



Florida Offshore Sand Management Working Group

Jacksonville, Florida

February 2, 2016

1:00 p.m. to 5:00 p.m.

Meeting Objectives

- Provide updates on BOEM Marine Mineral Program operations and current leases.
- Solicit input on future anticipated sand needs.
- Provide updates on efforts to evaluate sediment resources in federal water.
- Apprise stakeholders on where data on these resources are organized, maintained, and available.
- Identify and assess SW Florida and other statewide needs and challenges.



<i>Time</i>	<i>Discussion Topic</i>
1:00-1:10	Welcome & Introductions
1:10-1:55	MMP Overview and Projects
1:55-2:45	Resource Evaluation
2:45-3:00	Break
3:00-4:15	Data Repositories / Data Registry
4:15-4:50	Goals / Challenges
4:50-5:00	Wrap-up & Next Steps
5:00	Adjourn



Ground Rules

- “Honor” the agenda
- Participate actively and respectfully
- Focus comments and speak concisely
- Speak in order; facilitator will mind the queue
- Speak clearly into the microphone for those joining by phone/webinar
- Limit side conversations or take them outside
- Cell phones off/silent



Ground Rules for Webinar Participants

- Please select *6 or the mute button to mute your audio to the phone  
- **Please do not put the line on hold!**
- Click the “raise hand” icon in the top of the webinar window to enter the discussion queue; click again to lower your hand after speaking 
- You can also share questions using the chat pod in the bottom left of the webinar window
- Click the “full screen” button – top right of the presentation pod – to make the presentation bigger 

This call will be recorded for those unable to attend.



Introductions



- Recap
- **THANK YOU!**



AGENDA
Florida Offshore Sand Management Working Group
Bureau of Ocean Energy Management
Marine Minerals Program
1:00 - 5:00 p.m., Tuesday, February 2, 2016

OMNI JACKSONVILLE HOTEL
245 Water Street, Salon D
Jacksonville, FL 32202

The objectives of this meeting are to:

- Provide updates on BOEM Marine Mineral Program operations and current leases
- Solicit input on future anticipated sand needs
- Provide updates on efforts to evaluate sediment resources in federal water
- Apprise stakeholders on where data on these resources are organized, maintained, and available
- Identify and assess SW Florida and other statewide needs and challenges.

TIME	AGENDA ITEM
12:30-1:00 p.m.	Registration
1:00-1:10 p.m.	Welcome and Introductions BOEM MMP personnel introductions and overview of responsibilities, program history – Jeffrey Reidenauer, Ph.D., BOEM
1:10-1:55 p.m.	MMP Overview and Projects <ul style="list-style-type: none"> • Lease updates (active/ongoing lease updates, new lease requests, solicitation of input for future anticipated lease requests) – Paul Knorr, Ph.D., BOEM • Briefing on Jacksonville District USACE projects – Jason Engle, P.E., USACE • Environmental Studies update – Douglas Piatkowski, BOEM
1:55-2:45 p.m.	Resource Evaluation <ul style="list-style-type: none"> • Introduction – Leighann Brandt, P.G., BOEM • Florida co-op work update – Daniel C. Phelps, P.G., FGS • Atlantic Sand Assessment Project update – Beau Suthard, P.G., CB&I • Next steps - where we go from here
2:45-3:00 p.m.	Break
3:00-4:15 p.m.	Data Repositories / Data Registry <ul style="list-style-type: none"> • MMP-GIS - Lora Turner, BOEM • ROSSI Update - Jennifer Steele, Ph.D., FDEP • Marine Cadastre - Christine Taylor, BOEM (via webinar) • GeoESPIS Environmental Studies Program Information System - Jonathan Blythe, Ph.D., BOEM (via webinar)
4:15-4:50 p.m.	Goals / Challenges <ul style="list-style-type: none"> • Open floor discussion on regional sand source investigation needs for Southwest Florida <ul style="list-style-type: none"> -Introduction: Robert Brantly, P.E., FDEP • Open floor discussion of statewide needs/challenges
4:50-5:00 p.m.	Wrap Up & Next Steps
5:00 p.m.	Adjourn



Jeff Reidenauer, PhD
Chief, Marine Minerals Branch

Florida Sand Management Working Group Meeting

Jacksonville, FL

February 2, 2016



- Welcome
- MMP Staff
- MMP Roles and Responsibilities
- Past Meetings
- Current Meeting Objectives





The BOEM Environmental Studies Program and the NOAA Office of Coastal Management Collaborated on the Enhancement of the Environmental Studies Program Information System

BOEM Florida Offshore Sand Management Working Group Meeting
February 2, 2016

Jonathan Blythe

US DOI, Bureau of Ocean Energy Management

Outline for the presentation

1. Environmental Studies Program Introduction
2. Background on the system enhancements
3. Software development/ user requirements
4. Search tool application
5. Enhanced bibliographic and spatial info
6. Data hosting and services



Environmental Studies Program

Environmental Studies Program Mission:

To provide the information needed to identify, assess, and manage impacts from offshore energy and marine mineral exploration, development, and production activities on human, marine, and coastal environments.

Environmental science disciplines:

- Atmospheric Conditions and Meteorology
- Bathymetry and Seafloor topography
- Cryosphere
- Marine Biodiversity
- Marine Chemistry
- Marine Geology
- Physical Oceanography

Including Human Dimensions:

- Anthropogenic Properties
- Cultural, Heritage and Marine Archaeology
- Fisheries
- Socio-economic and Infrastructure





Environmental Studies Program

Environmental Studies Program Reports:

- The Environmental Studies Program Information System (ESPIS) provides access to scientific research funded through the Environmental Studies Program.
- There are ~3500 PDF reports in ESPIS documenting research spanning 40 years of the Environmental Studies Program.
- These include annual, interim, and final reports that document the results of scientific research efforts.

Environmental Studies Program

ESPIS enhancement project:

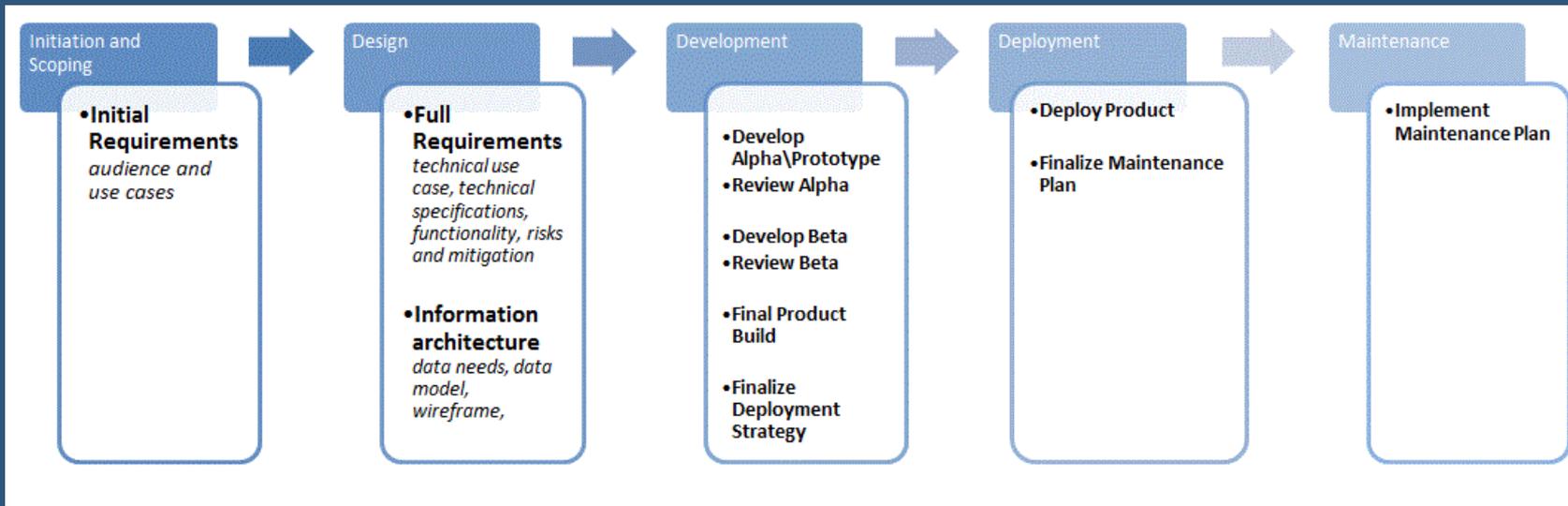
- Use latest technology to disseminate BOEM, ESP reports
- Enable Internet based search of geospatial bibliography
- Partnership with NOAA Office of Coastal Management to improve the support of Marine Spatial Planning and environmental consultations under NEPA.



ESPIS Enhancement

Enhanced ESPIS Search Tool goal – Simple map-based interface to enable spatial and text-based search of ESPIS studies.

Software Development Process



ESPIS Enhancement

➤ Search Tool Requirements

Geographic Searches:

- By county
- By state
- By planning areas
- By blocks
- By user defined polygon and points
- Ability to draw resulting polygons on map
- Ability to save searches

Text Searches:

- Make as Google like as possible
- Keyword and wildcards
- ID literature sources
- ID data sources
- Search by date
- Coast per study and cumulatively
- Search by institution
- Searching ESPIS pdfs

Filters:

- discipline
- date
- region
- Sort by start and completion

Future:

- Present citations in standard format
- Bibliography by geography
- Adding other spatial reference data

➤ Search Tool Tech Specs

- Interface – Angularjs and Leaflet
- Backend – Data services created with SQL Server via REST
- PDF Indexing – Foxit's iFilter

ESPIS Search Tool



[Learn More](#)

Explore more than 40 years of Environmental Studies Program
Ocean Science

FIND

ex: Marine Mammals

NEAR

ex: Gulf of Mexico

SEARCH

 Search using a map and other filters

BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT

APPLIED SCIENCE FOR INFORMED DECISION MAKING



ESPIS Search Tool



FIND

ex: Marine Mammals

NEAR

Florida



SHARE

HELP



YEAR

1972 - 2019



STATUS

SHOW ALL



REGION

SHOW ALL



RESET FILTERS

A partnership between



WE FOUND **609** RESULTS MATCHING YOUR SEARCH

SORT BY **START DATE NEW**



Using Dredge Plant Operational Data to Measure Cumulative Use and Cumulative Impacts

National 2016 - 2017 Information Management

This is an ongoing study.
Please see link under "BOEM Study Reports and Documents" for more information.



Delineating Areas of Enhanced Sediment Accumulation in the Northern Gulf of Mexico

Gulf of Mexico 2015 - 2017 Physical Oceanography

This is an ongoing study.
Please see link under "BOEM Study Reports and Documents" for more information.



Continued archiving of Outer Continental Shelf invertebrates by the Smithsonian Institution National Museum of Natural History

ESPIS Search Tool

ESPIS FIND

Map showing ASIA

YEAR

STATUS

REGION

RESET

A partnership with BOEM



SHARE HELP



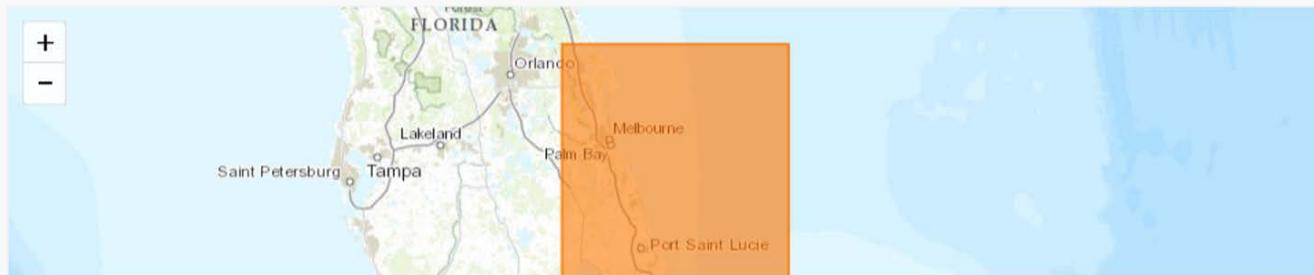
Environmental Surveys Of Potential Borrow Areas On The East Florida Shelf And The Environmental Implications Of Sand Removal For Coastal And Beach Restoration

Atlantic Mar 01, 2000 - Nov 30, 2002 Marine Minerals

ABSTRACT

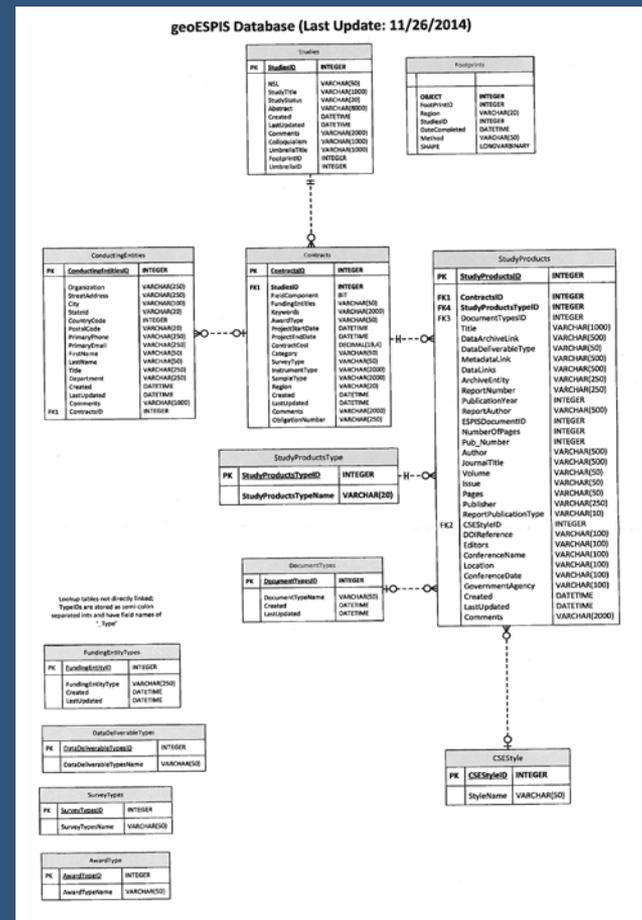
The Federal Outer Continental Shelf (OCS) contains large sand deposits that are expected to serve as long-term sources of borrow material for beach nourishment and coastal restoration projects. Potential for exploitation of these resources has grown rapidly in the last several years with identification of suitable sand resource areas in some OCS regions. The MMS is responsible for managing exploration and development of mineral resources on submerged Federal OCS lands. Among MMS missions is the need to develop approaches for managing the Nation's OCS mineral resources in an environmentally sound and safe manner. The MMS has been actively working with the State of Florida to identify and convey OCS sand for beach nourishment. The MMS initiated a Federal/State partnership in July 1994 with the State of Florida to identify offshore areas that may contain suitable sand resources. The primary purpose of this study was to address environmental concerns raised by the potential for dredging OCS sand offshore the central east coast of Florida and to document the findings in a technical report. Environmental information was collected and compiled to assist the MMS in making future decisions relative to negotiated agreements (non-competitive leases), NEPA documents (Environmental Assessments and Environmental Impact Statements), and other regulatory requirements concerning Federal sand deposits off Florida.

STUDY FOOTPRINT



Enhanced Data Model

- 6 – 9 months of end user engagement
- Significantly enhanced attribution for studies
- Hierarchical data model to capture variety of relationships in schema



Enhanced Cataloging



STUDY: Title, Abstract, FootprintID

CONTRACT: StudyID, FundingEntities, Keywords, AwardType, ProjectStartDate, ProjectEndDate, ContractCost, Category, SurveyType, InstrumentType, SampleType, Region, ObligationNo

PRODUCT: ContractID, DocumentTypesID, Title, DataArchiveLink, DataDeliverableType, MetadataLink, DataLink, ArchiveEntity, ReportNumber, PublicationYear, ReportAuthor, ESPISDocumentID, NumberOfPages, Pub_Number, Author, JournalTitle, Volume, Issue, Pages, Publisher, ReportPublicationType, CSEStyleID, DOIReference, Editors, ConferenceName, Location, ConferenceDate, Location, ConferenceName

Enhanced Spatial Referencing

FINAL REPORT

**OCS Study
MMS 2004-037**

**ENVIRONMENTAL SURVEYS OF POTENTIAL BORROW AREAS
ON THE CENTRAL EAST FLORIDA SHELF AND THE
ENVIRONMENTAL IMPLICATIONS OF SAND REMOVAL FOR
COASTAL AND BEACH RESTORATION**

Contract Number 1435-01-00-CT-31044



Prepared For:

MMS U.S. Department of the Interior
Minerals Management Service
Leasing Division
Marine Minerals Branch

Prepared By:

Continental Shelf Associates, Inc.
759 Parkway Street
Jupiter, Florida 33477

In Cooperation With:

Applied Coastal Research and Engineering, Inc.
Blary A. Vittor & Associates, Inc.
Florida Geological Survey

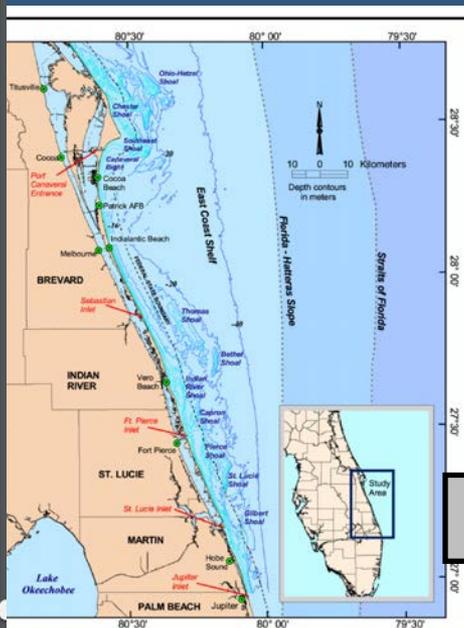


Figure 1-1. Central east Florida study area and key geographical features.

Environmental Surveys Of Potential Borrow Areas On The East Florida Shelf And The Environmental Implications Of Sand Removal For Coastal And Beach Restoration

Atlantic Mar 01, 2000 - Nov 30, 2002 Marine Minerals

ABSTRACT

The Federal Outer Continental Shelf (OCS) contains large sand deposits that are expected to serve as long-term sources of borrow material for beach nourishment and coastal restoration projects. Potential for exploitation of these resources has grown rapidly in the last several years with identification of suitable sand resource areas in some OCS regions. The MMS is responsible for managing exploration and development of mineral resources on submerged Federal OCS lands. Among MMS' missions it the need to develop approaches for managing the Nation's OCS mineral resources in an environmentally sound and safe manner. The MMS has been actively working with the State of Florida to identify and convey OCS sand for beach nourishment. The MMS initiated a Federal/State partnership in July 1994 with the State of Florida to identify offshore areas that may contain suitable sand resources. The primary purpose of this study was to address environmental concerns raised by the potential for dredging OCS sand offshore the central east coast of Florida and to document the findings in a technical report. Environmental information was collected and compiled to assist the MMS in making future decisions relative to negotiated agreements (non-competitive leases), NEPA documents (Environmental Assessments and Environmental Impact Statements), and other regulatory requirements concerning Federal sand deposits off Florida.

STUDY FOOTPRINT

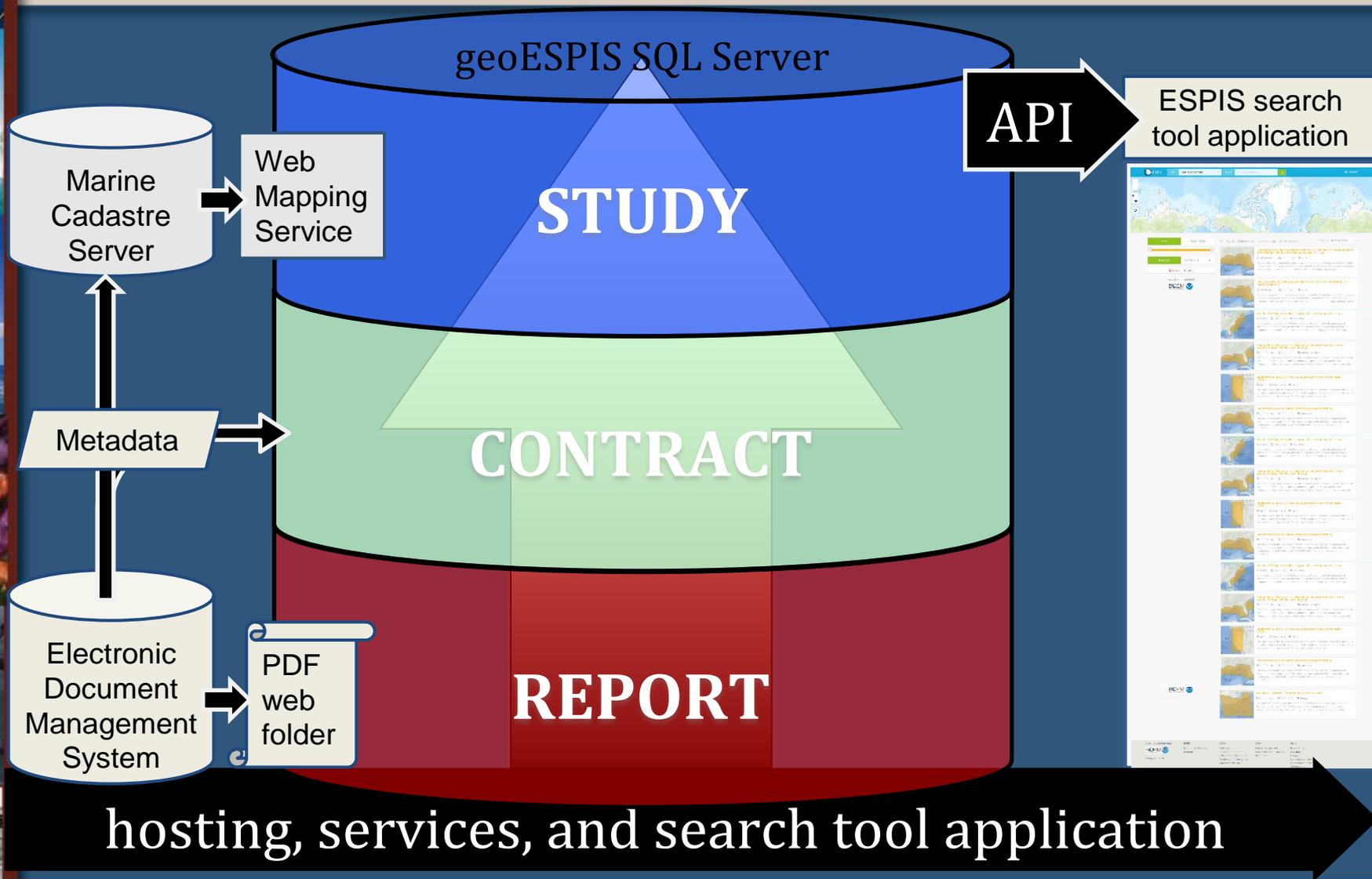


STUDY INFORMATION

PROJECT DATES	March 01, 2000 - November 30, 2002
REGION	Atlantic
CONDUCTING ENTITIES	Applied Coastal Research and Engineering, Inc., Continental Shelf Associates, Inc.
DISCIPLINE	Marine Minerals
KEYWORD(S)	Sand, Deposits, Beach Nourishment, Coastal Restoration, Environmental, Dredging, Florida, OCS, Offshore

Environmental Surveys of Potential Borrow Areas on the Central East Florida Shelf and the Environmental Implications of Sand Removal for Coastal and Beach Restoration.
OCS Study Final Report MMS 2012-012

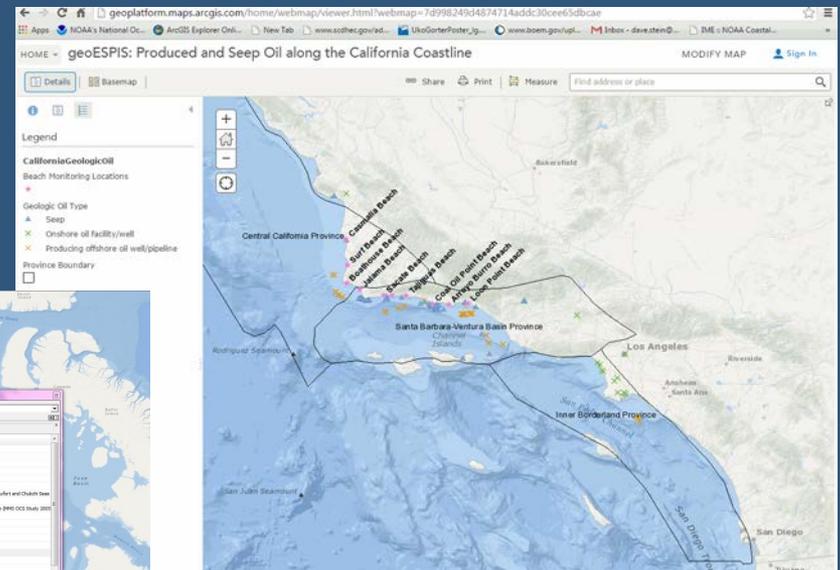
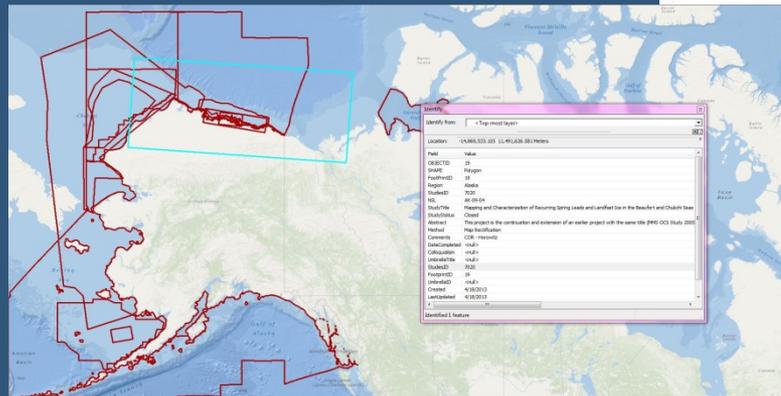
Enhanced IT Integration



Enable Spatial Search

ESPIS spatial search capabilities:

- Fully documented REST Web Service
- 1500 geofootprints – Esri FGDB, WMS, WFS
- geoESPIS Search Tool
- Select derived GIS data



ESPIS Enhancement Project Team

BOEM – Mike Rasser, Jonathan Blythe, and Ravenna Westphal

BSEE – Susan Roper, and Ozzy Bolukbas

NOAA – Dave Stein, Lindsay Goodwin, Steve Cummings, Jeff Skahill, Charlie Molnar, and Michael Brown

Quantum Spatial – Cherie Jarvis, Steve Raber, Ian Watson, Emily Foster, and Kandace Krejci



Thank You



Dan Richards

Status of OCS Sand Leasing in Florida

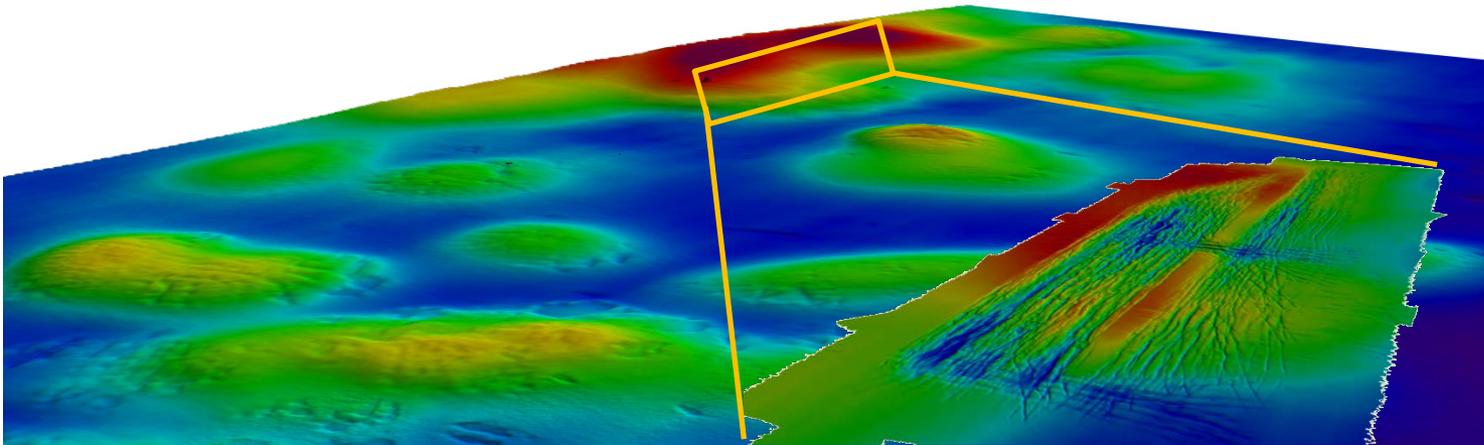


Paul O. Knorr, PhD
Marine Minerals Branch
Leasing Division
Office of Strategic Resources

Florida Sand Management Working Group
February, 2016



- BOEM's authority under Outer Continental Shelf Lands Act ("OCLSA", 1953, Sec. 8(k))
- Negotiated Non-Competitive Agreement Leasing Process (currently drafting a rule to codify this process)

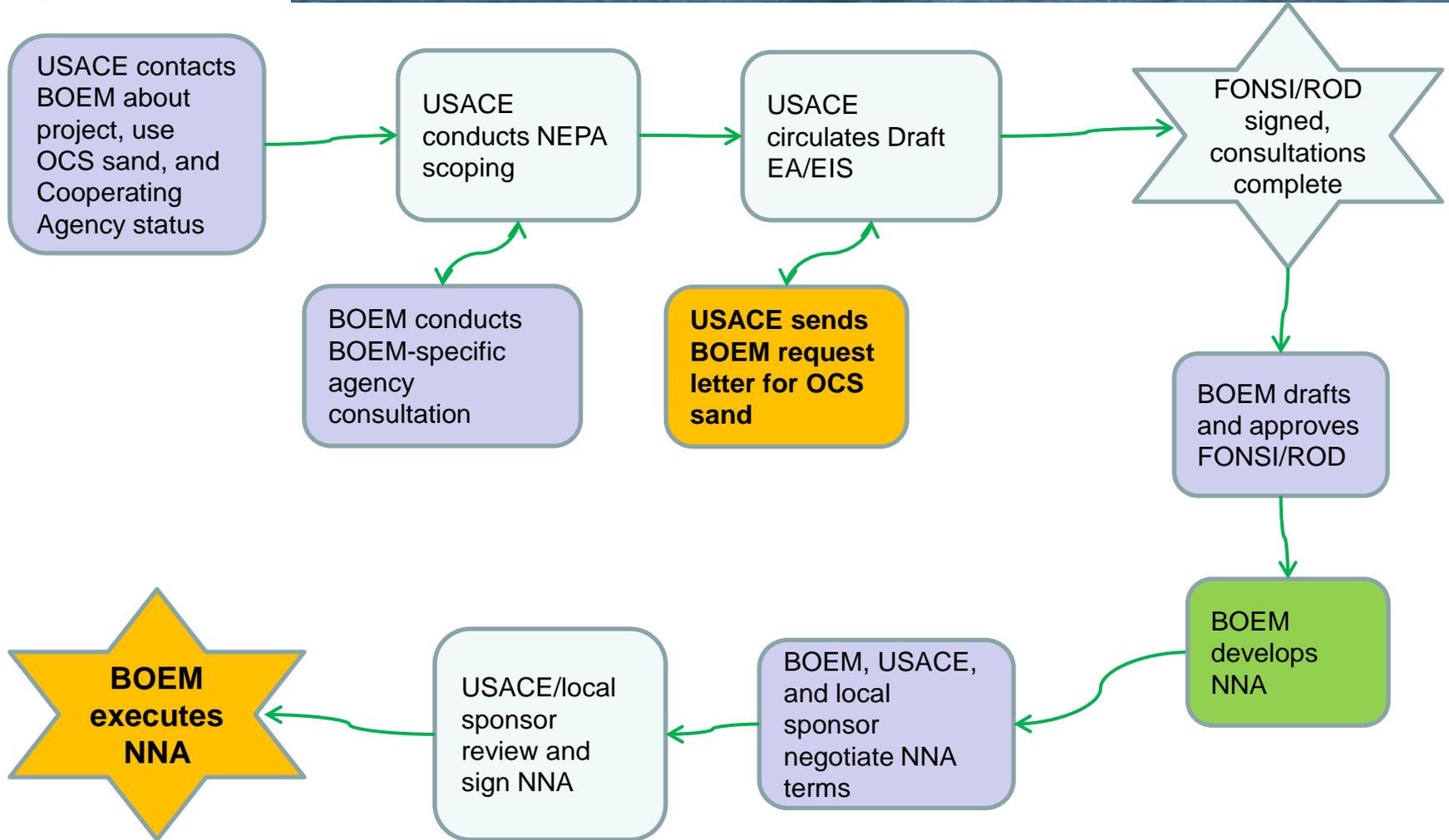


3 Types of Agreements Are Used to Convey Sand and Gravel Noncompetitively

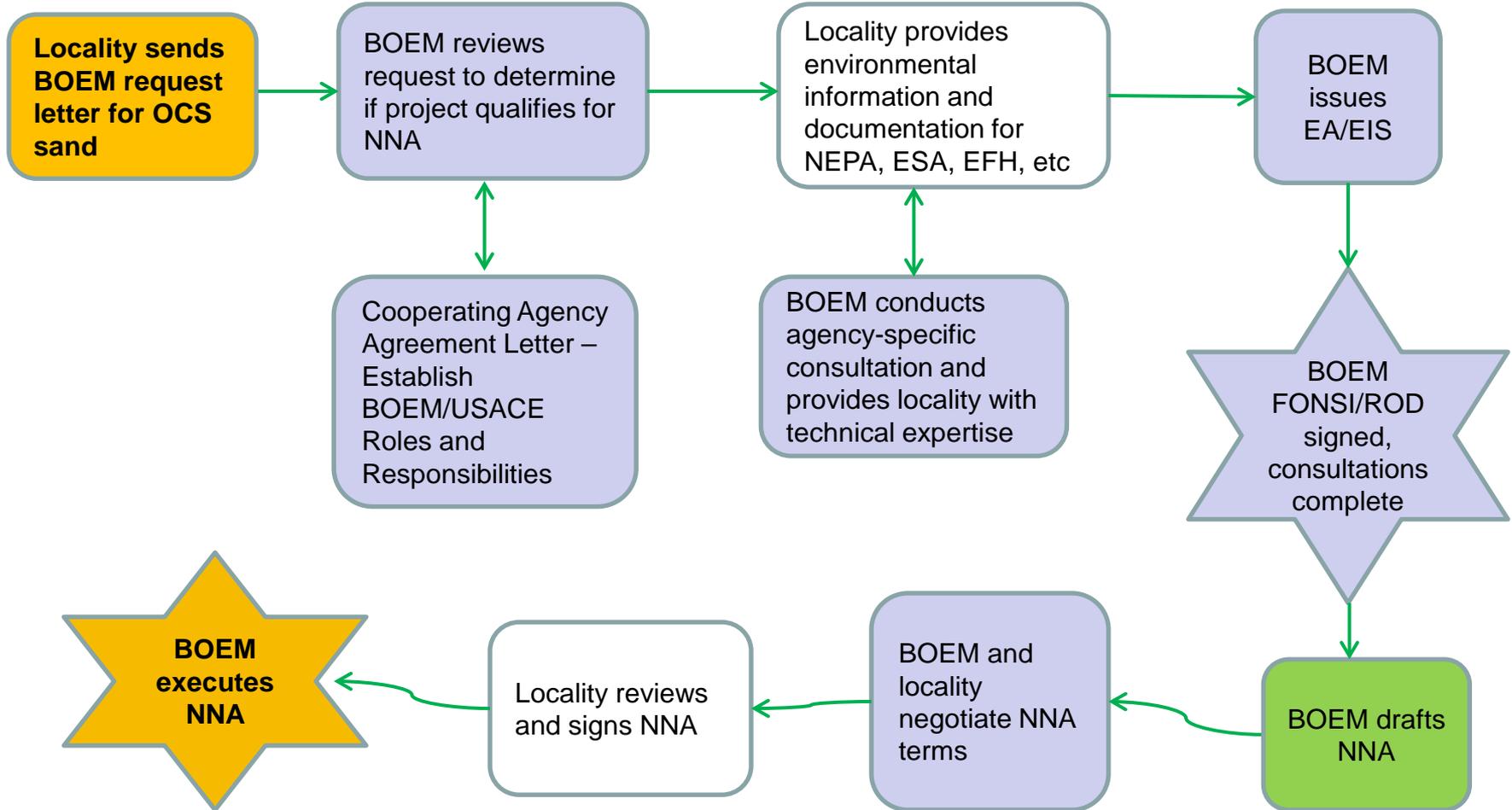
- **2-Party Memorandum of Agreement (MOA)**
 - An Agreement negotiated between Another Federal Agency and BOEM
- **3-Party Memorandum of Agreement (MOA)**
 - An Agreement negotiated between a Locality (State, county, city, parish etc.), Another Federal Agency (typically USACE) and BOEM. USACE Civil Works.
- **2-Party Lease**
 - An Agreement negotiated between a Locality (State, county, city, parish etc.) and BOEM. USACE Regulatory involvement (e.g., CWA 404).

Each project is unique, having different parties involved, different environmental and leasing concerns, because of this each Agreement is for a one-time use. Typically for two or three years. Extensions may be granted.





Process for Locality to Obtain a Lease (USACE Regulatory Program)

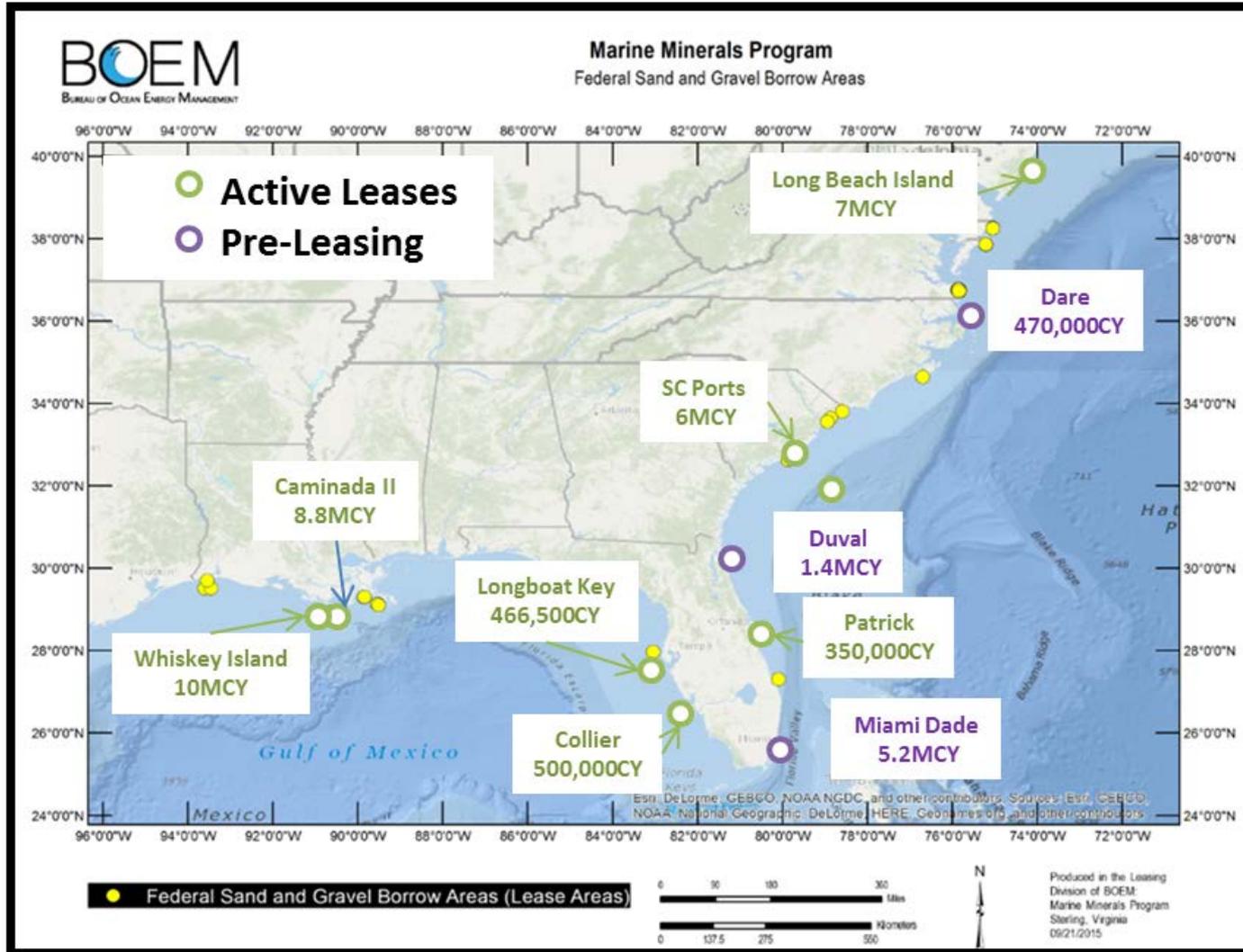


Can typically be executed within 12 to 18 months of the initial request, subject to:

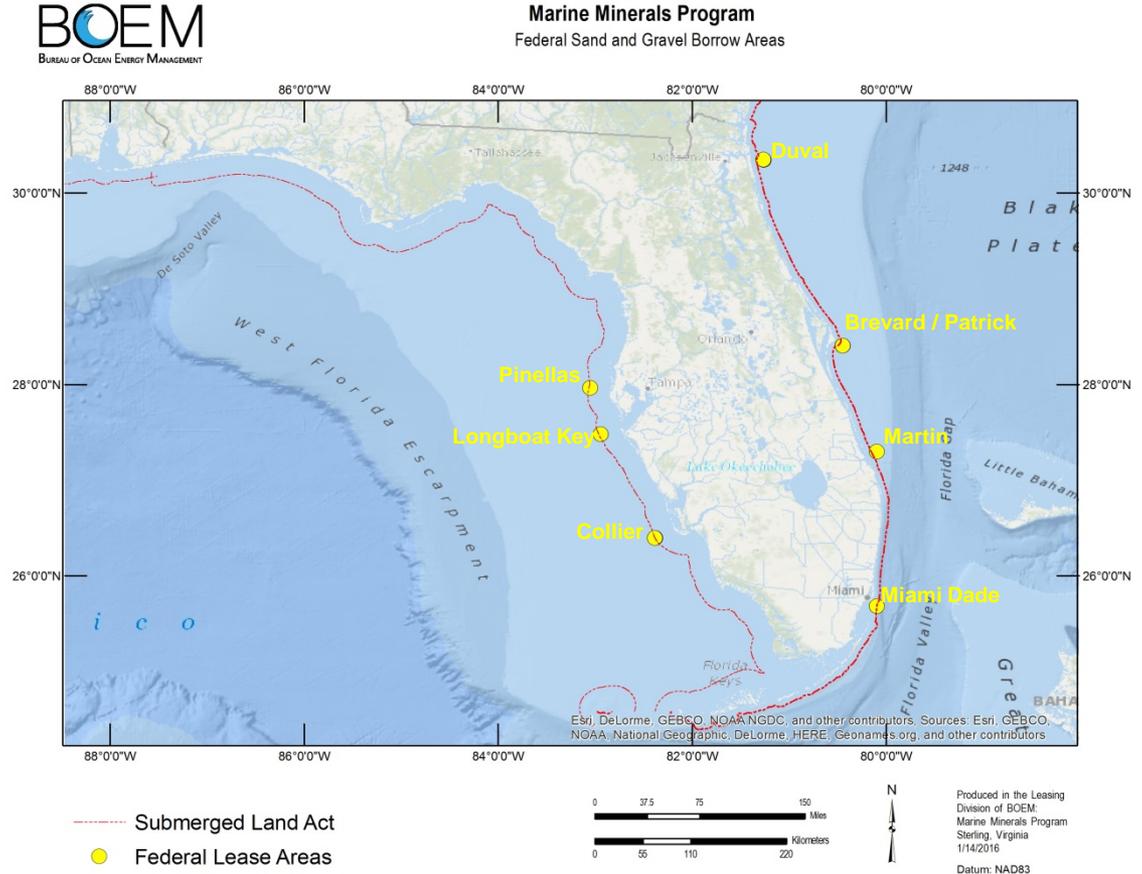
- Completion of a NEPA review (EA or EIS) and decision document (Finding of No Significant Impact (FONSI) or Record of Decision (ROD))
- Presence of major environmental or multiple-use conflicts
- Regulatory issues
- **Completion of the necessary environmental consultations (e.g., Sec. 7 NMFS consultation)**
- Project deadlines
- MMP workload commitments

Project scheduling and deadlines are cooperatively developed by BOEM and the Applicant.





Project	Volume (cy3)	Year
Duval County	1,240,000	1995
Collier County	1,000,000	1996
Patrick Air Force Base	600,000	2001
Brevard County (North Reach)	4,500,000	2002
Brevard County (South Reach) (Amendment)	2,800,000	2003
Duval County (Amendment)	1,500,000	2005
Brevard County	2,000,000	2005
Patrick Air Force Base	350,000	2005
Collier County	673,000	2006
Brevard County	1,300,000	2010
Duval County	1,200,000	2011
Pinellas County	1,800,000	2011
Miami-Dade County	474,000	2011
Martin County	1,000,000	2012
Brevard County - N Reach (Amendment)	1,730,000	2014



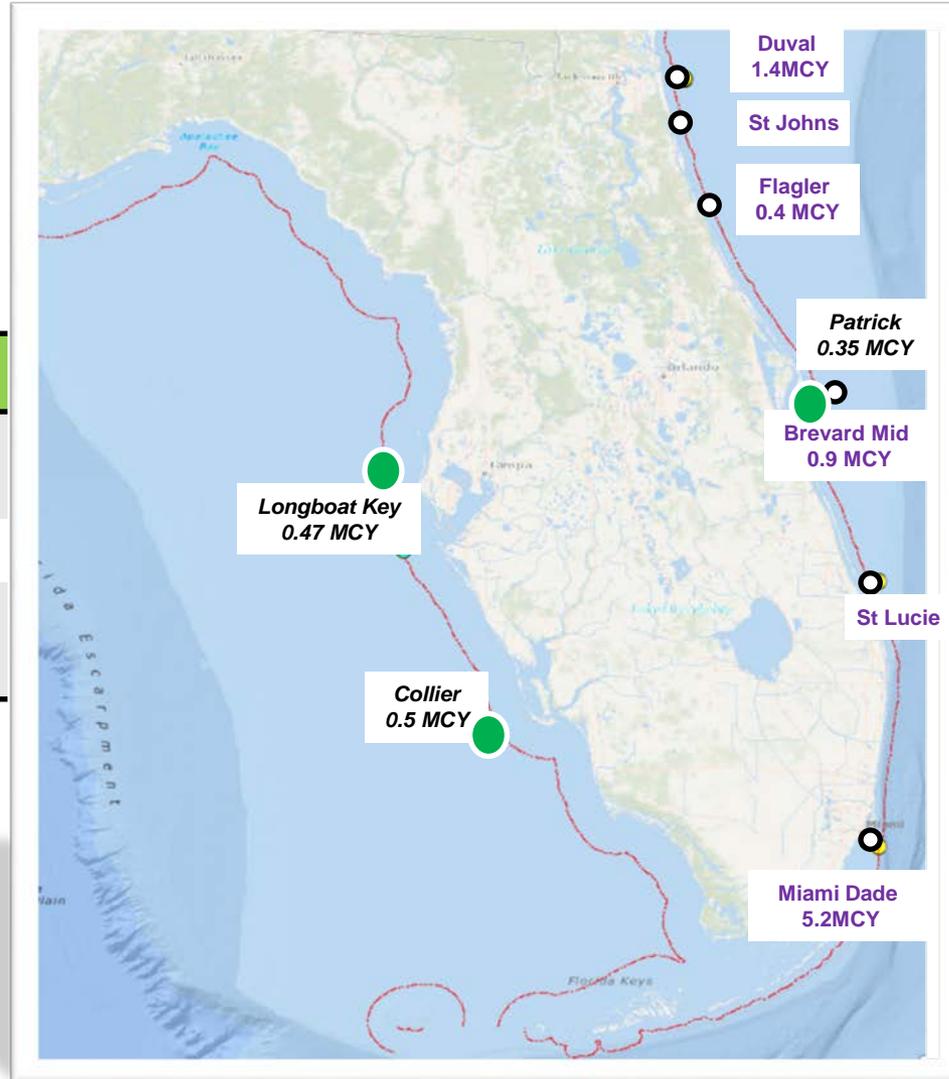
~23,000,000 cubic yards



Active Leases

Project	Volume (cy3)	Lease Expire
Patrick Air Force Base (amendment)	350,000	1/13/17
Collier County	500,000	4/14/18
Longboat Key (amendment)	466,500	10/10/16

● Active Leases

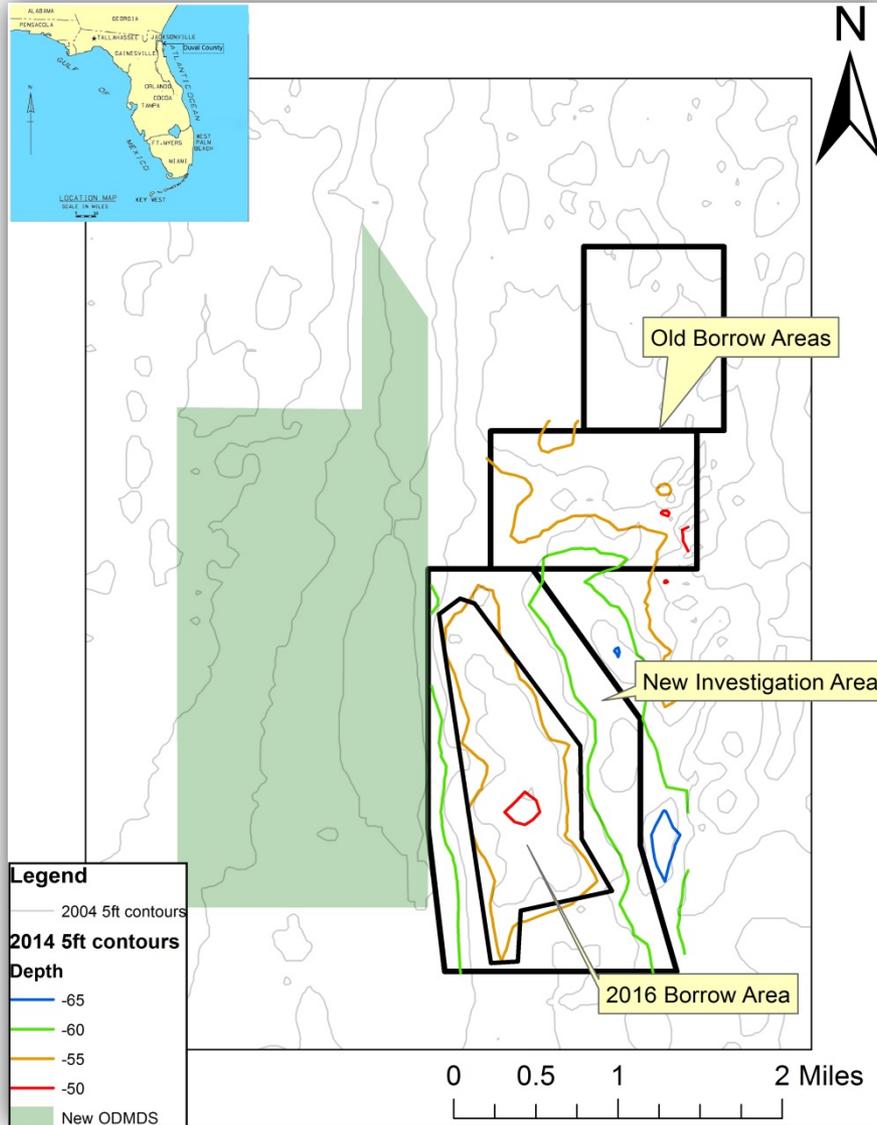


Pending Leases

Project	Volume (cy3)
Duval County	1,394,000
Miami/Dade County	5,200,000
Brevard County (Mid-Reach)	900,000
Flagler County	415,800
St Johns County	tbd
St Lucie County	~500,000?

○ Planning Phase

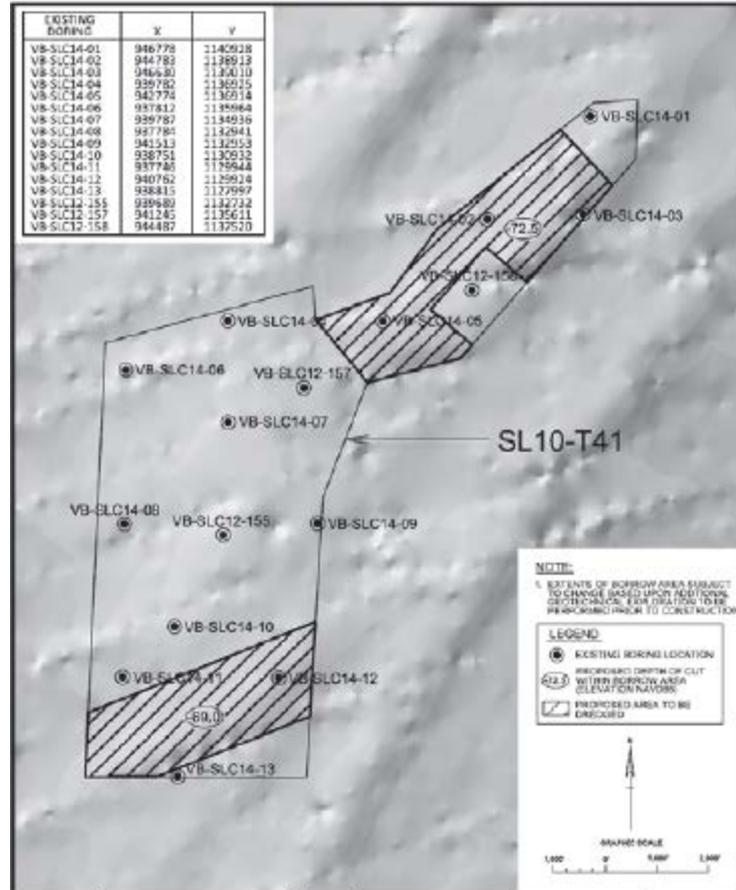
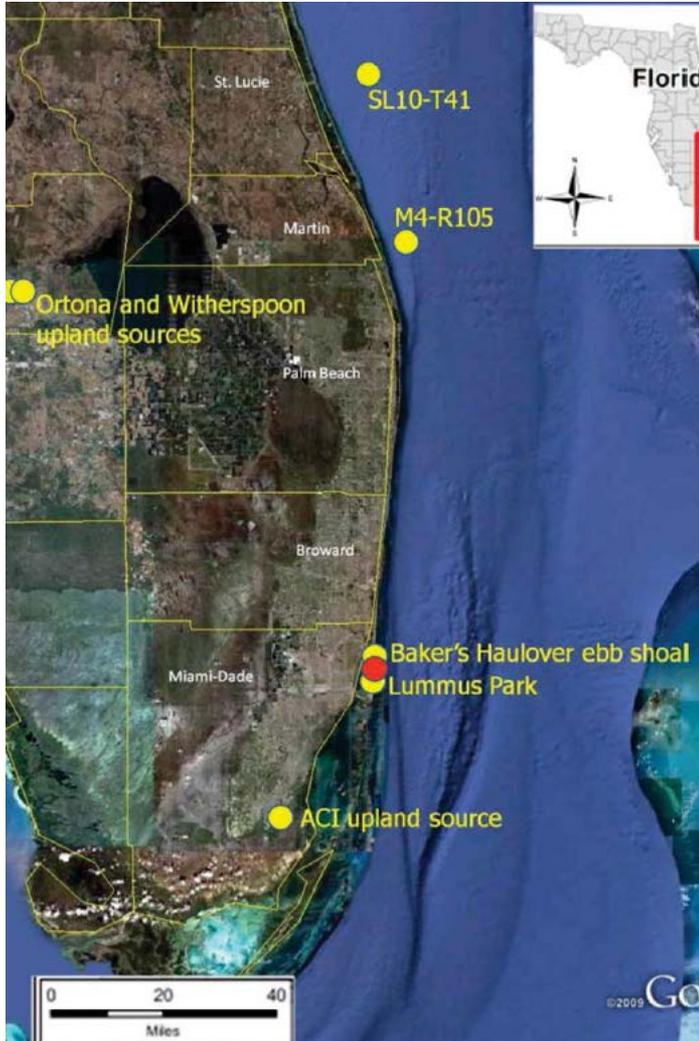




<u>Project</u>	<u>Volume (cy3)</u>
Duval County, FL	1,400,000



<u>Project</u>	<u>Volume (cy3)</u>
Miami/Dade County, FL	5,200,000



Brevard (Mid)

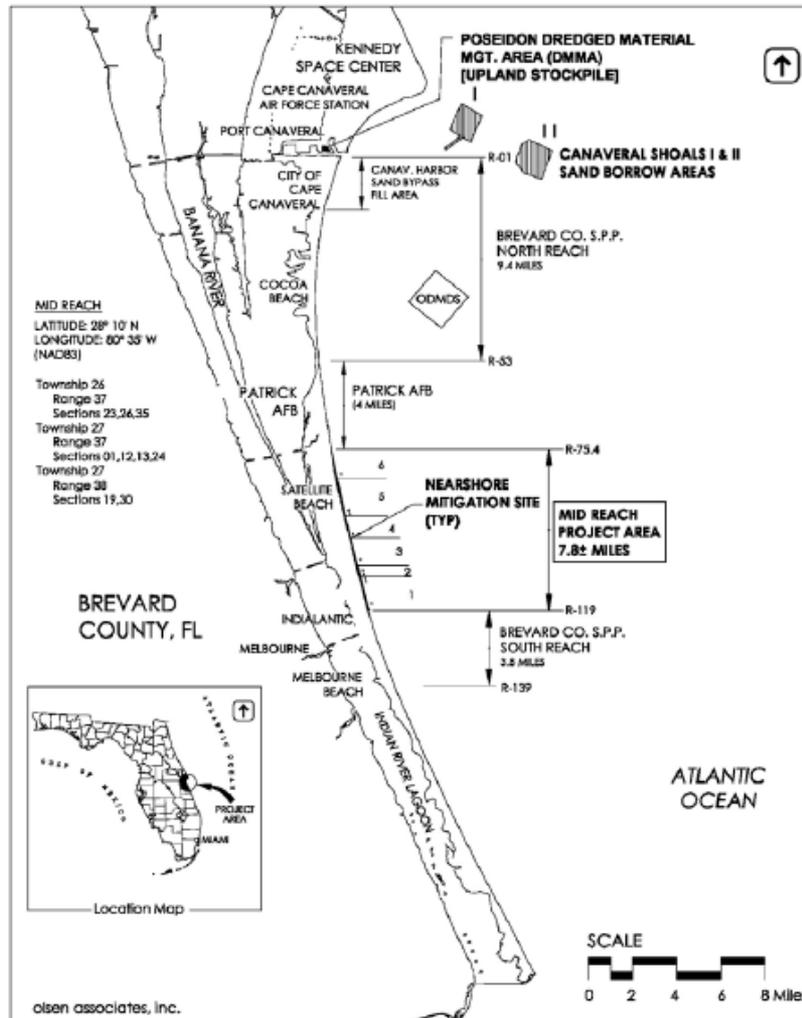
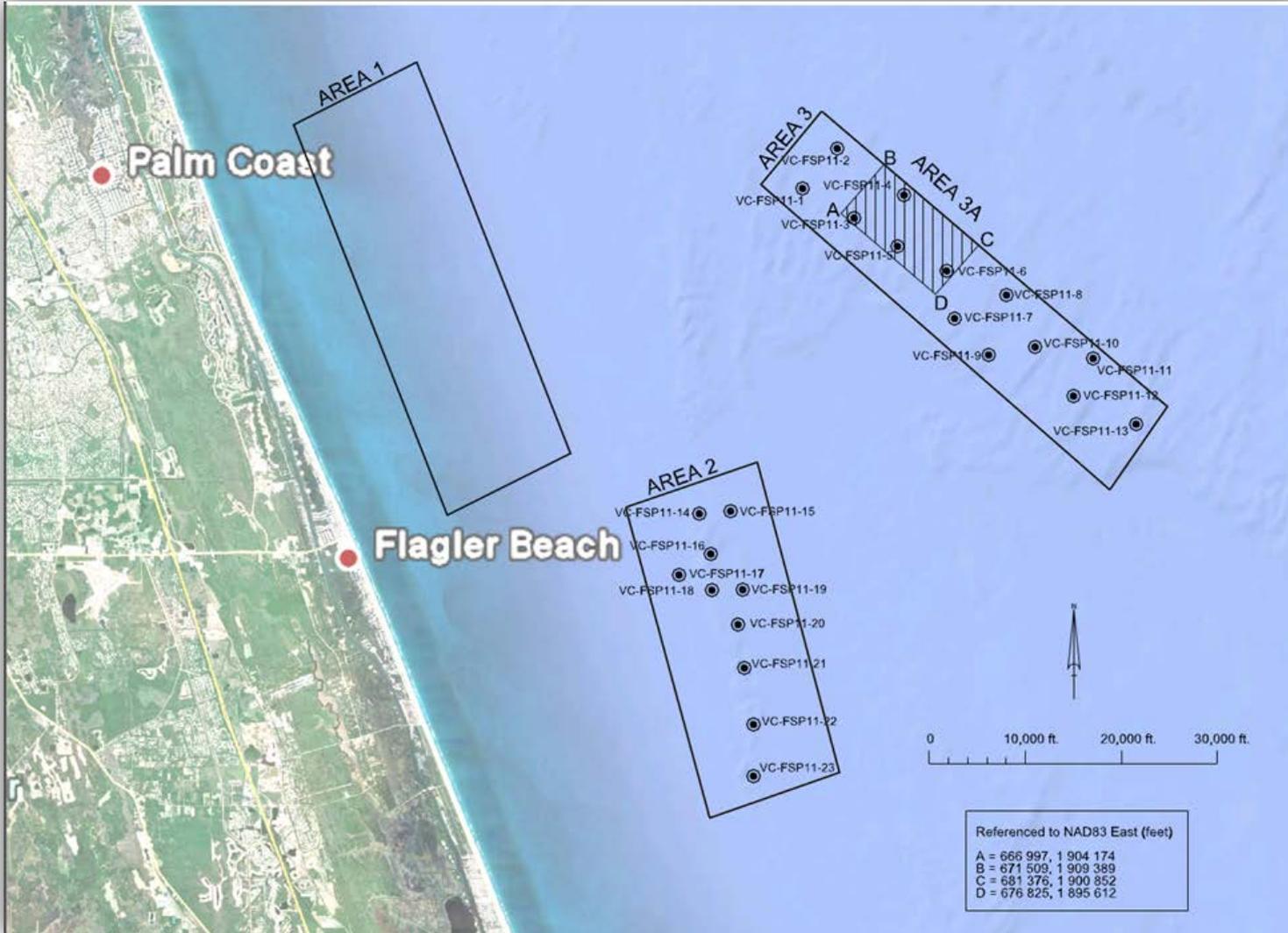


Figure 2-5. Location of project shoreline and major elements.

Project	Volume (cy3)
Brevard County (Mid-Reach), FL	900,000

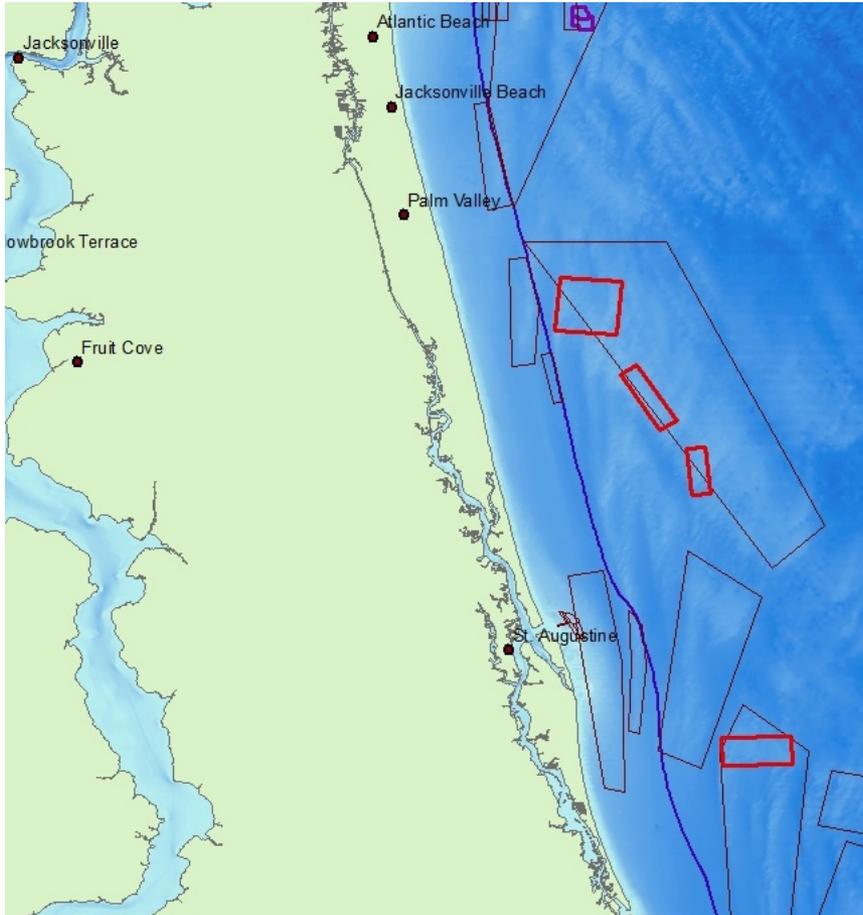




<u>Project</u>	<u>Volume (cy3)</u>
Flagler County, FL	415,800



St Johns Proposed Borrow Area



<u>Project</u>	<u>Volume (cy3)</u>
St Johns County, FL	tbd

 **Proposed Borrow Areas**



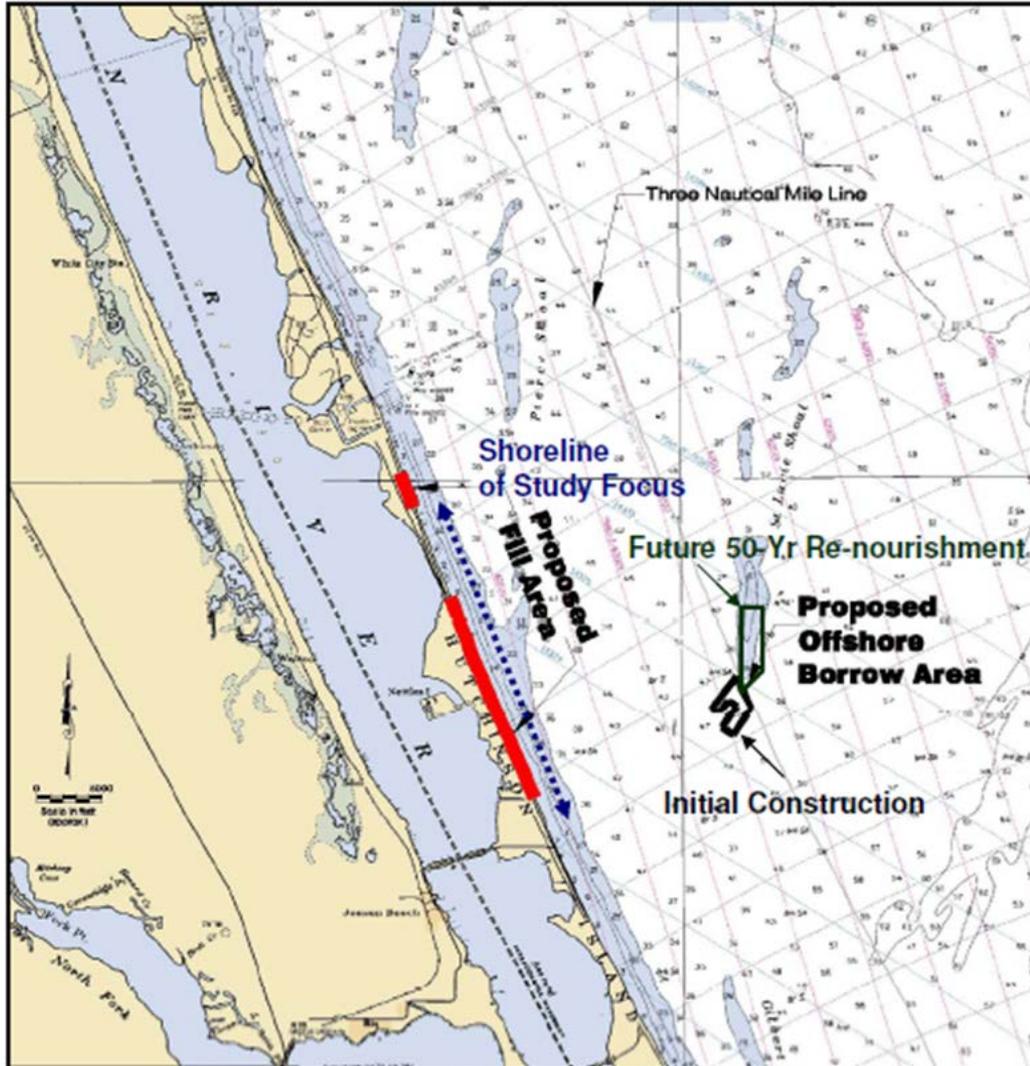


Figure 2: Project Area - Borrow Area & Fill Area

<u>Project</u>	<u>Volume (cy3)</u>
St Lucie County, FL	Tbd (500k?)



Thank You!



Paul O. Knorr, PhD
Paul.Knorr@boem.gov
Marine Minerals Branch
Leasing Division
Office of Strategic Resources

Florida Sand Management Working Group
February, 2016



Borrow Area	Project	Cubic Yards Allocated / Projected	Construction Complete	Lease Number	Applicant
Tom's Hill	Collier County	1,000,000	Sep-96	OCS-FL-1996	Collier County Board of Commissioners
Tom's Hill - T1	Collier County	500,000	The Collier County Board of County Commissioners approved the agreement and Tim Nance, Board Chairman, signed it on April 14, 2015. (Update 4/27/15)	OCS-G-35160	Collier County Board of Commissioners

1,500,000 cubic yards has been leased since 2015.



Active Federal Leases

<u>Project</u>	<u>Volume (cy3)</u>	<u>Lease Expire</u>	<u>Type of Project</u>	<u>EA / EIS</u>	<u>ROD/ FONSI</u>	<u>Response Ltr Sent</u>	<u>Kick Off Mtg Held</u>	<u>Lease Execution</u>	<u>Construction Status</u>
Patrick Air Force Base, FL (amendment)	350,000	1/13/17	2-Party MOA/EA/FONSI	Yes	Yes	Yes	Yes	Yes	Not Begun
Collier County, FL	500,000	4/14/18	2-Party Lease/EA/FONSI	Yes	Yes	Yes	Yes	Yes	Not Begun
Longboat Key, FL (amendment)	466,500	10/10/16	2-Party Lease/EA/FONSI	Yes	Yes	Yes	Yes	Yes	Not Begun



Environmental Review / Pre-Lease / Resource Evaluation in Progress / Feasibility

Study

<u>Project</u>	<u>Volume (cy3)</u>	<u>Lease Expire</u>	<u>Type of Project</u>	<u>EA / EIS</u>	<u>ROD/ FONSI</u>	<u>Response Ltr Sent</u>	<u>Kick Off Mtg Held</u>	<u>Lease Execution</u>	<u>Construction Status</u>
Duval County, FL	1,400,000		3-Party MOA/EA/FONSI	Yes	Yes	Yes	No	In progress	Not Begun
Brevard County (Mid-Reach), FL	900,000		3-Party MOA/EIS/ROD	In progress	In progress	No	No	No	Not Begun
Miami/Dade County, FL	5,200,000		3-Party MOA/EA/FONSI	In progress	No	Yes	No	In progress	Not Begun
Flagler County, FL	415,800		3-Party MOA/EA/FONSI	Yes	In progress	No	No	No	Not Begun
St Johns County, FL				No	No	No	No	No	Not Begun
St Lucie County, FL				No	No	No	No	No	Not Begun



Florida Offshore Sand Management Working Group USACE Jacksonville District Update

2 Feb 2016

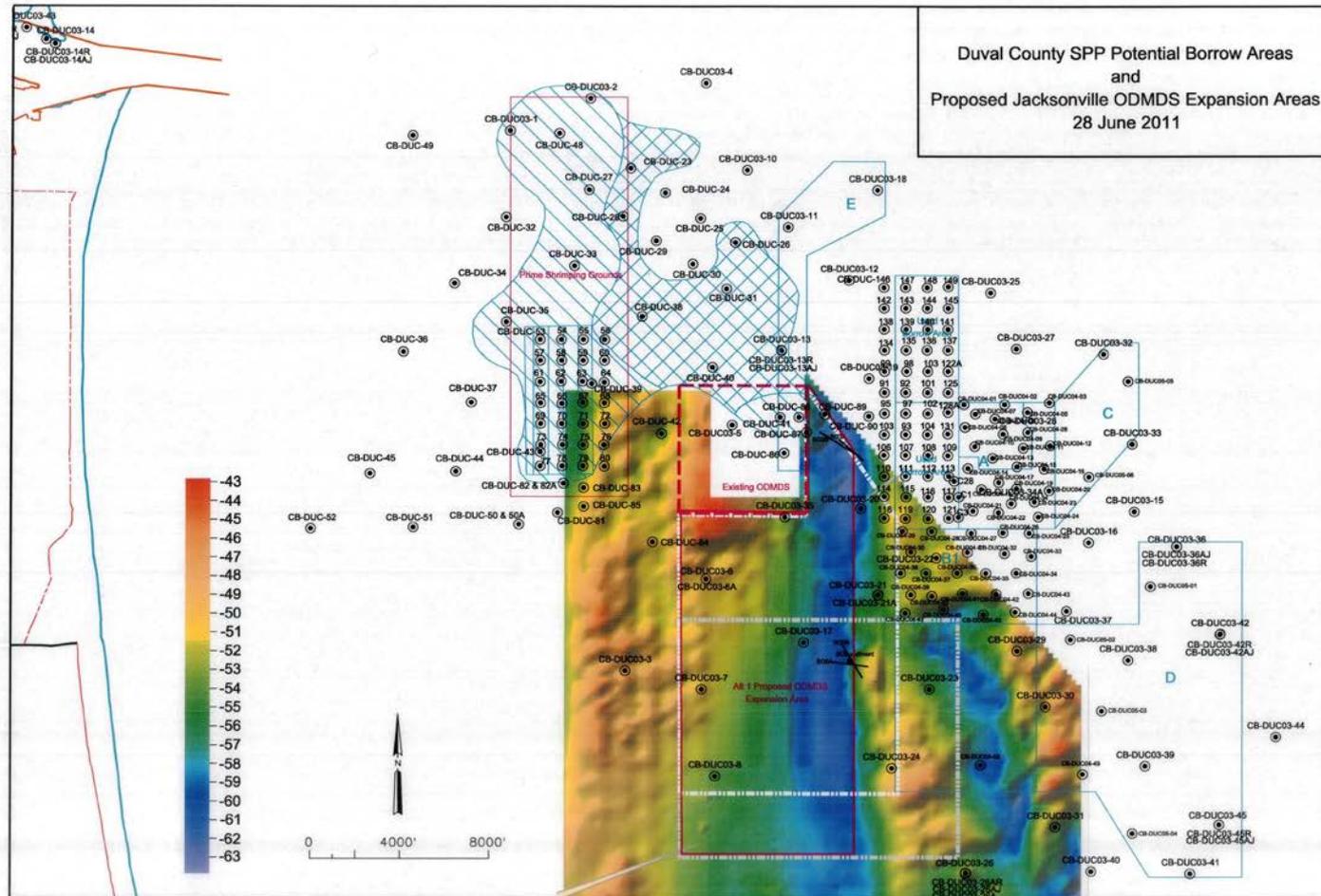
Presented by:
Jason Engle, P.E.
Jacksonville District
U.S. Army Corps of Engineers



®

Project Update: Duval

- Duval SPP borrow area adjacent to Jacksonville Harbor ODMDS
- ODMDS undergoing study/permitting for expansion for harbor deepening project
- Beach-quality sand discovered in/adjacent to expansion area
- Next Duval renourishment will remove good sand from expansion area before disposal in expanded ODMDS



RSM and Storm Response: Be Prepared

2013 SAJ Post-Sandy RSM Projects

FY13 NAVIGATION RSM	TOTAL COST (NAV)	PLACEMENT	BEACH VOLUME*	ROUGH VALUE TO FRM**
Port Everglades* (partial)	\$ 1,898,489	Broward SPP	96,126	\$5,959,812
Palm Beach Harbor	\$ 4,870,074	Palm Beach Co NF	420,000	\$6,300,000
Ft Pierce Inlet	\$ 3,299,090	Fort Pierce SPP	191,000	\$2,330,200
St Lucie Inlet	\$ 6,465,600	Martin Co. SPP	200,000	\$3,000,000
St Augustine Inlet	\$ 1,932,600	St Johns SPP	116,000	\$696,000
Ponce Inlet (SAW)	\$ 1,000,000	St Lucie SPP (NS)	141,000	\$2,115,000
AIWW-Jupiter Inlet	\$ 2,601,207	Palm Beach Co	55,000	\$825,000
AIWW-Haulover Inlet		Dade Co. SPP	120,000	\$6,180,000
	\$ 22,067,060			\$27,406,012

INCREASED VALUE TO NATION

* Includes 15% placement losses

** Contract costs only, additional FRM value for E&D/S&A not included

Regional Sediment Management

- OCS resources with beach-quality sand are integral part of RSM strategies
- OCS resources are valuable and scarce
- RSM extends the life of these non-renewable resources
- Key goal of RSM Center is to quantify the true cost of sediment management alternatives
- Costs
 - ODMDS expansions
 - CDF/DMMS expansions
- Value
 - Beach placement
 - Nearshore placement
 - Ecosystem benefits



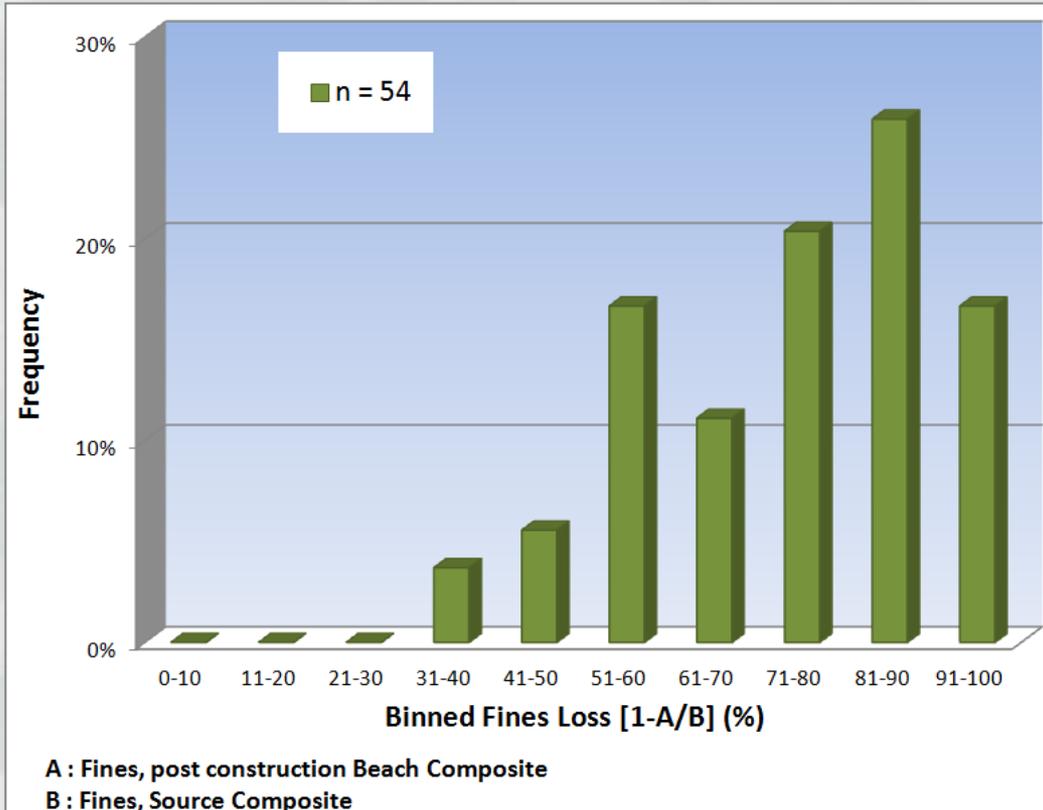
2015 Vilano Beach Nearshore Placement with the Murden

Project Update: St Johns Feasibility Study

- OCS borrow resources were found to be too costly for project justification, however a project was found to be justified using the much closer inlet shoals for borrow material
- OCS borrow areas are still included in the Environmental Assessment



Fate of Fines



- ❑ n=54
- ❑ Mean loss: 74%
- ❑ Median loss: 78%
- ❑ Most frequent: 80-90%
- ❑ 91% show greater than 50% loss

- FDEP 'Sand Rule' limits
 - Beach renourishment = 5%
 - Navigation maintenance beach = 10%
 - Navigation maintenance nearshore = 20%
- Current practice with FDEP WQC process assumes in-situ fines % = to post-placement fines %
- OCS resources have been 'Ruled' out based on assumption of zero fines loss
- Navigation material placed in nearshore when beach placement might have been an option
- Jennifer Coor is new Jacksonville District POC for FoF
- Joint BOEM and ERDC tool development—MCDA
- BOEM FoF proposal

Thank You

Jason Engle, P.E.
Chief Coastal Design Section
USACE Jacksonville District
904-232-2230
jason.a.Engle@usace.army.mil



Environmental Studies Program: An Update of Ongoing and Proposed MMP Studies



Doug Piatkowski

Division of Environmental Assessment

Douglas.Piatkowski@boem.gov



Note to Stakeholders

Oct. 26, 2015



BOEM invites ideas for Environmental Studies,
Fiscal Year 2017

Good morning,

The Bureau of Ocean Energy Management (BOEM) is responsible for ensuring that the effects on the natural and human environment are taken into consideration during the leasing and development of oil, natural gas, renewable energy and marine mineral resources on the Outer Continental Shelf (OCS).



Pacific waves

To help inform management decisions affecting the OCS, BOEM develops, oversees and funds the collection of environmental information as directed by the Outer Continental Shelf Lands Act through its [Environmental Studies Program](#) (ESP). The ESP focuses on applied science, including baseline information about the environment and the effects from activities that result from the leasing and development processes under our authority. The goals of the ESP are to establish the information needed to assess, predict, monitor and manage environmental impacts on marine biota and the human, marine and coastal environments. BOEM is beginning to formulate its FY 2017 Environmental Studies Development Plan covering all BOEM energy and minerals activities.

BOEM invites your input in identifying potential study ideas for consideration on Alaska, Atlantic, Gulf of Mexico and Pacific OCS areas. BOEM's ESP is

- Solicit input from stakeholders
- Fill data gaps identified through past study investments
- Internal and external collaboration
- Prioritization based on the resource management implications and regional interests
- Develop a “road map” of study ideas





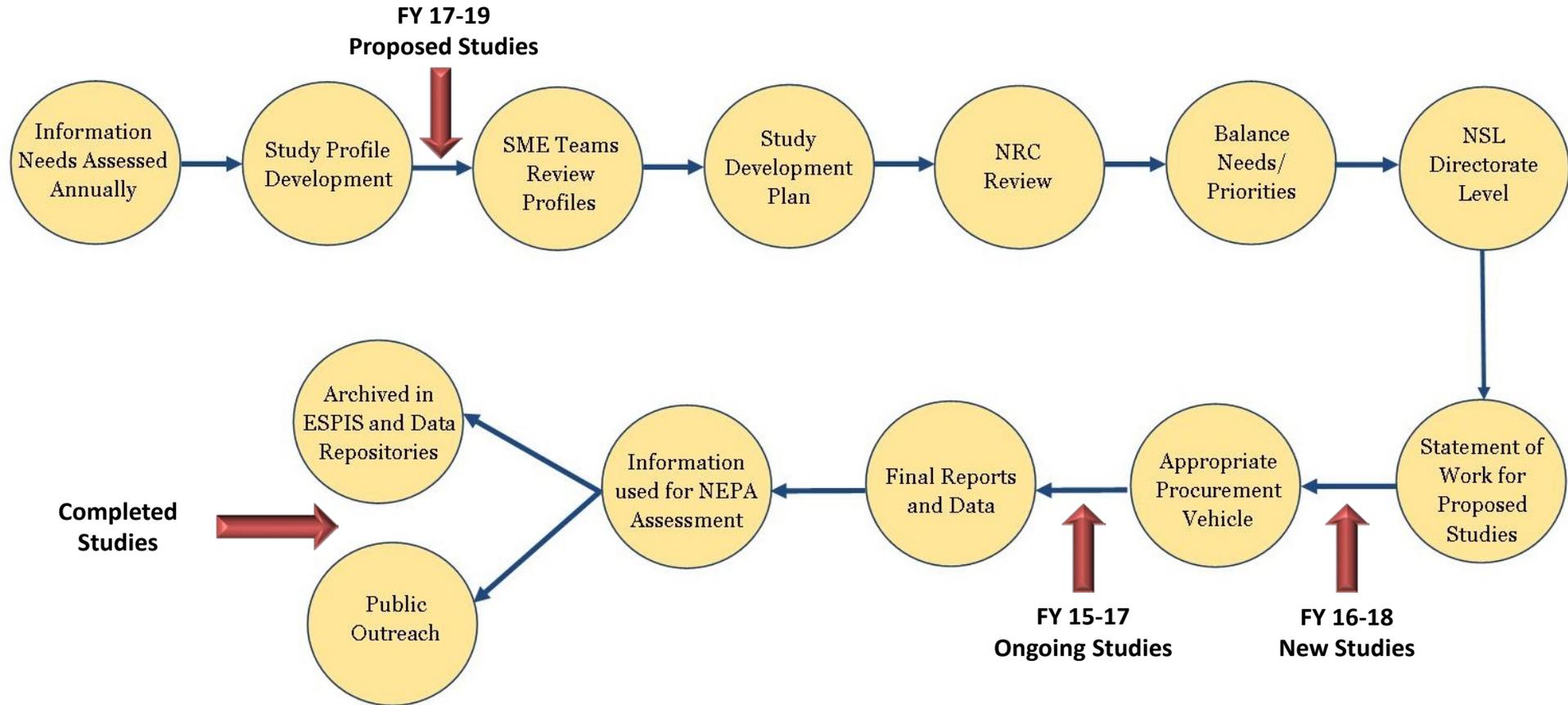
Environmental Studies Program

Studies Development Plan Fiscal Years 2016-2017

Studies Development Plan (SDP)

- Internal, strategic planning tool for the upcoming two years of studies and beyond.
- Describes a cohesive and integrated plan to collect and generate the environmental information needed to support the Bureau's activities.
- Lays the foundation on which to make future decisions regarding the National Studies List (NSL)





BOEM Environmental Studies Program (ESP) is dynamic and flexible to the changing information requirements. New information needs routinely arise outside the annual planning process and in response proposed studies are often added/deleted. This schema is a simplified version of the program process and does not entirely capture its complexity and variability.



- Provide the information needed to predict, assess, and manage impacts from offshore marine mineral exploration, development, and production activities on human, marine, and coastal environments
- About \$40 million over the past 22 years
- Potential mitigation and minimization measures derived from research findings
- Provide information for consultations
- Identify critical data gaps for guiding future research needs
- <http://www.boem.gov/Marine-Mineral-Studies/>
 - Studies organized by state and/or programmatic relevance
- <http://marinecadastre.gov/espis>



- **Investigation of dredging guidelines to maintain and protect the integrity of offshore ridge and shoal regimes/detailed morphologic evaluation of offshore shoals. Mohammad, D., Nairn, R. 2010. BOEM 2011-025**
 - See Poster
- **Improving Emission Estimates and Understanding of Pollutant Dispersal for Impact Analysis of Beach Nourishment and Coastal Restoration Projects. ENVIRON International Corporation, 2013. BOEM 2013-123.**
 - See Poster
- **Review of Biological and Biophysical Impacts from Dredging and Handling of Offshore Sand. J. Michel, A.C. Bejarano, C.H. Peterson, and C. Voss, 2013.**
 - See Poster
- **Understanding the Habitat Value and Function of Shoals and Shoal Complexes to Fish and Fisheries on the Atlantic and Gulf of Mexico Outer Continental Shelf, a Literature Synthesis and Gap Analysis. BOEM 2015-012**



- **Develop a framework to assess geological, engineering, economic, environmental, and dredge operations to optimize borrow use**
- **Develop decision support tool to assess project entrainment risk and improve effectiveness mitigation planning w/in sand borrow areas**
- Ecological Function and Recovery of Biological Communities within Dredged Ridge-Swale Habitats in the South-Atlantic Bight. University of Florida
- Natural Habitat Associations and the Effects of Dredging on Fish at the Canaveral Shoals, East-central Florida. Navy Interagency Agreement.

Continued



- Glider-based fish tracking – Canaveral Shoals, FL
- Regional Essential Fish Habitat Geospatial Assessment and Framework of Offshore Sand Features
- **Discerning behavioral patterns of sea turtles in the Northern Gulf of Mexico to inform management decisions**
- **Sediment sorting during coastal restoration projects: implications for resource management, environmental impacts, and multiple use conflicts**



- Ecological Function and Recovery of Biological Communities within Sand Shoal Habitats within the Gulf of Mexico
- Assessing biological processes that drive fisheries productivity on New England Sand Shoals, determining costs to fisheries as a result of sand mining.



POC: Leighann Brandt; 703-787-1570; Leighann.brandt@boem.gov

Concern: Extent of sediment sorting during dredging, handling, and placement processes

Proposed Study: Build upon the current “fate of fines” work conducted by USACE to better categorize the percent of fine-grained losses relative to habitat type during each phase of dredging. These data will be used to better inform environmental trade-offs and impacts assessments.



Mechanical Losses Associated with Dredging and Placement Operations

(1) Draghead



(2) Inflow



(3) Overflow



(4) Productive Load



(5) Re-Slurry/Pumpout



(6) Placement



POC: Jessica Mallindine; 504-736-7516; Jessica.Mallindine@boem.gov

- **Interagency Agreement:** BOEM / USGS
- **Study Objective :** Capture and tag sub-adult, juvenile, and adult sea turtles in the Northern GOM using trawling operations.
- **Specific goals:**
 - Determine the extent of movements and seasonal site fidelity
 - Fine scale characterization of dive profiles
 - Identify and assess physical and biological features to characterize habitats
 - Assess the population structure and isotopic signatures
 - Status of abundance and distribution
- **Methodologies:**
 - Flipper, PIT, and satellite tagging/tracking (w/ acceleration data loggers (ADLs))
 - Biological sampling and gastric lavage
 - Health assessments
 - Sampling and analysis of available coastal data
 - Mapping suitable turtle habitats within the Northern GOM.



POC: Doug Piatkowski; 703-787-1833;douglas.piatkowski@boem.gov

Concern: Adverse effects to sea turtles associated with dredging operations in the OCS could be minimized through deliberate project specific planning efforts

Proposed Study: Develop a standardized decision support tool to assess project specific dredging entrainment risk and improve the effectiveness of mitigation planning decisions within federal marine mineral resource areas

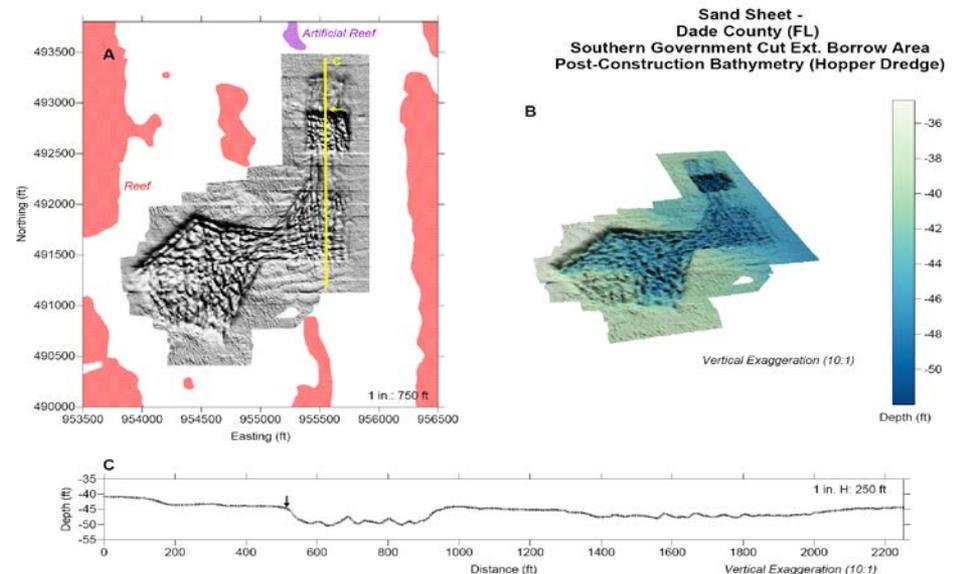
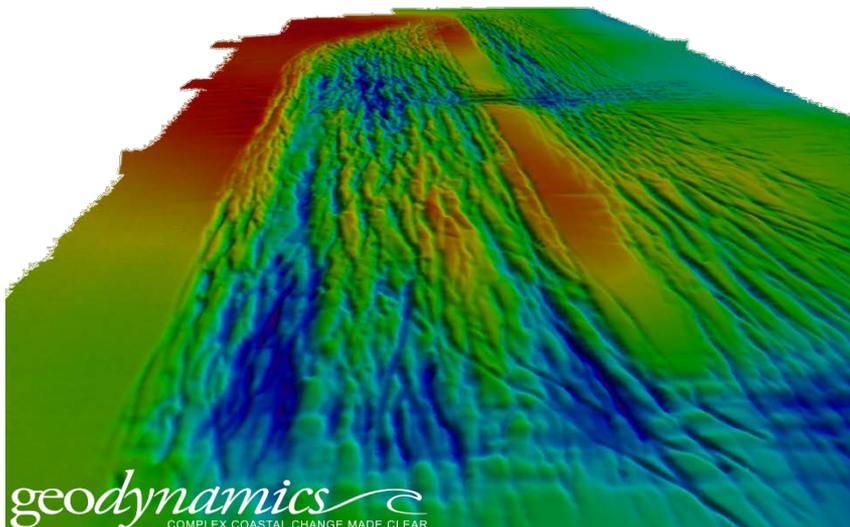


POC: Paul Knorr; 703-787-1524; paul.knorr@boem.gov

Concern: OCS sand resources are finite and need to be carefully managed for long term sustainability

Proposed Study: Optimize borrow area use by integrating geological, engineering, economic, environmental, and dredge operation variables in a common analytical framework. A draft sediment source management plan will be developed for Canaveral Shoals, FL.

Four Tiered Approach: (1) Assess resources, dynamics, and engineering requirements, (2) Integrate environmental and multiple use conflicts, (3) Best practices and mitigation measures, (4) determine cost effectiveness and quantitatively analyze decision tradeoffs.



The Marine Minerals Program:

- Is a science-based program that responsibly manages development of America's offshore non-energy resources.
- Has robust partnerships with other federal agencies, states and communities
- Is forward-looking to build and strengthen coastal resilience.



ADDITIONAL BACKGROUND & FACT SHEETS:

Website: <http://www.boem.gov/Marine-Minerals-Program/>

Fact sheets: <http://www.boem.gov/BOEM-Fact-Sheets/>

- MARINE MINERALS FACT SHEET
- HURRICANE SANDY FACT SHEET
- ATLANTIC SAND ASSESSMENT FACT SHEET
- SEA TECHNOLOGY MAGAZINE ARTICLE BY DIRECTOR HOPPER

Contact us: MarineMinerals@boem.gov



Marine Minerals Program



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



BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT

Resource Evaluation

- Successful resource management requires:
 - Inventory of the resource location and extent
 - Evaluation of resource characteristics
- Superstorm Sandy Disaster Recovery Funds:
 - \$13.6 Million allocated to BOEM
 - \$5M Atlantic Sand Assessment Project (ASAP)
 - \$3M 1st round of State Cooperative Agreements
 - \$1.5M 2nd round of State Cooperative Agreements

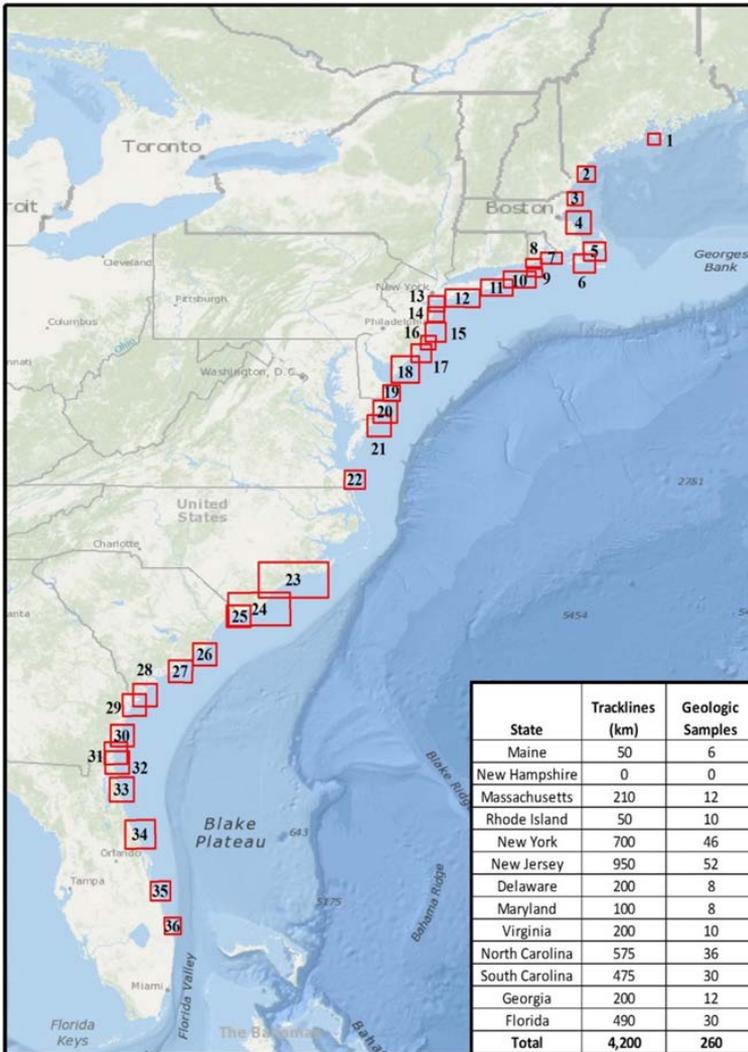


Brevard County – Superstorm Sandy



Atlantic Sand Assessment Project (ASAP)

- Contracted with CB&I to perform field work
 - Geophysical data collection
 - Geologic Sampling
- Reconnaissance and Design-Level sampling
- Worked with states through cooperative agreements to select sampling locations



State Cooperative Agreements

- Goals:
 - Evaluate existing offshore data
 - Identify data gaps/priority areas (coordinate w/ CB&I)
 - Assess future sand needs
 - Facilitate public accessibility of data
- The current Florida agreement included:
 - Update / Modernization of ROSSI database
 - Synthesis of existing geophysical data from Florida's central Atlantic OCS



Marine Minerals Program



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



BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT

State Cooperative Agreements

- Second round of state cooperative agreements
- Tailored to individual state needs / capacity
- Share thematic element of Interpreting ASAP data from each state
- Intended to start later this year.



Brevard County

Atlantic Sand Assessment Project

- Lamont-Doherty Core Repository
- Cores arriving imminently
- Core cataloguing through late spring
- Expected availability: early summer
- 40°F cold storage
- Sediment analysis data reports will be made available
- Core viewing and further sampling possible through LDEO



<http://www.ldeo.columbia.edu>

Atlantic Sand Assessment Project

- Goal is to continue the ASAP data acquisition and add to Lamont-Doherty repository
- Pursuing funding through:
 - limited MMP program funds
 - future budget initiatives
- Collaborating with other state and federal partners and leveraging our resources



Gulf Sand Assessment Project?

- BOEM pursuing a resource inventory in the Gulf similar to the ASAP
- Coordinating with state partners
- Looking at different potential funding sources
- Includes consideration of the entire Gulf coast of Florida



Waiting for some Gulf work...



Florida Department of Environmental Protection Florida Geological Survey



M14AC00004 Florida Cooperative Agreement:

“Synthesis of Existing Geophysical Data from Selected Areas on the Outer Continental Shelf Along Florida’s Central East Coast.”

**Florida Sand Management Working
Group Meeting, February 2, 2016**





M14AC00004 Florida Cooperative Agreement



Progress Update: Mapping seafloor, “top of rock” and unconsolidated sediment thicknesses on the inner continental shelf off the northeast and central east coast of Florida.

Florida Sand Management Working Group Meeting, February 2, 2016

Presented by Daniel C. Phelps, P.G.



Introduction



Previous work

ICON studies

FGS work in the area for the MMS

FGS Blue Horizon work

Data sources for present work

Legacy seismic data

The USGS/FGS Boomer data

USGS Crescent Beach Spring Boomer data

Consultant Chirp data sets south of Cape Canaveral

The Zig Zag Chirp data set

Vibracore data

Status of mapping south of Cape Canaveral

Status of mapping north of Cape Canaveral



USACE Inner Continental (ICON) Studies



Duane D.B., and Field, M.E., 1969, Geomorphology and sediments of the nearshore continental shelf, Miami to Palm Beach, Florida: U.S. Army Corps of Engineers Technical Memorandum No. 29, 120 p.

Meisburger, E.P., and Duane D.B., 1971, Geomorphology and sediments of the inner continental shelf, Palm Beach to Cape Kennedy, Florida: U.S. Army Corps of Engineers Technical Memorandum No. 34, 111 p.

Field, M.E., and Duane D.B., 1974, Geomorphology and sediments of the inner continental shelf, Cape Canaveral, Florida: U.S. Army Corps of Engineers Technical Memorandum No. 42, 88 p.

Meisburger, E.P., and Field, M.E., 1975, Geomorphology, shallow structure, and sediments of the Florida inner continental shelf, Cape Canaveral to Georgia: U.S. Army Corps of Engineers Technical Memorandum No. 54, 119 p.



Florida Geological Survey previous studies off the central east coast of Florida



Hoenstine, R., Freedenberg, H., Dabous, A., Cross, B., Fischler, C., and Lachance, M., 2002, A geological investigation of the offshore areas along Florida's central east coast, final summary report to the MMS: Florida Geological Survey unpublished report, 14 p. and appendices.



Previous central east coast of Florida study area





Florida Geological Survey previous studies off the northeast coast of Florida



- Phelps, D.C., Hoenstine, R.W., Balsillie, J.H., Dabous A., Lachance M., and Fischler C., 2003, A Geological Investigation of the Offshore Area Along Florida's North East Coast, Year 1 Annual Report to the United States Department of Interior, Minerals Management Service: 2002-2003: Florida Geological Survey, unpublished report. CD
- Phelps, D.C., Hoenstine, R.W., Balsillie, J.H., Ladner, L.J., Dabous A., Lachance M., Bailey K., and Fischler C., 2004, A Geological Investigation of the Offshore Area Along Florida's North East Coast, Year 2 Annual Report to the United States Department of Interior, Minerals Management Service: 2003-2004: Florida Geological Survey, unpublished report. DVD
- Phelps, D.C., Hoenstine, R.W., Balsillie, J.H., Ladner, L.J., Dabous A., Sparr, J. and Lachance M., 2005, A Geological Investigation of the Offshore Area Along Florida's North East Coast, Year 3 Annual Report to the United States Department of Interior, Minerals Management Service: 2004-2005: Florida Geological Survey, unpublished report. DVD
- Phelps, D.C., Dabous A., Lachance M., and Sparr J., 2007, A Geological Investigation of the Offshore Area Along Florida's North East Coast, Year 4 Annual Report to the United States Department of Interior, Minerals Management Service: 2005-2006: Florida Geological Survey, unpublished report. DVD
- Phelps, D.C., Ladle M., and Dabous A., 2011, A Geological Investigation of the Offshore Area Along Florida's North East Coast, Year 5 Annual Report to the United States Department of Interior, Minerals Management Service: 2010-2011: Florida Geological Survey, unpublished report. DVD



Previous northeast coast of Florida study area





Mapping example from previous work north of Cape Canaveral



Georgia

Florida

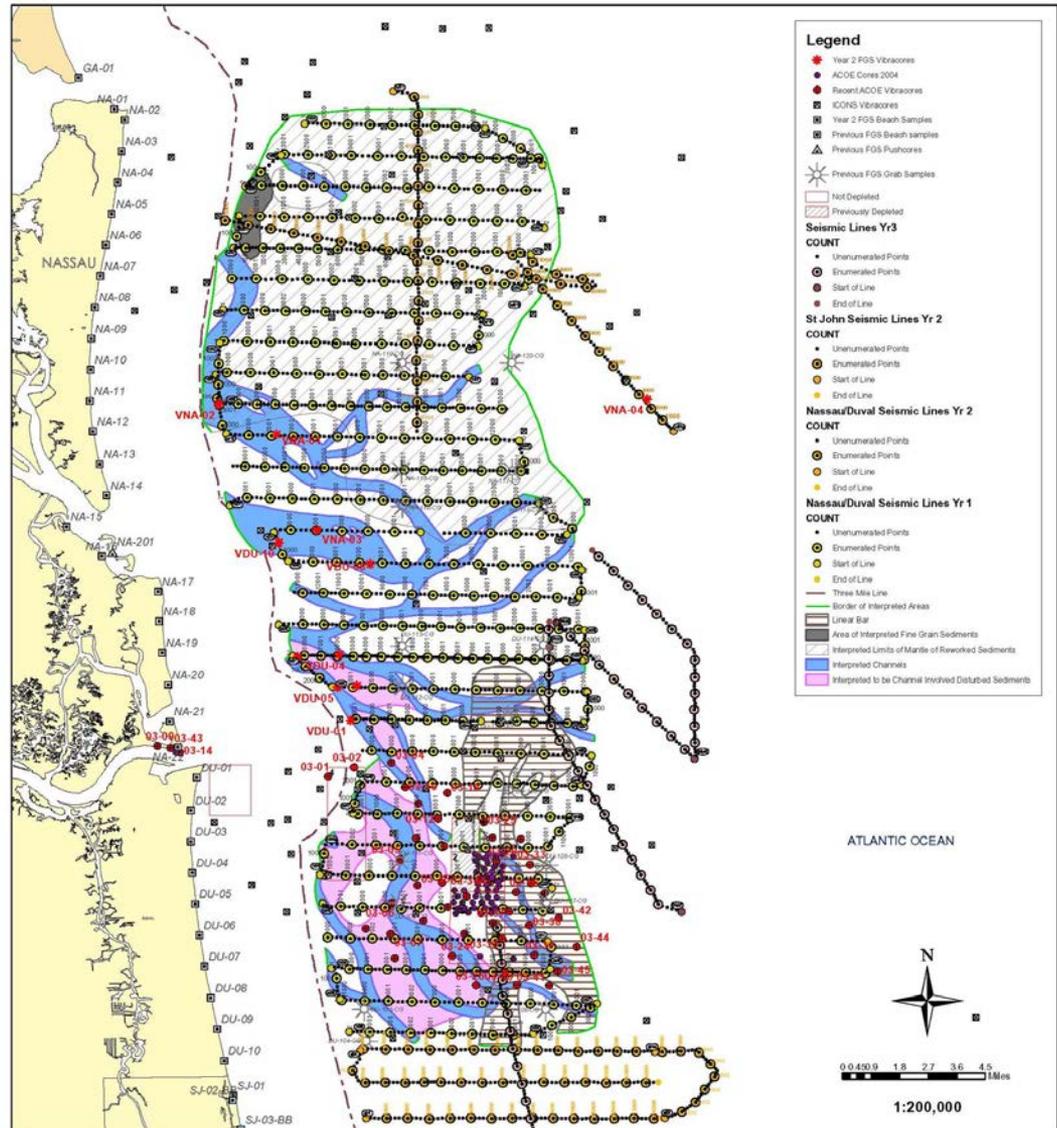
Nassau

County

Duval

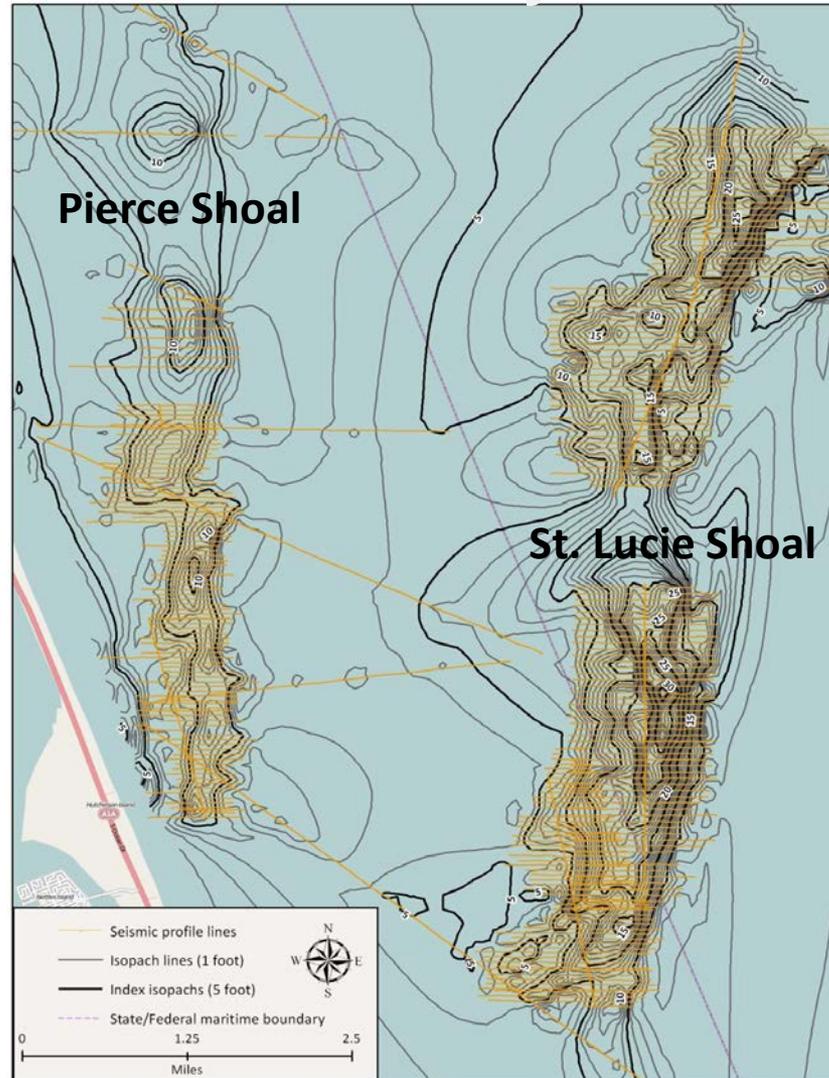
County

Jacksonville





“Blue Horizon” Study: Sediment Thickness of Shoals Offshore of St. Lucie County





Geophysical data sources for present work



Boomer Data

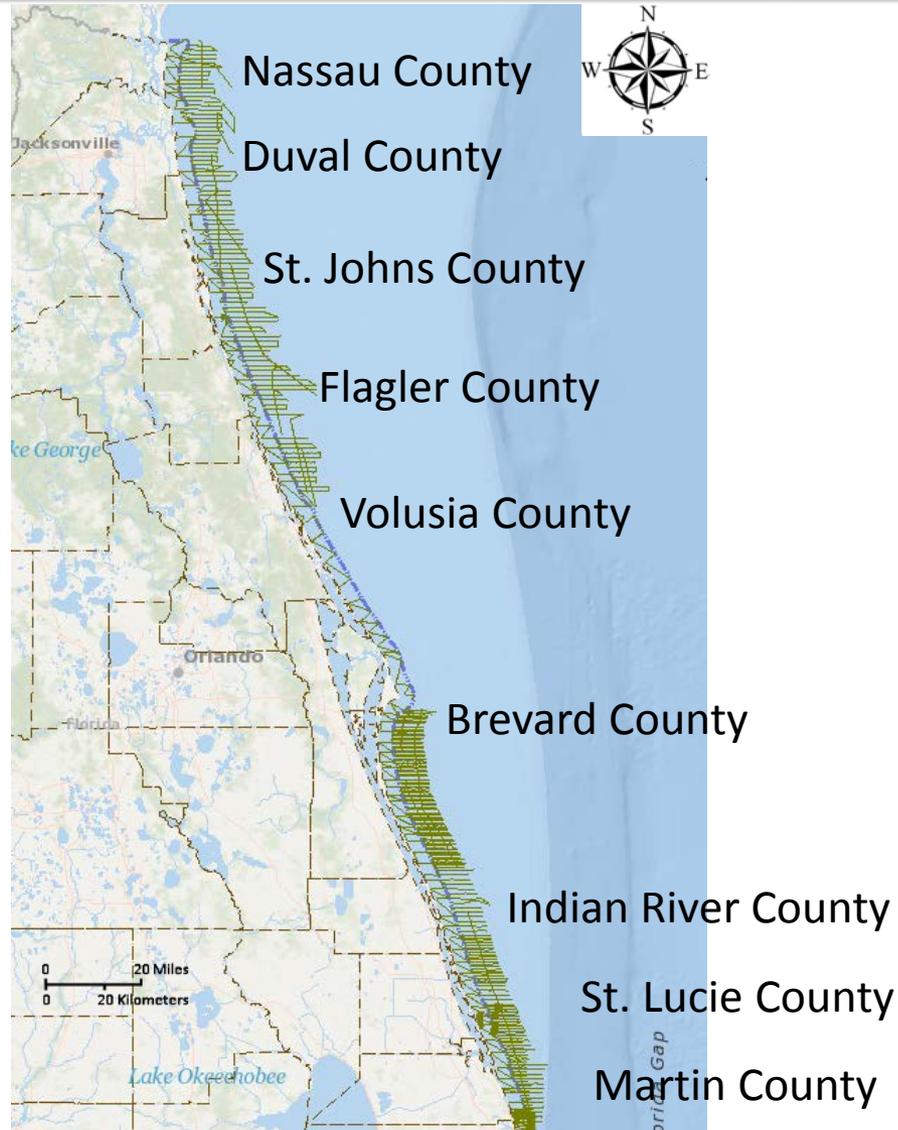
Collected as .TRA files, a now obsolete format somewhat indigestible to Chesapeake Technology's SonarWiz5[®] software. These data were collected during yearly cruises from 1996 to 2005. Much of these data have been reformatted by the USGS and made available with extensions .sgy or .seg. Where available and process-able those versions and .TRA files are what have been or will be used for mapping the seafloor, the "top of rock" and the sediment thickness between those surface. Typically approximately 150 feet of penetration of the seafloor can be seen on these data.

Chirp Data

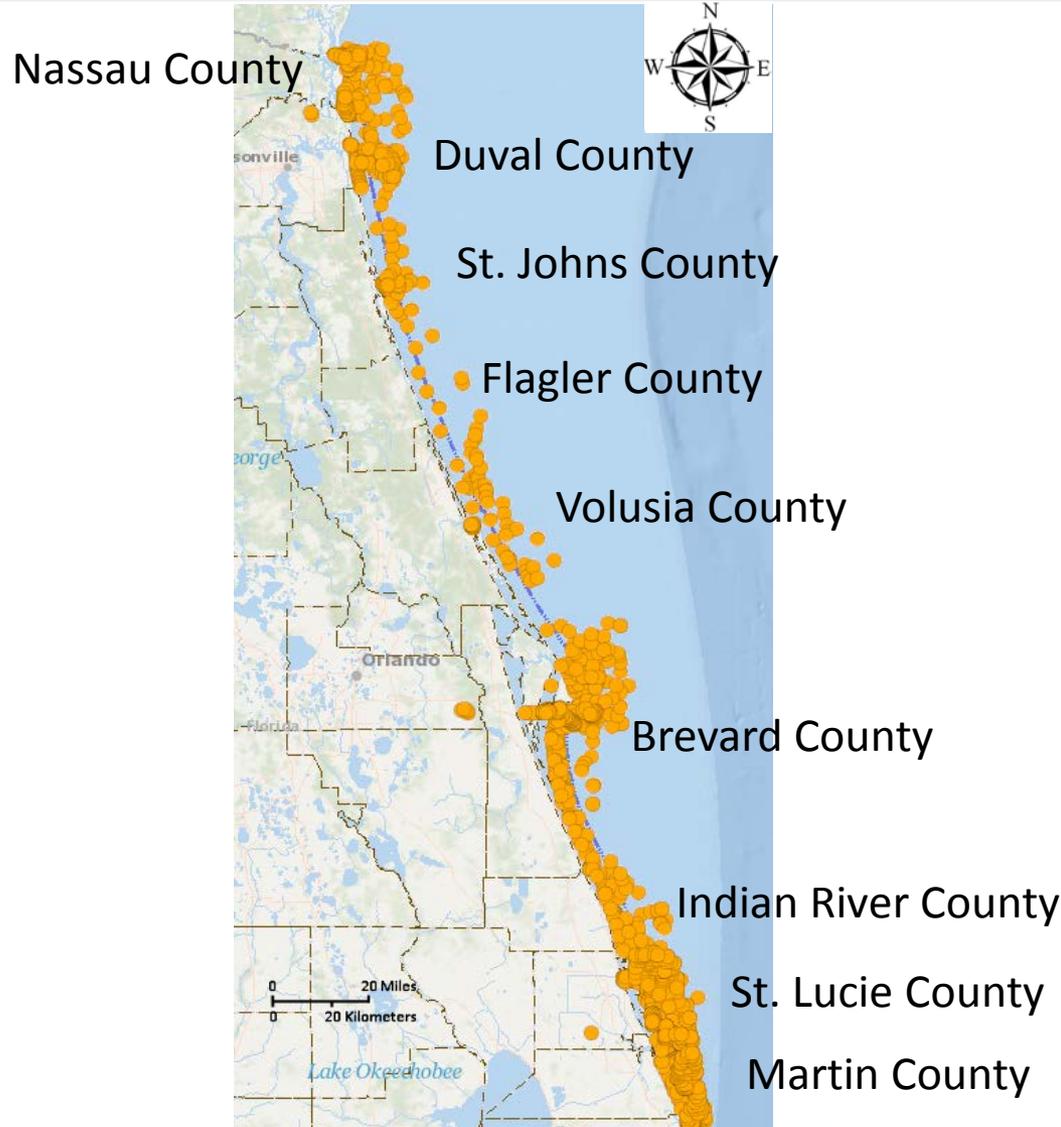
Typically collected by various consultants and not corrected for the depth of the towfish. Only sediment thickness can be derived from these uncorrected data. Typically approximately 30 feet of penetration of the seafloor can be seen on these data. Thus the penetration of these instruments may not be sufficient to reach "top of rock".



Seismic data sets to be used for mapping the thickness of unconsolidated sediments

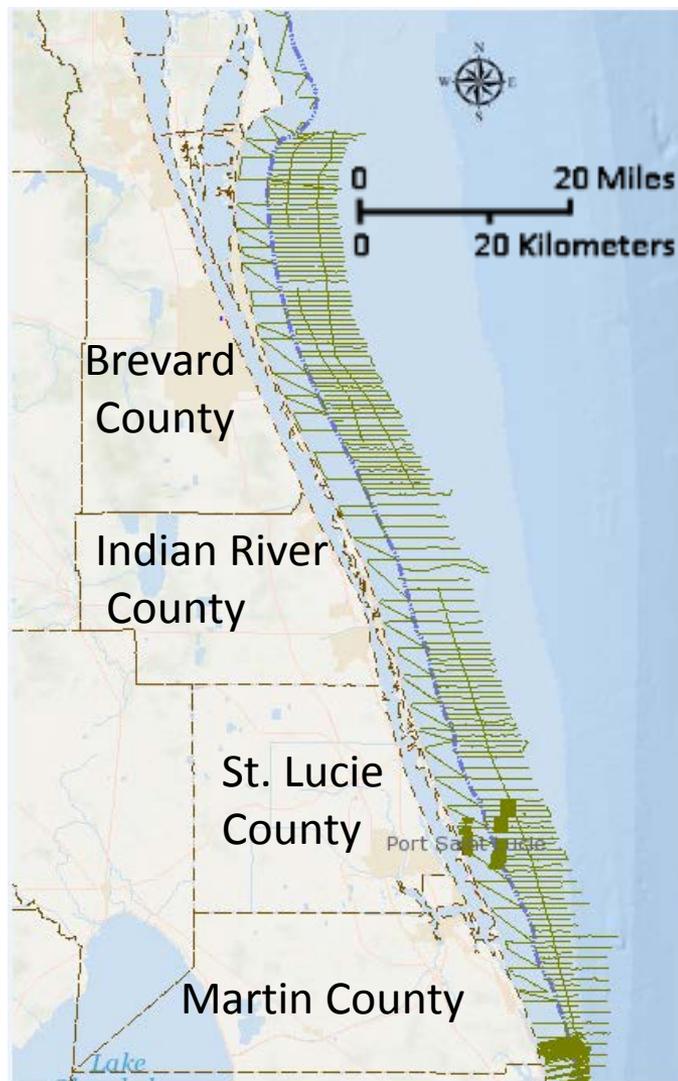


Vibracore data in the study area



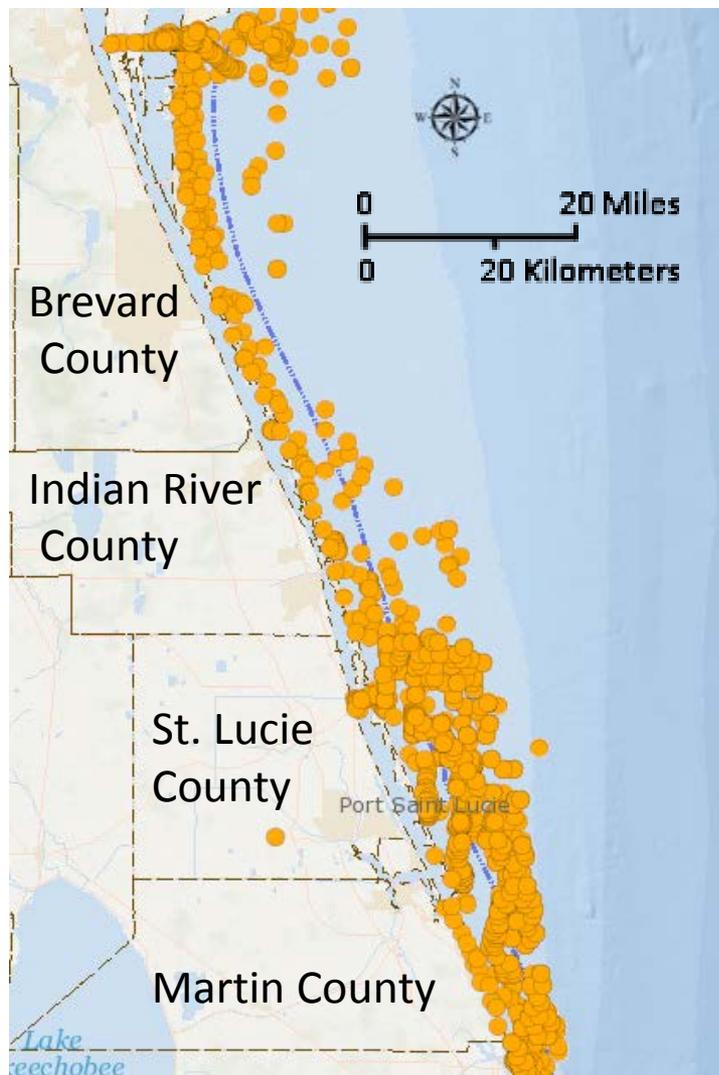


Seismic data sets south of Cape Canaveral





Vibracores in the study area south of Cape Canaveral

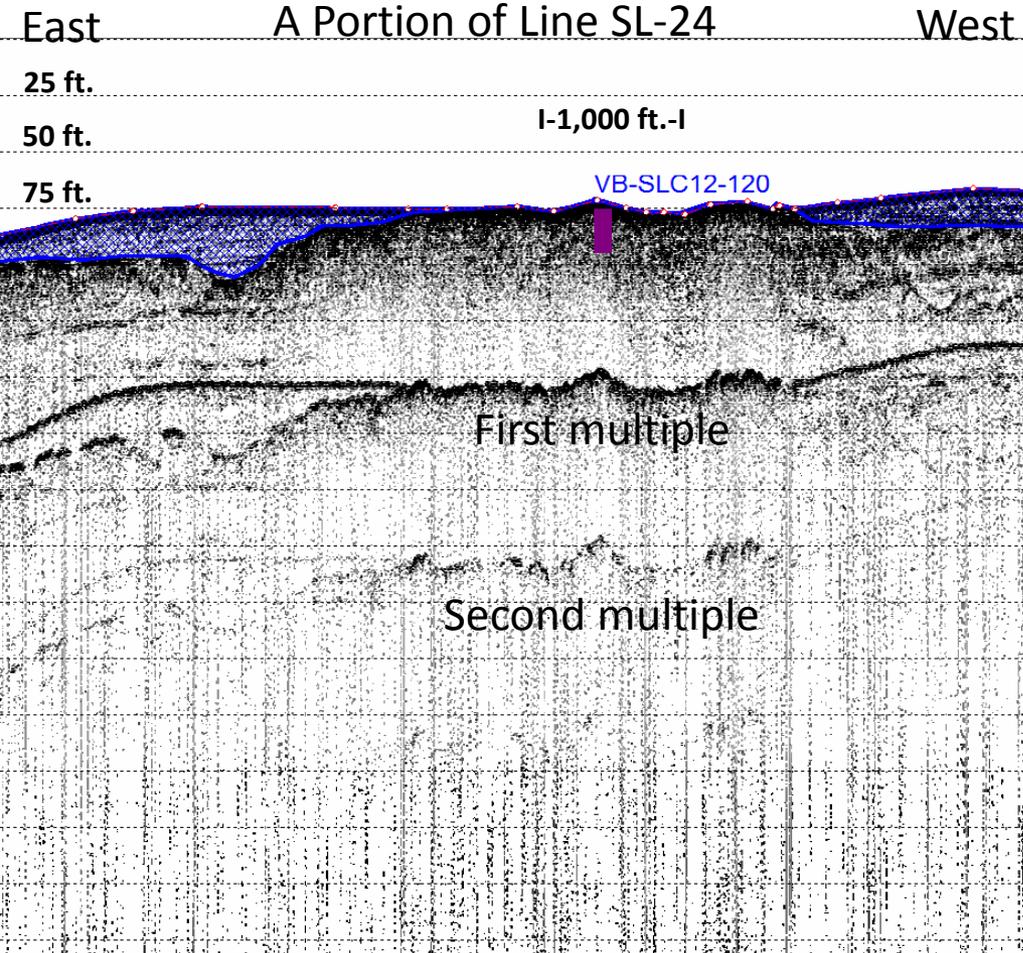




Sub-bottom profiler data example with vibracore showing top of rock at seabed



Boring Designation VB-SLC12-120



DRILLING LOG		DIVISION	INSTALLATION			SHEET 1		
1. PROJECT Southeast Florida SAND Study St. Lucie, Martin and Palm Beach Counties		South Atlantic	Jacksonville District			OF 1 SHEETS		
2. BORING DESIGNATION VB-SLC12-120		LOCATION COORDINATES X = 961,161 Y = 1,074,807		9. SIZE AND TYPE OF BIT See Remarks		10. COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. FL) NAD83 NAVD88		
3. DRILLING AGENCY Corps of Engineers - CESAW		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL ICE Model 2 Hydraulic Vibracore		<input checked="" type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER		
4. NAME OF DRILLER Joe Feith				12. TOTAL SAMPLES 0		<input type="checkbox"/> DISTURBED <input type="checkbox"/> UNDISTURBED (UD)		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL		13. TOTAL NUMBER CORE BOXES 1		14. ELEVATION GROUND WATER		
6. THICKNESS OF OVERBURDEN N/A				15. DATE BORING 04-27-12		STARTED 04-27-12		
7. DEPTH DRILLED INTO ROCK N/A				16. ELEVATION TOP OF BORING -75.7 Fl.		COMPLETED 04-27-12		
8. TOTAL DEPTH OF BORING 1.6 Fl.				17. TOTAL RECOVERY FOR BORING 19 %		18. SIGNATURE AND TITLE OF INSPECTOR J. Oustey, Geologist		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	REC.	RQD OR UD	REMARKS	BLOWS 1 FT.	N-VALUE
-75.7	0.0							
-76.0	0.3		SANDSTONE, non-fossiliferous, hard, unweathered, medium grained, broken due to drill action, 2.5Y 7/2 light gray	19		Vibracore		
-77.3	1.6	NR	BORING TERMINATED IN REFUSAL					
NOTES: 1. USACE Jacksonville is the custodian for these original files. 2. Soils are field visually classified in accordance with the Unified Soils Classification System.								

SAJ FORM 1836



Boring log for VB-SLC12-120 indicates penetration of 1.6 feet of unweathered medium grained rock!



Boring Designation VB-SLC12-120

DRILLING LOG		DIVISION		INSTALLATION			SHEET 1		
		South Atlantic		Jacksonville District			OF 1 SHEETS		
1. PROJECT				9. SIZE AND TYPE OF BIT See Remarks					
Southeast Florida SAND Study				10. COORDINATE SYSTEM/DATUM					
St. Lucia, Martin and Palm Beach Counties				State Plane, FLE (U.S. Ft.)		HORIZONTAL		VERTICAL	
				NAD83		NAVD88			
2. BORING DESIGNATION		LOCATION COORDINATES		11. MANUFACTURER'S DESIGNATION OF DRILL					
VB-SLC12-120		X = 981,181 Y = 1,074,807		ICE Model 2 Hydraulic Vibracore					
3. DRILLING AGENCY				12. TOTAL SAMPLES					
Corps of Engineers - CESA/W				CONTRACTOR FILE NO.		DISTURBED		UNDISTURBED (UD)	
4. NAME OF DRILLER						0		0	
Joa Feith				13. TOTAL NUMBER CORE BOXES 1					
5. DIRECTION OF BORING			DEG. FROM VERTICAL		14. ELEVATION GROUND WATER				
<input checked="" type="checkbox"/> VERTICAL									
<input type="checkbox"/> INCLINED					15. DATE BORING				
					STARTED		COMPLETED		
					04-27-12		04-27-12		
6. THICKNESS OF OVERBURDEN		N/A		16. ELEVATION TOP OF BORING -75.7 Ft.					
7. DEPTH DRILLED INTO ROCK		N/A		17. TOTAL RECOVERY FOR BORING 19 %					
8. TOTAL DEPTH OF BORING		1.8 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR					
				J. Ousley, Geologist					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	REC.	BOXES	SAMPLE	REMARKS	BLOWS 1 FT.	N-VALUE
-75.7	0.0								
-76.0	0.3								
		NR	SANDSTONE, non-fossiliferous, hard, unweathered, medium grained, broken due to drill action, 2.5Y 7/2 light gray	19			Vibracore		
-77.3	1.8		BORING TERMINATED IN REFUSAL						
			NOTES: 1. USACE Jacksonville is the custodian for these original files. 2. Soils are field visually classified in accordance with the Unified Soils Classification System.						



Sub-bottom profiler data example with vibracore showing top of rock below the seabed



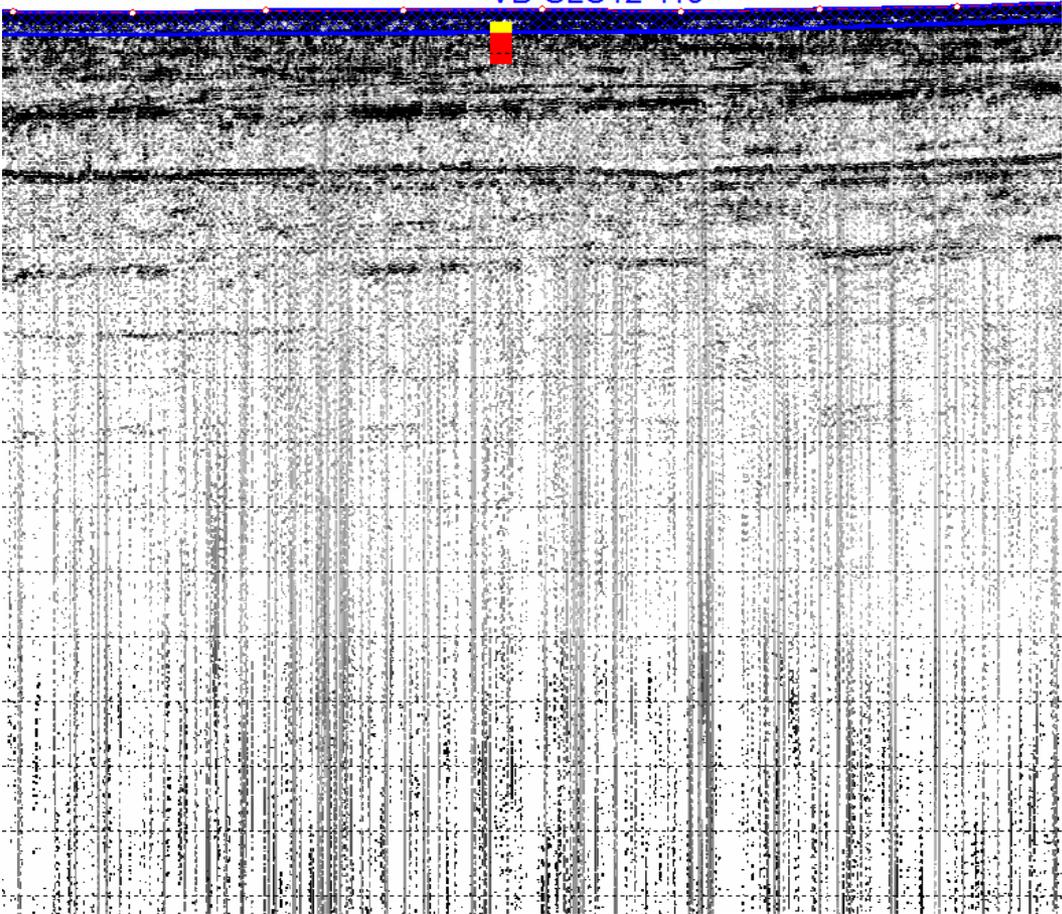
East A Portion of Line SL-24 West

25 ft.

50 ft.

I-1,000 ft.-I

VB-SLC12-119



Boring Designation VB-SLC12-119

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS					
1. PROJECT Southeast Florida SAND Study St. Lucie, Martin and Palm Beach Counties		South Atlantic	Jacksonville District	See Remarks					
2. BORING DESIGNATION VB-SLC12-119		LOCATION COORDINATES X = 937,837 Y = 1,074,580		10. COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD83 VERTICAL NAVD88				
3. DRILLING AGENCY Corps of Engineers - CESAW		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL ICE Model 2 Hydraulic Vibracore					
4. NAME OF DRILLER Joe Feith		5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		12. TOTAL SAMPLES DISTURBED: 0 UNDISTURBED (UD): 0					
6. THICKNESS OF OVERBURDEN N/A		DEG. FROM VERTICAL		BEARING					
7. DEPTH DRILLED INTO ROCK N/A		13. TOTAL NUMBER CORE BOXES 1		14. ELEVATION GROUND WATER					
8. TOTAL DEPTH OF BORING 19.7 FL.		15. DATE BORING 05-06-12		COMPLETED 05-06-12					
		16. ELEVATION TOP OF BORING -63.0 Ft.		17. TOTAL RECOVERY FOR BORING 87 %					
		18. SIGNATURE AND TITLE OF INSPECTOR C. Paplernik, Geologist							
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	NO. OF SAMPLES	RECOVERED	REMARKS	RECOVERED (%)	N-VALUE
-63.0	0.0		SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, few fine gravel-sized shell, trace silt, 10Y 5/1 greenish gray (SP)				-63.0		
-64.9	1.9		SAND, silty, mostly fine-grained sand-sized quartz, some fine to coarse-grained sand-sized shell, little silt, few fine gravel-sized shell up to 2", 10Y 3/1 very dark greenish gray (SM)						
-66.5	3.5		SAND, silty, mostly sand to gravel-sized shell, little fine-grained sand-sized quartz (SM)						
-67.8	4.8		SANDSTONE, fossiliferous, moderately hard, highly weathered, few layers of cemented sand up to 6", 10Y 8/1 light greenish gray						
						87	Vibracore		

SAJ FORM 1836

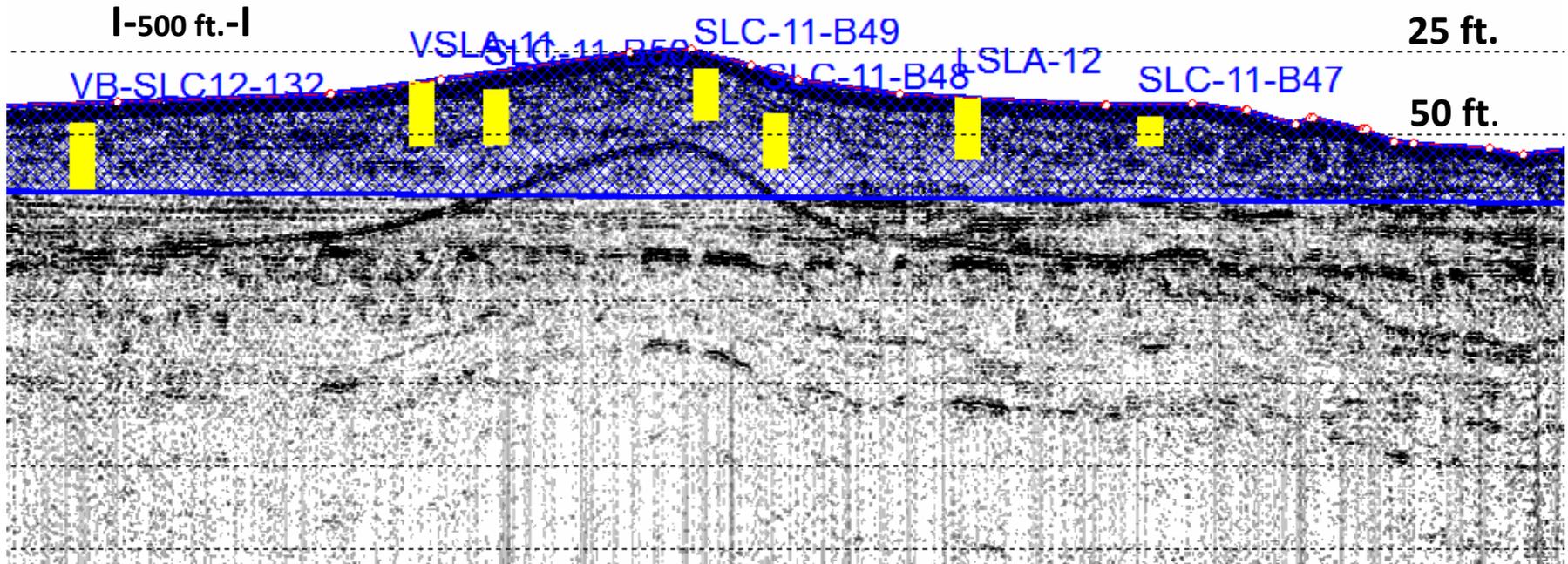
(Continued)

Sub-bottom profiler data example: Vibracores not reaching interpreted top of rock

West

A portion of Line SL 18

East



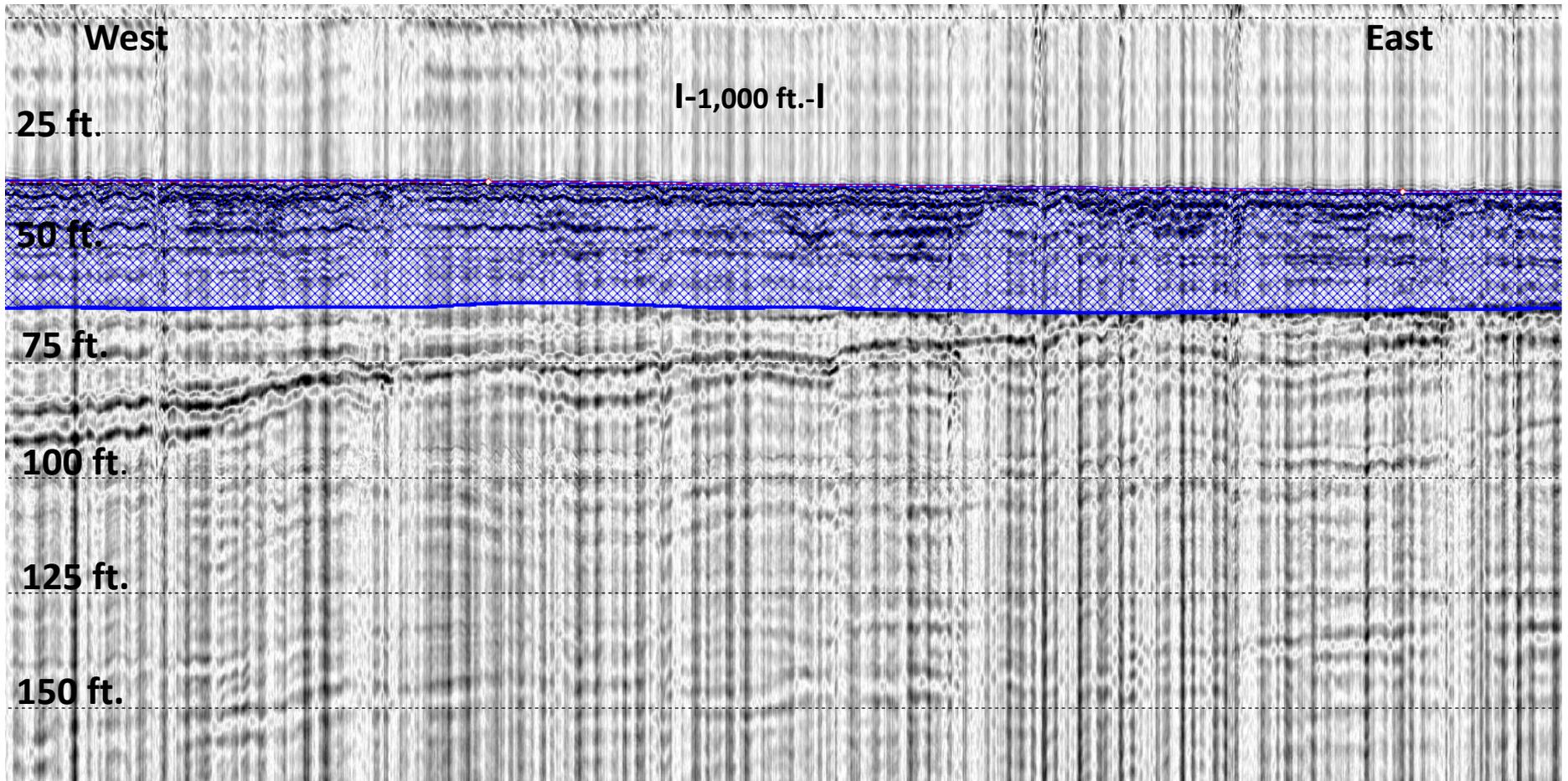
Note: All vibracores within a 500 foot corridor of the trace of seismic lines were projected into the line. Thus a vibracore's lack of intersection with the seabed may be due to either that or a change in water depth which occurred in the intervening time period between the collection of the seismic data and the collection of individual vibracores.



Sub-bottom profiler data example with no vibracores available to tie



A portion of Line SB_B31





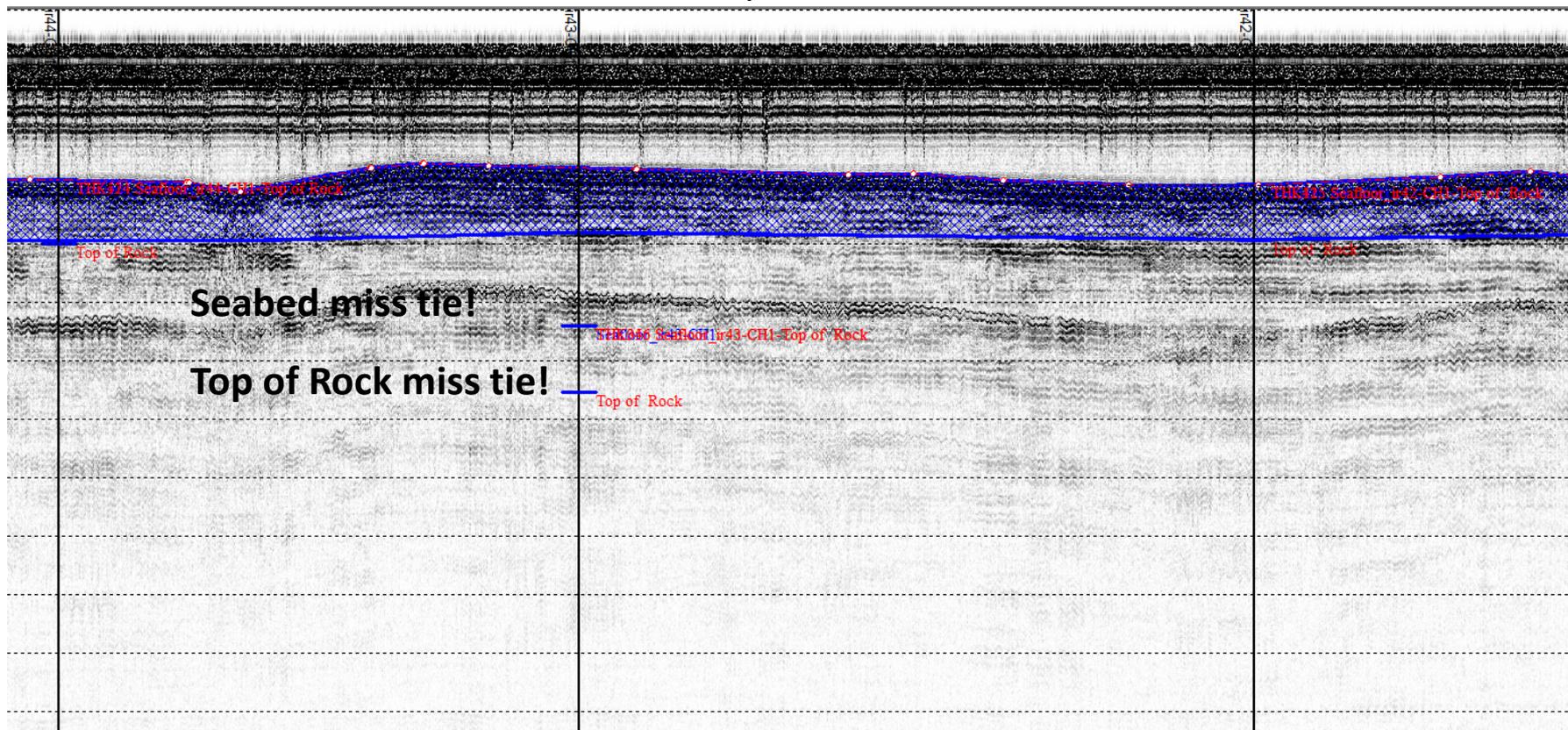
Processing issues example



South

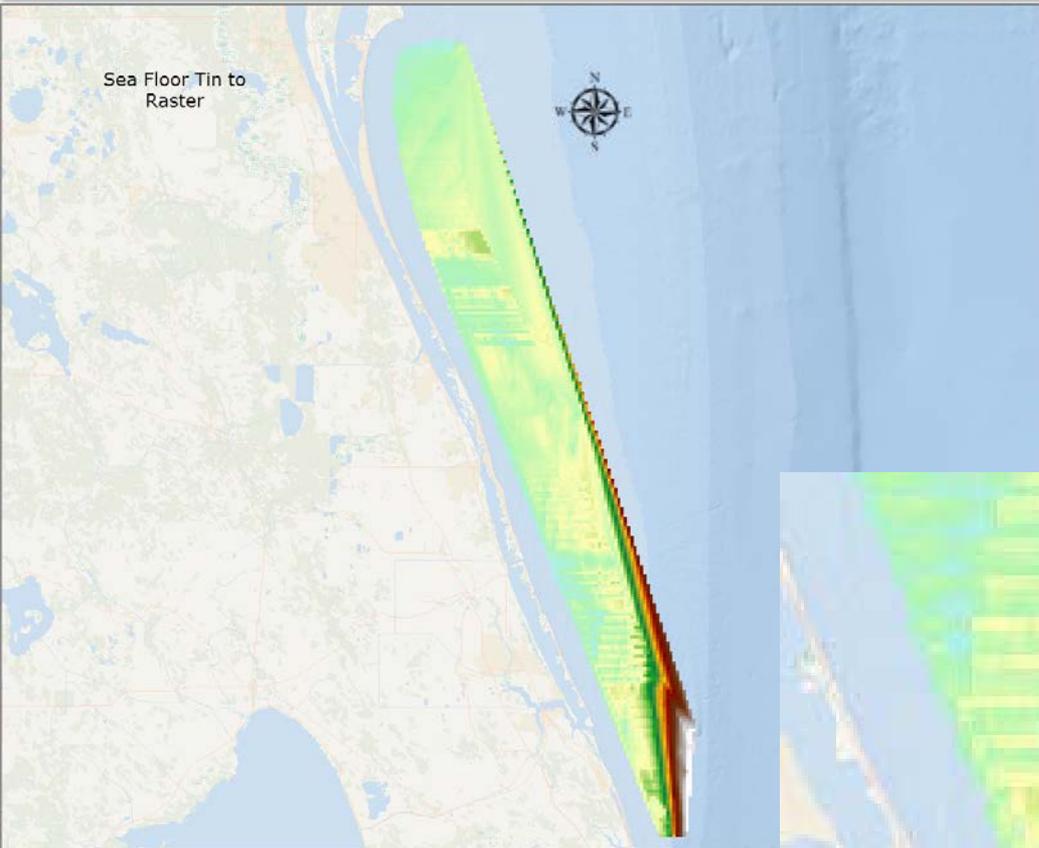
Tie Line LA5
|-1,000 ft.-|

North

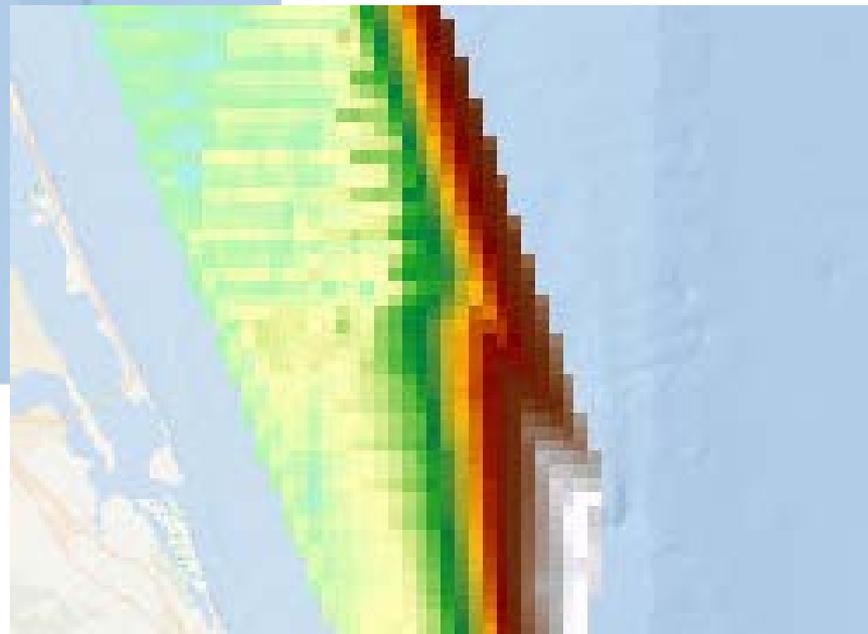




Seafloor raw data

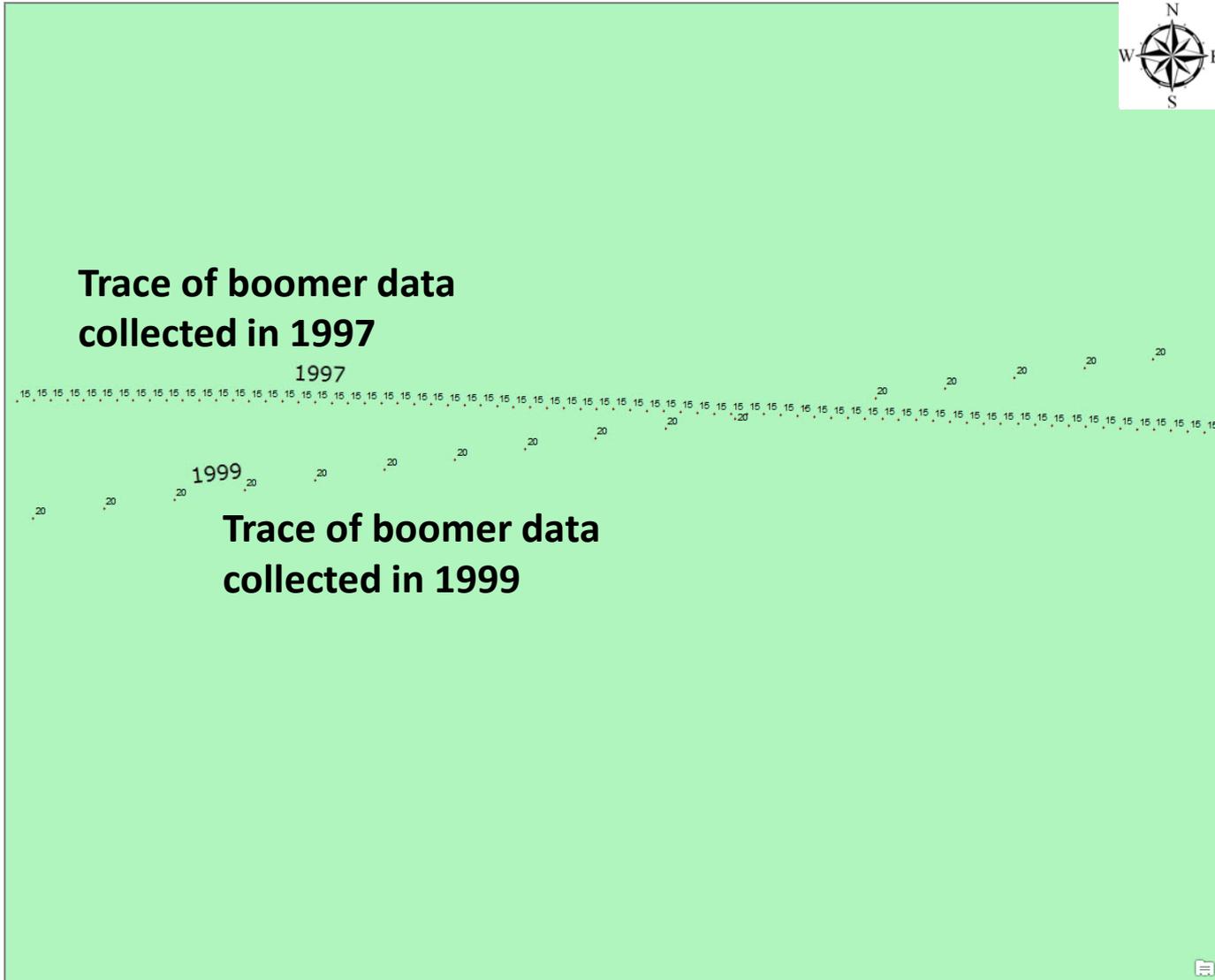


The disconnect seen on the inset is between data collected in various years.





Example of seafloor depth change over time?

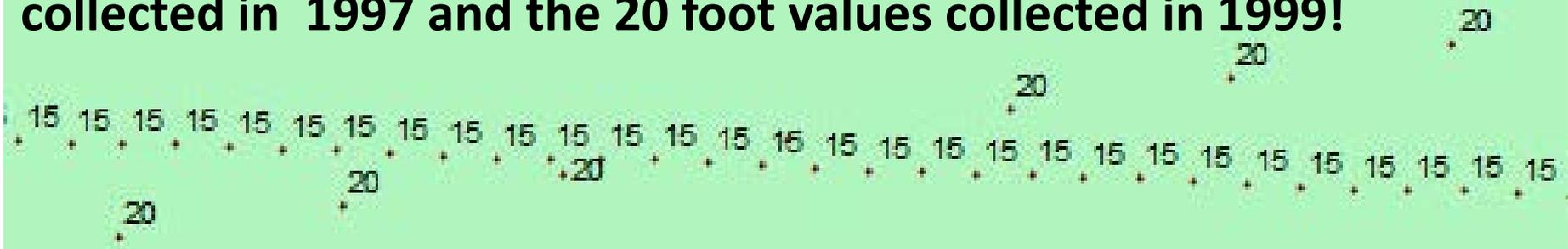




The line crossing point from the previous slide

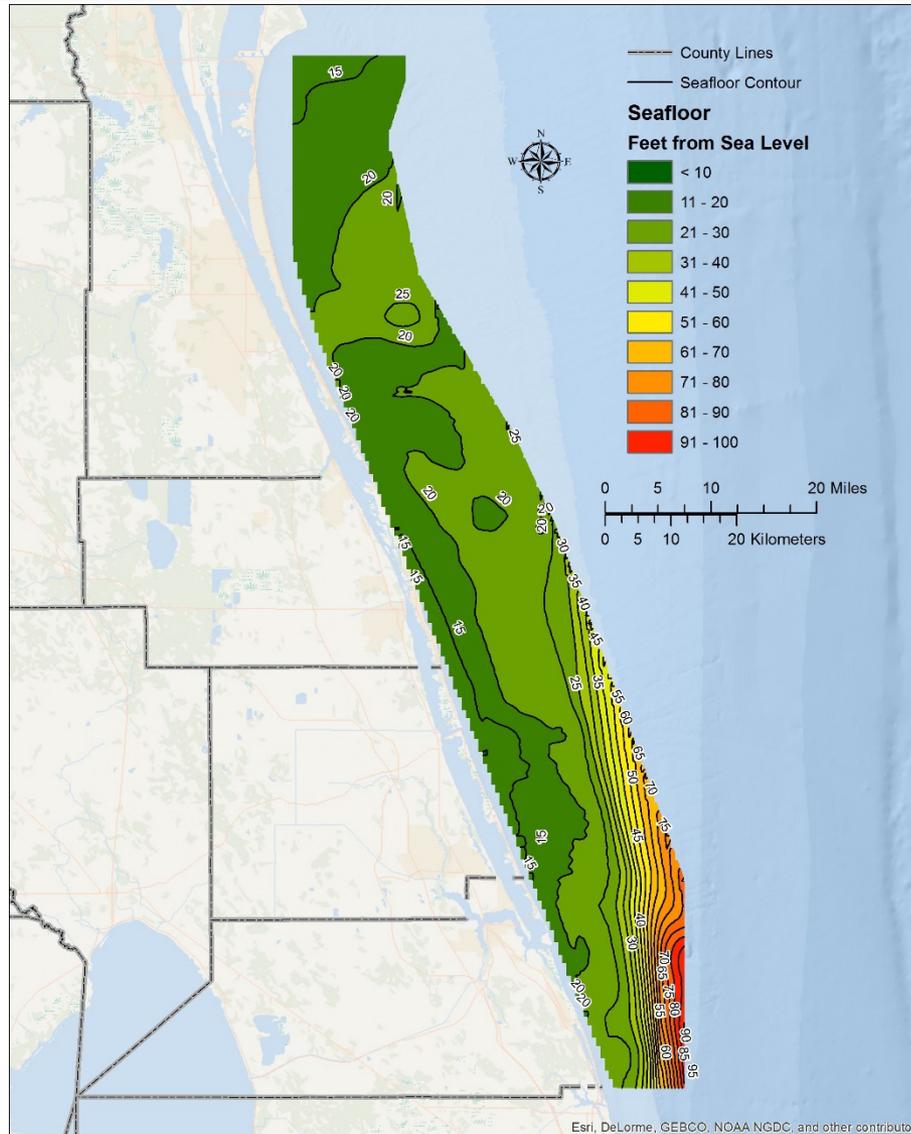


Note that there is 5 feet of difference between the 15 foot values collected in 1997 and the 20 foot values collected in 1999!



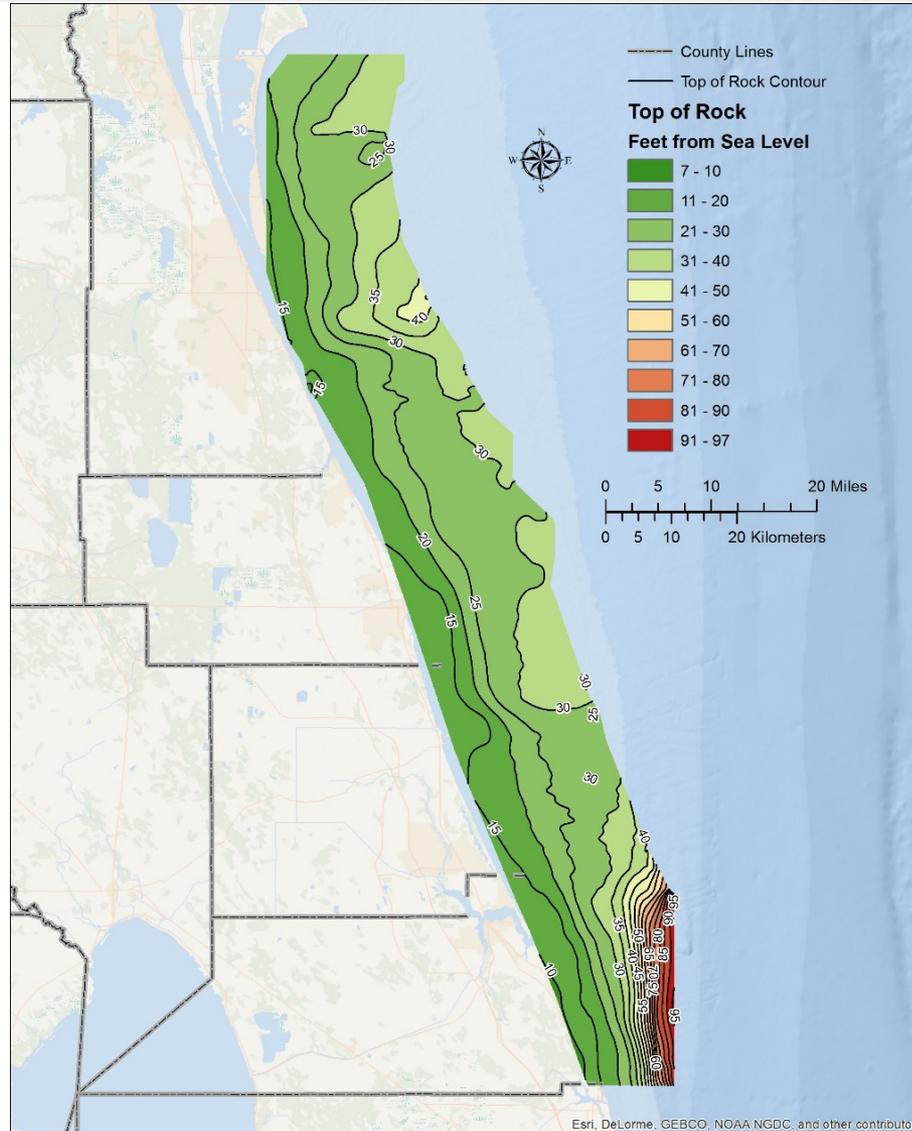


Smoothed seafloor with contours



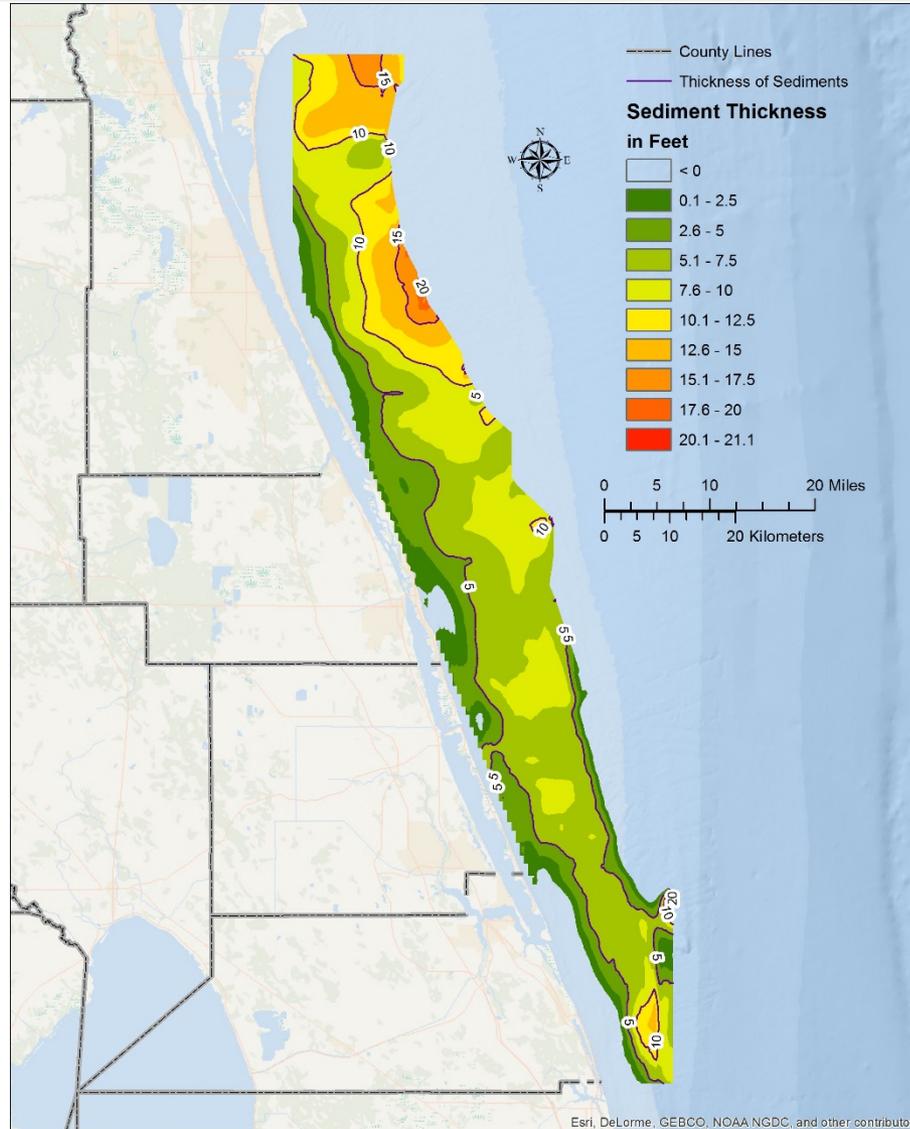


“Top of rock” map for the study area south of Cape Canaveral



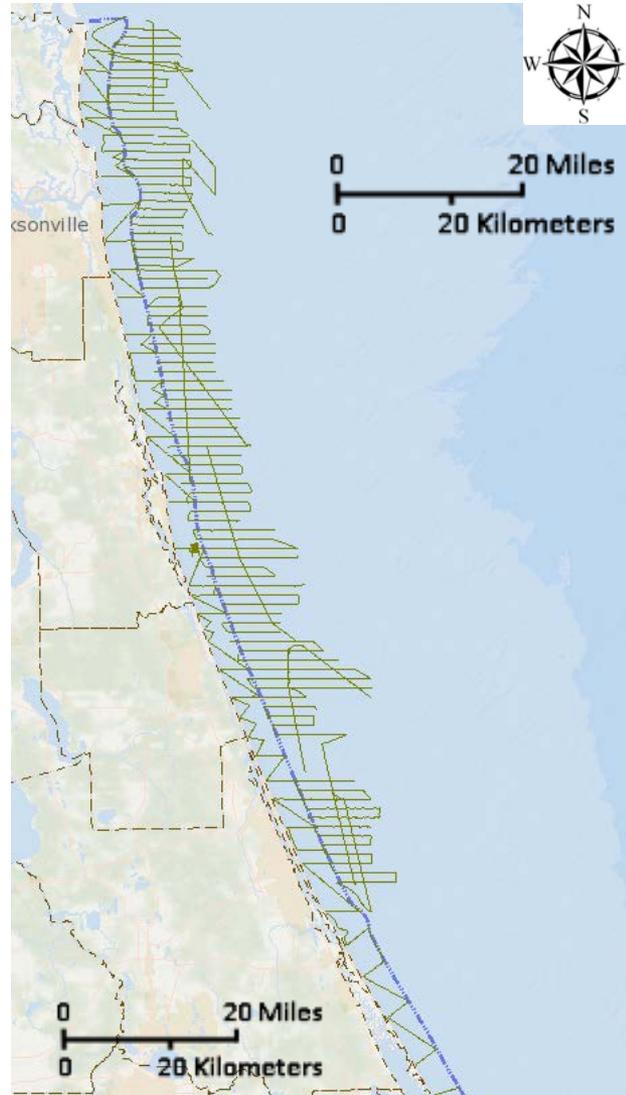


Map of the thickness of unconsolidated sediments in the study area south of Cape Canaveral



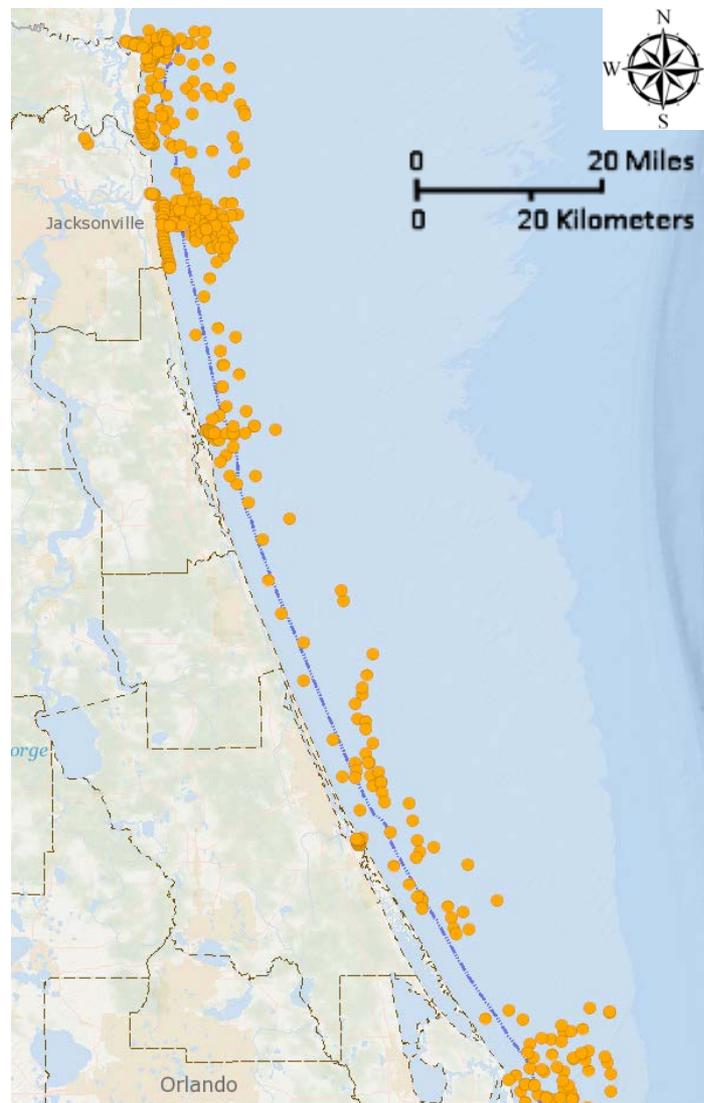


Seismic data sets to be used for mapping north of Cape Canaveral





Vibracores in the study area north of Cape Canaveral





Seismic line 43 collected off of Duval County



West

East

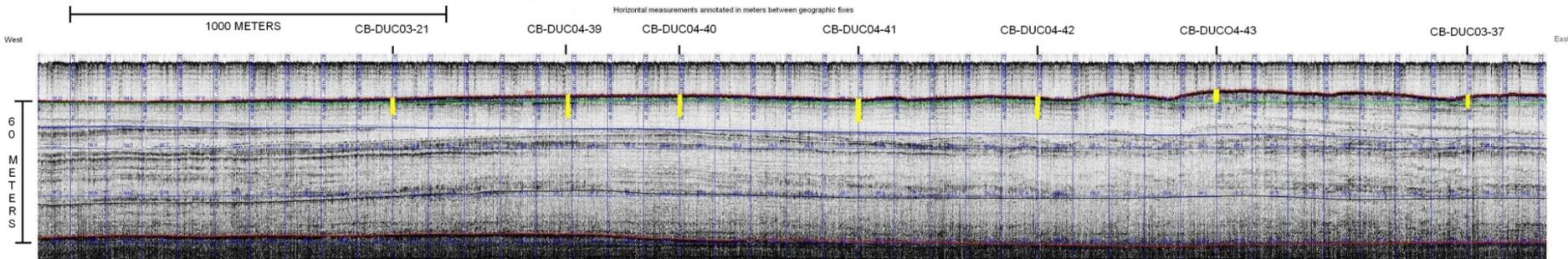


Figure 6. Geologically Interpreted Selected Segment of Nassau Duval Seismic Line 43



The End



Daniel C. Phelps, P.G. II

Geological Investigations Section

Office of the Florida Geological Survey

Suite 1, 3000 Commonwealth Blvd.

Tallahassee, FL 32303-7700

O. 850.617.0313

F. 850.617.0341

dan.phelps@dep.state.fl.us

FGS Coastal Research Projects web page:

<http://www.dep.state.fl.us/geology/programs/coastal/coastal.htm>



Preliminary Results of the 2015 Reconnaissance Phase of Bureau of Ocean Energy Management's Atlantic Sand Assessment Project

Florida Offshore Sand Management Working Group
Tuesday, February 2, 2016

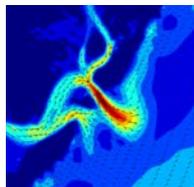
Joe Maloney
Geologist, BOEM
Sterling, Virginia

Beau C. Suthard, PG
Client Program Manager, CB&I
St. Petersburg, Florida

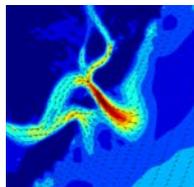


- *CB&I* (NYSE: CBI) has designed, permitted, implemented, and monitored over 75 coastal restoration projects, more than any other firm in the US, having identified billions of cubic yards of sand resources on the Inner and OCS.
- *CB&I* is the most complete energy infrastructure focused company in the world. With 125 years of experience and the expertise of approximately 54,000 employees, *CB&I* provides reliable solutions while maintaining a relentless focus on safety and an uncompromising standard of quality.

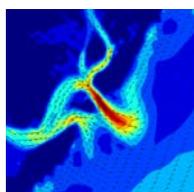
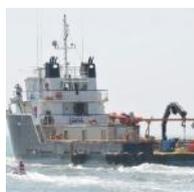
NATIONAL SAFETY COUNCIL "GREEN CROSS FOR SAFETY" 2015 RECIPIENT



- 1) Project Description
- 2) Project Schedule and Milestones
- 3) 2015 Reconnaissance Survey Equipment
- 4) 2015 Reconnaissance Survey Preliminary Results
- 5) 2016 Design Level Survey Plan

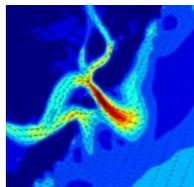


- **\$342 Million Allocated to DOI for Hurricane Sandy Recovery**
- **\$13.6 Million to BOEM**
 - \$5 million for Atlantic Sand Assessment Project (ASAP)
 - \$3 million for initial round of State Cooperative Agreements
 - \$1.5 million for second round of State Cooperative Agreements (in 2016)
 - \$3.1 million to Division of Environmental Assessment
 - Environmental Assessment and monitoring

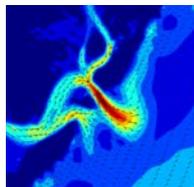


Project Scope:

- Collection of a minimum of 5,600 km of geophysical data on the OCS
 - Between 3-8 nm (4.8-12.9 km) from the shoreline
 - To a depth of approximately 90 ft (27.5 m)
 - Geophysical data will not be processed and interpreted (except for QA/QC subset)
- Collection of 350 geotechnical samples
 - 250 vibracores
 - Cores will be split, logged, sampled/analyzed, and photographed
 - 100 grab samples
 - Division of vibracore vs. grab samples to be determined upon geophysical survey results



- The geophysical and geotechnical survey will be conducted under two (2) phases totaling 5,600 km of data and 350 geotechnical samples
 - **Reconnaissance level (2015):** Approximately 4,200 km of geophysical data and 260 geotechnical samples (160 vibracores, 100 surface grab samples)
 - **Design level (2016):** Approximately 1,400 km of geophysical data and 90 geotechnical vibracore samples

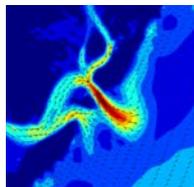


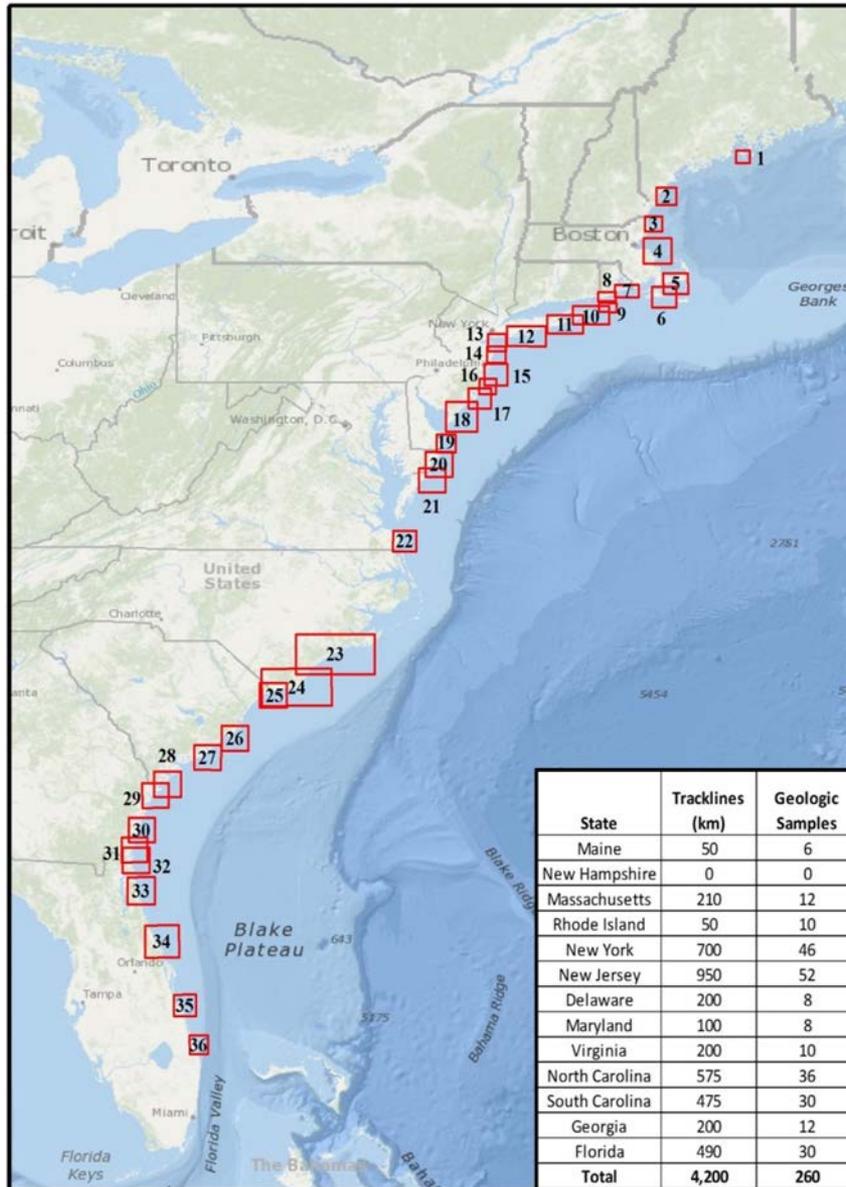
Breakdown of Reconnaissance Geophysical and Geotechnical Data

State	Geophysical		Geotechnical	
	km	%	Number	%
MA	210	5%	14	5%
RI	50	1%	10	4%
NY	700	17%	49	18%
NJ	950	23%	52	20%
DE	200	5%	8	3%
MD	100	2%	8	3%
VA	200	5%	10	4%
NC	575	14%	37	14%
SC	475	11%	30	12%
GA	200	5%	12	5%
FL	490	12%	30	12%

Design-Level Data Acquisition will be allocated to:

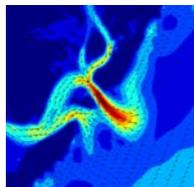
- Develop potential borrow areas offshore New York and New Jersey to maintain 40% effort contract requirement
- Potentially develop one additional potential borrow area offshore a different state based on reconnaissance geophysical data analysis and BOEM direction



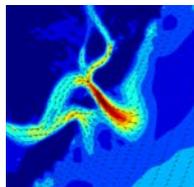


State	Geophysical	
	Planned (km)	As-run (km)
MA	210	216
RI	50	54
NY	736	768
NJ	950	969
DE	200	203
MD	100	100
VA	200	201
NC	586	587
SC	475	511
GA	200	203
FL	505	527
Totals	4262	4338

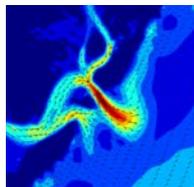
State	Geologic		
	Vibracores	Surface Samples	Total Samples
MA	7	7	14
RI	6	4	10
NY	31	18	49
NJ	32	20	52
DE	5	3	8
MD	5	3	8
VA	6	4	10
NC	23	14	37
SC	19	11	30
GA	7	5	12
FL	19	11	30
Totals	160	100	260



- Project Kickoff: *November 19, 2014*
- State/Stakeholder Meetings: *January/February 2015*
- Final Data Acquisition Plan: *March 24, 2015*
- 2015 Reconnaissance Geophysical Survey (Complete)
 - Complete Geophysical Mobilization: *April 16, 2015*
 - Equipment Calibrations: *April 17-18, 2015*
 - Data Collection Begins Offshore FL: *April 19, 2015*
 - Complete Geophysical Survey Offshore MA: *July 26, 2015*
 - Complete Demobilization: *July 30, 2015*
- 2015 Reconnaissance Geologic Sampling Cruise (Complete)
 - Complete Geologic Sampling Cruise Mobilization: *July 27-28, 2015*
 - First Sample Collected Offshore FL: *July 29, 2015*
 - Complete Geophysical Survey Offshore MA: *December 13, 2015*
 - Complete Demobilization: *December 14, 2015*



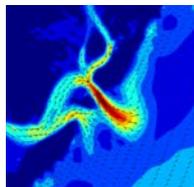
- Augmented differential global navigation satellite system (DGNSS)
- Dual frequency satellite corrections
- Integrated into Hypack Navigation station
- Data is logged for post processing with Continually Operating Reference Stations (CORS)



- Motion reference unit mounted to the survey vessel
- Attitude, heading, heave, position and velocity
- Combining GPS with inertial measurements

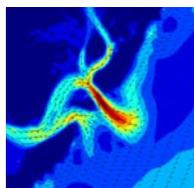
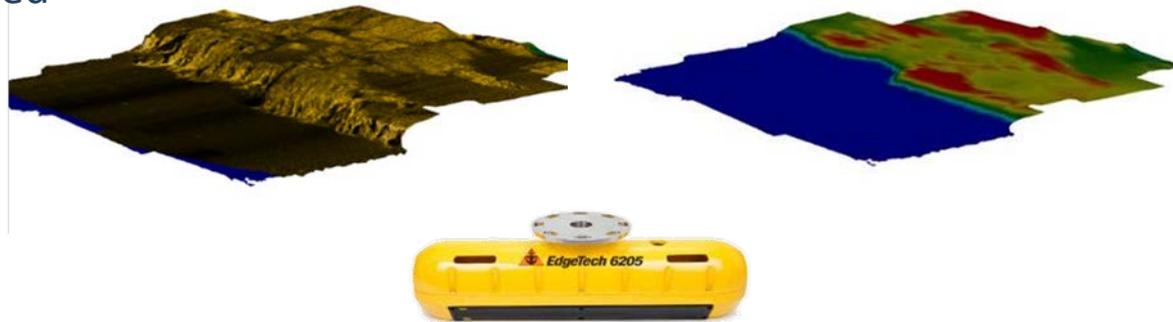


	Accuracy
Horizontal	+/- (8 mm + 1 ppm x baseline length)
Vertical	+/- (15 mm + 1 ppm x baseline length)
Pitch and Roll	0.01° (up to 0.008° with post processing)
Heave	5 cm or 5% (TrueHeave of 3 cm or 2%).



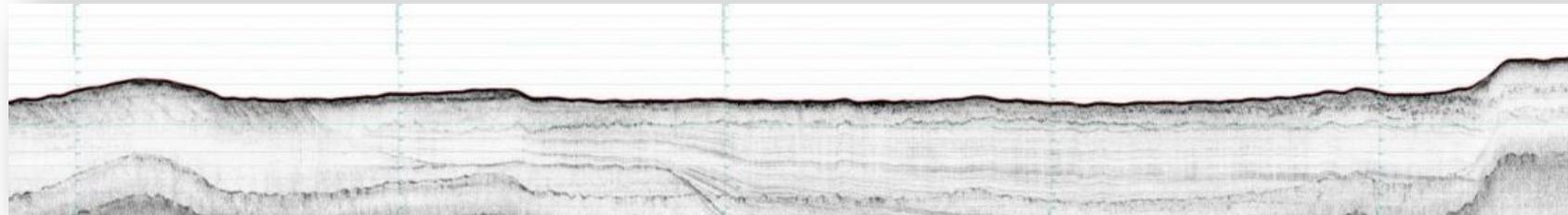
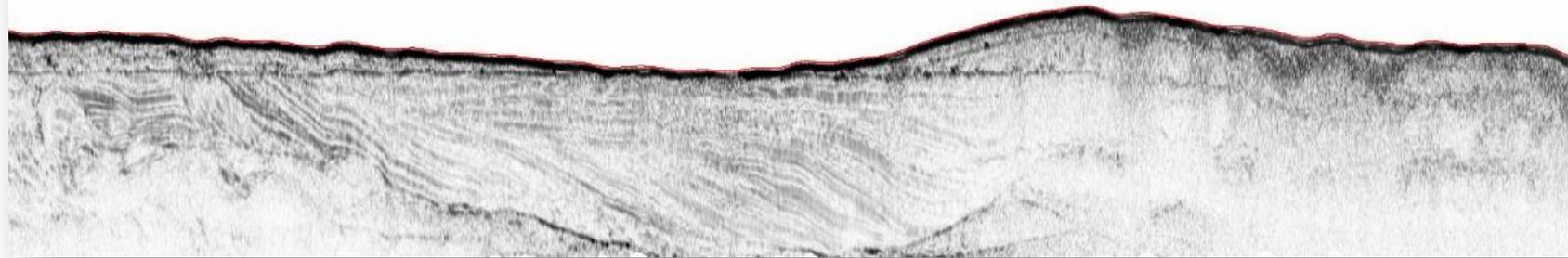
- Pole mounted bathymetry and backscatter acquisition
- Chirp pulse modulation
- Integrate different data sources
 - Sound velocity
 - Altimeter
 - Motion reference unit
- .jsf - backscatter
- X/Y/Z - processed bathymetry

	Bathymetry		Sidescan sonar		
Power	230 kHz	550 kHz	230 kHz	550 kHz	1600 kHz
Swath	350 m	150 m	450 m	250 m	70 m
Range Resolution	3 cm	1 cm	3 cm	1 cm	0.6 cm

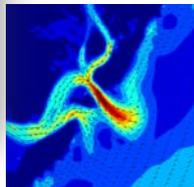




- High-resolution seismic reflection profile data
- Frequency Modulated pulse
- Full spectrum of frequency range
- Resolution: 0.06 to 0.10 m
- *.jsf* file format



EdgeTech 3200 data examples from the Atlantic Outer Continental Shelf offshore NC (top) and VA (bottom)

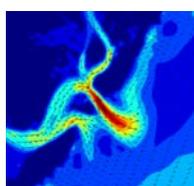


- Dual acquisition system
- 300/600 kHz
- Controlled by a topside box running Discover software
- .jsf file format

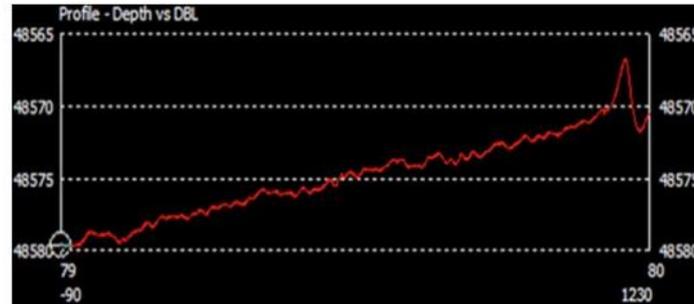
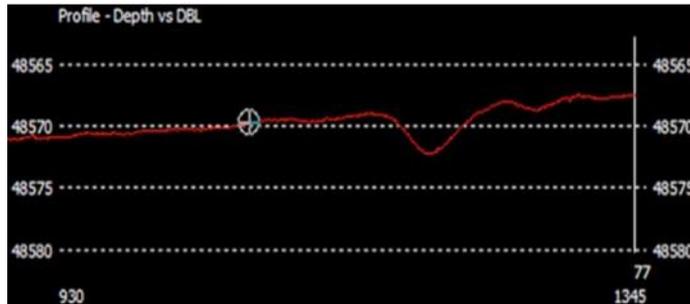
Resolution	300kHz	600kHz
Along Track	1.3 m at 150 m	0.45 m at 100 m
Across Track	3 cm	1.5 cm



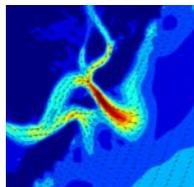
Image of the EdgeTech 4200 Sidescan Sonar towfish (left) and data example depicting a shipwreck and adjacent seafloor from the northern Gulf of Mexico, offshore Louisiana in approximately 35 ft of water depth (right).



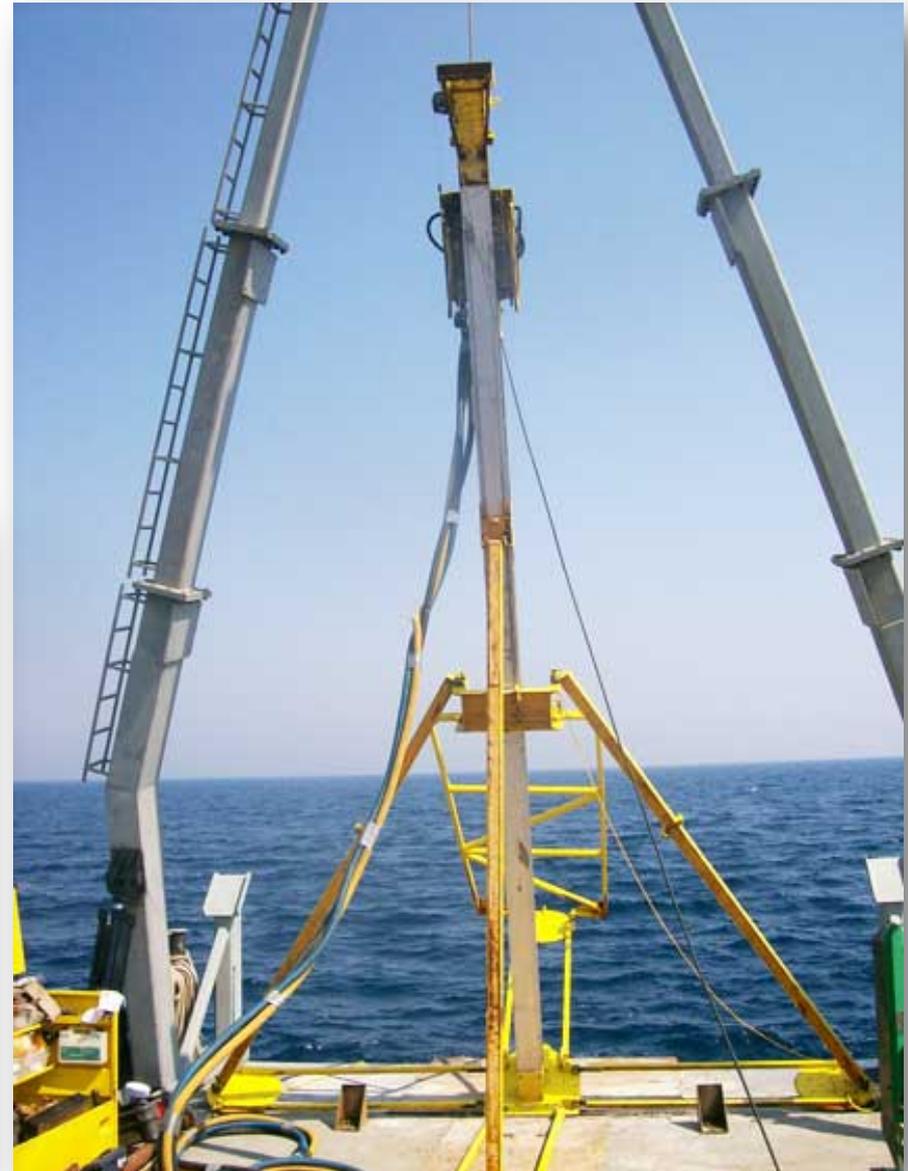
- Used to identify magnetic anomalies within the study area
 - Potential hazards and cultural resources
- Necessary for geotechnical sample collection site clearance by a qualified archaeologist
- Hypack *.raw* file format

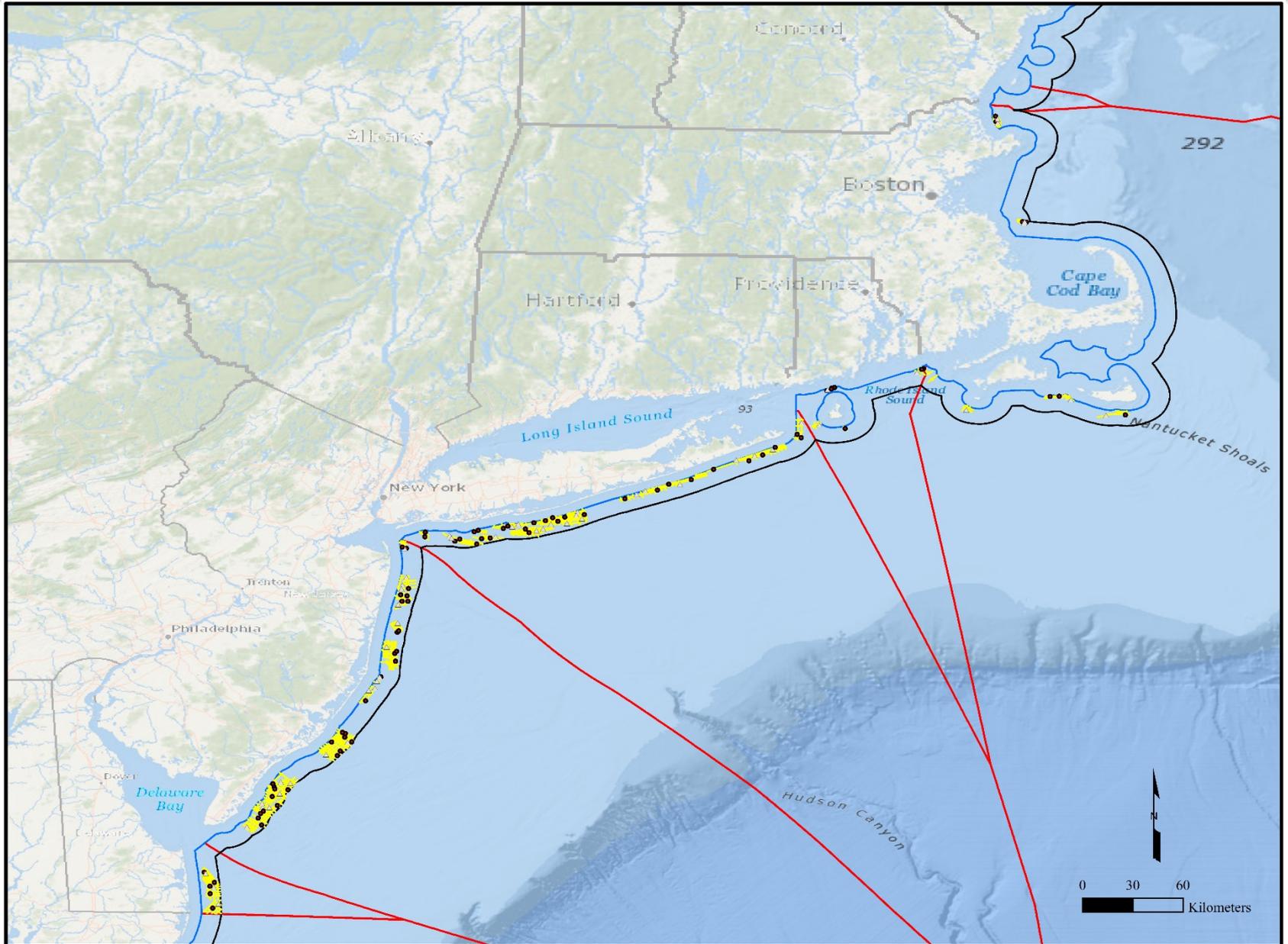


Geometrics G882 magnetometer (top) and magnetometer data examples (bottom) from the Maryland Outer Continental Shelf in approximately 20 m of water depth. Examples show a small magnitude multicomponent target (left) and a small magnitude dipolar target (right)



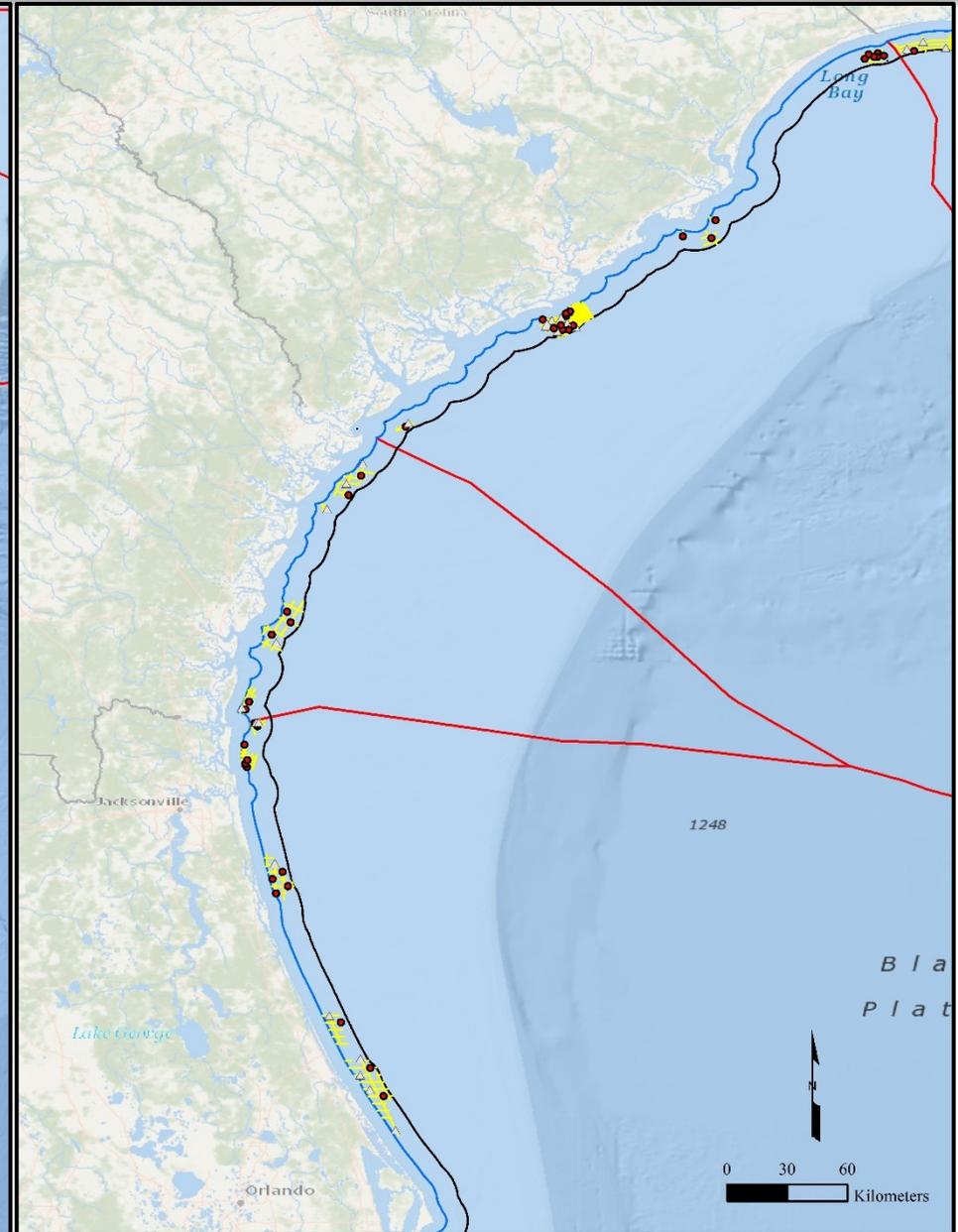
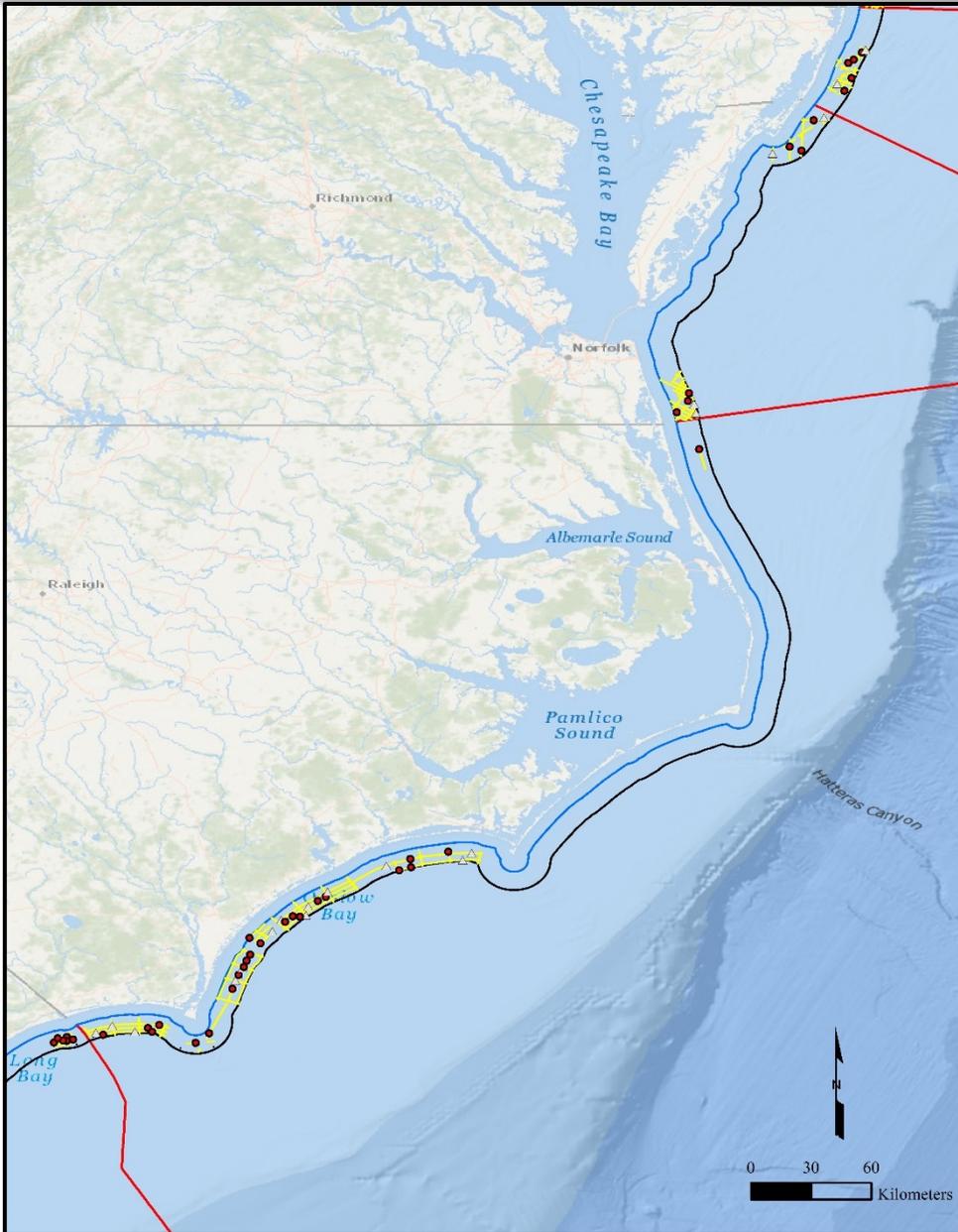
- Air-driven vibratory hammer, aluminum H-beam and drilling bit with a cutting edge
- Core sample: 6.09 m (20 ft) in length, 10.16 cm (4 inches) in diameter
- gINT file format

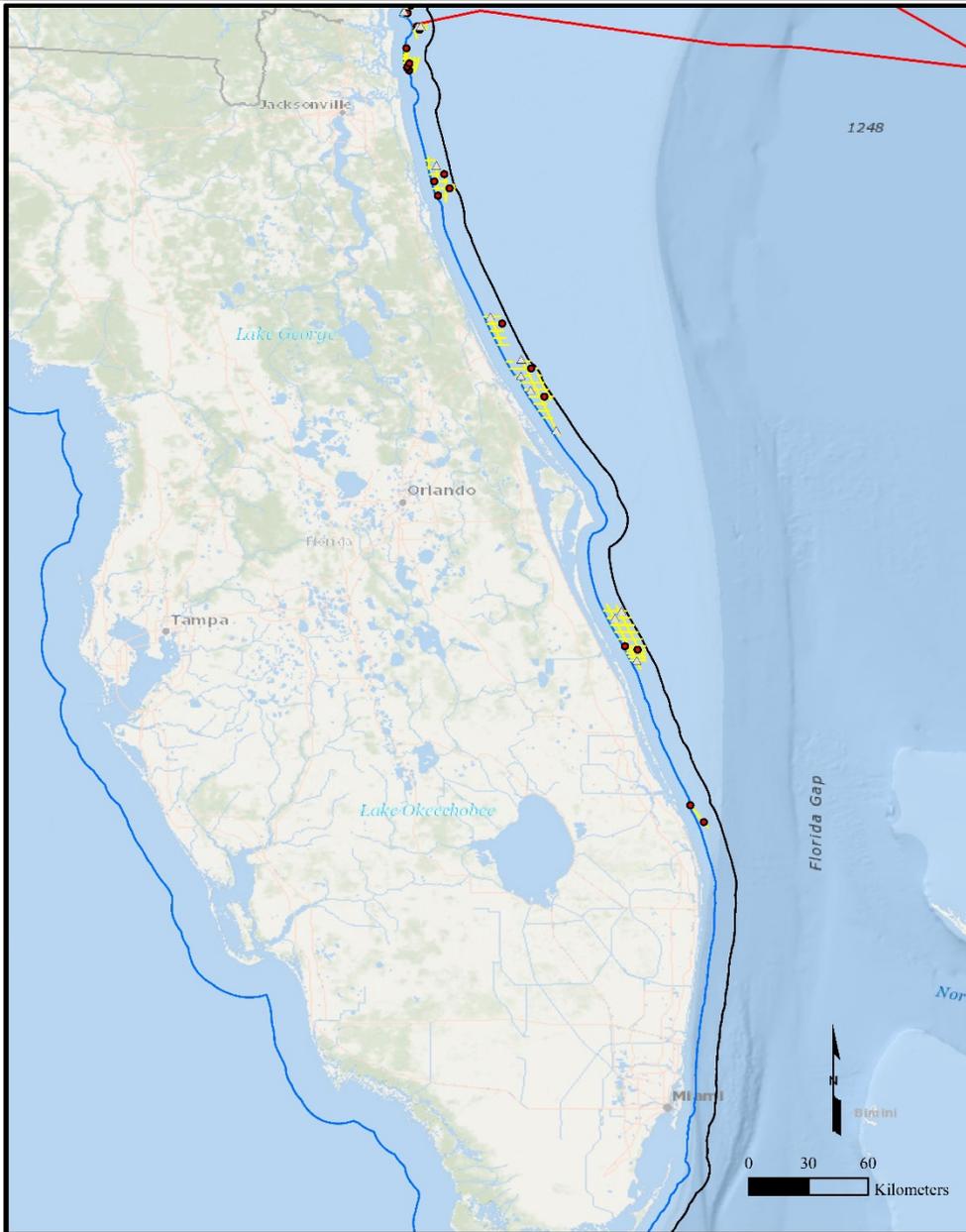


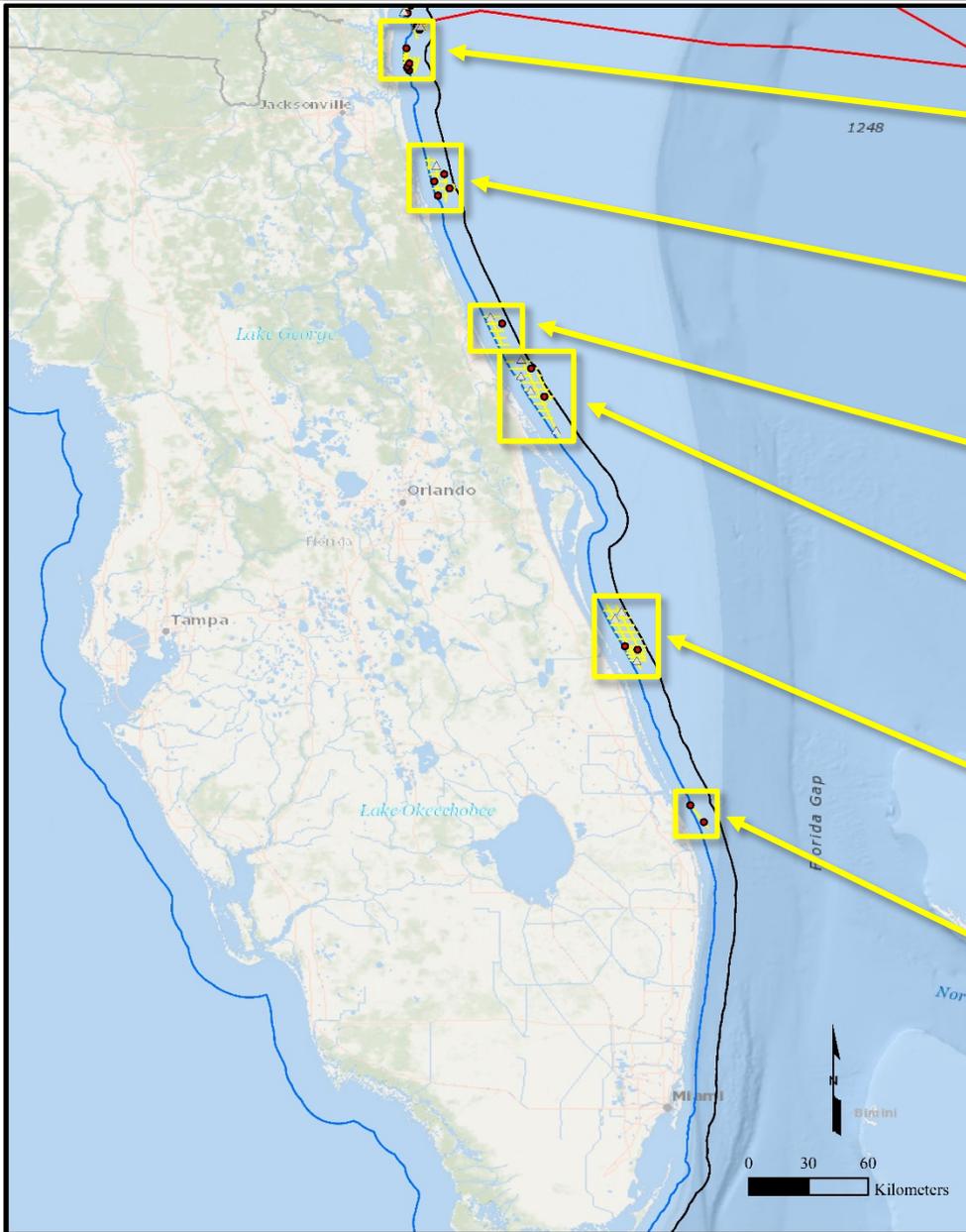




Mid-Atlantic/Southeast Regional As-Collected Data







Florida Area 1

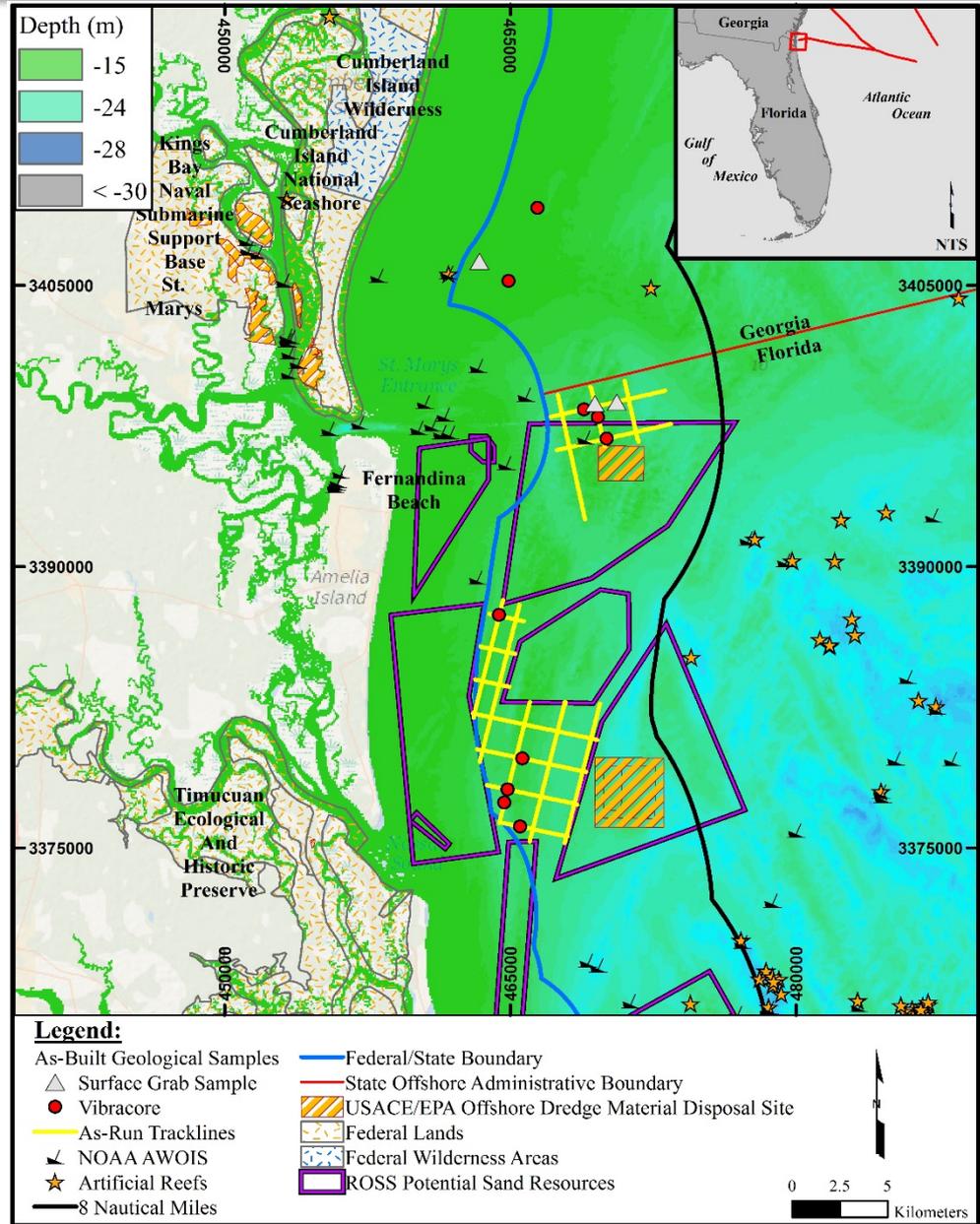
Florida Area 2

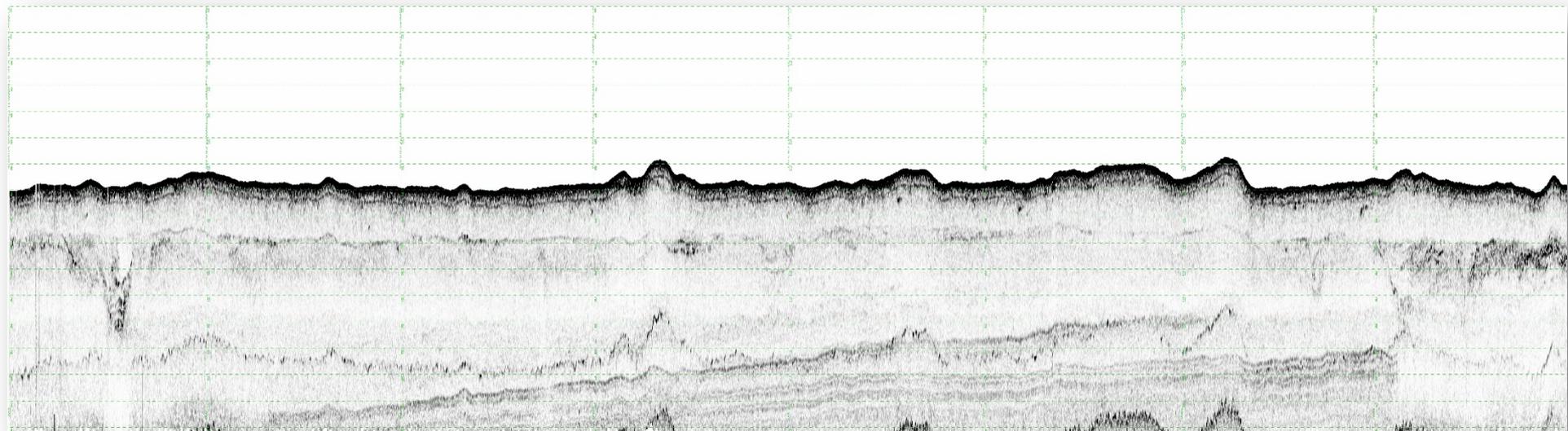
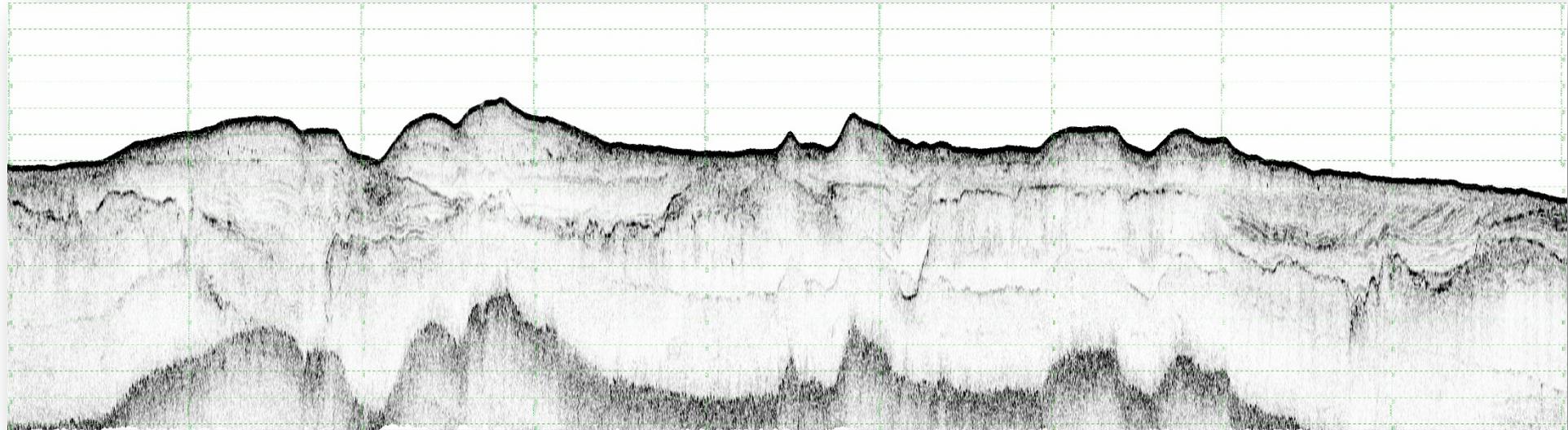
Florida Area 3

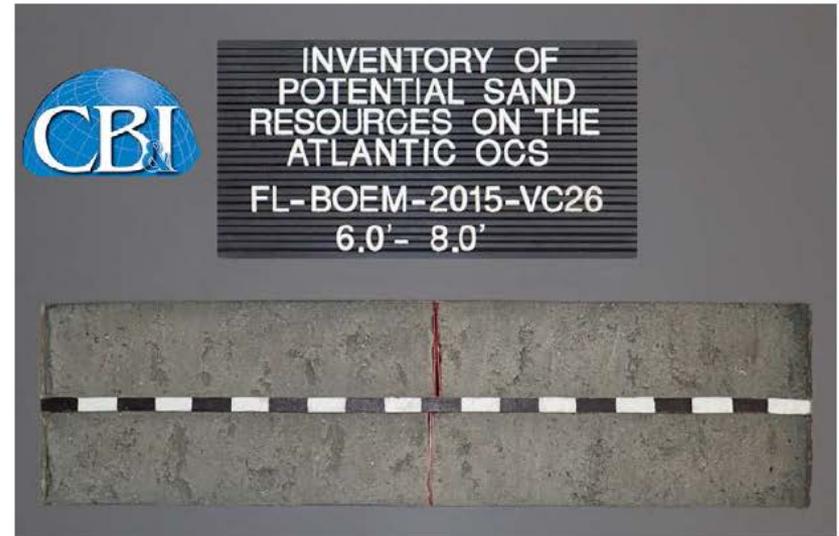
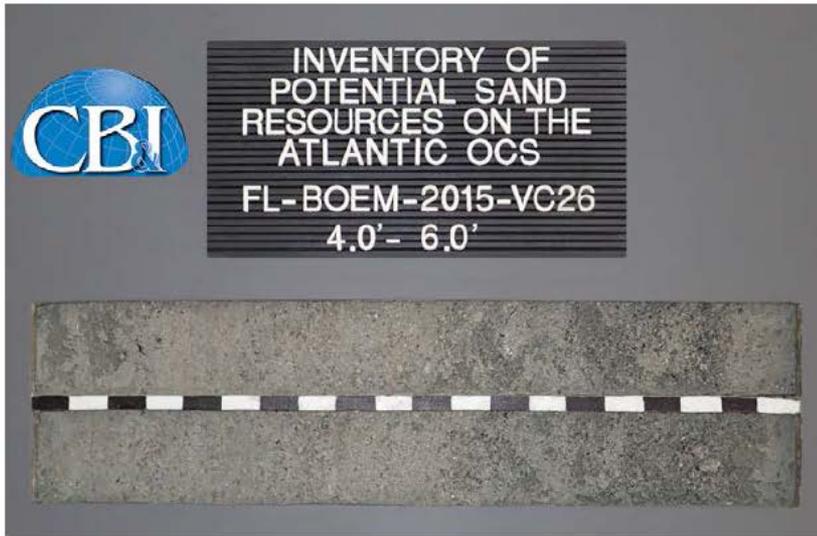
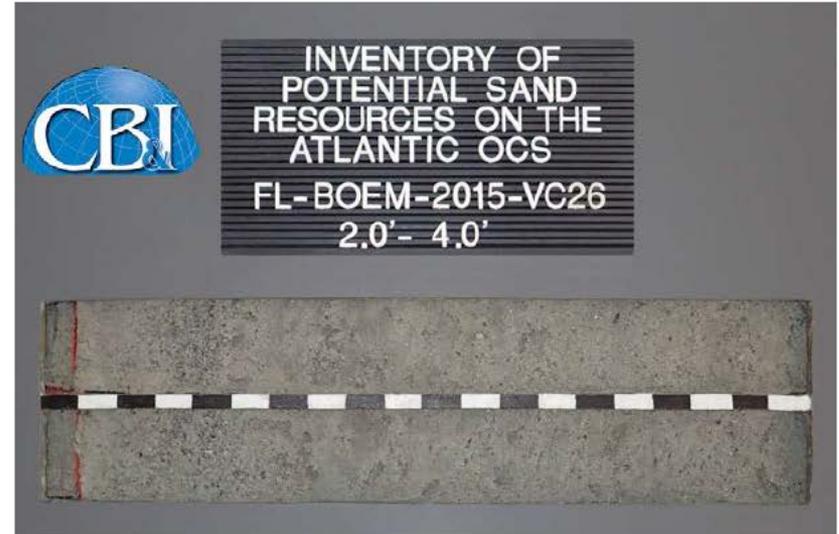
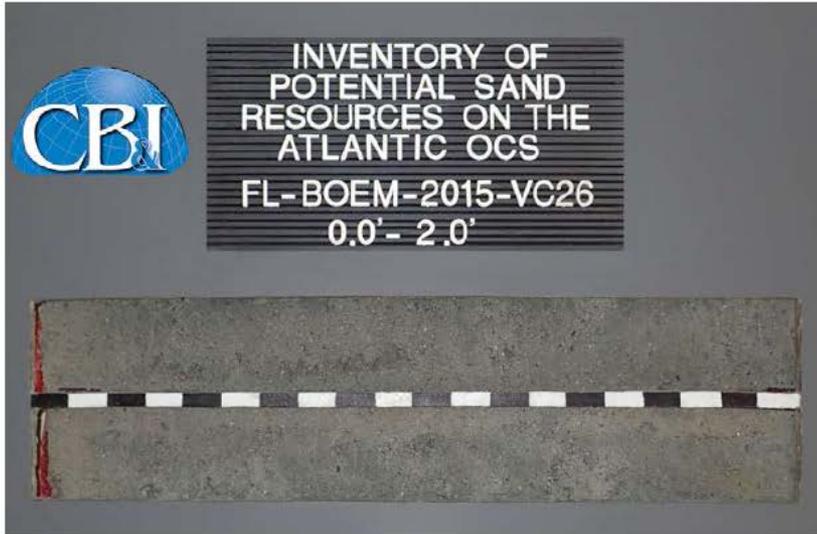
Florida Area 4

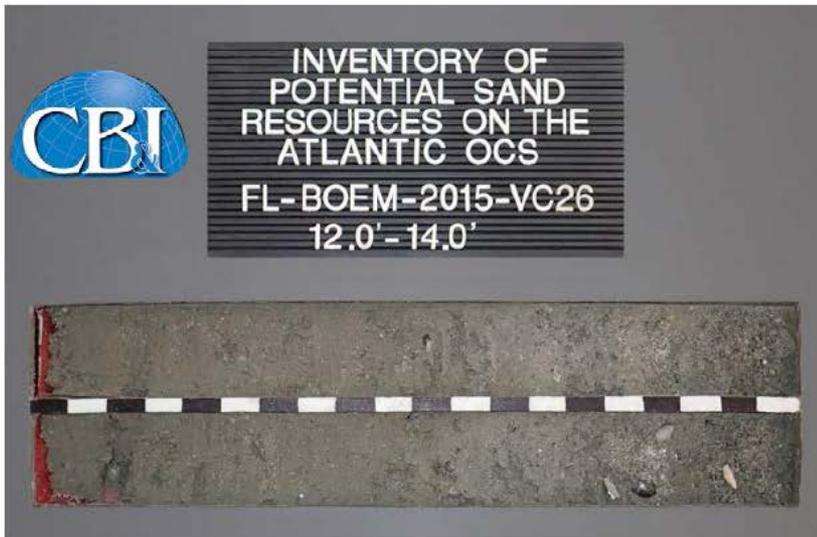
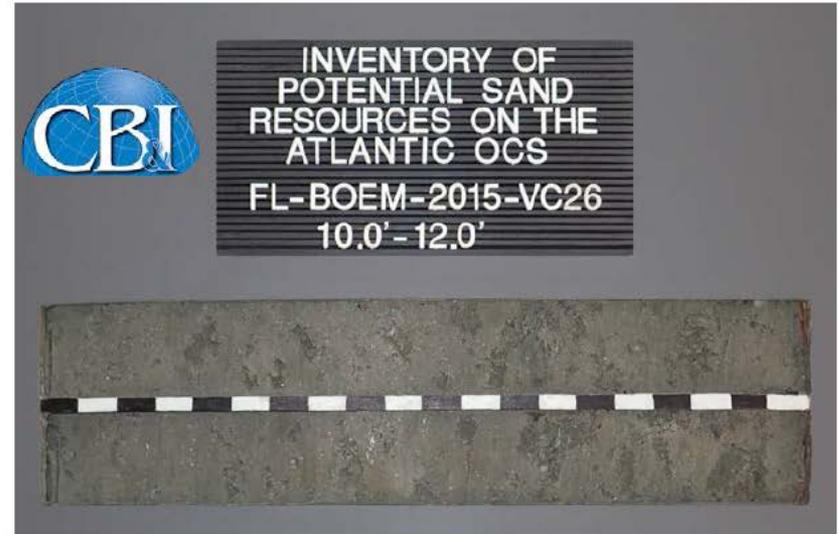
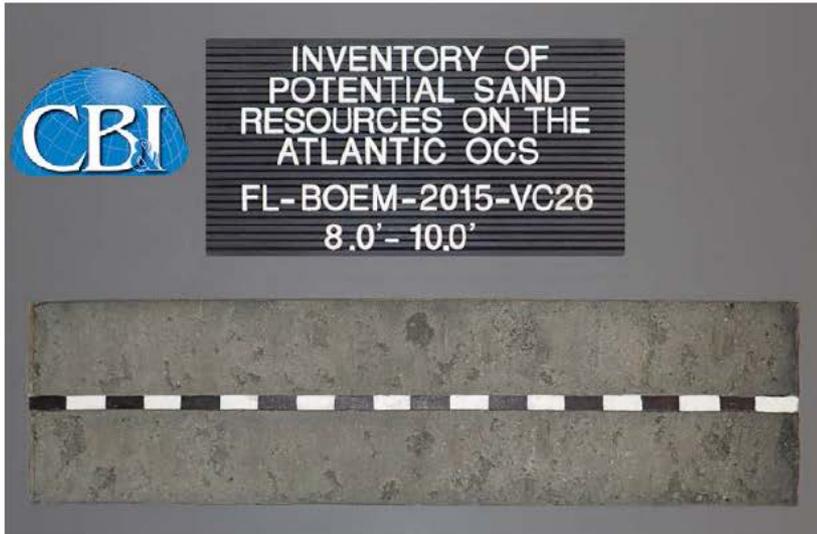
Florida Area 5

Florida Area 6









DRAFT

Boring Designation FL-BOEM-2015-VC26

DRAFT

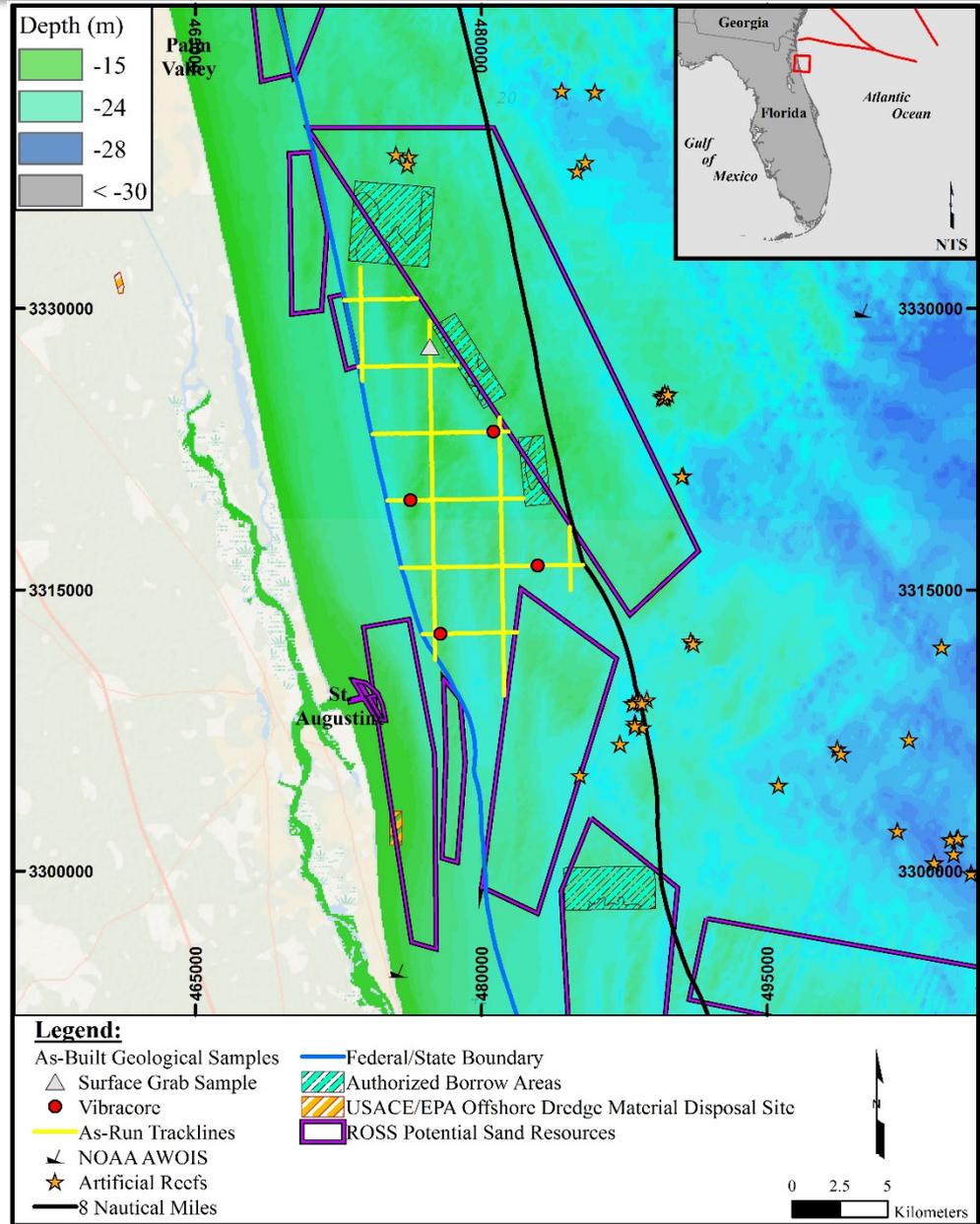
DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS		9. SIZE AND TYPE OF BIT 3.0 In.		
2. BORING DESIGNATION FL-BOEM-2015-VC26		10. COORDINATE SYSTEM/DATUM UTM		
3. DRILLING AGENCY American Vibrocore Services, Inc.		11. MANUFACTURER'S DESIGNATION OF DRILL Alpine Pneumatic Vibrocore		
4. NAME OF DRILLER Brian McCord		12. TOTAL SAMPLES DISTURBED		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN 0.0 Ft.		14. ELEVATION GROUND WATER		
7. DEPTH DRILLED INTO ROCK 0.0 Ft.		15. DATE BORING STARTED 08-16-15 13:51 COMPLETED 08-16-15 13:58		
8. TOTAL DEPTH OF BORING 20.0 Ft.		16. ELEVATION TOP OF BORING Not Determined		
		17. TOTAL RECOVERY FOR BORING 17 Ft.		
		18. SIGNATURE AND TITLE OF INSPECTOR SMT		

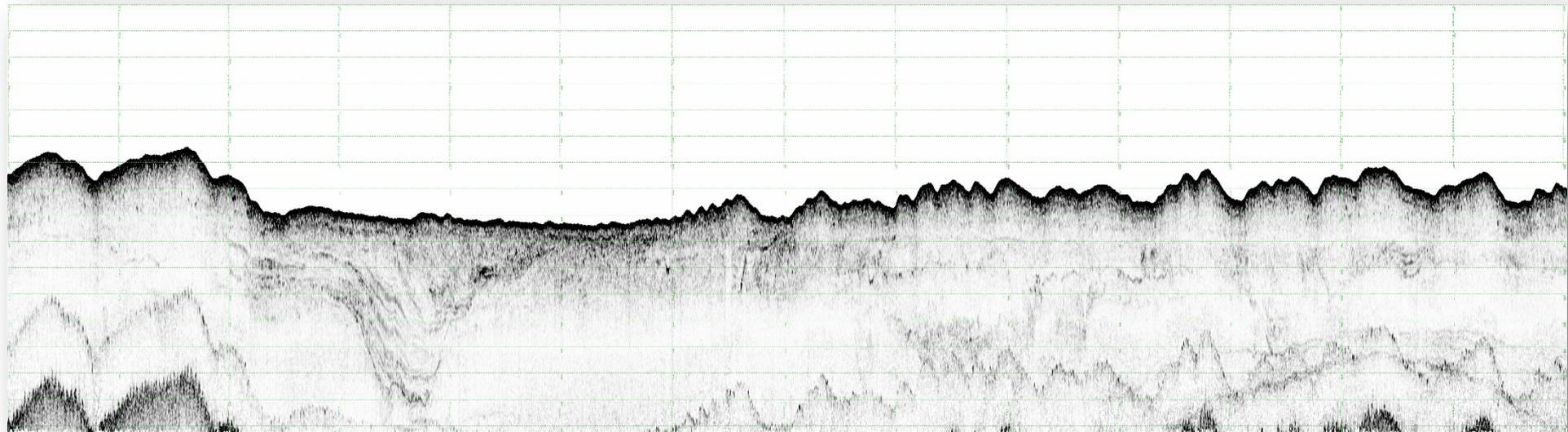
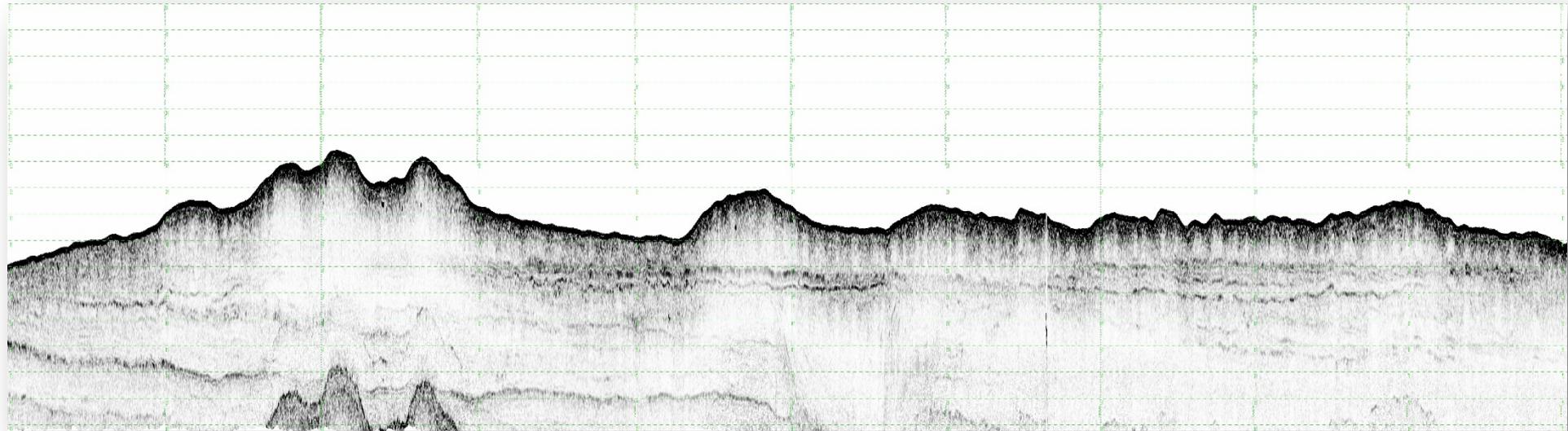
ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	SAMPLE	REMARKS
	0.0					
	5.0		SAND, fine grained, quartz, trace shell hash, trace silt, (1.5" x 1.0") whole shell @ 4.0', gray (2.5Y-5/1), (SP).		1	Sample #1, Depth = 2.9' Mean (mm): 0.17, Phi Sorting: 0.67 Fines (230): 1.52% (SP)
	6.0		Shelly SAND, fine grained, quartz, trace silt, shell components are shell hash, whole shells and shell fragments up to 0.5", (1.0" x 0.5") shell fragment @ 5.8', gray (5Y-5/1), (SW).		2	Sample #2, Depth = 5.5' Mean (mm): 0.28, Phi Sorting: 1.17 Fines (230): 1.53% (SW)
	10.0		SAND, fine grained, quartz, trace shell hash, trace silt, gray (2.5Y-5/1), (SP).		1	
	12.1		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to 0.5", 0.5" whole shell @ 11.9', dark gray (5Y-4/1), (SP).		3	Sample #3, Depth = 11.0' Mean (mm): 0.16, Phi Sorting: 0.76 Fines (230): 3.33% (SP)
	13.2		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, trace whole shell, shell fragments and whole shells up to 0.75", olive gray (5Y-4/2), (SW).		4	Sample #4, Depth = 12.6' Mean (mm): 0.17, Phi Sorting: 1.11 Fines (230): 3.87% (SW)
	14.2		Shelly SAND, fine grained, quartz, trace silt, shell components are shell hash, shell fragments and whole shells up to 1.0", shell increases with depth, gray (5Y-5/1), (SW).		5	Sample #5, Depth = 13.6' Mean (mm): 0.45, Phi Sorting: 2.03 Fines (230): 3.06% (SW)
	17.0		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, trace whole shell, whole shells and shell fragments up to 0.75", 1.0" whole shell @ 15.3', (1.5" x 0.5") whole shell @ 15.7', dark gray (5Y-4/1), (SP-SM).		6	Sample #6, Depth = 15.5' Mean (mm): 0.14, Phi Sorting: 0.83 Fines (230): 7.10% (SP-SM)
	20.0		No Recovery.			
			End of Boring			

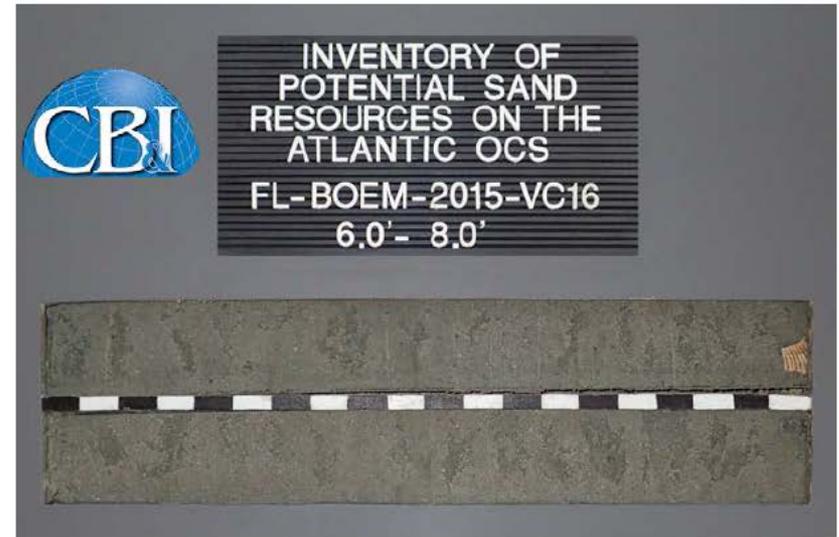
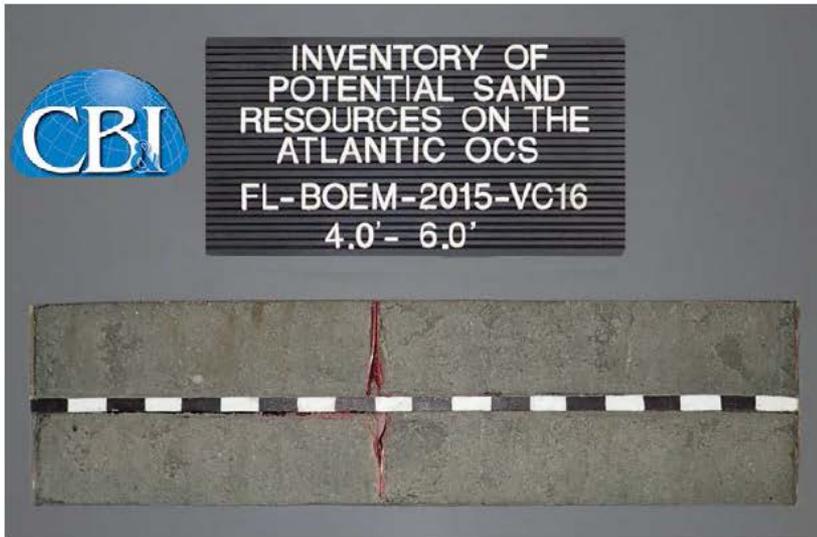
SAJ FORM 1836 MODIFIED FOR THE FLORIDA DEP JUN 02 JUN 04

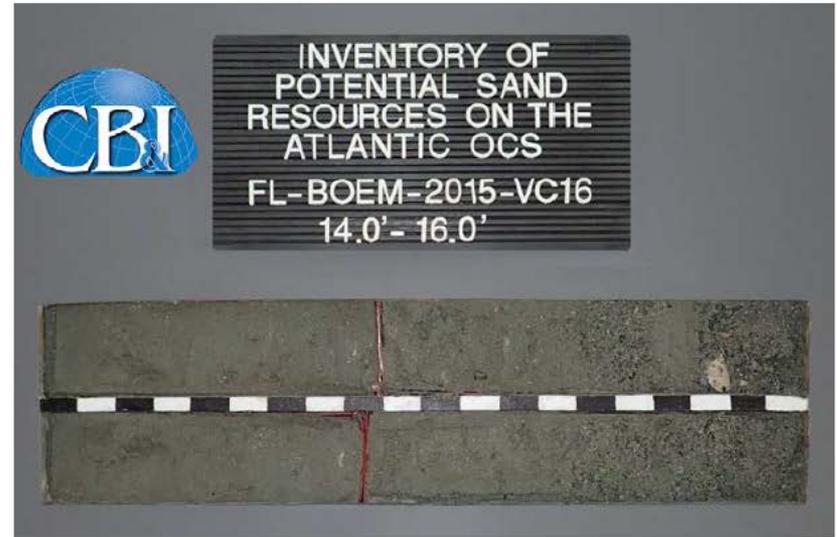
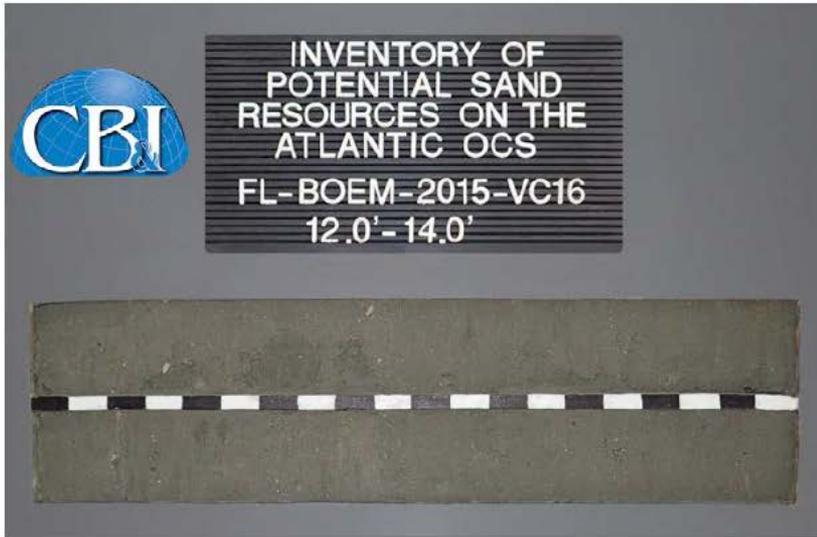
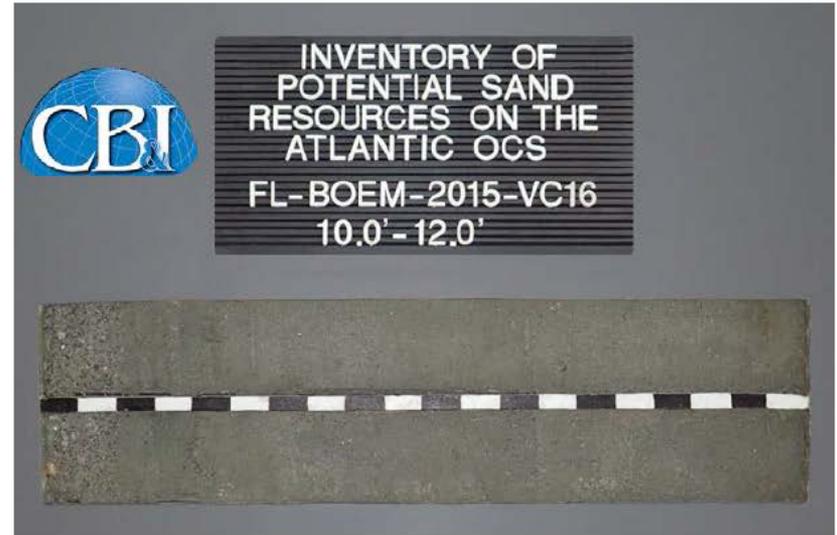
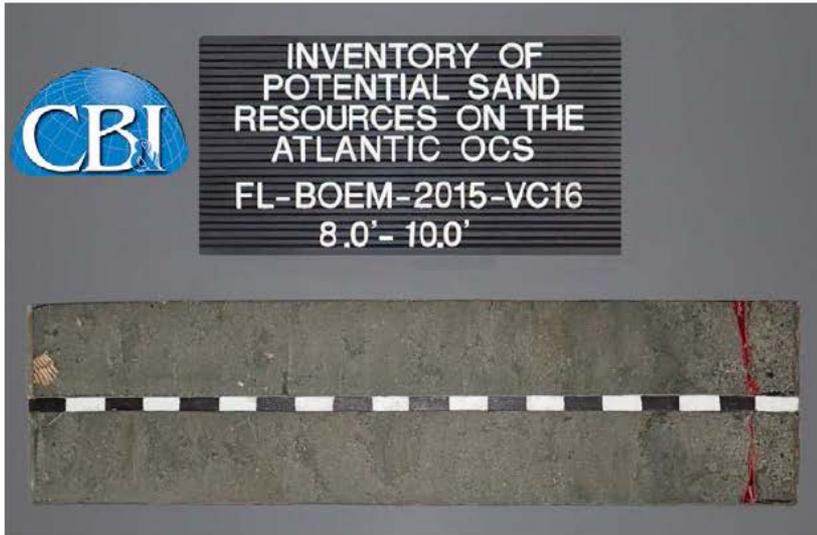
Granulometric Report						
Depths and elevations based on measured values						
Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS Sample Name: FL-BOEM-2015-VC26 #1 Analysis Date: 10-13-16 Analyzed By: SMT						
Easting (ft): 470,058		Northing (ft): 3,396,823		Coordinate System: UTM		Elevation (ft):
USCS: SP		Munsell: Wet - 2.5Y-5/1 Dry - 2.5Y-7/1 Washed - 2.5Y-7/1		Comments:		
Dry Weight (g): 96.76	Wash Weight (g): 95.40	Fan Retained (g): 0.01	Sieve Loss (%): 0.10	Fines (%): #200 - 1.69 #230 - 1.52	Organics (%):	Carbonates (%):
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.14	0.14	0.14	0.14
4	-2.25	4.76	0.03	0.03	0.17	0.17
5	-2.00	4.00	0.12	0.12	0.29	0.29
7	-1.50	2.83	0.12	0.12	0.41	0.41
10	-1.00	2.00	0.33	0.34	0.74	0.75
14	-0.50	1.41	0.48	0.50	1.22	1.25
18	0.00	1.00	0.46	0.48	1.68	1.73
25	0.50	0.71	0.50	0.52	2.18	2.25
35	1.00	0.50	0.52	0.54	2.70	2.79
45	1.50	0.35	1.15	1.19	3.85	3.98
60	2.00	0.25	3.89	4.02	7.74	8.00
80	2.50	0.18	23.13	23.90	30.87	31.90
120	3.00	0.13	52.74	54.51	83.61	86.41
170	3.50	0.09	10.87	11.23	94.48	97.64
200	3.75	0.07	0.65	0.67	95.13	98.31
230	4.00	0.06	0.16	0.17	95.29	98.48
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.38	2.98	2.90	2.67	2.36	2.17	1.63
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.54	0.17	0.67	-3.53	21.53	

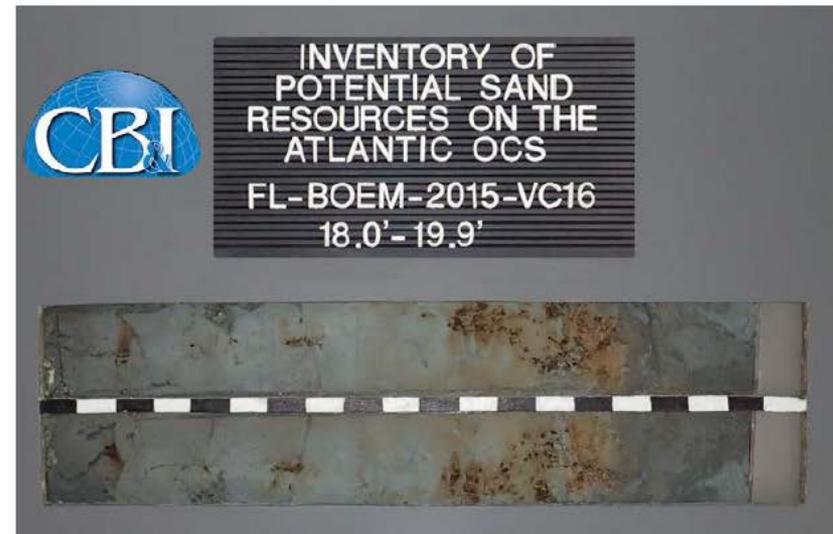
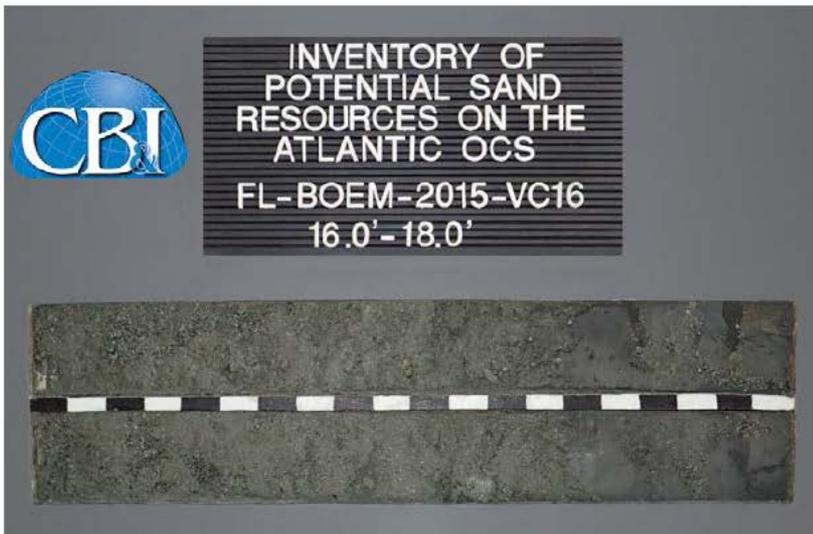
GRANULOMETRIC REPORT BOEM 2015 VCS.GPJ JBRRAZL QDT 12/20/16









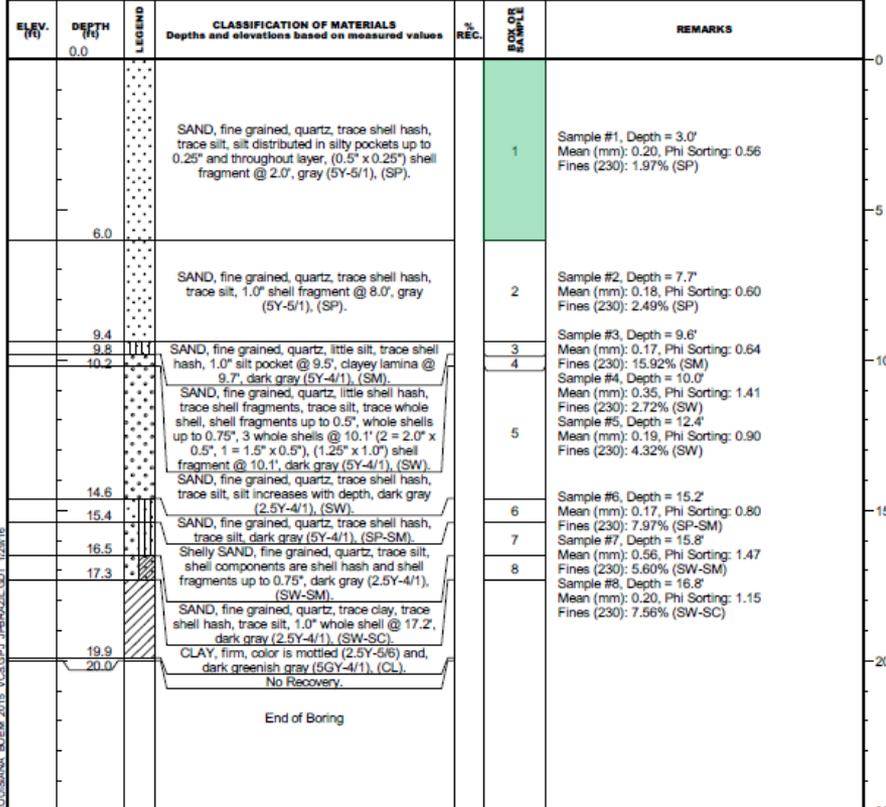


DRAFT

Boring Designation FL-BOEM-2015-VC16

DRAFT

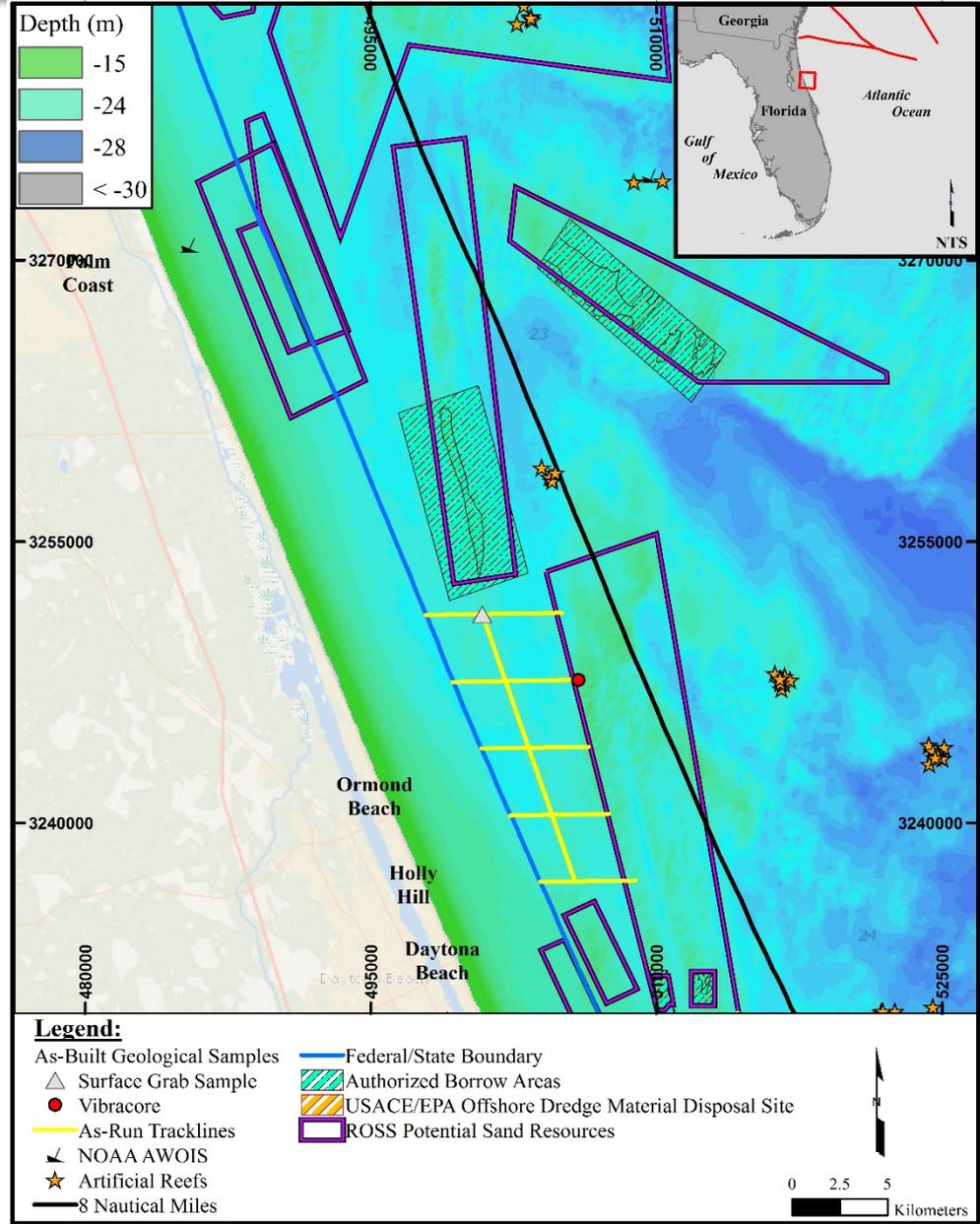
DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS				
2. BORING DESIGNATION FL-BOEM-2015-VC16		LOCATION COORDINATES X = 480,634 Y = 3,323,433		
3. DRILLING AGENCY American Vibrocore Services, Inc.		CONTRACTOR FILE NO.		
4. NAME OF DRILLER Brian McCord				
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	
6. THICKNESS OF OVERBURDEN 0.0 Ft.		11. MANUFACTURER'S DESIGNATION OF DRILL Alpine Pneumatic Vibrocore		
7. DEPTH DRILLED INTO ROCK 0.0 Ft.		12. TOTAL SAMPLES DISTURBED UNDISTURBED (UD)		
8. TOTAL DEPTH OF BORING 20.0 Ft.		13. TOTAL NUMBER CORE BOXES		
14. ELEVATION GROUND WATER				
15. DATE BORING 08-15-15 13:20		16. ELEVATION TOP OF BORING Not Determined		
		17. TOTAL RECOVERY FOR BORING 19.9 Ft.		
18. SIGNATURE AND TITLE OF INSPECTOR SMT				

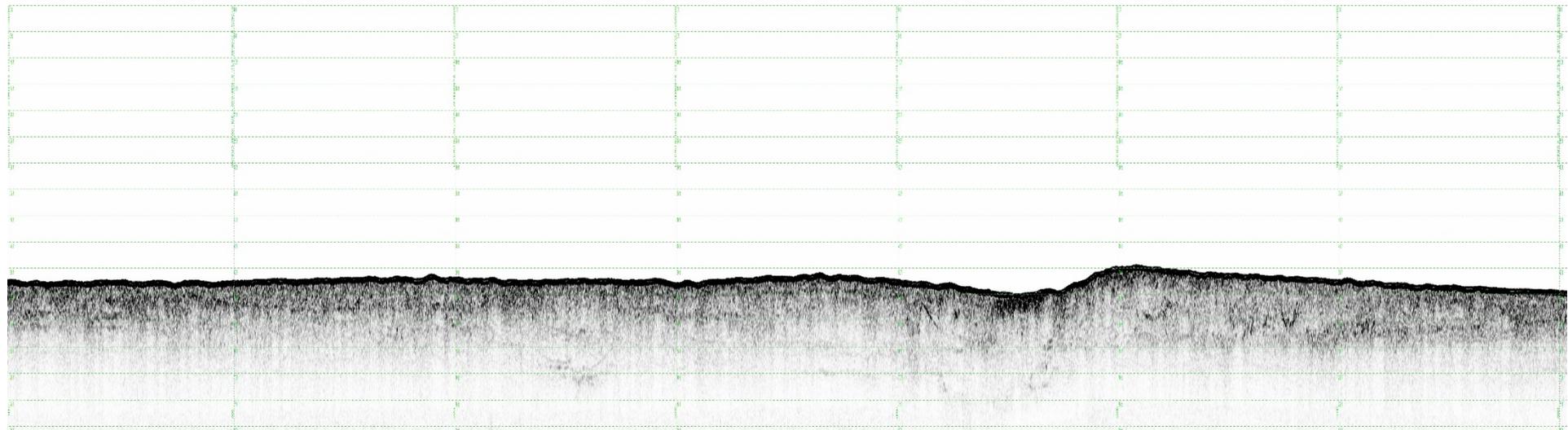
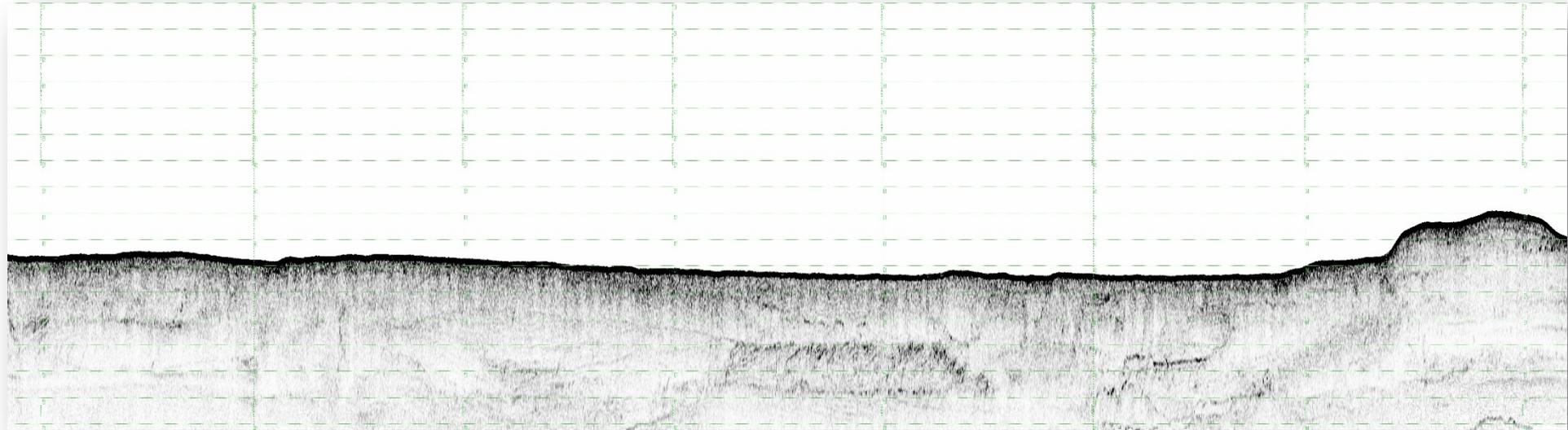


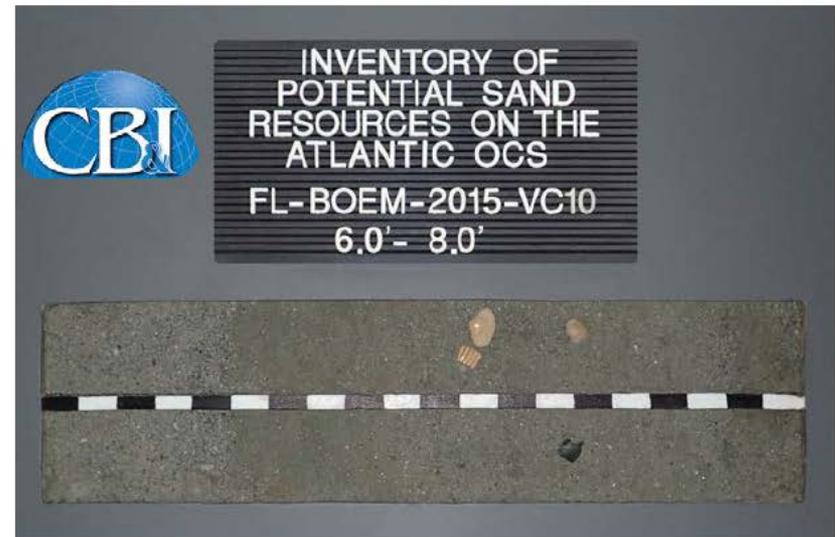
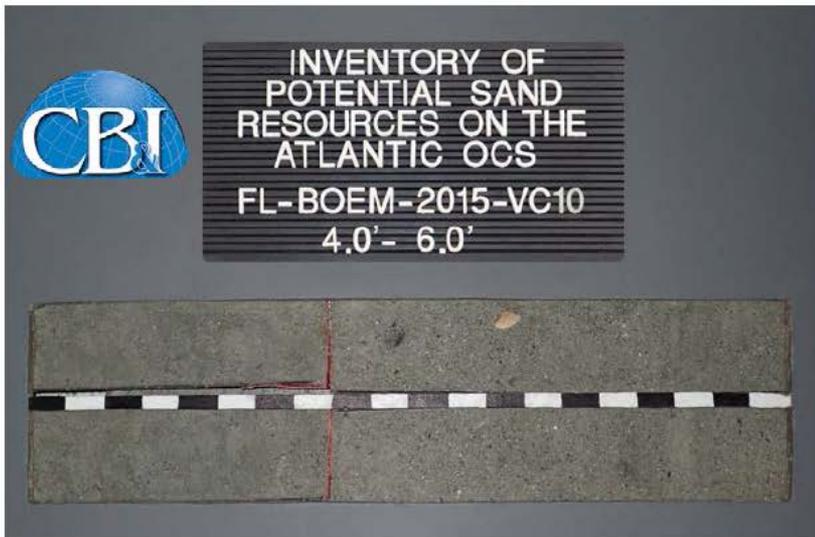
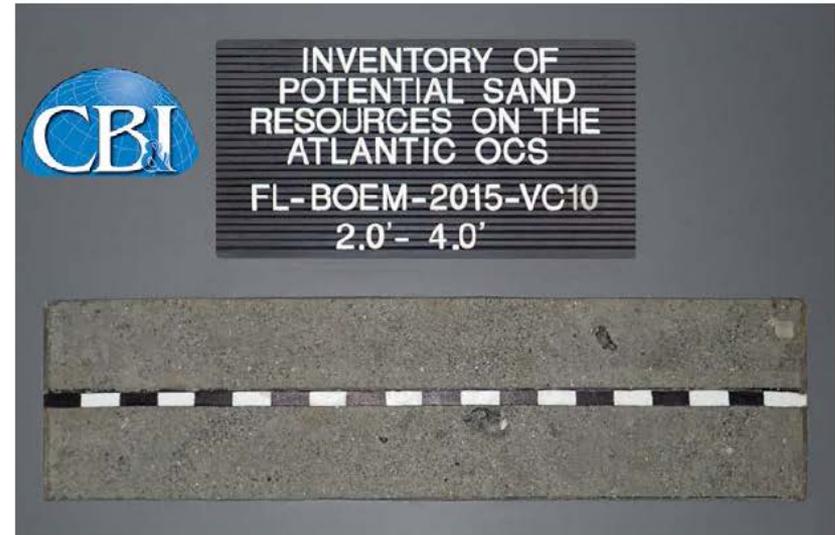
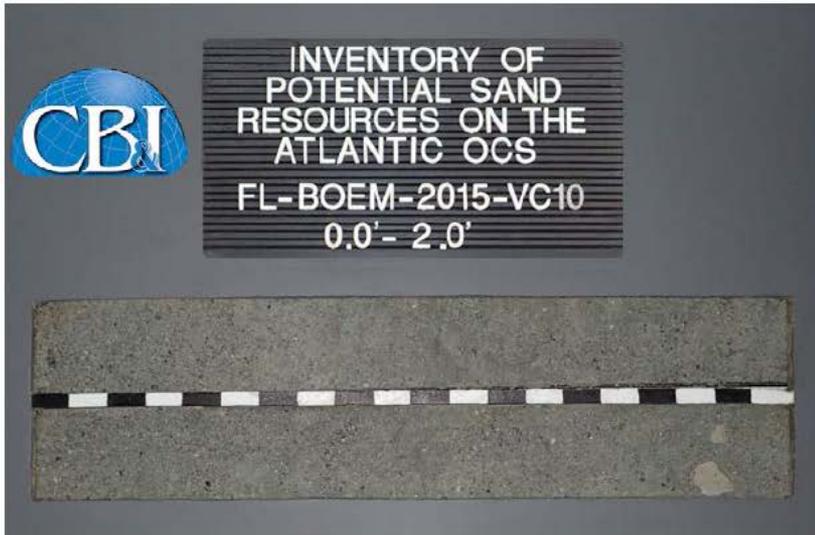
SAJ FORM 1836 MODIFIED FOR THE FLORIDA DEP
JUN 02 JUN 04

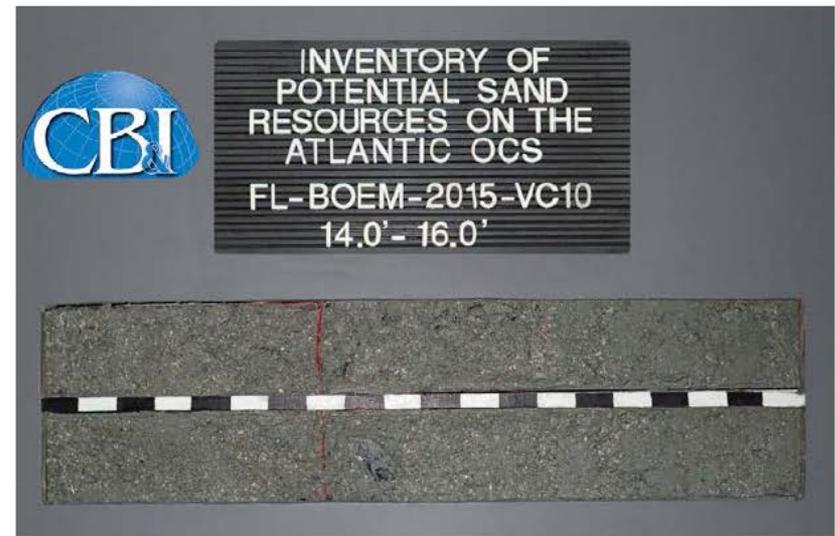
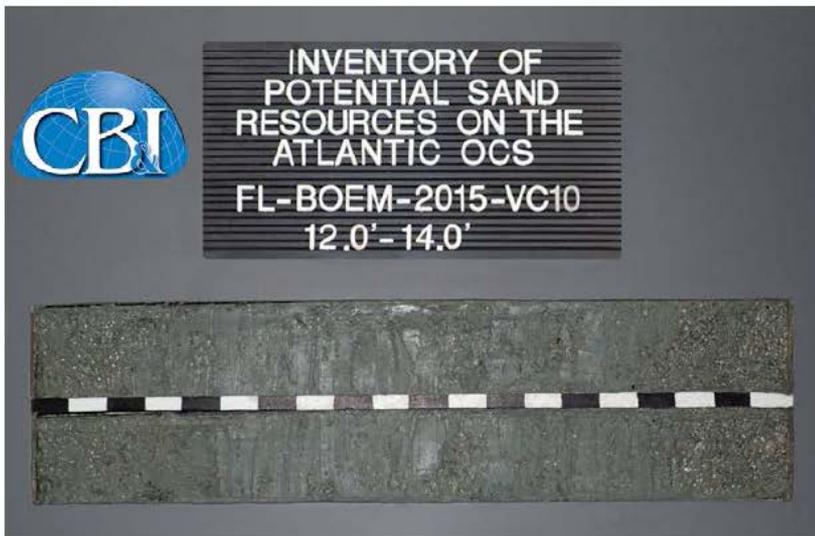
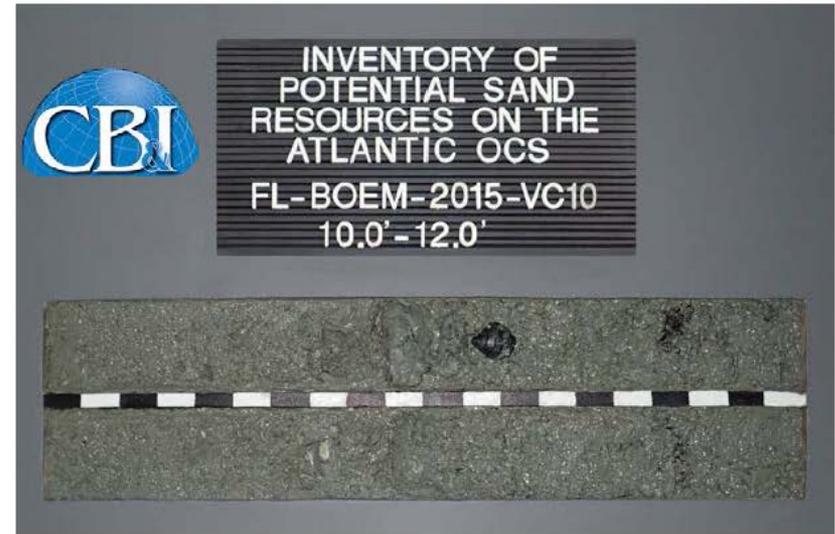
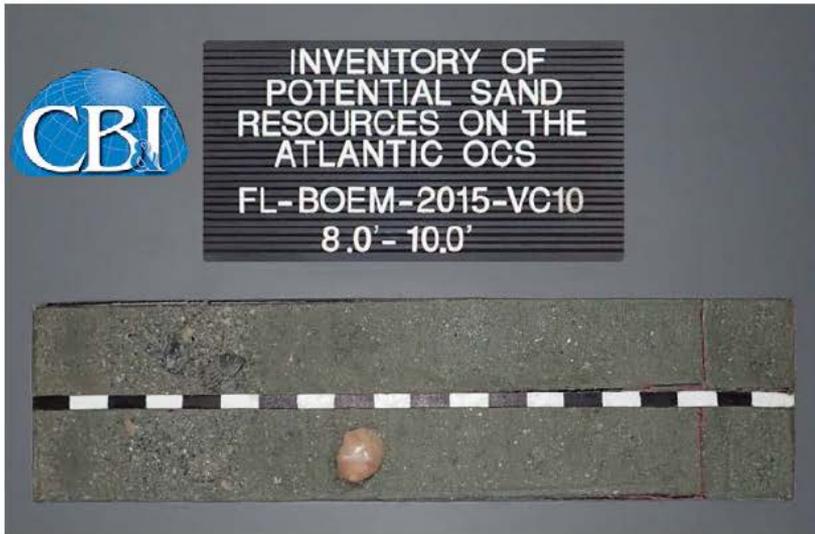
Granulometric Report				Depths and elevations based on measured values			
 <p>Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS Sample Name: FL-BOEM-2015-VC16 #1 Analysis Date: 10-13-15 Analyzed By: SMT</p>							
Easting (ft): 480,634		Northing (ft): 3,323,433		Coordinate System: UTM			
USCS: SP		Munsell: Wet - 5Y-5/1 Dry - 5Y-7/1 Washed - 5Y-8/1		Comments:			
Dry Weight (g): 94.49	Wash Weight (g): 92.72	Fan Retained (g): 0.01	Sieve Loss (%): 0.07	Fines (%): #200 - 2.13 #230 - 1.97	Organics (%):	Carbonates (%):	Shell Hash (%):
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained	
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00	
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00	
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00	
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00	
3.5	-2.50	5.66	0.00	0.00	0.00	0.00	
4	-2.25	4.76	0.00	0.00	0.00	0.00	
5	-2.00	4.00	0.00	0.00	0.00	0.00	
7	-1.50	2.83	0.03	0.03	0.03	0.03	
10	-1.00	2.00	0.04	0.04	0.07	0.07	
14	-0.50	1.41	0.08	0.08	0.15	0.15	
18	0.00	1.00	0.14	0.15	0.29	0.30	
25	0.50	0.71	0.34	0.36	0.63	0.66	
35	1.00	0.50	1.36	1.44	1.99	2.10	
45	1.50	0.35	4.52	4.78	6.51	6.88	
60	2.00	0.25	15.49	16.39	22.00	23.27	
80	2.50	0.18	34.66	36.68	56.66	59.95	
120	3.00	0.13	30.74	32.53	87.40	92.48	
170	3.50	0.09	4.44	4.70	91.84	97.18	
200	3.75	0.07	0.65	0.69	92.49	97.87	
230	4.00	0.06	0.15	0.16	92.64	98.03	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
3.27	2.87	2.73	2.36	2.02	1.78	1.30	
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
Statistics	2.31	0.20	0.56	-0.99	6.25		

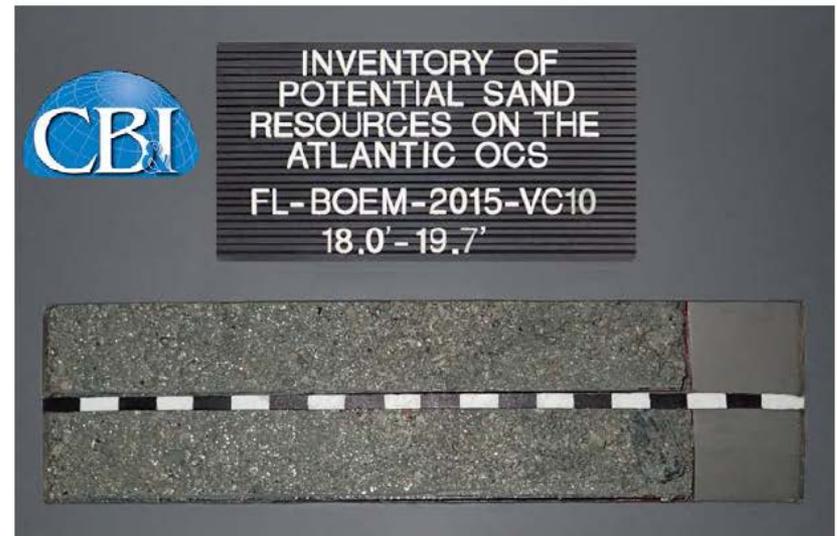
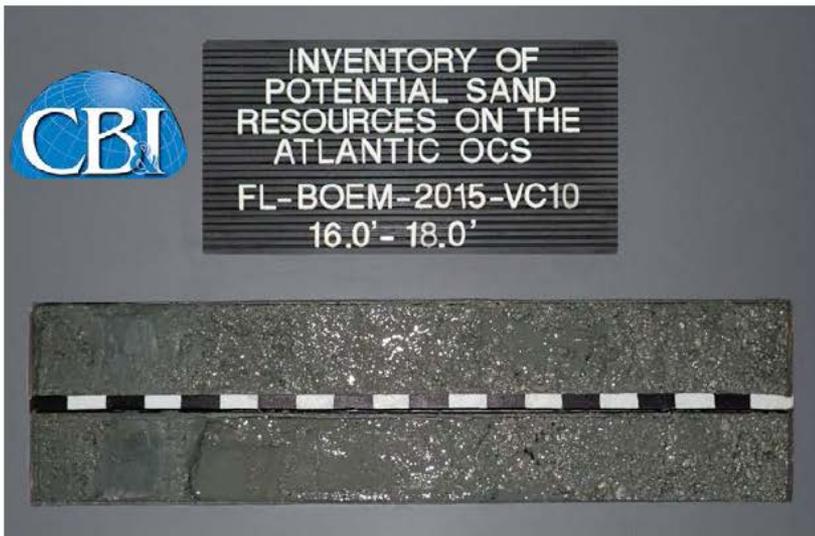
GRANULOMETRIC REPORT BOEM 2015 VCSG01 JURRAZL GDT 125W16











DRAFT

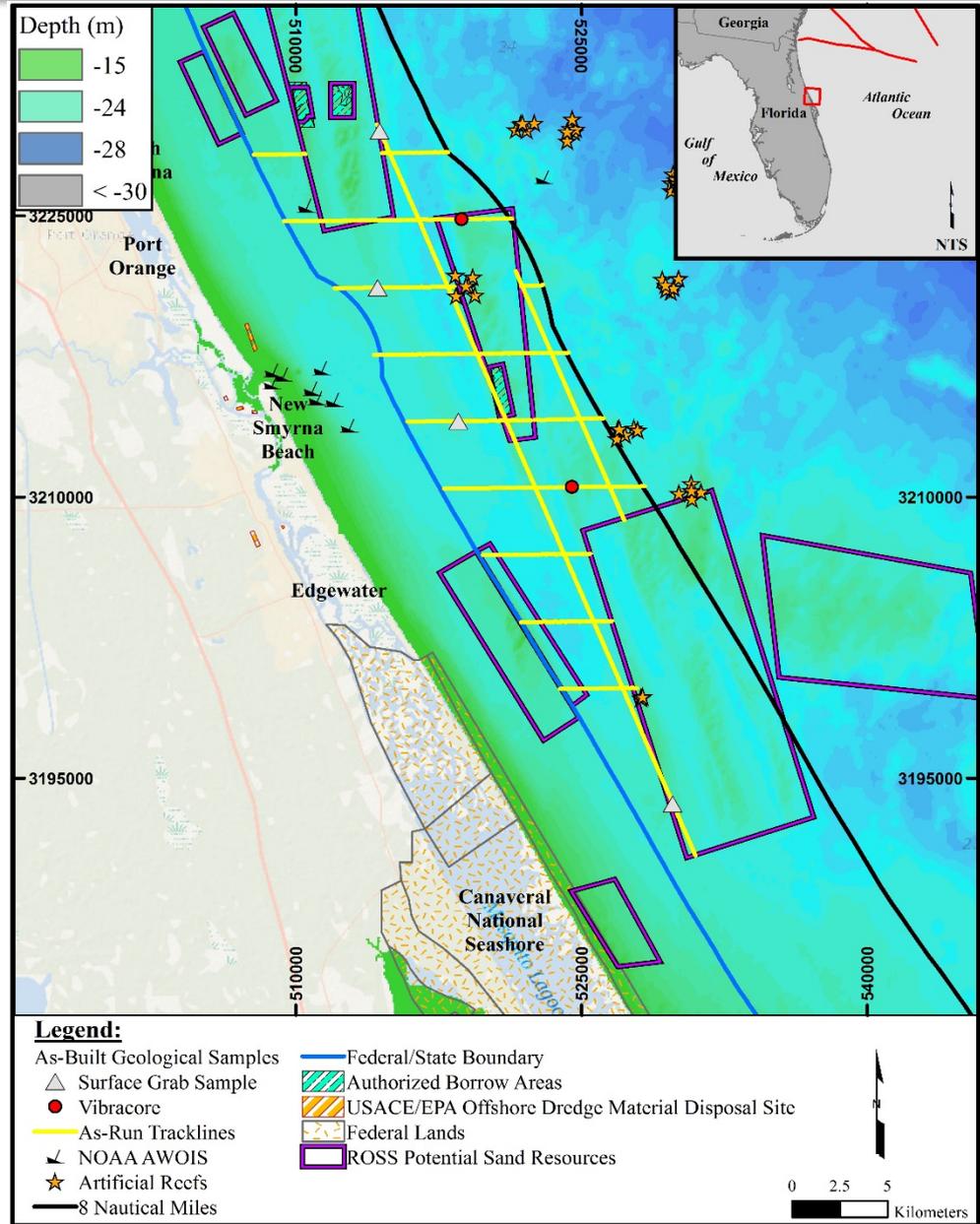
Boring Designation FL-BOEM-2015-VC10

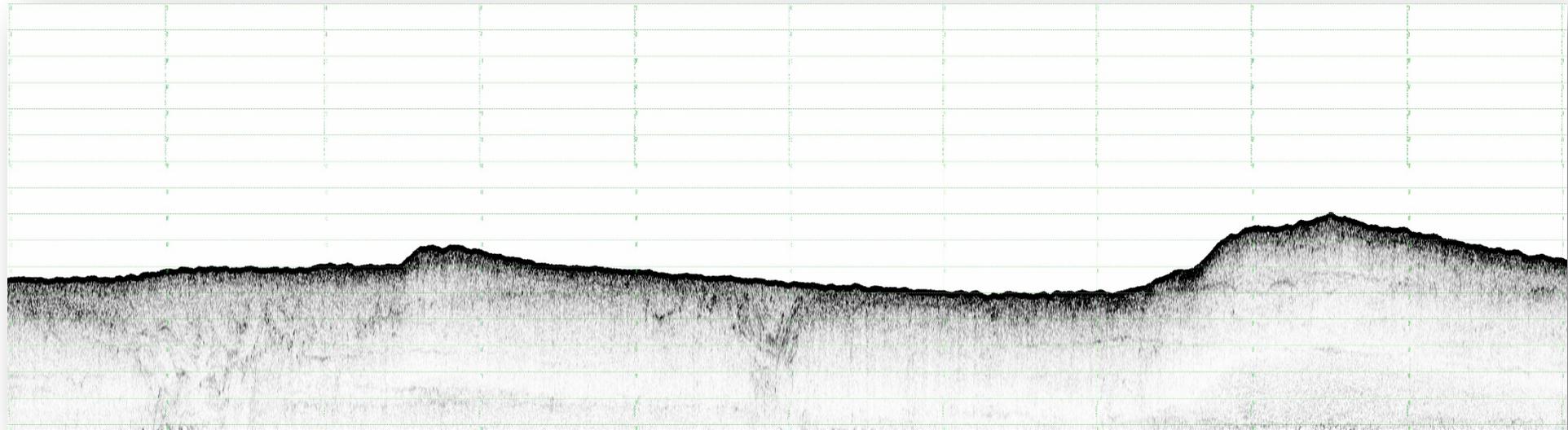
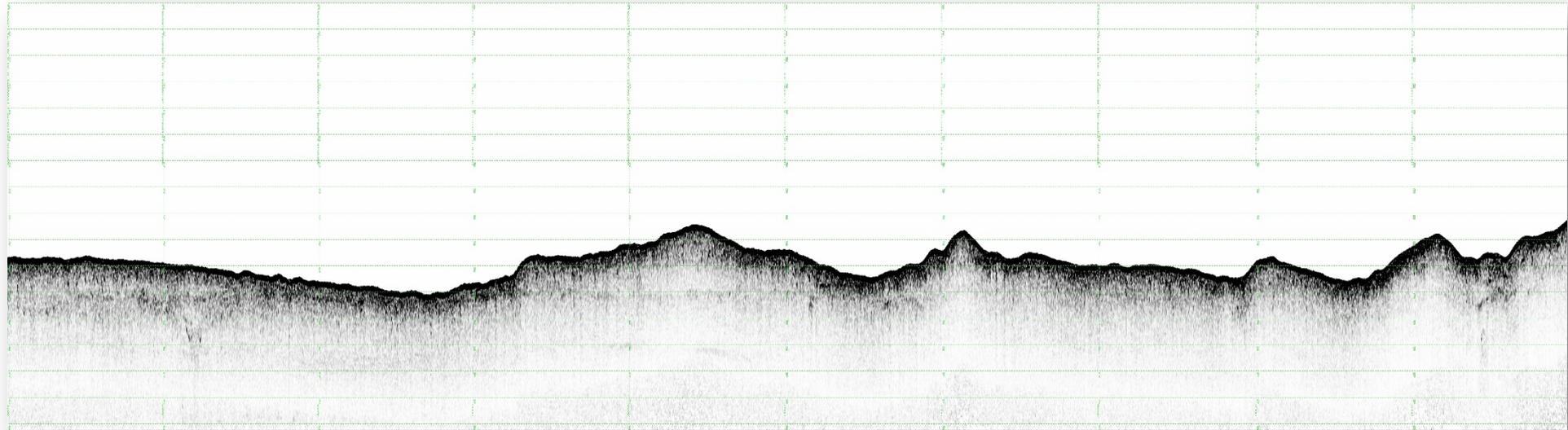
DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 1 SHEETS	
1. PROJECT Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS				9. SIZE AND TYPE OF BIT 3.0 In.			
2. BORING DESIGNATION FL-BOEM-2015-VC10				10. COORDINATE SYSTEM/DATUM UTM			
3. DRILLING AGENCY American Vibracore Services, Inc.				11. MANUFACTURER'S DESIGNATION OF DRILL Alpine Pneumatic Vibracore			
4. NAME OF DRILLER Justin Robertson				12. TOTAL SAMPLES			
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED				13. TOTAL NUMBER CORE BOXES			
6. THICKNESS OF OVERBURDEN 0.0 Ft.				14. ELEVATION GROUND WATER			
7. DEPTH DRILLED INTO ROCK 0.0 Ft.				15. DATE BORING			
8. TOTAL DEPTH OF BORING 20.0 Ft.				16. ELEVATION TOP OF BORING Not Determined			
				17. TOTAL RECOVERY FOR BORING 19.7 Ft.			
				18. SIGNATURE AND TITLE OF INSPECTOR			

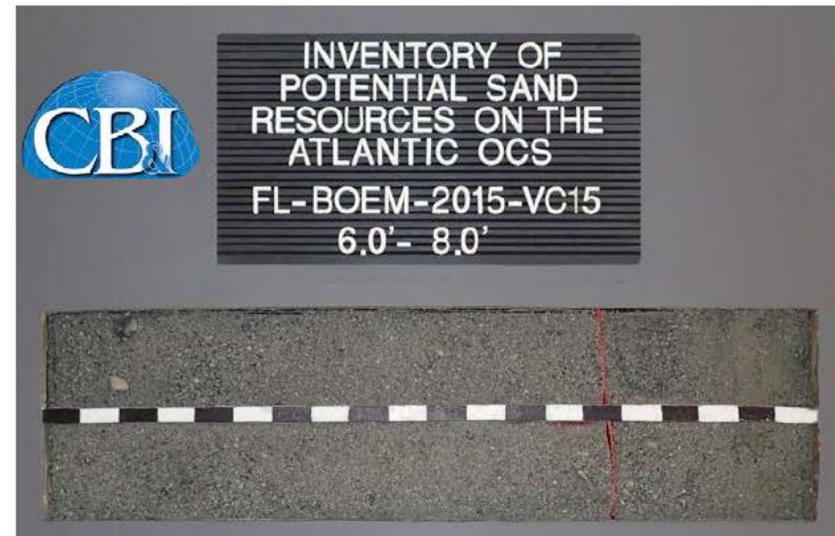
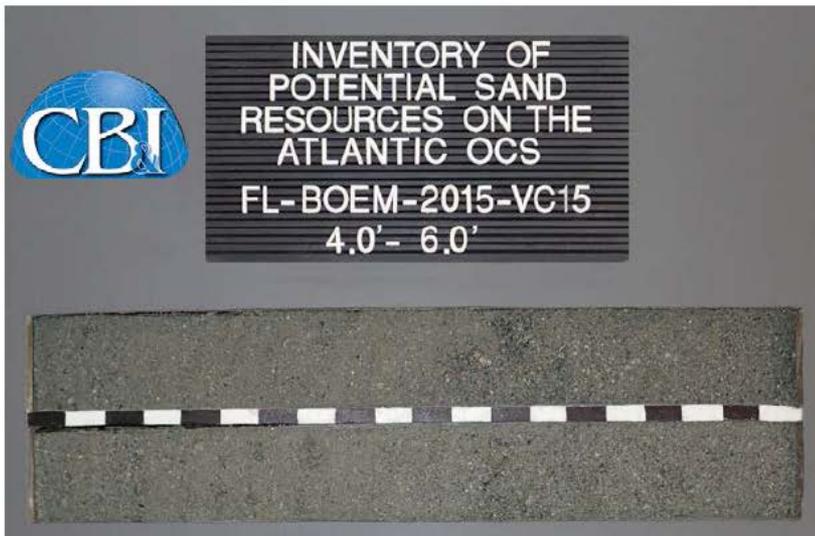
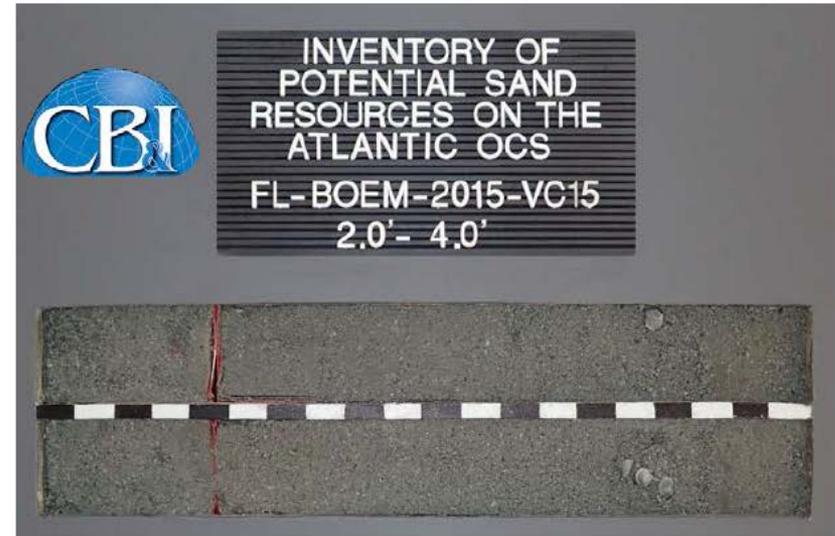
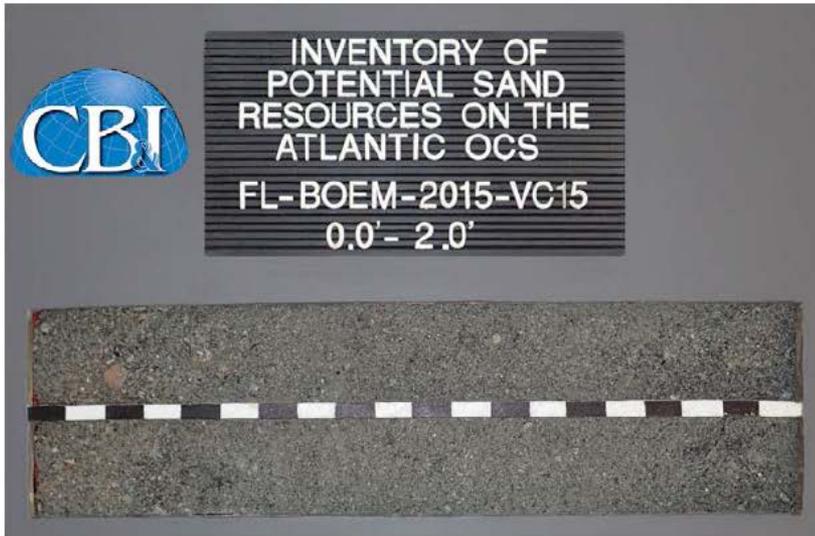
ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE NO.	REMARKS
	0.0					
	0.7		SAND, fine grained, quartz, some shell hash, trace shell fragments, trace silt, shell fragments up to 0.5", dark gray (5Y-4/1), (SW).		1	Sample #1, Depth = 0.3' Mean (mm): 0.31, Phi Sorting: 1.16 Fines (230): 1.30% (SW)
	4.0		SAND, fine grained, quartz, little shell hash, trace shell fragments, trace silt, shell fragments up to (1.0" x 0.5"), (1.25" x 1.0") shell fragment @ 1.8", (1.5" x 1.0") shell fragment @ 3.2", gray (5Y-5/1), (SW).		2	Sample #2, Depth = 2.5' Mean (mm): 0.25, Phi Sorting: 0.88 Fines (230): 1.47% (SW)
	4.9		SAND, fine grained, quartz, trace shell hash, trace silt, gray (5Y-5/1), (SP).		3	Sample #3, Depth = 4.4' Mean (mm): 0.20, Phi Sorting: 0.54 Fines (230): 1.74% (SP)
	6.5		SAND, fine grained, quartz, little shell hash, trace shell fragments, trace silt, shell fragments up to 0.75", 0.25" silty pocket @ 5.6", gray (5Y-5/1), (SP).		4	Sample #4, Depth = 5.7' Mean (mm): 0.22, Phi Sorting: 0.61 Fines (230): 1.86% (SP)
	8.2		SAND, fine grained, quartz, little shell hash, trace shell fragments, trace silt, shell fragments up to 0.75", (1.25" x 1.0") whole shell @ 7.2", (1.0" x 3.0") silty pocket @ 8.1", dark gray (5Y-4/1), (SW-SM).		5	Sample #5, Depth = 7.3' Mean (mm): 0.22, Phi Sorting: 1.29 Fines (230): 4.95% (SW-SM)
	8.6				6	Sample #6, Depth = 8.4' Mean (mm): 0.46, Phi Sorting: 1.81 Fines (230): 4.51% (SW)
	10.5		SHELL, trace silt, shell components are shell hash and shell fragments up to 0.75", (1.25" x 1.0") shell fragment @ 8.4", dark gray (5Y-4/1), (SW).		7	Sample #7, Depth = 9.6' Mean (mm): 0.16, Phi Sorting: 1.00 Fines (230): 11.23% (SM)
	12.4		SAND, fine grained, quartz, little shell hash, little silt, (2.0" x 1.5") shell fragment @ 8.9", dark greenish gray (10Y-4/1), (SM).			
	13.7		Clayey SHELL, shell components are shell hash and shell fragments up to (1.5" x 1.0"), (3.0" x 1.75") shell fragment @ 11.0", 1.5" whole shell @ 11.3", dark greenish gray (5GY-4/1), (GC).			
	16.5		CLAY, little shell hash, dark gray (N-4/0), (CL). Clayey SHELL HASH, little sand, 1.5" whole shell @ 15.0", 3.0" clay pocket @ 16.4", dark gray (N-4/0), (GC).			
	19.7		SHELL HASH, little clay, little sand, little shell fragments, shell fragments up to 0.5", (2.5" x 1.5") shell fragment @ 19.7", dark gray (N-4/0), (GC).			
	20.0		No Recovery.			
			End of Boring			

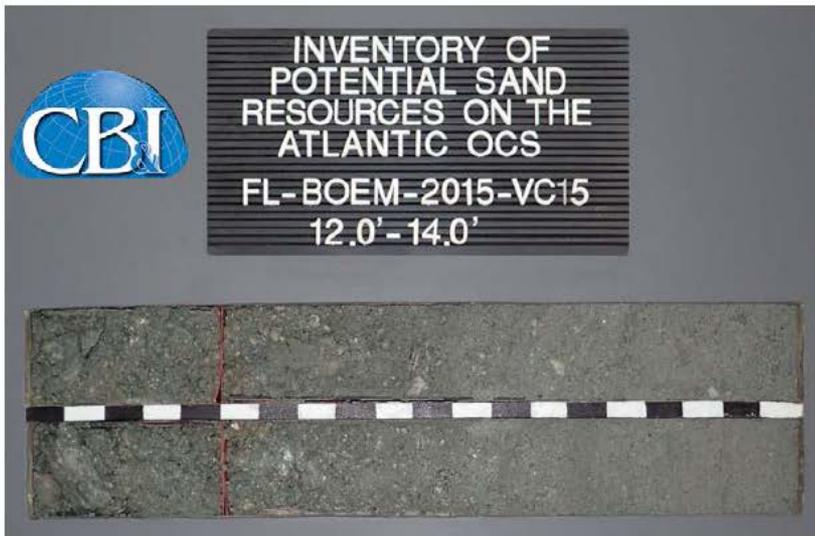
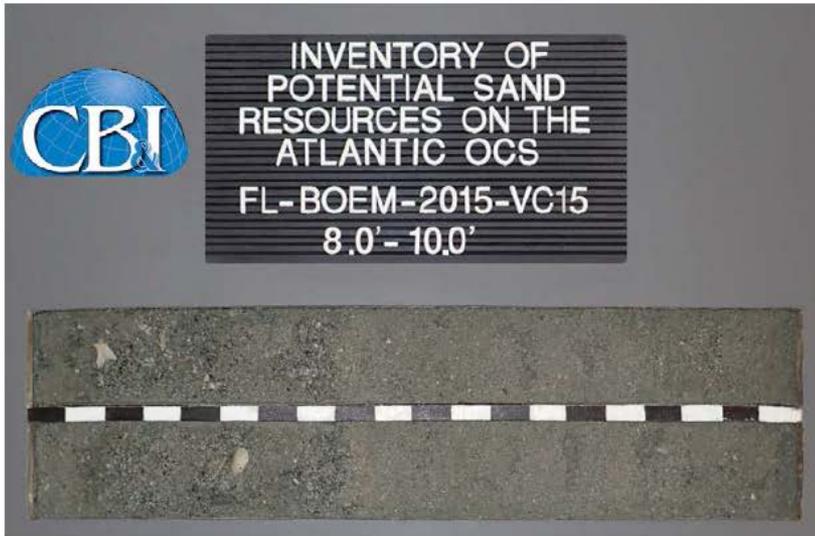
DRAFT

Granulometric Report				Depths and elevations based on measured values			
Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS				CBI Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102			
Sample Name: FL-BOEM-2015-VC10-#2				Analysis Date: 10-28-15			
Analyzed By: DA				Coordinate System: UTM			
Easting (ft): 505,911		Northing (ft): 3,247,612		Elevation (ft):			
USCS: SW		Munsell: Wet - 5Y-5/1 Dry - 5Y-6/1 Washed - 5Y-7/1		Comments:			
Dry Weight (g): 99.82	Wash Weight (g): 98.48	Fan Retained (g): 0.02	Sieve Loss (%): 0.10	Fines (%): #200 - 1.58 #230 - 1.47	Organics (%):	Carbonates (%):	Shell Hash (%):
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained	
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00	
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00	
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00	
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00	
3.5	-2.50	5.66	0.50	0.50	0.50	0.50	
4	-2.25	4.76	0.06	0.06	0.56	0.56	
5	-2.00	4.00	0.16	0.16	0.72	0.72	
7	-1.50	2.83	0.21	0.21	0.93	0.93	
10	-1.00	2.00	0.85	0.85	1.78	1.78	
14	-0.50	1.41	0.86	0.86	2.64	2.64	
18	0.00	1.00	1.54	1.54	4.18	4.18	
25	0.50	0.71	1.73	1.73	5.91	5.91	
35	1.00	0.50	3.09	3.10	9.00	9.01	
45	1.50	0.35	6.06	6.07	15.06	15.08	
60	2.00	0.25	18.54	18.57	33.60	33.65	
80	2.50	0.18	43.13	43.21	76.73	76.86	
120	3.00	0.13	18.01	18.04	94.74	94.90	
170	3.50	0.09	3.01	3.02	97.75	97.92	
200	3.75	0.07	0.50	0.50	98.25	98.42	
230	4.00	0.06	0.11	0.11	98.36	98.53	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
3.02	2.70	2.48	2.19	1.77	1.52	0.24	
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
	2	0.25	0.88	-2.24	10.29		









DRAFT

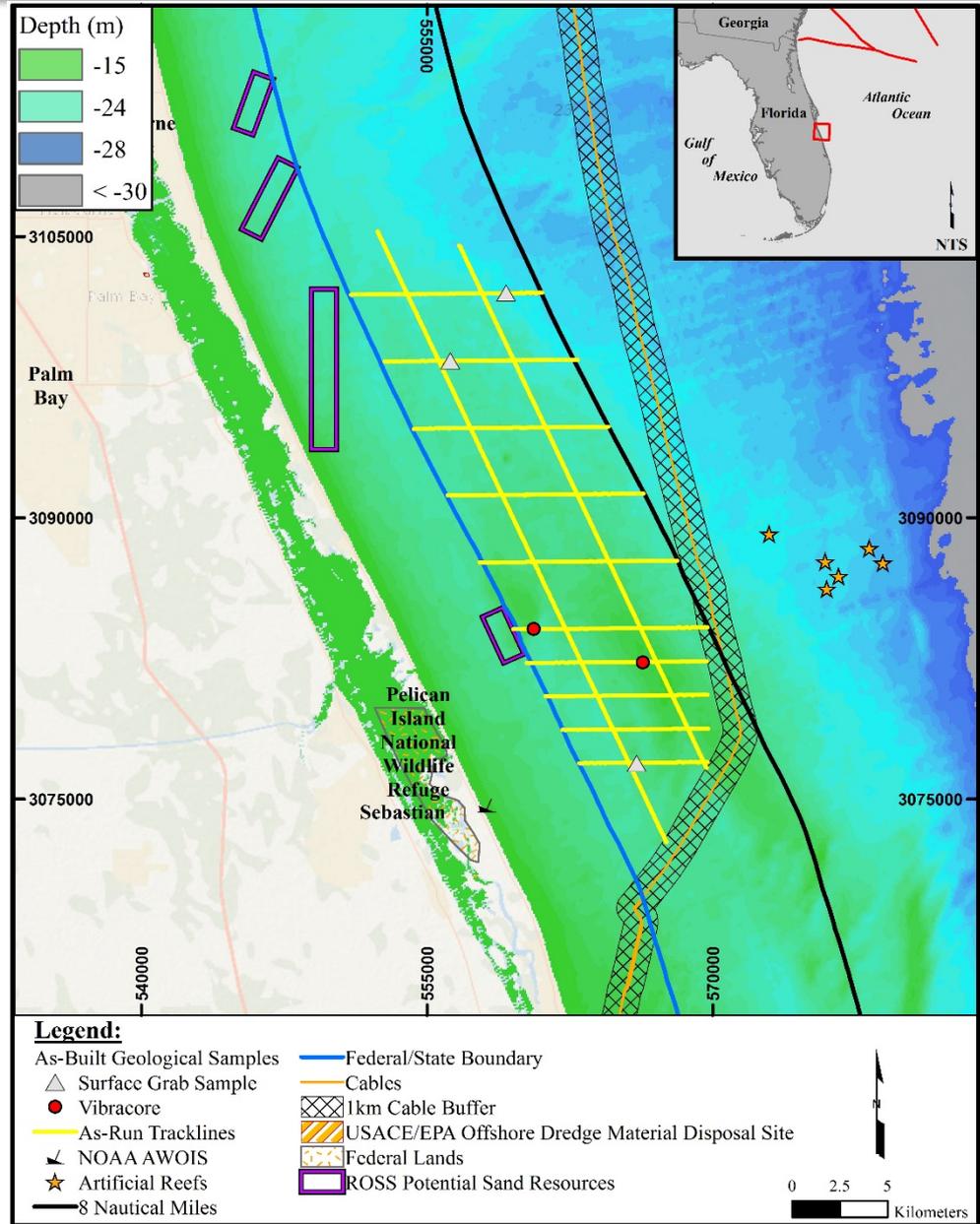
Boring Designation FL-BOEM-2015-VC15

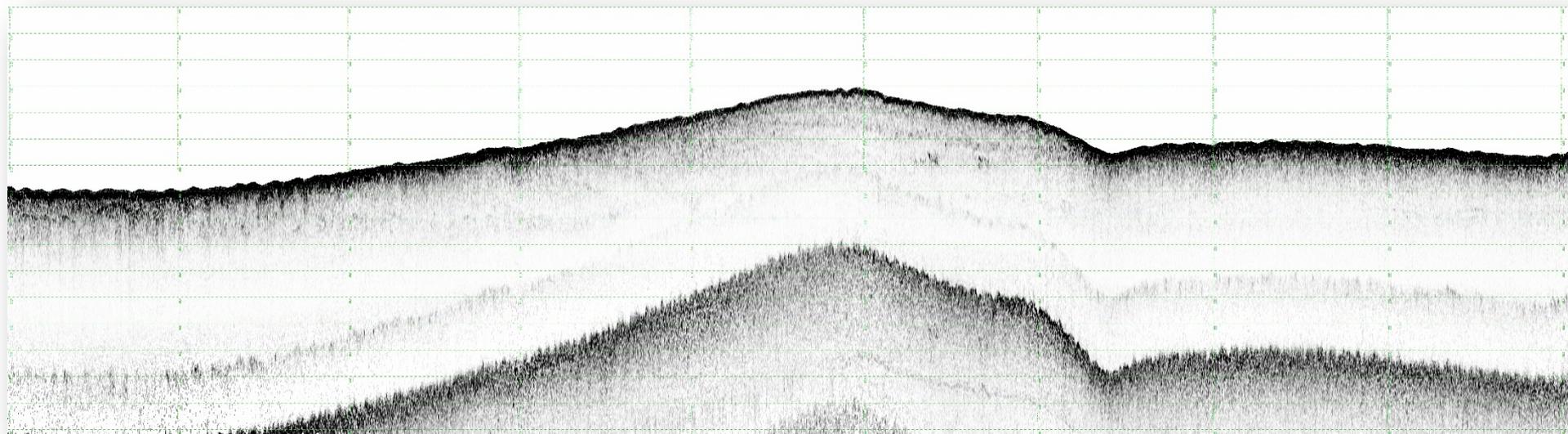
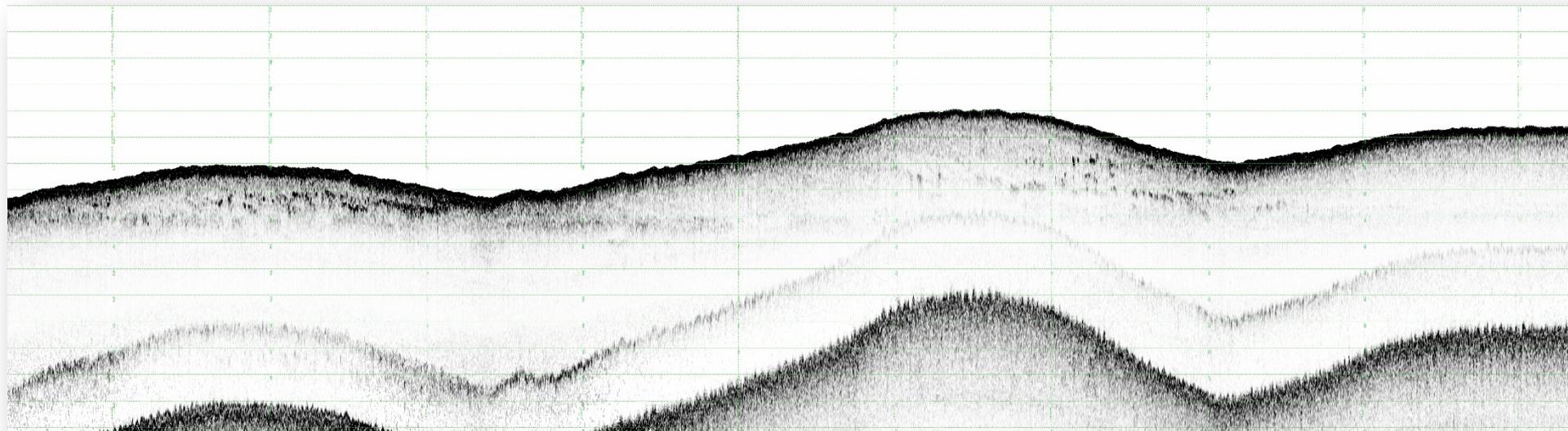
DRAFT

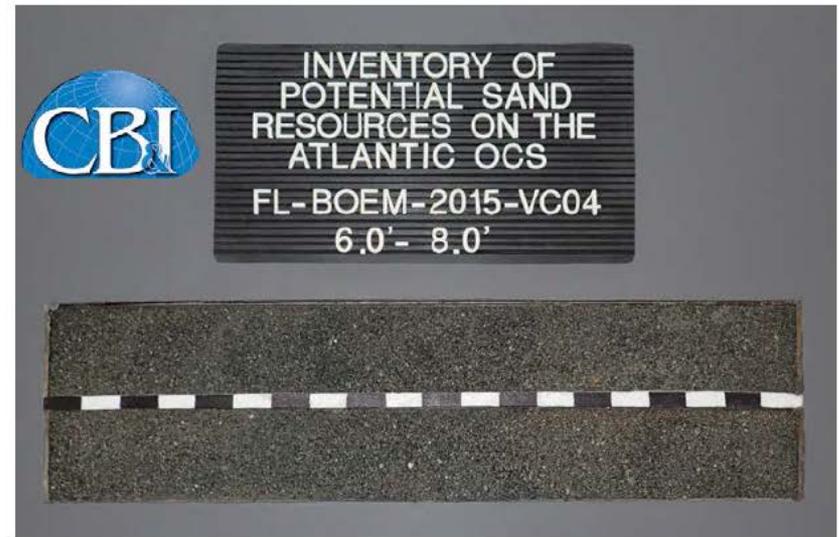
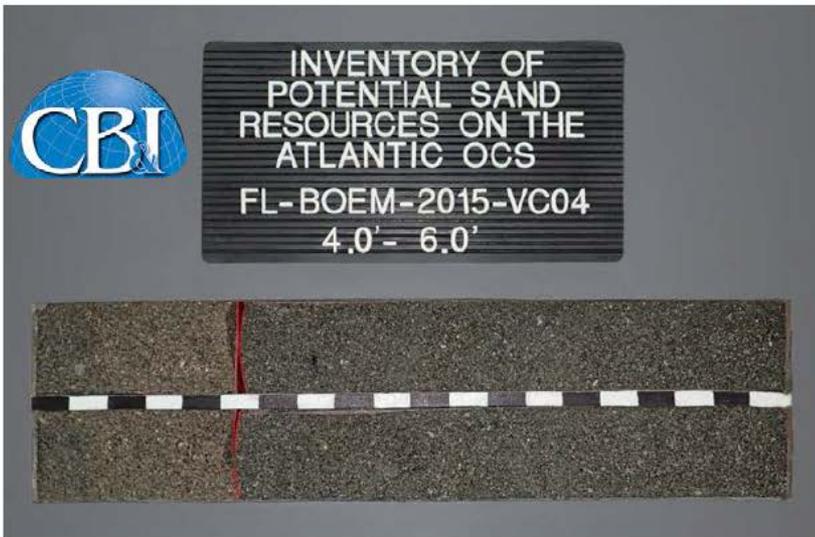
DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
1. PROJECT Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS	2. BORING DESIGNATION FL-BOEM-2015-VC15	9. SIZE AND TYPE OF BIT 3.0 In.	10. COORDINATE SYSTEM/DATUM UTM HORIZONTAL: NAD 1983 VERTICAL:
3. DRILLING AGENCY American Vibracore Services, Inc.	LOCATION COORDINATES X = 518,706 Y = 3,224,812	11. MANUFACTURER'S DESIGNATION OF DRILL Alpine Pneumatic Vibracore	<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Brian McCord	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	<input type="checkbox"/> DISTURBED <input type="checkbox"/> UNDISTURBED (UD)
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	DEG. FROM VERTICAL	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN 0.0 Ft.	BEARING	14. ELEVATION GROUND WATER	
7. DEPTH DRILLED INTO ROCK 0.0 Ft.		15. DATE BORING	STARTED 08-14-15 12:32 COMPLETED 08-14-15 12:36
8. TOTAL DEPTH OF BORING 20.0 Ft.		16. ELEVATION TOP OF BORING Not Determined	
		17. TOTAL RECOVERY FOR BORING 17.5 Ft.	
		18. SIGNATURE AND TITLE OF INSPECTOR BF	

ELEV. (ft)	DEPTH (ft)	LOG	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
0.0	0.0					
	0.7		SHELL HASH, some sand, fine grained, quartz, trace shell fragments, trace silt, trace whole shell, whole shells up to 1.0", shell fragments up to 0.25", gray (2.5Y-5/1), (SW).		1	Sample #1, Depth = 0.3' Mean (mm): 0.59, Phi Sorting: 1.67 Fines (230): 1.30% (SW)
	1.7				2	Sample #2, Depth = 1.1' Mean (mm): 0.34, Phi Sorting: 1.15 Fines (230): 1.60% (SW)
	2.0		SAND, fine grained, quartz, little shell hash, trace silt, dark gray (5Y-4/1), (SW).		3	Sample #3, Depth = 1.8' Mean (mm): 0.48, Phi Sorting: 1.41 Fines (230): 1.18% (SW)
	3.7		Shelly SAND, fine grained, quartz, trace silt, shell components are shell fragments up to 0.5", dark gray (5Y-4/1), (SW).		4	Sample #4, Depth = 2.7' Mean (mm): 0.24, Phi Sorting: 0.77 Fines (230): 1.19% (SP)
	5.1		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to 0.25", 1.5" shelly pocket @ 3.6", shell components are whole shells up to 0.75" and shell fragments up to 0.25", gray (5Y-5/1), (SP).		5	Sample #5, Depth = 4.4' Mean (mm): 0.26, Phi Sorting: 0.91 Fines (230): 2.05% (SW)
	7.7		SAND, fine grained, quartz, trace silt, silt distributed in laminae, dark gray (2.5Y-4/1), (SW).		6	Sample #6, Depth = 5.9' Mean (mm): 0.35, Phi Sorting: 1.19 Fines (230): 2.37% (SW)
	8.1				7	Sample #7, Depth = 8.5' Mean (mm): 0.48, Phi Sorting: 1.62 Fines (230): 3.63% (SW)
	8.8		SAND, fine grained, quartz, little shell hash, trace shell fragments, trace silt, trace whole shell, whole shells up to 1.0", shell fragments up to 0.5", dark gray (5Y-4/1), (SW).		8	Sample #8, Depth = 9.2' Mean (mm): 0.21, Phi Sorting: 0.73 Fines (230): 4.93% (SP-SM)
	9.8		SAND, fine grained, quartz, trace shell hash, trace silt, dark gray (2.5Y-4/1), (SP-SM).		9	Sample #9, Depth = 10.5' Mean (mm): 0.22, Phi Sorting: 0.87 Fines (230): 6.23% (SW-SM)
	11.6		Shelly SAND, fine grained, quartz, trace silt, shell components are shell fragments up to 1.0" and whole shells up to 0.5", 0.5" clay pocket @ 8.1", dark gray (2.5Y-4/1), (SW).		10	Sample #10, Depth = 14.5' Mean (mm): 0.17, Phi Sorting: 0.65 Fines (230): 3.40% (SP)
	13.1		SAND, fine grained, quartz, trace shell hash, trace silt, dark gray (2.5Y-4/1), (SP-SM).		11	Sample #11, Depth = 17.0' Mean (mm): 0.57, Phi Sorting: 2.09 Fines (230): 2.53% (SW)
	16.2		SAND, fine grained, quartz, trace shell hash, trace silt, and shell hash increases with depth, dark gray (2.5Y-4/1), (SW-SM).			
	17.5		Shelly SILT, little sand, shell components are shell hash and shell fragments up to 1.5", 2 (3.0" x 2.0") shell fragments @ 12.2", (1.75" x 1.0") whole shell @ 11.7", dark gray (5Y-4/1), (GM).			
	20.0		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to 1.0", (1.0" x 0.5") whole shell @ 13.4", gray (5Y-5/1), (SP).			
			Sandy SHELL, trace silt, shell components are whole shells and shell fragments up to 1.0", (2.0" x 1.5") shell fragments @ 17.2' & 17.4', (1.25" x 1.0") shell fragments @ 17.1' & 17.2', gray (2.5Y-5/1), (GW).			
			No Recovery.			
			End of Boring			

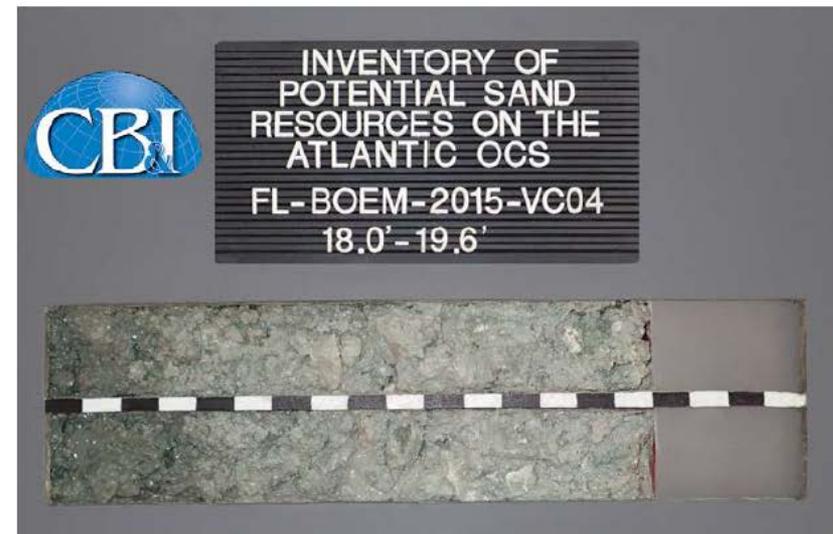
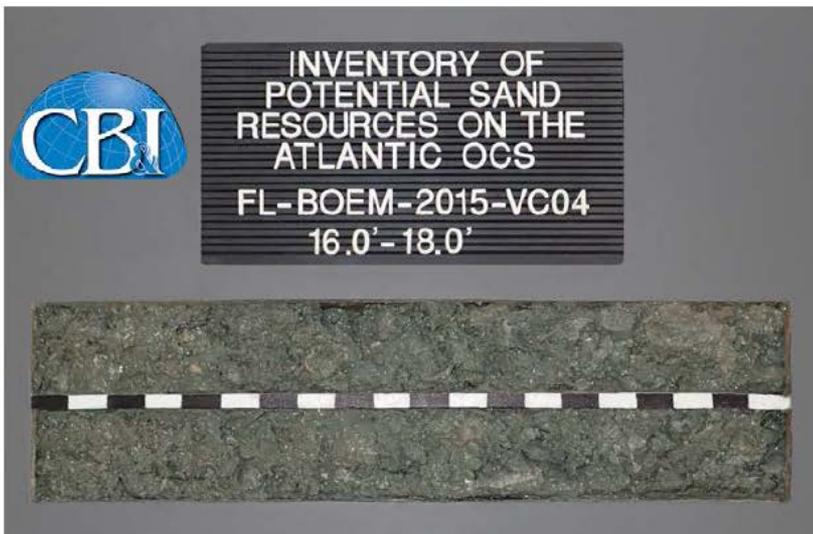
Granulometric Report				Depths and elevations based on measured values			
Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS				CBI Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102			
Sample Name: FL-BOEM-2015-VC15-#4				Analysis Date: 08-30-15			
Analyzed By: SMT				Coordinate System: UTM			
Easting (ft): 518,706		Northing (ft): 3,224,812		Elevation (ft):			
USCS: SP		Munsell: Wet - 5Y-5/1 Dry - 5Y-7/1 Washed - 5Y-7/1		Comments:			
Dry Weight (g): 92.86	Wash Weight (g): 91.80	Fan Retained (g): 0.02	Sieve Loss (%): 0.02	Fines (%): #200 - 1.25 #230 - 1.19	Organics (%):	Carbonates (%):	Shell Hash (%):
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained	
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00	
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00	
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00	
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00	
3/5"	-2.50	5.66	0.00	0.00	0.00	0.00	
4"	-2.25	4.76	0.06	0.06	0.06	0.06	
5"	-2.00	4.00	0.00	0.00	0.06	0.06	
7"	-1.50	2.83	0.23	0.25	0.29	0.31	
10"	-1.00	2.00	0.35	0.38	0.64	0.69	
14"	-0.50	1.41	1.00	1.08	1.64	1.77	
18"	0.00	1.00	1.29	1.39	2.93	3.16	
25"	0.50	0.71	1.86	2.00	4.79	5.16	
35"	1.00	0.50	2.70	2.91	7.49	8.07	
45"	1.50	0.35	5.84	6.29	13.33	14.36	
60"	2.00	0.25	16.97	18.27	30.30	32.63	
80"	2.50	0.18	40.33	43.43	70.63	76.06	
120"	3.00	0.13	17.60	18.95	88.23	95.01	
170"	3.50	0.09	3.08	3.32	91.31	98.33	
200"	3.75	0.07	0.39	0.42	91.70	98.75	
230"	4.00	0.06	0.06	0.06	91.76	98.81	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
3.00	2.71	2.49	2.20	1.79	1.54	0.46	
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
	2.05	0.24	0.77	-1.78	7.8		











DRAFT

Boring Designation FL-BOEM-2015-VC04

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 1 SHEETS	
1. PROJECT Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS				9. SIZE AND TYPE OF BIT 3.0 In.			
2. BORING DESIGNATION FL-BOEM-2015-VC04				10. COORDINATE SYSTEM/DATUM UTM			
3. DRILLING AGENCY American Vibracore Services, Inc.				11. MANUFACTURER'S DESIGNATION OF DRILL Alpine Pneumatic Vibracore			
4. NAME OF DRILLER Brian McCord				12. TOTAL SAMPLES DISTURBED			
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED				13. TOTAL NUMBER CORE BOXES			
6. THICKNESS OF OVERBURDEN 0.0 Ft.				14. ELEVATION GROUND WATER			
7. DEPTH DRILLED INTO ROCK 0.0 Ft.				15. DATE BORING STARTED 07-31-15 10:11 COMPLETED 07-31-15 10:13			
8. TOTAL DEPTH OF BORING 20.0 Ft.				16. ELEVATION TOP OF BORING Not Determined			
				17. TOTAL RECOVERY FOR BORING 19.6 Ft.			
				18. SIGNATURE AND TITLE OF INSPECTOR BF			

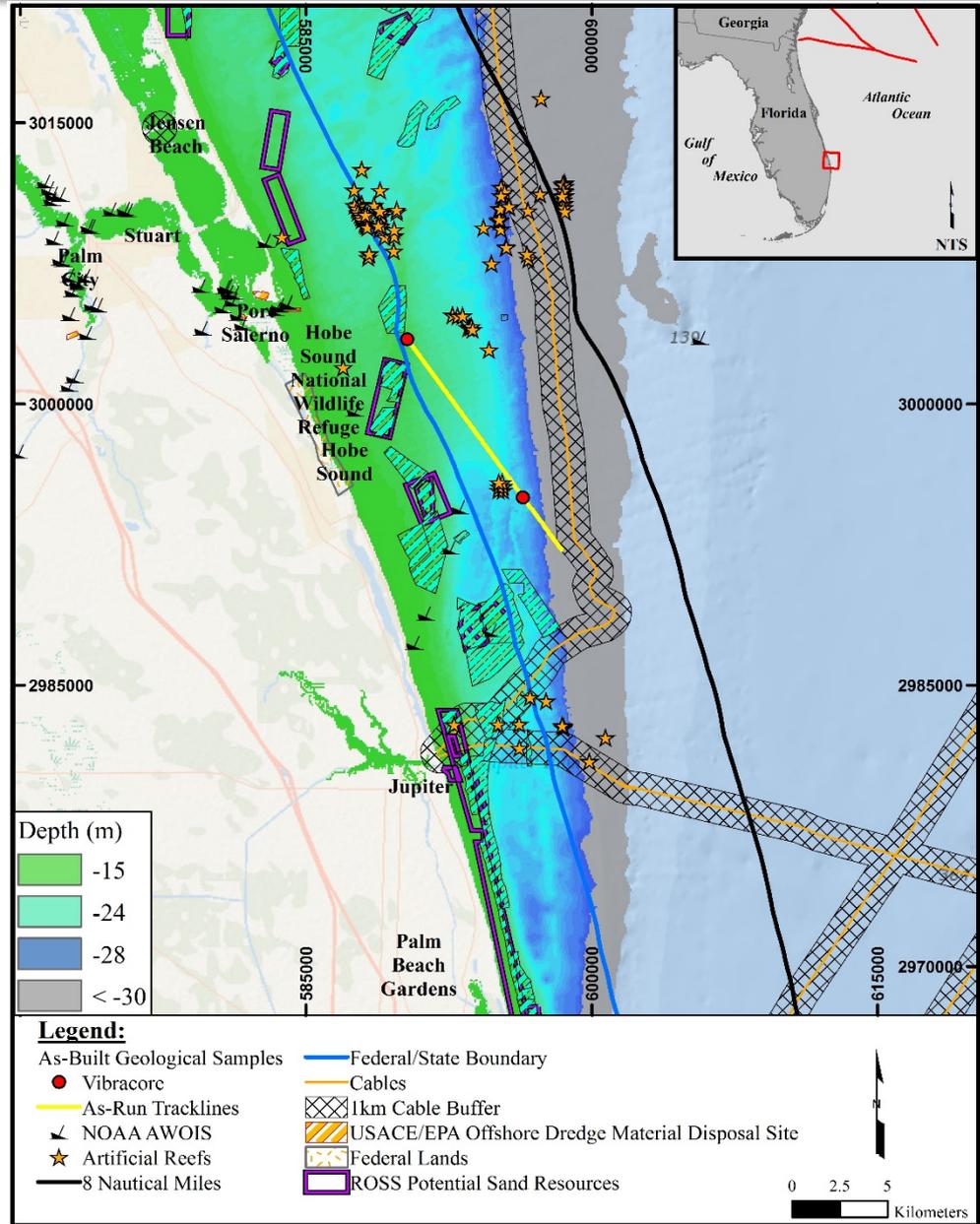
ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX NO. SAMPLE	REMARKS
	0.0					
	12.3		Shelly SAND, fine grained, quartz, little whole shell, trace silt, shell component is shell hash, whole shells up to 0.5", (1.0" x 0.5") whole shell @ 8.7", 1.0" clay pocket @ 11.8", very dark gray (5Y-3/1), (SW).		1	Sample #1, Depth = 3.0' Mean (mm): 0.54, Phi Sorting: 0.96 Fines (230): 2.06% (SW)
	14.6		SAND, fine grained, quartz, some shell hash, trace shell fragments, trace silt, shell fragments up to 0.25", (1.0" x 0.5") shell fragment @ 13.8", 0.5" clay pocket @ 13.6", dark gray (5Y-4/1), (SP-SM).		2	Sample #2, Depth = 6.0' Mean (mm): 0.57, Phi Sorting: 0.89 Fines (230): 1.99% (SW)
	15.5		SAND, fine grained, quartz, little shell hash, trace shell fragments, trace silt, shell fragments up to 0.75", (3.0" x 1.0") shell hash pocket @ 15.0", clay distributed in pockets up to 0.5" and increases with depth, dark gray (5Y-4/1), (SC).		3	Sample #3, Depth = 9.0' Mean (mm): 0.53, Phi Sorting: 0.94 Fines (230): 1.65% (SW)
	18.3		Clayey SHELL, little silt, shell components are shell fragments up to 1.0" and whole shells up to 2.0", dark greenish gray (10Y-4/1), (GC).		4	Sample #4, Depth = 13.2' Mean (mm): 0.32, Phi Sorting: 0.85 Fines (230): 6.16% (SP-SM)
	19.6		Clayey SHELL FRAGMENTS, shell fragments up to 2.0", greenish gray (10Y-6/1), (GC).		5	Sample #5, Depth = 14.8' Mean (mm): 0.27, Phi Sorting: 1.03 Fines (230): 14.47% (SC)
	20.0		No Recovery.			
			End of Boring			

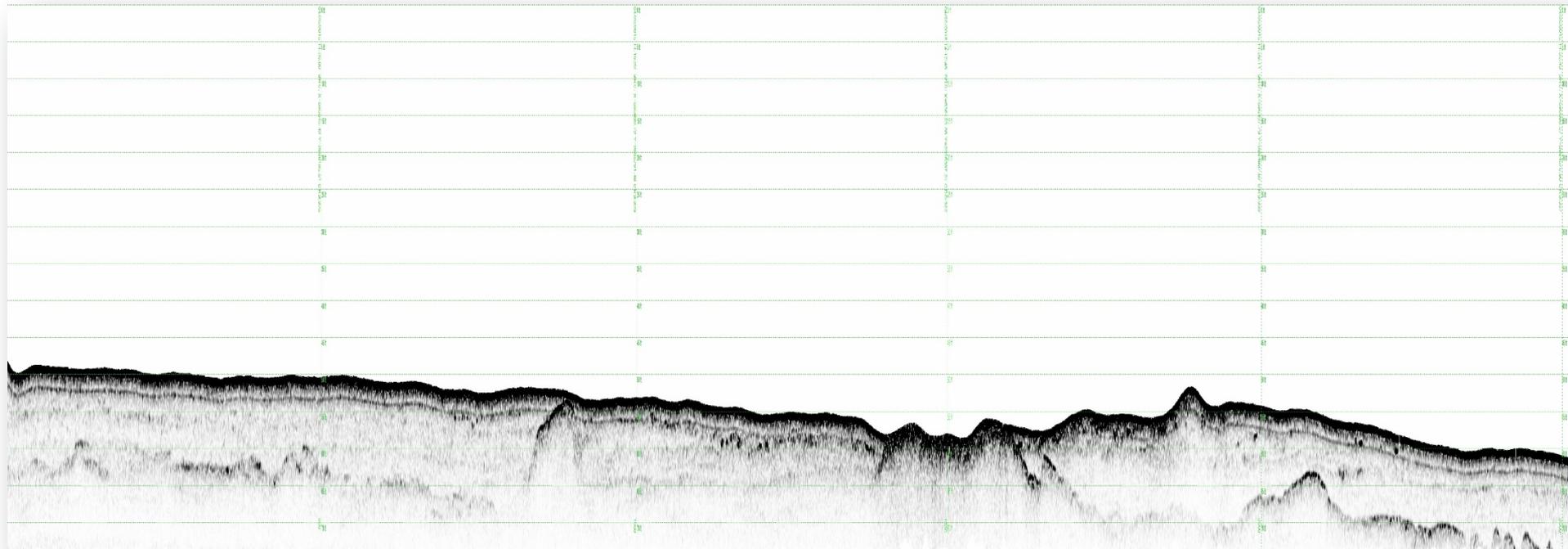
SAJ FORM 1836 MODIFIED FOR THE FLORIDA DEP
JUN 02 JUN 04

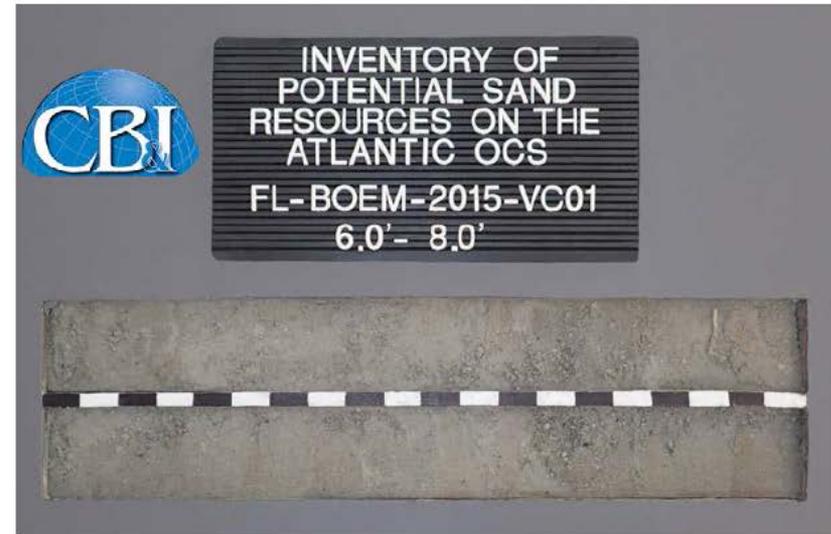
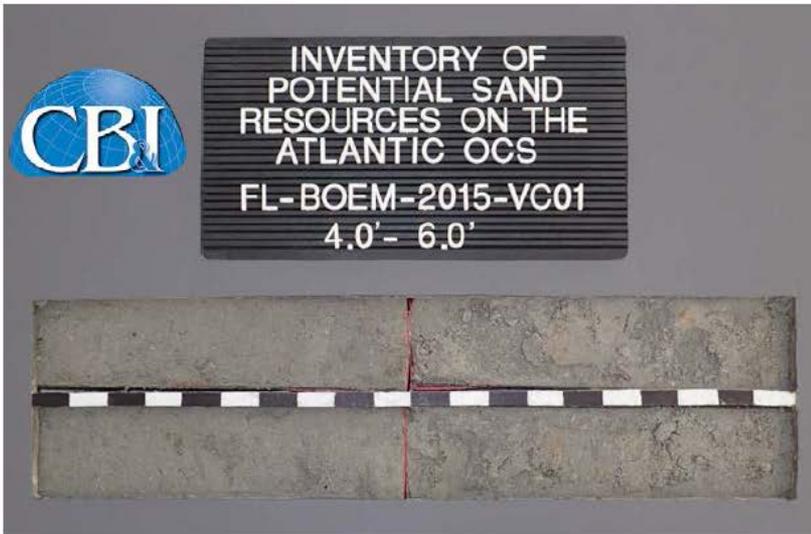
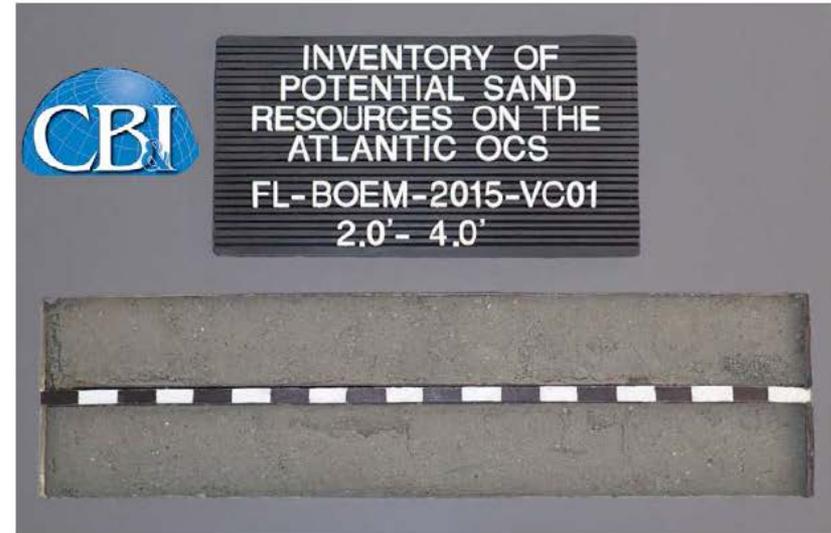
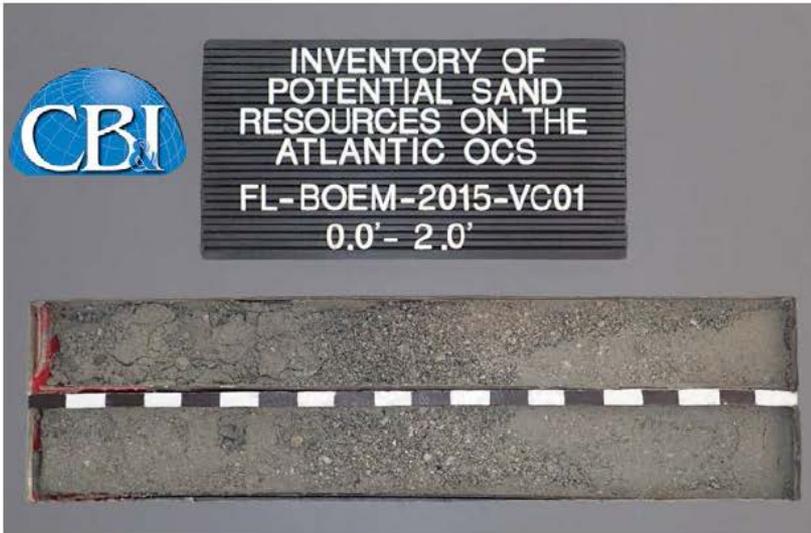
DRAFT

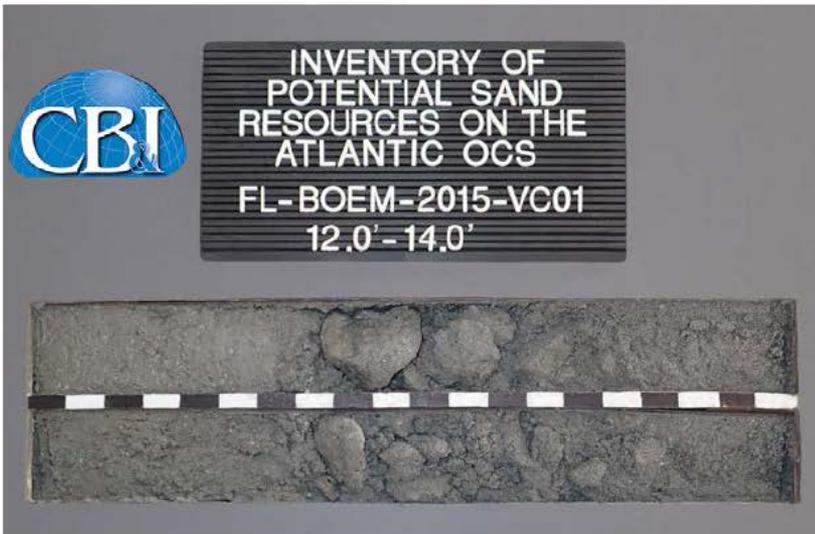
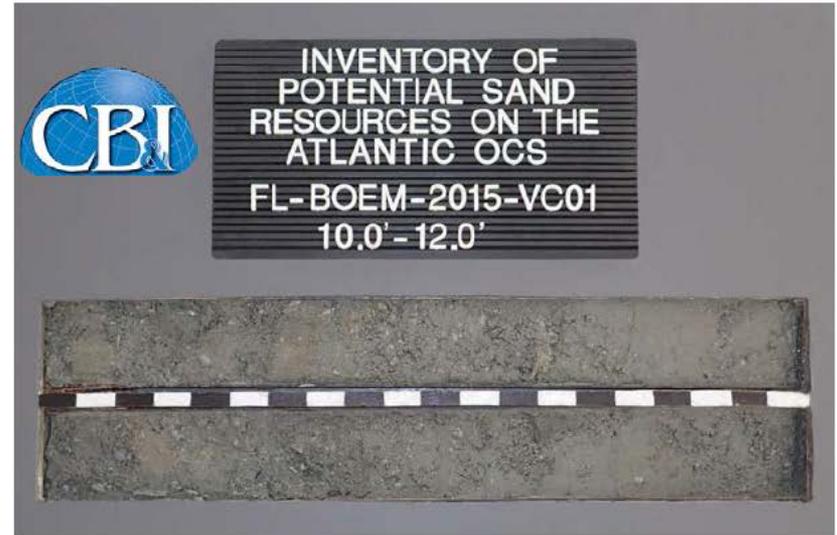
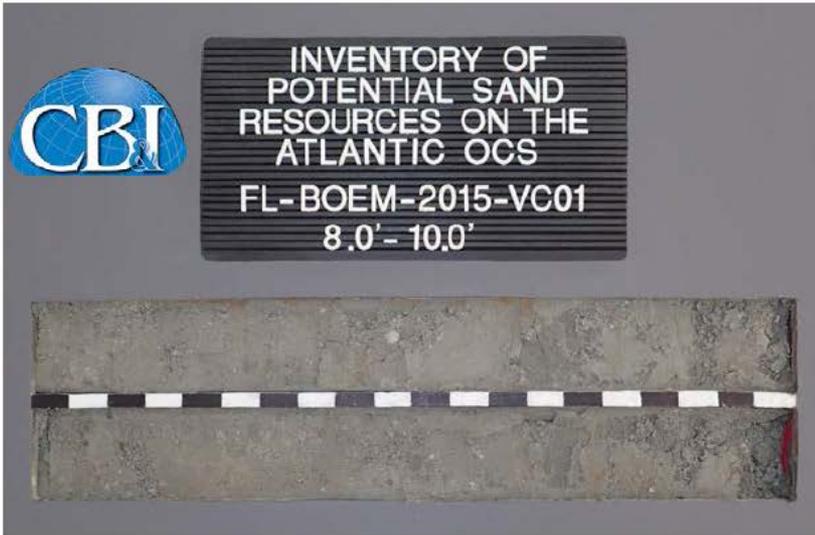
Granulometric Report				Depths and elevations based on measured values			
Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS				 CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102			
Sample Name: FL-BOEM-2015-VC04 #2							
Analysis Date: 10-29-15							
Easting (ft): 560,596		Northing (ft): 3,084,074		Coordinate System: UTM		Elevation (ft):	
USCS: SW		Munsell: Wet - 5Y-3/1 Dry - 5Y-6/1 Washed - 5Y-5/1		Comments:			
Dry Weight (g): 94.71	Wash Weight (g): 92.86	Fan Retained (g): 0.00	Sieve Loss (%): 0.02	Fines (%): #200 - 2.03 #230 - 1.99	Organics (%):	Carbonates (%):	Shell Hash (%):
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained	
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00	
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00	
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00	
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00	
3.5	-2.50	5.66	0.00	0.00	0.00	0.00	
4	-2.25	4.76	0.07	0.07	0.07	0.07	
5	-2.00	4.00	0.18	0.19	0.25	0.26	
7	-1.50	2.83	0.59	0.62	0.84	0.88	
10	-1.00	2.00	1.04	1.10	1.88	1.98	
14	-0.50	1.41	4.21	4.45	6.09	6.43	
18	0.00	1.00	12.80	13.51	18.89	19.94	
25	0.50	0.71	14.64	15.46	33.53	35.40	
35	1.00	0.50	15.94	16.83	49.47	52.23	
45	1.50	0.35	21.89	23.11	71.36	75.34	
60	2.00	0.25	15.61	16.48	86.97	91.82	
80	2.50	0.18	4.63	4.89	91.60	96.71	
120	3.00	0.13	0.92	0.97	92.52	97.68	
170	3.50	0.09	0.22	0.23	92.74	97.91	
200	3.75	0.07	0.06	0.06	92.80	97.97	
230	4.00	0.06	0.04	0.04	92.84	98.01	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
2.33	1.76	1.49	0.93	0.16	-0.15	-0.66	
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
	0.81	0.57	0.89	-0.28	2.92		

GRANULOMETRIC REPORT BOEM 2015 VCS GFI JURRAZL QDT 12/2/15









DRAFT

Boring Designation FL-BOEM-2015-VC01

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 1 SHEETS	
1. PROJECT Inventory of Potential Beach Nourishment and Coastal Restoration Sand Sources on the Atlantic OCS				9. SIZE AND TYPE OF BIT 3.0 In.			
2. BORING DESIGNATION FL-BOEM-2015-VC01				10. COORDINATE SYSTEM/DATUM UTM			
3. DRILLING AGENCY American Vibracore Services, Inc.				11. MANUFACTURER'S DESIGNATION OF DRILL Alpine Pneumatic Vibracore			
4. NAME OF DRILLER Brian McCord				12. TOTAL SAMPLES DISTURBED: _____ UNDISTURBED (UD): _____			
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED				13. TOTAL NUMBER CORE BOXES			
6. THICKNESS OF OVERBURDEN 0.0 Ft.				14. ELEVATION GROUND WATER			
7. DEPTH DRILLED INTO ROCK 0.0 Ft.				15. DATE BORING STARTED: 07-29-15 17:54 COMPLETED: 07-29-15 17:59			
8. TOTAL DEPTH OF BORING 18.0 Ft.				16. ELEVATION TOP OF BORING Not Determined			
				17. TOTAL RECOVERY FOR BORING 15 Ft.			
				18. SIGNATURE AND TITLE OF INSPECTOR DA			

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX NO.	SAMPLE	REMARKS
0.0	0.0						
	0.7		SAND, fine grained, quartz, trace shell fragments, trace silt, shell fragments up to 0.25", 1.75" shell fragment @ 0.5', gray (2.5Y-5/1), (SW-SM).		1		Sample #1, Depth = 0.4' Mean (mm): 0.16, Phi Sorting: 1.24 Fines (230): 6.78% (SW-SM)
	1.3		Sandy SHELL HASH, trace silt, gray (2.5Y-5/1), (SW).		2		Sample #2, Depth = 1.0' Mean (mm): 0.49, Phi Sorting: 1.51 Fines (230): 3.05% (SW)
	5.6		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to 0.5", shell hash distributed in pockets up to 0.5" and throughout layer, gray (2.5Y-5/1), (SP-SM).		3		Sample #3, Depth = 4.1' Mean (mm): 0.13, Phi Sorting: 0.78 Fines (230): 4.01% (SP-SM)
	9.8		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to 0.5", shell hash distributed in pockets up to 0.5" and throughout layer, gray (2.5Y-5/1), (SM).		4		Sample #4, Depth = 7.0' Mean (mm): 0.11, Phi Sorting: 0.73 Fines (230): 6.03% (SM)
	12.7		SAND, fine grained, quartz, some silt, little shell hash, (1.75" x 1.25") shell fragment @ 11.3', gray (2.5Y-5/1), (SM).		5		Sample #5, Depth = 11.3' Mean (mm): 0.16, Phi Sorting: 1.69 Fines (230): 22.18% (SM)
	13.6		Sandy ROCK FRAGMENTS, some shell fragments, rock fragments up to 3.25", shell fragments up to 0.5", dark gray (2.5Y-4/1), (GW).		6		Sample #6, Depth = 14.3' Mean (mm): 0.41, Phi Sorting: 0.98 Fines (230): 10.16% (SW-SM)
	15.0		SAND, medium to coarse grained, quartz, little shell hash, little silt, trace rock fragments, rock fragments up to 0.5", dark gray (2.5Y-4/1), (SW-SM). No Recovery.				
	18.0		End of Boring				

LOUISIANA BOEM 2015 VCS-GPJ JBRRAZL QDT 1/25/16

SAJ FORM 1836 MODIFIED FOR THE FLORIDA DEP
JUN 02 JUN 04

DRAFT

Granulometric Report Depths and elevations based on measured values				 CB&I Coastal Planning & Engineering, Inc. 2481 NW Boca Raton Blvd. Boca Raton, FL 33431 ph (561) 391 8102			
Project Name: Inventory of Potential Beach Nourishment and Coastal Restoration							
Sand Sources on the Atlantic OCS							
Sample Name: FL-BOEM-2015-VC01 #5							
Analysis Date: 10-30-15				Coordinate System: UTM			
Easting (ft): 596,390		Northing (ft): 2,995,020		Elevation (ft):			
USCS: SP-SM		Munsell: Wet - 2.5Y-5/1 Dry - 2.5Y-7/1 Washed - 2.5Y-8/1		Comments:			
Dry Weight (g): 93.03	Wash Weight (g): 89.83	Fan Retained (g): 0.51	Sieve Loss (%): 0.02	Fines (%): #200 - 7.64 #230 - 4.01	Organics (%):	Carbonates (%):	Shell Hash (%):
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained	
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00	
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00	
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00	
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00	
3.5	-2.50	5.66	0.14	0.15	0.14	0.15	
4	-2.25	4.76	0.09	0.10	0.23	0.25	
5	-2.00	4.00	0.00	0.00	0.23	0.25	
7	-1.50	2.83	0.16	0.17	0.39	0.42	
10	-1.00	2.00	0.37	0.40	0.76	0.82	
14	-0.50	1.41	0.36	0.39	1.12	1.21	
18	0.00	1.00	0.51	0.55	1.63	1.76	
25	0.50	0.71	0.61	0.66	2.24	2.42	
35	1.00	0.50	0.86	0.92	3.10	3.34	
45	1.50	0.35	0.94	1.01	4.04	4.35	
60	2.00	0.25	1.26	1.35	5.30	5.70	
80	2.50	0.18	3.21	3.45	8.51	9.15	
120	3.00	0.13	31.11	33.44	39.62	42.59	
170	3.50	0.09	35.81	38.49	75.43	81.08	
200	3.75	0.07	10.49	11.28	85.92	92.36	
230	4.00	0.06	3.38	3.63	89.30	95.99	
Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95	
3.93	3.56	3.42	3.10	2.74	2.60	1.74	
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis		
	2.94	0.13	0.78	-3.31	18.22		

GRANULOMETRIC REPORT BOEM 2015 VCS-GPJ JBRRAZL QDT 1/25/16

- Geophysical Survey
 - Total contracted survey effort (**5,600** km's) less 2015 planned reconnaissance effort (**4,262** km's) allows planned 2016 design level effort (**1,338** km's)
 - 2016 planned design level effort (**1,338** km's) plus Maine's allocation (**50** km's) totals adjusted 2016 design level effort (**1,388** km's)
 - **1,388** km's of geophysical data
 - **554** km's to NY & NJ to satisfy 40% total effort stipulation
 - **834** km's remaining to allocate

- Geologic Sampling
 - **350** total samples less **260** reconnaissance samples allows **90** samples for design level geologic sampling effort
 - **Approx. 39** samples to NY/NJ to satisfy 40% total effort stipulation
 - **Approx. 51** samples remaining to allocate to other states based on geophysical data

Joe Maloney

(703) 787-1820

Joe.Maloney@boem.gov



Beau C. Suthard, PG

(727) 565-4660

Beau.Suthard@cbi.com

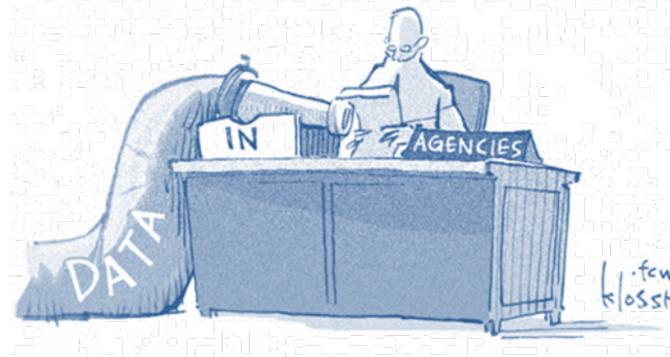
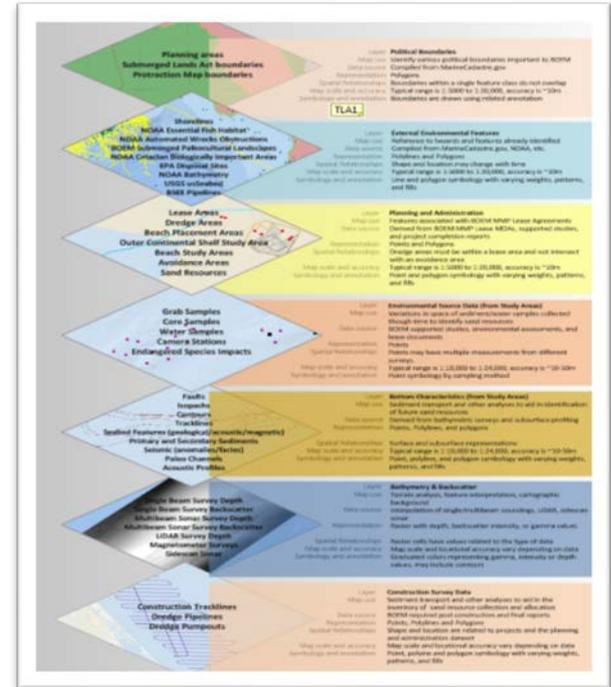
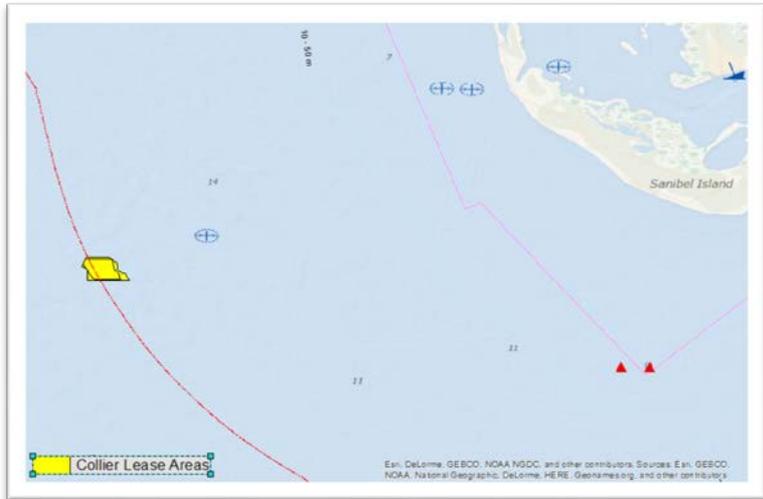


Minerals Geospatial and Information System

Offshore Florida

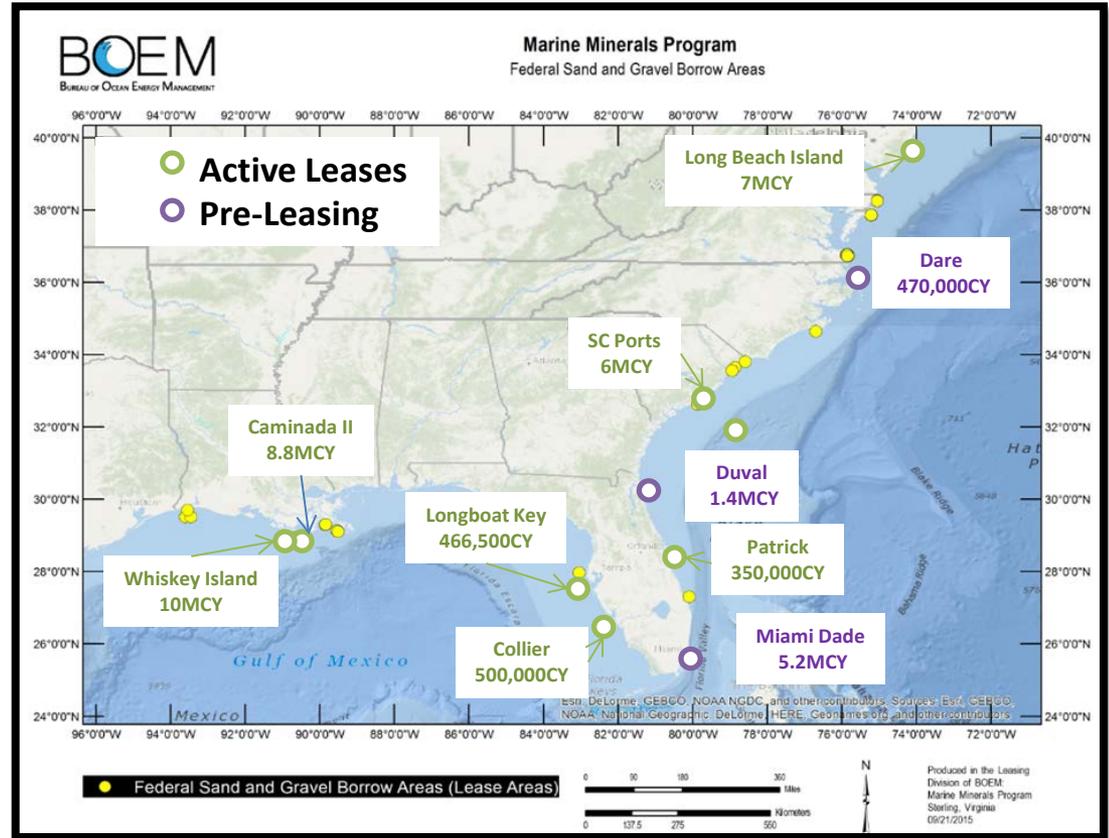
Lora Turner
February 2, 2016
FL SMWG

MMPGIS Thematic Layers



➤ What we are doing

- ✓ Geophysical and Geological mapping data collected
- ✓ Identification and Analysis of Sediment / Sand Resources
- ✓ Resource Planning and Administration
- ✓ Coastal Restoration / Offshore Dredging Projects

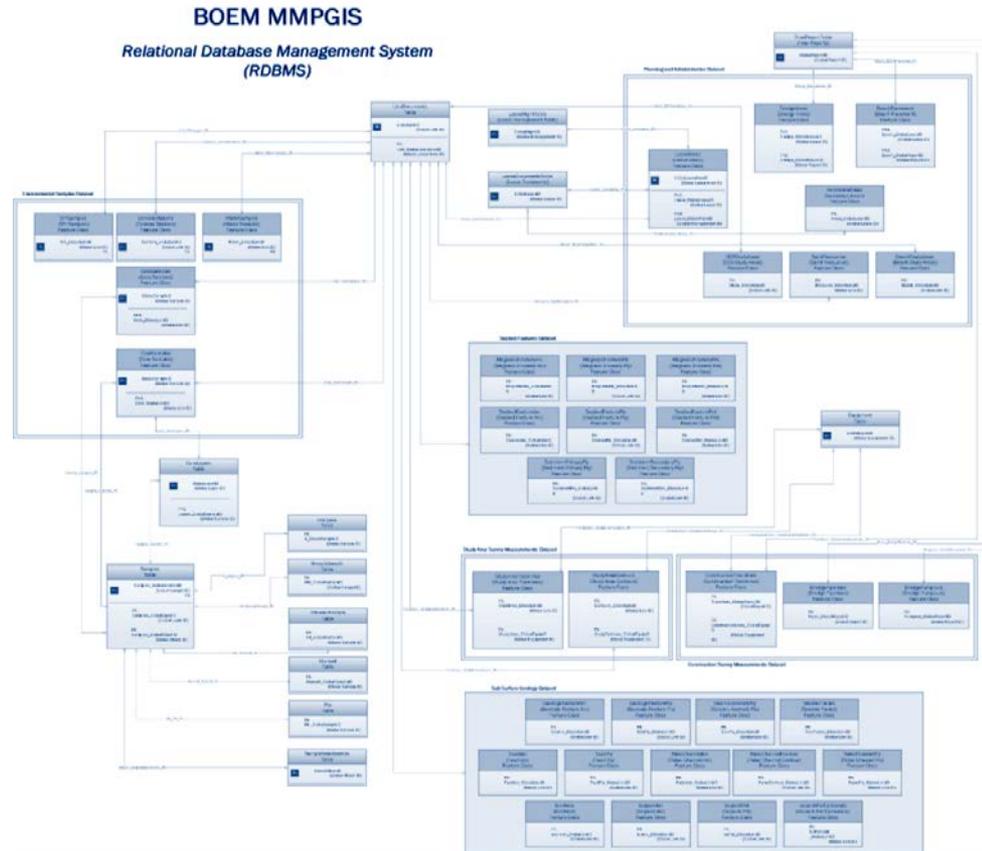


How to get to a comprehensive sand / sediment inventory (Atlantic and Gulf)?

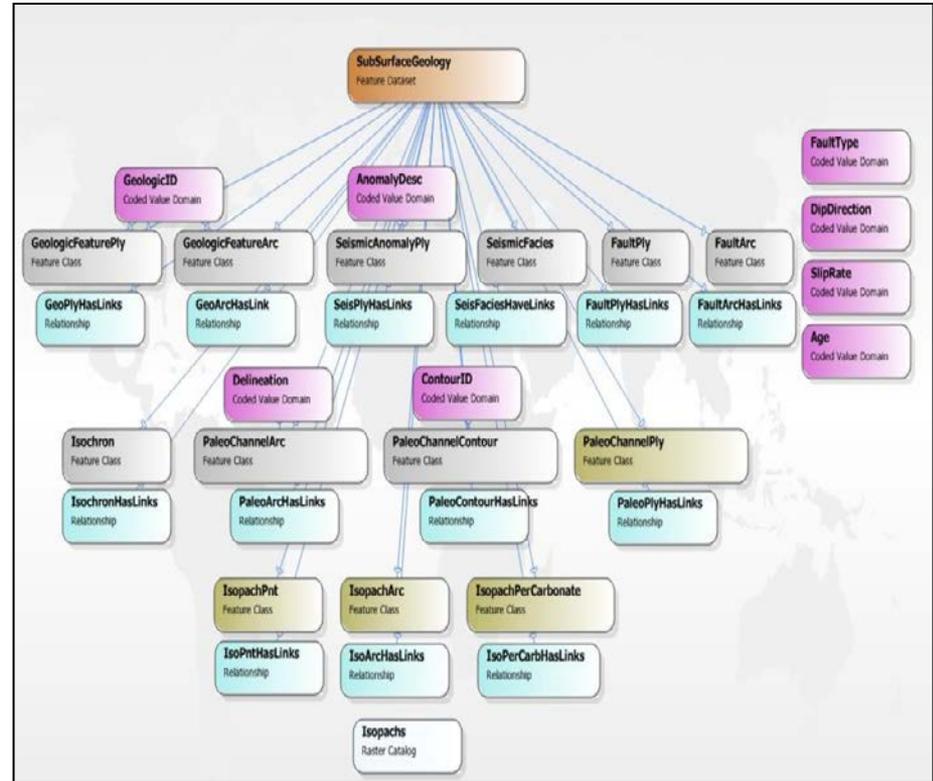
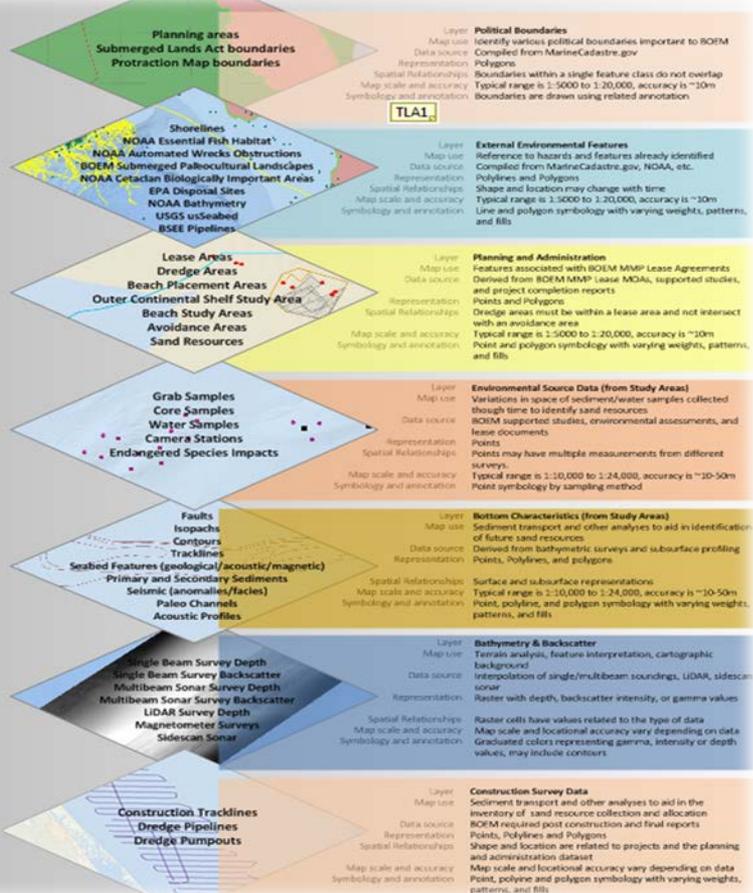


What we are doing

- Leverage investments of historic and current project data (e.g., leasing, cooperative agreements, studies, resource evaluation) and maintain a repository of applicable offshore marine mineral data;
- Implement and maintain a system to support offshore mineral resource planning and decisions;
- Manage use conflicts with other offshore activities;
- Provide reliable shared access to applicable marine minerals data; and
- Leverage and align with applicable federal IT technologies.



MMPGIS Thematic Layers



MMPGIS Data Model

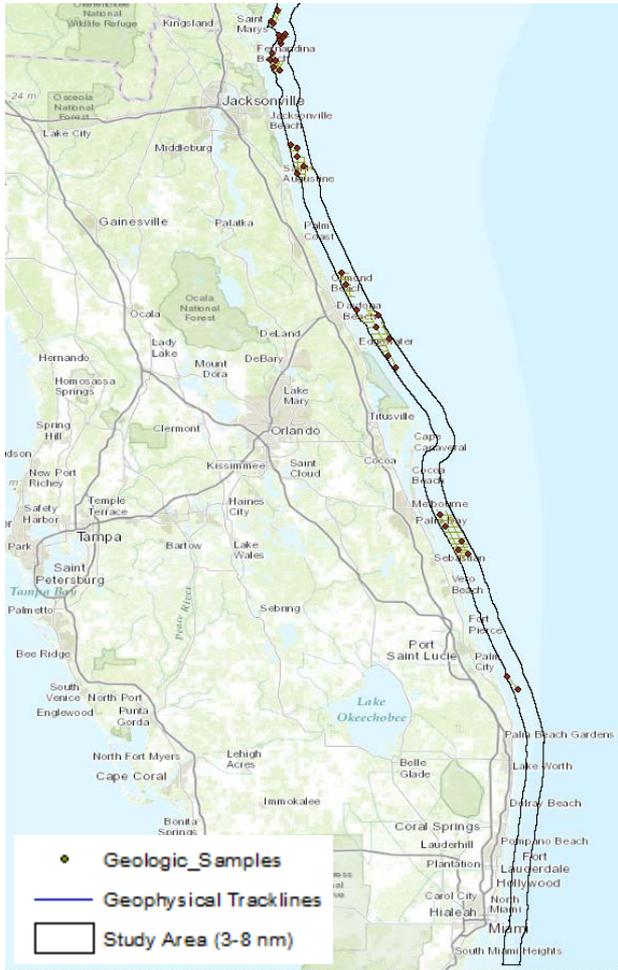


Need to know what we have to manage the resource successfully

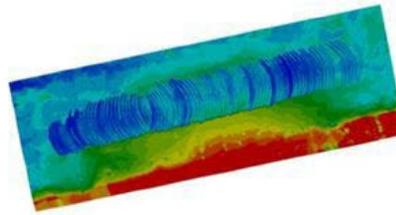
Collect

Resource Evaluation – Sand / Sediment Resource Delineation

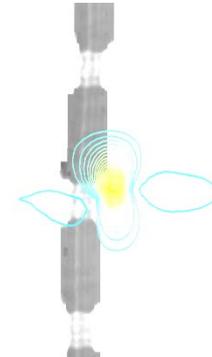
Identification and Analysis of Sediment / Sand Resources



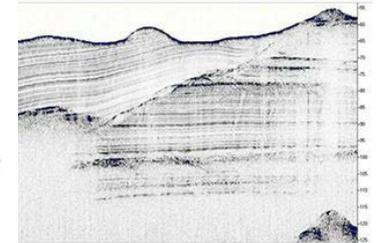
Bathymetry



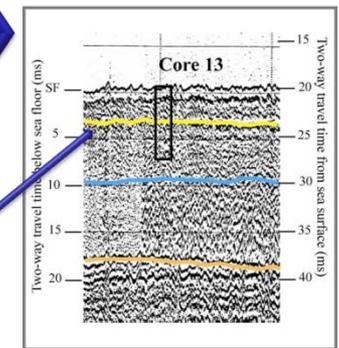
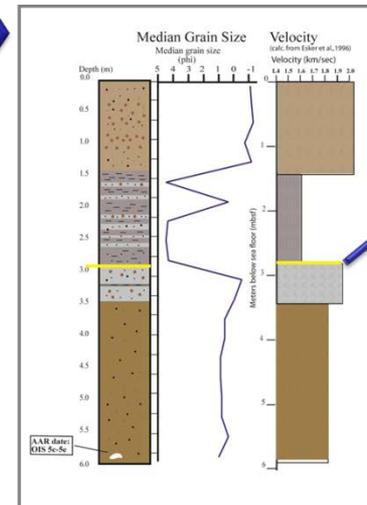
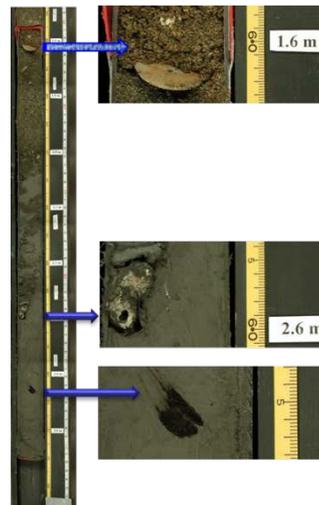
Magnetometer



Chirp sub-bottom seismic



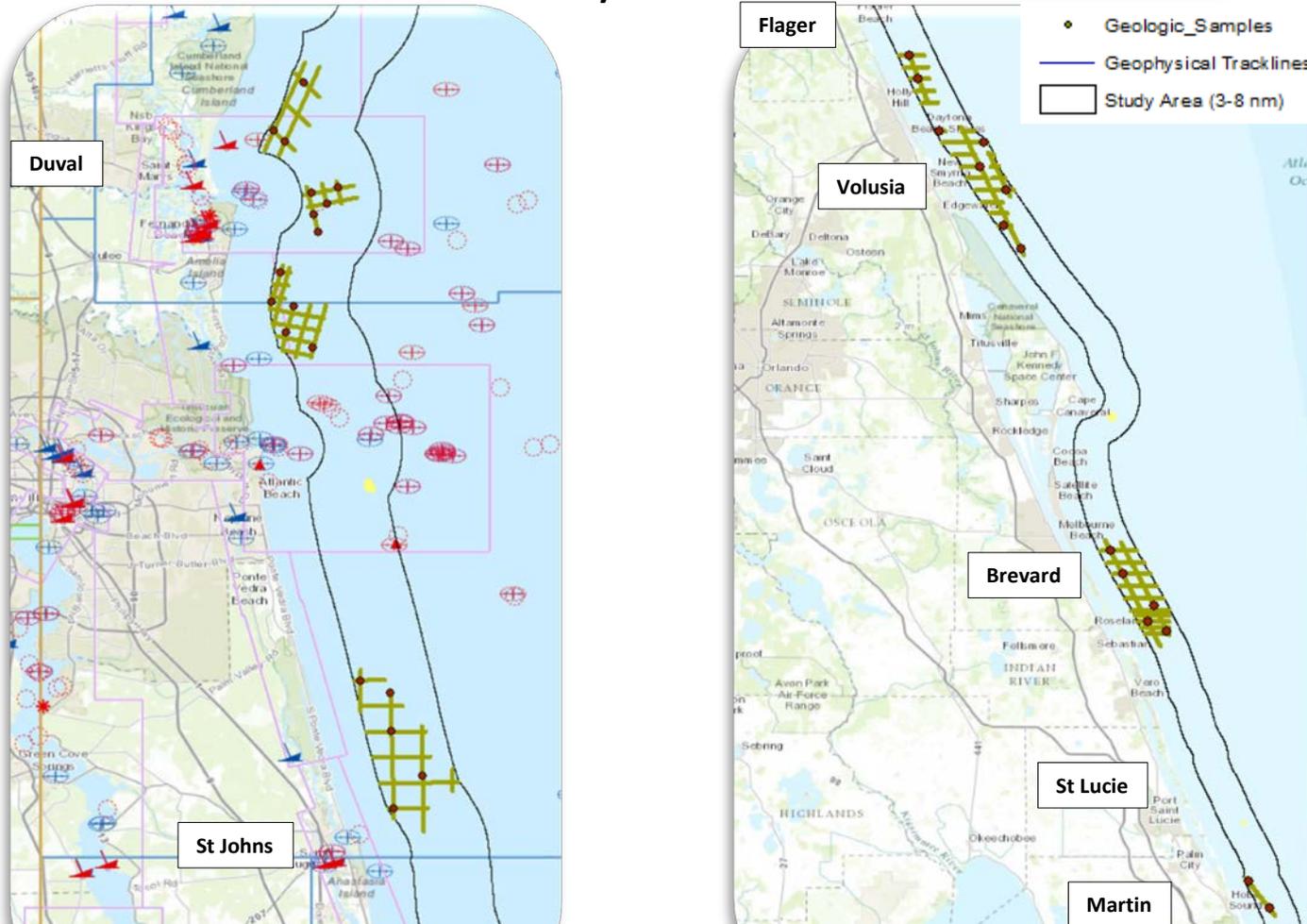
Vibracores / Grab Samples



**Atlantic Sand Assessment Project
(Supplemental Funding -Hurricane Sandy)**

Need to know what we have to manage the resource successfully

Resource Evaluation – Sand / Sediment Resource Delineation



**Geophysical and Geotechnical Collection
Atlantic Sand Assessment Project (Hurricane Sandy Supplemental Funding)**

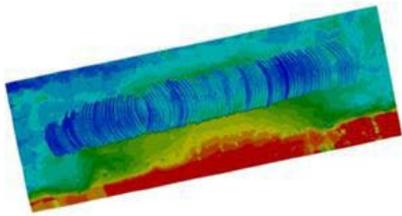


Need to know what we have to manage the resource successfully

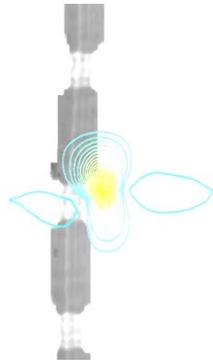
Resource Evaluation – Sand / Sediment Resource Delineation

Identification and Analysis of Sediment / Sand Resources

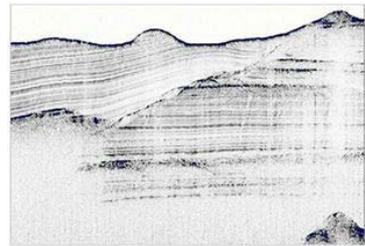
Bathymetry



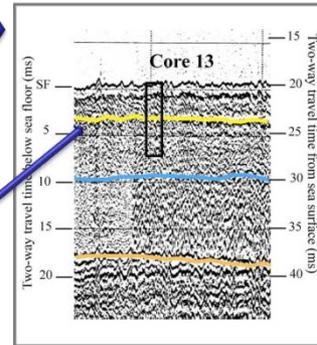
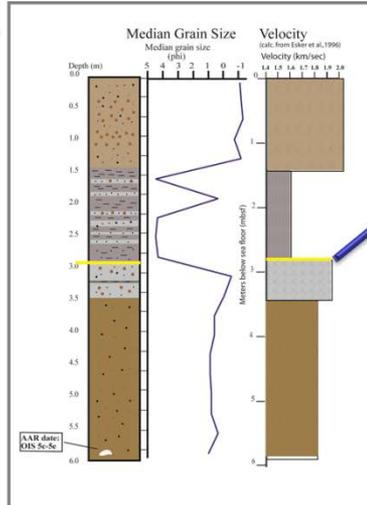
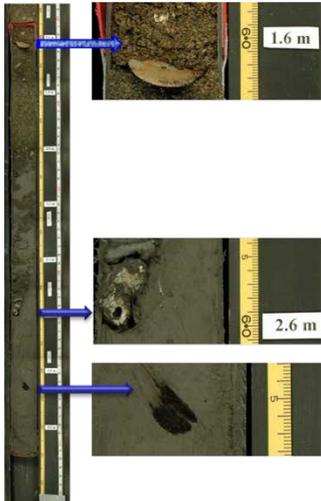
Magnetometer



Chirp sub-bottom seismic



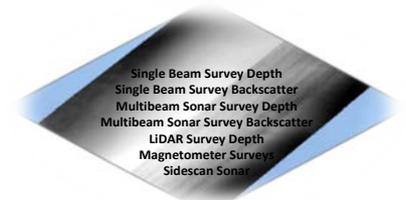
Vibracores / Grab Samples



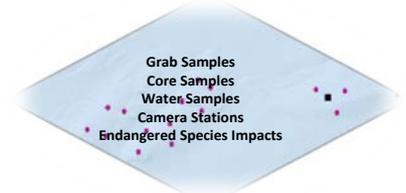
Collect

M
M
P
G
I
S

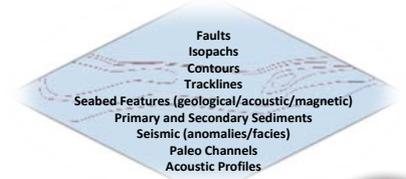
Bathymetry & Backscatter



Environmental Data



Bottom Characteristics



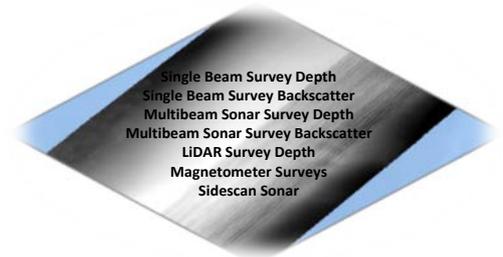
Transform



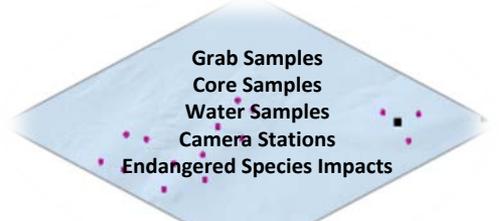
Marine Minerals Program Geospatial and Information System (MMPGIS)

Identification and Analysis of Sediment / Sand Resources

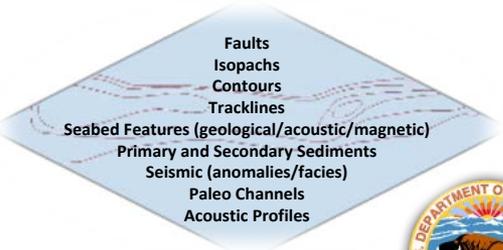
Bathymetry & Backscatter



Environmental Data



Bottom Characteristics



MMPGIS

Reconnaissance Offshore Sand Search Inventory (OSS)

OSSI registered with DATA.GOV planned for late 2016

Mapping offshore resources with our partners

Capturing where it is, what it is, how much is there

Florida Cooperative Agreements

PROJECT: MMS COOPERATIVE STUDY CENTRAL FLORIDA EAST COAST		BORING ID: VM-4	
INSTALLATION DATE:		DRILLING METHOD: VIBRACORE	
CORE DIAMETER: 3.5"	TOTAL DEPTH: 19.3 FT	GEOLOGISTS: H. FREEDENBERG, A. DABOVI C. FISCHLER	
DEPTH (FT)	GEOLOGIC DESCRIPTION	LITH. SYMBOL CLASS	USCS COMMENTS
(0-4)	FINE TO MEDIUM GRAINED SAND MODERATE LIGHT GRAY ANGULAR TO SUB-ANGULAR LOW SPHERICITY	SW	ACCESSORY MINERALS: <1% HEAVY MINERALS, 21% SHELL, 30.1% CALCARENITE FOSFOLS, MOLLUSCS, BRYOZOA, BARNACLES, OOLITES, BENTHIC FORAMINIFERA, CRUSTACEA, ECHINODERM, ORTRACODS 8.0% FINES
(4-6)	FINE TO COARSE SAND MODERATE LIGHT GRAY TO MODERATE GRAY ANGULAR TO SUB-ANGULAR LOW SPHERICITY		ACCESSORY MINERALS: 20% CALCARENITE, 20% SHELL, <1% HEAVY MINERALS, FOSFOLS, MOLLUSCS, ORTRACODS, OOLITES, BARNACLES, BENTHIC FORAMINIFERA, BRYOZOA, ECHINODERM 1.4% FINES
(6-8)			1.2% FINES
(8-10)			2.37% FINES
(10-12)			12.70% FINES
(12-14)			5.33% FINES
(14-16)			ACCESSORY MINERALS: 11% SHELL, FOSFOLS, MOLLUSCS, BARNACLES, ECHINODERM, BENTHIC FORAMINIFERA 16.7% FINES
(16-18)			ACCESSORY MINERALS: 8% CALCARENITE, <1% QUARTZ SAND FOSFOLS, OOLITES, MOLLUSCS, BENTHIC FORAMINIFERA 8.4% FINES

Collaborate



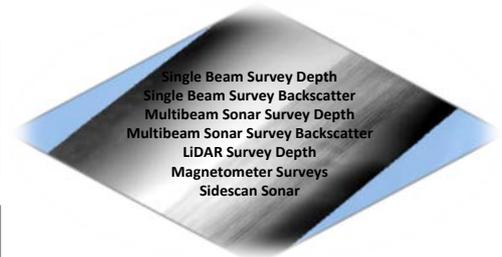
What we are doing

BOEM Environmental Studies Program

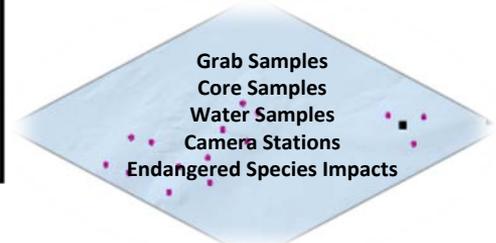
Marine Minerals Program Geospatial and Information System (MMPGIS)

Identification and Analysis of Sediment / Sand Resources

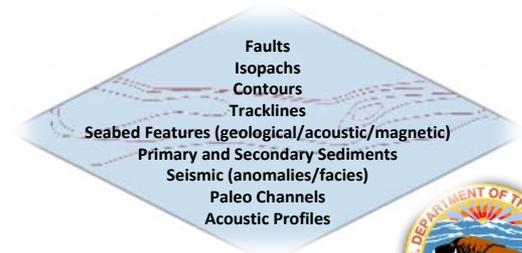
Bathymetry & Backscatter



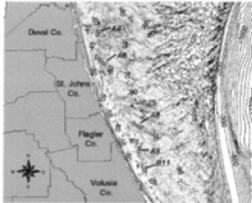
Environmental Data



Bottom Characteristics



MMS 2008-09
Final Biological Characterization/Numerical Wave Model Analysis within Borrow Sites Offshore of Florida's Northeast Coast Contract No. 1435-01-05-CT-39075-M05PC00005 Report Volume II Appendices A-D



Submitted to:

Department of the Interior Minerals Management Service (MMS)
Sand and Gravel Program Leasing Division Herndon, VA

Prepared by:



Scientific Environmental Applications, Inc. (S.E.A.)

In Cooperation with:



The Louis Berger Group, Inc.

UNSATURATED FINE SANDS
Densities and void ratios based on measured values

Project Name: MMS Field Study 2006 CT - 39075
Sample Name: NE 1-A4-24
Analysis Date: 11-23-05
Analysed By: SEA, Inc.
Drawing No: 2,182,367
Coordinate System: FL State Plane East NAD 83

| Wet Weight (g) |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 30.13 | 29.75 | 0.00 | -0.03 | 1.36 | 1.36 | 0.33 | 3.49 |
| 14 | 0.50 | 1.41 | 0.01 | 0.04 | 0.01 | 0.04 | 0.04 |
| 18 | 0.00 | 1.00 | 0.03 | 0.08 | 0.04 | 0.04 | 0.12 |
| 25 | 0.50 | 0.71 | 0.05 | 0.15 | 0.08 | 0.08 | 0.27 |
| 35 | 1.00 | 0.50 | 0.23 | 0.78 | 0.32 | 1.15 | 1.05 |
| 45 | 1.50 | 0.35 | 0.83 | 2.75 | 1.15 | 3.74 | 3.80 |
| 60 | 2.00 | 0.25 | 2.59 | 8.61 | 3.74 | 13.89 | 12.41 |
| 80 | 2.50 | 0.18 | 9.95 | 33.04 | 13.89 | 45.49 | 45.49 |
| 120 | 3.00 | 0.13 | 13.92 | 48.39 | 27.52 | 91.68 | 91.68 |
| 170 | 3.50 | 0.09 | 1.96 | 6.49 | 29.57 | 98.14 | 98.14 |
| 200 | 3.75 | 0.07 | 0.15 | 0.50 | 29.72 | 98.64 | 98.64 |

Environmental Samples Tables

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID	Yes					250
ReportTitle	String	Yes					250
Report	String	Yes					250
GlobalLinkID	GUID	Yes			0	0	38

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID	Yes					250
StudyID	String	Yes					50
CoreID	String	Yes					50
CoreLayerID	String	Yes					50
SampleID	String	Yes					50
TopInterval	Double	Yes			0	0	
BottomInterval	Double	Yes			0	0	
PhiMean	Double	Yes			0	0	
MunsellHueWet	String	Yes					10
MunsellValueWet	Double	Yes			0	0	
MunsellChromaWet	Double	Yes			0	0	
Lithology	String	Yes					50
Comments	String	Yes					250
GlobalLayerID	GUID	Yes			0	0	38
Layers_GlobaSampleID	GUID	Yes			0	0	38

M
M
P
G
I
S

Collaborate

Mapping offshore resources with our partners

Capturing where it is, what it is, how much is there

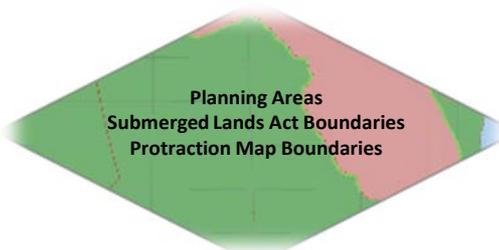


Marine Minerals Program Geospatial and Information System (MMPGIS)

Resource

Planning and Administration

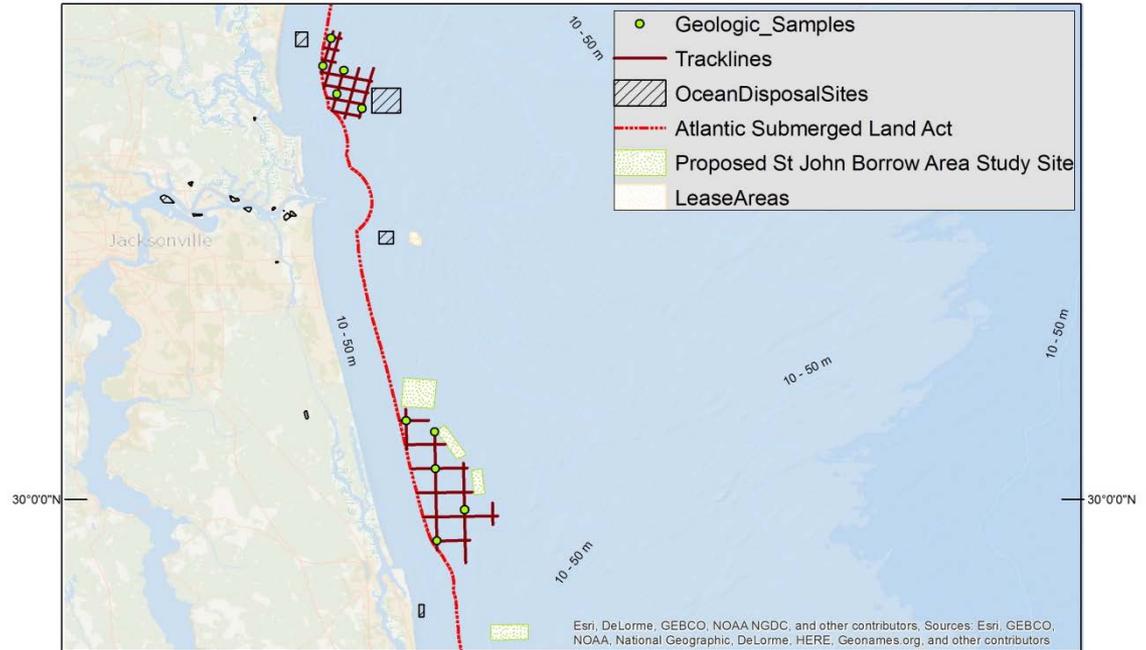
Planning Areas / Boundaries



Partner Data

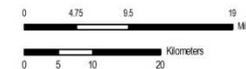
- Shorelines
- NOAA Essential Fish Habitat
- NOAA Automated Wrecks Obstructions
- BOEM Submerged Paleocultural Landscapes
- NOAA Cetacean Biologically Important Areas
- EPA Disposal Sites
- NOAA Bathymetry
- USGS usSeabed
- BSEE Pipelines

Leasing / Environmental



Marine Cadastre

- Lease Areas (dataset registered)
- Significant Sand Resource Areas (dataset in development)
- Consume partner data



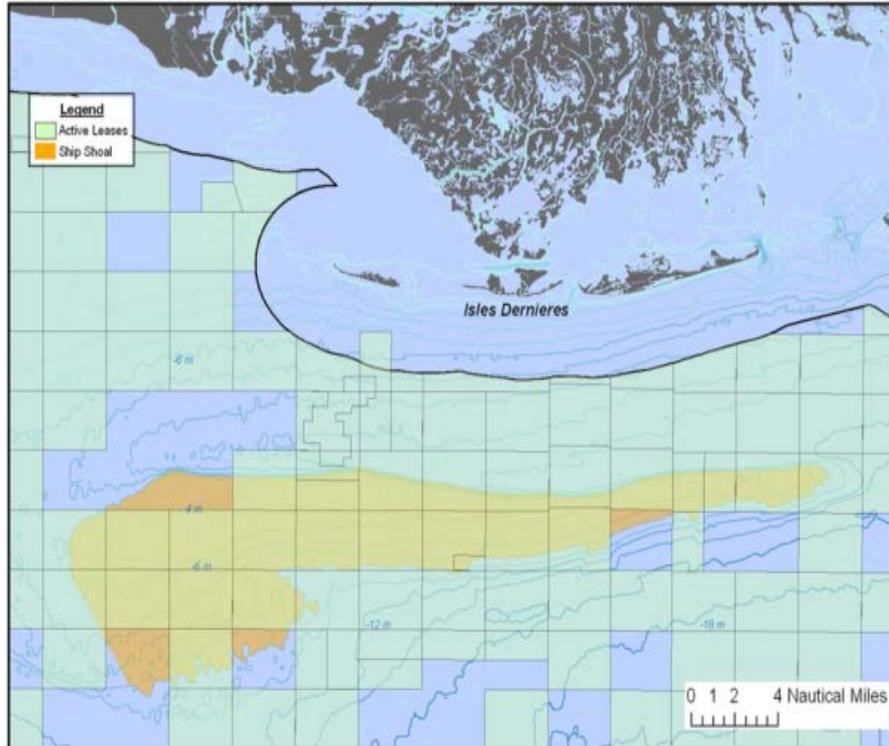
Produced in the Leasing
Division of BOEM:
Marine Minerals Program
Sterling, Virginia
1/14/2016
Datum: NAD83



Collaborate

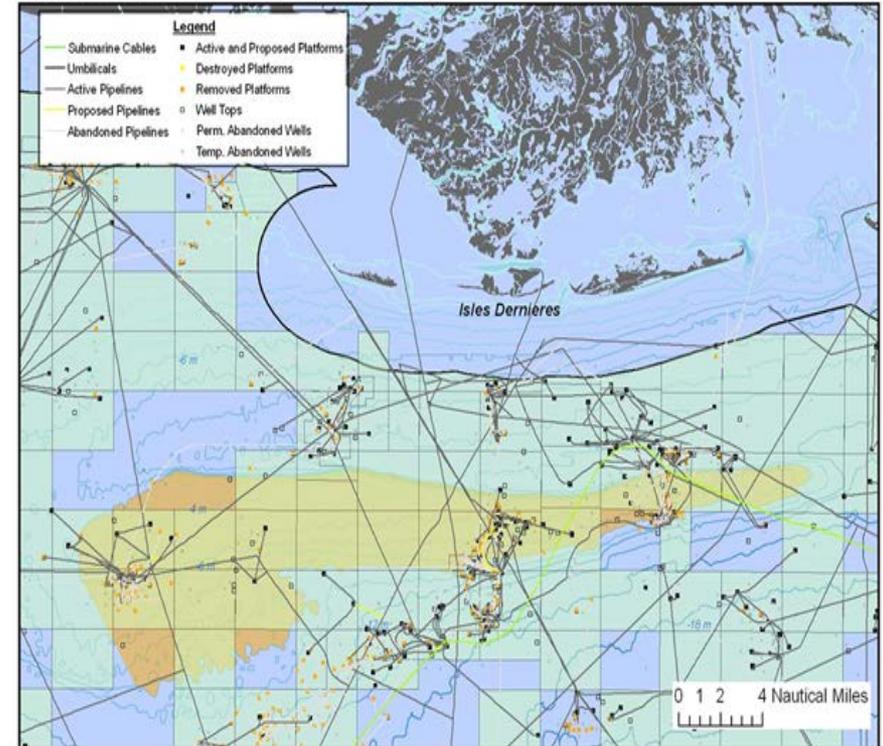
Ship Shoal and South Pelto Areas (Ship Shoal)

1:300,000



Ship Shoal and South Pelto Areas (Ship Shoal)

1:300,000



Multiple Use Conflicts: Significant Sand Resources Ship Shoal



Federal Agencies

- BOEM
- DOI OCIO
- USGS
- BSEE
- USACE
- NOAA

State Entities

- New Jersey Department of Environmental Protection
- New York State Department of State
- Delaware Department of Natural Resource & Environmental Control
- Virginia Department of Mines, Minerals and Energy
- Maryland Department of Natural Resources
- Florida Department of Environmental Protection
- South Carolina Department of Natural Resources
- Maine Geological Survey
- Louisiana Geological Survey
- Geological Survey of Alabama

Educational Institutions

- University of Delaware - Delaware Geological Survey
- University of Rhode Island
- University of New Hampshire
- University of Massachusetts Amherst - Massachusetts Geological Survey
- Dept of Geological Sciences, East Carolina University & UNC Coastal Studies Institute
- Skidway Institute of Oceanography, University of Georgia
- Louisiana State University
- The University of Texas
- Texas A&M University

Industry

- Coastal Engineering Consulting Firms
- Geospatial Services
- Cloud Services

Current / Previous Cooperative Agreement Partners

New Jersey	New Jersey Department of Environmental Protection	Jane Uptegrove
New York	New York State Department of State	Michael D. Snyder
Delaware	University of Delaware - Delaware Geological Survey	Kelvin W. Ramsey
Virginia	Virginia Department of Mines, Minerals and Energy	William L. Lassetter
Rhode Island	University of Rhode Island	John King
Maryland	Maryland Department of Natural Resources	Robert D. Conkwright
New Hampshire	University of New Hampshire	Larry Ward
Massachusetts	University of Massachusetts Amherst - Massachusetts Geological Survey	Jon Woodruff
Florida	Florida Department of Environmental Protection	Jennifer Coor / Daniel C. Phelps
North Carolina	Dept of Geological Sciences, East Carolina University & UNC Coastal Studies Institute	John P. Walsh
South Carolina	South Carolina Department of Natural Resources	Scott Howard
Maine	Maine Geological Survey	Matthew Nixon
Georgia	Skidway Institute of Oceanography, University of Georgia	Clark R. Alexander
Louisiana	Office of Coastal Protection, Louisiana State University	Syed Khalil
Texas	Texas General Land Office	Ray Newby
Alabama	Geological Survey Alabama	Steve Jones
Mississippi	Mississippi Department of Marine Resources	George Ramseur

Partnerships are Valued





Questions



Lora Turner

Physical Oceanographer

Bureau of Ocean Energy Management

lora.turner@boem.gov

703-787-1747



Backup Slides



U.S. Federal Mapping Coordination
A Demonstration Site for Federal Mapping Data Acquisition Coordination

seasketch

English take a tour ? help Sign In

Data Layers My Plans Participate

Data Layers Basemap Legend & Ordering

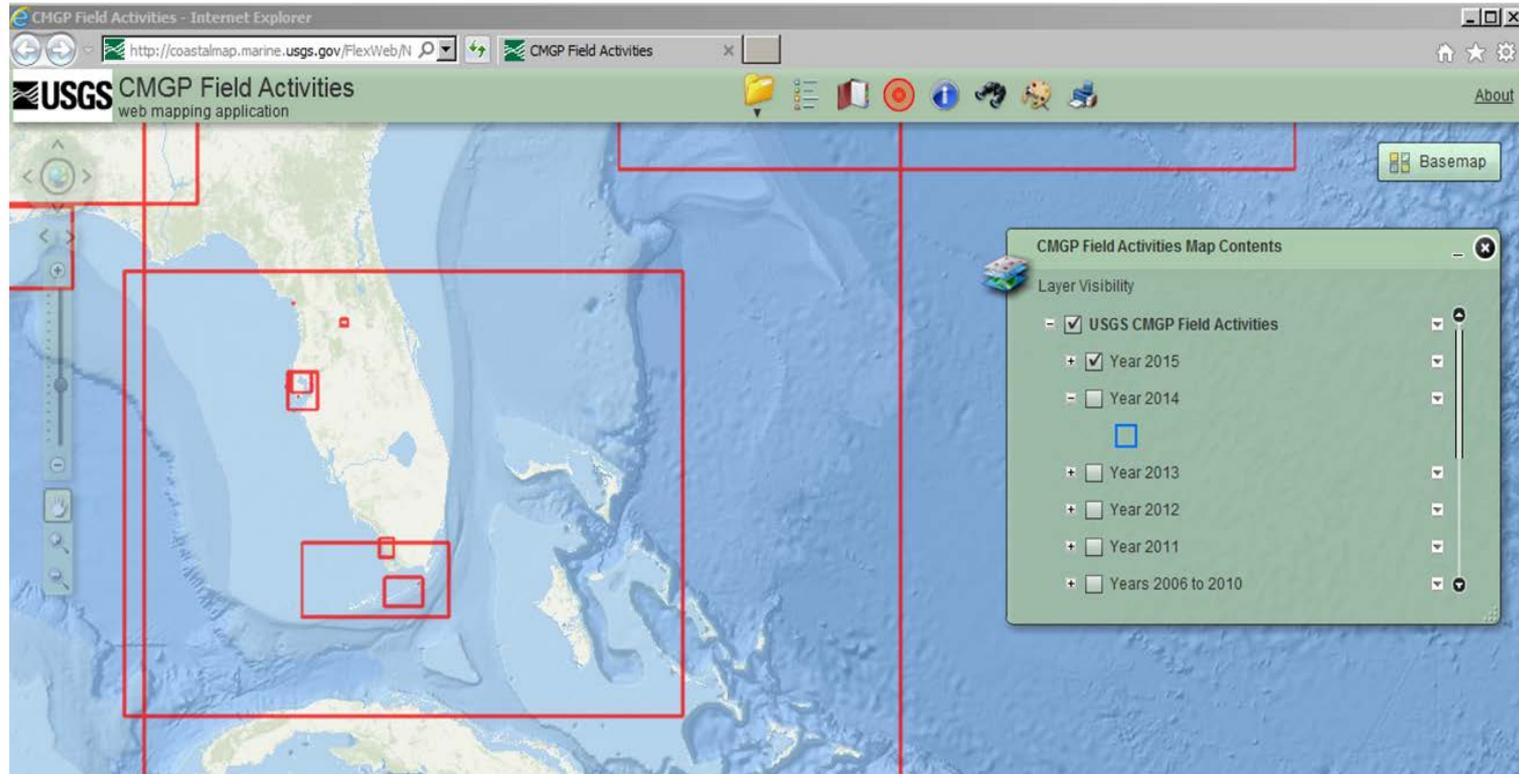
Search layers by name or keyword

- Acoustic/Sonar (Hydro, Bathy, Water Column, etc)
 - Federal
 - NOAA
 - NOAA AEFSC FISHPAC_16_tracklines
 - NOAA OCS Survey Plans 2015-17
 - NOAA_ESI_SF_Bay_Bathy
 - NOAA NCCOS FY15/16 Survey Plans
 - NF-15-08_v1_surveyareas
 - NF_2015_USVI
 - NCCOS_FY16_Survey_Plans
 - NOAA Office of Ocean Exploration Planned Acquisitions
 - EX1502L1_Coverage
 - Okeanos Explorer Hawaii 2015
 - Okeanos Explorer 2015
 - Okeanos Explorer 2016
 - NOAA Vessel Project Areas FY15 FY16
 - PASSfy15fy16
 - NOAA CBO FY15/16 Survey Plans
 - NOAA Ches Bay Office FY15 Survey Plans
 - CY16_IOCMB_CBO_SurveyArea
 - BOEM
 - BOEM_SC_20150120
 - BOEM Atlantic Sand Assessment Project FY15_16
 - ASAP Proposed Geologic Samples
 - ASAP Proposed Tracklines
 - NEFSC-BOEM Benthic Habitat Mapping Project
 - De Benthic Habitat '15 Plans
 - BOEM Renewable Energy Plans
 - BOEM_renewable_StudyArea
 - BOEM_NC_WEA_Kitty_Hawk
 - BOEM_SC_Planning_Area
 - State
 - NROC_HCOM_LIS_Survey_Areas
 - Maine BOFM 2014 Survey Area

<http://www.seasketch.org/#projecthomepage/5272840f6ec5f42d210016e4>

Partnerships are Valued





USGS Coastal and Marine Geology Program Field Activities

Partnerships are Valued



What we are doing

- **Developing a Marine Minerals Geodatabase**
 - To help manage the development of the Nation’s offshore mineral resources in an environmentally and economically way and establish data stewardship and data structure for Marine Minerals Program (MMP).
- **Project Goals**
 - To integrate MMP and partner agency geospatial data and related non-geospatial information systematically into a uniform data model with applicable geodatabase schemas and develop a Marine Minerals Geospatial Information and Management System that enables MMP to characterize and delineate sand resources on the Outer Continental Shelf (OCS) and support resource decisions.
 - Create a data strategy that supports an OCS sand resource inventory for MMP.
 - Develop geospatial services and a database management system to support sand resource management for the MMP.
 - Optimize and standardize common geospatial functions, services, and processes to leverage and align with other Federal initiatives.
 - Support productive local, state, and Federal collaboration for OCS sand resource geospatial information exchange and investments across all levels of government.



The **New** MarineCadastre.gov



What's a Marine Cadastre?



- ❑ **Cadastre** – Spatial extent (map) of real property – think tax assessors maps.
- ❑ **Marine** – Salt water 
- ❑ **Marine Cadastre** – Property in Salt Water?
- ❑ We started years ago with a bunch of jurisdictional and planning boundaries.
- ❑ Now – we've got just about anything needed for regional and ocean planning needs from the coast to the EEZ.
- ❑ If we don't – then you can combine our **276** layers with other layers you may have access to.





What sorts of data?



- ❑ Authoritative data –Data from State/Fed Gov't and partners
- ❑ Easily accessible – you don't need to know where to find it anymore
- ❑ Updated regularly
- ❑ Cartographically understandable
- ❑ Short bio for each dataset
- ❑ FGDC or ISO metadata included



What sorts of data?

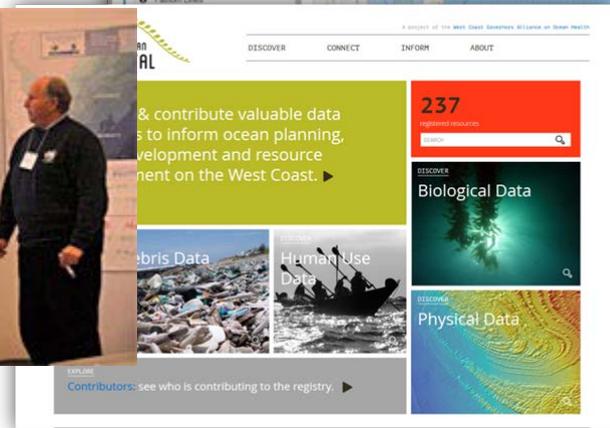
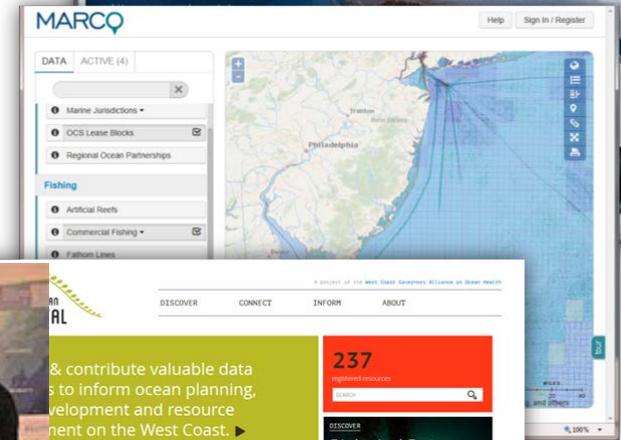


- ❑ Data in many categories:
 - ❑ Jurisdictional Boundaries & Federal Georegulations
 - ❑ Marine Habitats
 - ❑ Ocean Uses
 - ❑ Physical and Oceanographic
 - ❑ Bathymetry
 - ❑ Corals, Mammals, Turtles, Birds, & Fisheries
- ❑ Data availability varies by region



Who uses it?

You, me, anyone who might need to view or use marine spatial data.



Examples of users: NGOs, Federal Agencies, State Ocean Planners, Universities, Students, Lawyers, Task Force Groups, Other MSP data/map portals

An Ocean of Information

A joint BOEM and NOAA initiative providing authoritative data to meet the needs of the offshore energy and marine planning communities.



Maps

Data

Uses

Features



Aids to Navigation



Environmental Studies Program Information System



Arctic Environmental Response Management Application

Latest News and Updates



Data Registry

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)



Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

★ My Map 0

Currently displaying 263 Datasets

[Clear Filters](#)

Theme

- Birds
- Corals
- Elevation
- Federal GeoRegulations
- Jurisdictions and Boundaries [Show More](#)

Region

- Alaska
- Caribbean
- East Coast
- Great Lakes
- Gulf of Mexico [Show More](#)

Provider

- Bureau of Ocean Energy Management
- Center for Coastal and Ocean Mapping/Joint Hydrographic Center
- DOE National Renewable Energy Laboratory
- DOE Office of Energy Efficiency and Renewable Energy
- Federal Emergency Management Agency [Show More](#)

Service Type

- Esri GeoServices (Image Server)
- Esri GeoServices (cached)
- Esri GeoServices (dynamic)
- OGC WMS

2009 Vessel Traffic (AIS) ⓘ Bureau of Ocean Energy Management		+ Add to Map
2010 Vessel Traffic (AIS) ⓘ Bureau of Ocean Energy Management		+ Add to Map
2011 Vessel Traffic (AIS) ⓘ Bureau of Ocean Energy Management		+ Add to Map
Active Renewable Energy Leases ⓘ Bureau of Ocean Energy Management		+ Add to Map
Atlantic Wildlife Survey Study Areas (2005-2012) ⓘ Bureau of Ocean Energy Management		+ Add to Map
Atlantic Wildlife Survey Tracklines (2005-2012) ⓘ Bureau of Ocean Energy Management		+ Add to Map
Black Scoter ⓘ Bureau of Ocean Energy Management		+ Add to Map
Black-legged Kittiwake ⓘ Bureau of Ocean Energy Management		+ Add to Map

Data Registry

Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

duck

★ My Map 3

Currently displaying
1 Datasets

[Clear Filters](#)

Theme

Birds

Corals

Elevation

Federal GeoRegulations

Jurisdiction and Boundaries

[Show More](#)

Region

Alaska

Caribbean

East Coast

Great Lakes

Gulf of Mexico

[Show More](#)

Provider

Bureau of Ocean Energy Management

Center for Coastal and Ocean Mapping/Joint Hydrographic Center

DOE National Renewable Energy Laboratory

DOE Office of Energy Efficiency and Renewable Energy

Federal Emergency Management Agency

[Show More](#)

Service Type

Esri GeoServices (Image Server)

Esri GeoServices (cached)

Esri GeoServices (dynamic)

OGC WMS

Long-tailed Duck ⓘ

Bureau of Ocean Energy Management



[Remove from Map](#)

Annual average abundance prediction models were constructed in a study modeling at-sea occurrence and abundance of marine birds. The study was conducted for BOEM by NOAA/NOS/NCCOS in collaboration with the USGS Patuxent Wildlife Research Center under interagency agreement. Within the study twenty-seven different species were modeled with up to four seasonal models for each species. The data represent predicted number of individuals in each listed seabird species per standardized survey segment (15 minute travel time at 10 knots = approx. 2.5 nautical miles (Nm) or 2.9 statute miles.) Therefore, if the average annual abundance number for a species is 0.2-0.3, then this model estimates that a single animal could be seen at any time of year every 3.3 - 5 survey segments or 1 animal every 8.25 -12.5 Nm. Note that some animals were not estimated for all seasons, so the annual abundance is based only on the actual seasons surveyed. Please refer to the final report for more information about how these estimates were calculated.

Data Registry

Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

wind

★ My Map 3

Currently displaying
4 Datasets

[Clear Filters](#)

Theme

- Birds
- Corals
- Elevation
- Federal GeoRegulations
- Jurisdictions and Boundaries
- [Show More](#)

Region

- Alaska
- Caribbean
- ✖ East Coast
- Great Lakes
- Gulf of Mexico
- [Show More](#)

Provider

- ✖ Bureau of Ocean Energy Management
- Center for Coastal and Ocean Mapping/Joint Hydrographic Center
- DOE National Renewable Energy Laboratory
- DOE Office of Energy Efficiency and Renewable Energy
- Federal Emergency Management Agency
- [Show More](#)

Service Type

- Esri GeoServices (Image Server)
- Esri GeoServices (cached)
- Esri GeoServices (dynamic)
- VMS

Active Renewable Energy Leases ⓘ

Bureau of Ocean Energy Management



[Remove from Map](#)

BOEM Wind Planning Areas ⓘ

[Bureau of Ocean Energy Management](#)



[Remove from Map](#)

Limit of OCSLA '8(g)' zone ⓘ

Bureau of Ocean Energy Management



[+ Add to Map](#)

Proposed Centerline for the Atlantic Wind Connect Project ⓘ

Bureau of Ocean Energy Management



[+ Add to Map](#)

Data Registry

Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

wind

★ My Map 3

Currently displaying
4 Datasets

Theme

- Birds
- Corals
- Elevation
- Federal GeoRegulations
- Jurisdictions and Boundaries

Region

- Alaska
- Caribbean
- East Coast
- Great Lakes
- Gulf of Mexico

Provider

- Bureau of Ocean Energy Management
- Center for Coastal and Ocean Mapping/Joint Hydrographic Center
- DOE National Renewable Energy Laboratory
- DOE Office of Energy Efficiency and Renewable Energy
- Federal Emergency Management Agency

Service Type

- Esri GeoServices (Image Server)
- Esri GeoServices (cached)

Active Renewable Energy Leases ⓘ
Bureau of Ocean Energy Management

BOEM Wind Planning Areas ⓘ
Bureau of Ocean Energy Management

Limit of OCSLA '8(g)' zone ⓘ
Bureau of Ocean Energy Management

Proposed Centerline for the Atlantic Wind Connect Project ⓘ
Bureau of Ocean Energy Management

Long-tailed Duck
Bureau of Ocean Energy Management
(Remove Layer)

Active Renewable Energy Leases
Bureau of Ocean Energy Management
(Remove Layer)

BOEM Wind Planning Areas
Bureau of Ocean Energy Management
(Remove Layer)

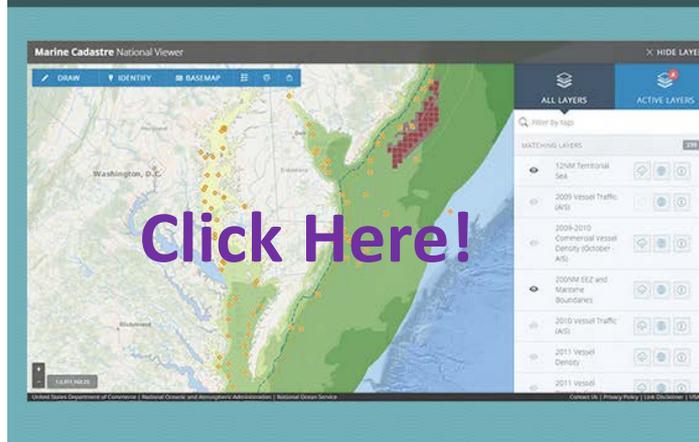
Here are your layers on the National Viewer

The screenshot displays the Marine Cadastre National Viewer interface. The main map area shows the Northeast United States coastline, including parts of Massachusetts, Connecticut, Rhode Island, and New York. Overlaid on the map are several layers: a green shaded area representing a large marine area, a dark blue area representing a specific planning area, and a yellow grid pattern representing a specific layer. The interface includes a top navigation bar with options like DRAW, IDENTIFY, BASEMAP, and LABEL. On the right side, there is a layer control panel titled "ALL LAYERS" and "ACTIVE LAYERS". The active layers list includes:

- BOEM Wind Planning Areas
- Active Renewable Energy Leases
- Long-tailed Duck

Each layer in the active list has a trash icon, a refresh icon, a globe icon, and a "LAYER OPACITY" slider. The bottom right corner of the interface features a "VIEW IN ARCGIS.COM" button and the Esri logo.

National Viewer



Maps

MarineCadastr.gov data can be viewed a number of ways: through a national viewer, regional and thematic maps, and story maps. Additional maps can be found within the marine cadastre group on ArcGIS.com.

NEW National Viewer v3.0

The MarineCadastr.gov National Viewer contains most of the data in the registry and also some custom tools, such as adding coordinates.

Regional Maps

Regional Web maps have been developed in ArcGIS Online to focus on ocean planning data at the regional level.



North Carolina Offshore Wind Turbine Simulation

Simulation depicting offshore wind facilities at different locations along the North Carolina coastline.



US Atlantic Coast Fishing Atlas

Digital version of the Anglers' Guide to the United States Atlantic Coast.



North-Atlantic Seafloor and Marine Habitat Occurrences

This MarineCadastr.gov map features the Nature Conservancy's Northwest Atlantic Marine Ecoregional Assessment data.

[View All](#)

Thematic Maps

Thematic Web maps have been developed in ArcGIS Online and include data that focus on a specific theme.



Human Uses of the Ocean

This MarineCadastr.gov map features ocean uses data gathered from use experts through participatory GIS methods offer spatial representations for a wide range of uses.



National Environmental Sensitivity Index

This MarineCadastr.gov map features the Environmental Sensitivity Index (ESI) shoreline in combination with other data useful for offshore energy planning.



California Offshore Marine Habitat and Biodiversity

This MarineCadastr.gov map features a number of marine habitat and biodiversity layers off the coast of California.

[View All](#)

Story Maps

Story maps combine data and textual information to explain how ocean data can be used and why it is important.



North Carolina Offshore Wind Turbine Simulation

Simulation depicting offshore wind facilities at different locations along the North Carolina coastline.



Considering Atlantic Shipwrecks when Planning Offshore Energy

Atlantic Shipwreck Database density analysis of coordinate locations compiled in the Outer Continental Shelf.

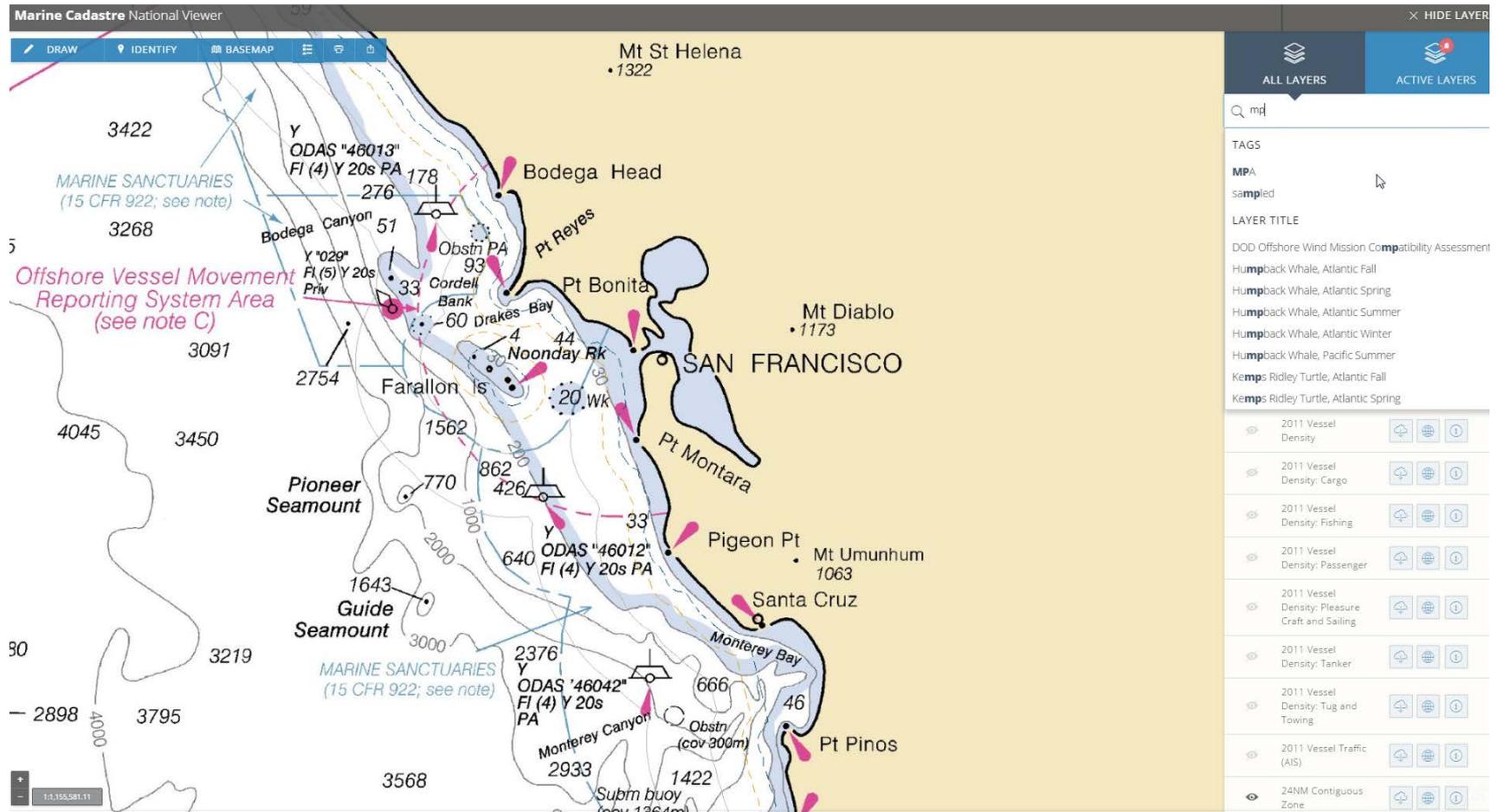


Understanding Ocean Wind Energy

Check out how MarineCadastr.gov is being used to assist in Ocean Wind Energy planning.

[View All](#)

National Viewer – Data Search



Set up your map

The screenshot displays the Marine Cadastre National Viewer interface. The main map area shows a coastal region of Florida, including Lake Okechobee, the Florida Gulf Stream, and the Little Bahama Bank. The map is overlaid with numerous colored lines and shapes representing different marine cadastre layers. A toolbar at the top left includes options for DRAW, IDENTIFY, and BASEMAP. A coordinate display at the bottom left shows the values 12,311,162.22 and 27,55211, -80,98572. On the right side, there is a layer management panel with a 'HIDE LAYERS' button at the top. Below this, there are two tabs: 'ALL LAYERS' and 'ACTIVE LAYERS' (which is selected and shows 16 active layers). A plus sign icon indicates that layers can be reordered by service type. The 'DYNAMIC SERVICES' section lists several layers, each with a trash icon, a globe icon, a refresh icon, and a layer opacity slider. The layers listed are: Federal OCS Sand and Gravel Borrow (Lease Areas), Ocean Disposal Sites, Deepwater Ports, Pilot Boarding Areas, Coastal Maintained Channels, Danger Zones and Restricted Areas, Unexploded Ordnances, and Shipping Lanes and

Layer Name	Layer Opacity
Federal OCS Sand and Gravel Borrow (Lease Areas)	LAYER OPACITY
Ocean Disposal Sites	LAYER OPACITY
Deepwater Ports	LAYER OPACITY
Pilot Boarding Areas	LAYER OPACITY
Coastal Maintained Channels	LAYER OPACITY
Danger Zones and Restricted Areas	LAYER OPACITY
Unexploded Ordnances	LAYER OPACITY
Shipping Lanes and	LAYER OPACITY

Dig deeper

The screenshot displays the 'Marine Cadastre National Viewer' interface. The main map area shows a coastal region of Florida, including Orlando, Tampa, and Lake Okechobee. The map is overlaid with various colored lines and shapes representing different types of marine cadastre data. A sidebar panel on the right is open, showing a layer titled 'Coastal Maintained Channels' from the 'U.S. ARMY CORPS OF ENGINEERS'. The sidebar includes a 'DESCRIPTION' section with text about the layer's purpose, a 'VISIBLE SCALE RANGE' of 0 to 0, and a 'LEGEND PATCH' consisting of a small black square. Below the legend patch is an 'ADDITIONAL KEYWORDS' section with a grid of blue buttons containing various terms like 'EAST COAST', 'WEST COAST', 'GULF OF MEXICO', 'GREAT LAKES', 'ALASKA', 'PACIFIC ISLANDS', 'CARIBBEAN', 'NAVIGATION', 'MARINE TRANSPORTATION', 'BENTHIC', 'USACE', 'ACOE', 'NATIONAL', 'OCEAN USES', 'TRANSPORTATION', 'SAFETY', 'NAUTICAL', 'SEAFLOOR', 'COASTAL', and 'NOAA'. The top of the interface has a dark grey header with the title 'Marine Cadastre National Viewer' and a 'HIDE LAYERS' button. Below the header is a blue toolbar with icons for 'DRAW', 'IDENTIFY', and 'BASEMAP'. The bottom left corner shows coordinate information: '12,311,162.22' and '29,10418,-77,68982'.

Marine Cadastre National Viewer

HIDE LAYERS

DRAW IDENTIFY BASEMAP

Coastal Maintained Channels
U.S. ARMY CORPS OF ENGINEERS

DATA SERVICES MORE INFO

DESCRIPTION

This layer shows coastal channels and waterways that are maintained and surveyed by the U.S. Army Corps of Engineers (USACE). These channels are necessary transportation systems that serve economic and national security interests. The possibility of silting is always present. Local authorities should be consulted for the controlling depth. NOS Charts frequently show controlling depths in a table, which is kept current by the US Coast Guard Local Notice to Mariners. These data are intended for coastal and ocean use planning. Not for navigation.

VISIBLE SCALE RANGE

0 to 0

LEGEND PATCH

ADDITIONAL KEYWORDS

- EAST COAST WEST COAST GULF OF MEXICO
- GREAT LAKES ALASKA PACIFIC ISLANDS
- CARIBBEAN NAVIGATION
- MARINE TRANSPORTATION BENTHIC USACE
- ACOE NATIONAL OCEAN USES
- TRANSPORTATION SAFETY NAUTICAL
- SEAFLOOR COASTAL NOAA

12,311,162.22 29,10418,-77,68982

Draw and label

Marine Cadastre National Viewer X HIDE LAYERS

Orlando

DRAW IDENTIFY BASEMAP

LINE POLYGON MARKER LABEL

- Manage your custom features. Edit, delete or drag to reorder.
- Uncharted Wreck Edit
- Hectares Edit
- Survey Area Edit

Map Legend

- Federal OCS Sand and Gravel Borrow (Lease Areas)
- Ocean Disposal Sites
- Deepwater Ports
 - Operational
 - Future Construction
- Pilot Boarding Areas
- Coastal Maintained Channels
- Danger Zones and Restricted Areas
- Unexploded Ordnances
- Shipping Lanes and Regulations
 - Traffic Separation Schemes/Traffic Lanes
 - Area to be Avoided
 - Particularly Sensitive Sea Area
 - Precautionary Areas
 - Recommended Routes
 - Traffic Separation Schemes
 - Speed Restrictions/Right Whales
 - Shipping Fairways Lanes and Zones
- Submarine Cables
- Wrecks and Obstructions

Survey Area

Port St. Lucie

Lake Okechobee

Florida Gap

Investigate the data

Marine Cadastre National Viewer

Orlando

DRAW IDENTIFY BASEMAP

Wrecks and Obstructions

CHART	11460
DEPTH	0
FEATURE_TYPE	Not Charted
FID	1010299
GEOM	Point
GP_QUALITY	Low
GP_SOURCE	
HISTORY	DESCRIPTION 24 NO.502; SCHOONER, 1926 GT; POS. ACCURACY WITHIN 1 MILE AT POSITION 28-11-10N, 80-19-40W; IN 12

Survey Area

Port of Tampa

Lake Okeechobee

Florida Gap

ALL LAYERS ACTIVE LAYERS 16

Drag to reorder layers by service type

- Unexploded Ordnances
- Shipping Lanes and Regulations
- Submarine Cables
- Wrecks and Obstructions
- Anchorage Areas
- Selected Pipelines
- Drilling Platforms
- Oil and Natural Gas Wells

VIEW IN ARCGIS.COM

1:1,155,581.11 28,35273, -81,40594

Share your map

Marine Cadastre National Viewer

Orlando

DRAW IDENTIFY BASEMAP

Copy the link below to share.

<http://marinecadastre.gov/nationalviewer/#/D0E20A2A-B091-E211-A1F4-D0>

Warning! Custom drawn features will not be shared.

Survey Area

Port of St. Lucie

Lake Okeechobee

Florida Gap

HIDE LAYERS

ALL LAYERS ACTIVE LAYERS 16

Drag to reorder layers by service type

- Unexploded Ordnances LAYER OPACITY
- Shipping Lanes and Regulations LAYER OPACITY
- Submarine Cables LAYER OPACITY
- Wrecks and Obstructions LAYER OPACITY
- Anchorage Areas LAYER OPACITY
- Selected Pipelines LAYER OPACITY
- Drilling Platforms LAYER OPACITY
- Oil and Natural Gas Wells LAYER OPACITY

VIEW IN ARCGIS.COM esri

Keep your graphics by printing your map

Print
Total: 5 sheets of paper
Print Cancel

Destination
\\mshmpmt01\Atrium...
Change...

Pages
 All
 eg. 1-5, 8, 11-13

Copies
1 + -

Color
Color

Paper size
Legal (8.5 x 14")

Margins
Default

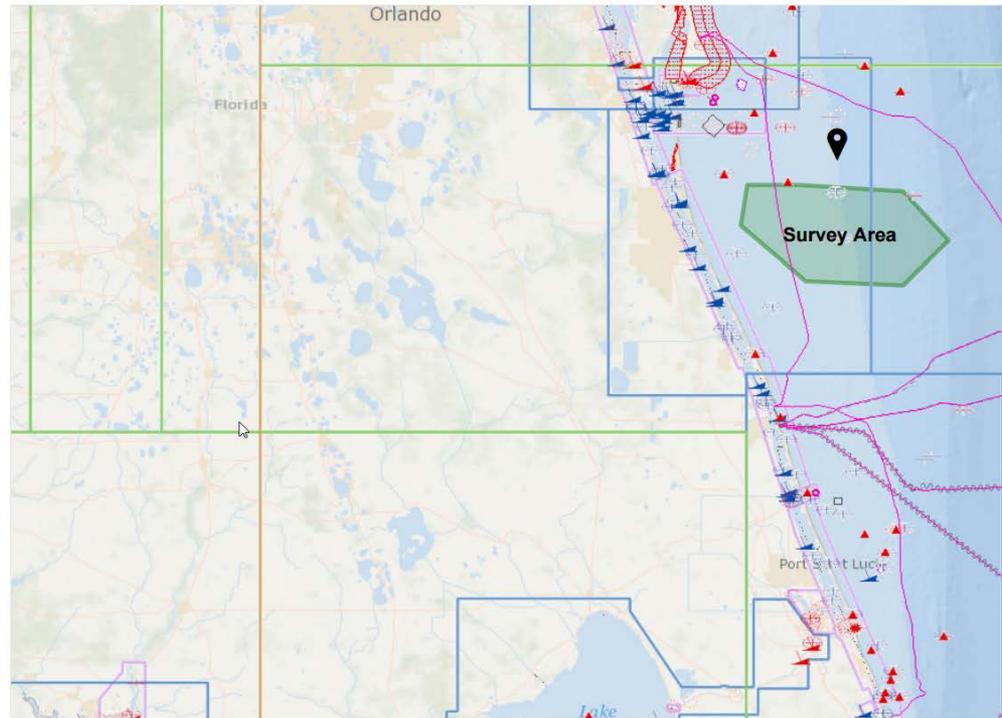
Quality
600 dpi

Options
 Headers and footers
 Two-sided
 Background graphics

— Fewer settings

Print using system dialog... (Ctrl+Shift+P)

Marine Cadastre National Viewer | Potential New Survey



MAP LEGEND

BOEM Oil and Gas Leases

- OCS Drilling Platforms
- OCS Oil and Natural Gas Wells
- OCS Oil & Gas Pipelines

Shipping Lanes and Regulations

- Traffic Separation Schemes/Traffic Lanes
- Area to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Traffic Separation Schemes
- Speed Restrictions/Right Whales
- Shipping Fairways Lanes and Zones

Anchorage Areas

- Anchorage Areas
- Coastal Maintained Channels

Wrecks and Obstructions

- awois_wrecks_approach_scale**
Weck - Submerged, nondangerous
- Weck - Submerged, dangerous to surface navigation
- Weck - Visible
- Not Charted
- Unknown
- awois_wrecks_coastal_scale**
Weck - Submerged nondangerous

Back to Active Layers – you can view it all in ArcGIS.com

The screenshot displays the 'Marine Cadastre National Viewer' interface. The main map area shows a coastal region with various colored overlays representing different marine cadastre data. The interface includes a top navigation bar with 'DRAW', 'IDENTIFY', and 'BASEMAP' options. On the right side, there is a 'LAYERS' panel with 'ALL LAYERS' and 'ACTIVE LAYERS' tabs. The 'ACTIVE LAYERS' tab is selected, showing a list of dynamic services with their respective icons and layer opacity controls. A red box highlights the 'VIEW IN ARCGIS.COM' button at the bottom of the layers panel.

Marine Cadastre National Viewer

DRAW IDENTIFY BASEMAP

Orlando
Tampa
Lake Okeechobee
Escarpment
Florida Keys
Little Bahama Bank
Freeport Freeport
Northwest Providence Channel
Nicholls and Berry Islands
Gree

ACTIVE LAYERS 16

Drag to reorder layers by service type

DYNAMIC SERVICES 15

- Federal OCS Sand and Gravel Borrow (Lease Areas) LAYER OPACITY
- Ocean Disposal Sites LAYER OPACITY
- Deepwater Ports LAYER OPACITY
- Pilot Boarding Areas LAYER OPACITY
- Coastal Maintained Channels LAYER OPACITY
- Danger Zones and Restricted Areas LAYER OPACITY
- Unexploded Ordnances LAYER OPACITY
- Shipwrecks

VIEW IN ARCGIS.COM

Open in ArcGIS.com and manipulate cartography, pop-ups, and add other layers not in MarineCadastre.gov and save it as your own.

ArcGIS My Map

Details Add Basemap Save Print Measure Bookmarks Find address or place

About Content Legend

Contents

- MMC Layers - BOEM Oil and Gas Leases
- MMC Layers - OCS Drilling Platforms
- MMC Layers - OCS Oil & Gas Pipelines
- MMC Layers - OCS Oil and Natural Gas Wells
- NavigationAndMarineTransportation - Anchorage Areas
- NavigationAndMarineTransportation - Submarine Cables
- MarineTransportation - Shipping Lanes and Regulations
- NavigationAndMarineTransportation - Unexploded Ordnances
- NavigationAndMarineTransportation - Danger Zones and Restricted Areas
- NavigationAndMarineTransportation - Coastal Maintained Channels
- NavigationAndMarineTransportation - Pilot Boarding Areas
- OceanEnergy - Deepwater Ports
- BOEM Layers - Federal OCS Sand and Gravel Borrow (Lease Areas)
- NavigationAndMarineTransportation - Ocean Disposal Sites
- FloridaStateBorrowAreas
- NASCASubmarineCables
- Wrecks And Obstructions
- Topographic

The screenshot displays the ArcGIS.com interface. On the left, a 'Contents' panel lists various map layers, many of which are checked. The main map area shows a coastal region with numerous colored overlays and symbols. A pop-up window is open over a specific feature, displaying a table of attributes. The table includes fields such as FID, BORROW_ARE, BORROW_A_1, BORROW_A_2, PRJ_PROJEC, JOINT_COAS, MEAN_GRAIN, PERCENT_CA, PERCENT_SH, PERCENT_RE, PERCENT_1, PERCENT_PA, and PERCENT_2. The map also shows a 'Basemap' layer and various navigation controls.

(1 of 2)	
FID	212
BORROW_ARE	1,987
BORROW_A_1	1
BORROW_A_2	Pinellas County Sand Ke
PRJ_PROJEC	323
JOINT_COAS	
MEAN_GRAIN	0.00
PERCENT_CA	0.00
PERCENT_SH	0.00
PERCENT_RE	0.00
PERCENT_1	0.00
PERCENT_PA	0.00
PERCENT_2	0.00

Zoom to

Uses



View Larger Map

Uses

This map provides examples of how MarineCadastre.gov has helped users meet their ocean planning goals. Click the icons on the map to explore how and where MarineCadastre.gov is being used. [Contact us](#) to have your example added to the map.

The information provided below explains the importance of various data sets within MarineCadastre.gov, why they should be considered when determining ocean use, and any caveats to the data set the user needs to know to use the data set successfully.



Shallow Coral Reefs (within Benthic Cover)

Shallow-water coral reefs are more than just pretty places to go snorkeling and scuba diving. These sensitive areas are some of the most biologically rich and economically valuable ecosystems on earth.



Essential Fish Habitat

Fish require healthy surroundings to survive and reproduce. Essential Fish Habitat includes all types of aquatic habitat—wetlands, coral reefs, seagrasses, rivers—where fish spawn, breed, feed, or grow to maturity.



Shipping Lanes and Regulations

The ocean is a highway for ship traffic, and highways require rules. Shipping fairways, lanes, and zones keep ships organized by guiding them on established “roads” and indicating the direction the traffic is moving.



Artificial Reefs

Why are old subway cars and army tanks littering our ocean floor? What purpose can these sunken relics serve? Societies have constructed artificial reefs out of obsolete objects or “trash” for thousands of years for everything from blockading pirate ships to benefiting algae farm productivity.

Uses

Essential Fish Habitat

Posted April 9, 2015 by Jodie Sprayberry

Fish require healthy surroundings to survive and reproduce. Essential Fish Habitat includes all types of aquatic habitat—wetlands, coral reefs, seagrasses, rivers—where fish spawn, breed, feed, or grow to maturity. The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (Fisheries) works with the regional fishery management councils to identify the essential habitat for every life stage of each federally managed species using the best available scientific information. Essential Fish Habitat has been described for approximately 1,000 managed species at multiple life stages to date. MarineCadastre.gov contains three types of Essential Fish Habitat (EFH) data: EFH, EFH Areas Protected from Fishing, and **Habitat Area of Particular Concern (HAPC)**. What do ocean planners need to know about Essential Fish Habitat?

1. **Essential Fish Habitat (EFH) contains information critical to identifying whether agencies need to consult with NOAA Fisheries.** Whenever federal agencies authorize, fund, or carry out actions that may adversely affect EFH, they must consult with NOAA Fisheries to identify measures the agency can take to reduce, minimize, or avoid adverse effects of the activities on EFH.
2. **Some areas within EFH contain specific fishing restrictions.** EFH Areas Protected from Fishing are areas where fishing or the use of fishing gear has been restricted or modified in order to minimize the adverse effects of fishing on EFH, as required by Section 303(a)(7) of the Magnuson-Stevens Fishery Conservation and Management Act.
3. **EFH is identified and described in coordination with the regional fishery management councils.** The Magnuson-Stevens Act requires NOAA and the eight regional fishery management councils to describe and identify EFH in their respective regions. EFH is described in both text and maps. If users have specific questions on the content and use of the EFH data, it is recommended they [contact the expert in their region of interest](#).

Quick Caveats. The data were developed using methods that reflected regional differences in both source data and management needs. Because of the variability in the quality and intended usage of these GIS data layers, each should be considered individually when interpreting the accuracy and utility of the information that they provide. Please be sure to view the [EFH Mapper](#) and read the information under the Data Quality tab in the Help menu to fully understand the usage constraints for each data layer and the completeness and accuracy of the information. Users are also advised that the spatial representation of essential fish habitat is for informational purposes only and should not be solely relied on for regulatory purposes. Implementing regulations [50 CFR 600.815(a)(1)(iv)(B)] specify that if there are differences between the descriptions of EFH in text and maps, the textual description as found in the amendment is ultimately determinative of the limits of EFH. EFH textual descriptions can be found in the [EFH Data Inventory](#).

Content Categories

- All (152)
- Multimedia (18)
- News (83)
- Updates (25)
- Uses (26)

Date Archives

- All(152)
- 2015 (100)
- 2014 (34)
- 2013 (8)
- 2012 (7)
- 2011 (3)

Tools



MarineCadastre.gov

Maps Data Uses Tools News About



Tools

The tools provided on this website are designed to support renewable energy siting and other marine planning efforts.

Please [contact us](#) if you have questions or need support in using these tools.

Web-based Tools



NEW MarineCadastre.gov National Viewer v3.0

This Web-based viewer provides ocean-related data and information from authoritative sources to support ocean-planning efforts.



Ocean Law Search

This tool allows users to search a database of environmental and historic preservation statutes, legislative histories, cases, and other documents on the protection of underwater cultural heritage on the Outer Continental Shelf.



Environmental Studies Program Information System (ESPIS)

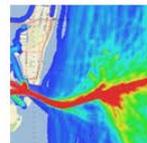
The ESPIS query tool enables users to search by text or map to find relevant study information, including downloadable study profiles, technical summaries and final reports, and links to publications and digital data.

Desktop Tools



AIS Data Handler

The AIS Data Handler is a desktop AIS data conversion tool and ArcGIS add-in that streamlines the acquisition, loading, filtering, display, and analysis of AIS vessel-tracking data. Please note that this tool is now archived.



AIS Track Builder

The AIS Track Builder is an ArcGIS Toolbox that converts a collection of point features into a track line according to date, time, and an identifier.

iate your patience. x

About

MarineCadastre

About Marine

Websites Featuring MarineCadastre.gov data

MarineCadastre.gov data also can be found within the following locations:

- [Data.gov Ocean Community Webpage](#)
- [Geoplatform.gov](#)
- [Digital Coast](#)
- [Mid-Atlantic Ocean Data Portal](#)
- [Northeast Ocean Data Portal](#)
- [West Coast Ocean Data Portal](#)

Home [Resources](#) [Tools](#) [News](#) [About](#)



Contact and Follow

Subscribe to MarineCadastre.gov

Thank you for your interest in MarineCadastre.gov. For more information, sign up to receive data updates.



Facebook



Twitter



Pinterest



Email Us



Newsletters

ent of
stal
gement
s data, tools,
esigned
also is

Additional Information

[Frequently Asked Questions](#)

[Quick Facts and User](#)

[Testimonials](#)

[Resources](#)

[Newsletter Sign-Up](#)

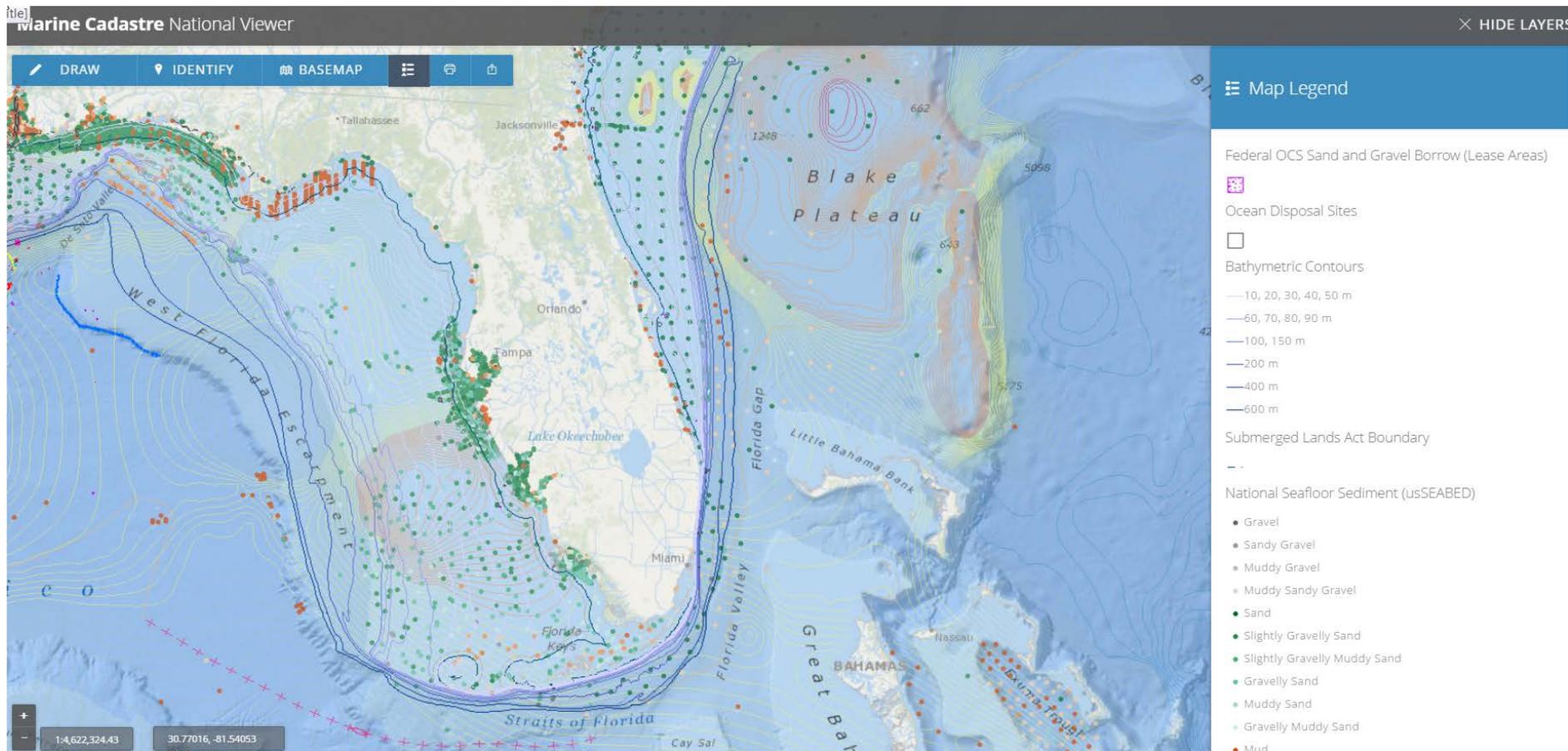
being used for other ocean-related efforts.

The MarineCadastre.gov team is continually working to increase access to data through data and map services. The services are designed to deliver data without replication and directly from the source. MarineCadastre.gov supports a number of complementary efforts, including Digital Coast,



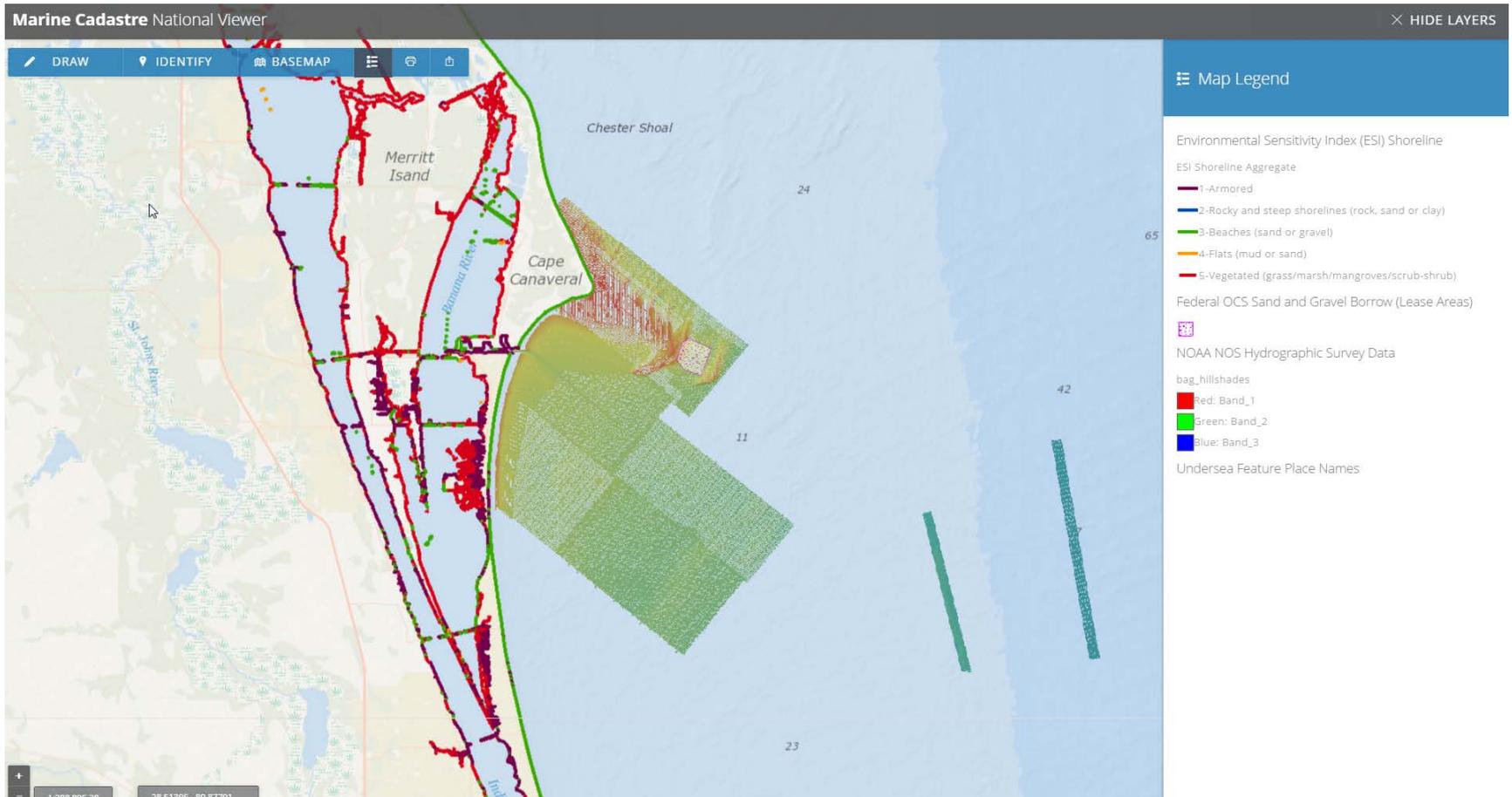
Physical Layers:

Seafloor Sediment, Bathymetry, Sediment Thickness, Seismic Anomalies (WGM/CGM), Sand and Gravel Leased Areas (federal), Maritime Boundaries



Physical Layers:

Environmental Sensitivity Index shoreline aggregate, Federal Sand Leases, selected NOAA survey.

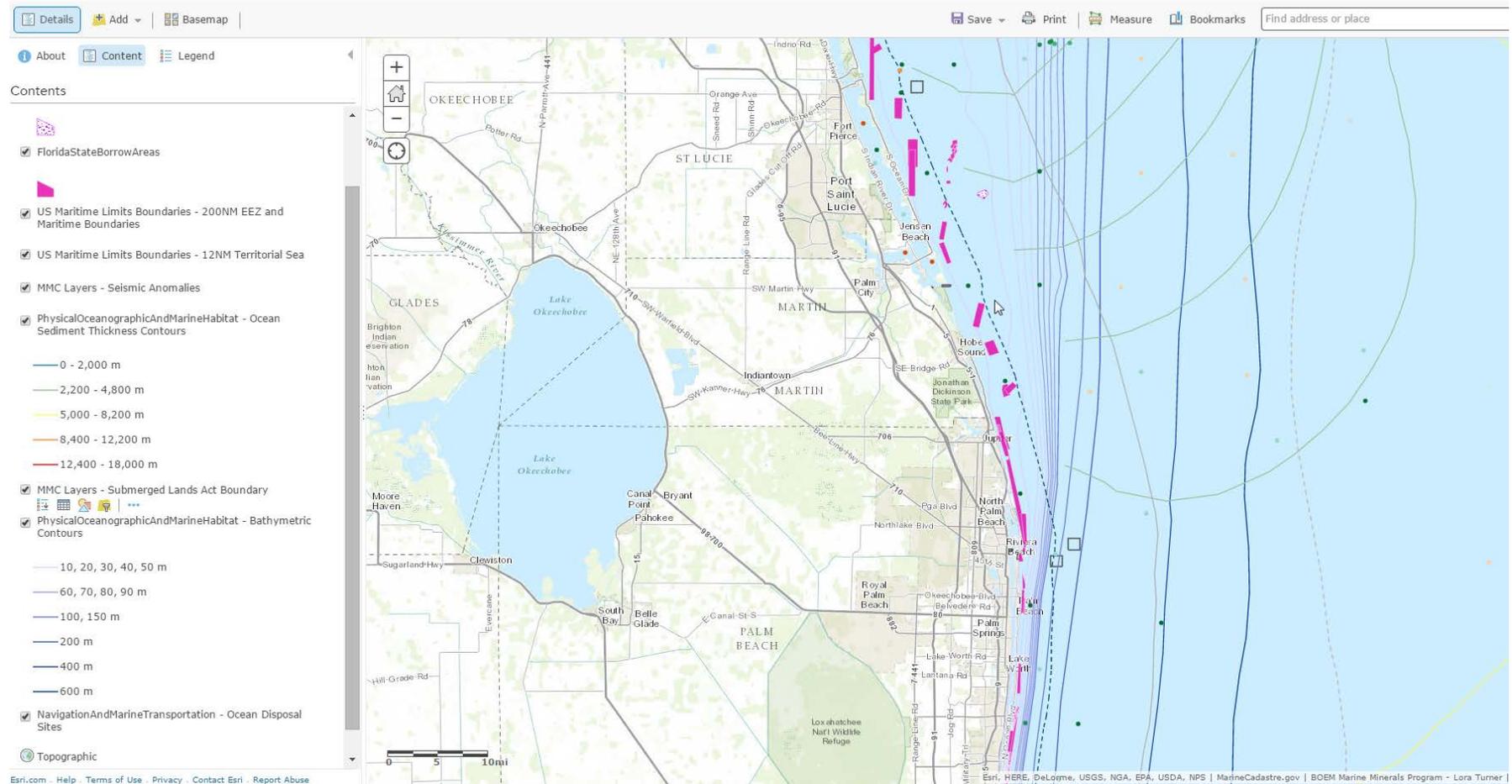


Mix MC.gov with your own data using ArcGIS.com

Used MarineCadastre.gov chosen layers “view in ArcGIS.com” button, then added shapefiles from Florida ROSSI

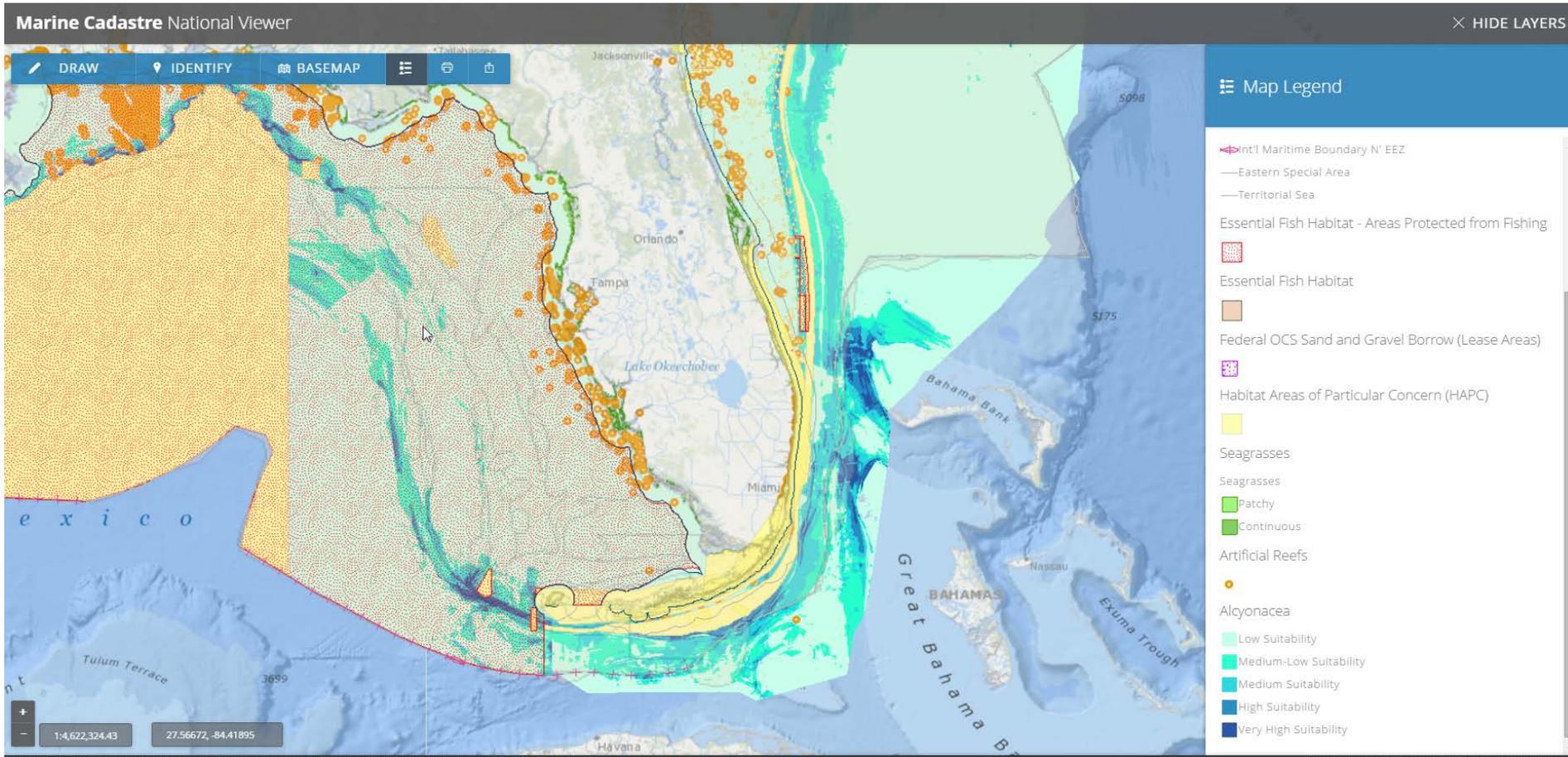
ArcGIS My Map

New Map



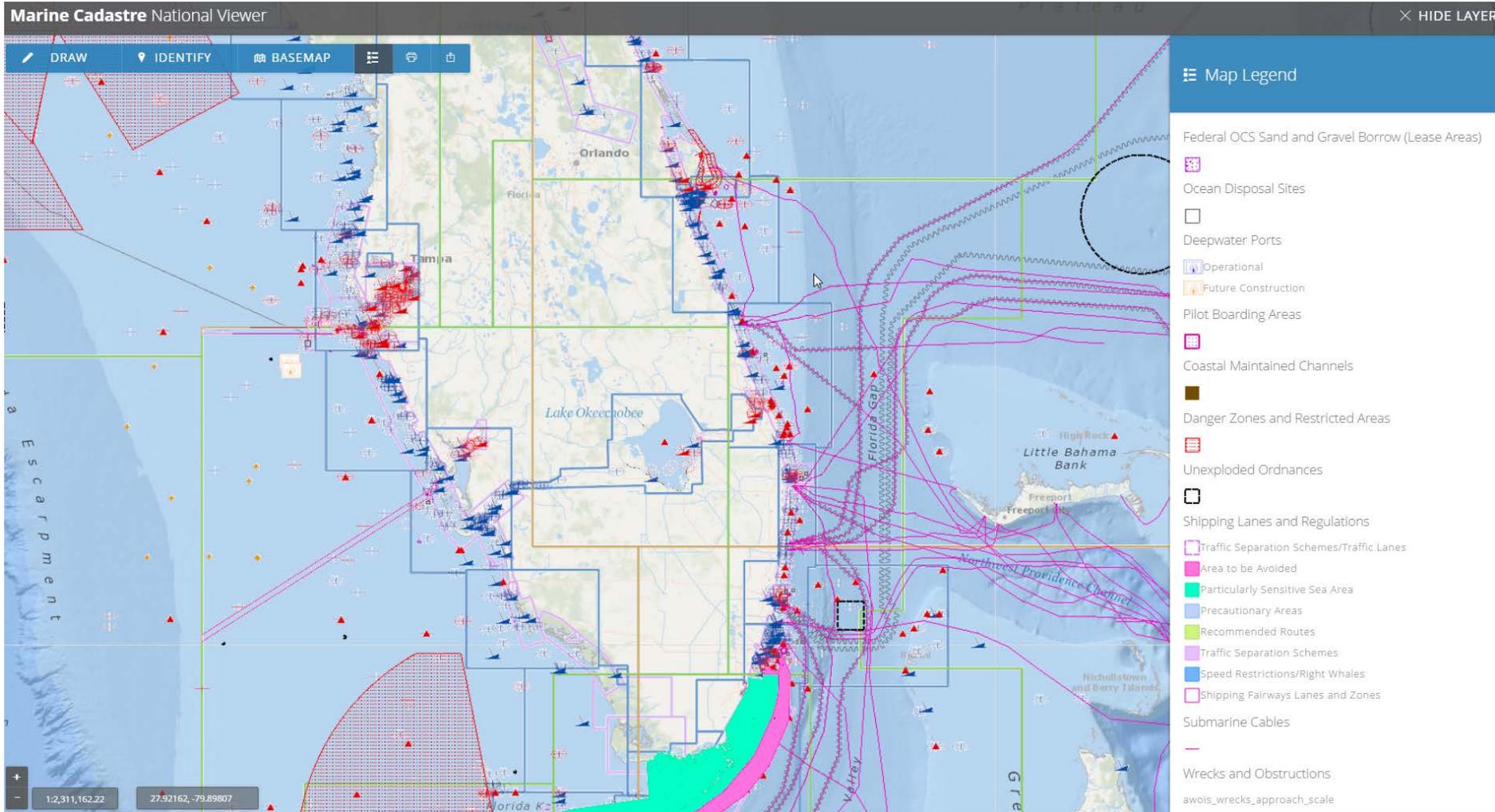
Habitat Layers:

EFH – No fishing, EFH Zone, HAPCs, Seagrasses, Artificial Reefs, Alcyonacea Potential Habitat Areas, Maritime Boundaries



Uses Layers:

Uses – Fed. Sand/Gravel Lease Areas, Disposal sites, deepwater ports, pilot boarding, maintained channels, danger/restricted areas, shipping lanes and restrictions, submarine cables, wrecks/obs. Wells, pipelines. Platforms.,



Uses Layers

- <http://marinecadastre.gov/nationalviewer/#/D0E20A2A-B091-E211-A1F4-D067E5FDEE55,DAE20A2A-B091-E211-A1F4-D067E5FDEE55,43C5D8DD-B4BA-E311-8DE8-D067E5FDEE55,DBE20A2A-B091-E211-A1F4-D067E5FDEE55,D10F451F-A874-E311-B66B-90E2BA100C34,D5E20A2A-B091-E211-A1F4-D067E5FDEE55,E1E20A2A-B091-E211-A1F4-D067E5FDEE55,107C31B3-963F-E511-B651-90E2BA100C1C,0BB4C899-76B7-E411-92FD-90E2BA100C1C,D4E20A2A-B091-E211-A1F4-D067E5FDEE55,B46FC628-BBB7-E411-92FD-90E2BA100C1C,D7E20A2A-B091-E211-A1F4-D067E5FDEE55,D2E20A2A-B091-E211-A1F4-D067E5FDEE55,D8E20A2A-B091-E211-A1F4-D067E5FDEE55,3DE30A2A-B091-E211-A1F4-D067E5FDEE55,D9E20A2A-B091-E211-A1F4-D067E5FDEE55/27.1618079465197,-80.24688720703125/8/esriocan>
- http://www.arcgis.com/home/webmap/viewer.html?¢er=-80.24688720703125,27.1618079465197&level=8&urls=https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/BOEM_Layers/MapServer/6,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/11,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/OceanEnergy/MapServer/1,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/7,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/6,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/9,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/10,http://encdirect.noaa.gov/arcgis/rest/services/NavigationChartData/MarineTransportation/MapServer/0,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/4,http://wrecks.nauticalcharts.noaa.gov/arcgis/rest/services/public_wrecks/Wrecks_And_Obstructions/MapServer,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/8,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/2,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/0,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/1,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/15,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NASCASubmarineCables/MapServer

Physical Layers

- <http://marinecadastre.gov/nationalviewer/#/FF19EABA-327E-E311-B66B-90E2BA100C34,32E30A2A-B091-E211-A1F4-D067E5FDEE55,D0E20A2A-B091-E211-A1F4-D067E5FDEE55,E3E20A2A-B091-E211-A1F4-D067E5FDEE55,BBE20A2A-B091-E211-A1F4-D067E5FDEE55,B7E20A2A-B091-E211-A1F4-D067E5FDEE55,D5E20A2A-B091-E211-A1F4-D067E5FDEE55,73D7C06A-AB15-E311-9FF8-D067E5FDEE55,40BFE118-EC17-E411-98AD-90E2BA100C34,E1E20A2A-B091-E211-A1F4-D067E5FDEE55,E6E20A2A-B091-E211-A1F4-D067E5FDEE55,107C31B3-963F-E511-B651-90E2BA100C1C,0BB4C899-76B7-E411-92FD-90E2BA100C1C,D4E20A2A-B091-E211-A1F4-D067E5FDEE55,D8E20A2A-B091-E211-A1F4-D067E5FDEE55,2EE30A2A-B091-E211-A1F4-D067E5FDEE55,3DE30A2A-B091-E211-A1F4-D067E5FDEE55,B5E20A2A-B091-E211-A1F4-D067E5FDEE55,D7E20A2A-B091-E211-A1F4-D067E5FDEE55,71C8D00E-7316-E311-9FF8-D067E5FDEE55,77D7C06A-AB15-E311-9FF8-D067E5FDEE55,BC486957-A266-E311-B66B-90E2BA100C34,DFE20A2A-B091-E211-A1F4-D067E5FDEE55/32.657875736955305,-77.442626953125/6/esriocan>

Thank Ewe For Your Attention



Christine Taylor
Bureau of Ocean Energy Management
Christine.Taylor@BOEM.gov

Spencer

The **New** MarineCadastre.gov



What's a Marine Cadastre?



- ❑ **Cadastre** – Spatial extent (map) of real property – think tax assessors maps.
- ❑ **Marine** – Salt water 
- ❑ **Marine Cadastre** – Property in Salt Water?
- ❑ We started years ago with a bunch of jurisdictional and planning boundaries.
- ❑ Now – we've got just about anything needed for regional and ocean planning needs from the coast to the EEZ.
- ❑ If we don't – then you can combine our **276** layers with other layers you may have access to.





What sorts of data?



- ❑ Authoritative data – Data from State/Fed Gov't and partners
- ❑ Easily accessible – you don't need to know where to find it anymore
- ❑ Updated regularly
- ❑ Cartographically understandable
- ❑ Short bio for each dataset
- ❑ FGDC or ISO metadata included



What sorts of data?

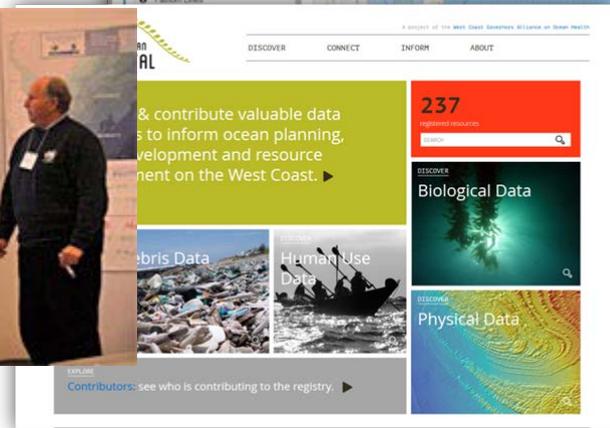
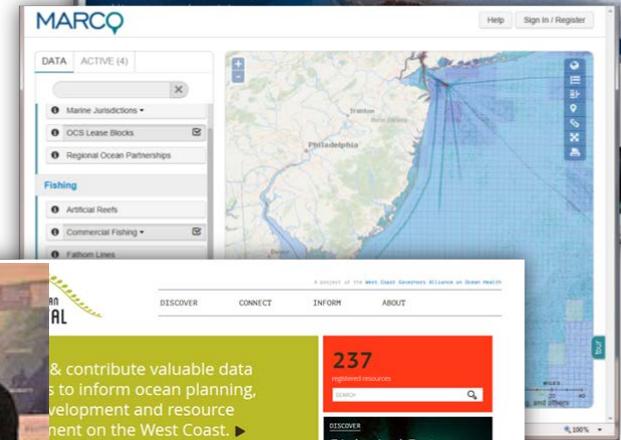


- ❑ Data in many categories:
 - ❑ Jurisdictional Boundaries & Federal Georegulations
 - ❑ Marine Habitats
 - ❑ Ocean Uses
 - ❑ Physical and Oceanographic
 - ❑ Bathymetry
 - ❑ Corals, Mammals, Turtles, Birds, & Fisheries
- ❑ Data availability varies by region



Who uses it?

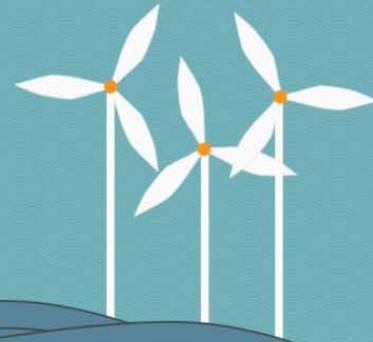
You, me, anyone who might need to view or use marine spatial data.



Examples of users: NGOs, Federal Agencies, State Ocean Planners, Universities, Students, Lawyers, Task Force Groups, Other MSP data/map portals

An Ocean of Information

A joint BOEM and NOAA initiative providing authoritative data to meet the needs of the offshore energy and marine planning communities.



Maps

Data

Uses

Features



Aids to Navigation



Environmental Studies Program Information System



Arctic Environmental Response Management Application

Latest News and Updates

Figure ES.1: LCOE ranges for baseload technologies (at each discount rate)



Data Registry

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)



Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

Search ★ My Map 0

Currently displaying 263 Datasets

Theme

- Birds
- Corals
- Elevation
- Federal GeoRegulations
- Jurisdictions and Boundaries

Region

- Alaska
- Caribbean
- East Coast
- Great Lakes
- Gulf of Mexico

Provider

- Bureau of Ocean Energy Management
- Center for Coastal and Ocean Mapping/Joint Hydrographic Center
- DOE National Renewable Energy Laboratory
- DOE Office of Energy Efficiency and Renewable Energy
- Federal Emergency Management Agency

Service Type

- Esri GeoServices (Image Server)
- Esri GeoServices (cached)
- Esri GeoServices (dynamic)
- OGC WMS

2009 Vessel Traffic (AIS) ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	
2010 Vessel Traffic (AIS) ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	
2011 Vessel Traffic (AIS) ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	
Active Renewable Energy Leases ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	
Atlantic Wildlife Survey Study Areas (2005-2012) ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	
Atlantic Wildlife Survey Tracklines (2005-2012) ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	
Black Scoter ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	
Black-legged Kittiwake ⓘ Bureau of Ocean Energy Management	<input type="button" value="Share"/> <input type="button" value="Refresh"/> <input type="button" value="Dropdown"/> <input type="button" value="Eye"/>
<input type="button" value="+ Add to Map"/>	

Data Registry

Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

duck

★ My Map 3

Currently displaying
1 Datasets

[Clear Filters](#)

Theme

Birds

Corals

Elevation

Federal GeoRegulations:

Jurisdictional and Boundaries

[Show More](#)

Region

Alaska

Caribbean

East Coast

Great Lakes

Gulf of Mexico

[Show More](#)

Provider

Bureau of Ocean Energy Management

Center for Coastal and Ocean Mapping/Joint Hydrographic Center

DOE National Renewable Energy Laboratory

DOE Office of Energy Efficiency and Renewable Energy

Federal Emergency Management Agency

[Show More](#)

Service Type

Esri GeoServices (Image Server)

Esri GeoServices (cached)

Esri GeoServices (dynamic)

OGC WMS

Long-tailed Duck ⓘ

Bureau of Ocean Energy Management



[Remove from Map](#)

Annual average abundance prediction models were constructed in a study modeling at-sea occurrence and abundance of marine birds. The study was conducted for BOEM by NOAA/NOS/NCCOS in collaboration with the USGS Patuxent Wildlife Research Center under interagency agreement. Within the study twenty-seven different species were modeled with up to four seasonal models for each species. The data represent predicted number of individuals in each listed seabird species per standardized survey segment (15 minute travel time at 10 knots = approx. 2.5 nautical miles (Nm) or 2.9 statute miles.) Therefore, if the average annual abundance number for a species is 0.2-0.3, then this model estimates that a single animal could be seen at any time of year every 3.3 - 5 survey segments or 1 animal every 8.25 -12.5 Nm. Note that some animals were not estimated for all seasons, so the annual abundance is based only on the actual seasons surveyed. Please refer to the final report for more information about how these estimates were calculated.

Data Registry

Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

wind

★ My Map 3

Currently displaying
4 Datasets

[Clear Filters](#)

Theme

- Birds
- Corals
- Elevation
- Federal GeoRegulations
- Jurisdictions and Boundaries
- [Show More](#)

Region

- Alaska
- Caribbean
- ✖ East Coast
- Great Lakes
- Gulf of Mexico
- [Show More](#)

Provider

- ✖ Bureau of Ocean Energy Management
- Center for Coastal and Ocean Mapping/Joint Hydrographic Center
- DOE National Renewable Energy Laboratory
- DOE Office of Energy Efficiency and Renewable Energy
- Federal Emergency Management Agency
- [Show More](#)

Service Type

- Esri GeoServices (Image Server)
- Esri GeoServices (cached)
- Esri GeoServices (dynamic)
- VMS

Active Renewable Energy Leases ⓘ

Bureau of Ocean Energy Management



[Remove from Map](#)

BOEM Wind Planning Areas ⓘ

[Bureau of Ocean Energy Management](#)



[Remove from Map](#)

Limit of OCSLA '8(g)' zone ⓘ

Bureau of Ocean Energy Management



[+ Add to Map](#)

Proposed Centerline for the Atlantic Wind Connect Project ⓘ

Bureau of Ocean Energy Management



[+ Add to Map](#)

Data Registry

Data Registry

The MarineCadastr.gov Data Registry provides direct access to data currently available through MarineCadastr.gov. Filter the data by provider, thematic category, geographic region, and service type. If you are looking for a data set that is currently not available on MarineCadastr.gov, please email us.

MarineCadastr.gov works with data sources to provide highest quality data sets available. When using data for planning purposes, please read the associated metadata and use constraints to be sure the data will meet your needs.

[Sign up](#) to receive email updates on changes to our map services.

- [How to Contribute Data](#)
- [How to Create Your Own Map](#)
- [MarineCadastr.gov Web Services Frequently Asked Questions](#)
- [Use MarineCadastr.gov Web Services in ArcMap](#)

wind

★ My Map 3

Currently displaying
4 Datasets

Theme

- Birds
- Corals
- Elevation
- Federal GeoRegulations
- Jurisdictions and Boundaries

Region

- Alaska
- Caribbean
- East Coast
- Great Lakes
- Gulf of Mexico

Provider

- Bureau of Ocean Energy Management
- Center for Coastal and Ocean Mapping/Joint Hydrographic Center
- DOE National Renewable Energy Laboratory
- DOE Office of Energy Efficiency and Renewable Energy
- Federal Emergency Management Agency

Service Type

- Esri GeoServices (Image Server)
- Esri GeoServices (cached)

Active Renewable Energy Leases ⓘ
Bureau of Ocean Energy Management

BOEM Wind Planning Areas ⓘ
Bureau of Ocean Energy Management

Limit of OCSLA '8(g)' zone ⓘ
Bureau of Ocean Energy Management

Proposed Centerline for the Atlantic Wind Connect Project ⓘ
Bureau of Ocean Energy Management

Long-tailed Duck
Bureau of Ocean Energy Management

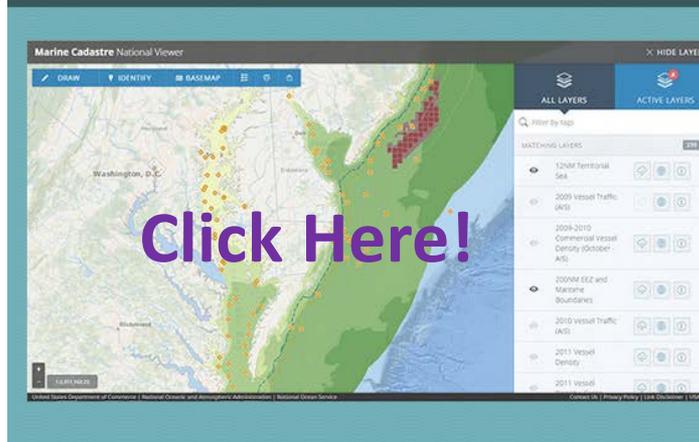
Active Renewable Energy Leases
Bureau of Ocean Energy Management

BOEM Wind Planning Areas
Bureau of Ocean Energy Management

Here are your layers on the National Viewer

The screenshot displays the Marine Cadastre National Viewer interface. The main map area shows the Northeast United States, including parts of Massachusetts, Connecticut, Rhode Island, and New York. Overlaid on the map are several layers: a green shaded area representing a large marine area, a dark blue area representing a specific planning area, and a yellow grid pattern representing a specific layer. The interface includes a top toolbar with options like DRAW, IDENTIFY, BASEMAP, and LABEL. On the right side, there is a layer control panel with a 'HIDE LAYERS' button and a list of active layers: BOEM Wind Planning Areas, Active Renewable Energy Leases, and Long-tailed Duck. Each layer has a 'LAYER OPACITY' slider and a 'VIEW IN ARCGIS.COM' button. The bottom left corner shows the coordinates 1:1,155,581.11.

National Viewer



Maps

MarineCadastr.gov data can be viewed a number of ways: through a national viewer, regional and thematic maps, and story maps. Additional maps can be found within the marine cadastre group on ArcGIS.com.

NEW National Viewer v3.0

The MarineCadastr.gov National Viewer contains most of the data in the registry and also some custom tools, such as adding coordinates.

Regional Maps

Regional Web maps have been developed in ArcGIS Online to focus on ocean planning data at the regional level.



North Carolina Offshore Wind Turbine Simulation

Simulation depicting offshore wind facilities at different locations along the North Carolina coastline.



US Atlantic Coast Fishing Atlas

Digital version of the Anglers' Guide to the United States Atlantic Coast.



North-Atlantic Seafloor and Marine Habitat Occurrences

This MarineCadastr.gov map features the Nature Conservancy's Northwest Atlantic Marine Ecoregional Assessment data.

[View All](#)

Thematic Maps

Thematic Web maps have been developed in ArcGIS Online and include data that focus on a specific theme.



Human Uses of the Ocean

This MarineCadastr.gov map features ocean uses data gathered from use experts through participatory GIS methods offer spatial representations for a wide range of uses.



National Environmental Sensitivity Index

This MarineCadastr.gov map features the Environmental Sensitivity Index (ESI) shoreline in combination with other data useful for offshore energy planning.



California Offshore Marine Habitat and Biodiversity

This MarineCadastr.gov map features a number of marine habitat and biodiversity layers off the coast of California.

[View All](#)

Story Maps

Story maps combine data and textual information to explain how ocean data can be used and why it is important.



North Carolina Offshore Wind Turbine Simulation

Simulation depicting offshore wind facilities at different locations along the North Carolina coastline.



Considering Atlantic Shipwrecks when Planning Offshore Energy

Atlantic Shipwreck Database density analysis of coordinate locations compiled in the Outer Continental Shelf.

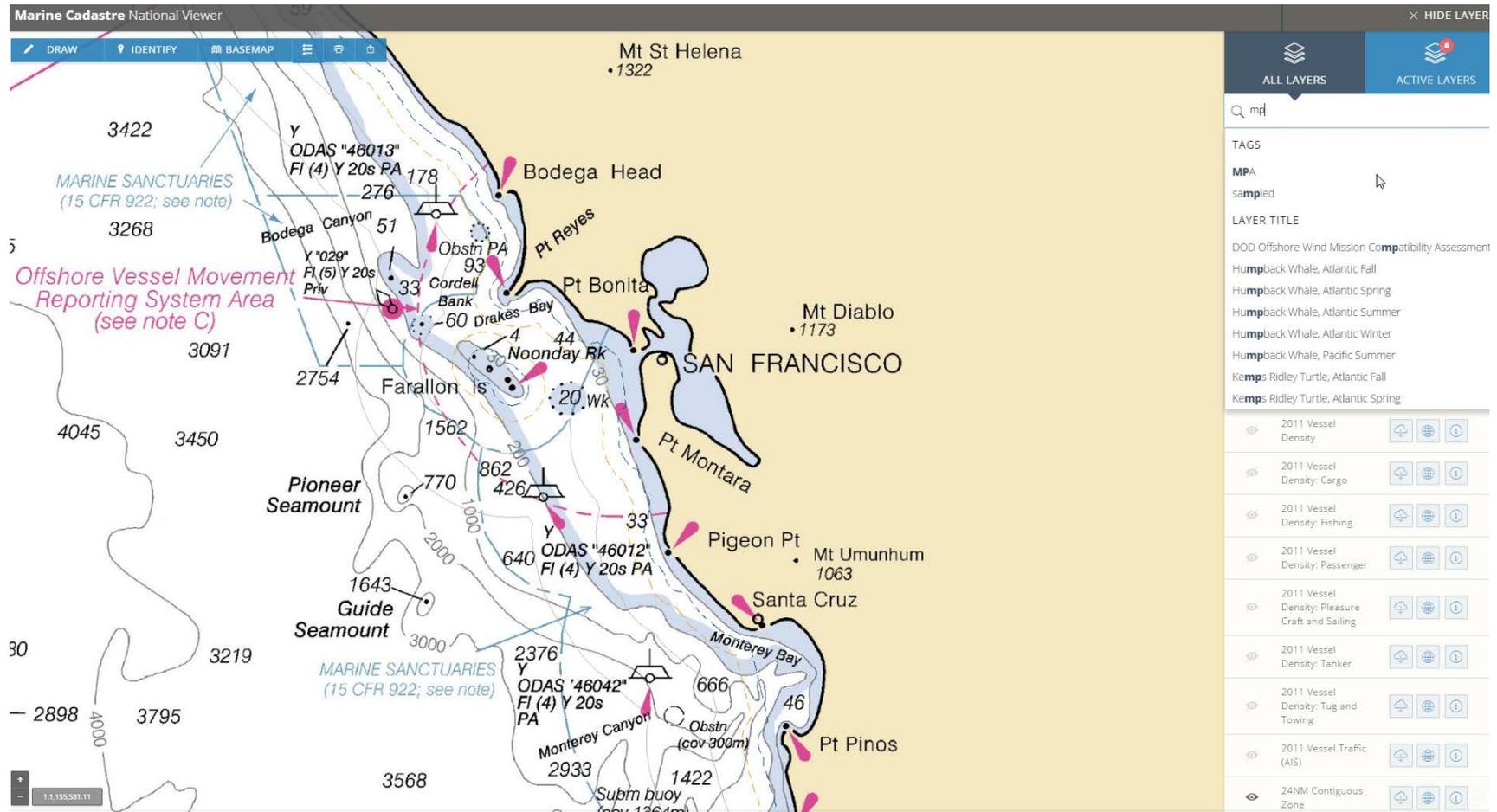


Understanding Ocean Wind Energy

Check out how MarineCadastr.gov is being used to assist in Ocean Wind Energy planning.

[View All](#)

National Viewer – Data Search



Set up your map

The screenshot displays the Marine Cadastre National Viewer interface. The main map area shows a coastal region of Florida, including Lake Okechobee and the Florida Keys. The map is overlaid with various colored lines and shapes representing different marine cadastre layers. A toolbar at the top left includes options for DRAW, IDENTIFY, and BASEMAP. A coordinate display at the bottom left shows the coordinates 12,311,162.22 and 27-55211, -80-98572. On the right side, there is a layer management panel with a 'HIDE LAYERS' button at the top. Below this, there are two tabs: 'ALL LAYERS' and 'ACTIVE LAYERS' (which is selected and shows 16 active layers). A plus sign icon indicates that layers can be reordered by service type. The 'DYNAMIC SERVICES' section lists several layers, each with a trash icon, a globe icon, a refresh icon, and a layer opacity slider. The layers listed are:

- Federal OCS Sand and Gravel Borrow (Lease Areas)
- Ocean Disposal Sites
- Deepwater Ports
- Pilot Boarding Areas
- Coastal Maintained Channels
- Danger Zones and Restricted Areas
- Unexploded Ordnances
- Shipping Lanes and

The interface also includes a 'VIEW IN ARCGIS.COM' button at the bottom right of the layer panel.

Dig deeper

Marine Cadastre National Viewer X HIDE LAYERS

Coastal Maintained Channels
U.S. ARMY CORPS OF ENGINEERS

DATA SERVICES MORE INFO

DESCRIPTION

This layer shows coastal channels and waterways that are maintained and surveyed by the U.S. Army Corps of Engineers (USACE). These channels are necessary transportation systems that serve economic and national security interests. The possibility of silting is always present. Local authorities should be consulted for the controlling depth. NOS Charts frequently show controlling depths in a table, which is kept current by the US Coast Guard Local Notice to Mariners. These data are intended for coastal and ocean use planning. Not for navigation.

VISIBLE SCALE RANGE

0 to 0

LEGEND PATCH

■

ADDITIONAL KEYWORDS

- EAST COAST WEST COAST GULF OF MEXICO
- GREAT LAKES ALASKA PACIFIC ISLANDS
- CARIBBEAN NAVIGATION
- MARINE TRANSPORTATION BENTHIC USACE
- ACOE NATIONAL OCEAN USES
- TRANSPORTATION SAFETY NAUTICAL
- SEAFLOOR COASTAL NOAA

Map labels: Orlando, Florida, Tamia, Lake Okeechobee, Florida Gap, Little Bahama Bank, Freeport, Freeport, Northeast Providence Channel, Nichollsown and Berry Islands, Escarpment, Florida Key, Valley, Gre.

Coordinates: 12,311,162.22 29,10418, -77,68982

Draw and label

Marine Cadastre National Viewer X HIDE LAYERS

Orlando

DRAW | IDENTIFY | BASEMAP

LINE | POLYGON | MARKER | LABEL

- Manage your custom features. Edit, delete or drag to reorder.
- Uncharted Wreck Edit
- Hectares Edit
- Survey Area Edit

Map Legend

- Federal OCS Sand and Gravel Borrow (Lease Areas)
- Ocean Disposal Sites
- Deepwater Ports
 - Operational
 - Future Construction
- Pilot Boarding Areas
- Coastal Maintained Channels
- Danger Zones and Restricted Areas
- Unexploded Ordnances
- Shipping Lanes and Regulations
 - Traffic Separation Schemes/Traffic Lanes
 - Area to be Avoided
 - Particularly Sensitive Sea Area
 - Precautionary Areas
 - Recommended Routes
 - Traffic Separation Schemes
 - Speed Restrictions/Right Whales
 - Shipping Fairways Lanes and Zones
- Submarine Cables
- Wrecks and Obstructions

Survey Area

Port St. Lucie

Lake Okechobee

Florida Gap

Investigate the data

Marine Cadastre National Viewer

Orlando

DRAW IDENTIFY BASEMAP

Wrecks and Obstructions

CHART	11460
DEPTH	0
FEATURE_TYPE	Not Charted
FID	1010299
GEOM	Point
GP_QUALITY	Low
GP_SOURCE	
HISTORY	DESCRIPTION 24 NO.502; SCHOONER, 1926 GT; POS. ACCURACY WITHIN 1 MILE AT POSITION 28-11-10N, 80-19-40W; IN 12

Survey Area

Port of Tampa

Lake Okeechobee

Florida Gap

ALL LAYERS ACTIVE LAYERS 16

Drag to reorder layers by service type

- Unexploded Ordnances
- Shipping Lanes and Regulations
- Submarine Cables
- Wrecks and Obstructions
- Anchorage Areas
- Selected Pipelines
- Drilling Platforms
- Oil and Natural Gas Wells

VIEW IN ARCGIS.COM

1:1,155,581.11 28,35273, -81,40594

Share your map

Marine Cadastre National Viewer

Orlando

DRAW IDENTIFY BASEMAP

Copy the link below to share.
<http://marinecadastre.gov/nationalviewer/#/D0E20A2A-B091-E211-A1F4-D0>

Warning! Custom drawn features will not be shared.

Survey Area

Port of St. Lucie

Lake Okeechobee

Florida Gap

HIDE LAYERS

ALL LAYERS ACTIVE LAYERS 16

Drag to reorder layers by service type

- Unexploded Ordnances LAYER OPACITY
- Shipping Lanes and Regulations LAYER OPACITY
- Submarine Cables LAYER OPACITY
- Wrecks and Obstructions LAYER OPACITY
- Anchorage Areas LAYER OPACITY
- Selected Pipelines LAYER OPACITY
- Drilling Platforms LAYER OPACITY
- Oil and Natural Gas Wells LAYER OPACITY

VIEW IN ARCGIS.COM esri

Keep your graphics by printing your map

Print
Total: 5 sheets of paper
Print Cancel

Destination
\\mshmpmt01\Atrium...
Change...

Pages
 All
 eg. 1-5, 8, 11-13

Copies
1 + -

Color
Color

Paper size
Legal (8.5 x 14")

Margins
Default

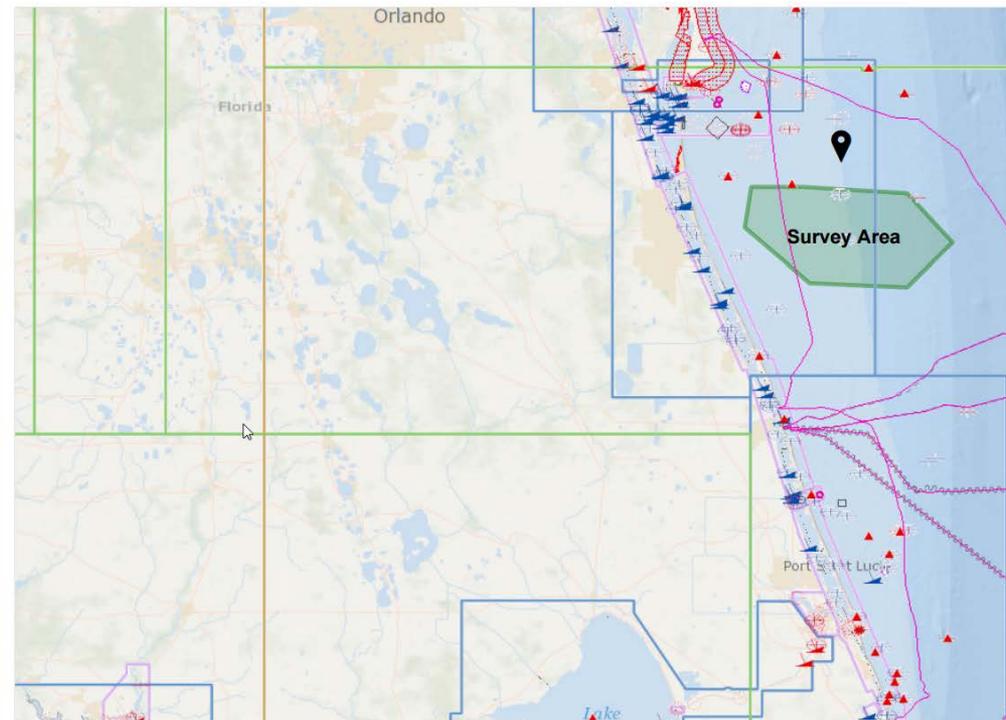
Quality
600 dpi

Options
 Headers and footers
 Two-sided
 Background graphics

— Fewer settings

Print using system dialog... (Ctrl+Shift+P)

Marine Cadastre National Viewer | Potential New Survey



MAP LEGEND

BOEM Oil and Gas Leases

- OCS Drilling Platforms
- OCS Oil and Natural Gas Wells
- OCS Oil & Gas Pipelines

Shipping Lanes and Regulations

- Traffic Separation Schemes/Traffic Lanes
- Area to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Traffic Separation Schemes
- Speed Restrictions/Right Whales
- Shipping Fairways Lanes and Zones

Anchorage Areas

- Anchorage Areas
- Coastal Maintained Channels

Wrecks and Obstructions

- awois_wrecks_approach_scale**
Weck - Submerged, nondangerous
- Weck - Submerged, dangerous to surface navigation
- Weck - Visible
- Not Charted
- Unknown
- awois_wrecks_coastal_scale**
Weck - Submerged nondangerous

Back to Active Layers – you can view it all in ArcGIS.com

The screenshot displays the 'Marine Cadastre National Viewer' interface. The main map area shows a coastal region with various colored overlays representing different marine cadastre data. The interface includes a top navigation bar with 'DRAW', 'IDENTIFY', and 'BASEMAP' options. On the right side, there is a 'LAYERS' panel with 'ALL LAYERS' and 'ACTIVE LAYERS' tabs. The 'ACTIVE LAYERS' tab is selected, showing a list of dynamic services with their respective icons and layer opacity controls. A red box highlights the 'VIEW IN ARCGIS.COM' button at the bottom of the layers panel.

Marine Cadastre National Viewer

DRAW IDENTIFY BASEMAP

Orlando
Tampa
Lake Okeechobee
Escarpment
Florida Keys
Little Bahama Bank
Freeport Freeport
Northwest Providence Channel
Nicholls and Berry Islands
Gree

ALL LAYERS ACTIVE LAYERS

Drag to reorder layers by service type

DYNAMIC SERVICES 15

- Federal OCS Sand and Gravel Borrow (Lease Areas) LAYER OPACITY
- Ocean Disposal Sites LAYER OPACITY
- Deepwater Ports LAYER OPACITY
- Pilot Boarding Areas LAYER OPACITY
- Coastal Maintained Channels LAYER OPACITY
- Danger Zones and Restricted Areas LAYER OPACITY
- Unexploded Ordnances LAYER OPACITY
- Shipwrecks

VIEW IN ARCGIS.COM

Open in ArcGIS.com and manipulate cartography, pop-ups, and add other layers not in MarineCadastre.gov and save it as your own.

ArcGIS My Map

Details Add Basemap Save Print Measure Bookmarks Find address or place

About Content Legend

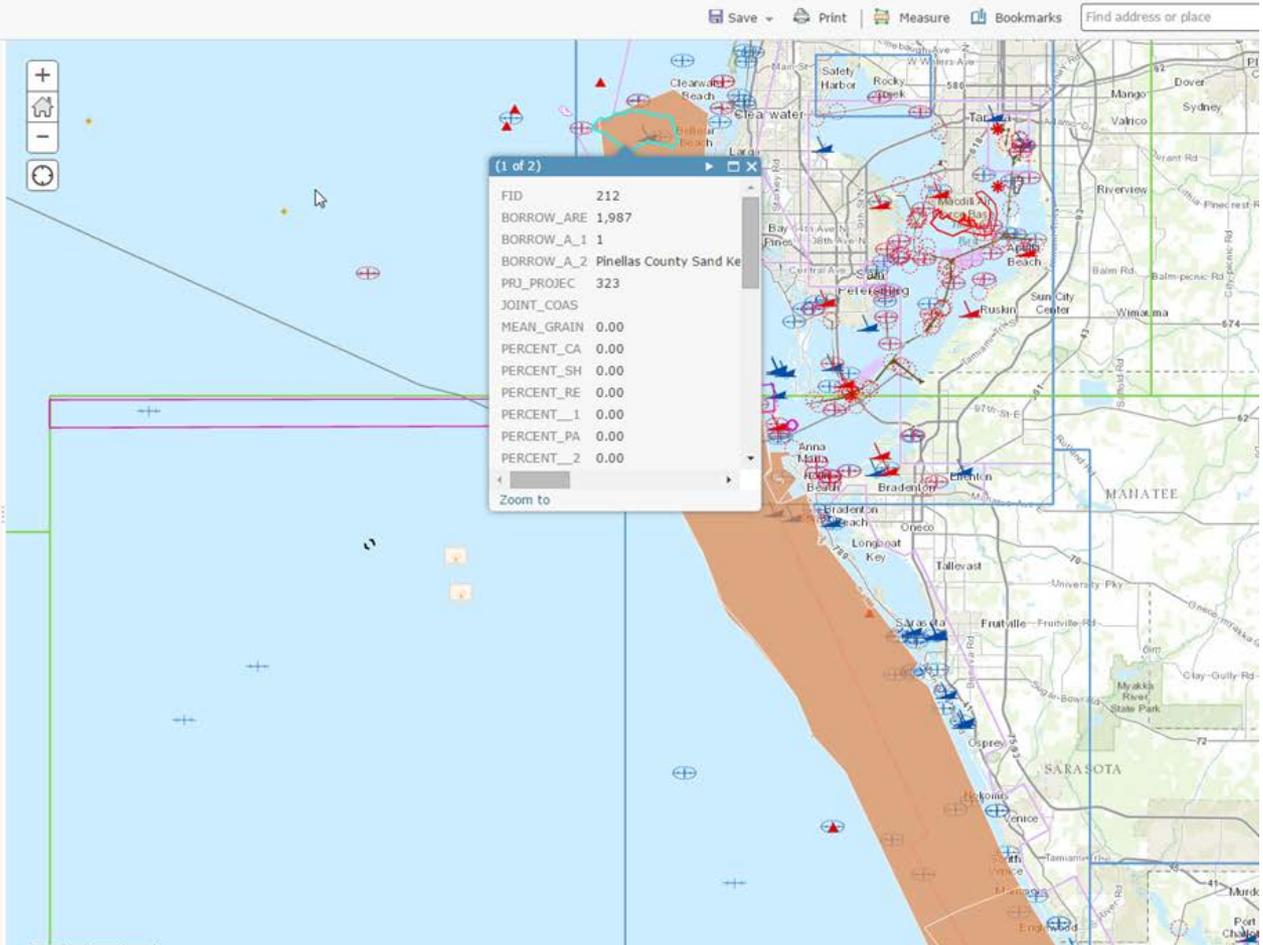
Contents

- MMC Layers - BOEM Oil and Gas Leases
- MMC Layers - OCS Drilling Platforms
- MMC Layers - OCS Oil & Gas Pipelines
- MMC Layers - OCS Oil and Natural Gas Wells
- NavigationAndMarineTransportation - Anchorage Areas
- NavigationAndMarineTransportation - Submarine Cables
- MarineTransportation - Shipping Lanes and Regulations
- NavigationAndMarineTransportation - Unexploded Ordnances
- NavigationAndMarineTransportation - Danger Zones and Restricted Areas
- NavigationAndMarineTransportation - Coastal Maintained Channels
- NavigationAndMarineTransportation - Pilot Boarding Areas
- OceanEnergy - Deepwater Ports
- BOEM Layers - Federal OCS Sand and Gravel Borrow (Lease Areas)
- NavigationAndMarineTransportation - Ocean Disposal Sites
- FloridaStateBorrowAreas
- NASCASubmarineCables
- Wrecks And Obstructions
- Topographic

(1 of 2)

FID	212
BORROW_ARE	1,987
BORROW_A_1	1
BORROW_A_2	Pinellas County Sand Ke
PRJ_PROJEC	323
JOINT_COAS	
MEAN_GRAIN	0.00
PERCENT_CA	0.00
PERCENT_SH	0.00
PERCENT_RE	0.00
PERCENT_1	0.00
PERCENT_PA	0.00
PERCENT_2	0.00

Zoom to



Uses



Uses

This map provides examples of how MarineCadastre.gov has helped users meet their ocean planning goals. Click the icons on the map to explore how and where MarineCadastre.gov is being used. [Contact us](#) to have your example added to the map.

The information provided below explains the importance of various data sets within MarineCadastre.gov, why they should be considered when determining ocean use, and any caveats to the data set the user needs to know to use the data set successfully.

[View Larger Map](#)



Shallow Coral Reefs (within Benthic Cover)

Shallow-water coral reefs are more than just pretty places to go snorkeling and scuba diving. These sensitive areas are some of the most biologically rich and economically valuable ecosystems on earth.



Essential Fish Habitat

Fish require healthy surroundings to survive and reproduce. Essential Fish Habitat includes all types of aquatic habitat—wetlands, coral reefs, seagrasses, rivers—where fish spawn, breed, feed, or grow to maturity.



Shipping Lanes and Regulations

The ocean is a highway for ship traffic, and highways require rules. Shipping fairways, lanes, and zones keep ships organized by guiding them on established “roads” and indicating the direction the traffic is moving.



Artificial Reefs

Why are old subway cars and army tanks littering our ocean floor? What purpose can these sunken relics serve? Societies have constructed artificial reefs out of obsolete objects or “trash” for thousands of years for everything from blockading pirate ships to benefiting algae farm productivity.

Uses

Essential Fish Habitat

Posted April 9, 2015 by Jodie Sprayberry

Fish require healthy surroundings to survive and reproduce. Essential Fish Habitat includes all types of aquatic habitat—wetlands, coral reefs, seagrasses, rivers—where fish spawn, breed, feed, or grow to maturity. The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (Fisheries) works with the regional fishery management councils to identify the essential habitat for every life stage of each federally managed species using the best available scientific information. Essential Fish Habitat has been described for approximately 1,000 managed species at multiple life stages to date. MarineCadastre.gov contains three types of Essential Fish Habitat (EFH) data: EFH, EFH Areas Protected from Fishing, and **Habitat Area of Particular Concern (HAPC)**. What do ocean planners need to know about Essential Fish Habitat?

1. **Essential Fish Habitat (EFH) contains information critical to identifying whether agencies need to consult with NOAA Fisheries.** Whenever federal agencies authorize, fund, or carry out actions that may adversely affect EFH, they must consult with NOAA Fisheries to identify measures the agency can take to reduce, minimize, or avoid adverse effects of the activities on EFH.
2. **Some areas within EFH contain specific fishing restrictions.** EFH Areas Protected from Fishing are areas where fishing or the use of fishing gear has been restricted or modified in order to minimize the adverse effects of fishing on EFH, as required by Section 303(a)(7) of the Magnuson-Stevens Fishery Conservation and Management Act.
3. **EFH is identified and described in coordination with the regional fishery management councils.** The Magnuson-Stevens Act requires NOAA and the eight regional fishery management councils to describe and identify EFH in their respective regions. EFH is described in both text and maps. If users have specific questions on the content and use of the EFH data, it is recommended they [contact the expert in their region of interest](#).

Quick Caveats. The data were developed using methods that reflected regional differences in both source data and management needs. Because of the variability in the quality and intended usage of these GIS data layers, each should be considered individually when interpreting the accuracy and utility of the information that they provide. Please be sure to view the [EFH Mapper](#) and read the information under the Data Quality tab in the Help menu to fully understand the usage constraints for each data layer and the completeness and accuracy of the information. Users are also advised that the spatial representation of essential fish habitat is for informational purposes only and should not be solely relied on for regulatory purposes. Implementing regulations [50 CFR 600.815(a)(1)(iv)(B)] specify that if there are differences between the descriptions of EFH in text and maps, the textual description as found in the amendment is ultimately determinative of the limits of EFH. EFH textual descriptions can be found in the [EFH Data Inventory](#).

Content Categories

- All (152)
- Multimedia (18)
- News (83)
- Updates (25)
- Uses (26)

Date Archives

- All (152)
- 2015 (100)
- 2014 (34)
- 2013 (8)
- 2012 (7)
- 2011 (3)

Tools



MarineCadastre.gov

Maps Data Uses Tools News About



Tools

The tools provided on this website are designed to support renewable energy siting and other marine planning efforts.

Please [contact us](#) if you have questions or need support in using these tools.

Web-based Tools



NEW MarineCadastre.gov National Viewer v3.0

This Web-based viewer provides ocean-related data and information from authoritative sources to support ocean-planning efforts.



Ocean Law Search

This tool allows users to search a database of environmental and historic preservation statutes, legislative histories, cases, and other documents on the protection of underwater cultural heritage on the Outer Continental Shelf.



Environmental Studies Program Information System (ESPIS)

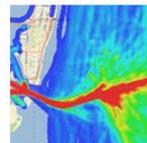
The ESPIS query tool enables users to search by text or map to find relevant study information, including downloadable study profiles, technical summaries and final reports, and links to publications and digital data.

Desktop Tools



AIS Data Handler

The AIS Data Handler is a desktop AIS data conversion tool and ArcGIS add-in that streamlines the acquisition, loading, filtering, display, and analysis of AIS vessel-tracking data. Please note that this tool is now archived.



AIS Track Builder

The AIS Track Builder is an ArcGIS Toolbox that converts a collection of point features into a track line according to date, time, and an identifier.

iate your patience. x

About

MarineCadastre

About Marine

Websites Featuring MarineCadastre.gov data

MarineCadastre.gov data also can be found within the following locations:

- [Data.gov Ocean Community Webpage](#)
- [Geoplatform.gov](#)
- [Digital Coast](#)
- [Mid-Atlantic Ocean Data Portal](#)
- [Northeast Ocean Data Portal](#)
- [West Coast Ocean Data Portal](#)

Home [Pages](#) [Tools](#) [News](#) [About](#)



Contact and Follow

Subscribe to MarineCadastre.gov

Thank you for your interest in MarineCadastre.gov. For more information, sign up to receive data updates.



Facebook



Twitter



Pinterest



Email Us



Newsletters

being used for other ocean-related efforts.

The MarineCadastre.gov team is continually working to increase access to data through data and map services. The services are designed to deliver data without replication and directly from the source. MarineCadastre.gov supports a number of complementary efforts, including Digital Coast,

Additional Information

[Frequently Asked Questions](#)

[Quick Facts and User](#)

[Testimonials](#)

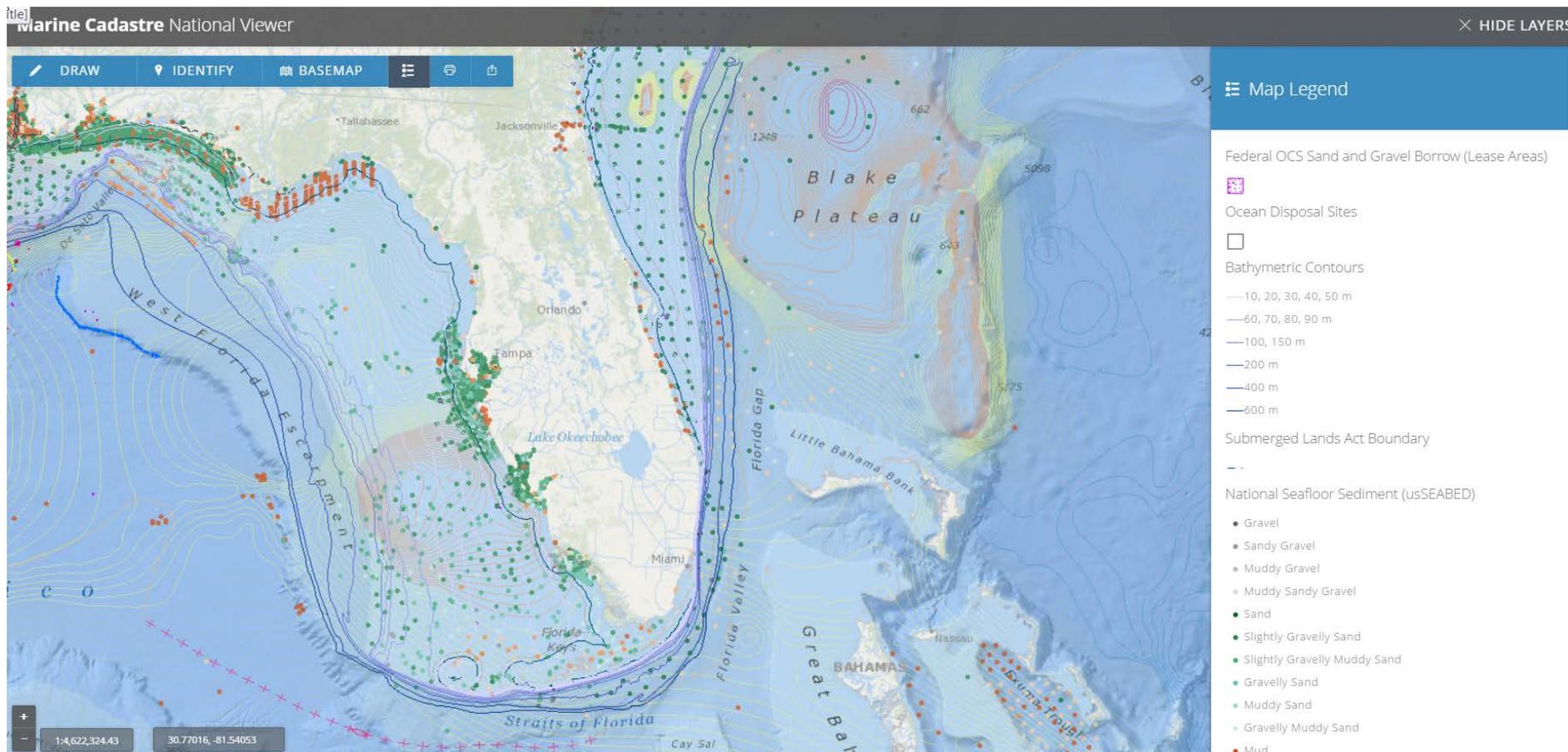
[Resources](#)

[Newsletter Sign-Up](#)



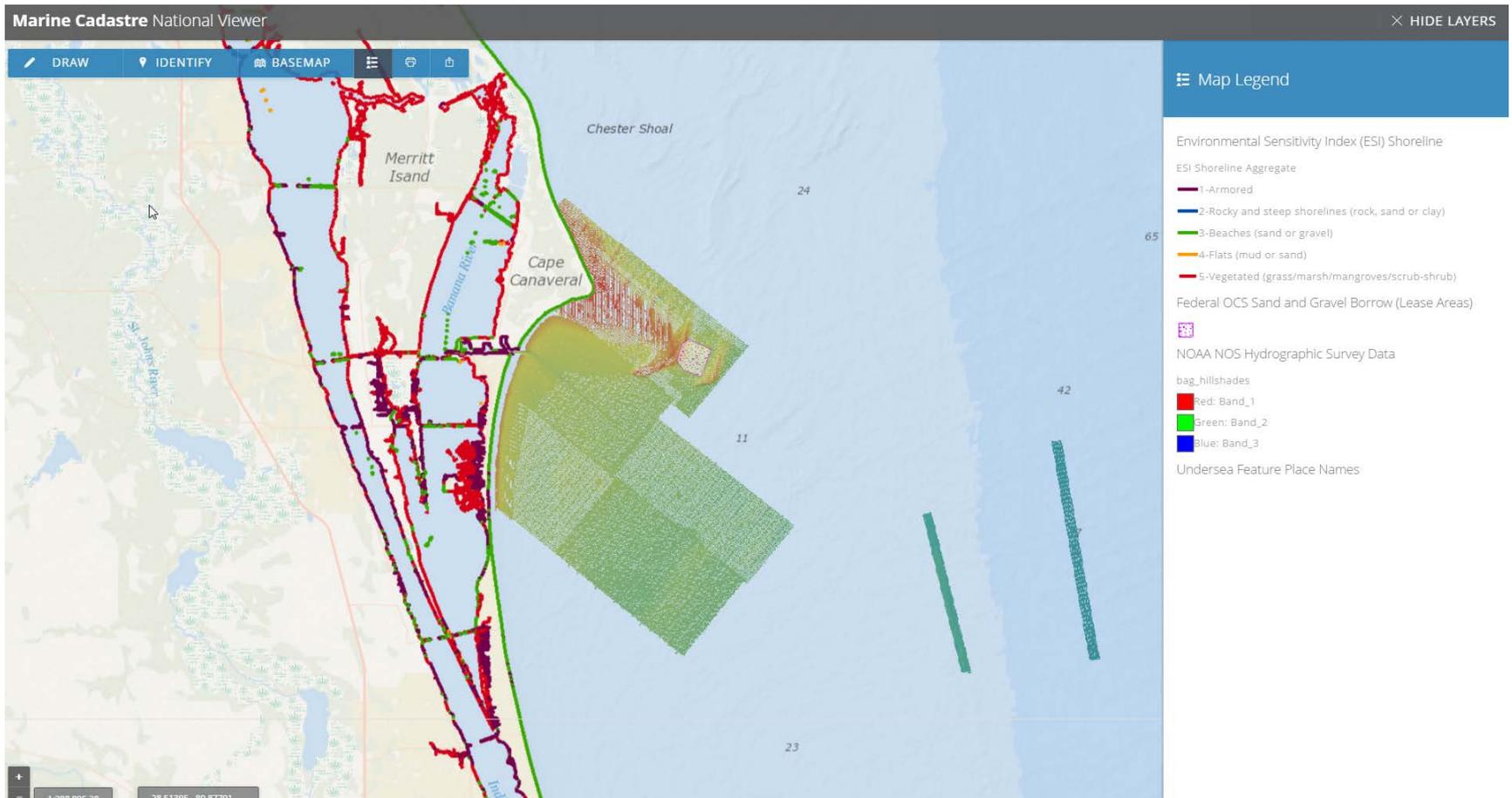
Physical Layers:

Seafloor Sediment, Bathymetry, Sediment Thickness, Seismic Anomalies (WGM/CGM), Sand and Gravel Leased Areas (federal), Maritime Boundaries



Physical Layers:

Environmental Sensitivity Index shoreline aggregate, Federal Sand Leases, selected NOAA survey.

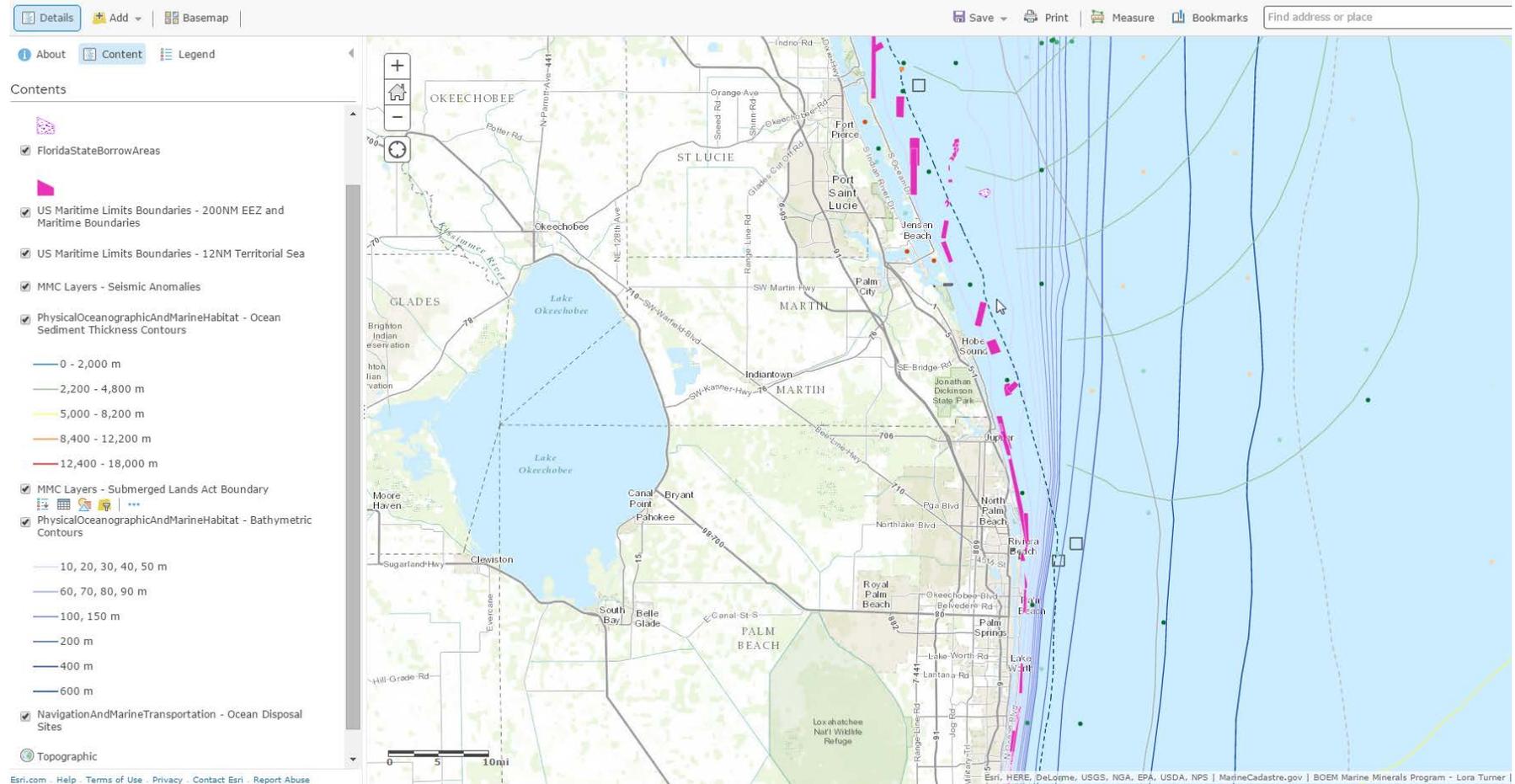


Mix MC.gov with your own data using ArcGIS.com

Used MarineCadastre.gov chosen layers “view in ArcGIS.com” button, then added shapefiles from Florida ROSSI

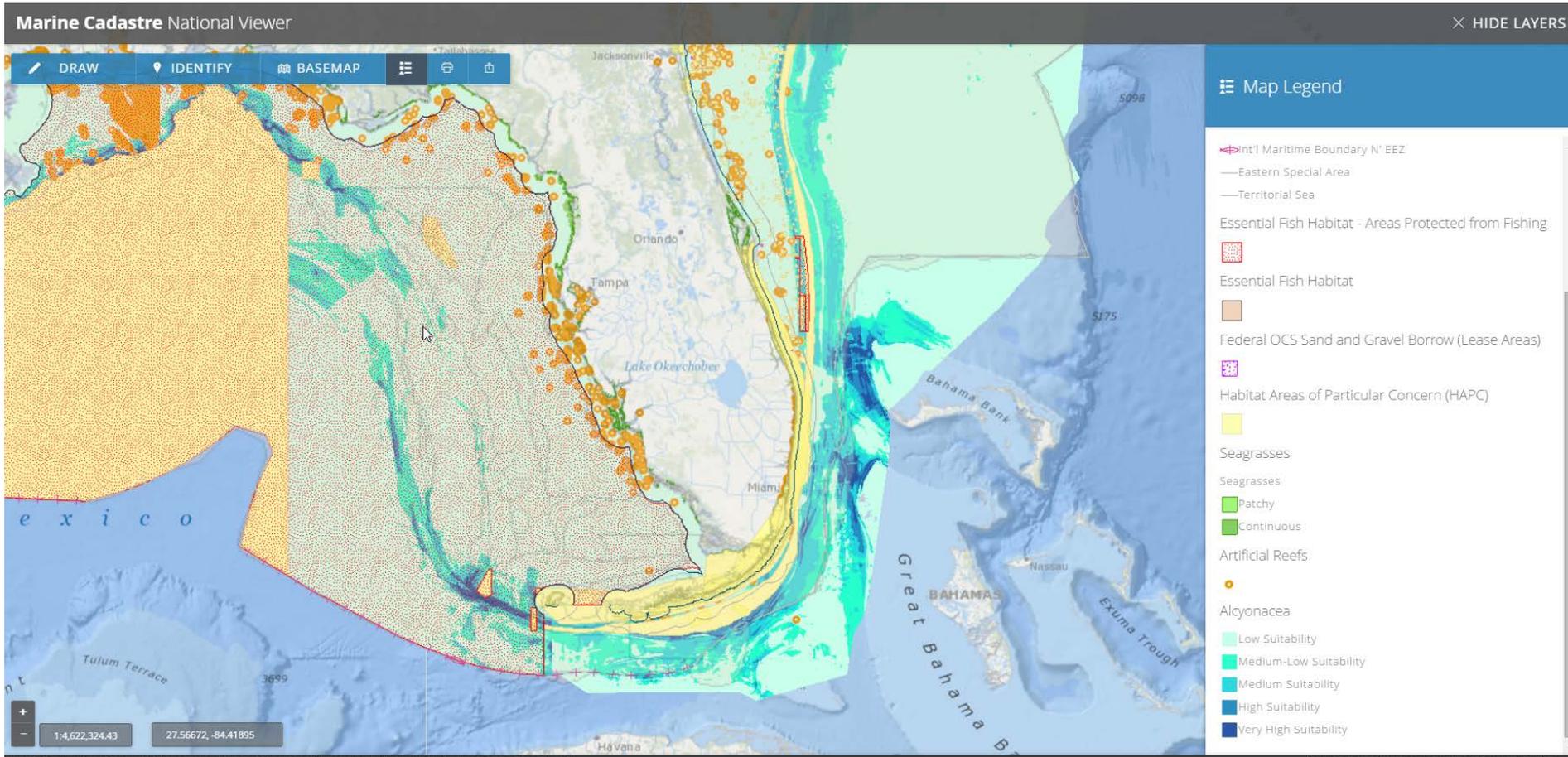
ArcGIS My Map

New Map



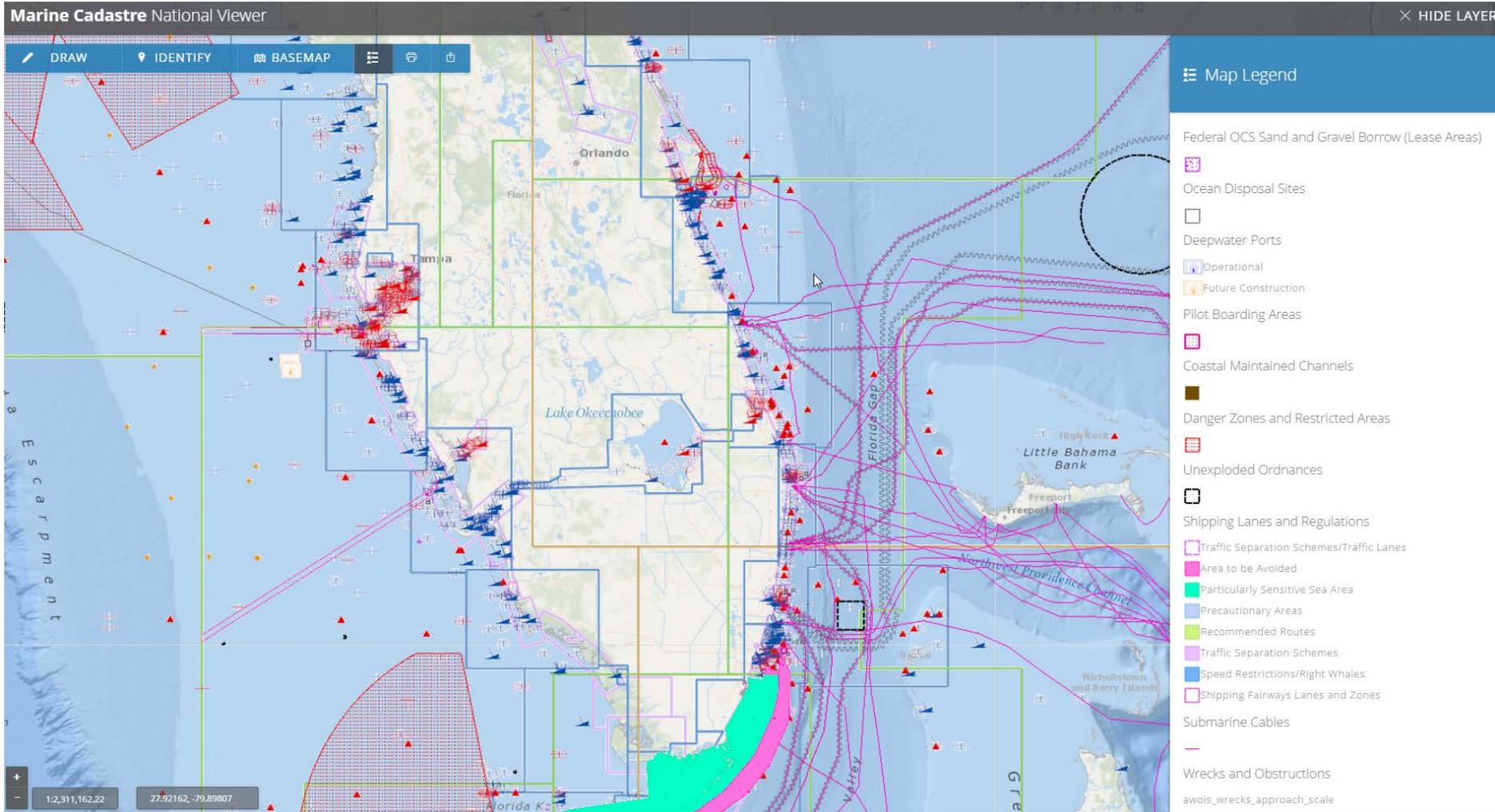
Habitat Layers:

EFH – No fishing, EFH Zone, HAPCs, Seagrasses, Artificial Reefs, Alcyonacea Potential Habitat Areas, Maritime Boundaries



Uses Layers:

Uses – Fed. Sand/Gravel Lease Areas, Disposal sites, deepwater ports, pilot boarding, maintained channels, danger/restricted areas, shipping lanes and restrictions, submarine cables, wrecks/obs. Wells, pipelines. Platforms.,



Uses Layers

- <http://marinecadastre.gov/nationalviewer/#/D0E20A2A-B091-E211-A1F4-D067E5FDEE55,DAE20A2A-B091-E211-A1F4-D067E5FDEE55,43C5D8DD-B4BA-E311-8DE8-D067E5FDEE55,DBE20A2A-B091-E211-A1F4-D067E5FDEE55,D10F451F-A874-E311-B66B-90E2BA100C34,D5E20A2A-B091-E211-A1F4-D067E5FDEE55,E1E20A2A-B091-E211-A1F4-D067E5FDEE55,107C31B3-963F-E511-B651-90E2BA100C1C,0BB4C899-76B7-E411-92FD-90E2BA100C1C,D4E20A2A-B091-E211-A1F4-D067E5FDEE55,B46FC628-BBB7-E411-92FD-90E2BA100C1C,D7E20A2A-B091-E211-A1F4-D067E5FDEE55,D2E20A2A-B091-E211-A1F4-D067E5FDEE55,D8E20A2A-B091-E211-A1F4-D067E5FDEE55,3DE30A2A-B091-E211-A1F4-D067E5FDEE55,D9E20A2A-B091-E211-A1F4-D067E5FDEE55/27.1618079465197,-80.24688720703125/8/esriocan>
- http://www.arcgis.com/home/webmap/viewer.html?¢er=-80.24688720703125,27.1618079465197&level=8&urls=https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/BOEM_Layers/MapServer/6,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/11,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/OceanEnergy/MapServer/1,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/7,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/6,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/9,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/10,http://encdirect.noaa.gov/arcgis/rest/services/NavigationChartData/MarineTransportation/MapServer/0,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/4,http://wrecks.nauticalcharts.noaa.gov/arcgis/rest/services/public_wrecks/Wrecks_And_Obstructions/MapServer,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NavigationAndMarineTransportation/MapServer/8,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/2,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/0,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/1,http://gis.boemre.gov/arcgis/rest/services/BOEM_BSEE/MMC_Layers/MapServer/15,https://coast.noaa.gov/arcgis/rest/services/MarineCadastre/NASCASubmarineCables/MapServer

Physical Layers

- <http://marinecadastre.gov/nationalviewer/#/FF19EABA-327E-E311-B66B-90E2BA100C34,32E30A2A-B091-E211-A1F4-D067E5FDEE55,D0E20A2A-B091-E211-A1F4-D067E5FDEE55,E3E20A2A-B091-E211-A1F4-D067E5FDEE55,BBE20A2A-B091-E211-A1F4-D067E5FDEE55,B7E20A2A-B091-E211-A1F4-D067E5FDEE55,D5E20A2A-B091-E211-A1F4-D067E5FDEE55,73D7C06A-AB15-E311-9FF8-D067E5FDEE55,40BFE118-EC17-E411-98AD-90E2BA100C34,E1E20A2A-B091-E211-A1F4-D067E5FDEE55,E6E20A2A-B091-E211-A1F4-D067E5FDEE55,107C31B3-963F-E511-B651-90E2BA100C1C,0BB4C899-76B7-E411-92FD-90E2BA100C1C,D4E20A2A-B091-E211-A1F4-D067E5FDEE55,D8E20A2A-B091-E211-A1F4-D067E5FDEE55,2EE30A2A-B091-E211-A1F4-D067E5FDEE55,3DE30A2A-B091-E211-A1F4-D067E5FDEE55,B5E20A2A-B091-E211-A1F4-D067E5FDEE55,D7E20A2A-B091-E211-A1F4-D067E5FDEE55,71C8D00E-7316-E311-9FF8-D067E5FDEE55,77D7C06A-AB15-E311-9FF8-D067E5FDEE55,BC486957-A266-E311-B66B-90E2BA100C34,DFE20A2A-B091-E211-A1F4-D067E5FDEE55/32.657875736955305,-77.442626953125/6/esriocan>

Thank Ewe For Your Attention



Christine Taylor
Bureau of Ocean Energy Management
Christine.Taylor@BOEM.gov

Spencer



Florida Department of Environmental Protection

ROSSI

The New and Improved Coastal Sediment Tool

**Jennifer K. Steele, PhD, PG
Engineering, Hydrology, & Geology Program**

February 2, 2016





Background

- ROSS – Reconnaissance Offshore Sand Search
- OSSI – Offshore Sand Source Inventory
- ArcIMS in early 2000s
- Upgraded to ArcGIS Server 9 in 2008
- Upgraded to ArcGIS Server 10 in 2013

Reconnaissance Offshore Sand Search Home Page

Mapping

Database

Reports



Downloads

ROSS
Regional Offshore Sand Source Inventory

Home | Map | Data | Resources | About Us | Site Map | BB Beers | Admin

Our purpose is to enable users to make the most informed decision possible when it comes to management of our Florida beaches and coastlines. Data that is both current and easily accessible are the key ingredients that facilitate the management process. Two basic types of data will be used in this effort. Spatial data will be used because the environment is geographic in nature. Tabular data will be used to store information about events which take place at locations stored as spatial data and referred to as spatial features.

The database stores information about sand samples. Information associated with sand samples includes, but is not limited to, granulometric data, bathymetry, seismic and sidescan sonar images, core photos, core logs, core descriptions, Munsell Color, metadata (information about the original data), and associated project information.

ROSS Map
Query, analyze and create a customized view of a large range of geoscientific data.
[View Map](#)

Preliminary Inventory Report
A report organized by Borrow Area type and subdivided by county that lists in tabular format selected information from the ROSS database.
[View Report](#)

Submit Your Own Data
Online data submission coming in 2015.

© 2015 - DEP



Recent Background

- 2014 BOEM cooperative agreement award
 - Populate remaining Atlantic counties following the SAND Study
 - Webpage update
 - Add feature datasets
 - Provided for two years of hosting
- ROSS/OSSI renamed ROSSI
 - Regional Offshore Sand Source Inventory
 - rossi.urs-tally.com



Ongoing Tasks

- Population of Gulf and Panhandle counties
- Link directly to JCPs
- Project File Delivery System
 - Direct data upload interface
 - DEP gINT® correspondence (export) format no longer supported by Bentley
 - Create program to directly upload gINT® data using the DEP library file





ROSSI Feedback

We welcome your comments and suggestions!!!

- Did we miss a dataset?
- Is there a functionality you would like to see?
- Is the new website easier to use?

A screenshot of the ROSSI (Regional Offshore Sand Source Inventory) website's feedback form. The page has a dark blue header with the ROSSI logo and navigation links: Home, Map, Data, Resources, About Us, Site Map, and Login. The feedback form is titled "Submit Feedback" and includes three input fields: "Name", "Email", and "Message". Below the "Message" field is a "Send Feedback" button. The Florida Department of Environmental Protection logo is also visible in the top right corner of the header area.

ROSSI
Regional Offshore Sand Source Inventory

Home Map Data Resources About Us Site Map Login

Submit Feedback

Name

Email

Message

Send Feedback



Florida Department of Environmental Protection

ROSSI

Updated website and compatibility





ROSSI Website Demo

ROSSI

Regional Offshore Sand Source Inventory



Map Data Resources Help

Our purpose is to enable users to make the most informed decision possible when it comes to management of our Florida beaches and coastlines. Data that is both current and easily accessible are the key ingredients that facilitate the management process. Two basic types of data will be used in this effort. Spatial data will be used because the environment is geographic in nature. Tabular data will be used to store information about events which take place at locations stored as spatial data and referred to as spatial features.

The database stores information about sand samples. Information associated with sand samples includes, but is not limited to, granulometric data, bathymetry, seismic and sidescan sonar images, core photos, core logs, core descriptions, Munsell Color, metadata (information about the original data), and associated project information.

<http://rossi.urs-tally.com/>



ROSSI Map

Query, analyze and create a customized view of a large range of geoscientific data.

[View Map](#)



Preliminary Inventory Report

A report organized by Borrow Area type and subdivided by county that lists in tabular format selected information from the ROSS database.

[View Report](#)



Submit Your Own Data

Authorized users can now provide project data directly via the website.

[View My Projects »](#)

© 2016 - DEP



Conclusion

- Webpage is now rossi.urs-tally.com
- ROSSI has seen significant improvements in functionality and design in the last 2 years
- The process of data submissions will be getting more efficient in the coming year
- Don't forget about the feedback page



Florida Department of Environmental Protection

Questions?

Jennifer K. Steele, PhD, PG

Jennifer.K.Steele@dep.state.fl.us

850-245-7580

