BOEM Marine Minerals Program

Marine Minerals Program

An Introduction to BOEM's Marine Mineral Activity in the OCS

April 2024

Marine Minerals Program

MISSION

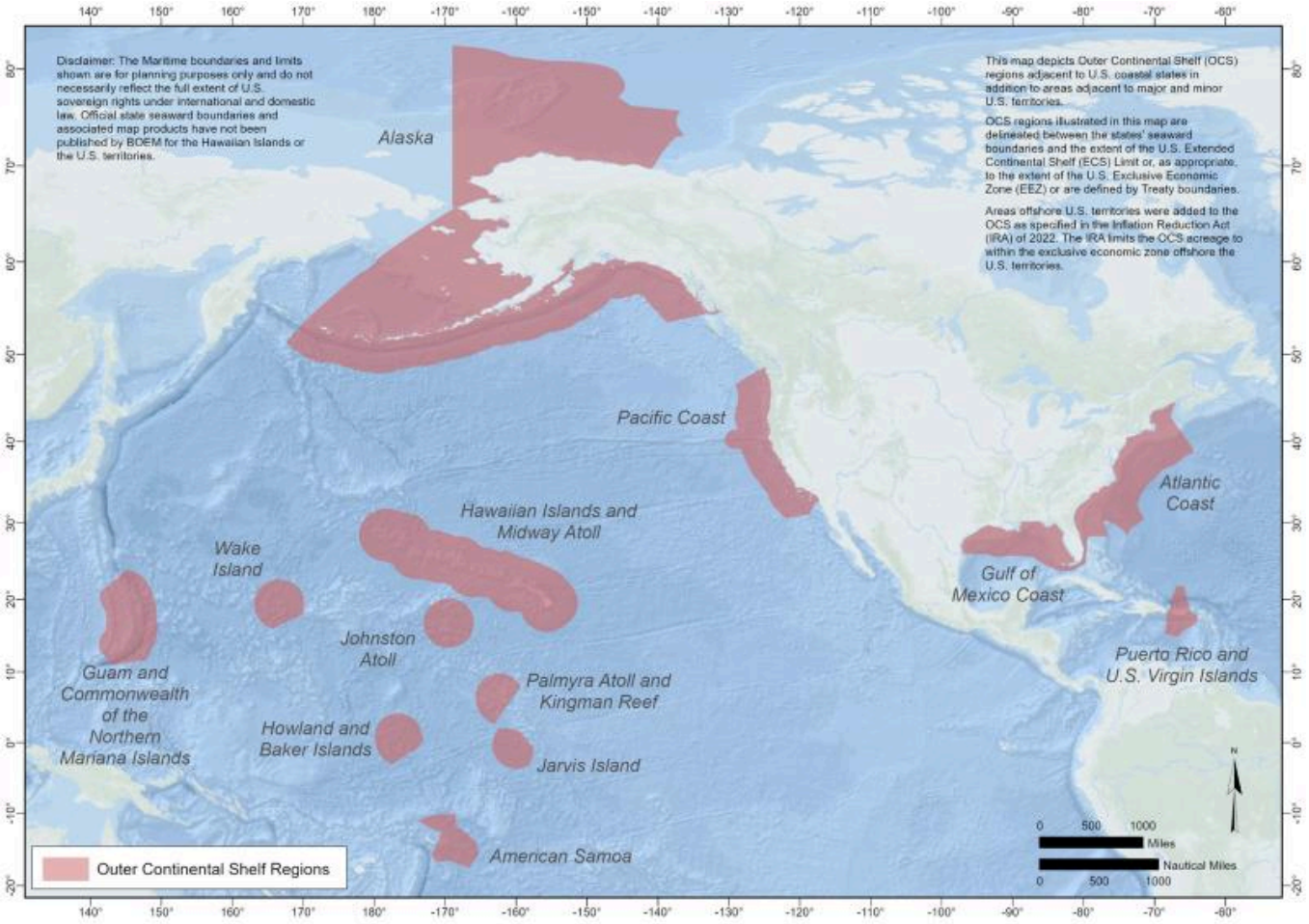
Facilitate access to and manage the Nation's Outer Continental Shelf (OCS) non-energy marine minerals through environmentally responsible stewardship, prudent exploration and leasing activities, coordination with governmental partners, stakeholder engagement, and mission-focused research to improve decision-making and risk management.

Program Overview

What is a Marine Mineral?

Three primary marine minerals BOEM considers:

1. Sand and sediment in shallow water environments for use in coastal resilience projects
2. Critical mineral deposits in diverse settings and of interest to specialized industries
3. Aggregates and other marine minerals in shallow settings for other uses



Diversity of Marine Minerals Activities

Location of Marine Mineral activities vary largely depending on marine mineral resource.

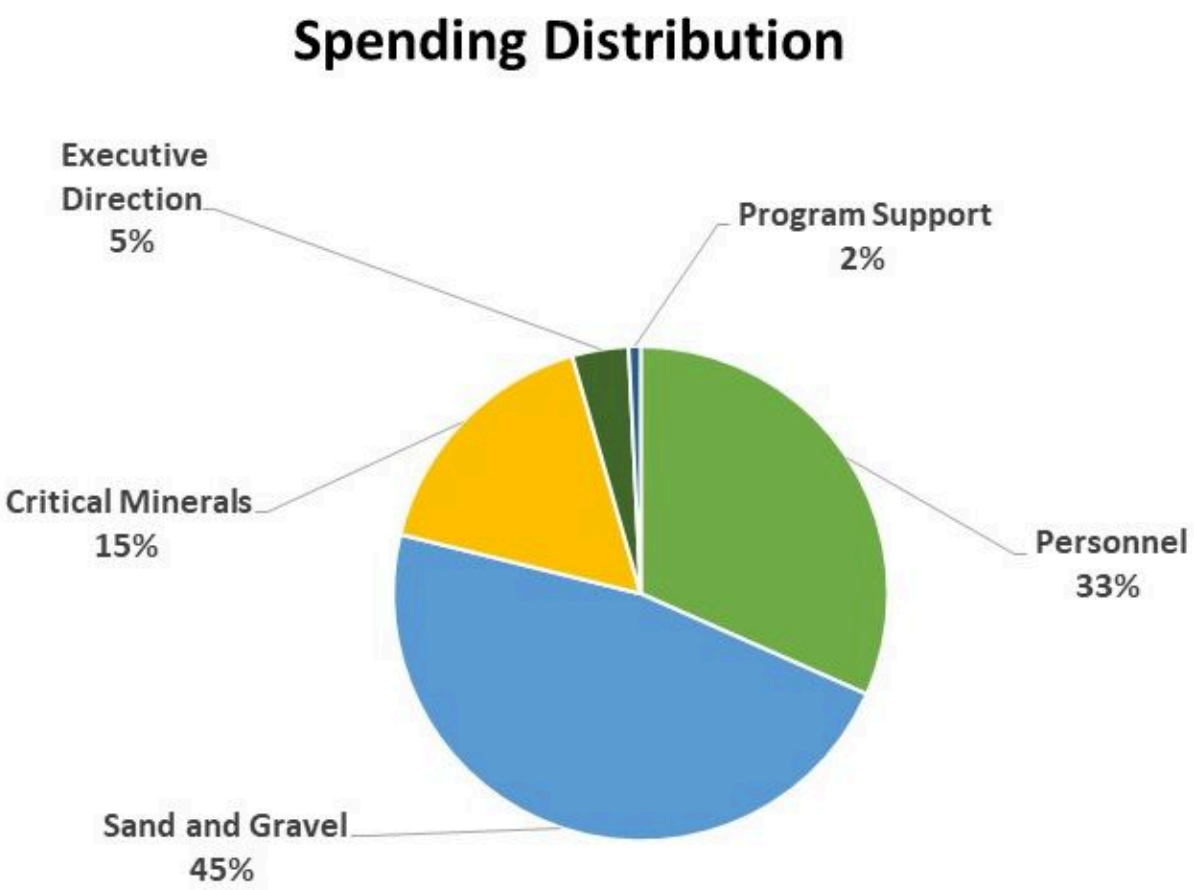
Program Functions & Priorities

1. Resource evaluation and environmental research
2. G&G exploration authorizations, leasing, and use/development oversight
3. Environmental assessment
4. Mineral and environmental stewardship
5. Data and information management
6. Stakeholder engagement

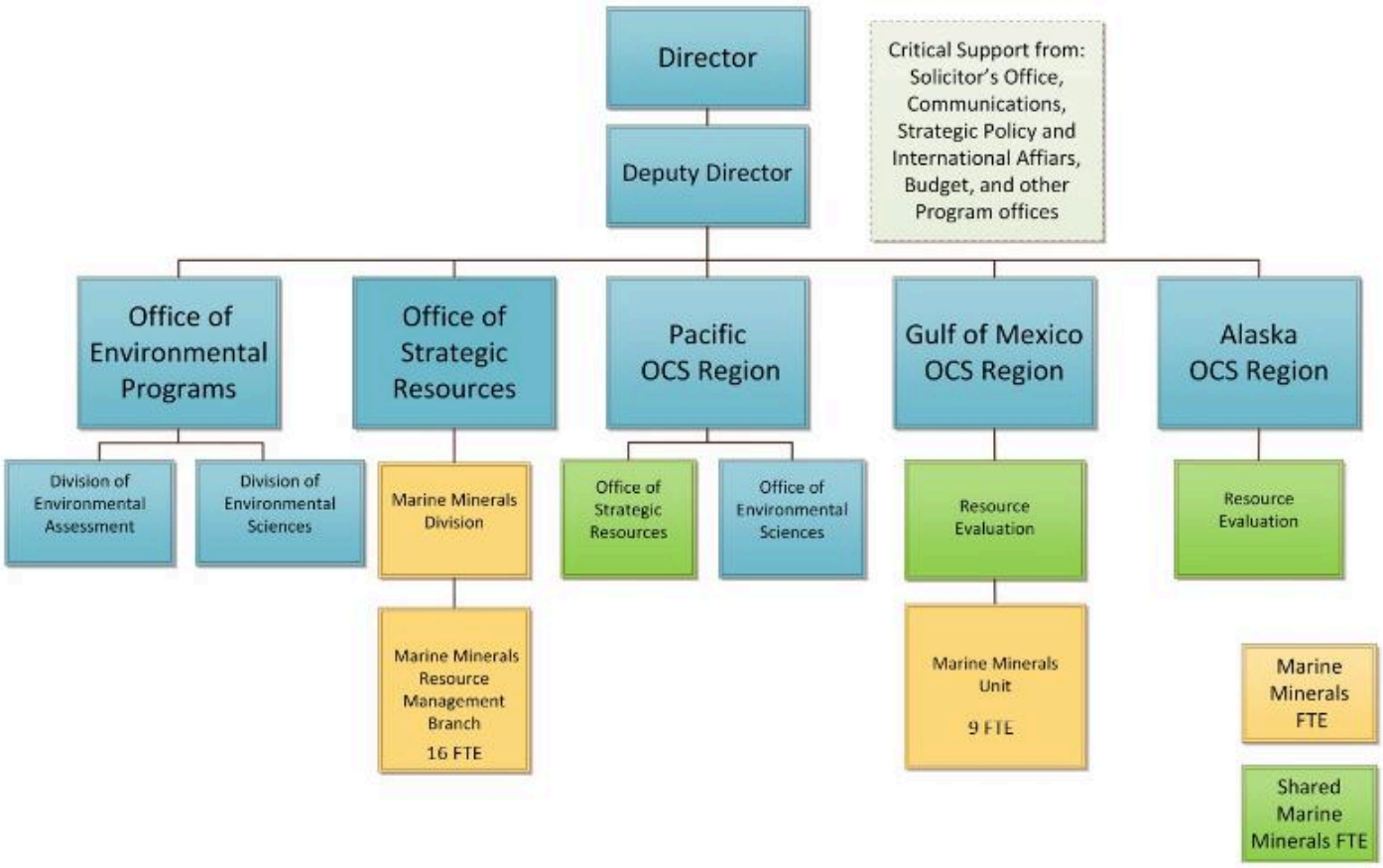
Marine Minerals Legal Framework

Outer Continental Shelf Lands Act (OCSLA)

- **Section 8** (43 U.S.C. 1337(k)) establishes a competitive and noncompetitive leasing process for marine minerals
- **Section 11** (43 U.S.C. 1340)) allows BOEM to authorize qualified persons to undertake geophysical and geological exploration, or prospecting when commercial in nature, for OCS minerals.
- **Section 19** (43 U.S.C. 1345(e)) and **Section 20** (43 U.S.C. 1346) authorize BOEM to fund cooperative agreement research and environmental studies related to the use and stewardship of OCS marine minerals.



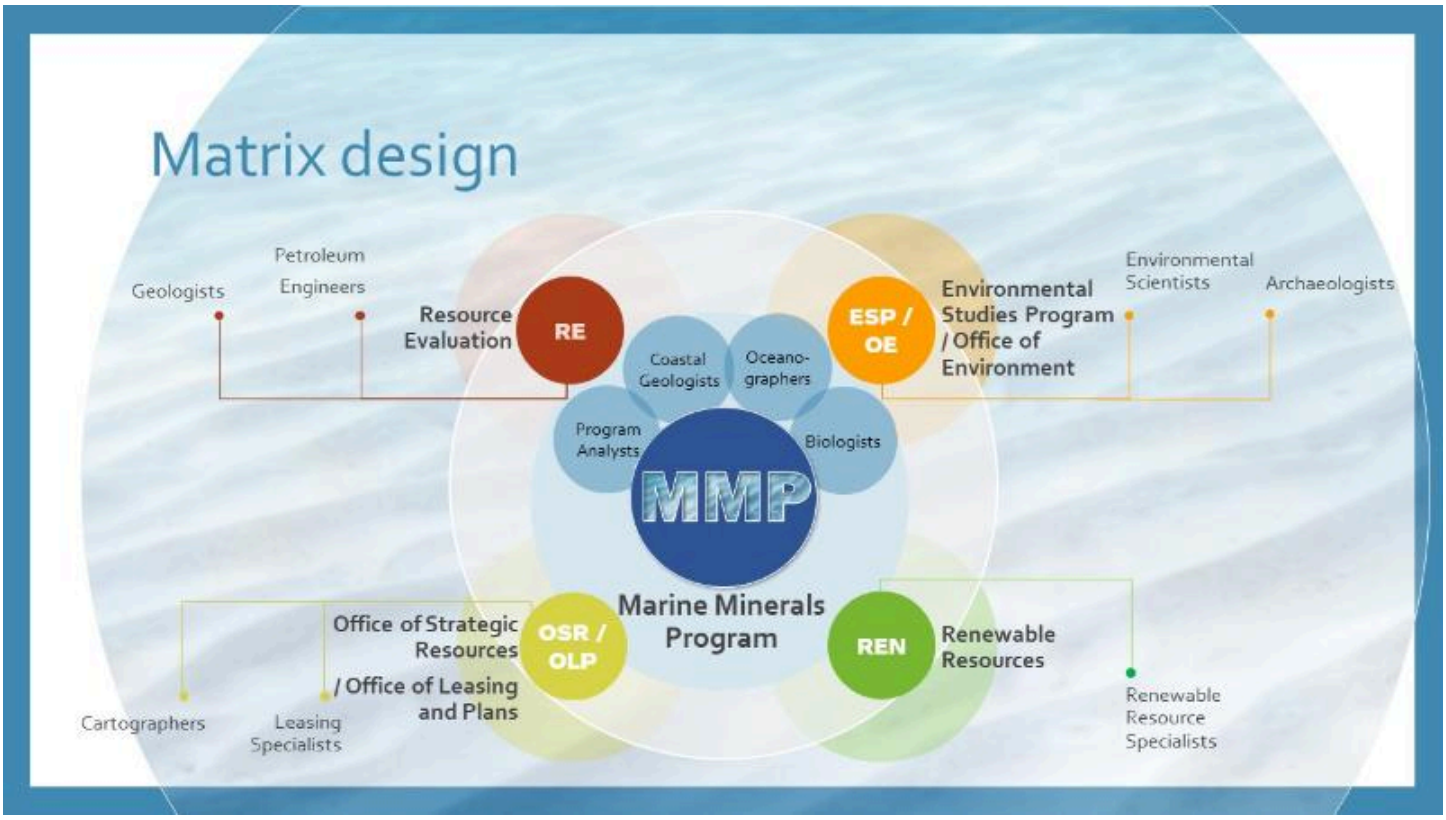
FY 2024 Marine Minerals Budget = $13.808 Million



FY24 FTE Ceiling = 25

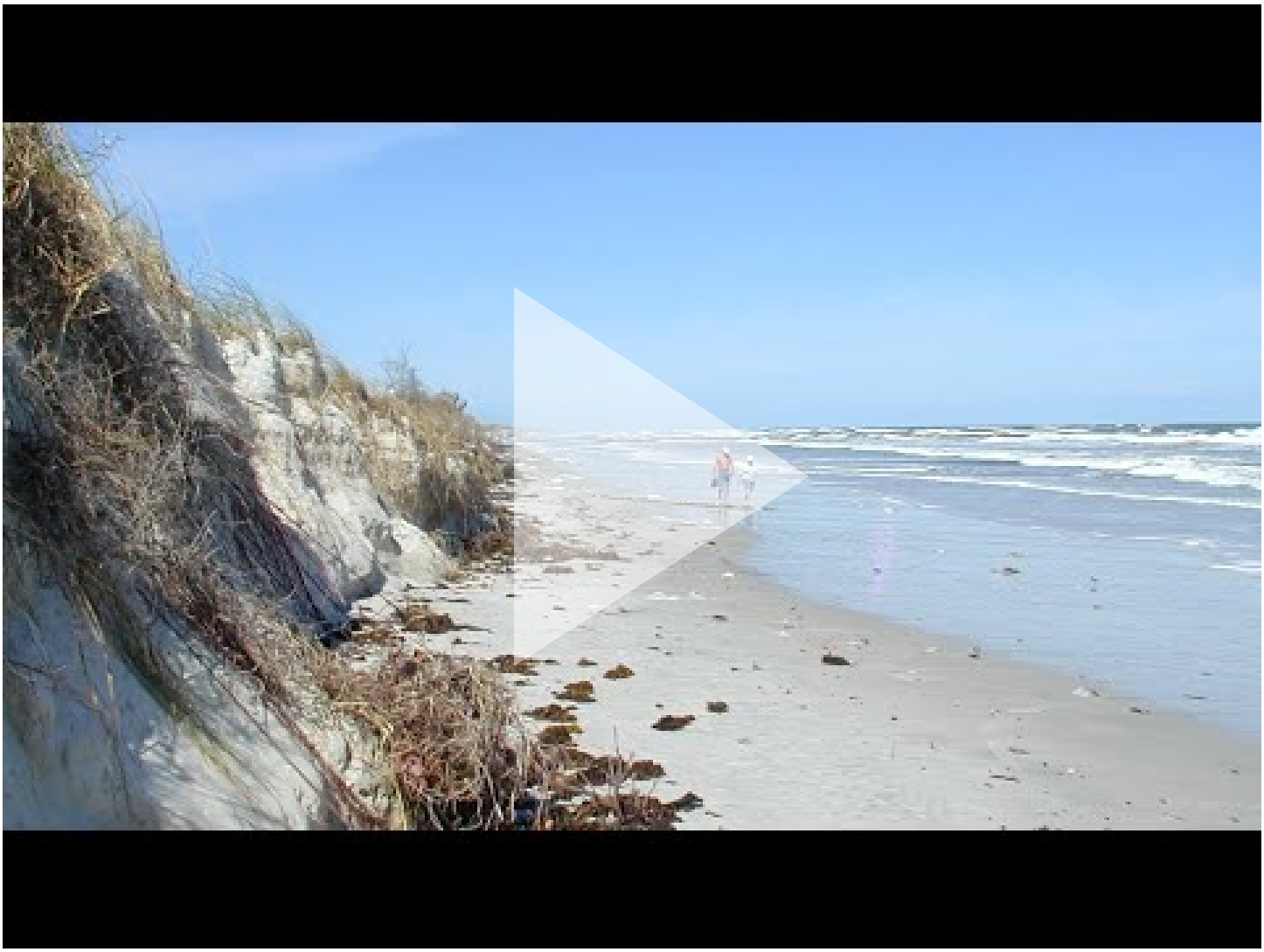
- Geologists*
- Biologists
- Oceanographers
- Program Analysts

* 2 focused on critical minerals



Matrixed style organization

MMP interacts in a matrixed style seeking support and SME expertise from other sectors within BOEM including engineers, archeologists, environmental scientists, and renewable energy specialists. This ensures that our small team has the resources, expertise, and support it needs to meet the needs of our stakeholders and BOEMs mission.



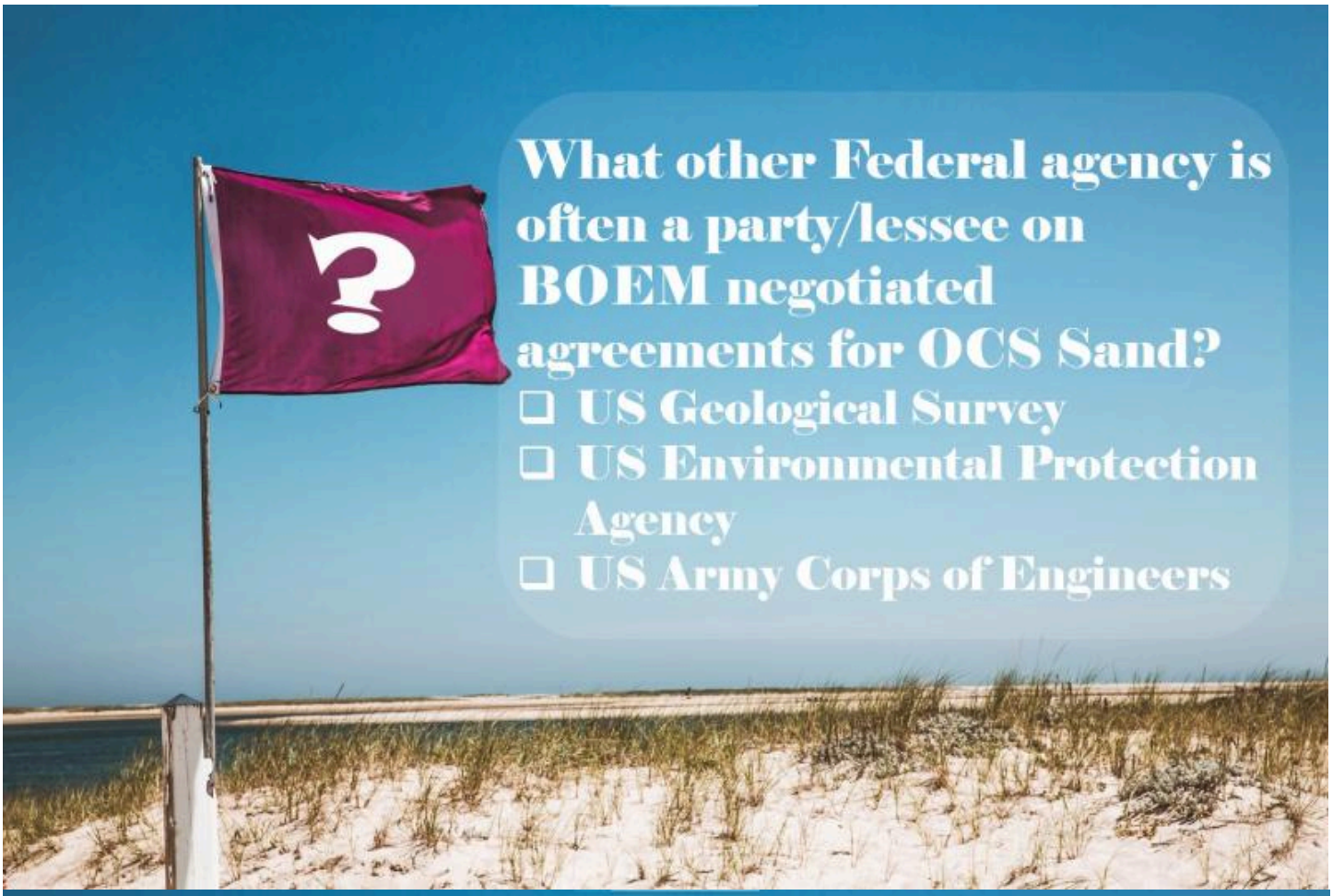
Promoting Coastal Resilience

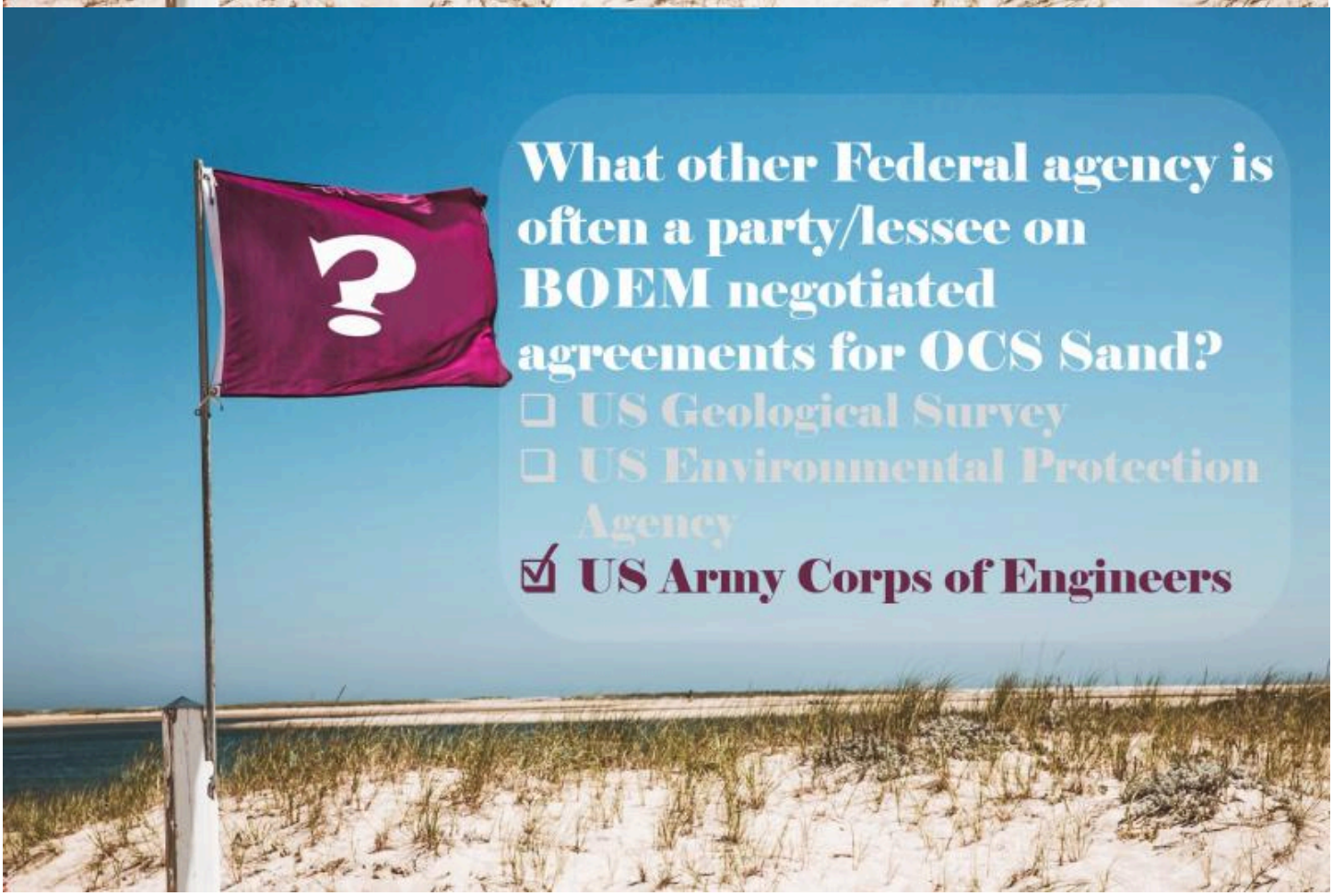
Coastal Resilience | Resource Evaluation | Environmental Stewardship | Multiple Ocean Use

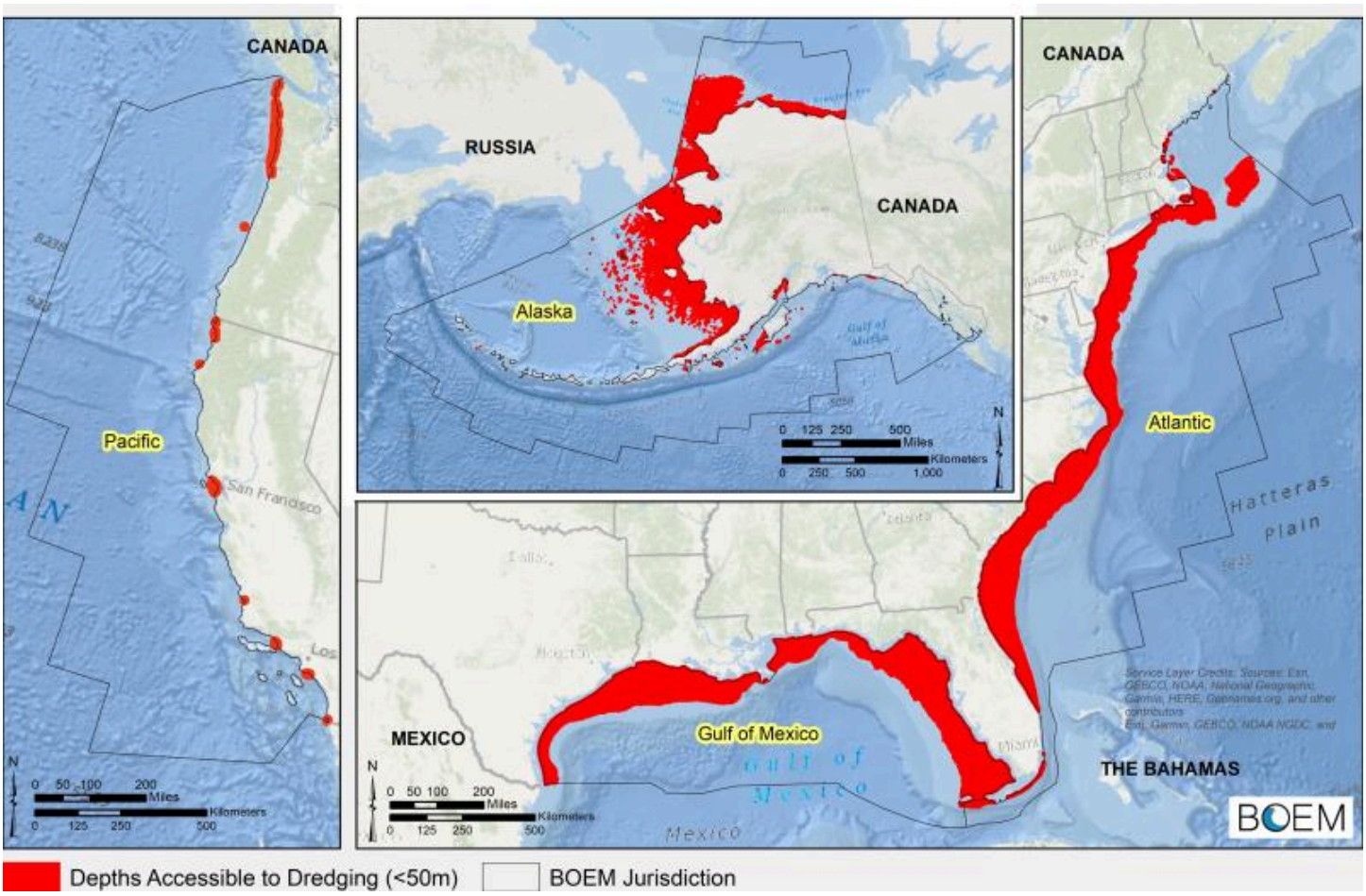
Coastal Resilience


What has OCS leased sediment been used for?
❑ Coastal Resilience
❑ Infrastructure Protection
❑ Ecosystem Restoration
❑ Habitat Creation


What has OCS leased sediment been used for?
☑ Coastal Resilience
☑ Infrastructure Protection
☑ Ecosystem Restoration
☑ Habitat Creation


What other Federal agency is often a party/lessee on BOEM negotiated agreements for OCS Sand?
☐ US Geological Survey
☐ US Environmental Protection Agency
☐ US Army Corps of Engineers


What other Federal agency is often a party/lessee on BOEM negotiated agreements for OCS Sand?
☐ US Geological Survey
☐ US Environmental Protection Agency
☑ US Army Corps of Engineers

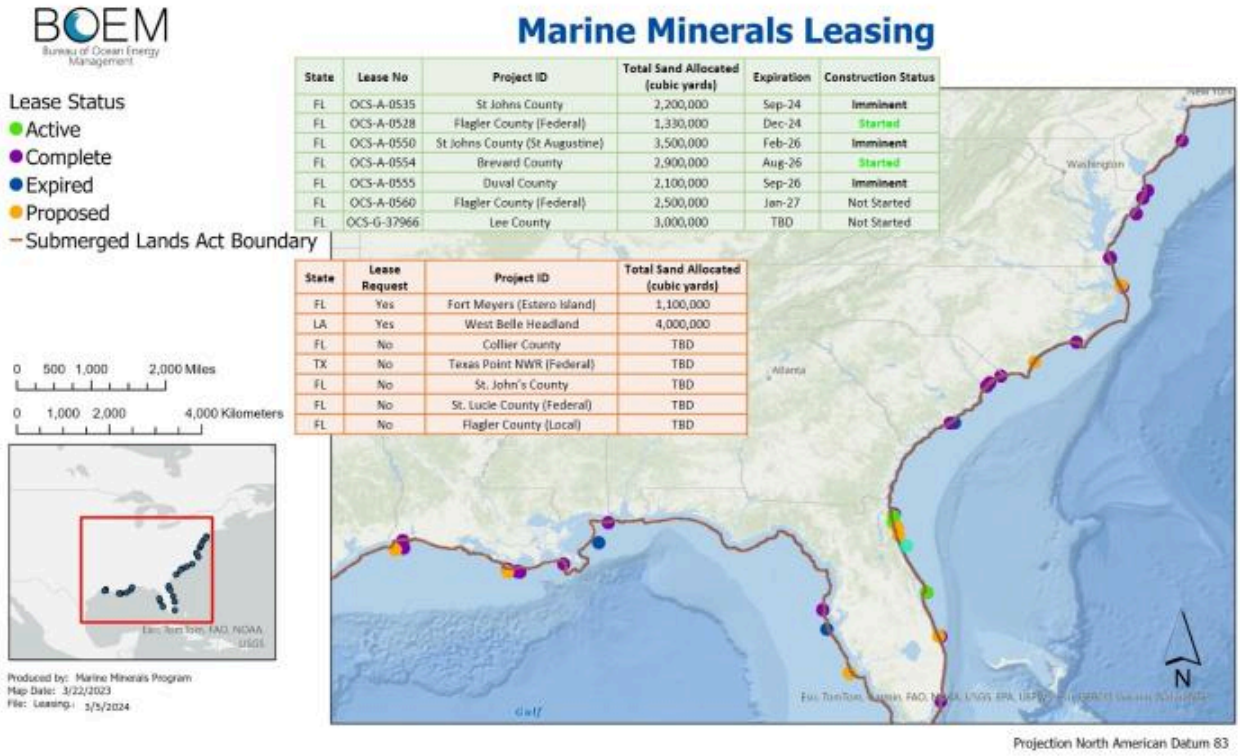


Coastal Resilience and Stewardship Mission

- Infrastructure protection
- Ecosystem restoration
- Habitat creation
- Resource sustainability

BOEM Marine Minerals Program Areas Where Dredging May Be Accessible Based on Depth (<50m)

Most BOEM leased borrow areas are 3-9 nautical miles off the Atlantic and Gulf of Mexico coastlines



State	Lease No	Project ID	Total Sand Allocated (cubic yards)	Expiration	Construction Status
FL	OCS-A-0535	St Johns County	2,200,000	Sep-24	Imminent
FL	OCS-A-0528	Flagler County (Federal)	1,330,000	Dec-24	Started
FL	OCS-A-0550	St Johns County (St Augustine)	3,500,000	Feb-26	Imminent
FL	OCS-A-0554	Brevard County	2,900,000	Aug-26	Started
FL	OCS-A-0555	Duval County	2,100,000	Sep-26	Imminent
FL	OCS-A-0560	Flagler County (Federal)	2,500,000	Jan-27	Not Started
FL	OCS-G-37966	Lee County	3,000,000	TBD	Not Started

State	Lease Request	Project ID	Total Sand Allocated (cubic yards)
FL	Yes	Fort Meyers (Estero Island)	1,100,000
LA	Yes	West Belle Headland	4,000,000
FL	No	Collier County	TBD
TX	No	Texas Point NWR (Federal)	TBD
FL	No	St. John's County	TBD
FL	No	St. Lucie County (Federal)	TBD
FL	No	Flagler County (Local)	TBD

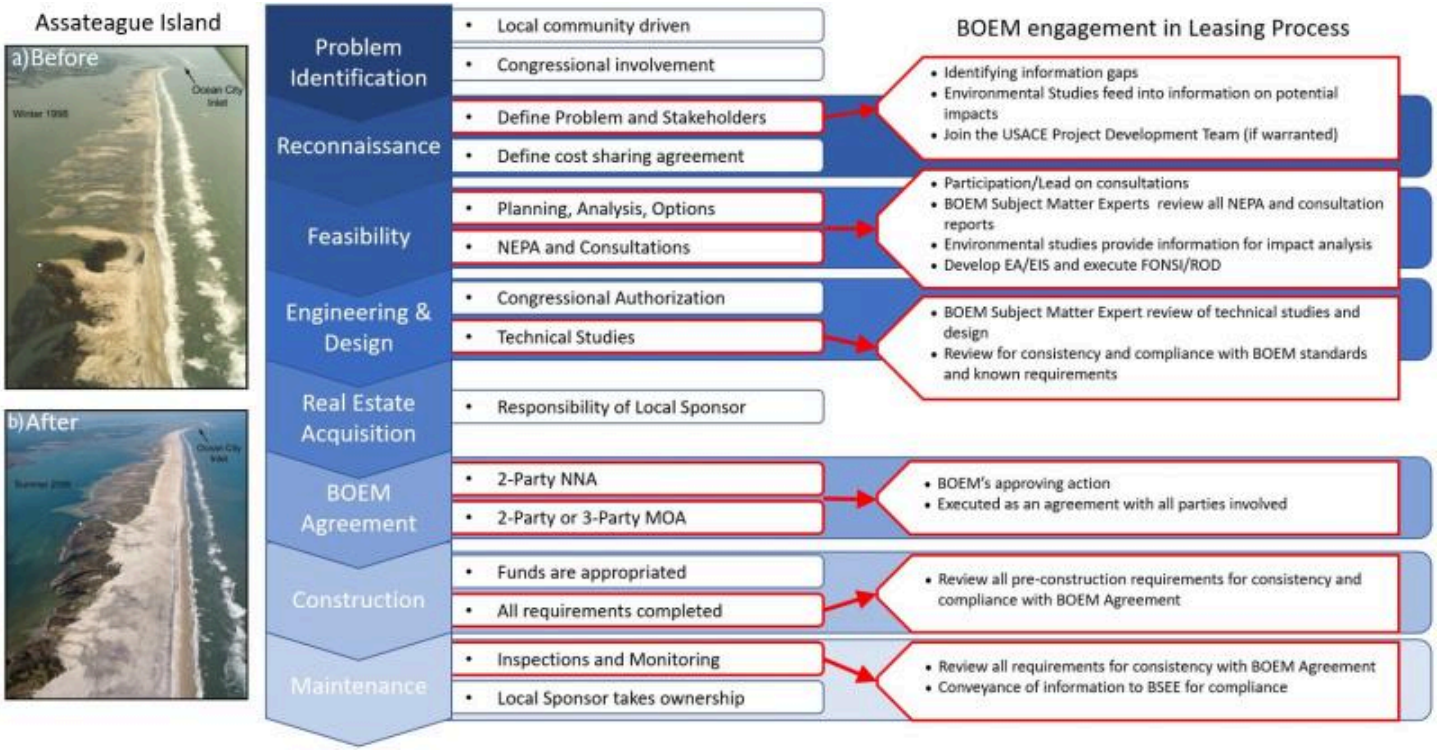
Construction Status

7 Active

57 Complete

6 Expired

7 Proposed



Project Coordination

BOEM is a partnering agency and not the lead on projects.

- Leasing authority - **Section 8(k)** of OCSLA
  - If used for shore protection, beach or wetlands restoration projects
  - Undertaken by Federal, State or local agencies, or
  - For use in construction projects funded in whole or in part by or authorized by the Federal Government.
- Negotiate agreements with federal partners (e.g., U.S. Army Corps of Engineers) and localities (e.g., counties)

Leasing Dashboard on the Marine Minerals Information System (MMIS)

What is increasing demand for leases on the OCS?

- Increased storm activity
- Diminishing resources in nearshore areas
- Adds to nearshore sediment budget
- Wave climate minimally affected
- Improves sustainability, including geologic and geomorphic function

Trailing Suction Hopper Dredge

- Self-propelled
- The dredge intake is dragged along the seafloor (vacuum), no anchoring needed
- Sediment is stored in the hopper (hull) of the vessel
- Transport distance ~3-30 miles from the borrow area to the designated offload site
- Dredge depths typically 30' - 80'
- Hopper capacity ranges from ~3k CY to 15k CY
- More commonly used for OCS projects as they are typically ocean certified

Cutterhead Suction Dredge

- Not self-propelled
- Utilizes tugs and an anchoring system to swing (windshield wiper) over the borrow area
- The intake point is wedged into sediment and spins to mobilize the sediments.
- Directly pumps to the beach via pipeline or pumped into scows for transportation
- Line lengths typically less than 4 miles
- 10'- 60' dredge depth
- Less commonly used for projects on the OCS as it is not typically ocean certified

Example 1: Wallops Island, Virginia

Project Purpose: To provide OCS sediment for storm protection and erosion control and critical infrastructure protection

Before and **After Wallops Island** Images (Left to Right)

Image Credit: NASA/Patrick Henderson

Example 2: Caminada Headland, Louisiana

Project Purpose: To provide OCS sediment in order to protect and preserve the geomorphic integrity and function of the barrier shoreline of the Caminada Headland by:

- Protecting and sustaining unique coastal habitats and threatened and endangered species.
- Reducing wave and tidal energy in back-barrier and interior wetland environments and maintaining estuarine salinity gradients.
- Providing a sediment source to sustain barrier islands down-drift (east and west) of the Headland.

Before and **After Caminada Headland** Images (Left to Right)

Photo Credit: Coastal Protection and Restoration Authority for Louisiana (CPRA)

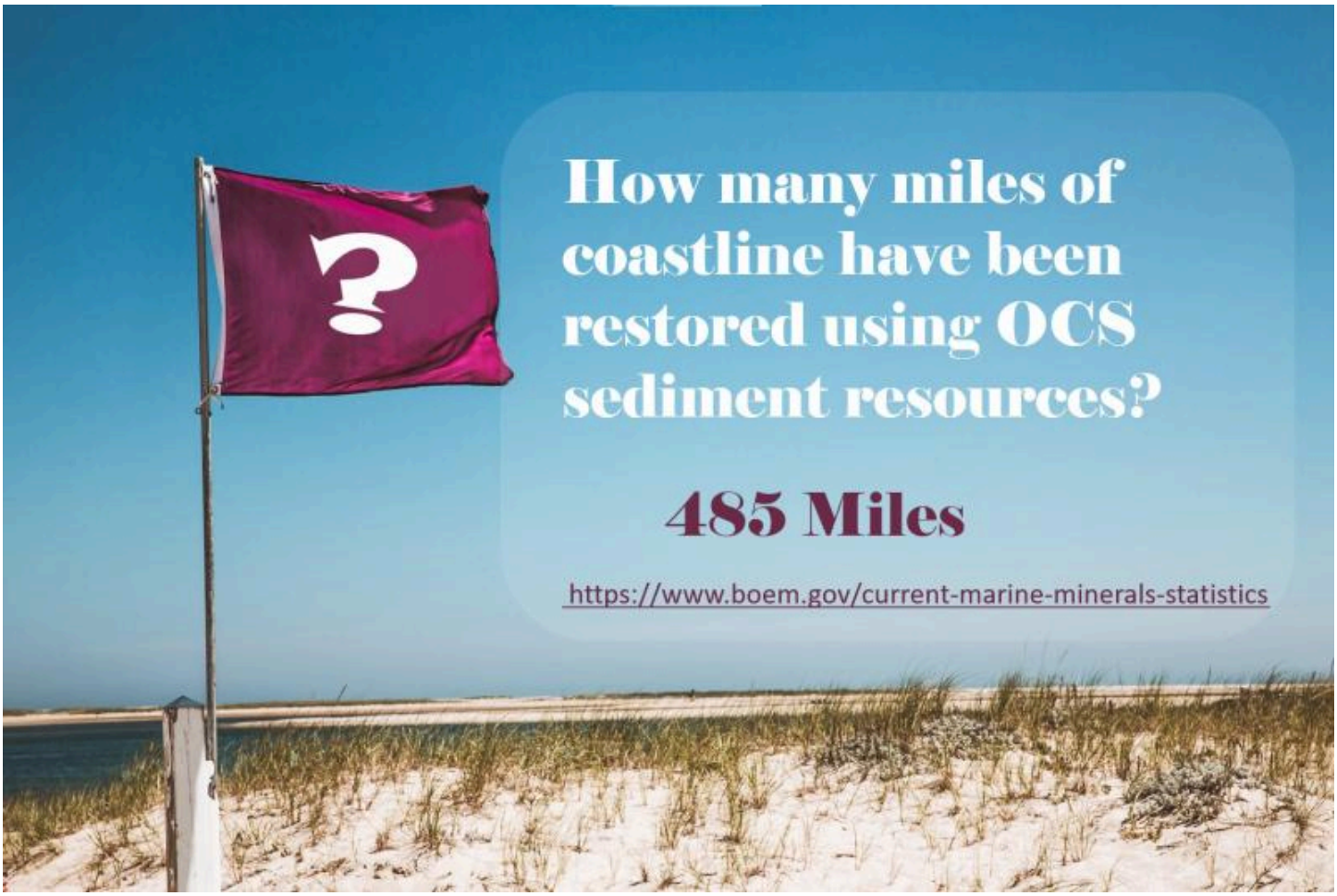
Resource Evaluation

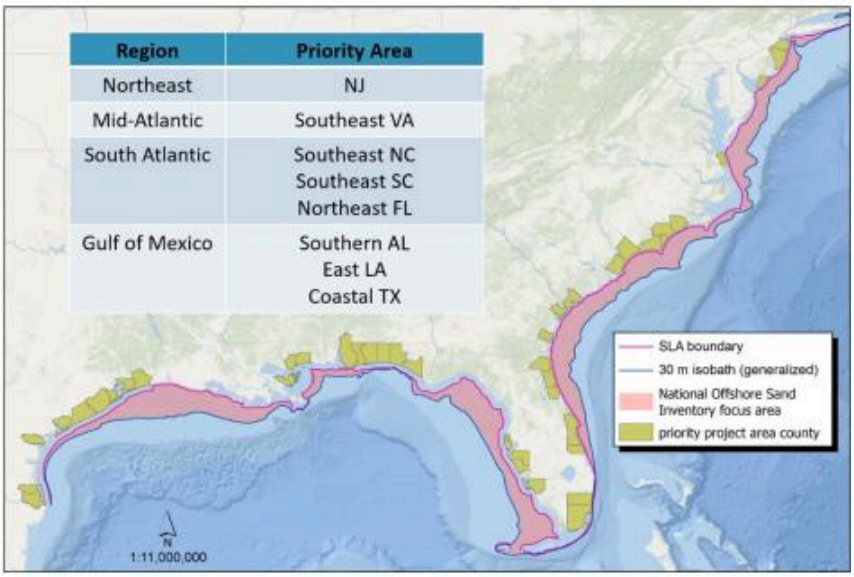

Which state has used the largest volume of sand from the OCS?
Louisiana


Which state has the most leases?


Which state has the most leases?
Florida


How many miles of coastline have been restored using OCS sediment resources?


How many miles of coastline have been restored using OCS sediment resources?
485 Miles
https://www.boem.gov/current-marine-minerals-statistics



National Offshore Sand Inventory

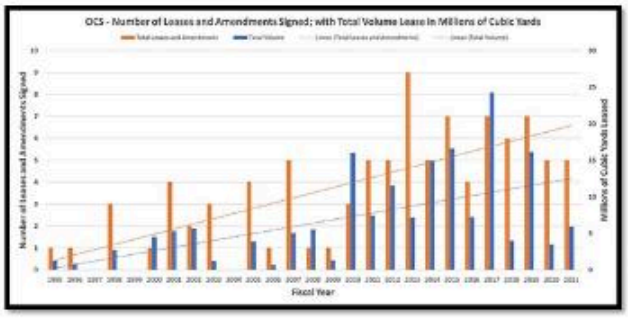
Vision

NOSI is the first resource consulted for offshore sediment management information.

Mission

To provide data, project insights, and analysis to coastal and marine researchers, engineers; and local, state, federal, and tribal stakeholders; and decision makers for coastal resilience and environmental and resource stewardship.

> **Investments** in NOSI **protect billions** in national resources and **reduce** emergency response time.



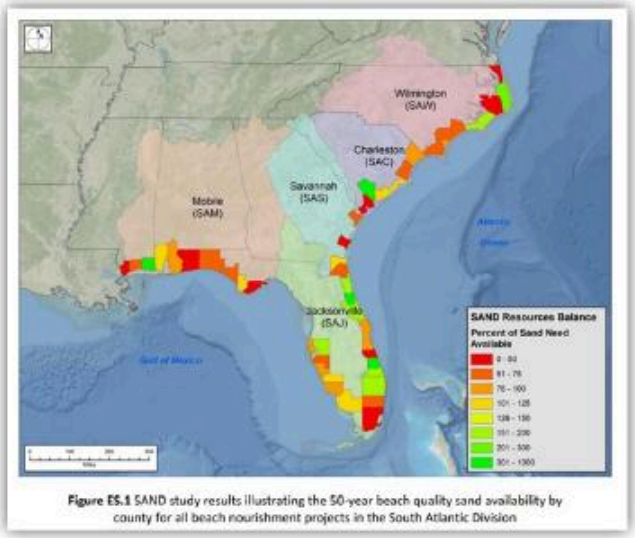
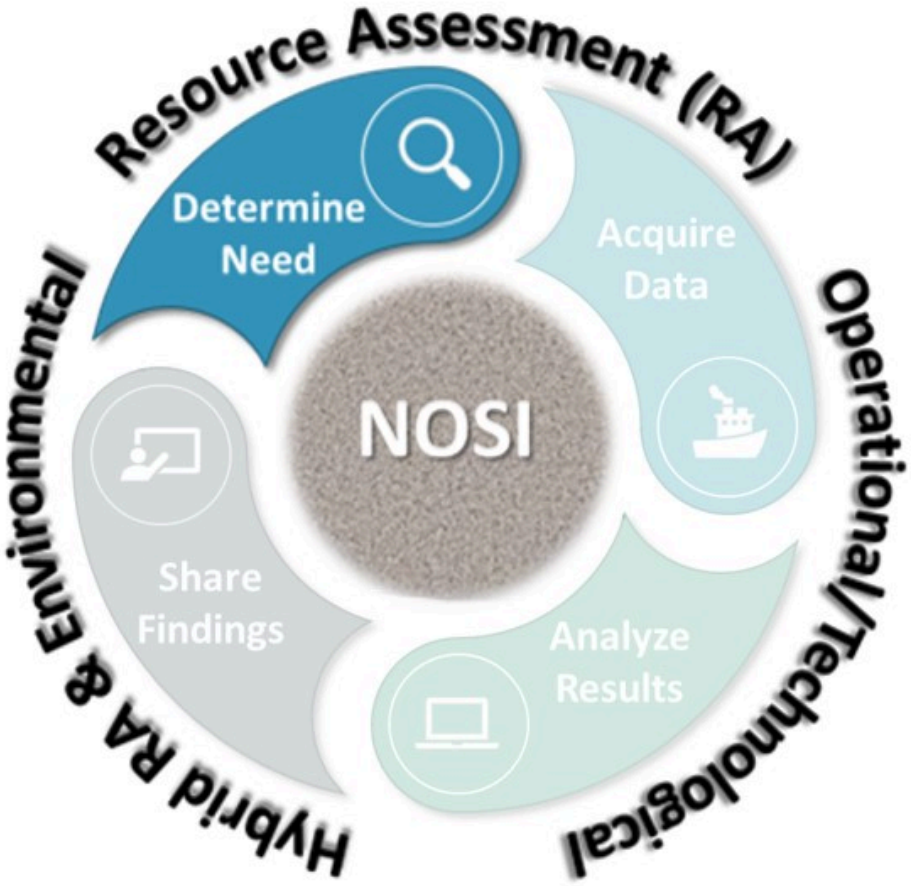
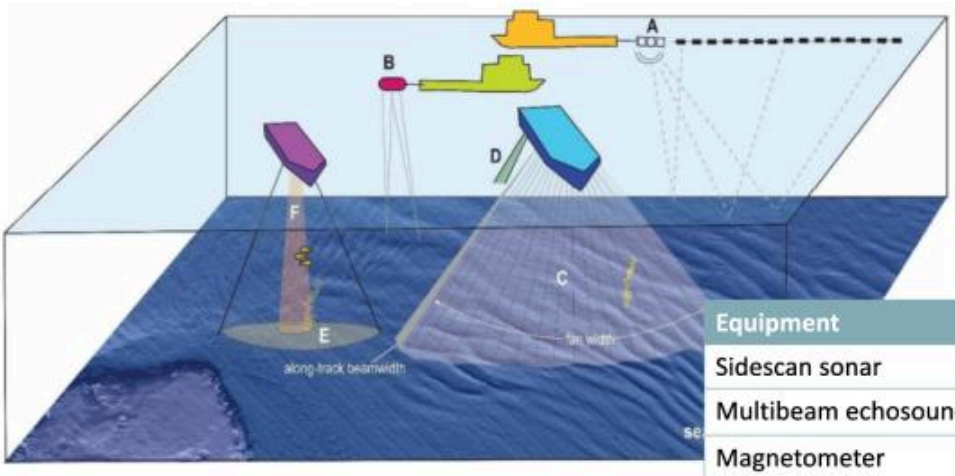


Figure ES.1 SAND study results illustrating the 50-year beach quality sand availability by county for all beach nourishment projects in the South Atlantic Division

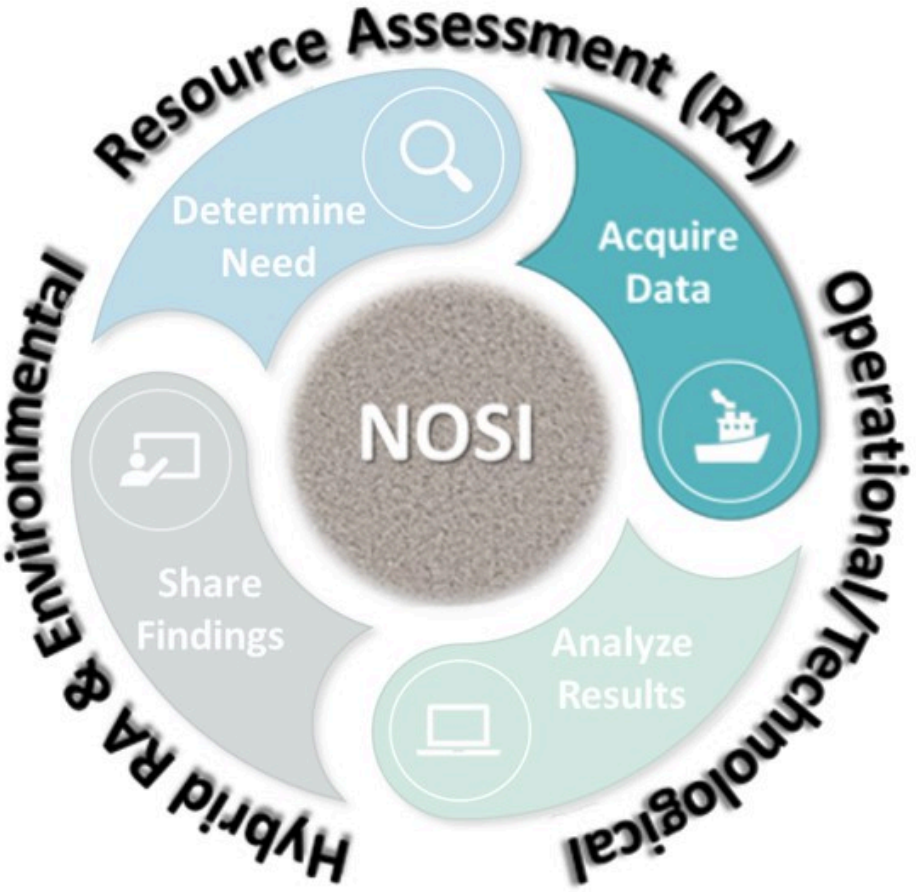


Increasing Demand, Where is the Sand?

An important step in NOSI is determining need at local and regional scales. Considerations include identification of data gaps, anticipated need, identified low or limited resources, environmental trends, and accessibility, among others.



Equipment	What We Learn
Sidescan sonar	Surface sediment/fish
Multibeam echosounder (C)	Bottom elevation
Magnetometer	Cultural resources/MEC
Chirp/boomer (A/B/E)	Subbottom sediment type
Benthic grabs	Benthos/surface sediment
Vibracores	Subbottom stratigraphy



Acquiring Data

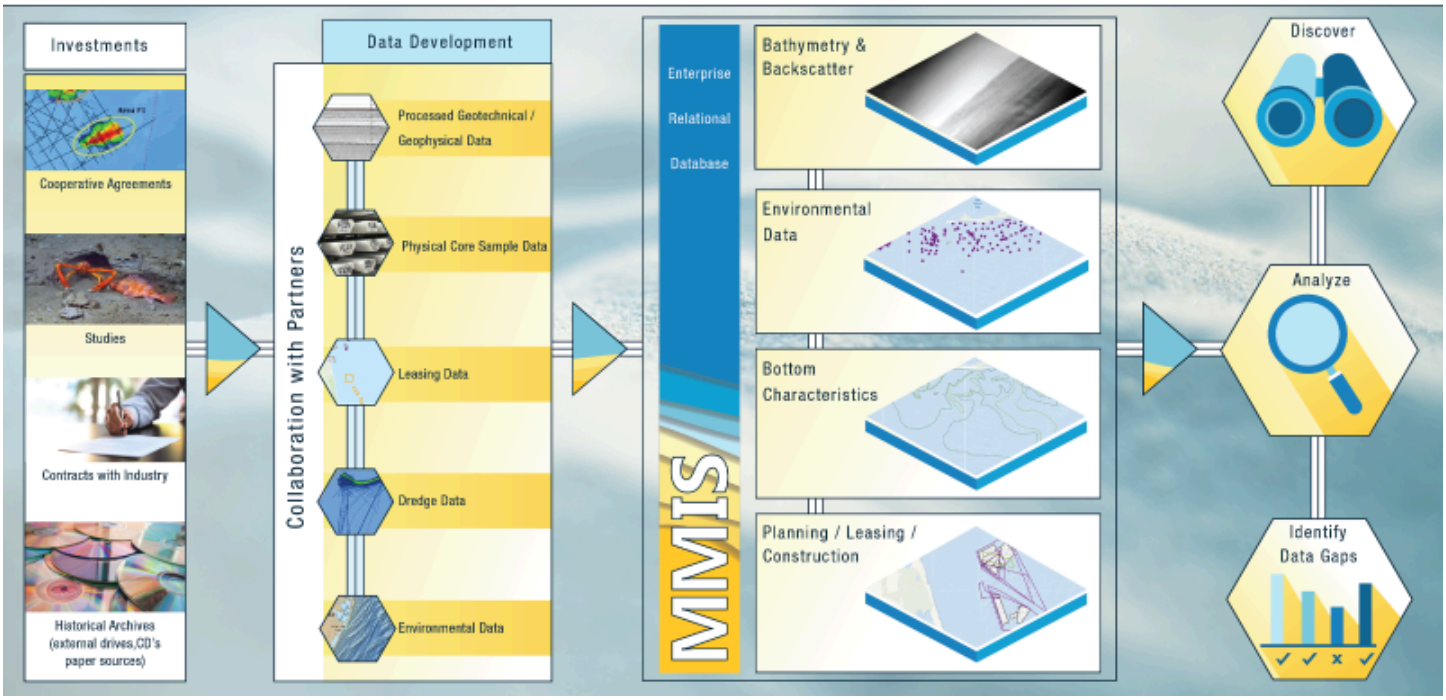
Once needs are identified, it is critical to characterize what resources may or may not be available in an area.

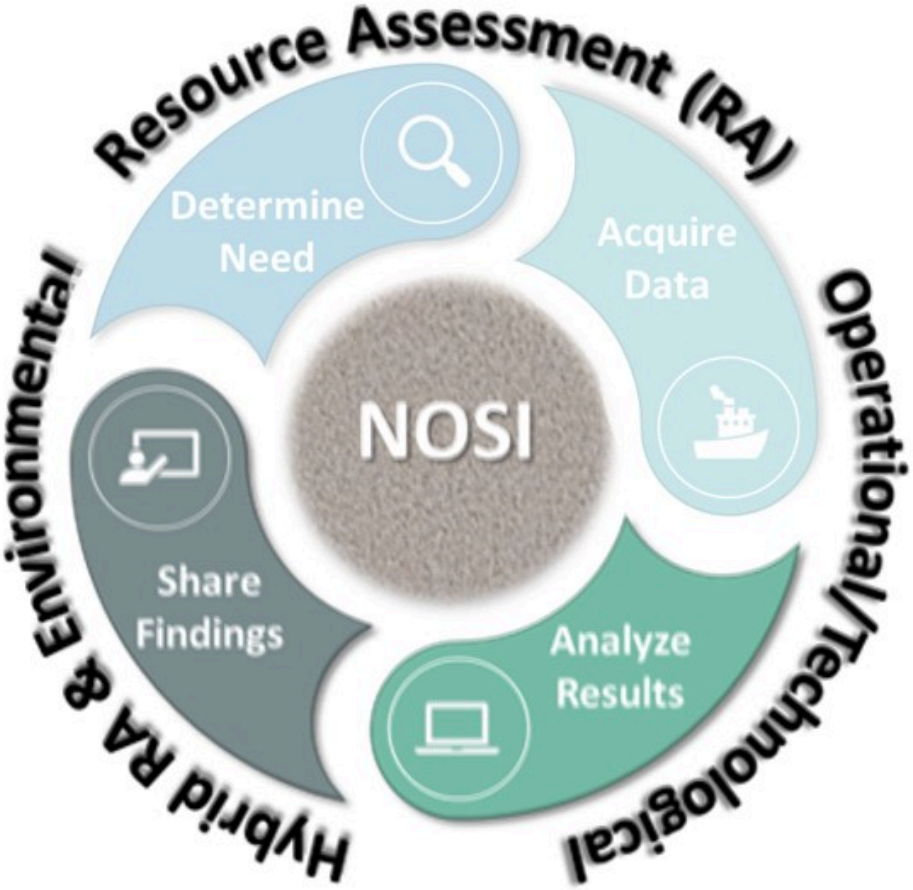
1. Geophysical Surveys
2. Geological Surveys

What is Marine Minerals Information System MMIS?

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

BOEM Bureau of Ocean Energy Management

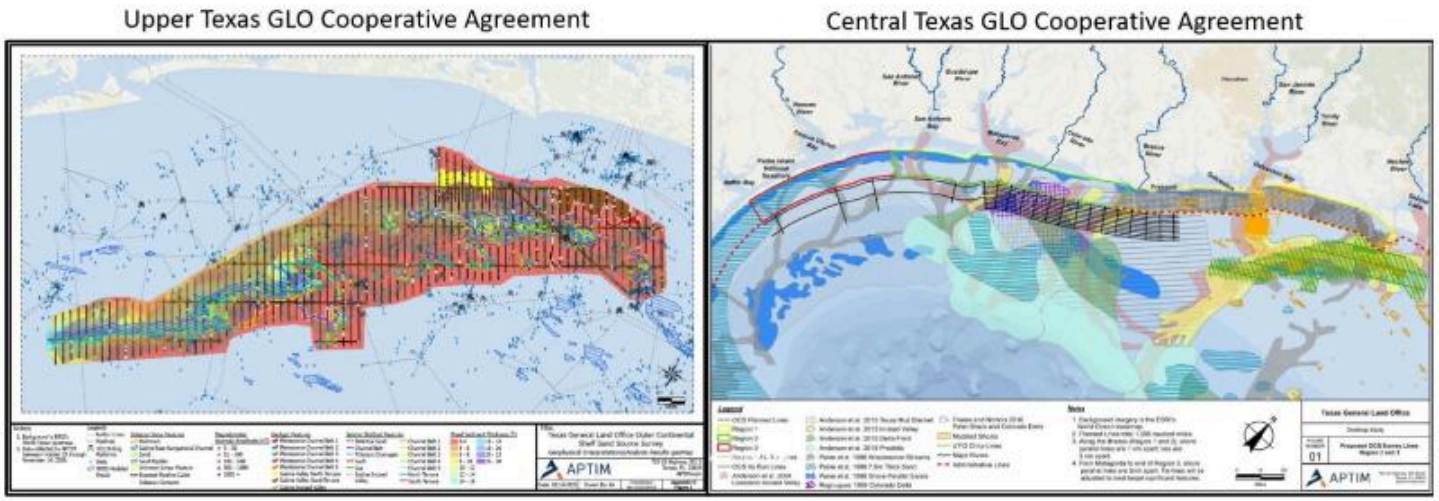




Once data is collected, the results can be analyzed, and findings shared by utilizing the **Marine Minerals Information System** (MMIS). This in turn informs identification of needs and the NOSI process repeats.

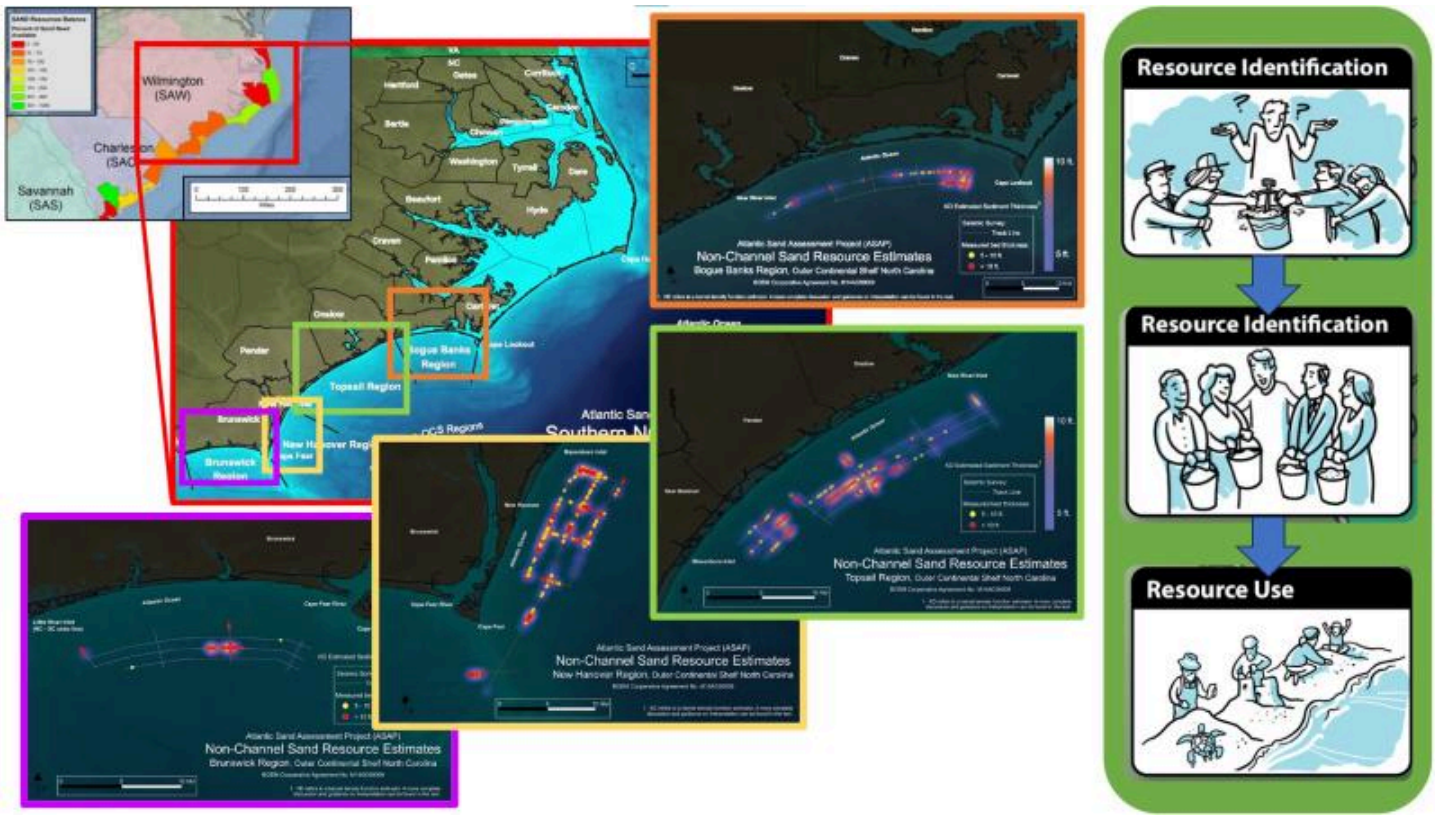
Key MMIS Features:

- Publicly accessible
- Interactive online support tool with GIS-mapping capabilities
- 30+ years of data from federal, state and local government, academia and other entities
- Links to environmental studies and assessments



Example 3: Upper and Central Texas OCS Shelf

- Major portions of Texas OCS Shelf lacking data
- Increasing storm frequency has triggered extensive Coastal resilience planning
- BOEM is working in coordination with the State and USACE to collect data to inform planning



Example 4: North Carolina OCS

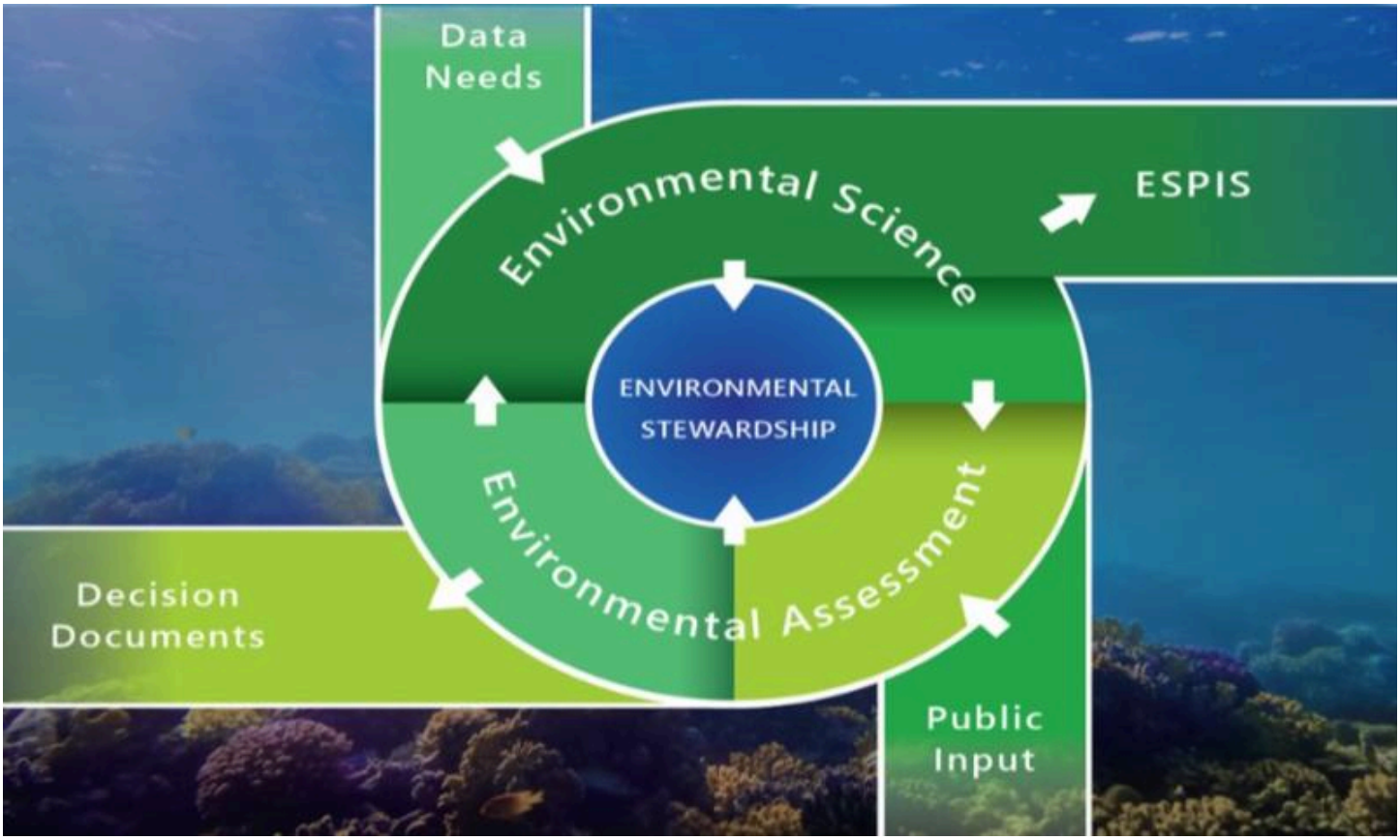
Offshore North Carolina, in comparison to Texas, has some identified resources but needs are higher than the resources available.

- Many projects are anticipated
- Limited sand resources identified
- Many stakeholders involved with different needs, timelines, and limitations
- Not all sites currently identified are viable and accessible
- Regional planning is critical

Proactive sediment management: identify, monitor, and report sediment resources to support the nations long-term coastal resiliency needs and for transparent, science-based and data-driven decision-making.

Environmental Stewardship


The BOEM Marine Minerals Program uses science to facilitate use of resources, assess impacts, resolve conflicts, and inform decisions.
☑ True
☐ False



Environmental Stewardship

The Marine Minerals Program funds environmental research to:

- Identify and facilitate the use of resources
- Ensure understanding of how decisions impact the environment
- Resolve conflicts between resource use and the environment

Goal: Assess and understand possible impacts, so effective and relevant mitigation measures can be applied.

Rigorous Study Selection Process:

- Identify topics of study
- Marine Minerals Program works together to refine study ideas and determine priorities
- Various procurement options:
  - Interagency agreements (e.g. Partnership with U.S. Geological Survey)
  - Cooperative agreements (e.g. Partnership with University)
  - Competitive contracts
- Use science to inform decisions and environmental compliance

Environmental Compliance

Study results are used to develop or recommend appropriate mitigation or monitoring techniques to avoid, alleviate, or prevent adverse environmental impacts.

Example: A study may be proposed to identify an endangered species use of a shoal. If it is identified that the species is not present in a particular season or area, those factors can be included in the project requirements.

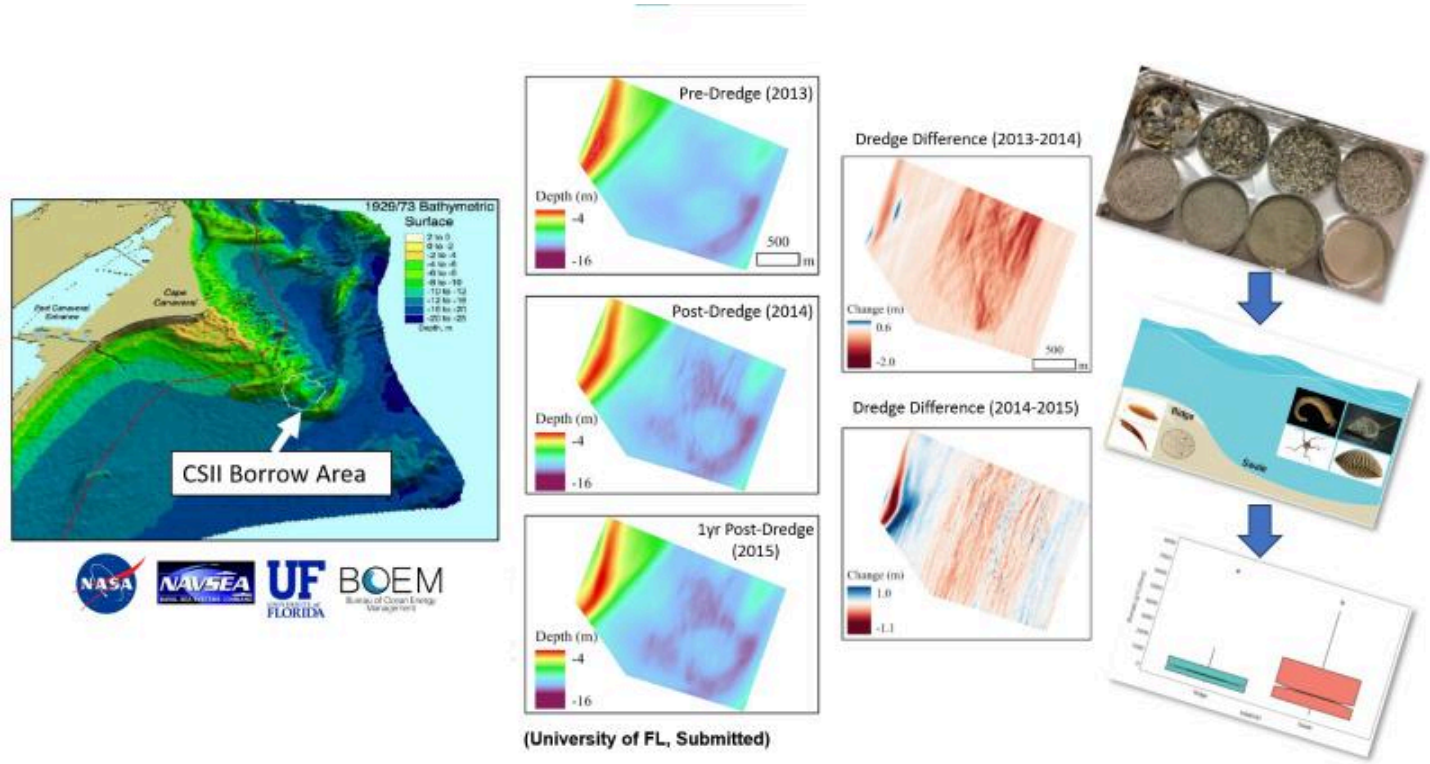
Environmental Study Research Disciplines

Social Science and Economics	The study of human societal relationships and the study of the production, consumption, and transfer of wealth
Air Quality	The condition of the air within our surroundings and the impacts to this air from dredging operations
Habitat and Ecology	The natural home or environment of a plant, animal, or other organism and the interaction of an organism with this environment
Marine Mammals and Protected Species	The study of marine mammals or other species protected under the Endangered Species Act
Fates and Effects	The study of the potential impacts on marine life as a consequence of dredging
Physical Sciences/Modeling	The potential for alteration in the local wave field and increased wave action following dredging and any adverse localized changes in erosional patterns and longshore coastal transport
Cultural Resources	Studies that document the physical evidence and places of past human activity and examine potential impacts to them from MMP activities. Cultural resources include sites, structures, objects, and landscapes, or natural features of significance to a group of people traditionally associated with it.

Environmental Studies

Whale Fluke, Duval County, FL (Florida Fish and Wildlife Commission)

- Publications on BOEM website: https://esp-boem.hub.arcgis.com/

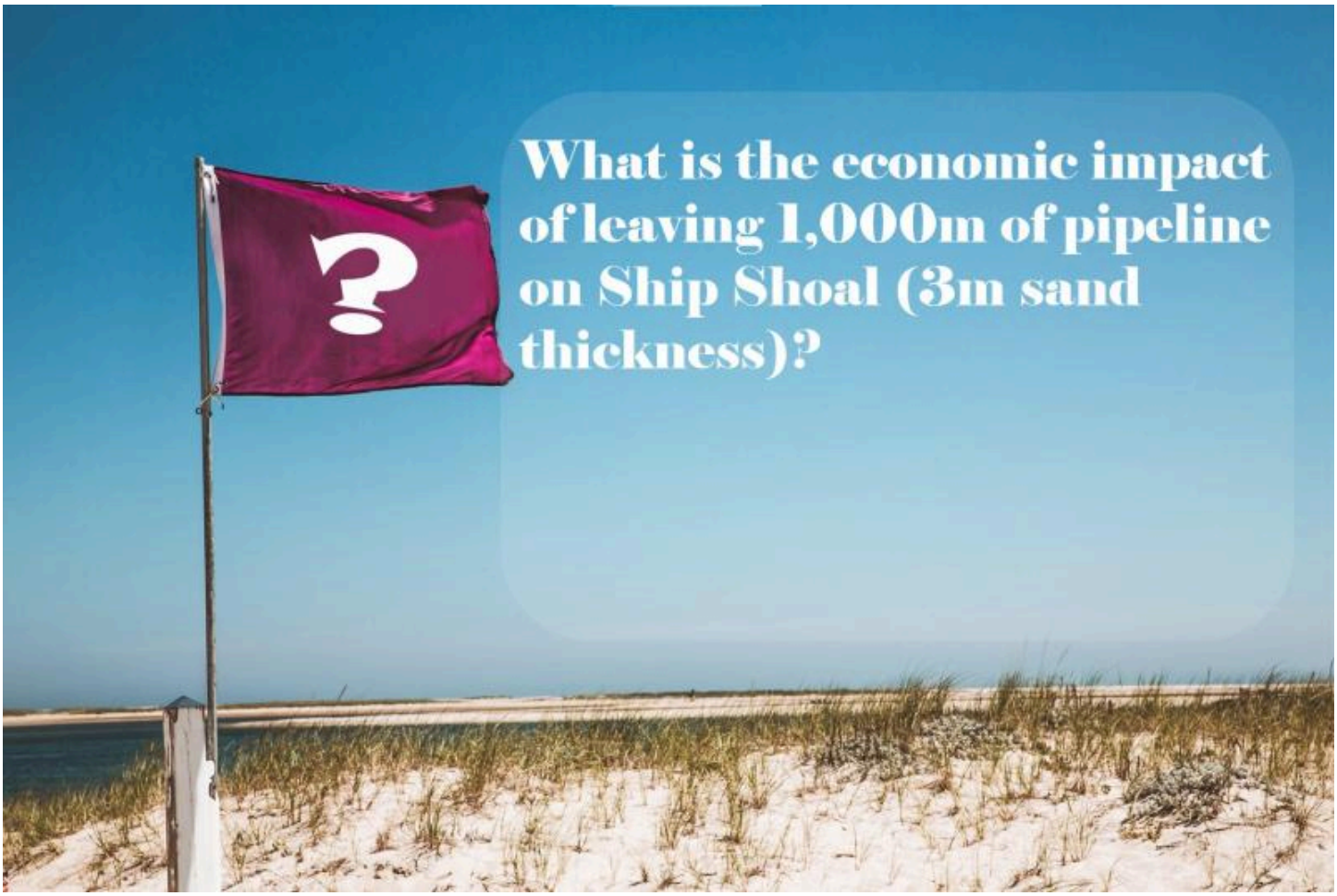


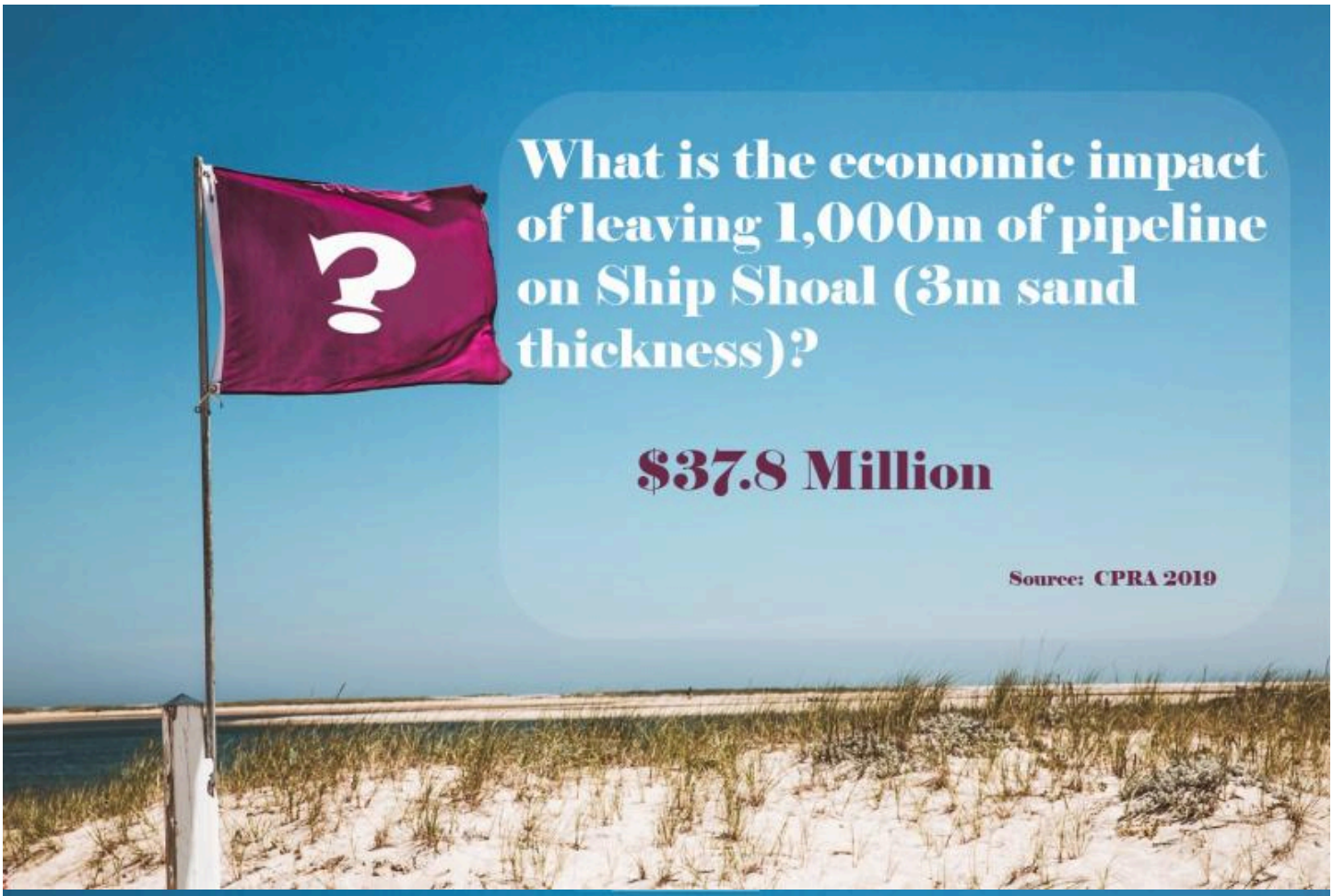
Example 5: Ecological Function and Recovery of Sand Shoals Following Repeat Dredge Events

Study Objective: Understand the potential impacts and recovery following dredging of a shoal ecosystem by monitoring various ecosystem components.

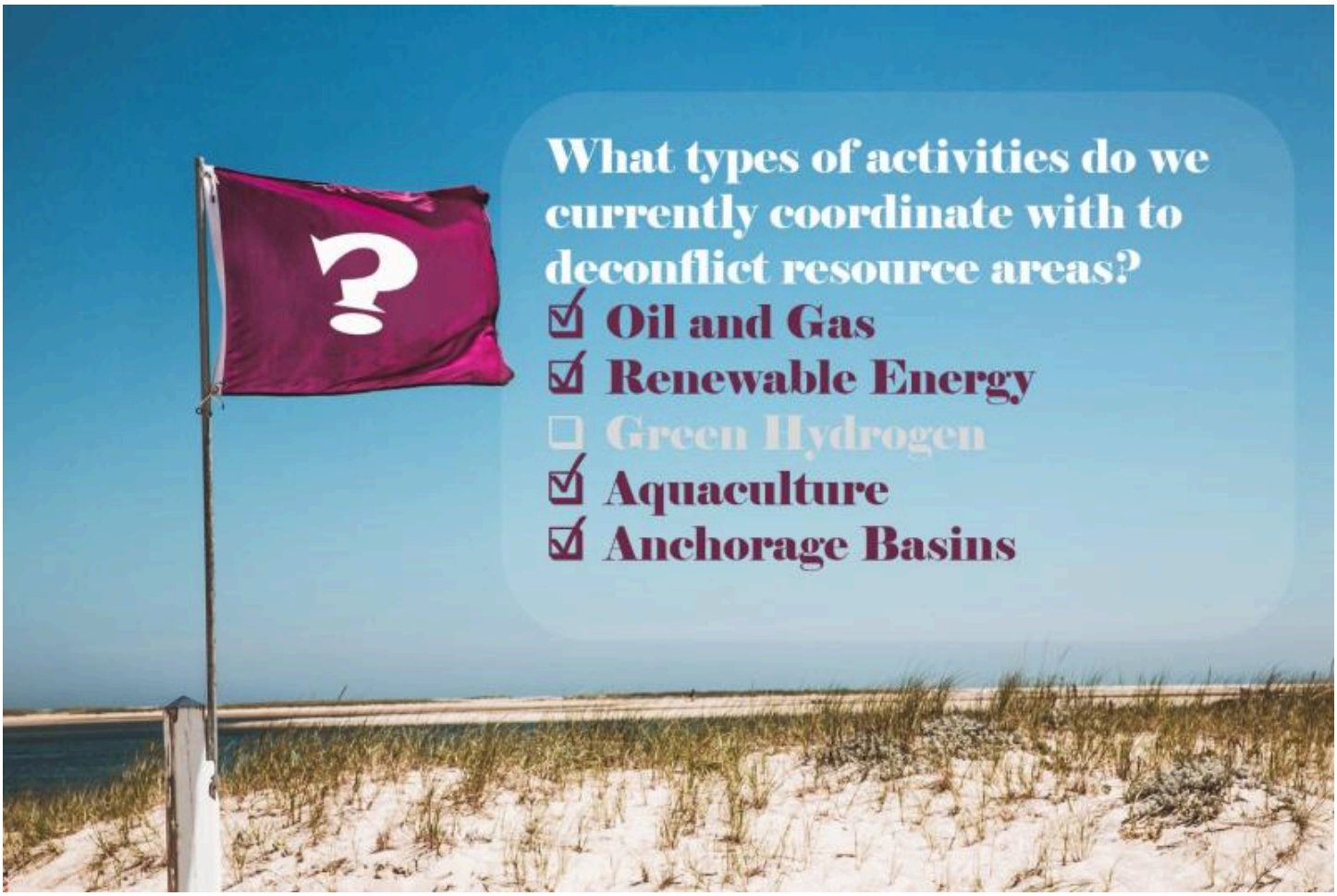
These monitoring studies tell us if there are changes in the composition and abundance of any of the biological groups due to the impacts of dredging.

Multiple Ocean Use




What is the economic impact of leaving 1,000m of pipeline on Ship Shoal (3m sand thickness)?
$37.8 Million
Source: CPRA 2019


What types of activities do we currently coordinate with to deconflict resource areas?
Oil and Gas
Renewable Energy
Green Hydrogen
Aquaculture
Anchorage Basins


What types of activities do we currently coordinate with to deconflict resource areas?
☑ Oil and Gas
☑ Renewable Energy
☐ Green Hydrogen
☑ Aquaculture
☑ Anchorage Basins

Partnerships are Essential

- Leverage investments
- Locate sand resources
- Manage conflicts
- Execute research
- Exchange information

Who does BOEM MMP Partner with?

- Federal, State, Counties
- Tribes
- Universities
- National Organizations
- Regional planning bodies

Coordination, collaboration, and engagement with Federal, State, and other Stakeholders enable us to locate and characterize additional resource areas, reduce and mitigate

conflicts and comprehensively manage these resources in a manner that facilitates long-term access and sustainability.

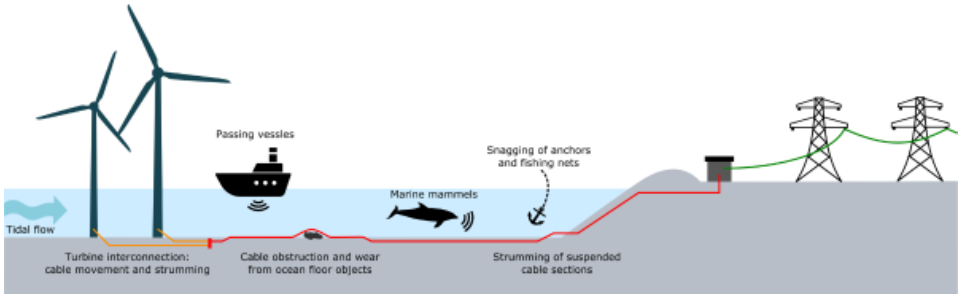
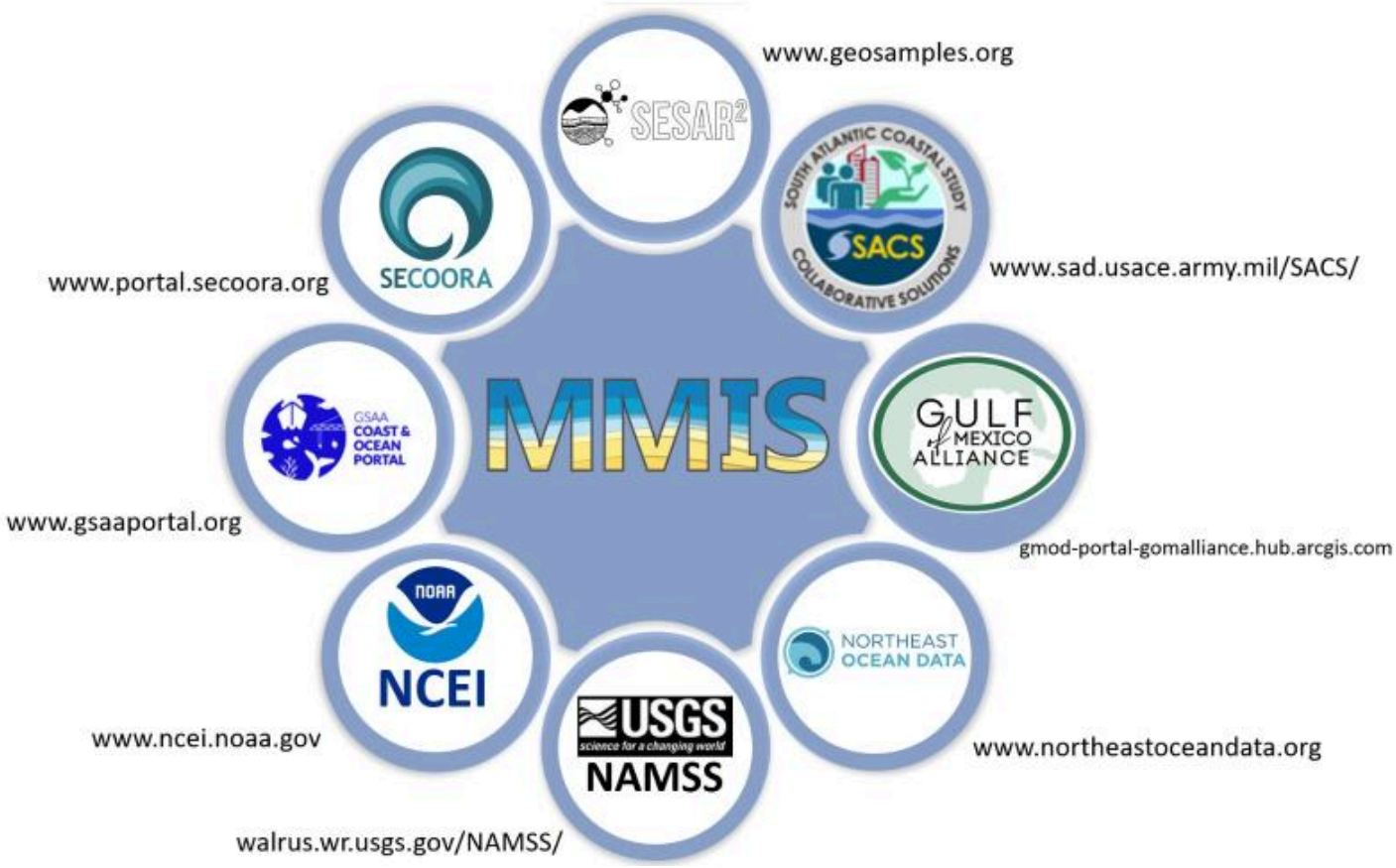
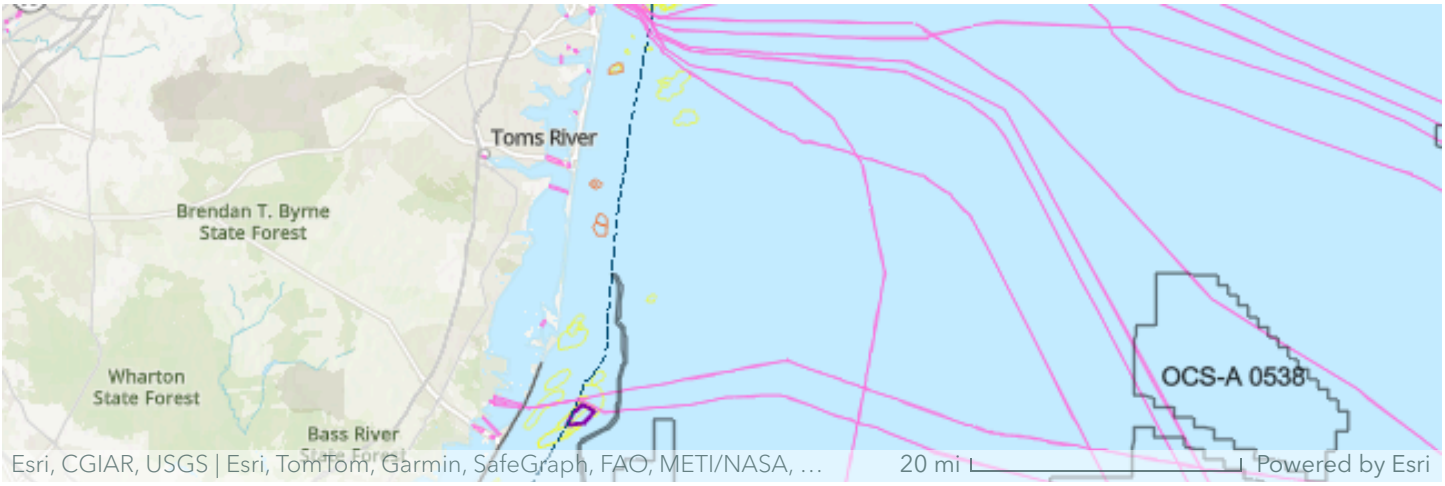


Photo Credit: Fraunhofer





Working Together

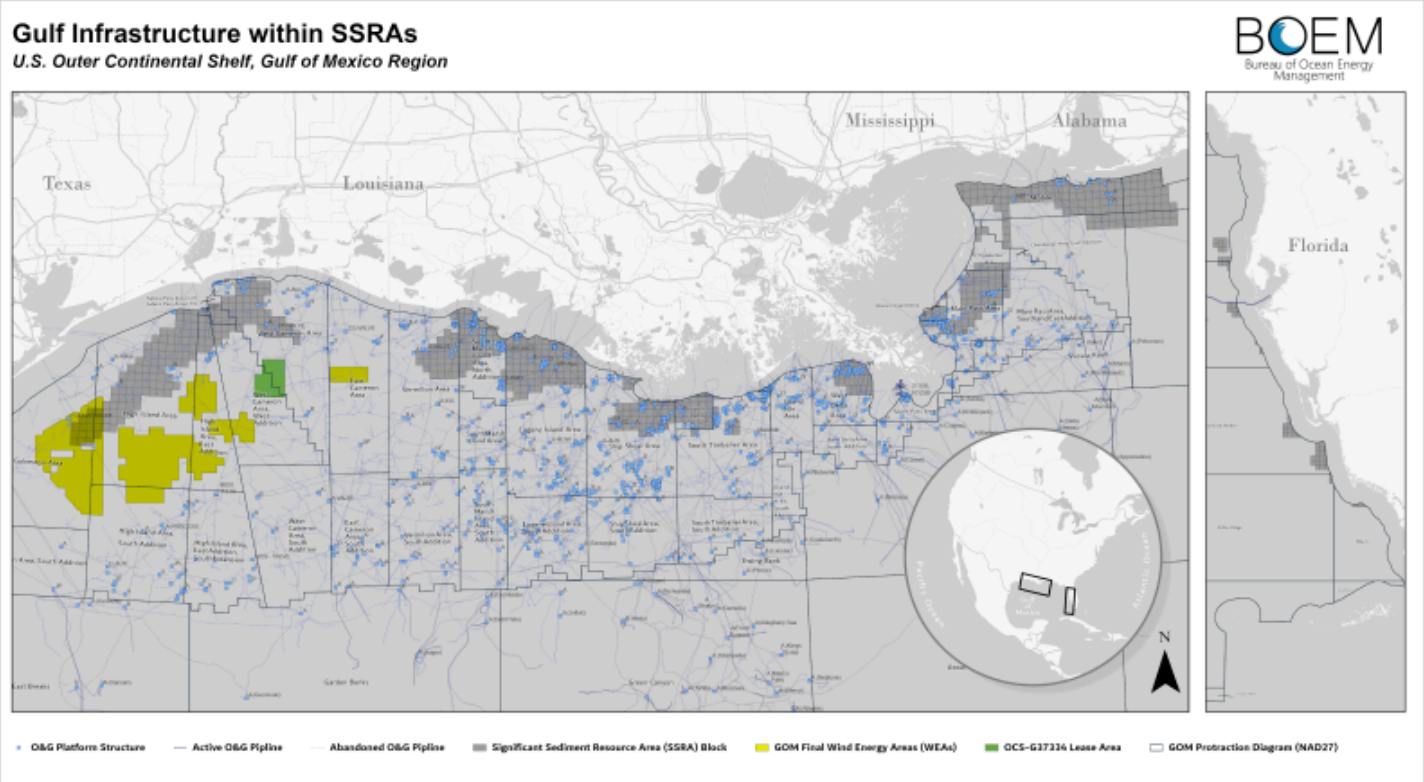
BOEM and partners taking a regional approach to managing offshore sand resources to inform future project planning and to identify multiple-use conflicts

Coordination across industries:

- Oil and Gas
- Renewable (wind) Energy
- Carbon Sequestration
- Commercial Fishing
- Aquaculture

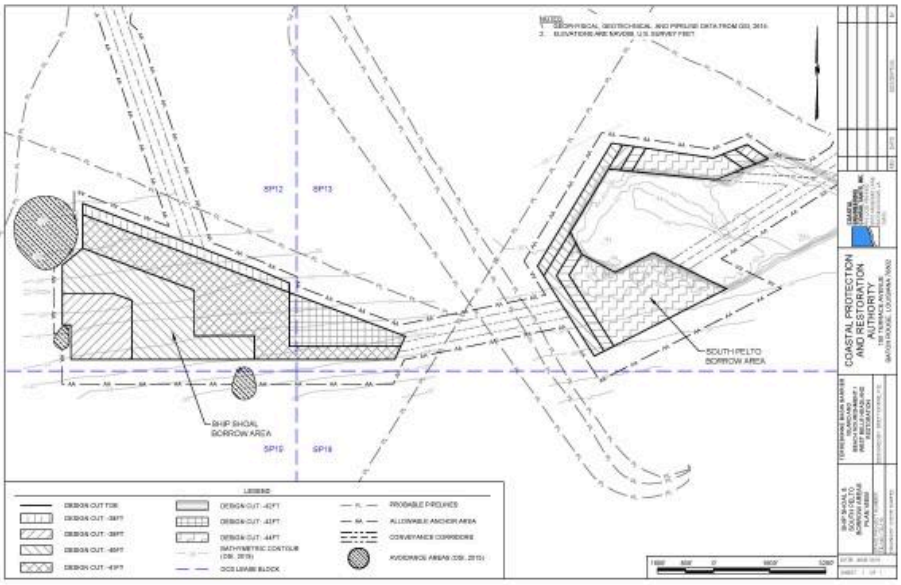
Requires:

- Quality geological, geophysical, and environmental data
- Structured data management to inform decisions
- Close coordination with State partners and other stakeholders



Example 6: A Busy Gulf of Mexico

- BOEM must proactively manage resources to ensure availability
- Every Gulf of Mexico Region OCS-identified borrow area has pipeline conflicts (usually multiple)
  - ~1,200 pipelines in Sediment Areas
- Oil and gas infrastructure obstructs access = higher costs to projects
- BOEM must proactively manage resources to ensure availability


SP12
SP13
SP15
SP16
SHIP SHOAL BORROW AREA
SOUTH PELTO BORROW AREA
COASTAL PROTECTION AND RESTORATION AUTHORITY

Future


Partnerships
Resource Stewardship
Informed Decision Making
Coastal Resilience
Environmental Stewardship

Marine Minerals Program: Small Program, Large Impact

- Promote resilience along our Nation's coasts
- Protect national coastal infrastructure from storm damage
- Respond to stronger and more frequent storms
- Manage multiple-use conflicts
- Develop a greater understanding of offshore critical mineral resources and characterize baseline environmental conditions
- Adapt to climate change and sea level rise

Credits

Speakers: Jeffrey Reidenauer | Victoria Brady | Jessica Mallindine

Story Map Product: Lora Turner | Ariel Kay | Victoria Brady | Jessica Mallindine