewer

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



Data Analysis – Sand Resource Evaluation



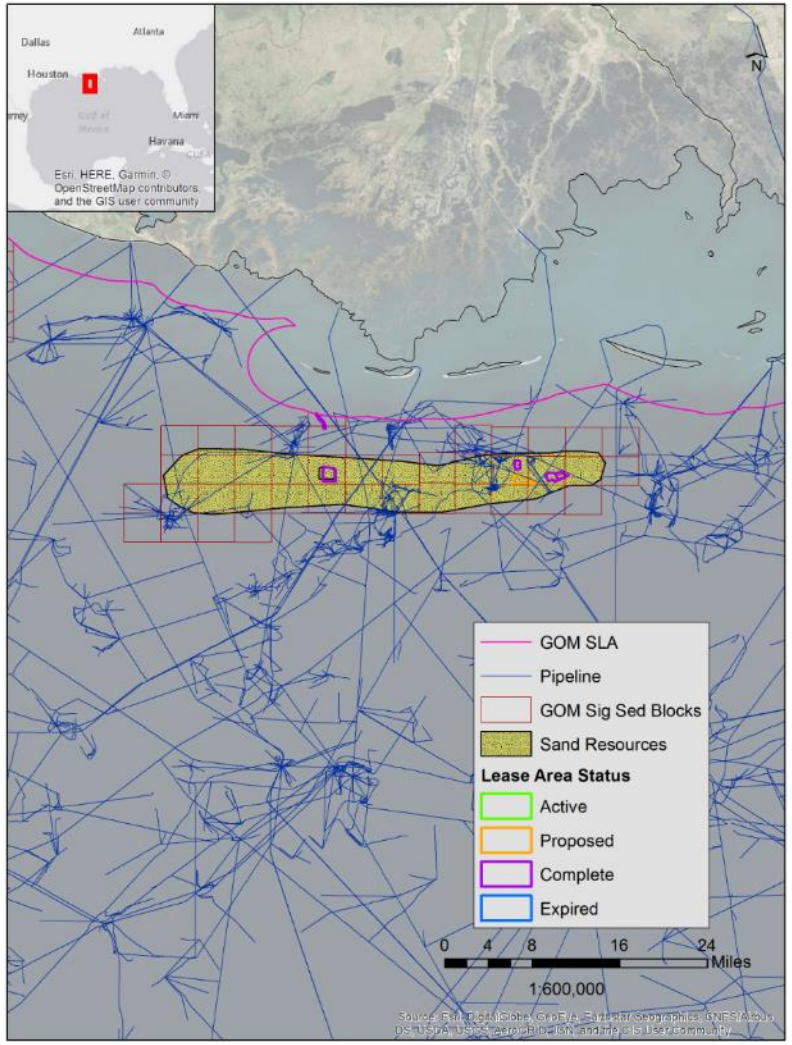


- State
- Year (of delineation)
- Mean grain size (phi)
- % sand, gravel, and fines
- % carbonate
- Resource Area ID
- Study ID
- Evaluation stage
- Sand body thickness
- Area
- Volume

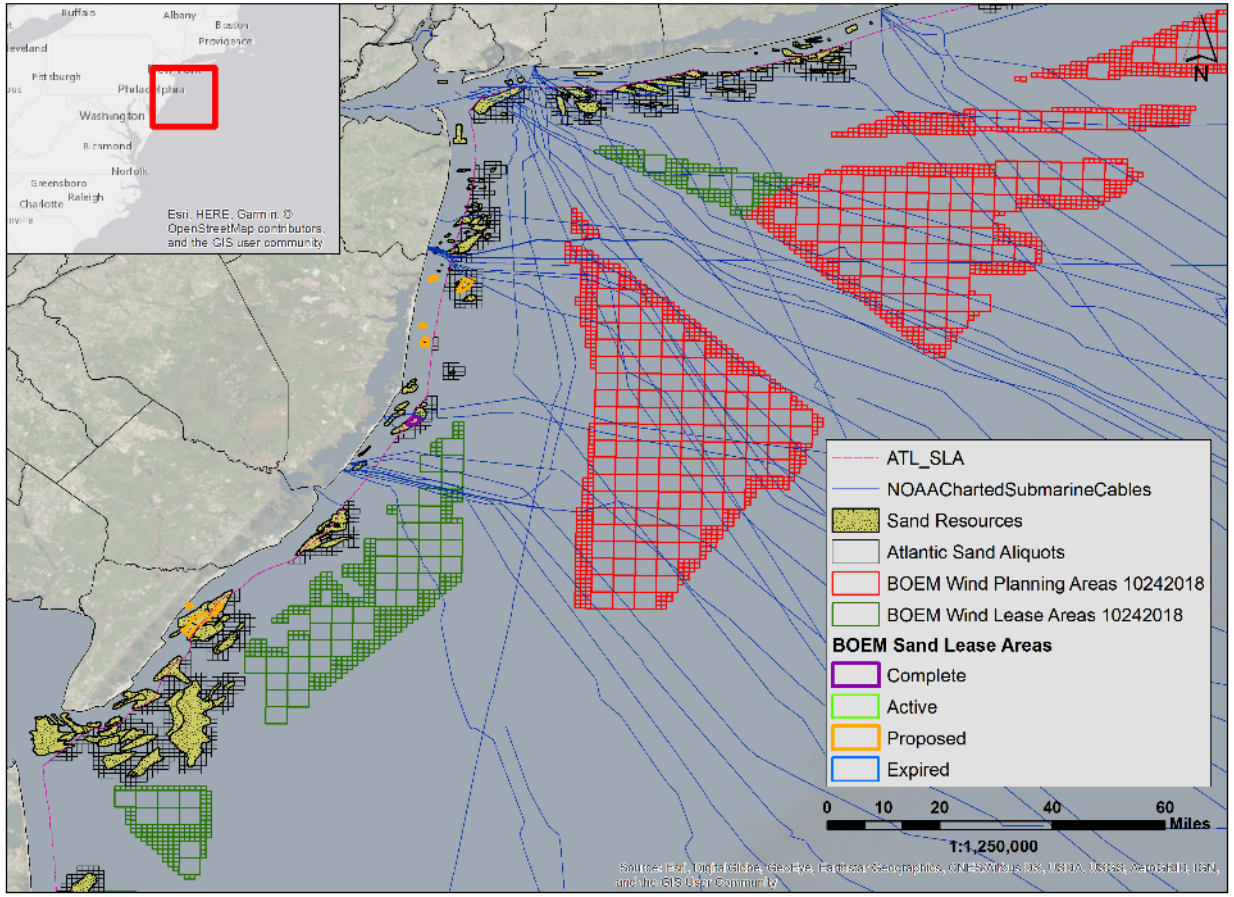
Evaluation Stage	Description
Proven	Resource areas whose thickness and lateral extent have been fully determined through design-level geotechnical and seismic coverage. Generally reserved for (but not limited to) areas that have already been authorized as part of a lease.
Potential	Resource areas whose 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

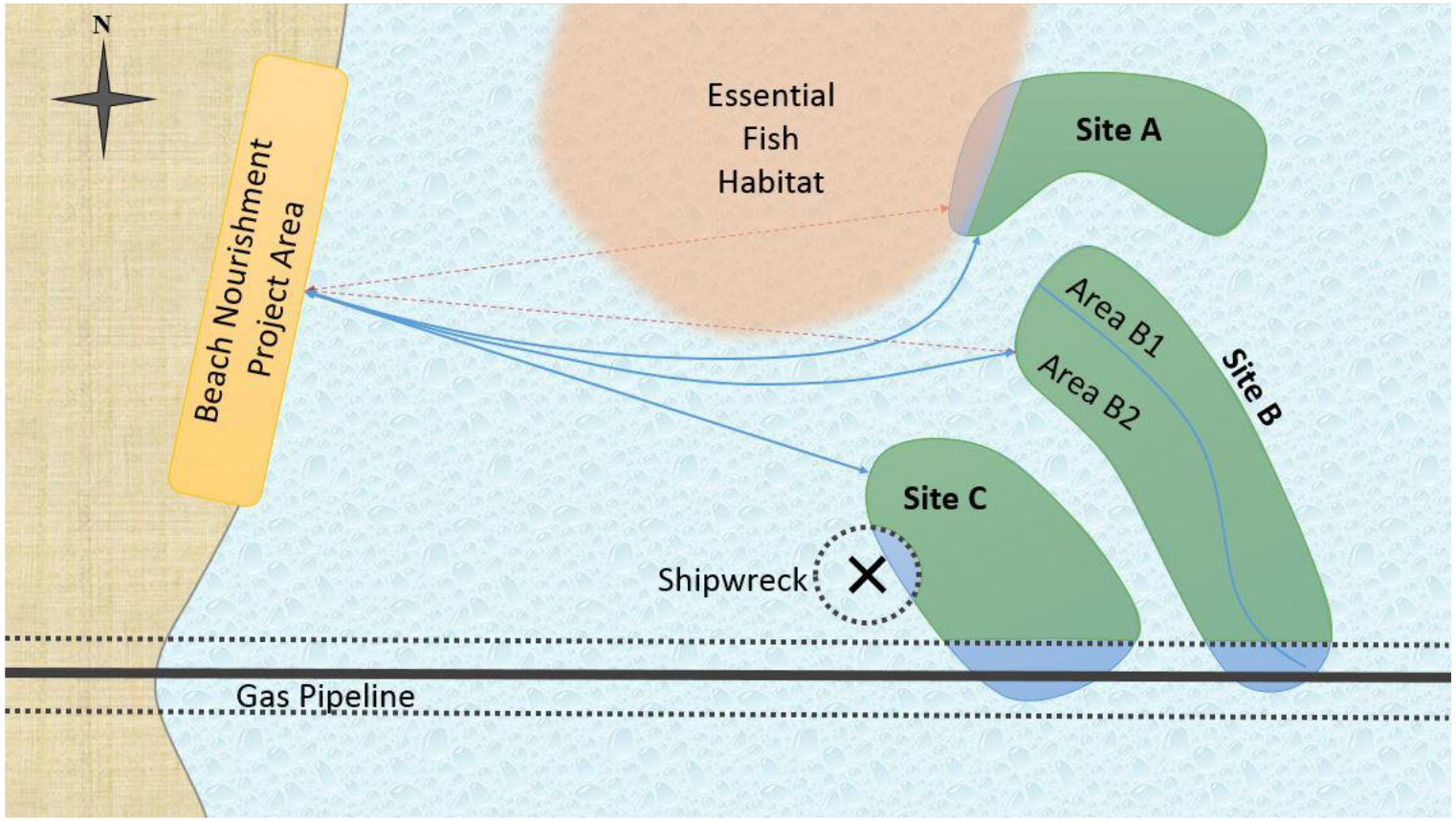
Oil & Gas Infrastructure - Gulf of Mexico



Submarine Cables – North Atlantic



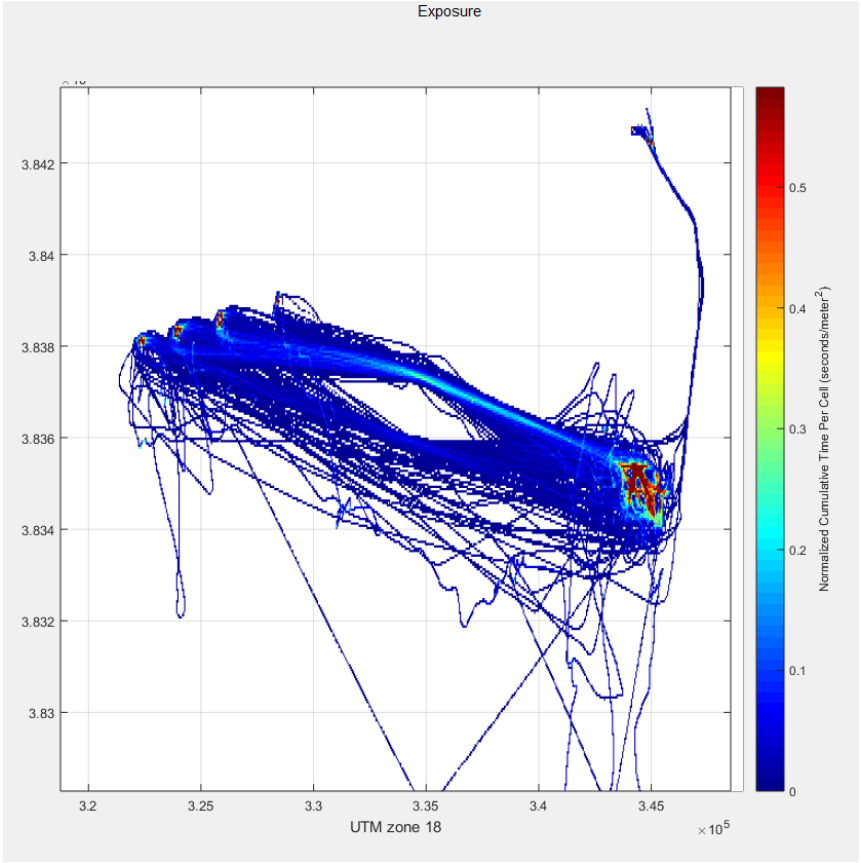
Resource Optimization



- **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)

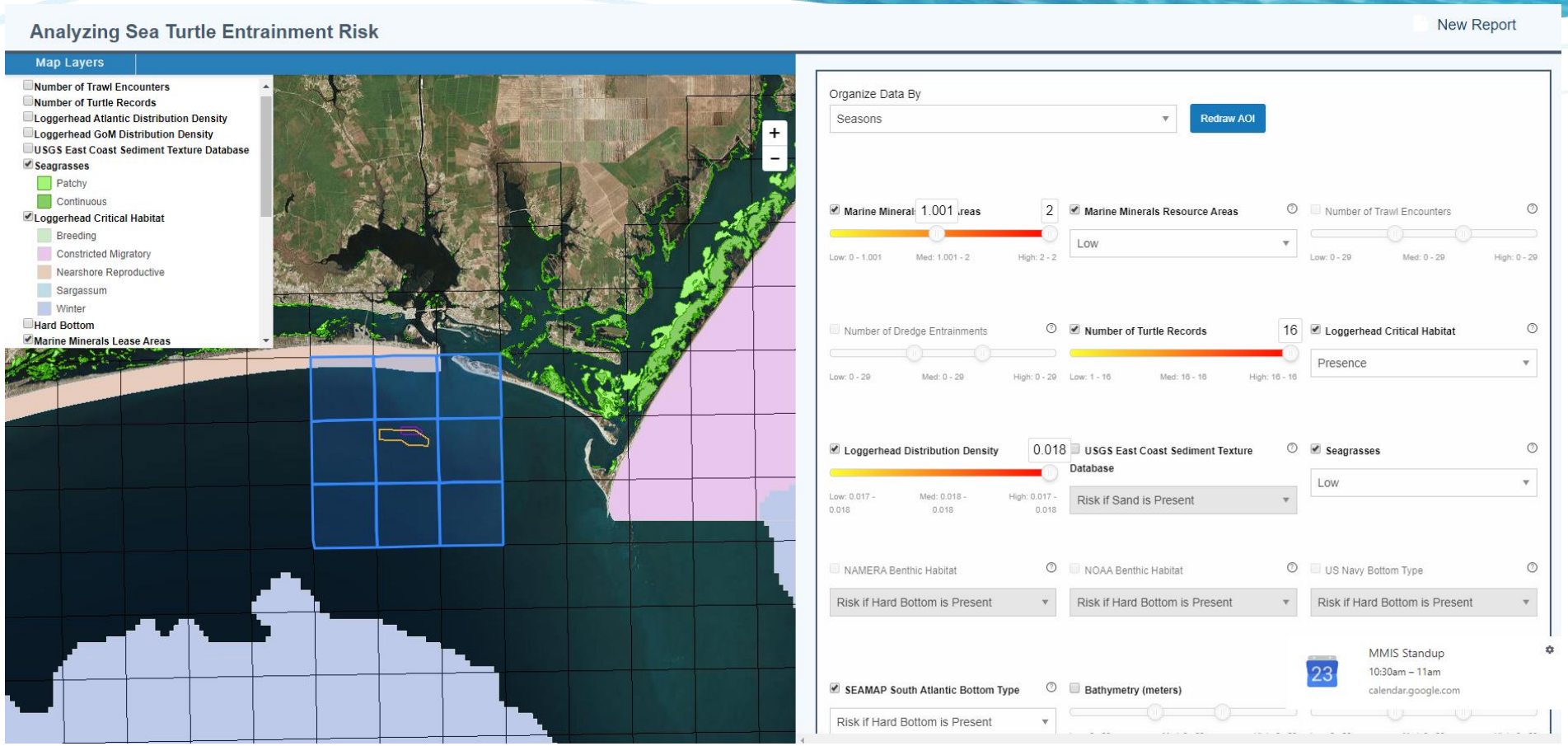
Applied Science

- **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

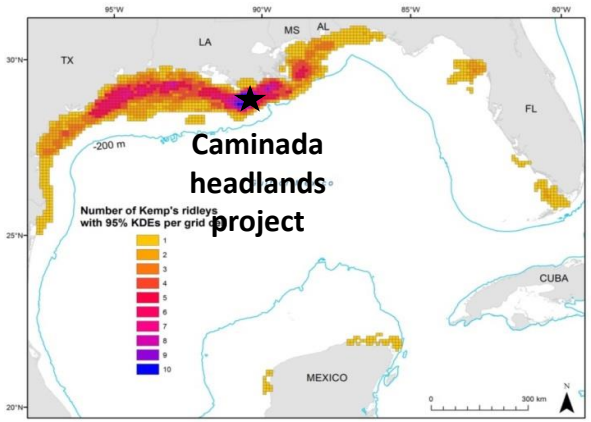


- Standardize geographic and temporal decision support tool
- Analyzes up to 21 biological and environmental parameters to inform entrainment risk
- **Publication**: https://marinecadastre.gov/espis/#/search/study/100095

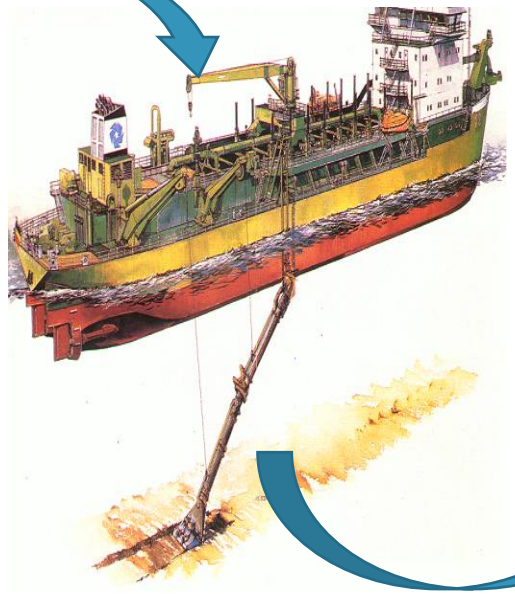
ASTER
Analyzing Sea Turtle Entrainment Risk

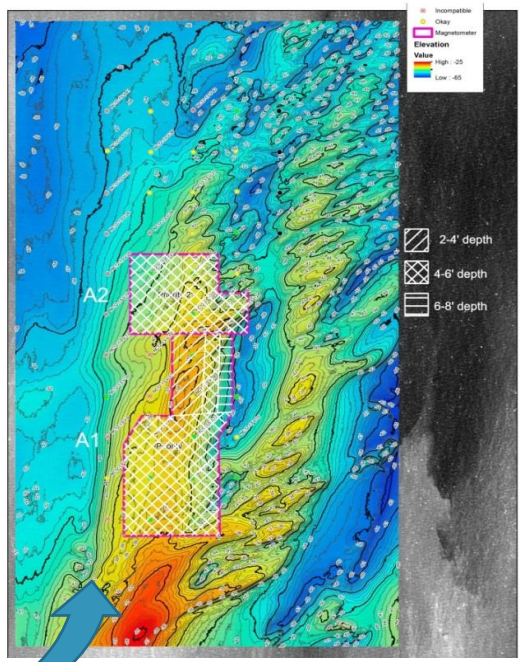
Objectives

- **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



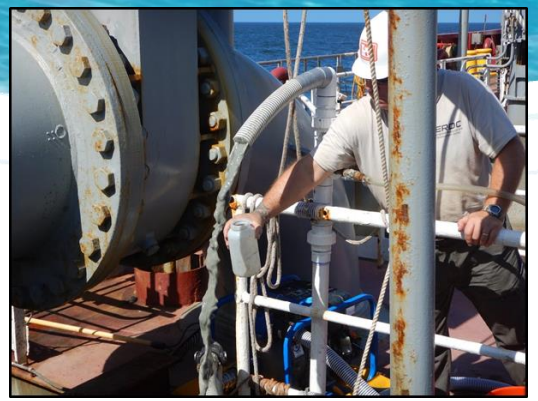


Source: USACE Wilmington District

Collaboration

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

Separation of Fines During Hopper Dredging

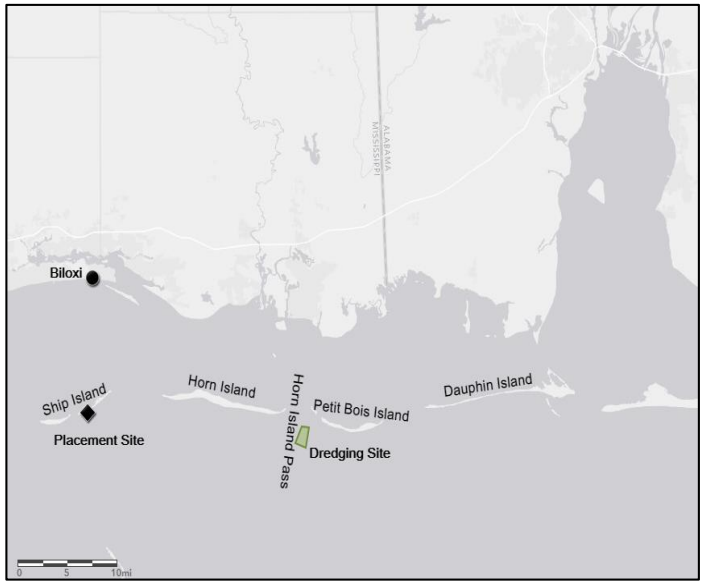


- **Publication**: https://espis.boem.gov/final%20reports/BOEM_2010-010.pdf and https://espis.boem.gov/technical%20summaries/BOEM_2010-010.pdf;

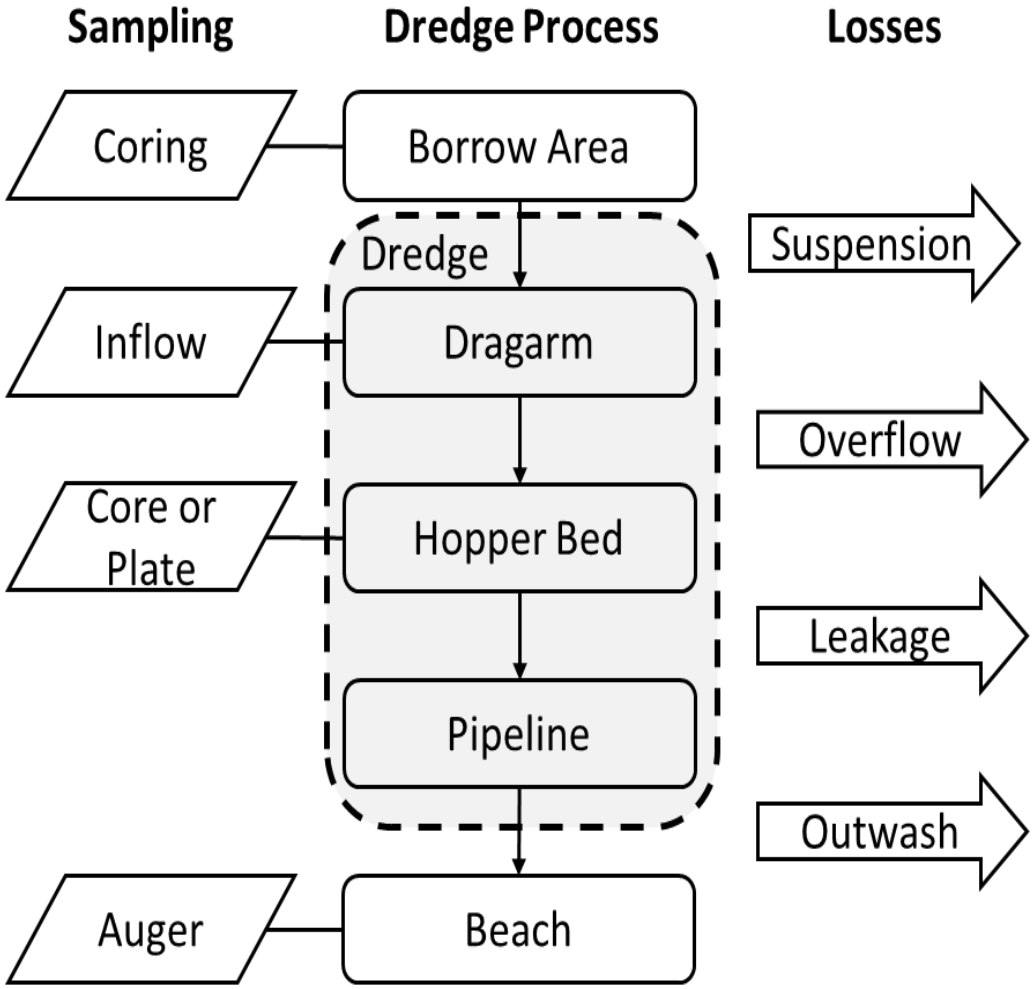
Separation of Fines During Hopper Dredging

- **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

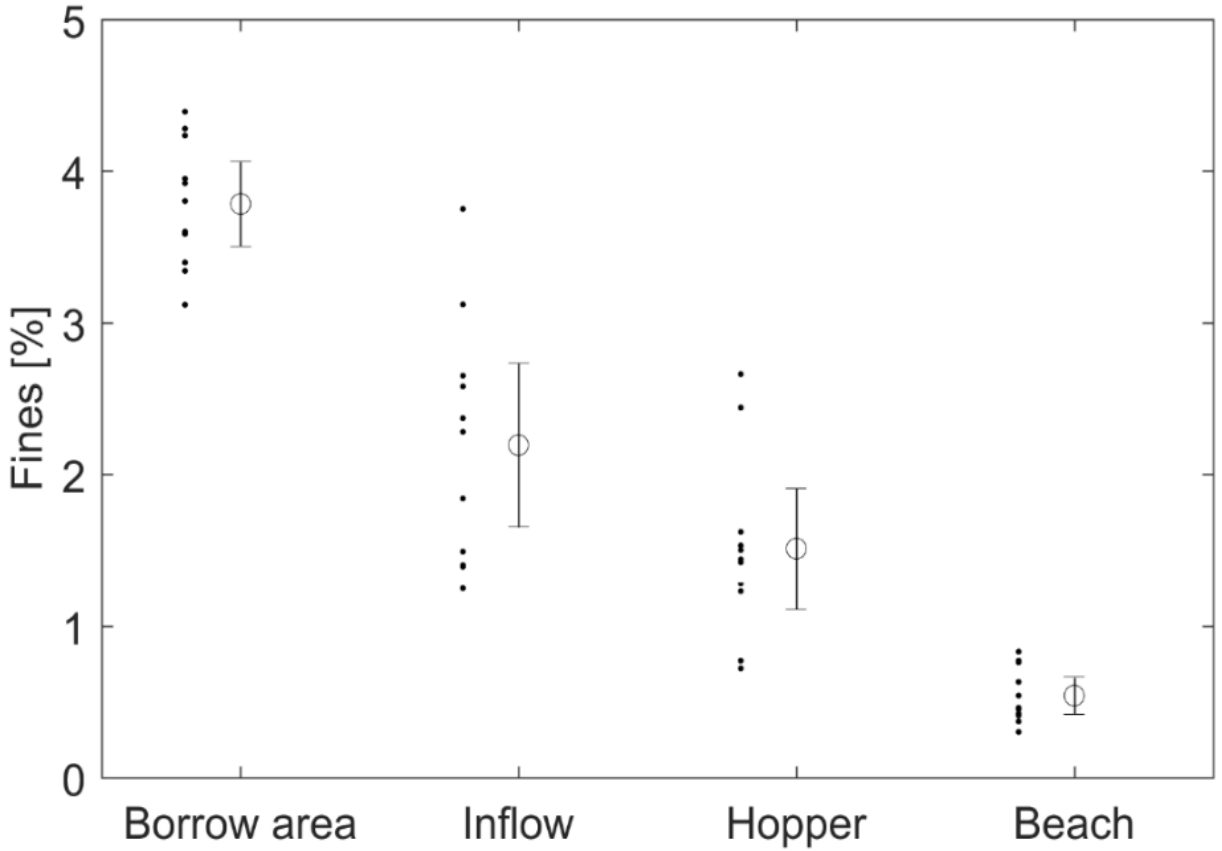


FOCUS: Changes in Sediment Characteristics at Loss Points



- **Borrow Sampling:**
  - 20’ cores spaced 150-600
  - Average fines: 4.4%
- **Dredge Sampling**:
  - Inflow Box
  - Hopper Load
- **Beach Sampling**:
  - Hand augur
  - 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

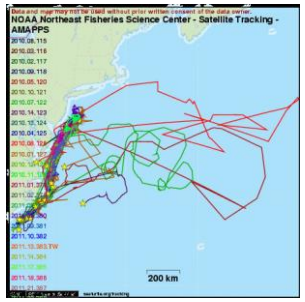
Building Research

ASTER
Analyzing Sea Turtle Entrainment Risk

GoMMAPPS

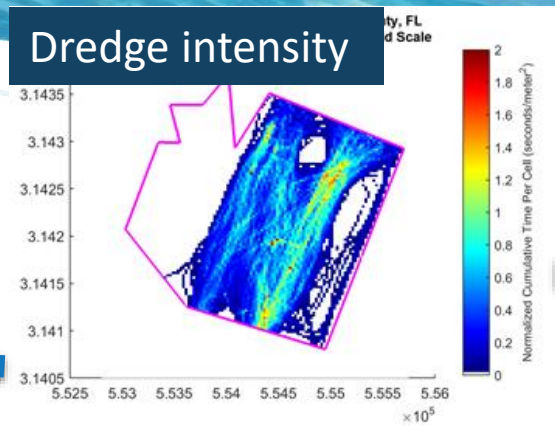
Ship Shoal

AMAPPS

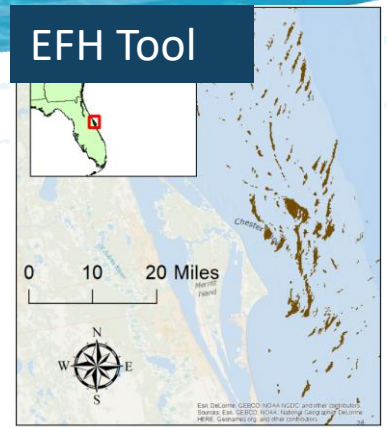


Canaveral Shoals

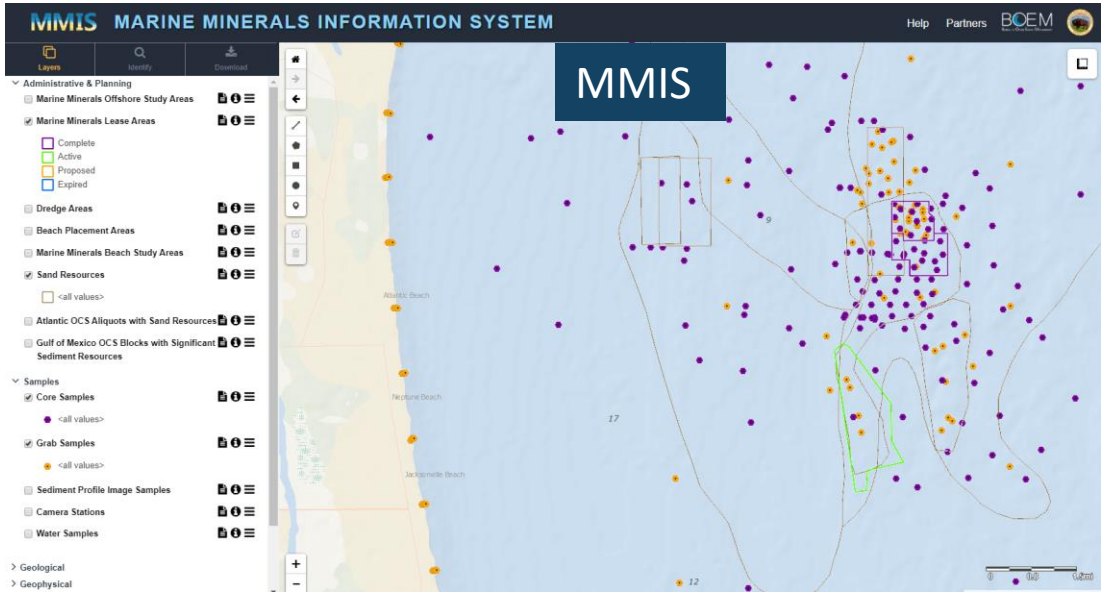
Dredge intensity



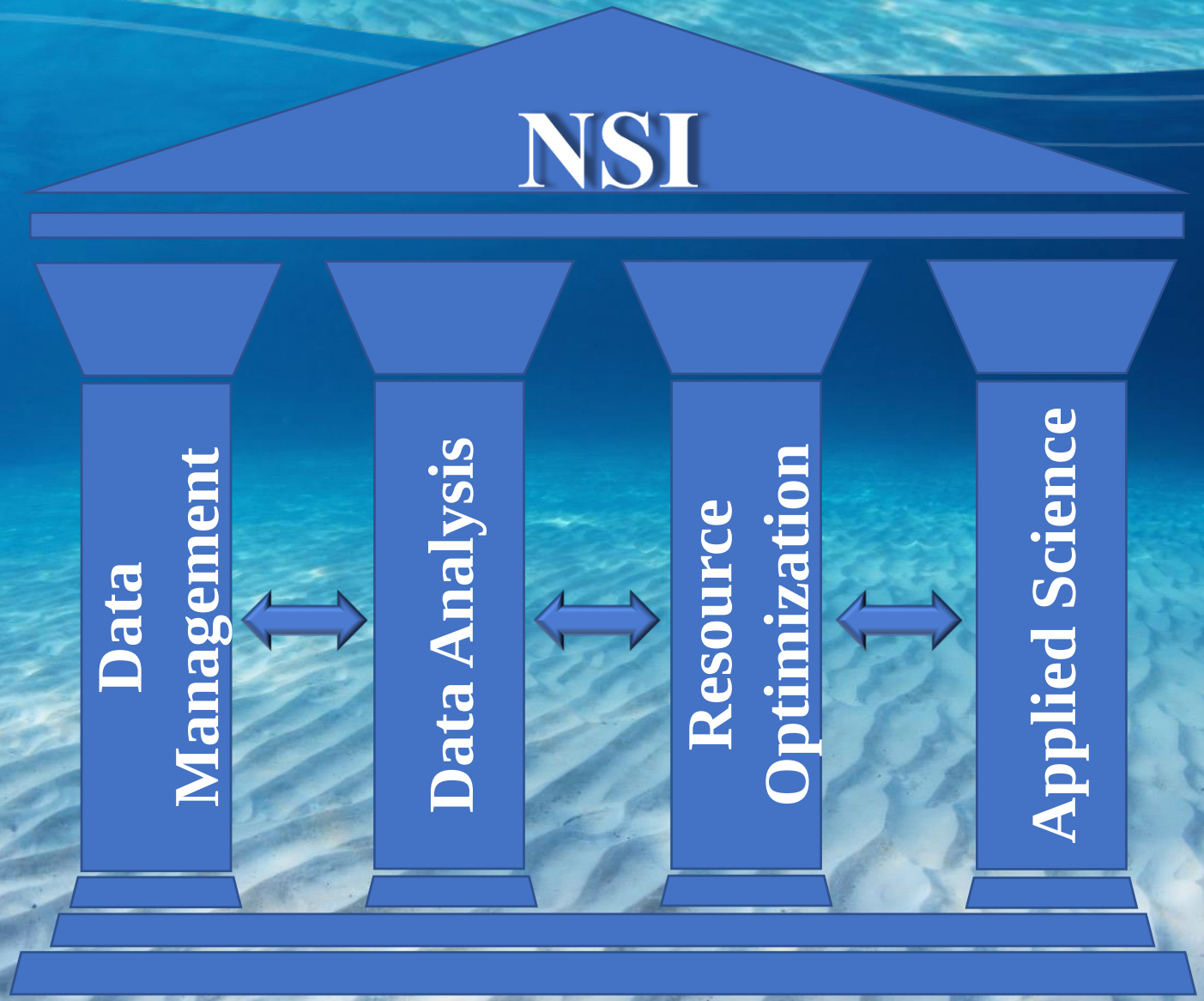
EFH Tool



MMIS



And….Why Do You Care Again?



Need to Know What We have to Manage the Resource Successfully

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