

# VINEYARD MID-ATLANTIC

## CONSTRUCTION AND OPERATIONS PLAN VOLUME II APPENDIX

JANUARY 2025

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SUBMITTED BY:

VINEYARD MID-ATLANTIC LLC

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PUBLIC VERSION

# Vineyard Mid-Atlantic COP

## Appendix II-B1 Marine Site Investigation Report Figures

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Prepared for:  
Vineyard Mid-Atlantic LLC



**January 2025**

Revision	Date	Description
0	March 2024	Initial submission.
1	September 2024	Updated to remove the Jones Beach B Approach from the Project Design Envelope (PDE).
2	November 2024	Updated to remove the Long Beach Approach from the PDE.
2	January 2025	Resubmitted without revisions.

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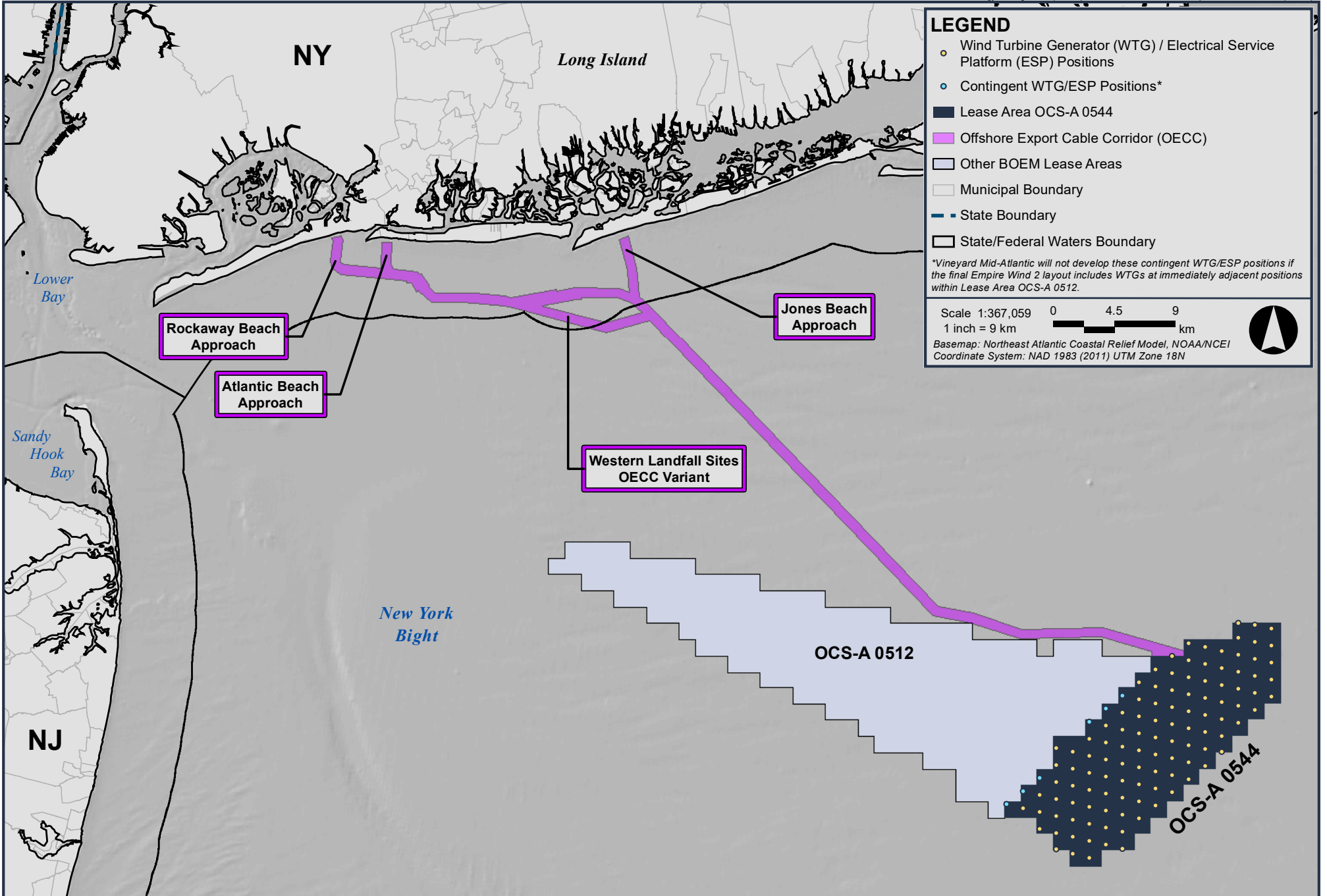
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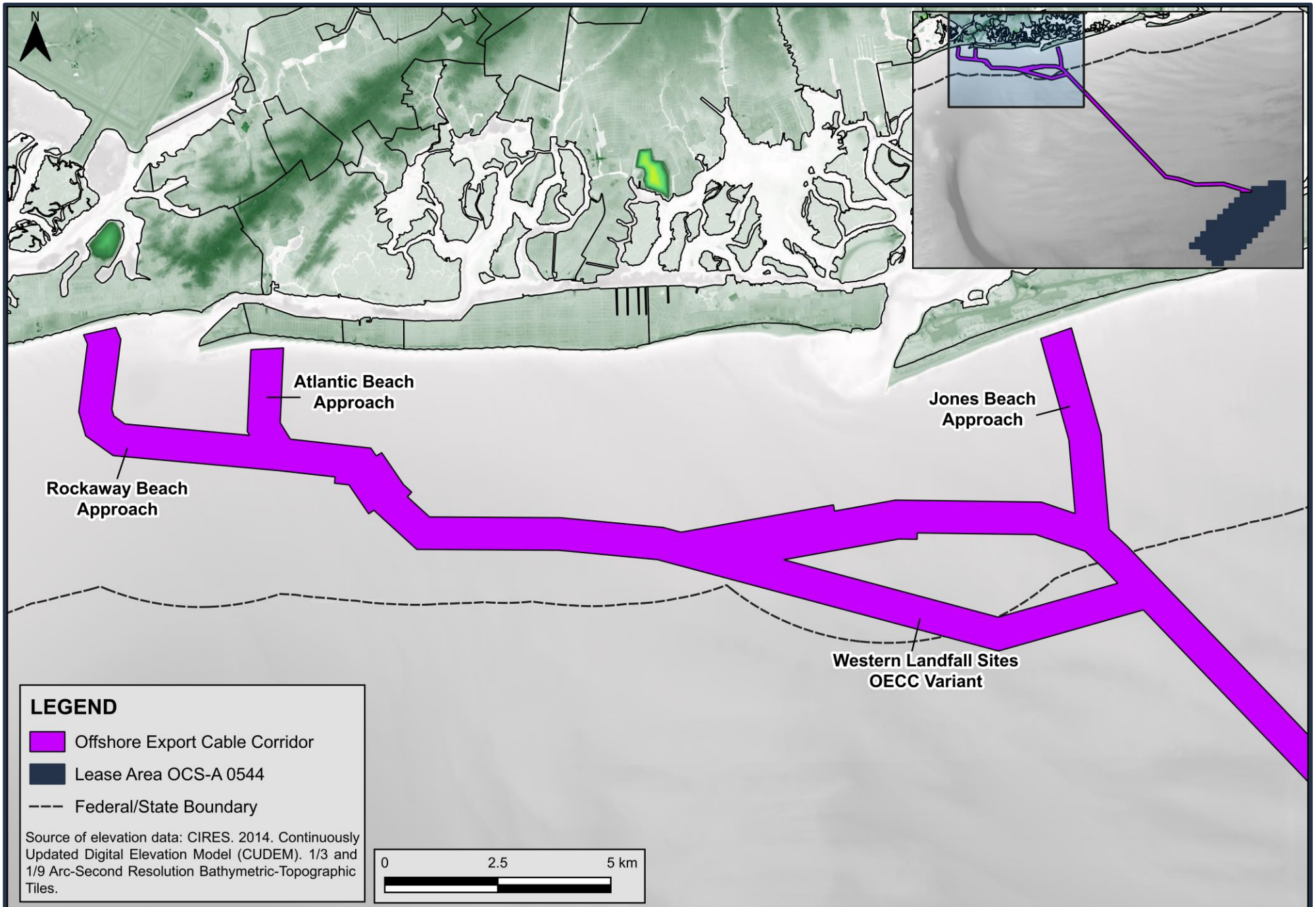




**Figure 1.1-1**  
Vineyard Mid-Atlantic Overview

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**Figure 1.1-2**  
Offshore Export Cable Corridor Approaches

## LEGEND

### 2022 Benthic Grab Sample Stations

- Stations with Three Replicates
- Stations with Single Sample
- Lease Area OCS-A 0544

Source of elevation data: CIRES. 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.



**Figure 1.3-4**

Benthic Grab Sampling Locations, Lease Area

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## LEGEND

— 2022 Underwater Video Transects

■ Lease Area OCS-A 0544

Source of elevation data: CIRES, 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.

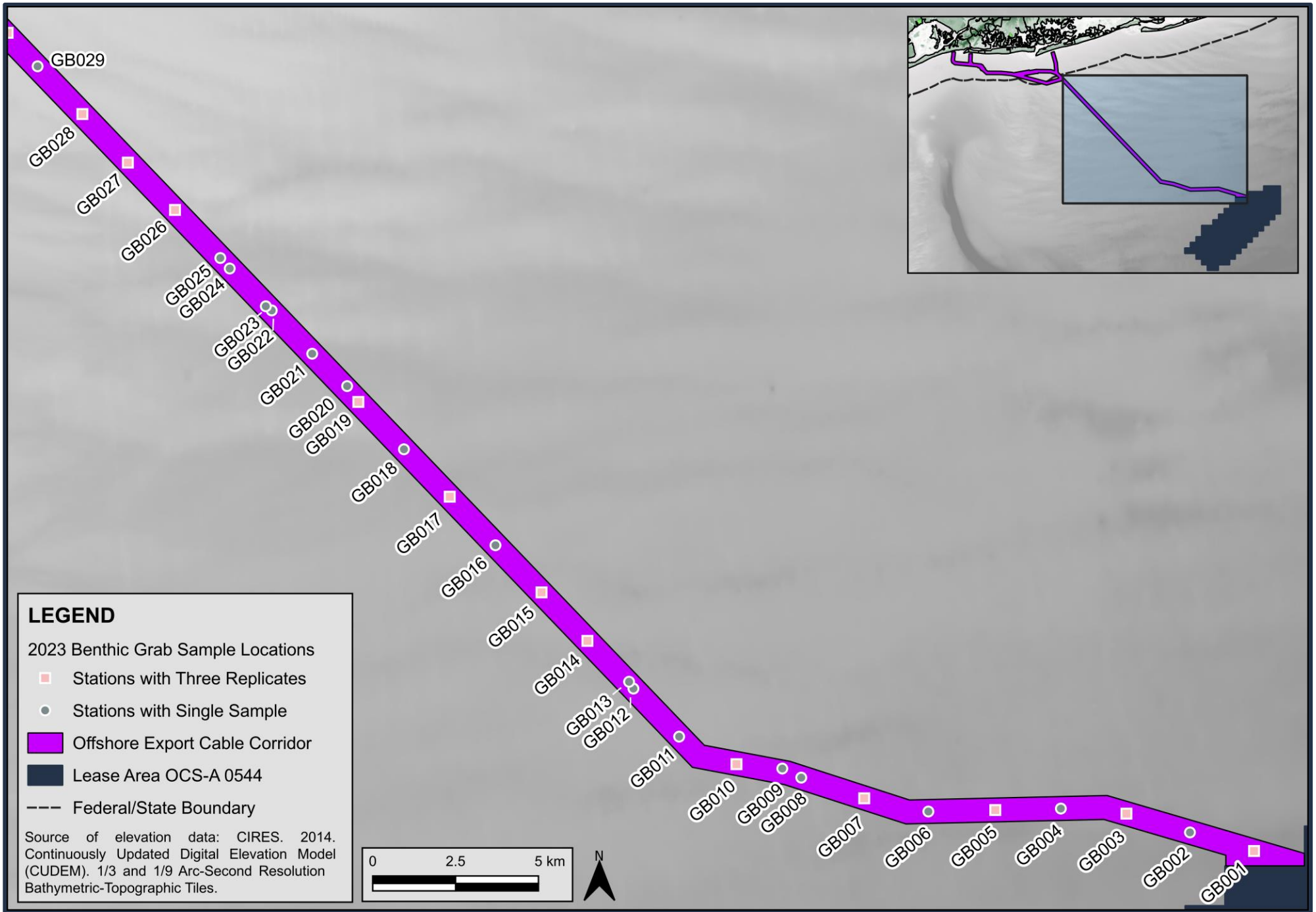


**Figure 1.3-5**

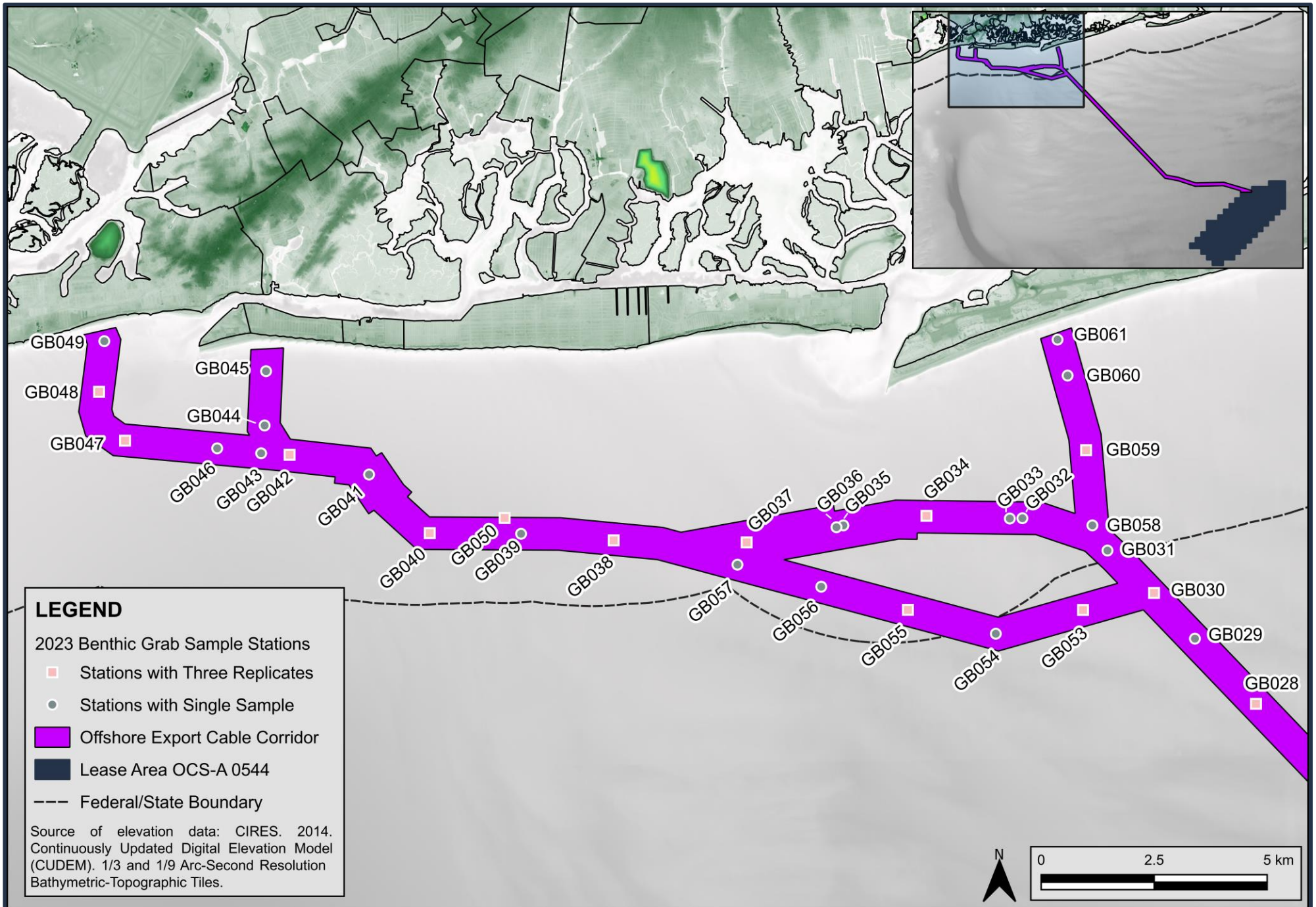
Underwater Video Transects, Lease Area

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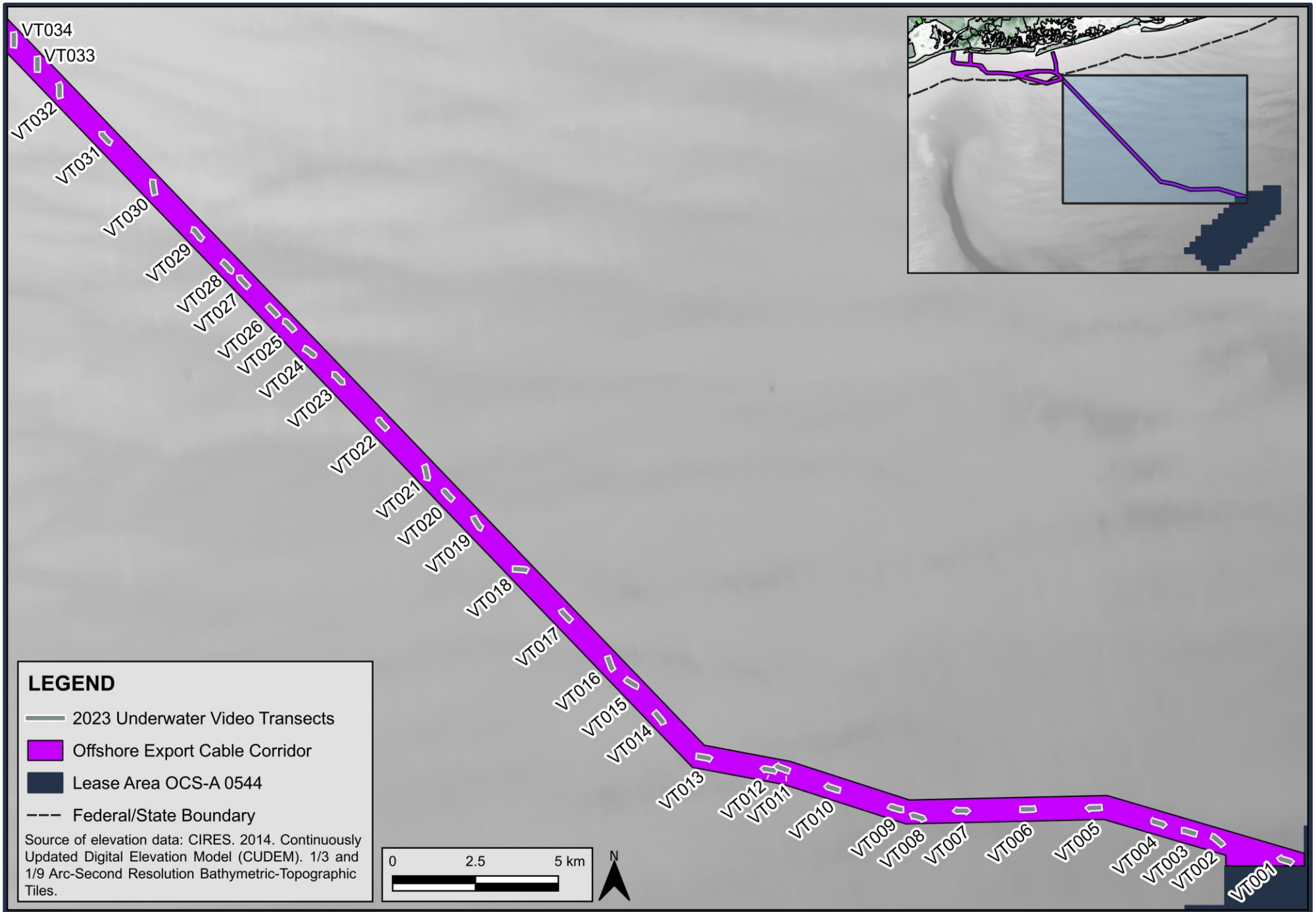
VINEYARD OFFSHORE



**Figure 1.3-12**  
Benthic Grab Sampling Locations, OECC Offshore



**Figure 1.3-13**  
Benthic Grab Sampling Locations, OECC Nearshore

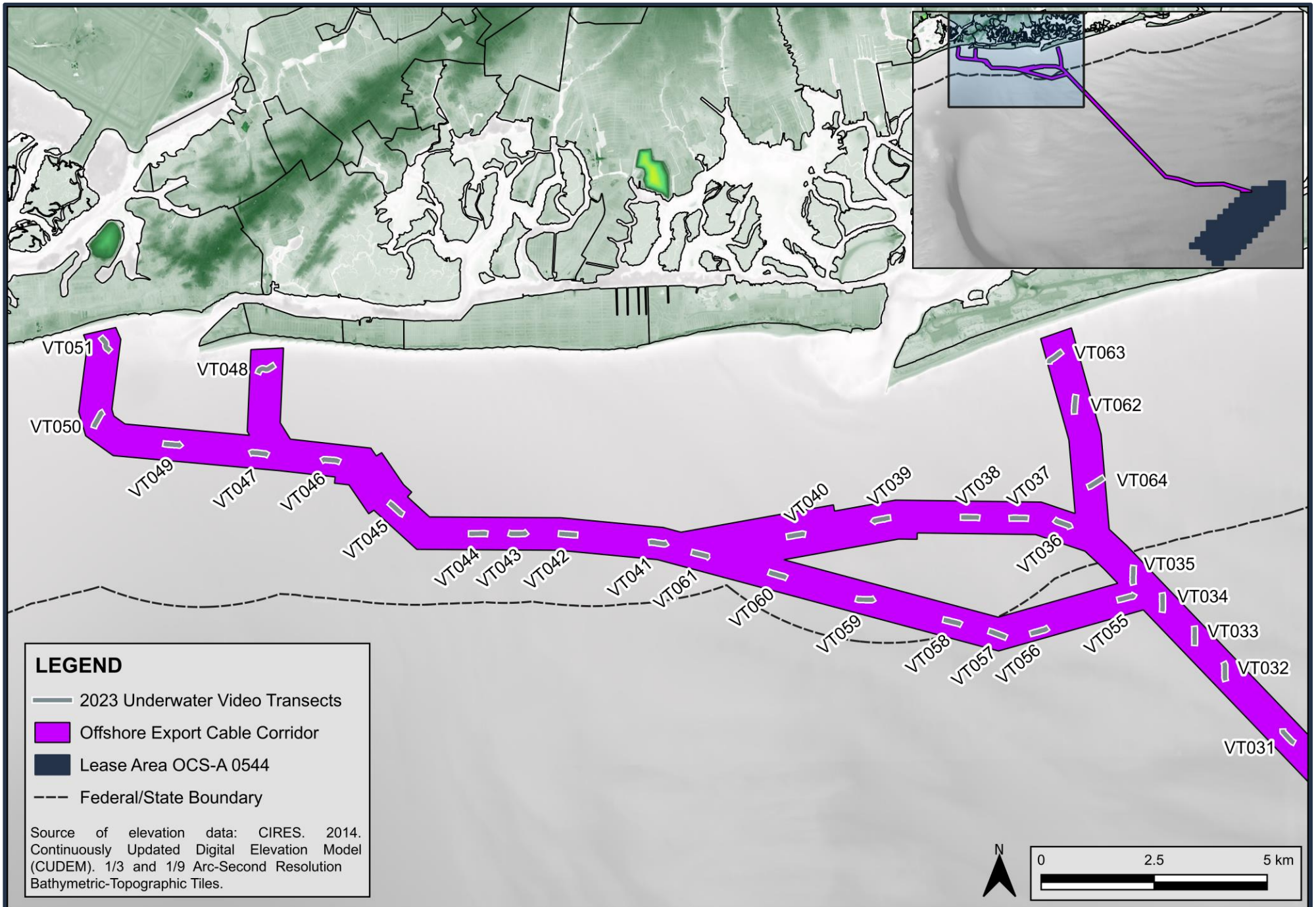


**Figure 1.3-14**

Underwater Video Transects, OECC Offshore

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**Figure 1.3-15**  
Underwater Video Transects, OECC Nearshore



## LEGEND

### NMFS-Modified CMECS Classifications

White Border = Soft Bottom Sample

Black Border = Complex Sample

■ Medium Sand

■ Very Coarse/Coarse Sand

■ Gravelly Sand

■ Lease Area OCS-A 0544

Source of elevation data: CIRES. 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.



**Figure 8.1-1**

Lease Area Benthic Grab Sample CMECS Classifications

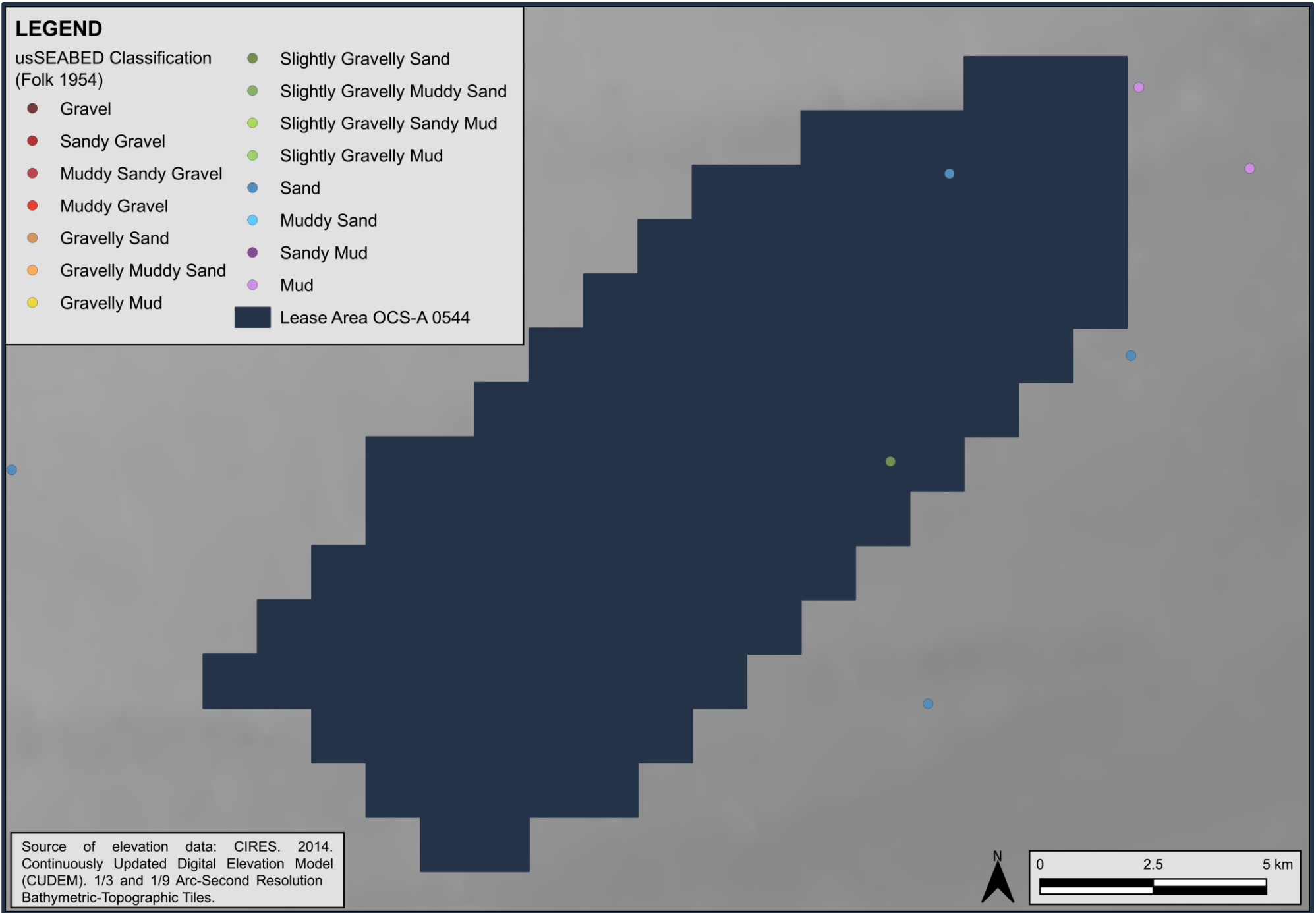
VINEYARD  
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## LEGEND

usSEABED Classification  
(Folk 1954)

- Gravel
- Sandy Gravel
- Muddy Sandy Gravel
- Muddy Gravel
- Gravelly Sand
- Gravelly Muddy Sand
- Gravelly Mud
- Slightly Gravelly Sand
- Slightly Gravelly Muddy Sand
- Slightly Gravelly Sandy Mud
- Slightly Gravelly Mud
- Sand
- Muddy Sand
- Sandy Mud
- Mud
- Lease Area OCS-A 0544



Source of elevation data: CIRES. 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.

**Figure 8.1-2**  
usSEABED Sample Classifications in the Lease Area

VINEYARD  
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VINEYARD OFFSHORE

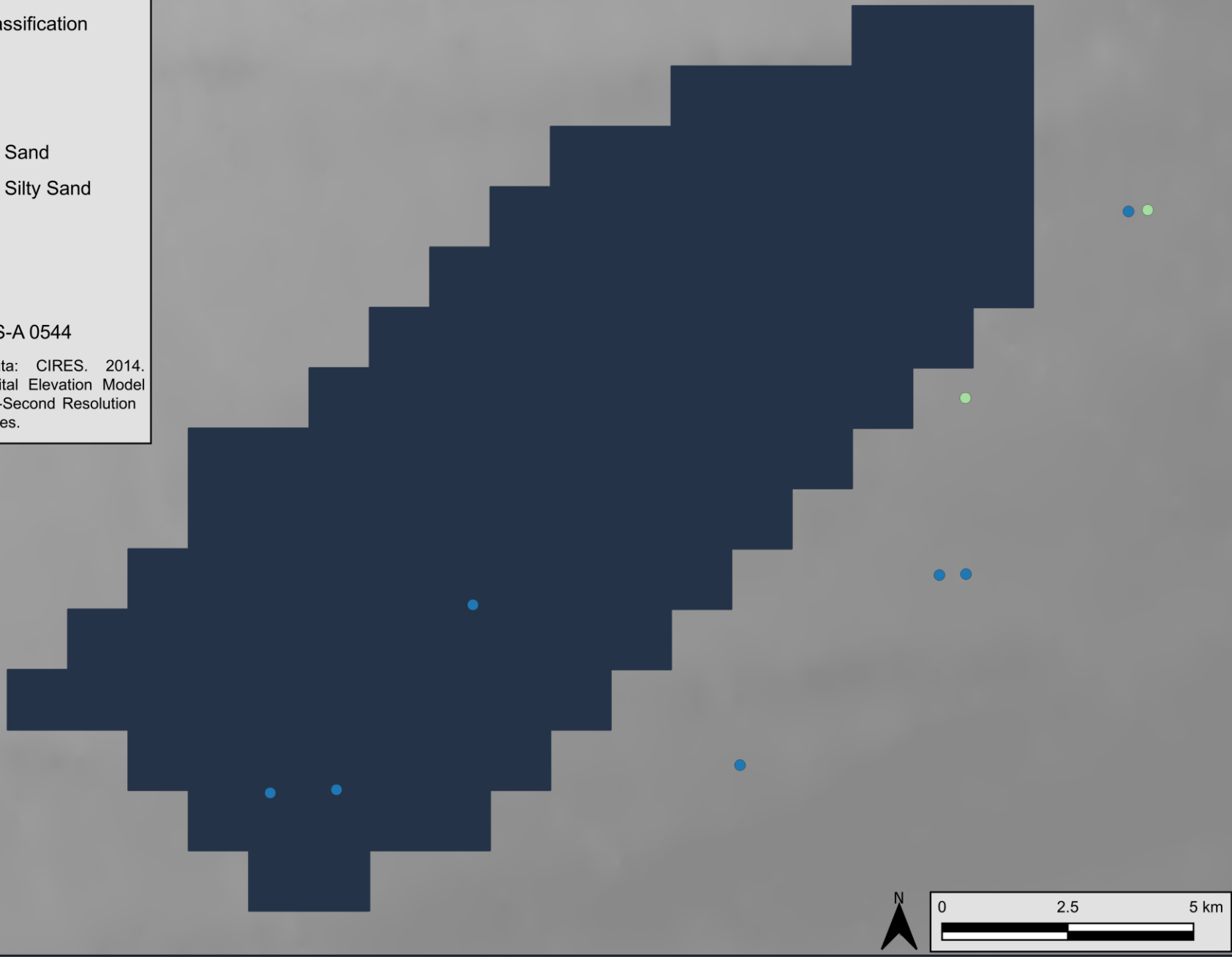
## LEGEND

CMECS Substrate Classification  
(FGDC 2012)

- Sandy Gravel
- Gravelly Sand
- Slightly Gravelly Sand
- Slightly Gravelly Silty Sand
- Sand
- Silty Sand
- Silt

■ Lease Area OCS-A 0544

Source of elevation data: CIRES. 2014.  
Continuously Updated Digital Elevation Model  
(CUDEM). 1/3 and 1/9 Arc-Second Resolution  
Bathymetric-Topographic Tiles.

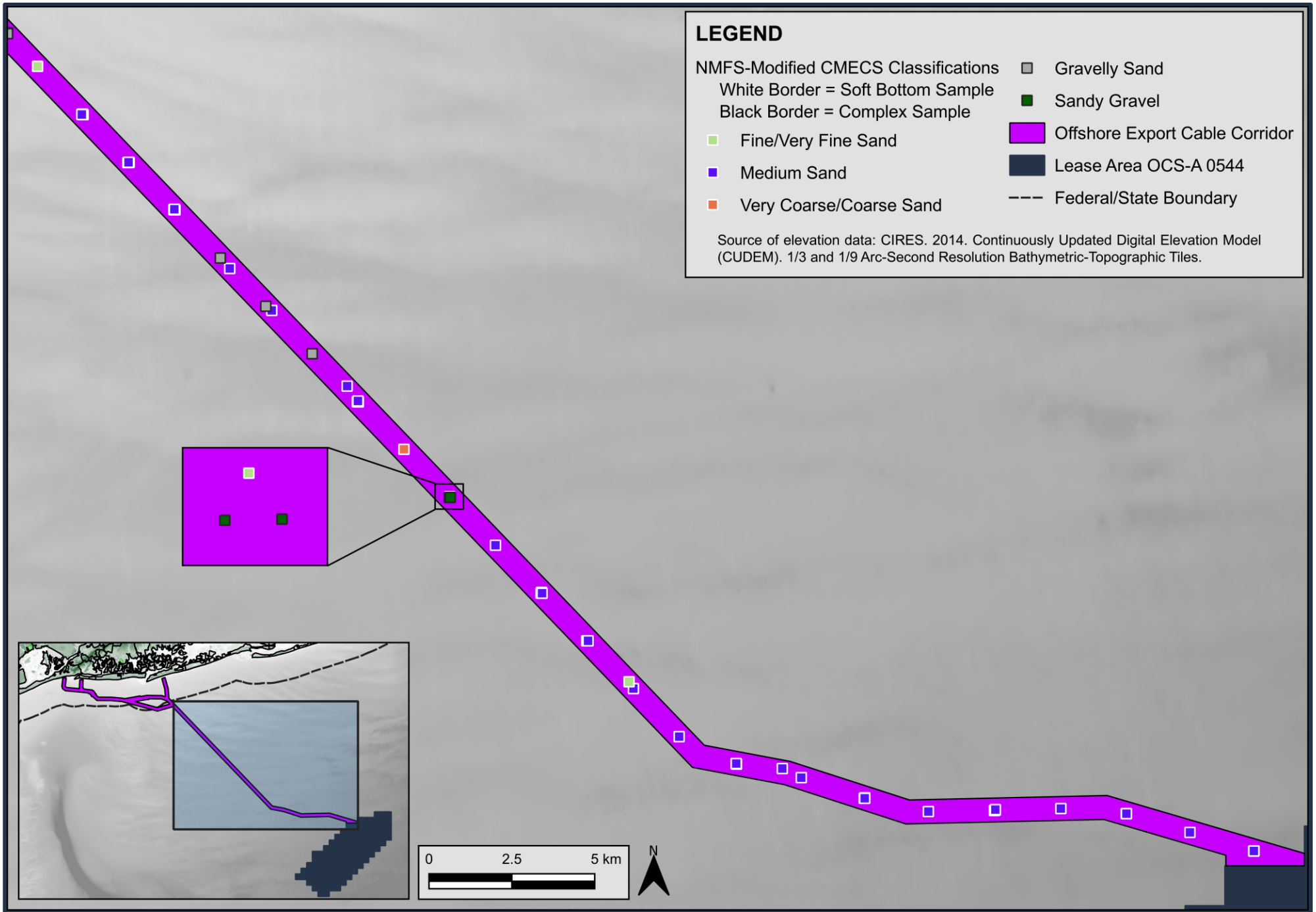


**Figure 8.1-3**

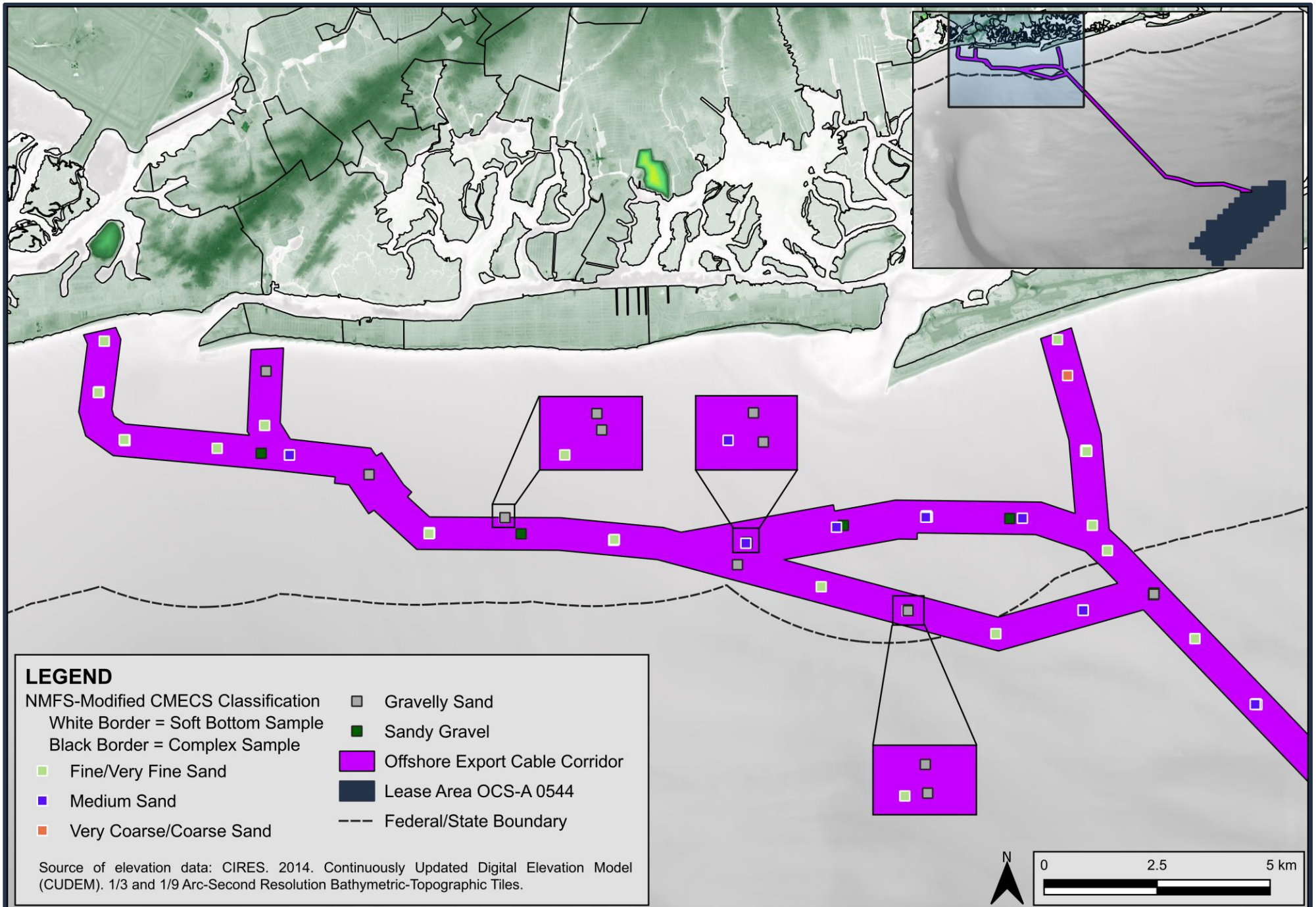
NYSERDA SPI/PV Image Classifications in the Lease Area

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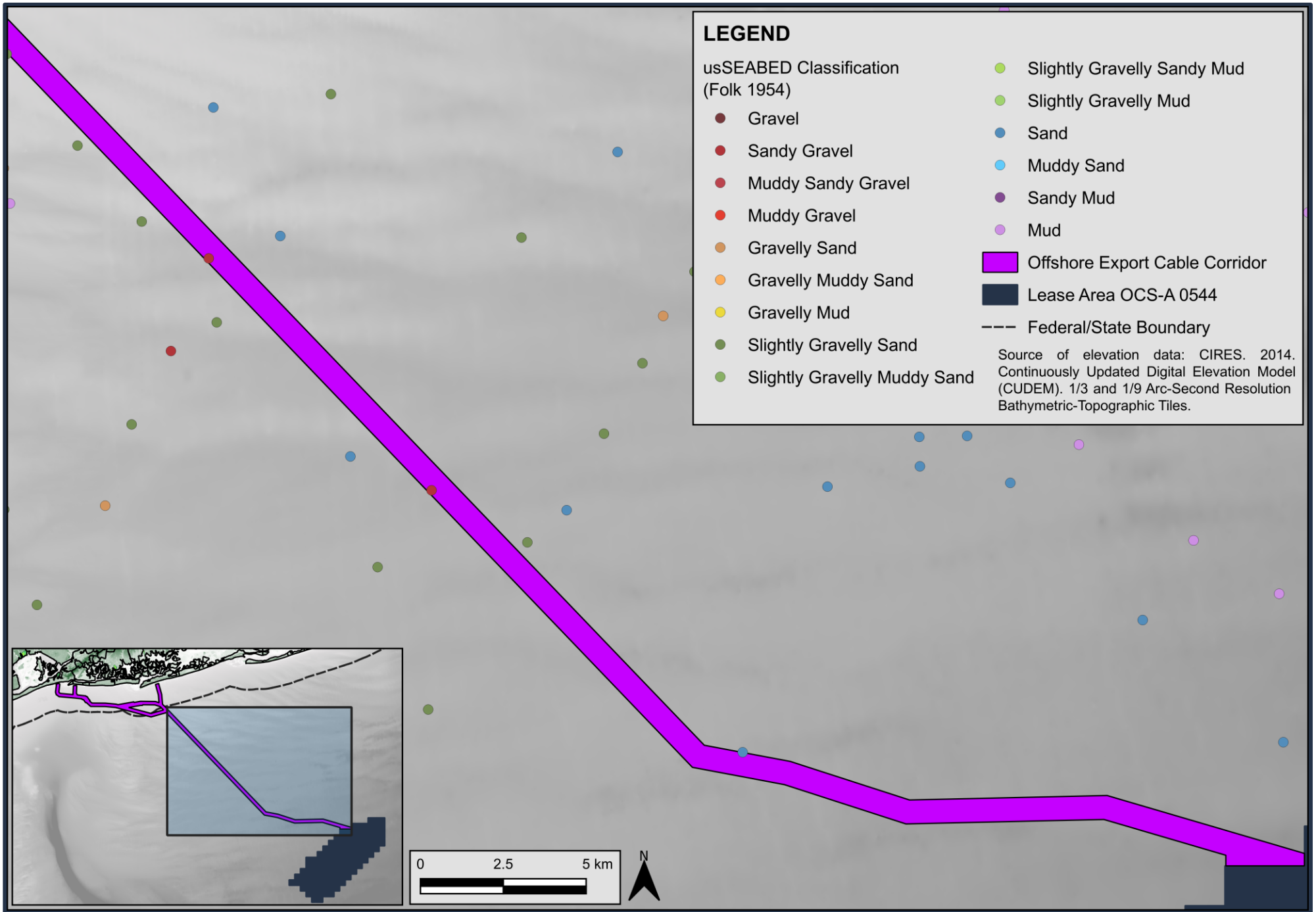
VINEYARD OFFSHORE



**Figure 8.1-4**  
 OECC Benthic Grab Sample CMECS Classifications, Offshore



**Figure 8.1-5**  
OECC Benthic Grab Sample CMECS Classifications, Nearshore



**Figure 8.1-6**  
usSEABED Sample Classifications in the OECC, Offshore

**LEGEND**

usSEABED Classification  
(Folk 1954)

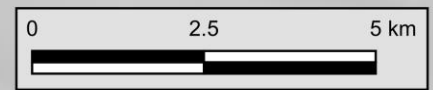
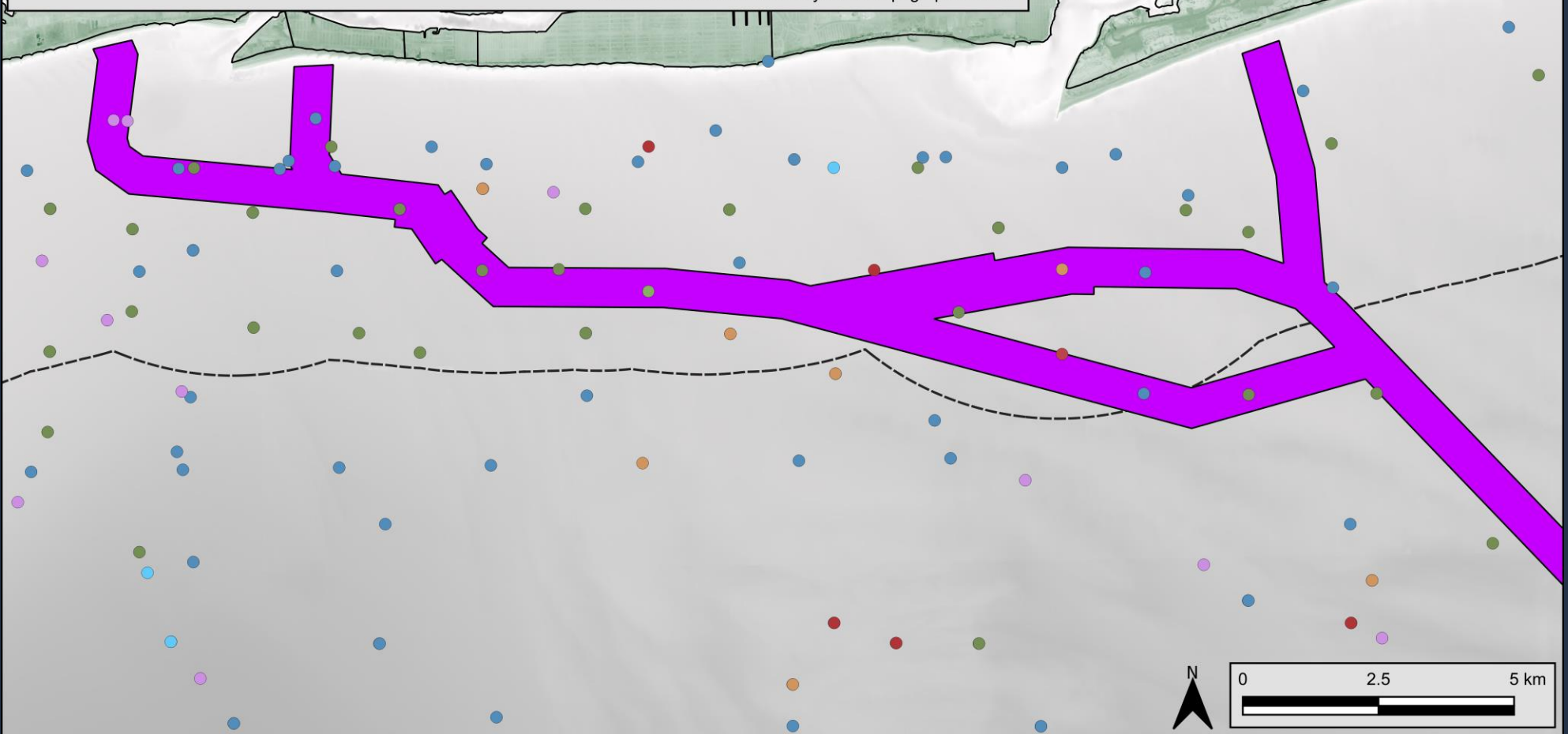
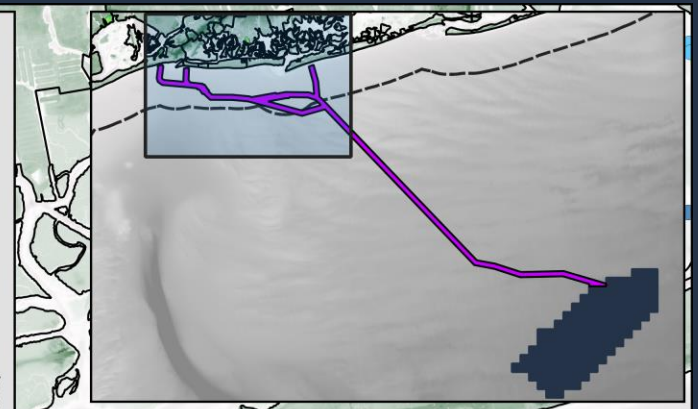
- Gravel
- Sandy Gravel
- Muddy Sandy Gravel
- Muddy Gravel
- Gravelly Sand

- Gravelly Muddy Sand
- Gravelly Mud
- Slightly Gravelly Sand
- Slightly Gravelly Muddy Sand
- Slightly Gravelly Sandy Mud
- Slightly Gravelly Mud
- Sand

- Muddy Sand
- Sandy Mud
- Mud

- █ Offshore Export Cable Corridor
- █ Lease Area OCS-A 0544
- Federal/State Boundary

Source of elevation data: CIRES, 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.



**Figure 8.1-7**




usSEABED Sample Classifications in the OECC, Nearshore

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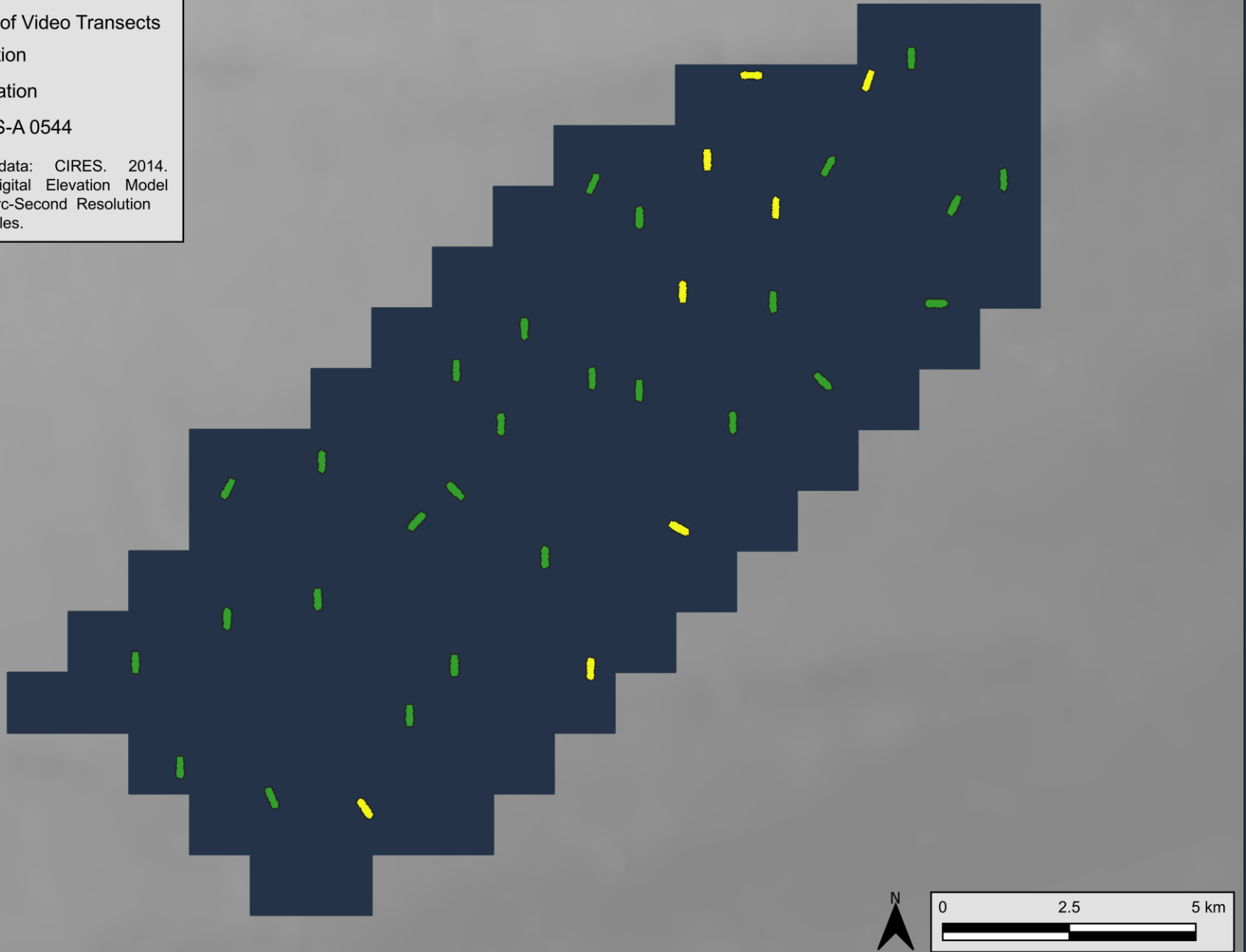
VINEYARD OFFSHORE

## LEGEND

### NMFS Classifications of Video Transects

-  Soft Bottom Station
-  Complex Mix Station
-  Lease Area OCS-A 0544

Source of elevation data: CIRES, 2014.  
Continuously Updated Digital Elevation Model  
(CUDEM), 1/3 and 1/9 Arc-Second Resolution  
Bathymetric-Topographic Tiles.



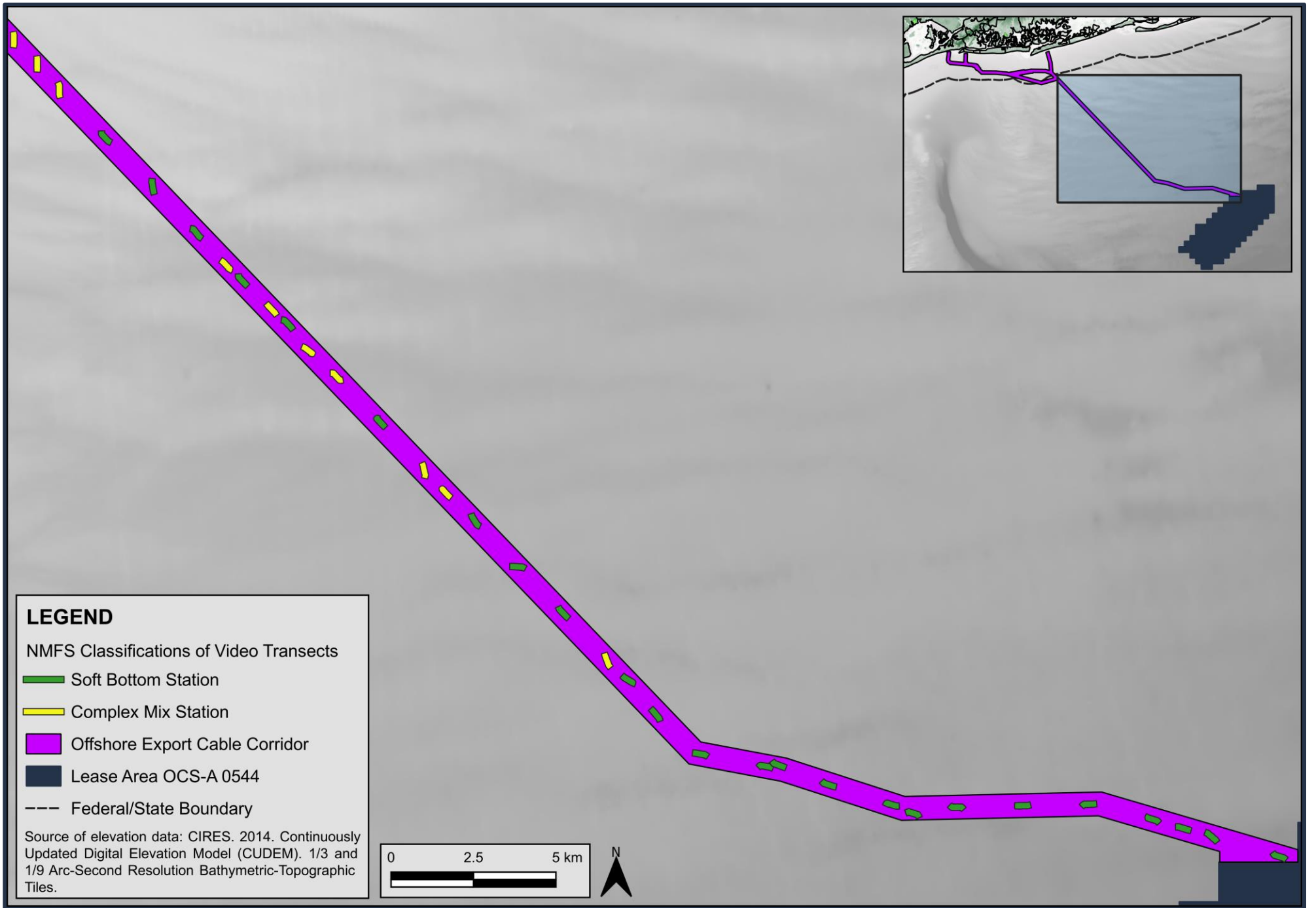
**Figure 8.1-8**

Lease Area Video Transect NMFS Classifications

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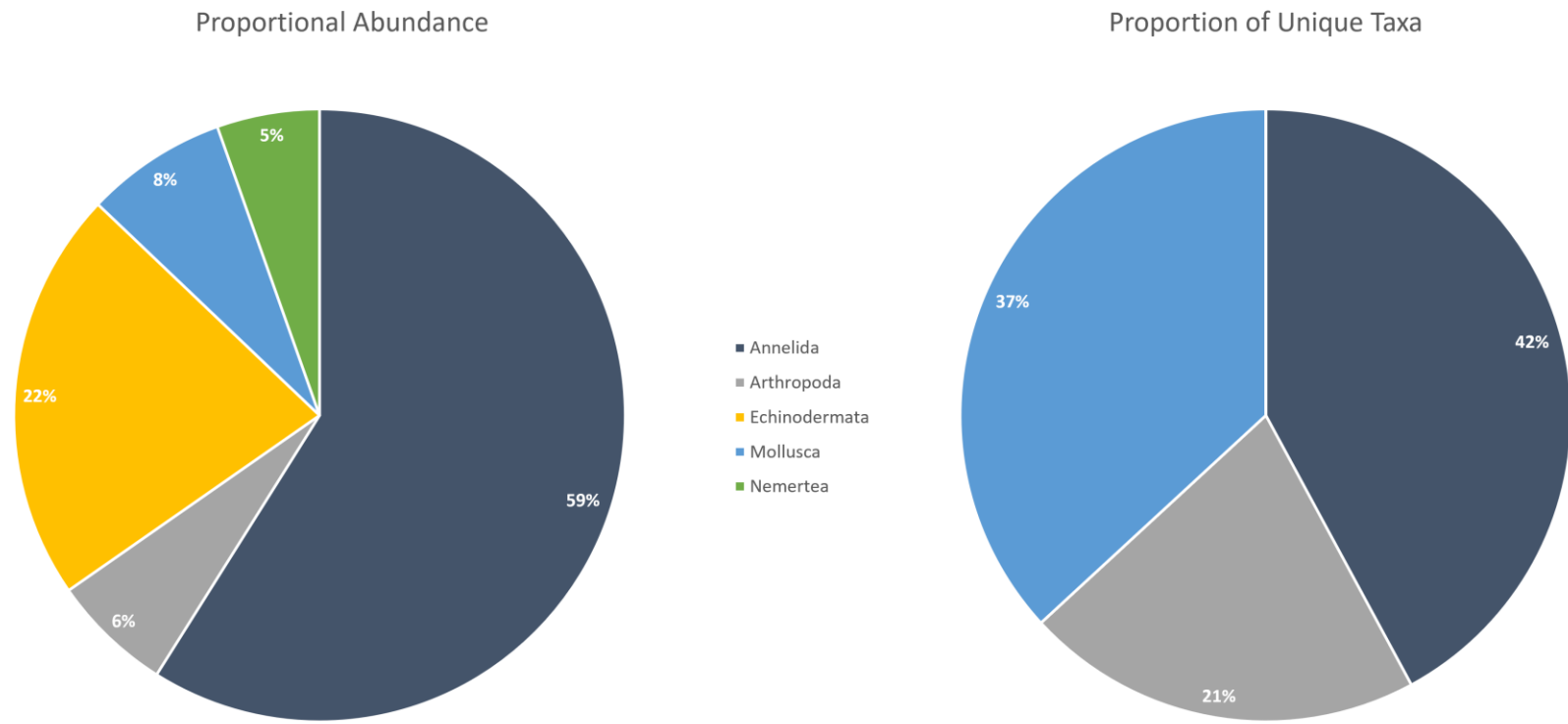




**Figure 8.1-9**  
OECC Video Transect NMFS Classifications, Offshore

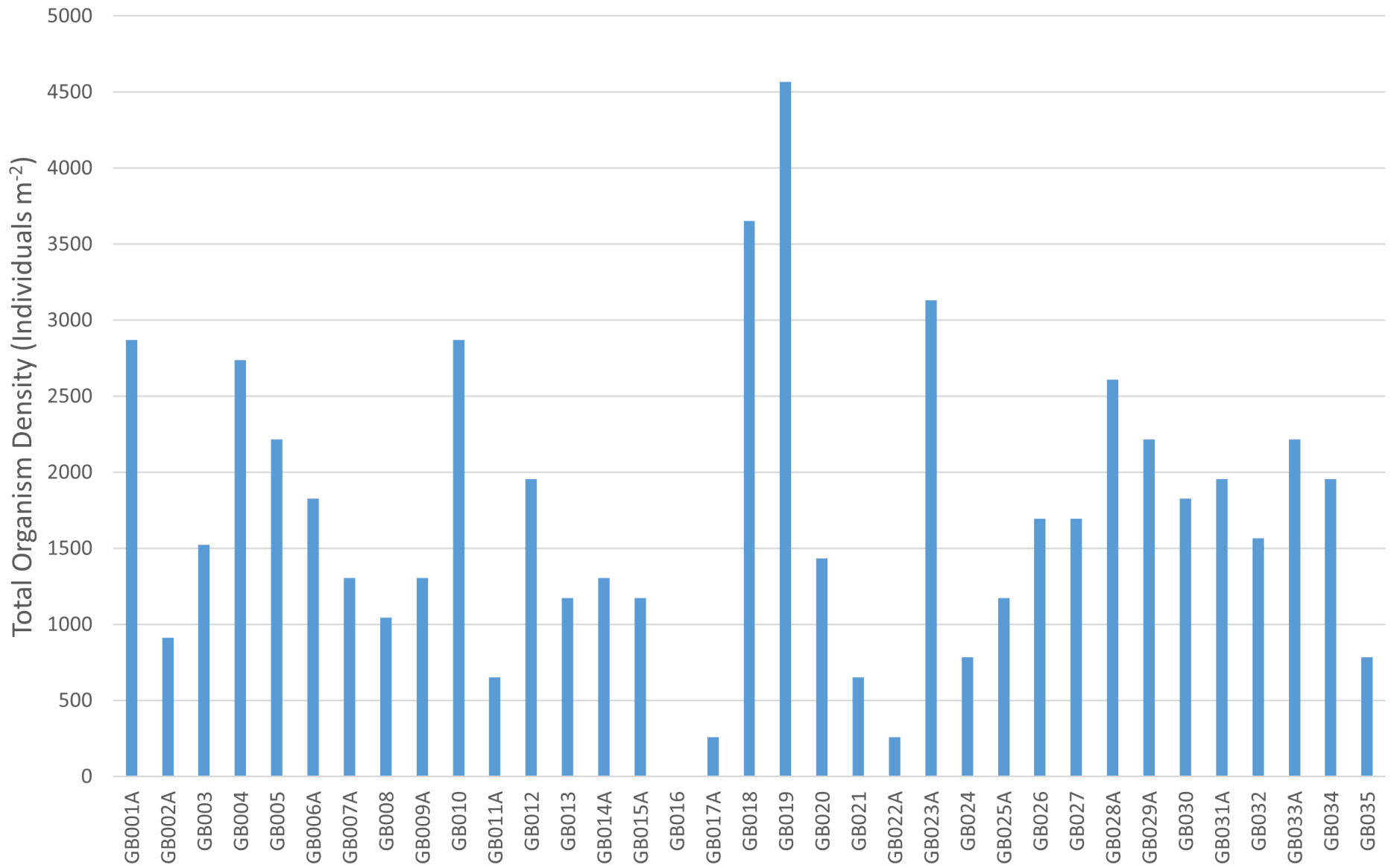


**Figure 8.1-10**  
 OECC Video Transect NMFS Classifications, Nearshore



**Figure 8.1-11**  
 Infauna Proportional Abundance and Unique Taxa by Phylum in the Lease Area

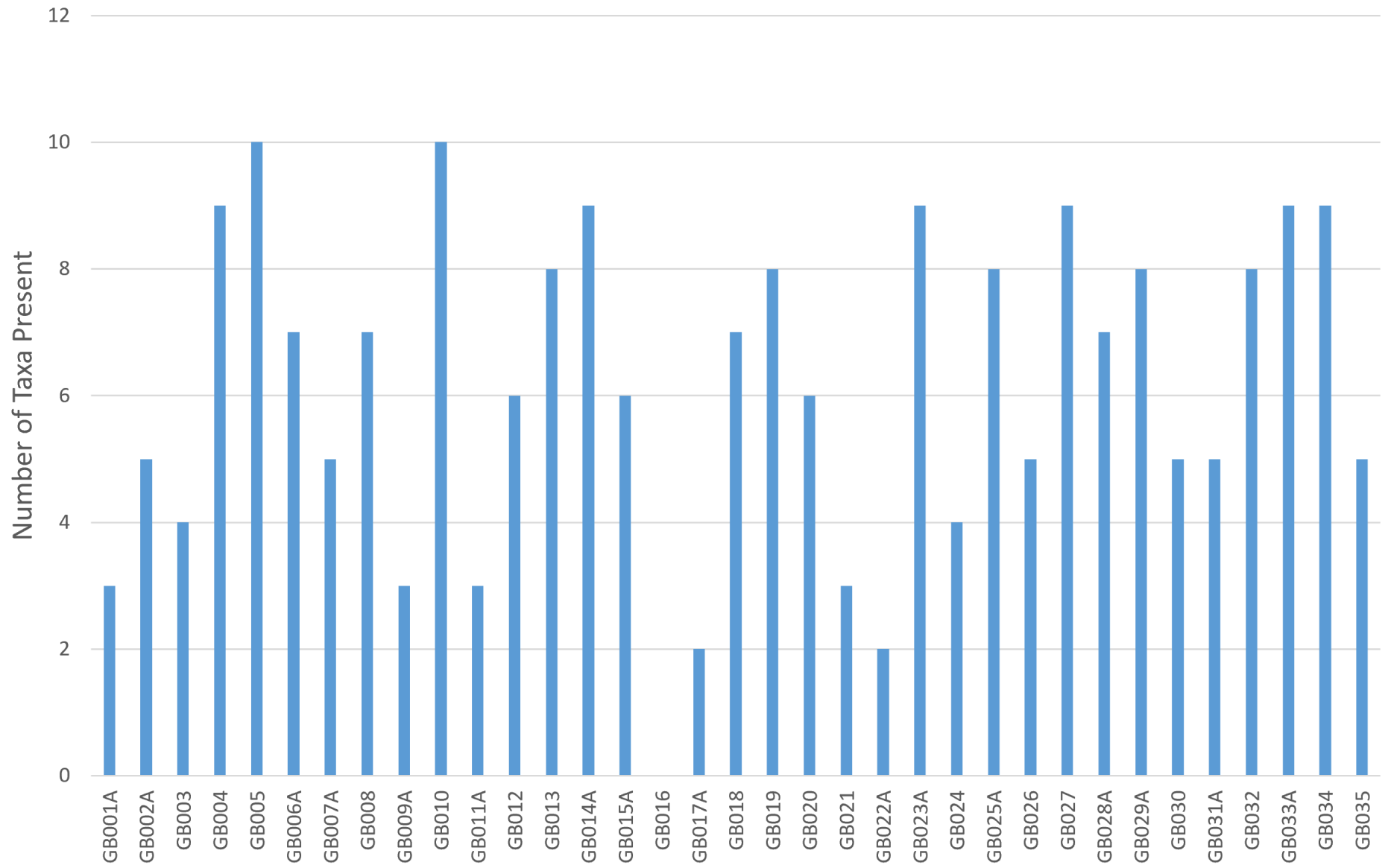
# Lease Area Infauna Density



Note: No infauna were present in GB016

**Figure 8.1-12**  
Lease Area Infauna Density

# Lease Area Infauna Taxonomic Richness

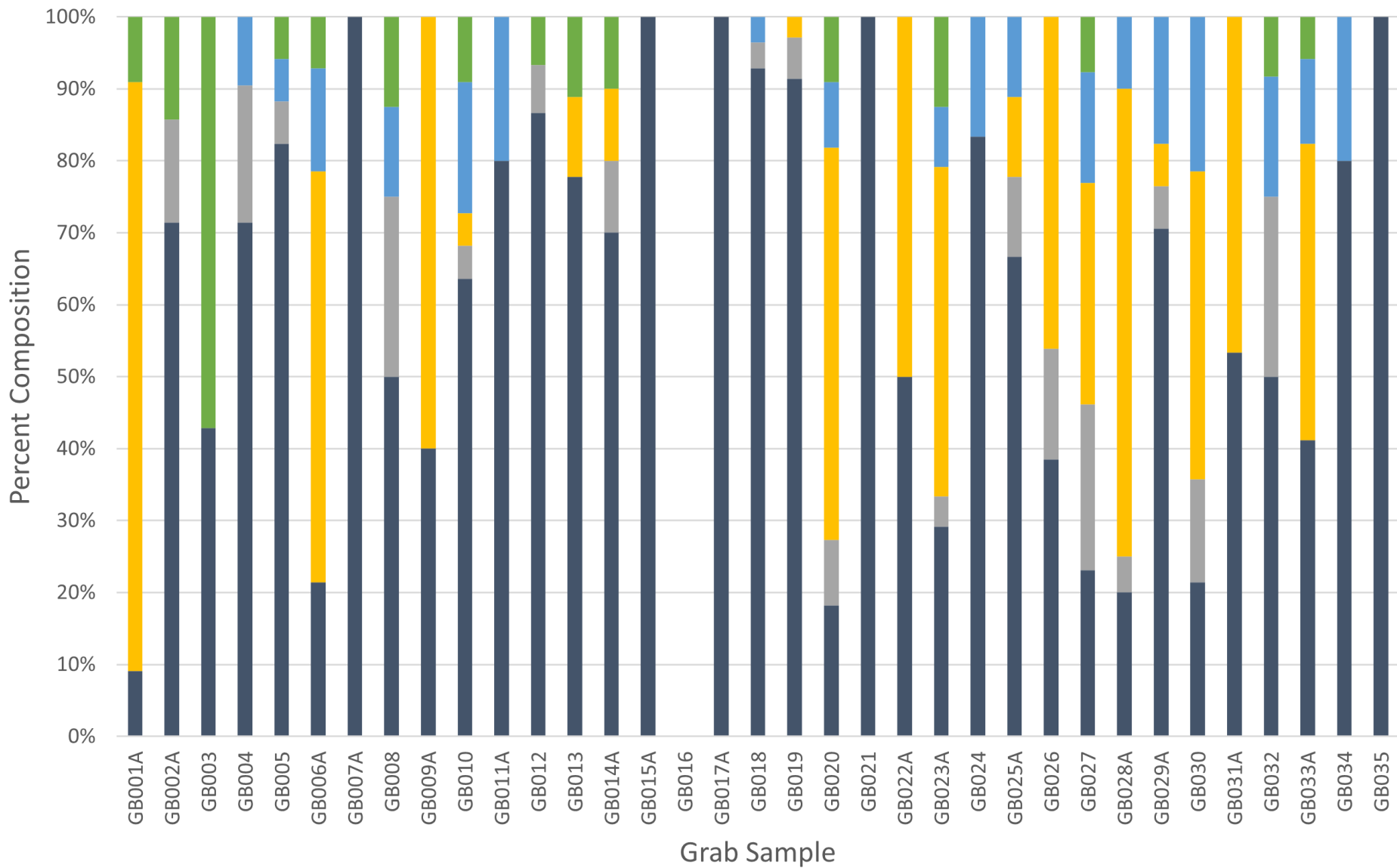


Note: No infauna were present in GB016

**Figure 8.1-13**

Lease Area Infauna Taxonomic Richness

## Lease Area Infauna Community Summary

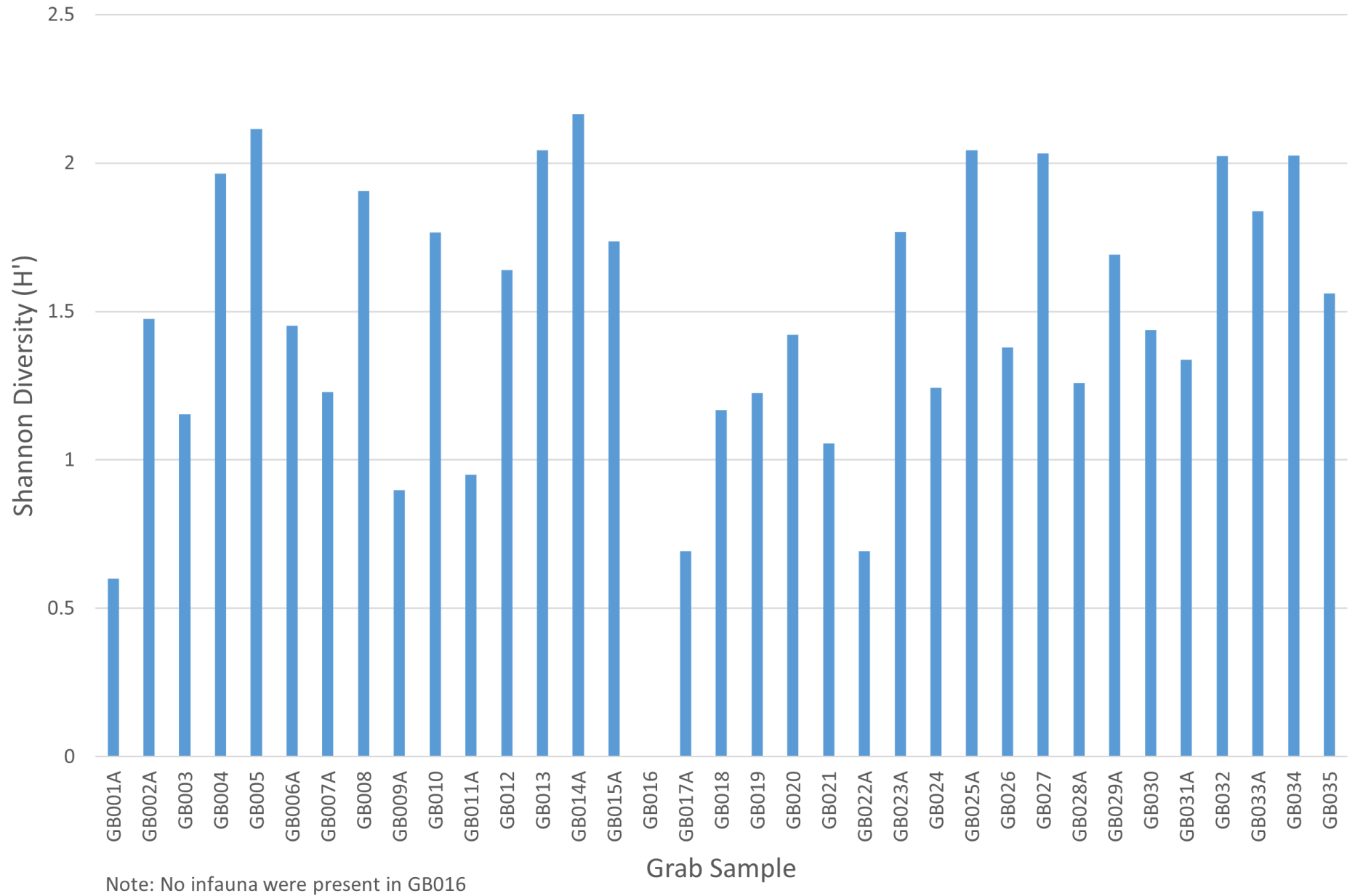


Note: No infauna were present in GB016

Annelida
  Arthropoda
  Echinodermata
  Mollusca
  Nemertea

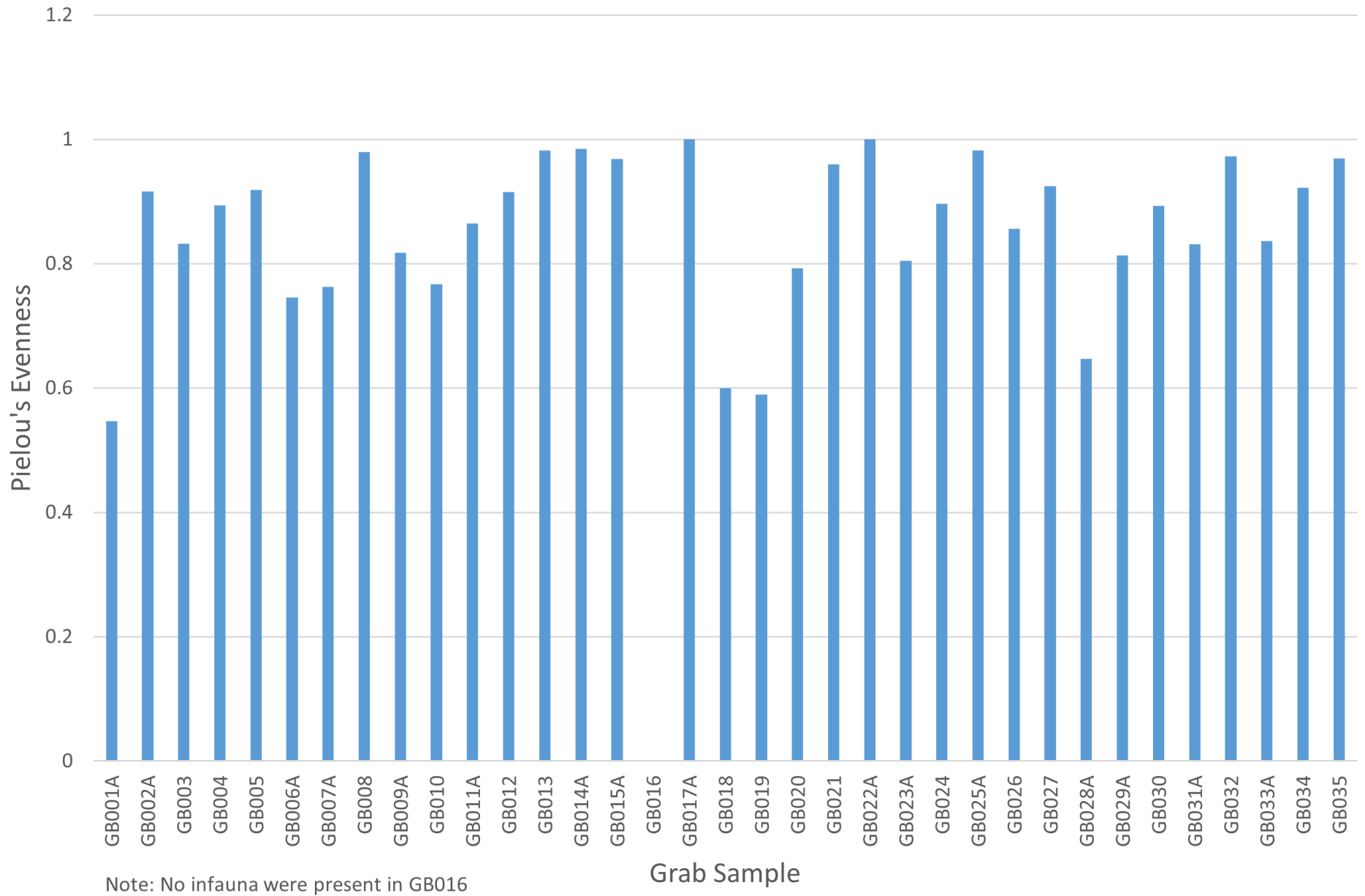
**Figure 8.1-14**  
Lease Area Infauna Community Summary

# Lease Area Infauna Diversity



**Figure 8.1-15**  
Lease Area Infauna Diversity

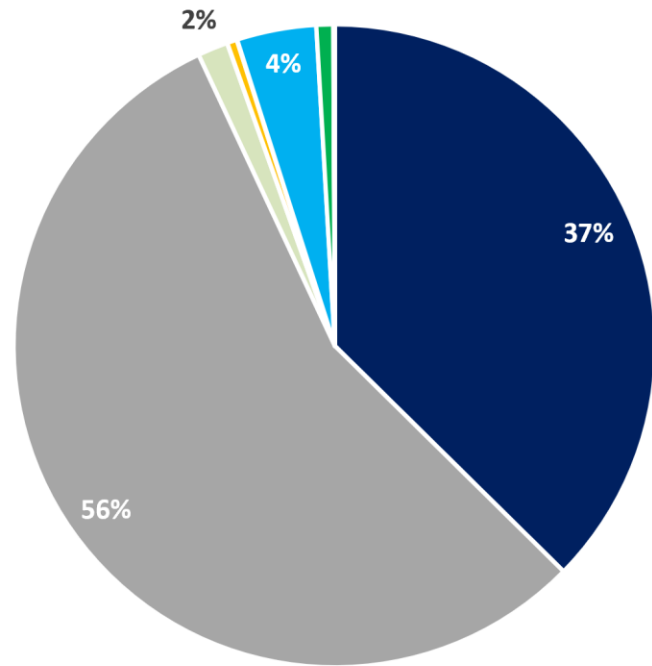
# Lease Area Infauna Evenness



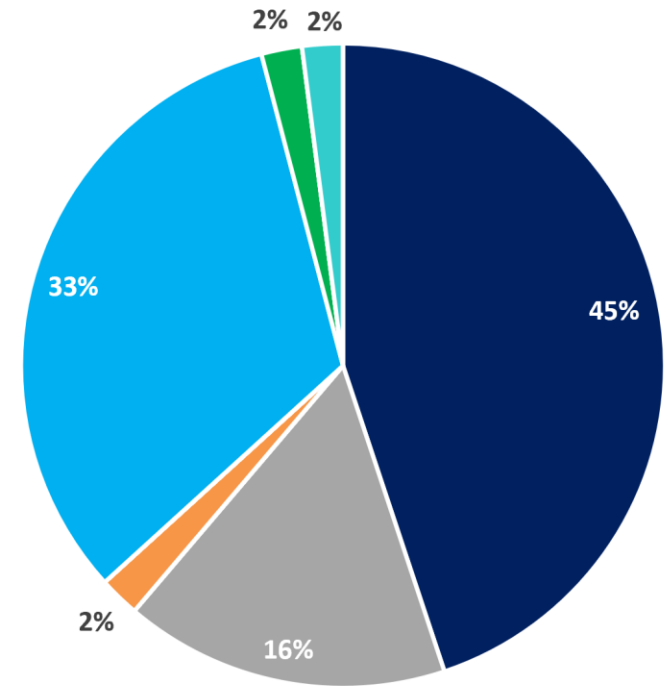
**Figure 8.1-16**  
Lease Area Infauna Evenness



Proportional Abundance



Proportion of Unique Taxa



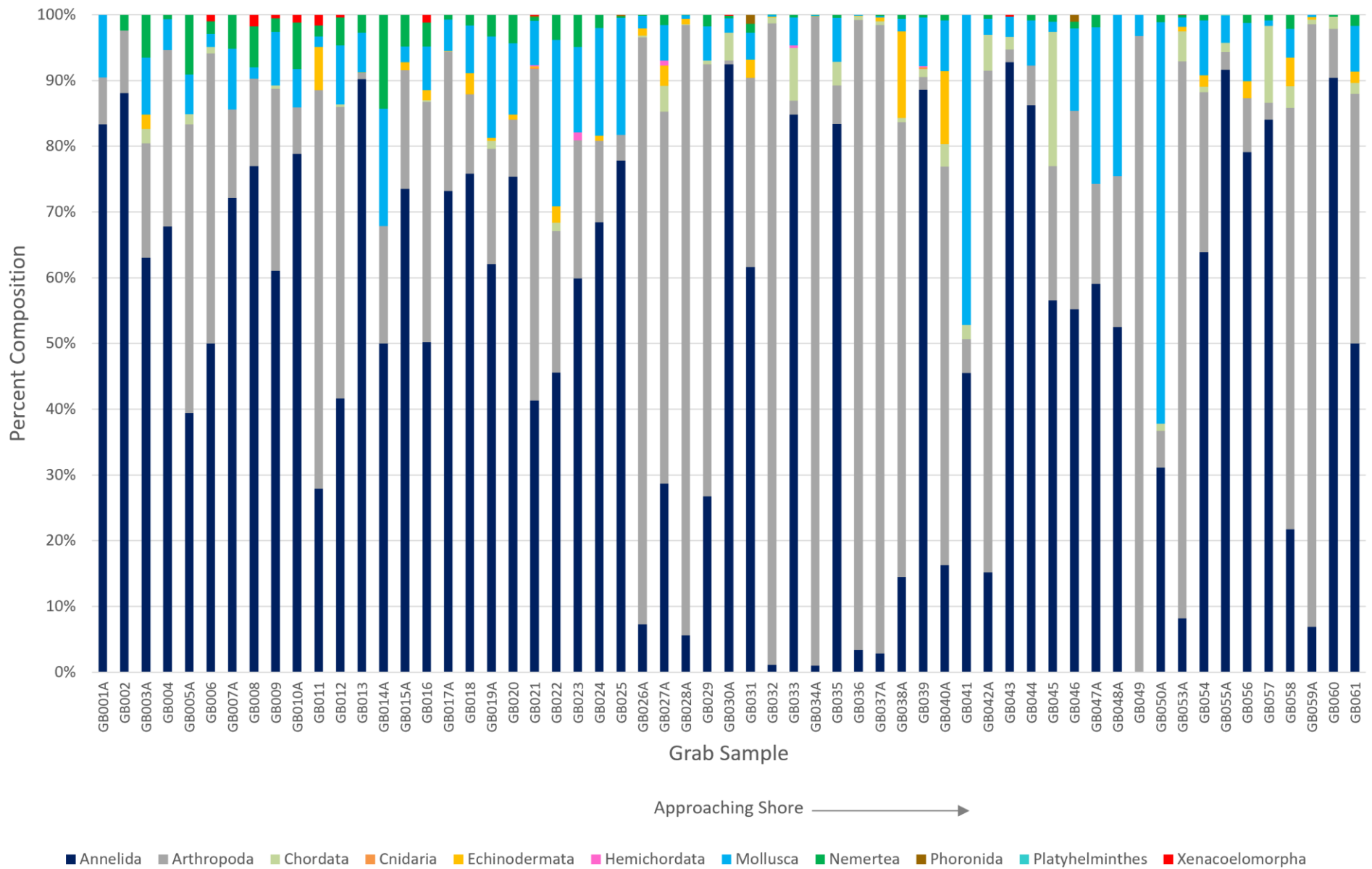
- Annelida
- Arthropoda
- Chordata
- Cnidaria\*
- Echinodermata\*
- Hemichordata\*
- Mollusca
- Nemertea\*
- Phoronida\*
- Platyhelminthes\*
- Xenacoelomorpha\*

\* Represents Phyla Responsible for <1% of Total Abundance

**Figure 8.1-17**

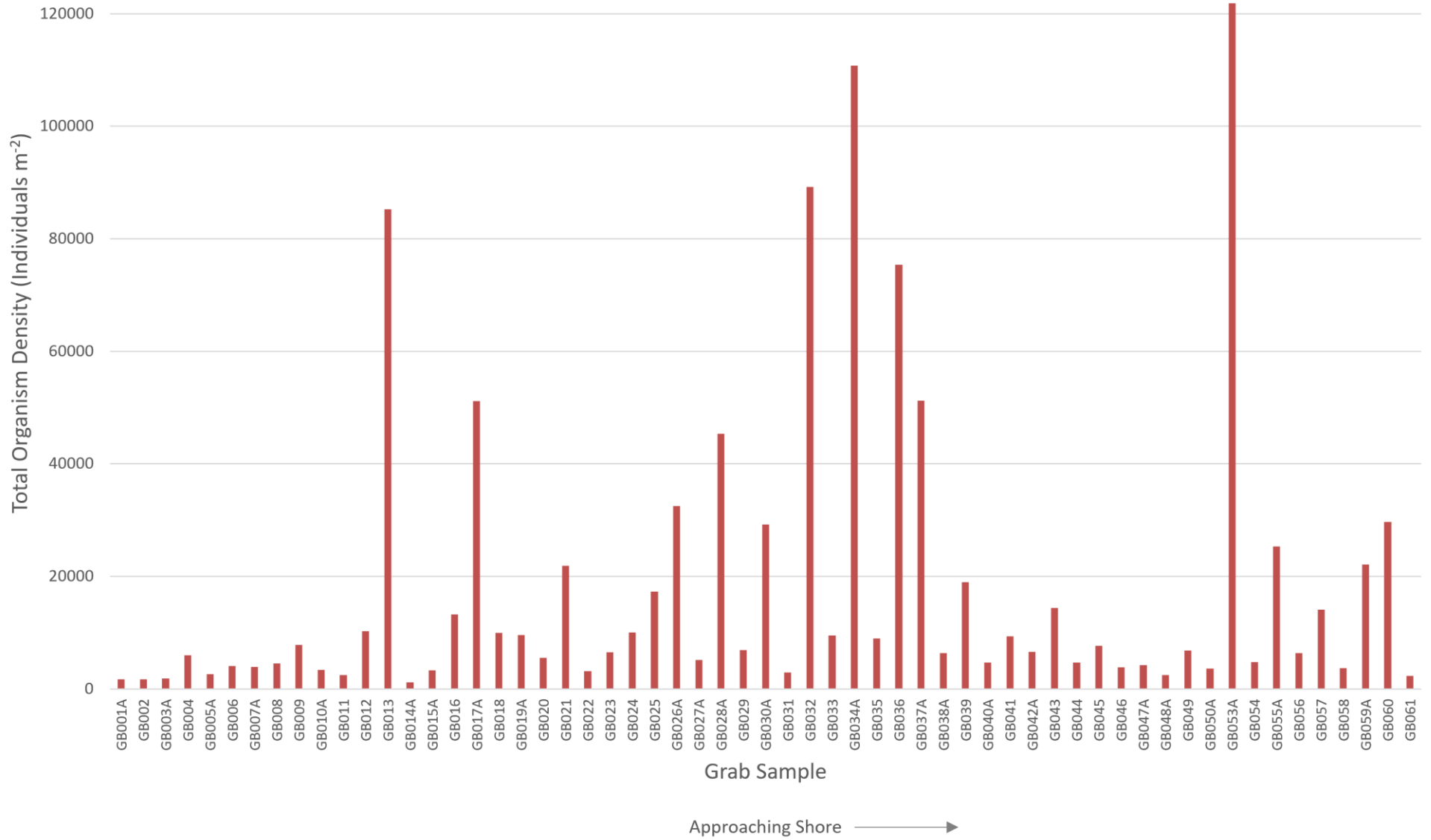
Infauna Proportional Abundance and Unique Taxa by Phylum in the OECC

### OECC Infauna Community Summary



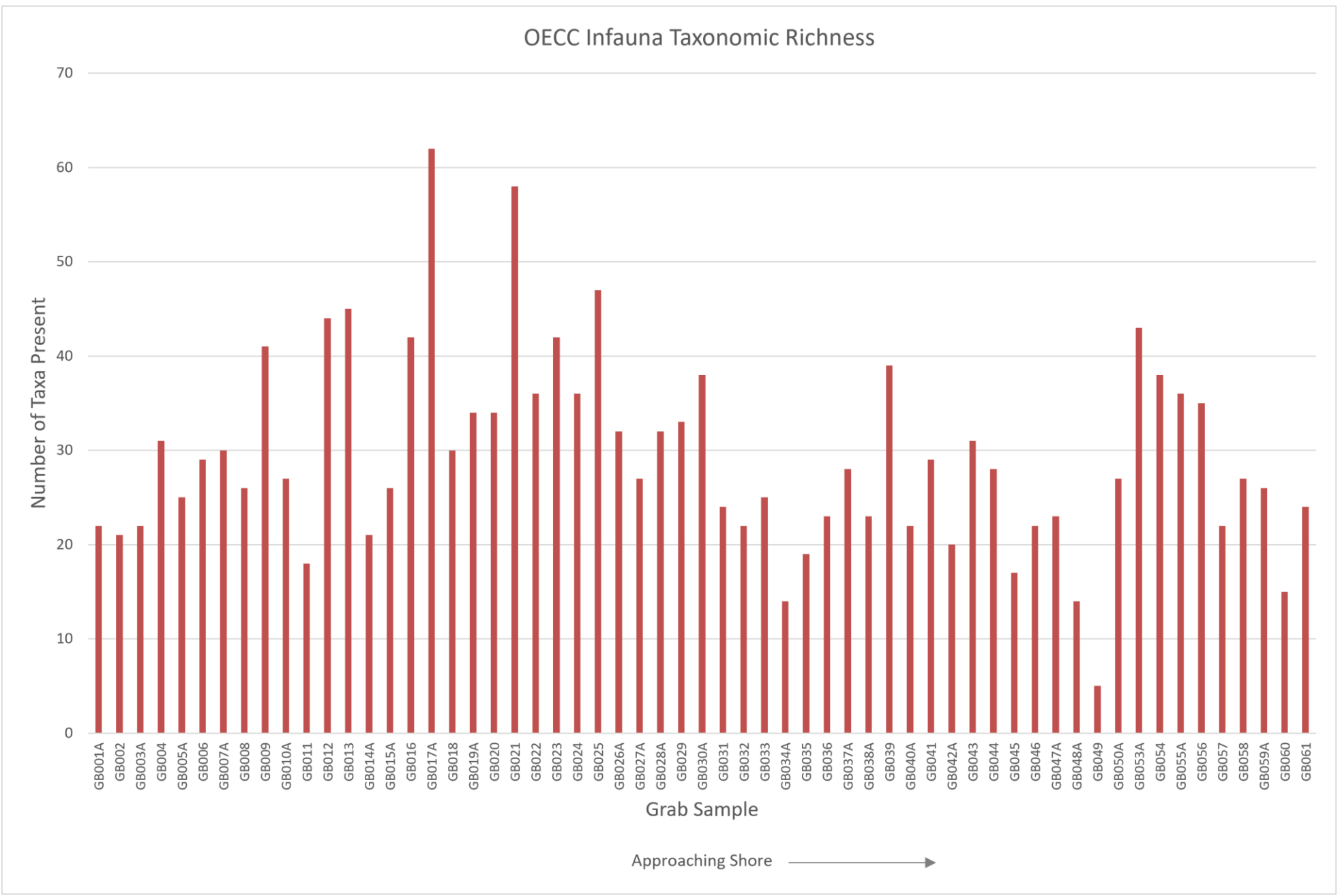
**Figure 8.1-18**  
OECC Infauna Community Summary

### OECC Infauna Density



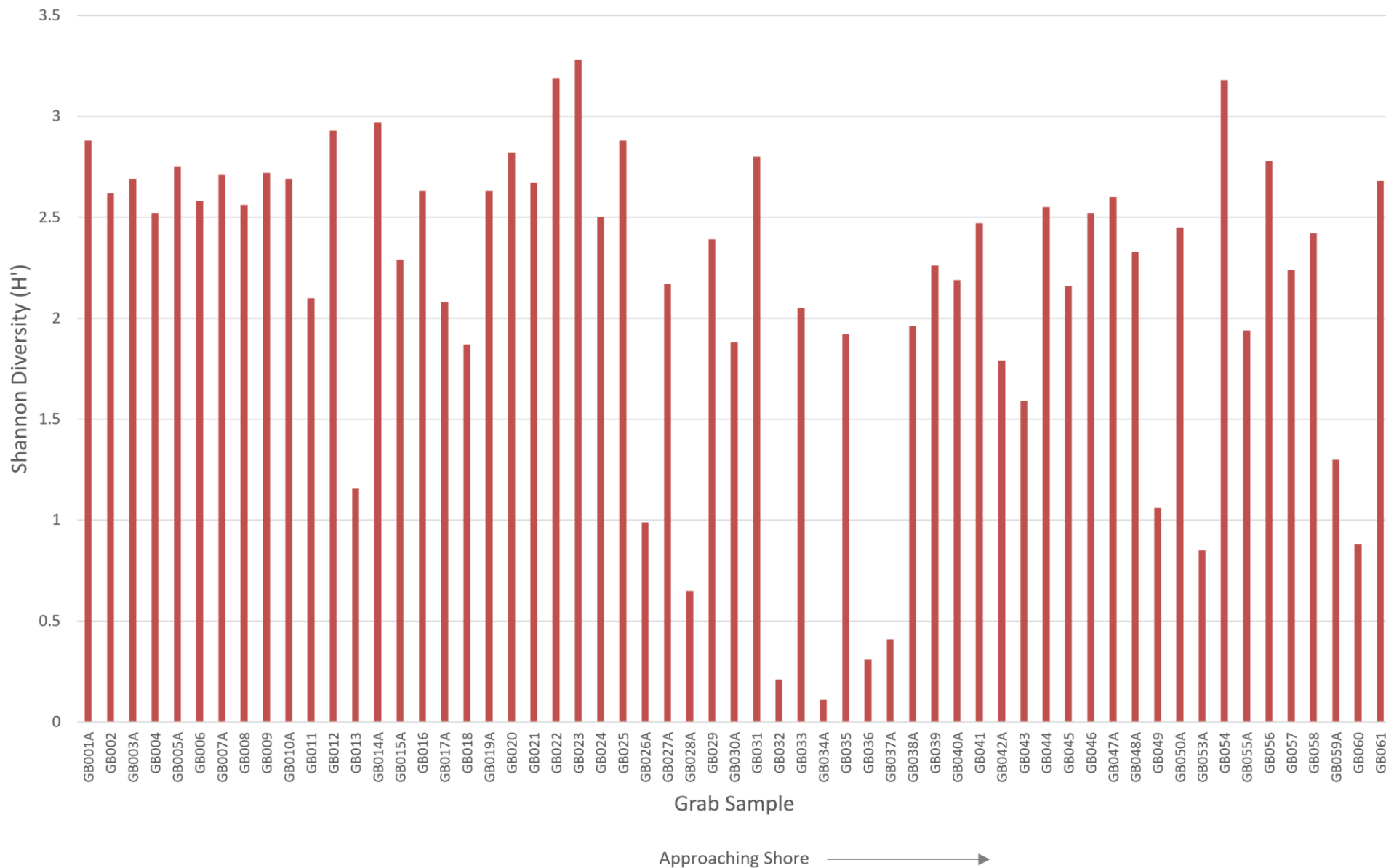
**Figure 8.1-19**  
OECC Infauna Density

### OECC Infauna Taxonomic Richness



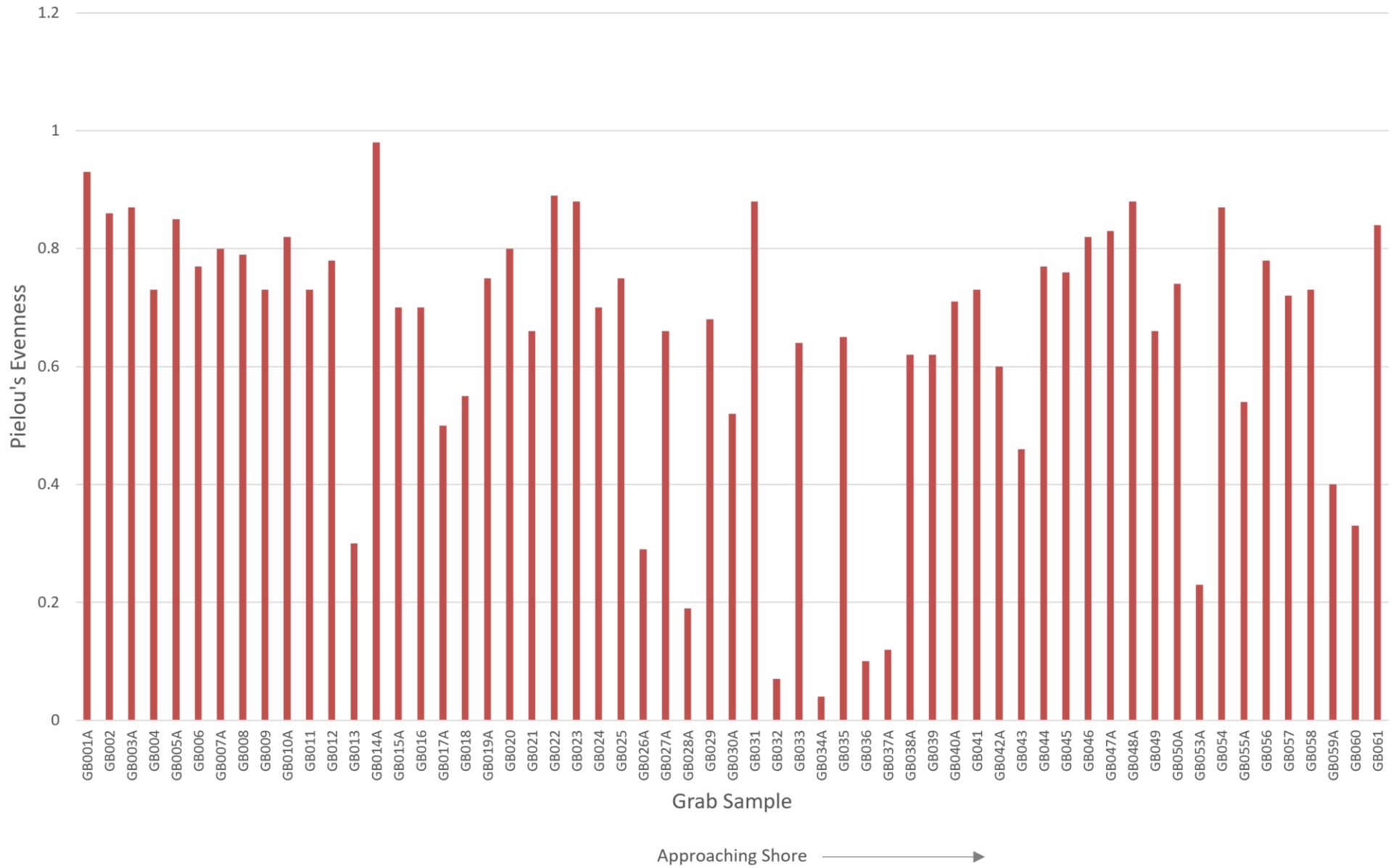
**Figure 8.1-20**  
OECC Infauna Taxonomic Richness

### OECC Infauna Diversity



**Figure 8.1-21**  
OECC Infauna Diversity

### OECC Infauna Evenness

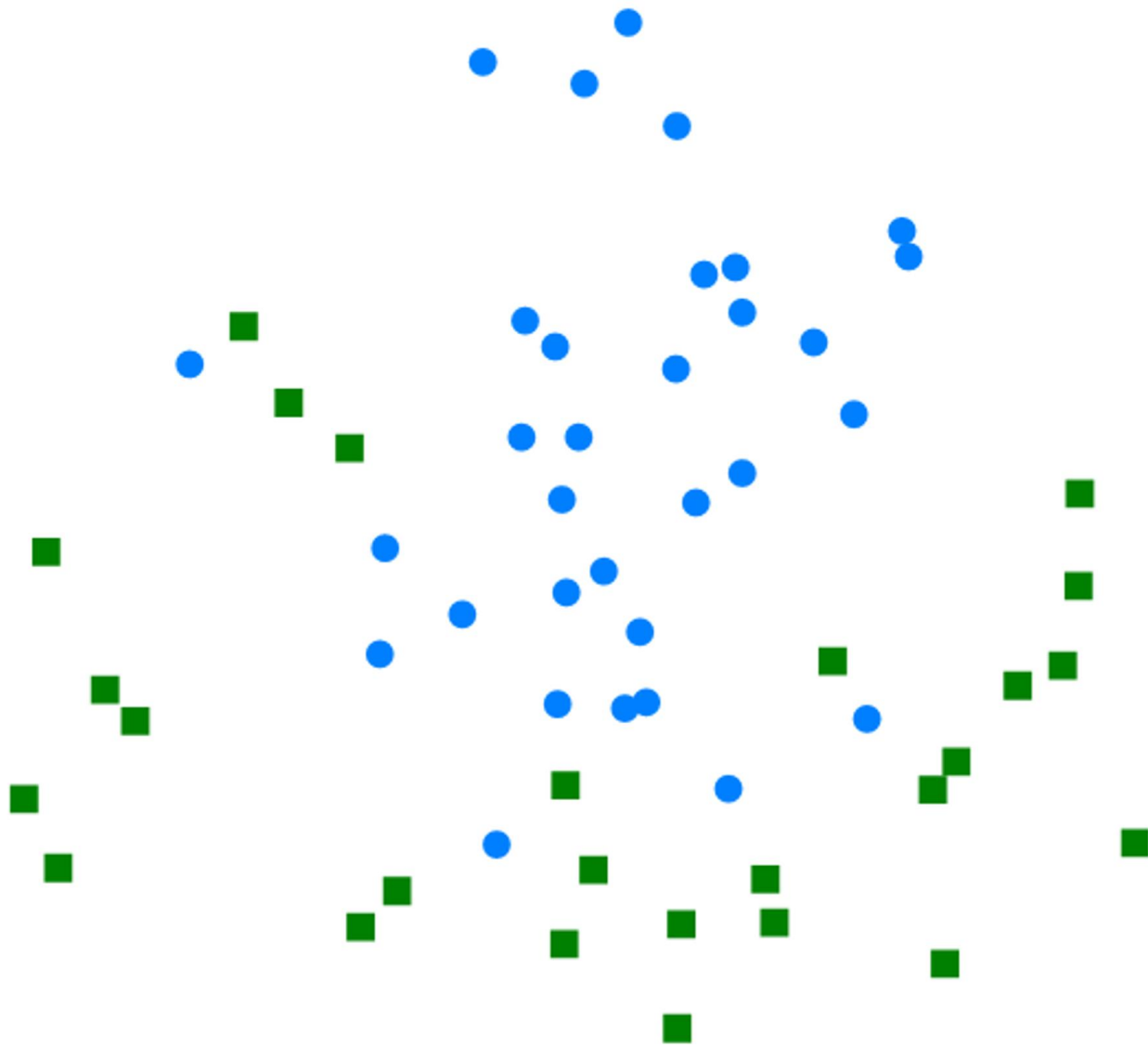


**Figure 8.1-22**  
OECC Infauna Evenness

2D Stress: 0.24

LOCATION

- Offshore
- Nearshore



Transform: Fourth root  
Resemblance: S17 Bray-Curtis similarity

**Figure 8.1-23**

NMDS Ordination of Community Composition in OECC Benthic Infauna Samples Comparing Nearshore and Offshore Waters

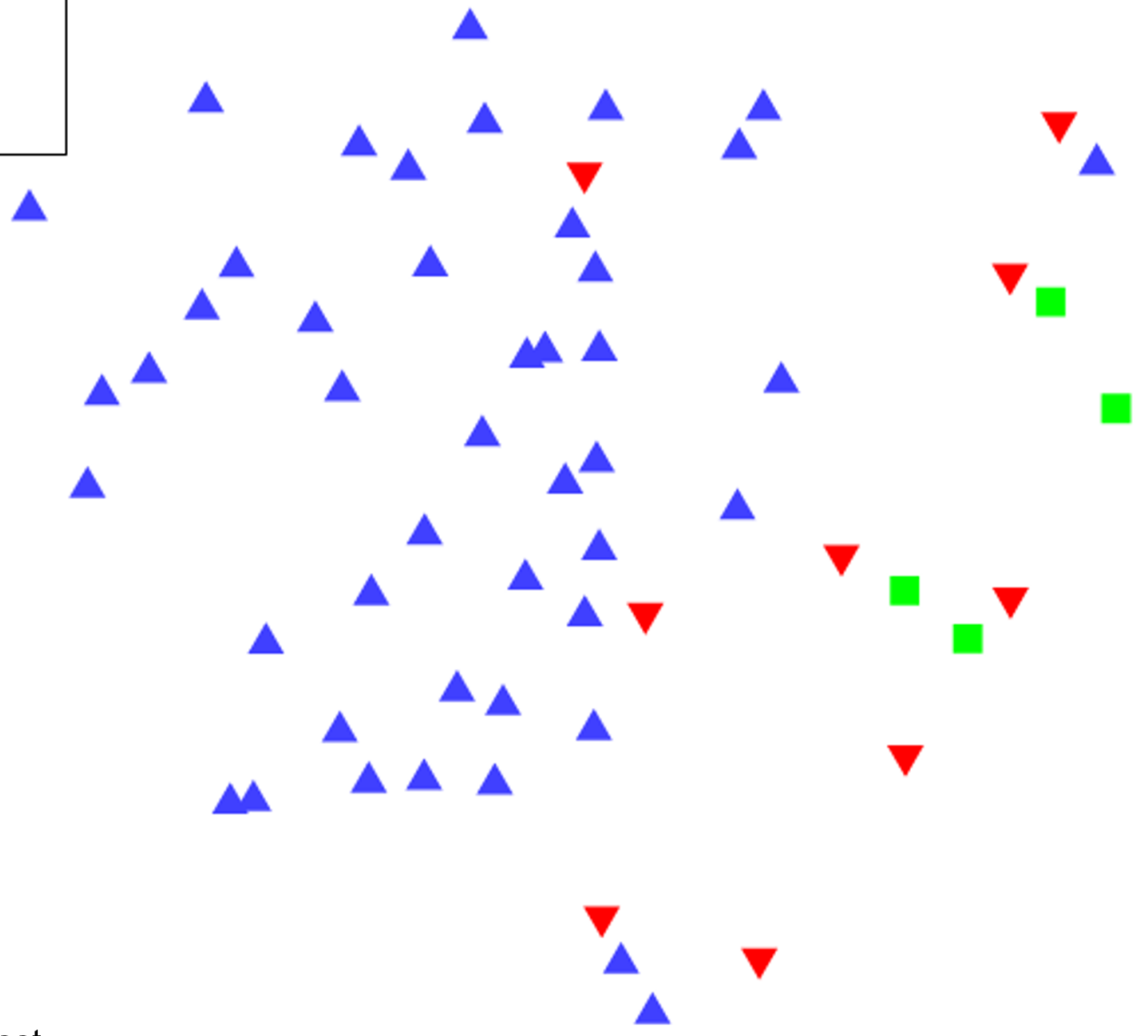
VINEYARD  
MID-ATLANTIC

VINEYARD  OFFSHORE

CMECS GROUP

- ▲ Sand
- ▼ Gravelly
- Gravel Mixes

2D Stress: 0.24



Transform: Fourth root  
Resemblance: S17 Bray-Curtis similarity

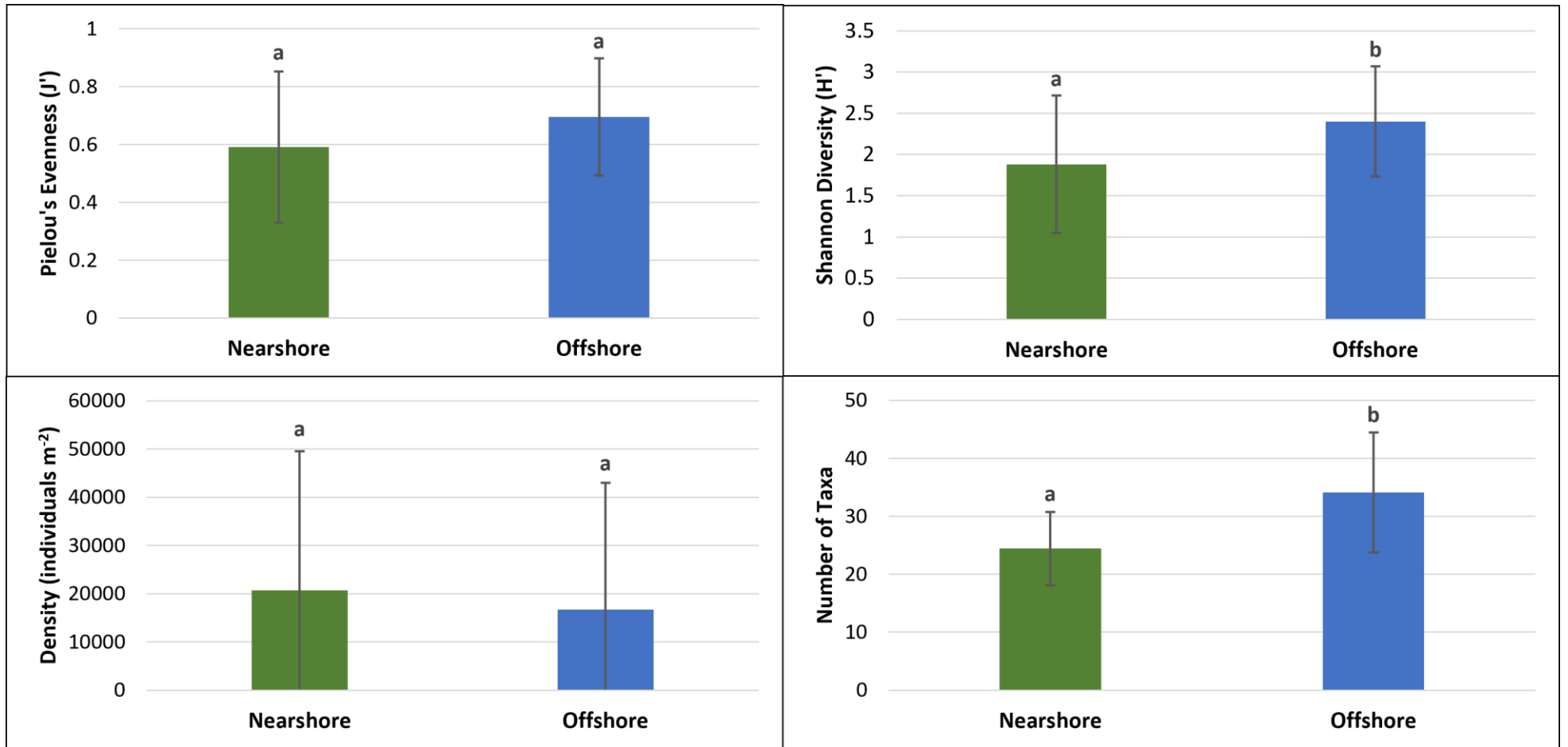
**Figure 8.1-24**

NMDS Ordination of Community Composition in OECC Benthic Infauna Samples by CMECS Substrate Group

VINEYARD  
MID-ATLANTIC

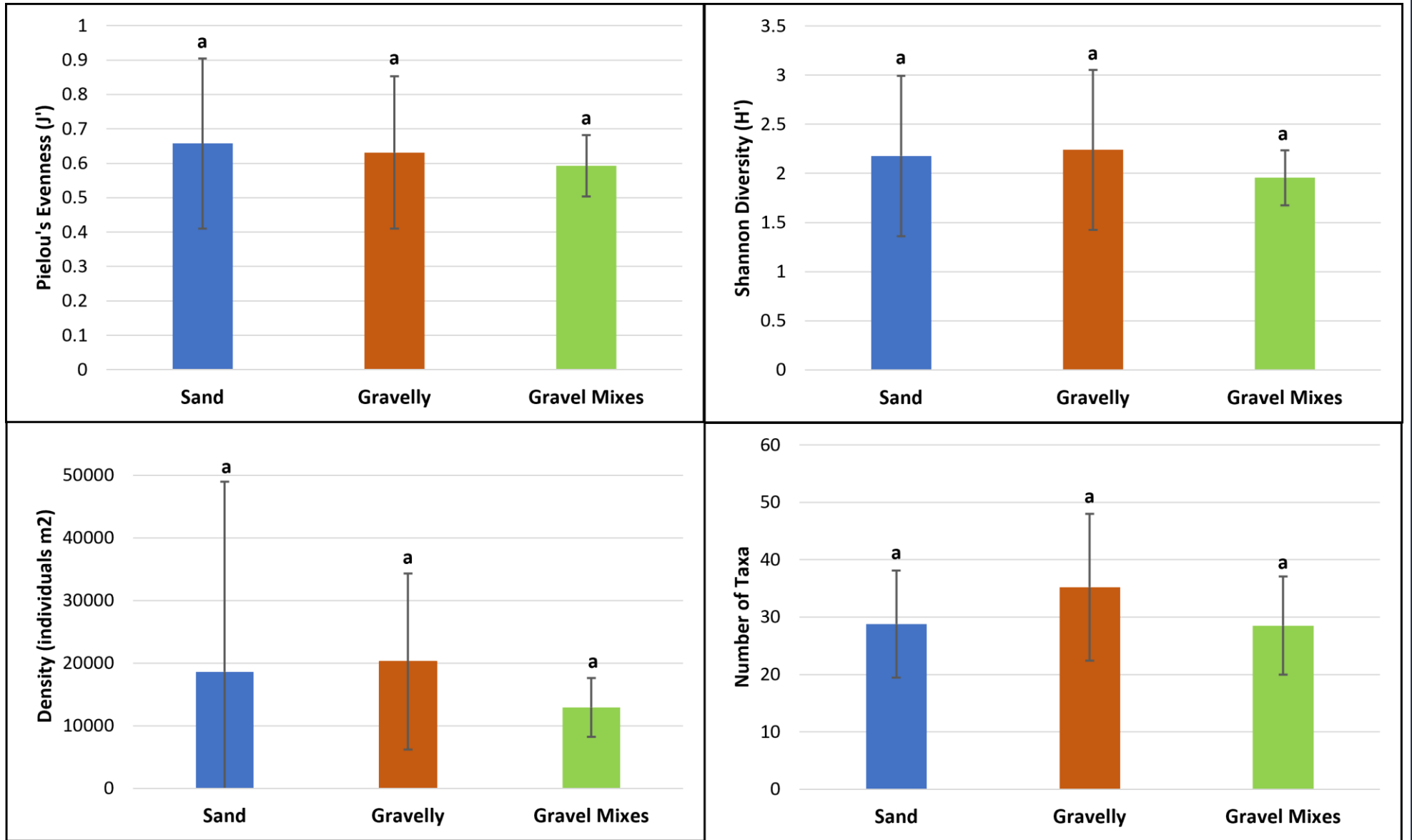
VINEYARD OFFSHORE





**Figure 8.1-25**







Comparison of Community Metrics between OECC Nearshore and Offshore Samples



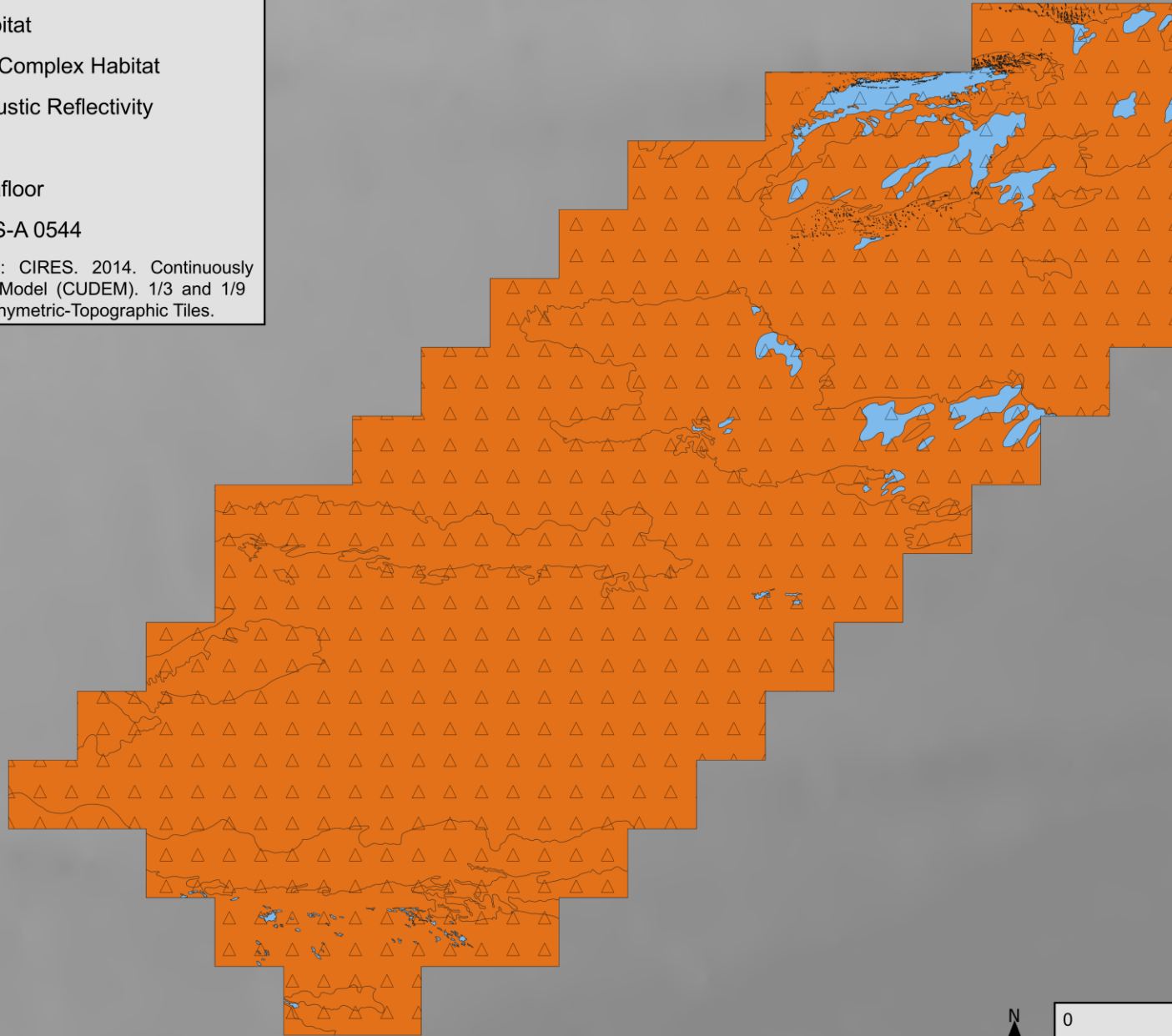
**Figure 8.1-26**

Comparison of Community Metrics across CMECS Substrate Groups in the OECC

## LEGEND

-  Soft Bottom Habitat
-  Heterogeneous Complex Habitat
-  Changes in Acoustic Reflectivity
-  Ripples
-  Featureless Seafloor
-  Lease Area OCS-A 0544

Source of elevation data: CIRES. 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.



**Figure 8.2-1**  
NMFS Habitat Mapping Lease Area

VINEYARD  
MID-ATLANTIC

VINEYARD  OFFSHORE

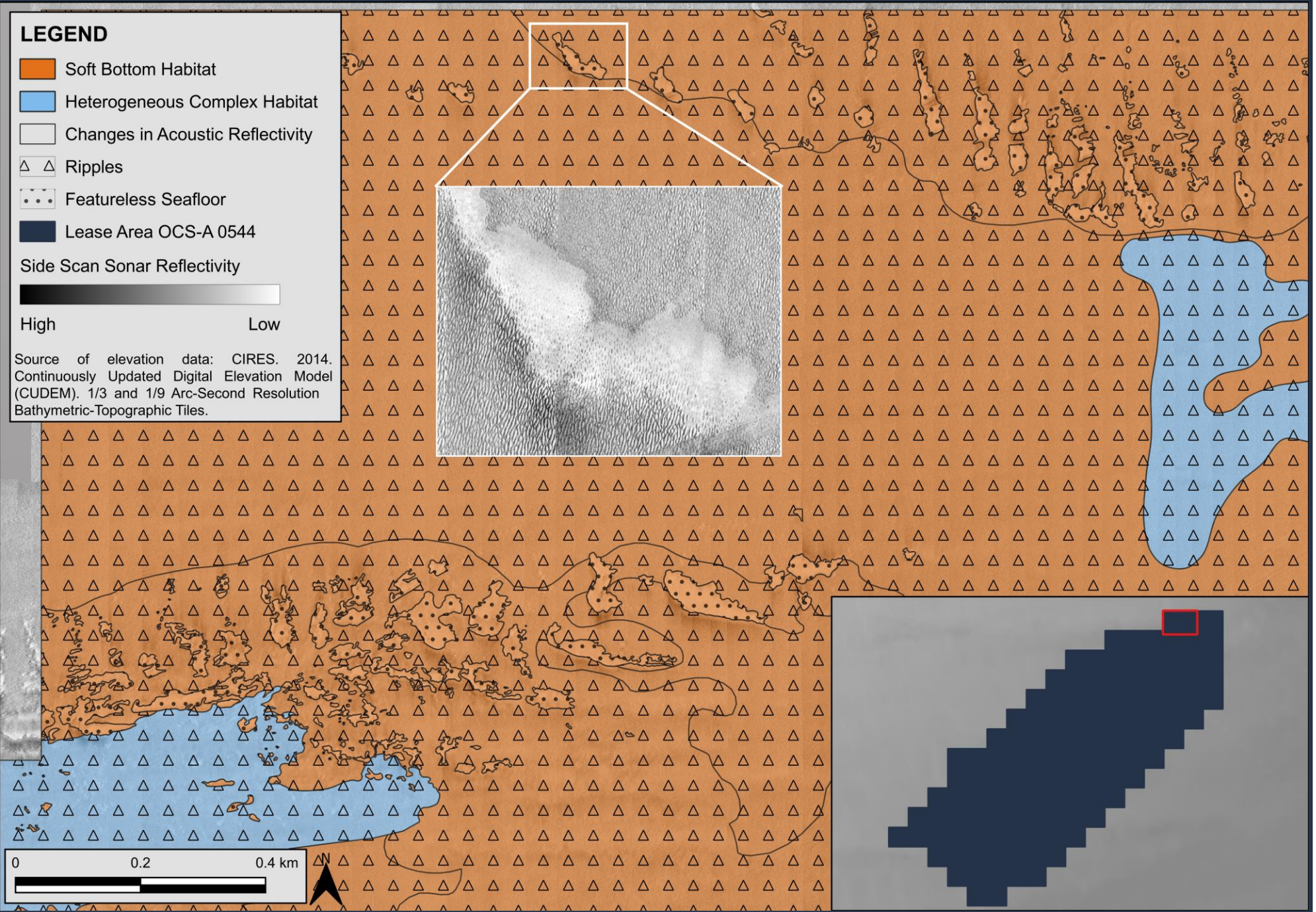
# LEGEND

- Soft Bottom Habitat
- Heterogeneous Complex Habitat
- Changes in Acoustic Reflectivity
- △ △ Ripples
- Featureless Seafloor
- Lease Area OCS-A 0544

## Side Scan Sonar Reflectivity



Source of elevation data: CIRES. 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.



**Figure 8.2-2**  
Patches of Silty Sand in the Lease Area

VINEYARD  
MID-ATLANTIC

VINEYARD OFFSHORE

## LEGEND

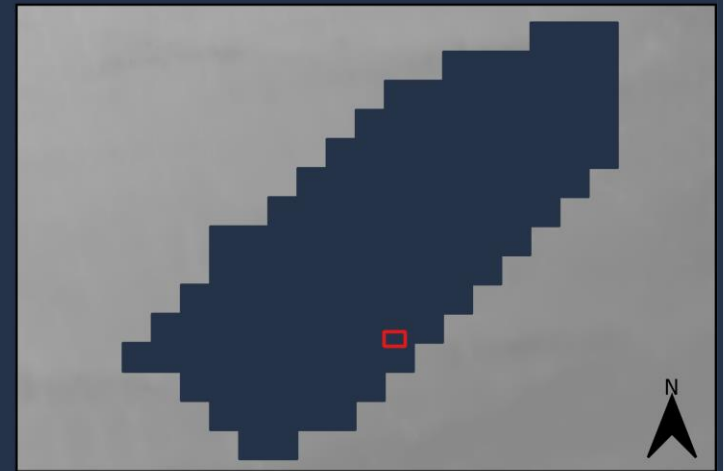
2022 Underwater Video Transect

— Medium Sand (NMFS Soft Bottom Habitat)

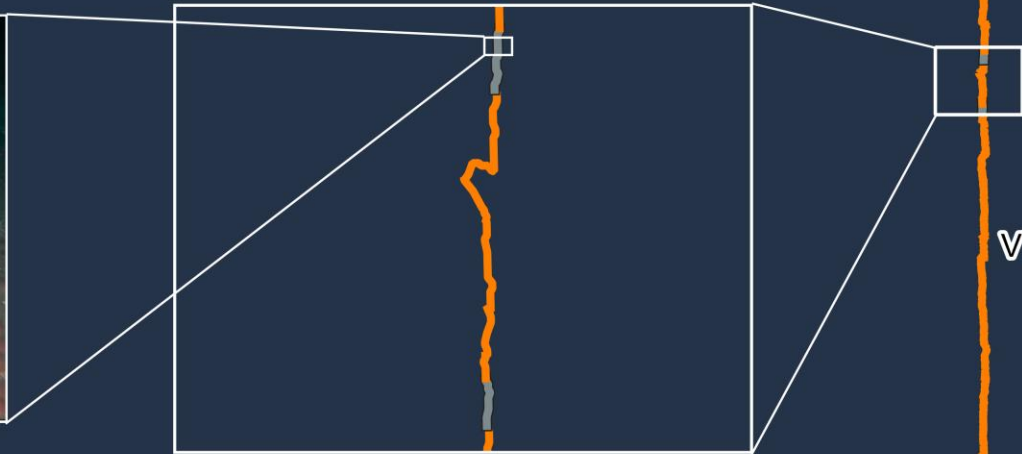
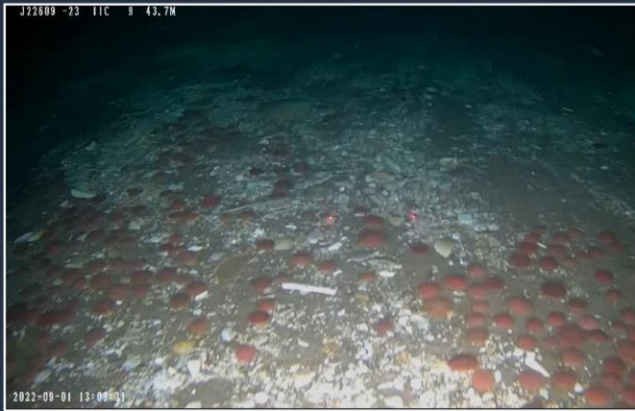
— Shell Hash (NMFS Complex Habitat)

■ Lease Area OCS-A 0544

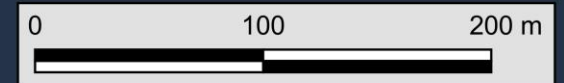
Source of elevation data: CIRES. 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.



DAT Time: 13:03:31



VT026

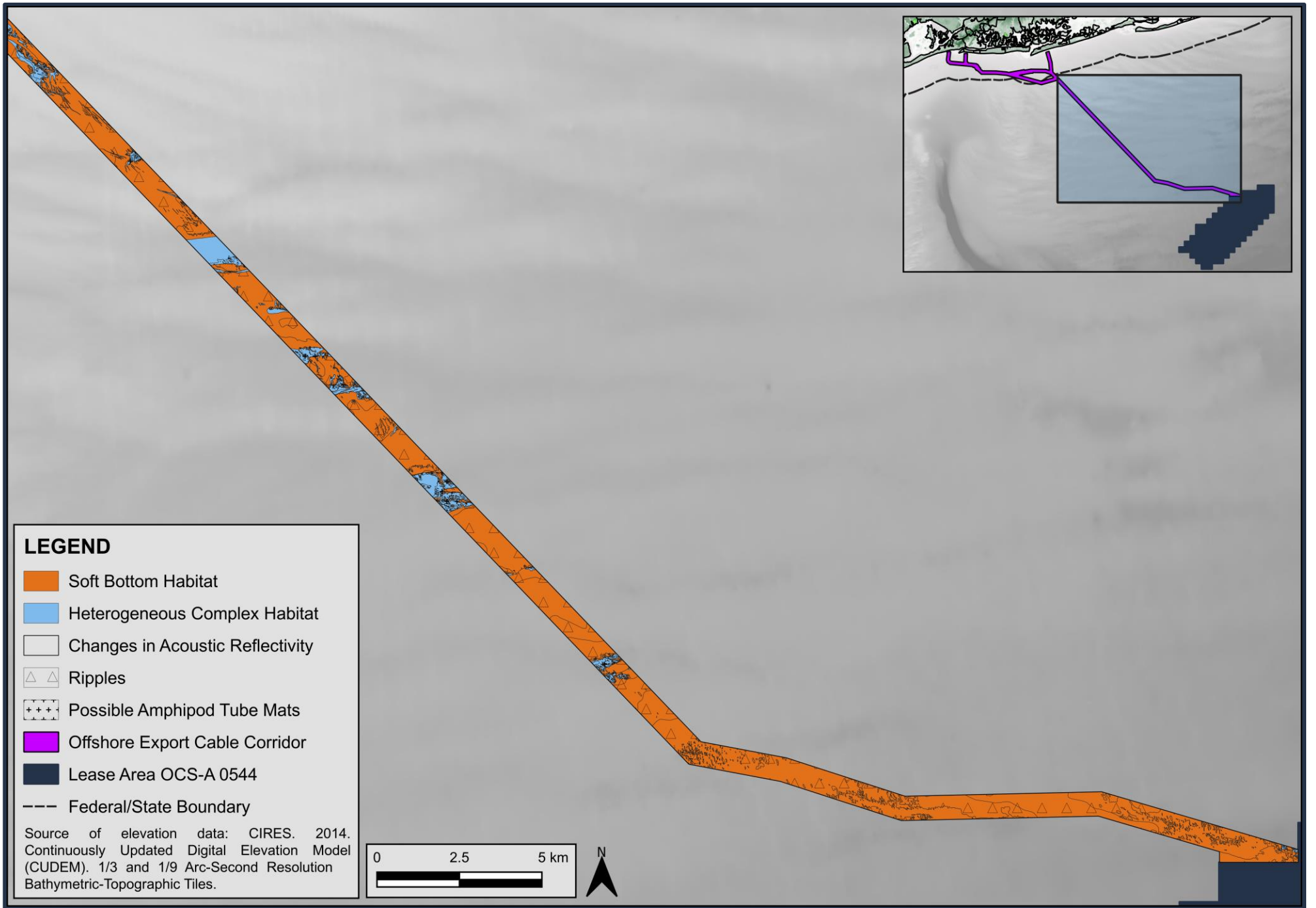


**Figure 8.2-3**

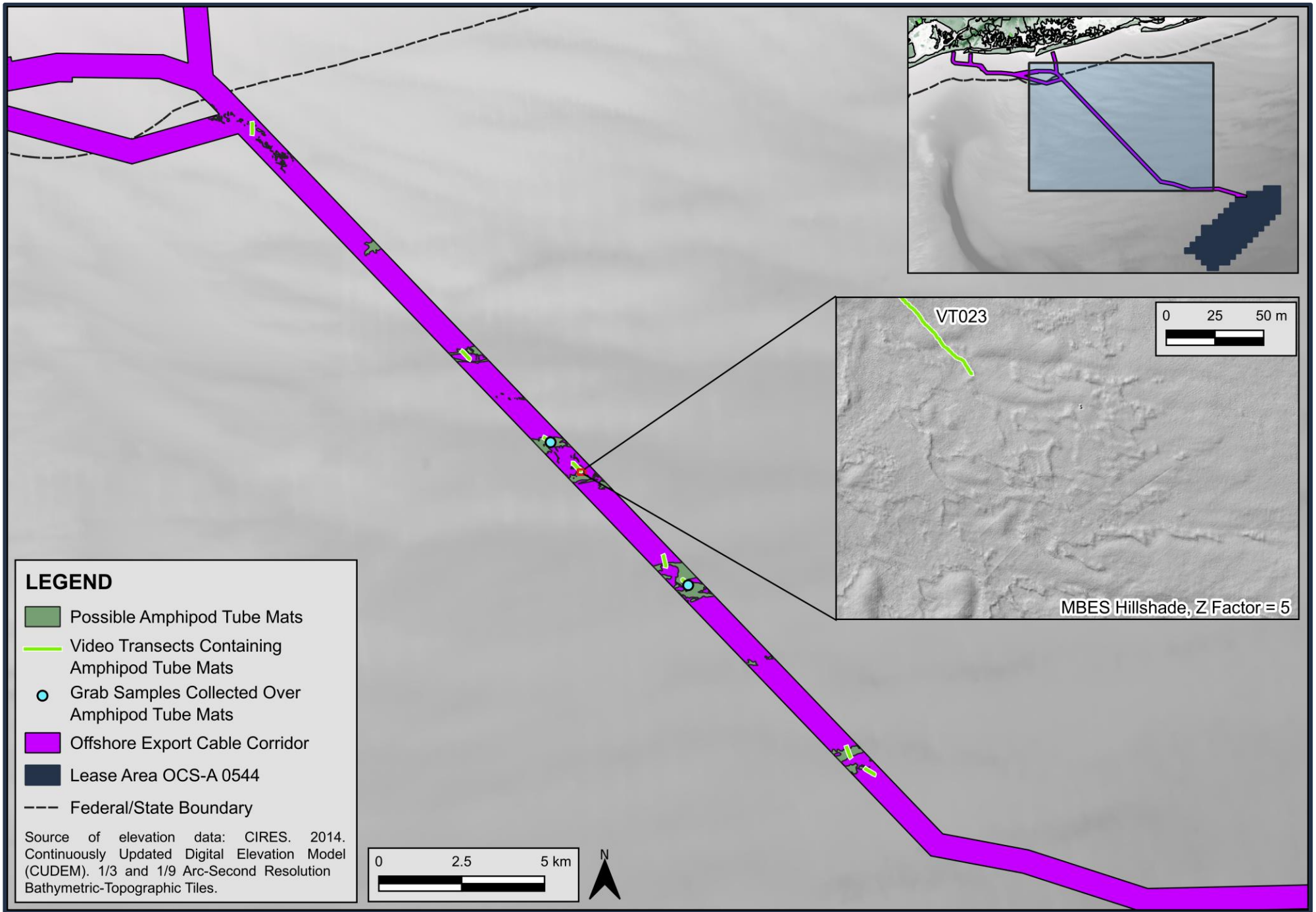
Shell Hash Observed in the Lease Area

VINEYARD  
MID-ATLANTIC

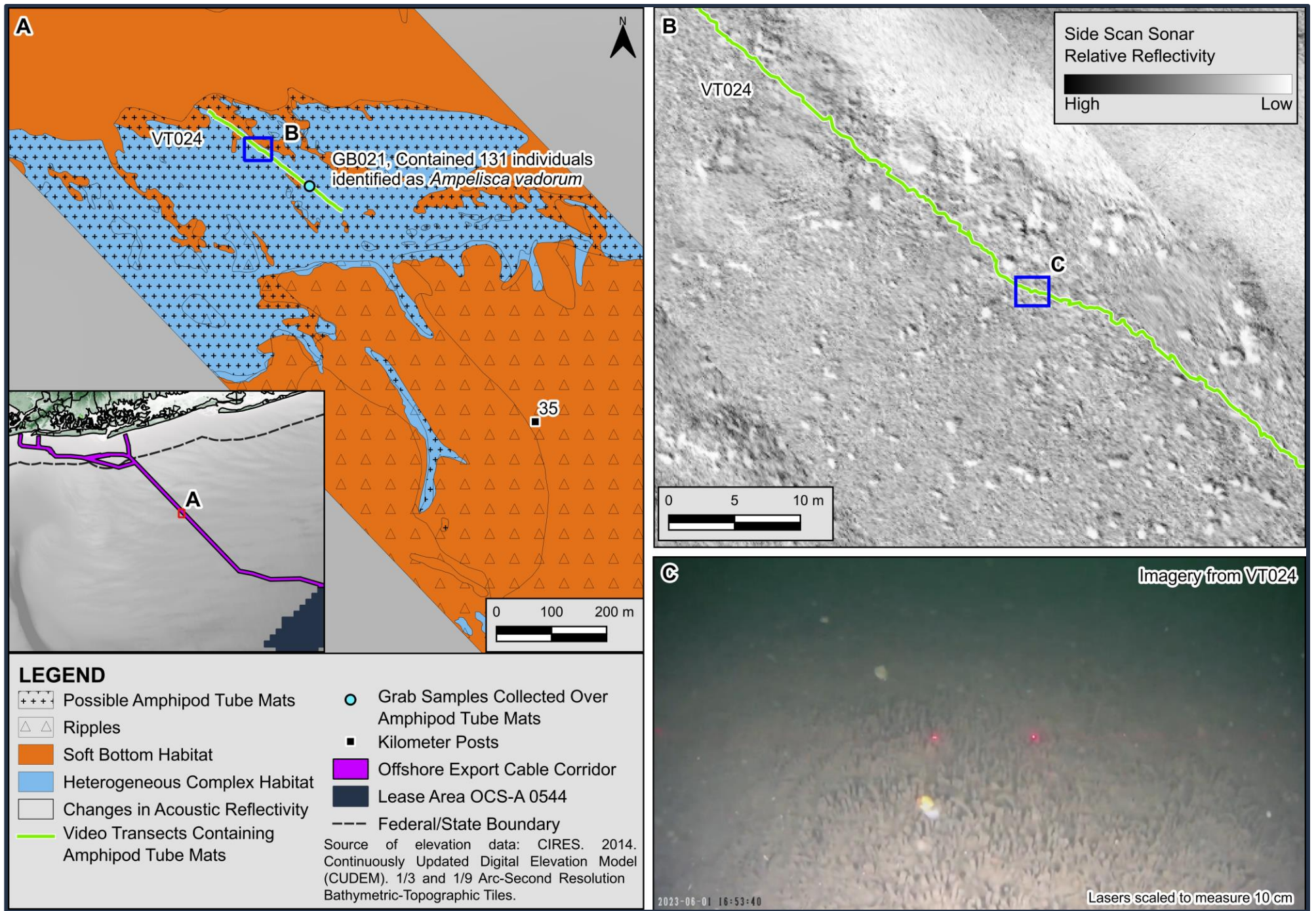
VINEYARD OFFSHORE



**Figure 8.2-4**  
 NMFS Habitat Mapping, OECC Offshore

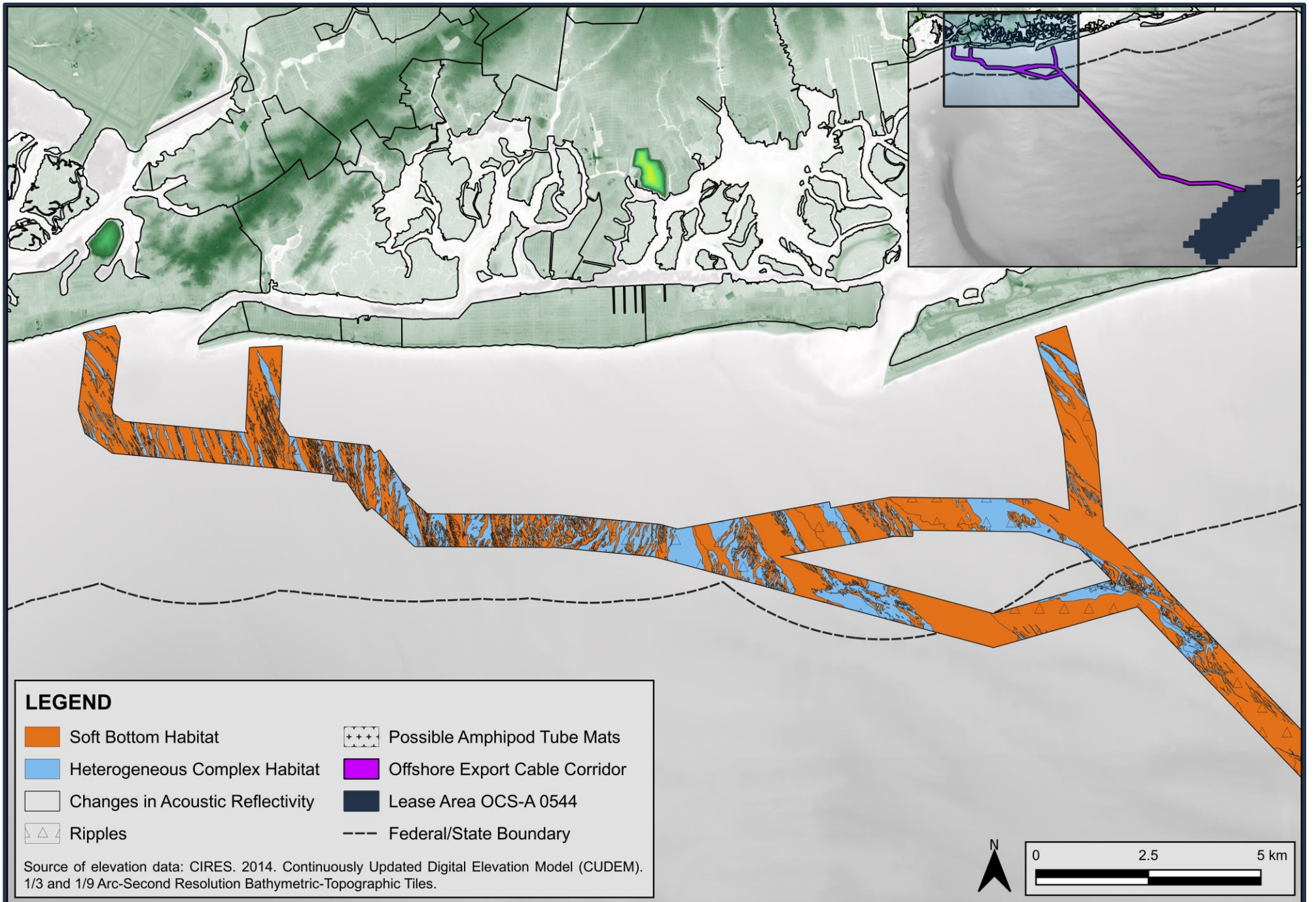


**Figure 8.2-5**  
Amphipod Tube Mats in the OECC, Overview

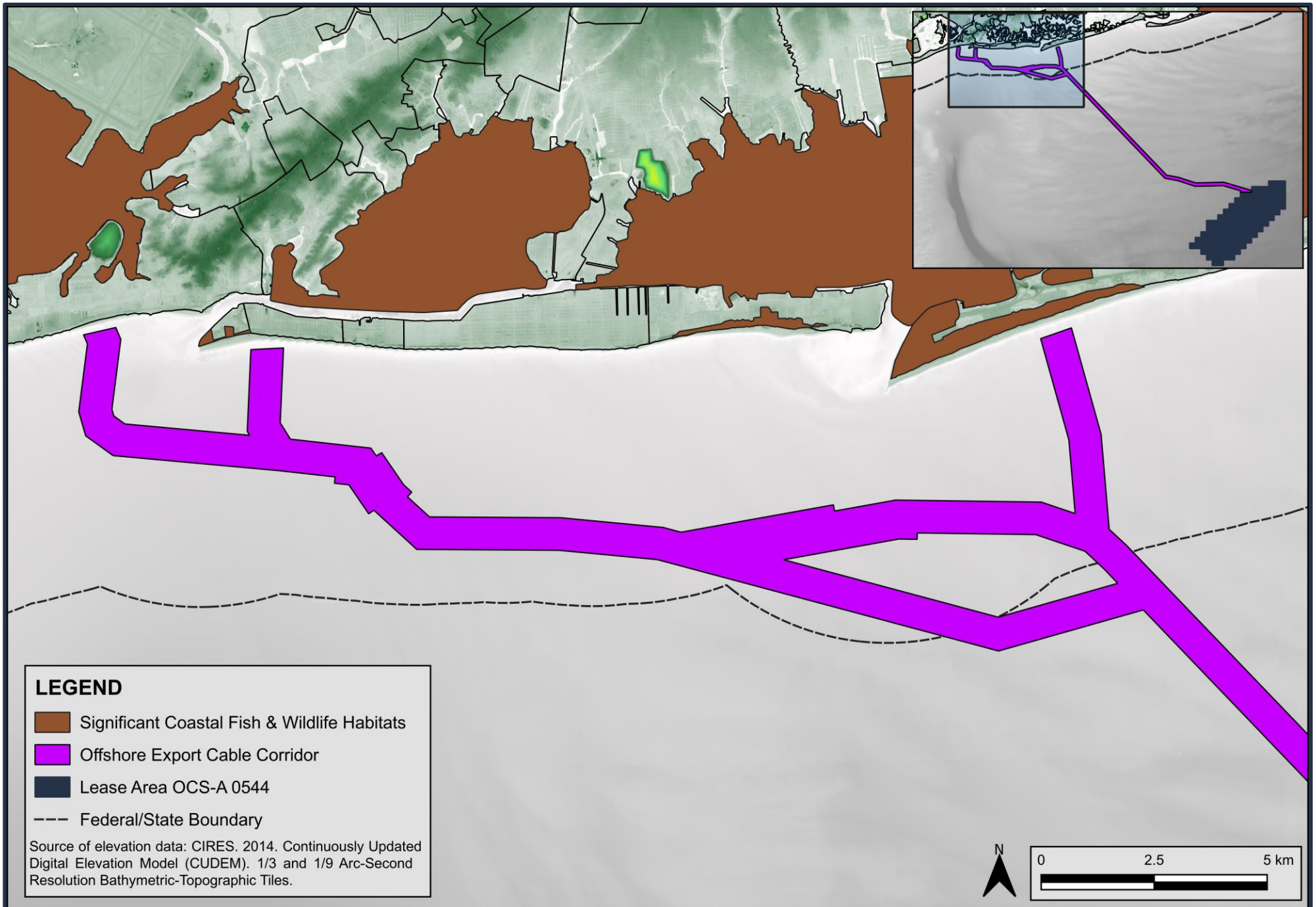


**Figure 8.2-6**  
Amphipod Tube Mats in the OECC, Example

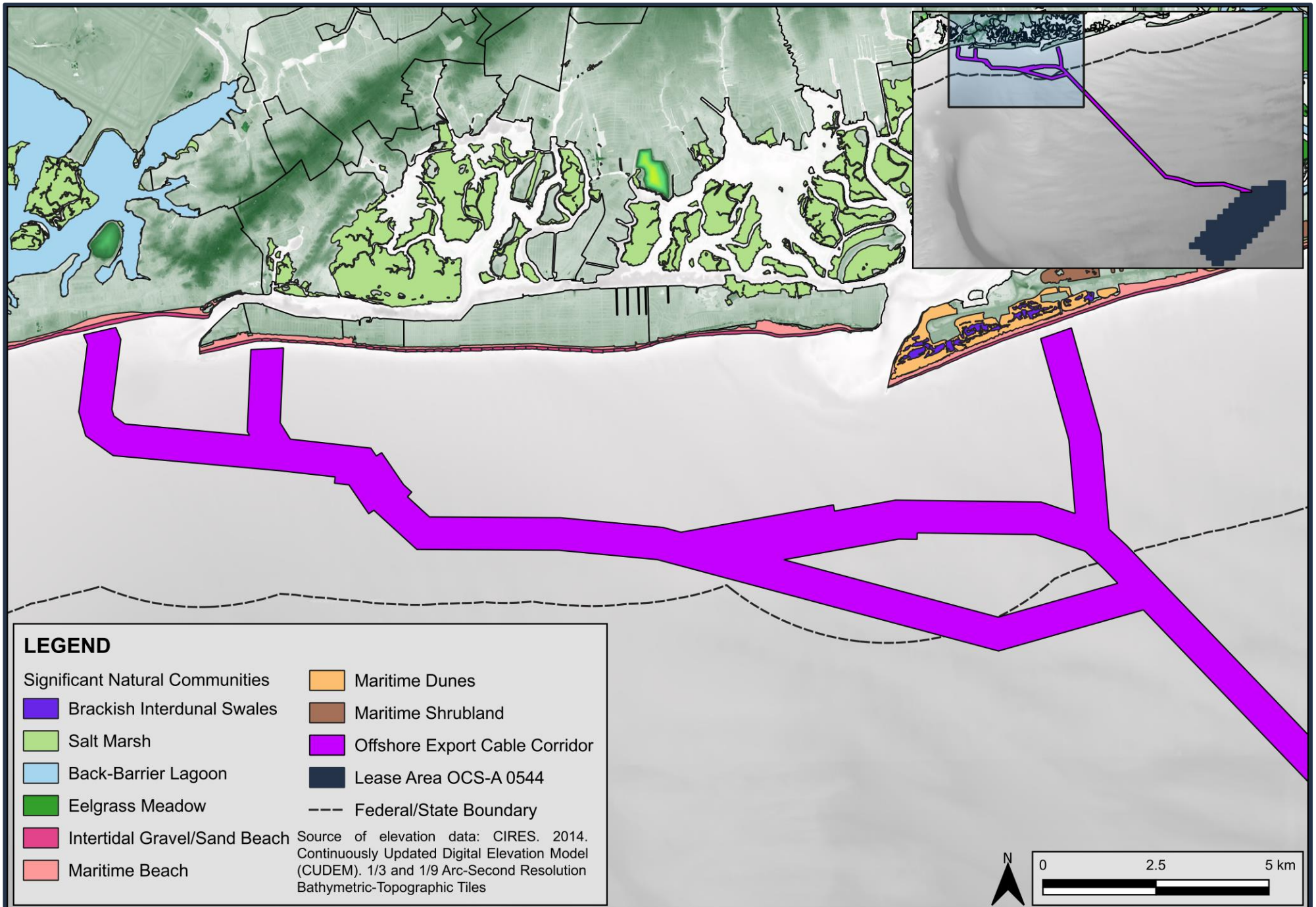




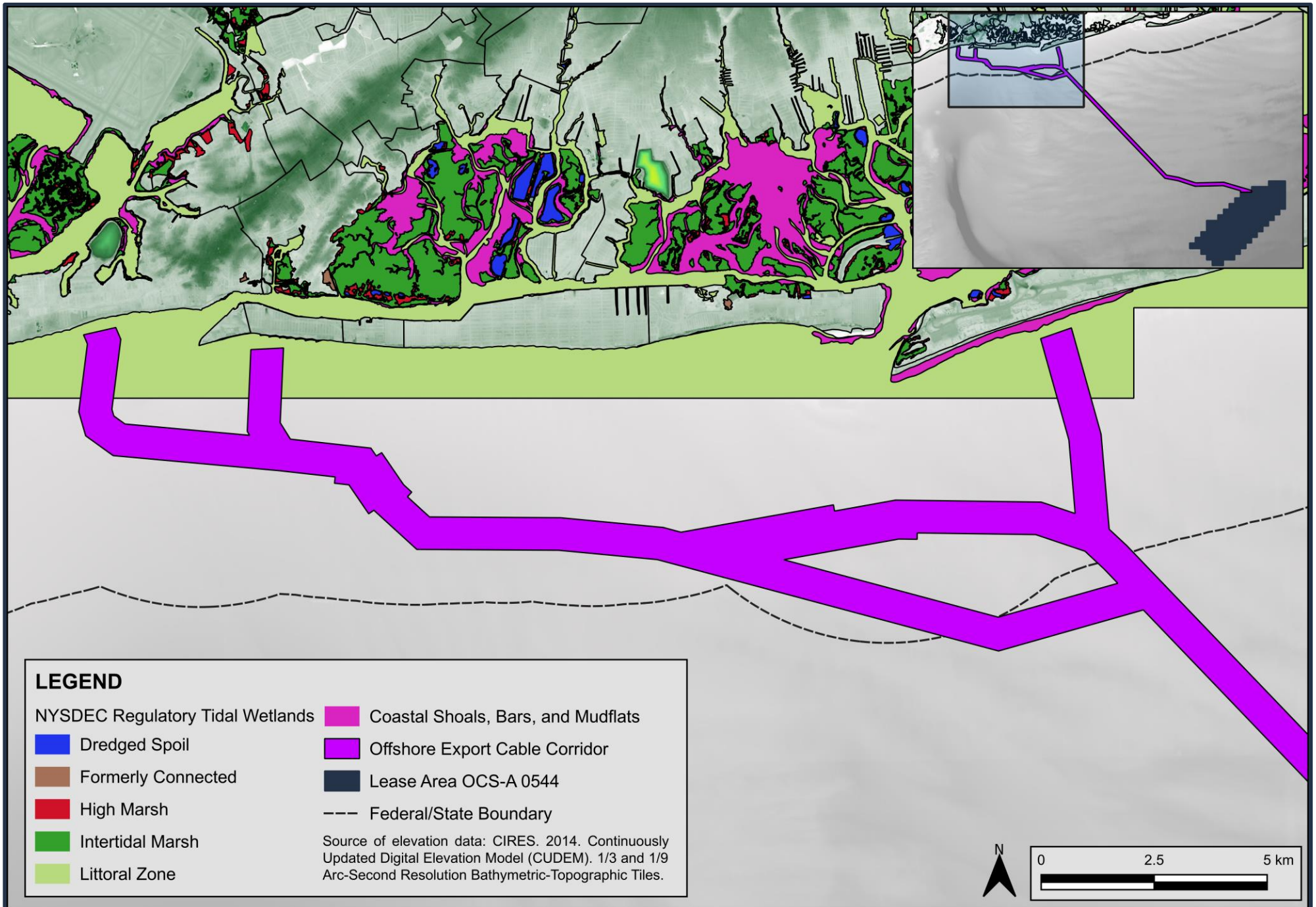
**Figure 8.2-7**  
 NMFS Habitat Mapping, OECC Nearshore



**Figure 8.2-8**  
New York State Significant Coastal Fish and Wildlife Habitats



**Figure 8.2-9**  
New York State Significant Natural Communities



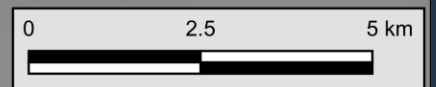
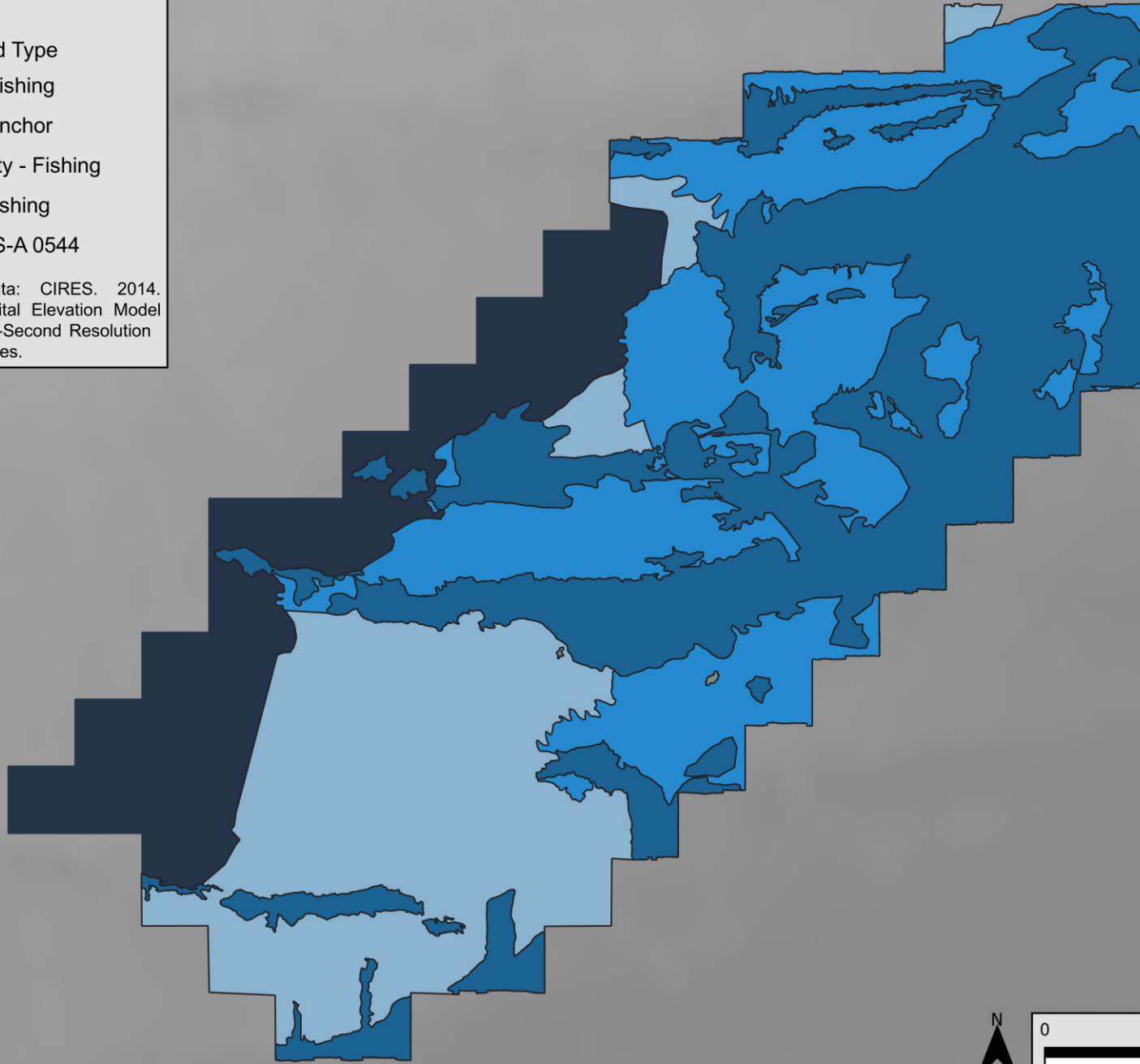
**Figure 8.2-10**  
New York State Regulatory Tidal Wetlands

## LEGEND

### Drag Scar Density and Type

- High Density - Fishing
- High Density - Anchor
- Moderate Density - Fishing
- Low Density - Fishing
- Lease Area OCS-A 0544

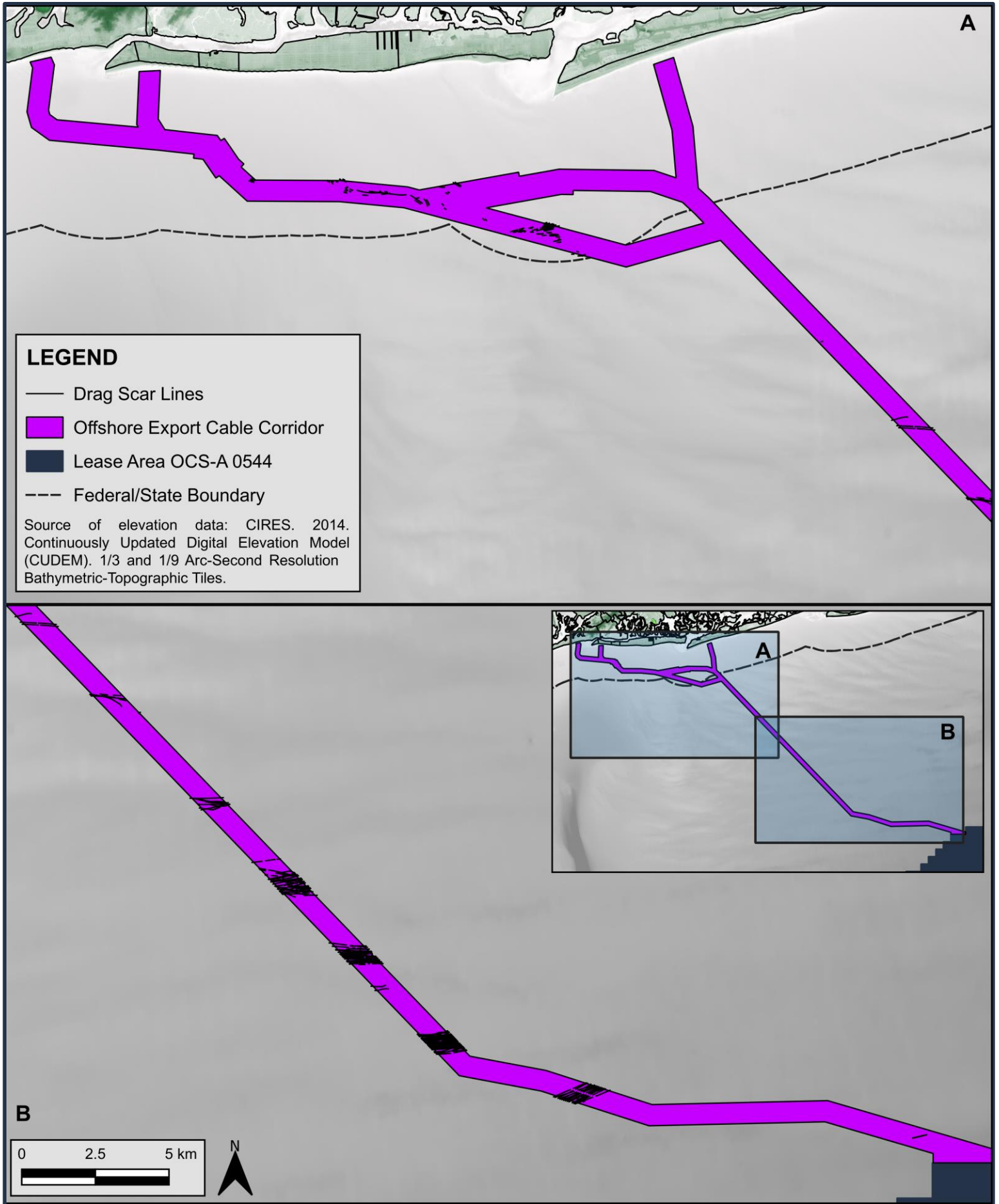
Source of elevation data: CIRES. 2014. Continuously Updated Digital Elevation Model (CUDEM). 1/3 and 1/9 Arc-Second Resolution Bathymetric-Topographic Tiles.



**Figure 8.2-11**  
Lease Area Drag Scar Overview

VINEYARD  
MID-ATLANTIC

VINEYARD OFFSHORE



**Figure 8.2-12**  
OECC Drag Scar Overview