Benthic Community Assessment Report

US Wind
Offshore Export Cable Survey
Offshore of MD and DE

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1.0 INTRODUCTION

1.1 Background

ESS Group, Inc. (ESS) conducted a benthic habitat assessment survey in the vicinity of the proposed submarine transmission cable associated with the Construction and Operations Plan (COP) for the Maryland Wind Energy Area leased by US Wind, Inc. (US Wind). Sampling was conducted in accordance with *Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585* issued November 4, 2013 by the Bureau of Ocean Energy Management (BOEM).

The survey included the collection and analysis of benthic grab samples from areas offshore of MD and DE, along the Offshore Export Cable Route. These data were used to supplement existing studies and generate a taxonomic classification of benthic habitat in the Offshore Export Cable Route under the Coastal and Marine Ecological Classification Standard (CMECS) (FGDC 2012).

1.2 Definitions

Benthic macroinvertebrate: For the purposes of this assessment, benthic macroinvertebrates are defined as those invertebrate organisms greater than 500 microns (μm) in length that either live on (epifauna) or within (infauna) the substrate, including but not limited to annelid (segmented) worms, mollusks, crustaceans, and echinoderms.

Hard bottom: Coral, cobble, rock, clay outcroppings, or other shelter-forming features.

SAV: Submerged aquatic vegetation, such as eelgrass (*Zostera marina*) or macroalgae.

Sensitive habitat: Benthic habitats containing hard bottom or SAV features.

2.0 APPROACH

The BOEM guidelines for benthic habitat survey (issued November 4, 2013) were used as the primary guidance document for developing the survey approach. Additional comments received from BOEM on February 23, 2015 were also incorporated into the approach. Protocols and sampling locations were approved by BOEM and the Delaware Department of Natural Resources and Environmental Conservation (DNREC) Division of Water.

The benthic field survey was conducted from the RV Shearwater on September 8 and 9, 2016 and was composed of two primary elements: 1) collection of still images of the seafloor, and 2) collection of benthic grab samples for laboratory analysis of taxonomic composition.

To obtain site-specific information on the benthic community, 23 sampling locations along the proposed transmission cable were targeted in areas offshore of MD and DE for imagery collection (Figure 1). Benthic grab samples were collected at fourteen of these locations. The survey vessel navigated to and recorded each sampling position using a Differential Global Positioning System (DGPS).

2.1 Benthic Imagery

Images of the seafloor were captured at each survey location with a Kongsberg/Simrad OE14-208 5.0-megapixel underwater camera with a dedicated strobe and video lamp, mounted within a stainless-steel frame.

A hover and drift technique allowed the frame to move progressively along the seafloor as the vessel traversed the study area. Footage was viewed in real time via an umbilical, assisting in the control of the digital stills camera and selection of still photograph locations. Images were captured using the surface control unit and initially stored on the camera's internal memory card. On completion, photographs were downloaded onto a PC and copied onto CD-ROM.

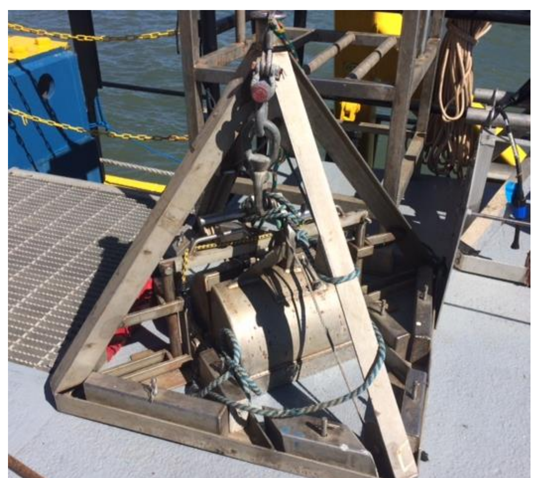
At least ten images were captured at each station, separated by a time gap of approximately 5 to 10 seconds. Substrate type was characterized and visible benthic taxa were identified in each set of images. Benthic images were collected at 23 locations along the Offshore Export Cable Route; at each of the fourteen benthic grab locations, and at an additional nine locations where cobble or rocky bottom habitats were suspected to be present based on geophysical survey results. Benthic image collection occurred on September 8 and 9, 2016.

2.2 Benthic Grab Sampling

2.2.1 Sample Collection

Surface benthic grab samples were successfully collected using a Day grab sampler at each of the fourteen sampling locations on September 8 and 9, 2016. The sampler measured approximately 12.5 inches by 12.5 inches (31.75 cm by 31.75 cm) at the sampling interface. After retrieval, each sample was examined for quality and a decision was made to accept or reject the sample based on representativeness of the grab. Sample grabs that did not retain at least 2.5 inches (6.4 cm) of material or showed evidence of uneven penetration (i.e. angled sample) were rejected as incomplete and the grab was redeployed until an acceptable sample was retained. Over the course of the field program, only six sample attempts were rejected, due to malfunction of the grab mechanism, or sample washout.

Once an acceptable sample was retrieved, descriptions of sample recovery and sediment type (i.e. grain size) were recorded in a field notebook. The top 4 inches (10 cm) of sediment in the grab was then removed from the sampler using a stainless-steel spoon and sieved in the field. Sieving consisted of gently rinsing the sample material through a bucket sieve with 500-µm mesh to remove fine sediments. Sieved samples were preserved in a solution containing 10% buffered formalin in seawater. Preserved samples were stored in plastic quart-size sample jars and labeled with the project name, sample identification code, sampling date, preservative, and the initials of the collector.



Day grab sampler on RV Shearwater

Preserved samples were returned to ESS offices in East Providence, Rhode Island for storage and laboratory analysis.

2.2.2 Laboratory Analysis

Upon receipt at the laboratory, each sample was logged in and decanted through a 500-µm sieve. Samples were gently rinsed in the sieve to remove the formalin fixative and any additional fine sediment that remained after the initial field sieving process. Once thoroughly rinsed, each sample was returned to a labeled jar and preserved with 70% ethanol for storage.

For sorting, the contents of each sample were examined using a high-power dissecting microscope (7X to 45X magnification) and high-intensity gooseneck fiber optic lamp.

All samples were sorted in their entirety. Organisms found during the sorting process were removed with forceps and placed in 70% ethanol. Each vial was labeled with the project name, collection date and sample identification number. All residue (sediment and organic matter) from the sorted and unsorted portion of each sample was placed in a separate labeled container and re-preserved in 70% ethanol.

Sorted organisms were subsequently identified by a qualified taxonomist to the lowest taxonomic level possible using a dissecting microscope and readily available taxonomic keys and references (Bartholomew 2001, Pollock 1998, Martinez 1999, Abbott and Morris 1995, Weiss 1995, Gosner 1971, 1978, Bousfield 1973, Smith 1964, Pettibone 1963). Temporary slide mounts were prepared for annelid worms, as necessary to improve the taxonomic precision of identification for these groups. Slide-mounted organisms were identified under a compound microscope capable of 64X to 1600X magnification.

For quality assurance and control (QA/QC) purposes, a second qualified staff member (quality assurance officer) resorted 10% of the samples (or one, whichever was greater) analyzed by each sorter to ensure organisms were being adequately removed from the samples. The quality assurance officer checked the sorted sample material for remaining organisms and calculated an efficiency rating (E) using the following formula:

$$E = 100 \times \frac{n_a}{n_a + n_b}$$

Where n_a is the number of individuals originally sorted and verified as identifiable organisms by the QC checker and n_b is the number of organisms recovered by the QC checker. If the original sorter achieved E < 90% (i.e., less than 90% of the organisms in the sample removed), corrective action was taken to ensure greater sorting efficiency for other samples sorted by the same individual. Corrective action includes but is not necessarily limited to, additional training on organism recognition and re-sorting of sample material.

In the identification phase, the QA/QC reviewer checked at least 10% of taxonomic identifications for accuracy. Incorrect identifications were reviewed with the taxonomist and revised, as applicable, in the project taxonomic database.

2.2.3 Data Analysis

Measures of benthic diversity, abundance and community structure were selected to describe the affected environment. The rationale behind selection of each measure is as follows:

Diversity: *Taxa richness* is the number of different taxa that are found within a given area or community and is widely accepted as a good assessment measure of diversity (Magurran 2003). For this study, taxa richness is defined as the total number of unique taxa found in a sample.

Abundance: *Macrofaunal density* is a measure of abundance expressed as an estimate of the number of individuals per unit area. Although macrofaunal density can reflect the productivity of marine habitats (Taylor 1998), it may also serve as an indication of stress or disturbance at a location (Dean 2008). Consequently, the density of benthic organisms may increase or decrease in response to different types of stress (e.g., thermal or chemical pollution, sediment deposition, physical abrasion or displacement).

The density of benthic organisms responds to disturbance as mitigated by the tolerance (or preference) of a given organism to the particular source of disturbance. However, density may vary substantially over small areas or short periods of time and should therefore be interpreted cautiously. For this study, macrofaunal density is expressed as the number of organisms per square meter.

Community structure: *Community composition* is a multivariate measure identifying the different benthic taxa present and respective abundances of each taxon. This descriptive measure provides detail to complement and help interpret summary metrics like taxa richness and macrofaunal density. Multivariate statistical analyses can also be used to evaluate changes in community composition over time.

3.0 RESULTS

3.1 Benthic Imagery

Analysis of benthic imagery revealed bottom habitats ranging from fine sand to gravel, and allowed for the identification of many mobile species that were not captured in benthic grabs.

Table A. Summary of Macroinvertebrate Taxa Observed in Benthic Imagery

Phyla	Taxa	Common Name	# Samples with Taxa
Porifera	Porifera	Sponge	1
Echinodermata	Clypeasteroida	Sand dollar	4
Bryozoa	Arborescent Bryozoan	Moss Animal	2
Cnidaria	Ceriantharia	Tube-dwelling anemone	2
	Leptogorgia sp.	Whip Coral	3
	Astrangia sp.	Stony Coral	2
Polychaeta	*Diopatra sp.*	Decorator Worm	5
Mollusca	*Crepidula sp.*	Slipper Shell	5
	Buccinidae	Small Whelk	1
	Busyconidae	Busycon Whelk	1
	Astartidae	Astarte Clam	2
Crustacea	*Pagurus sp.*	Hermit Crab	5
	Decapoda	Shrimp	1
	Cancer sp.	Cancer Crab	2
Chordata	Ascidiacea	Colonial Ascidian	1

Phyla	Taxa	Common Name	# Samples with Taxa
	Osteichthyes	Unidentified Fish	2
	Cottoidea	Sculpin	1
	Pleuronectiformes	Left-eyed Flatfish	1

The organisms most frequently observed in benthic imagery along the Offshore Export Cable Route were slipper shells (*Crepidula sp*.), hermit crabs (*Pagurus sp*.) and decorator worms (*Diopatra sp.*), which were present at five of the of the 18 image sample locations (Table A). Other widely distributed organisms included sand dollars (Clypeasteroidea) and whip coral (*Leptogorgia sp.*). All other organisms were found at less than 3 image sample locations. Sandy areas were generally inhabited by sand dollars and slipper shells, while common gravel and rocky bottom organisms included crabs (*Cancer sp*.), whip coral (*Leptogorgia sp*.), stony coral (*Astrangia sp*.), and arborescent bryozoans. Fish (sculpin, left-eyed flatfish, and unidentified bony fish) were observed in images from both sandy and gravel-dominated areas, and only at benthic grab locations.

The results of benthic imagery analysis along the Offshore Export Cable Route are consistent with recent video surveys and survey trawls of the Lease Area, which suggest that the primary benthic epifaunal taxa include common sand dollar (*Echinarachnius parma*), hermit crab (*Pagurus* spp.), and rock crab (*Cancer irroratus*) (Guida et al. 2015). However, other species found by Guida et al. (2015) to be common in the Lease Area, including moon snails (Naticidae), nassa snails (*Ilyanassa* [=*Nassarius*] spp.), and sea stars (*Asterias* spp.) were not observed along the Offshore Export Cable Route.

3.2 Benthic Grab Sampling

The benthic grab samples provided information about taxa richness, density and community composition along the Offshore Export Cable Route in waters offshore of MD and DE (Table B).

Table B. Summary of Key Statistics from the Benthic Sample Analysis

Statistic	Value
Number of Samples	14
Mean Density per Square Meter (±1 SD)	813 ± 1241
Mean Taxa Richness (±1 SD)	8 ± 5.48
Total Number of Taxa	73
Number of Taxa Observed by Taxonomic Group	
Polychaete worms	26
Crustaceans	26
Mollusks	12
Oligochaete worms	3
Other	6
Percent of Total Abundance by Taxonomic Group	
Polychaete worms	10.5%
Crustaceans	6.7%
Mollusks	15.2%
Oligochaete worms	0.8%
Other	66.9%

3.2.1 Taxa Richness

Overall, 73 species of benthic fauna were observed in the fourteen grab samples analyzed (Appendix A). Taxa richness per sample ranged from two to 22, and mean taxa richness was 8.0 per site (Tables B and Table C).

Table C. Taxa Richness by Sample Site

Taxon	Taxa Richness													
	BG-A-02	BG-A-04	BG-A-05	BG-A-06	BG-A-07	BG-A-09	BG-A-11	BG-A-13	BG-A-15	BG-A-16	BG-A-17	BG-A-19	BG-A-21	BG-A-23
Polychaeta	2	4	7	7	6	5	1	1	1	1	1	0	1	2
Crustacea	0	0	2	7	2	2	1	2	2	7	1	1	1	7
Mollusca	0	1	0	4	3	4	1	0	1	0	1	1	1	0
Oligochaeta	0	1	0	2	1	0	0	0	0	0	1	0	0	0
Other	1	2	2	2	2	1	2	0	0	1	2	0	1	0
Total	**3**	**8**	**11**	**22**	**14**	**12**	**5**	**3**	**4**	**9**	**6**	**2**	**4**	**9**

3.2.2 Macrofaunal Density

The mean macrofaunal density for the analyzed samples was 813 individuals/m^2 (Table B). The highest macrofaunal density (4,394 individuals/m^2) was found at BG-A-02, while macrofaunal density was lowest (30 individuals/m^2) at BG-A-19 (Table D). Of the fourteen samples analyzed, five were characterized by densities of 900 individuals/m^2 or more.

Table D. Macrofaunal Density by Sample Site

Taxon	Macrofaunal Density													
	BG-A-02	**BG-A-04**	**BG-A-05**	**BG-A-06**	**BG-A-07**	**BG-A-09**	**BG-A-11**	**BG-A-13**	**BG-A-15**	**BG-A-16**	**BG-A-17**	**BG-A-19**	**BG-A-21**	**BG-A-23**
Polychaeta	179	238	218	198	188	60	10	10	20	10	10	0	20	30
Crustacea	0	0	40	208	69	20	10	30	20	159	30	10	20	149
Mollusca	0	10	0	913	60	675	10	0	10	0	10	20	20	0
Oligochaeta	0	20	0	40	10	0	0	0	0	0	20	0	0	0
Other	4,216	2,172	645	69	20	179	89	0	0	169	30	0	30	0
Total	4,394	2,440	903	1,428	347	932	119	40	50	337	99	30	89	179

3.2.3 Community Composition

The benthic macrofaunal assemblage documented in the analyzed samples consisted of polychaete worms, nematode round worms, crustaceans, mollusks, oligochaete worms, nemertean ribbon worms, sea cucumbers, sea stars, and sand dollars, and lancelets (Amphioxiformes) (Appendix A).

The most speciose taxonomic groups were polychaete worms and crustaceans, which each contributed 36% of the taxa documented in the analyzed samples. Other, a grouping which includes nematode roundworms, nemertean ribbon worms, and echinoderms, was the taxonomic group with the highest density, followed by mollusks and crustaceans (Table B).

The most abundant taxon was nematode roundworms, which accounted for over 66% of all individuals identified in this study. The common slipper shell *Crepidula fornicata*, and the syllid polychaete *Exogone sp.* were the next most abundant taxa, and together accounted for over 15% of individuals (Table E).

Most of the taxa observed in the grab samples are typical of soft-sediment habitats. Nematodes, which were vary abundant, are meiofaunal organisms that dwell in the spaces between sediment grains. Other common species, including *Mediomastus ambiseta, Diopatra cuprea*, and *Unciola* sp. build tubes in sediments (Dobbs and Vozarik 1983, Weiss 1995, Bousfield 1973).

No taxa indicative of sensitive habitats were observed in the benthic grab samples. Soft-shell clams (*Mya sp.*) were observed at only one site, BG-A-21.

Table E. Relative Abundance of Taxa Encountered*

Scientific Name	Common Name	Relative Abundance (%)
Nematoda	Nematode Roundworm	66
Crepidula fornicata	Common Slipper Shell	12
Exogone sp.	Syllid Polychaete	3
Mediomastus ambiseta	Capitellid Polychaete	2
Diopatra cuprea	Decorator Worm	2
Unciola sp.	Aorid Amphipod	1
Scoletoma sp.	Lumbrinerid Worm	1
Crepidula plana	Eastern White Slippersnail	1

*Includes taxa accounting for at least 1% of total abundance

The most widespread taxa (i.e., observed in the most samples) were nematode roundworms, and the decorator worm *Diopatra cuprea*, which were observed in at least five samples (Table F). Other relatively widely distributed taxa included aorid amphipods, common slipper shells, syllid and capitellid polychaetes, Atlantic jackknife clams, oligochaete worms, and various amphipods (all found in at least three samples).

Table F. Most Widespread Taxa Encountered*

Scientific Name	Common Name	Number of Samples Containing this Taxon
Nematoda	Nematode Roundworm	9
Diopatra cuprea	Decorator Worm	5
Unciola sp.	Aorid Amphipod	4
Crepidula fornicata	Common Slipper Shell	4

Scientific Name	Common Name	Number of Samples Containing this Taxon
Exogone sp.	Syllid Polychaete	4
Mediomastus ambiseta	Capitellid Polychaete	4
Amphipoda	Amphipod	3
Ensis directus	Atlantic Jackknife Clam	3
Tubificinae	Oligochaete Worm	3

*Includes taxa observed in at least three samples

Larger nematode worms (longer than 500 microns) were included in the site-specific data analysis. However, nematodes are often treated entirely as meiofauna and not included in analyses of the benthic macroinvertebrate community (e.g., (Guida et al. 2015)). When nematodes are removed from the site-specific dataset, mollusks and polychaetes become the most dominant taxonomic group, contributing 44.9 percent and 30.9 percent of the total benthic abundance, respectively.

3.3 Quality Assurance/Quality Control

QA/QC sorting efficiency checks were conducted on two samples. All QA/QC criteria were met for this project.

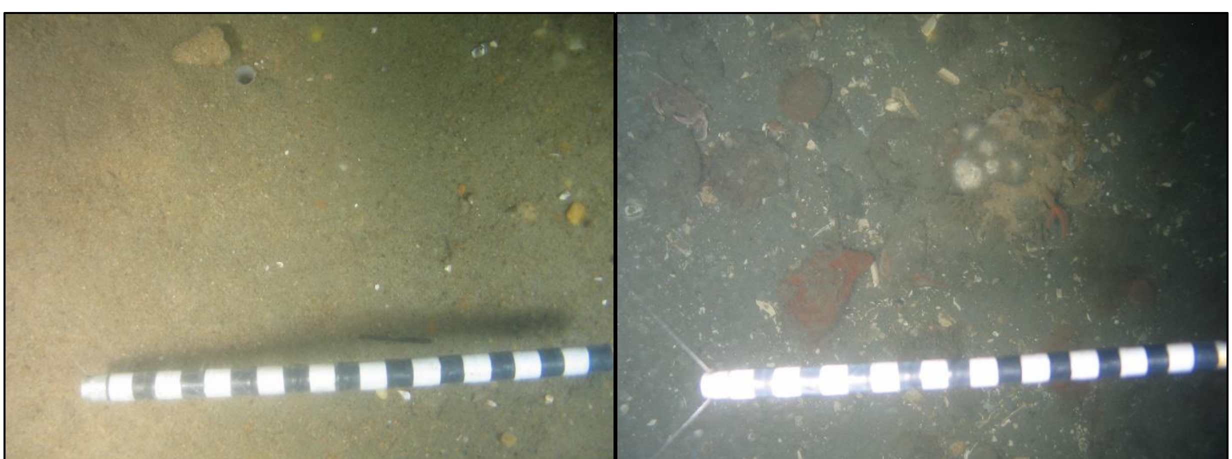
Identifications represent the lowest practicable taxonomic level, given the maturity and condition of the organisms encountered, as well as the current state of taxonomic consensus. With the exception of heavily damaged or immature specimens, organisms were successfully identified to family level or better.

4.0 TAXONOMIC CLASSIFICATION OF BENTHIC HABITAT

Based on information reviewed in Cutter et al. (2000) and site-specific investigations, benthic habitat in the Offshore Export Cable Route has been classified under the Coastal and Marine Ecological Classification System (CMECS).

Benthic habitats in the waters offshore of MD and DE are variable, but are often dominated by sandy substrates with varying levels of gravel and or silt, and shell hash (Cutter et al. 2000).

Benthic habitat along the Offshore Export Cable Route was somewhat variable, though typical of Mid-Atlantic nearshore shelf habitats, and included areas of fine sand and silt, fine, medium, and coarse sand



Representative images of soft sediment (left, site BG-A-13) and attached fauna (right, site P-01) biotic subclasses.

with interspersed shell hash, gravel, and cobble. Water depths along the Offshore Export Cable Route ranged from 2.8 to 31.1 m (9.2 ft to 102.7 ft). To identify potentially sensitive habitat areas, the dominant biotic subclass under the CMECS framework was determined for each benthic sample site. Of the 23 sites sampled, one location (benthic imagery only) could not be classified due to insufficient photo quality. Of the remaining 22 sites, 20 were dominated by soft sediment fauna (Figure 1).

Attached fauna, indicative of potentially sensitive hard bottom or live bottom benthic habitats, was the dominant biotic subclass observed at two sites (both sampled with benthic imagery only) (Figure 1). These sites were characterized by the presence of whip corals (*Leptogorgia sp.*), arborescent bryozoans, and stony corals (*Astrangia sp.*) growing attached to cobbles. Attached organisms including slipper shells (*Crepidula sp*.) were also observed through imagery or grab sample analysis at five sites dominated by soft sediment fauna (Figure 1). No evidence of submerged aquatic vegetation was observed at any of the benthic sample locations.

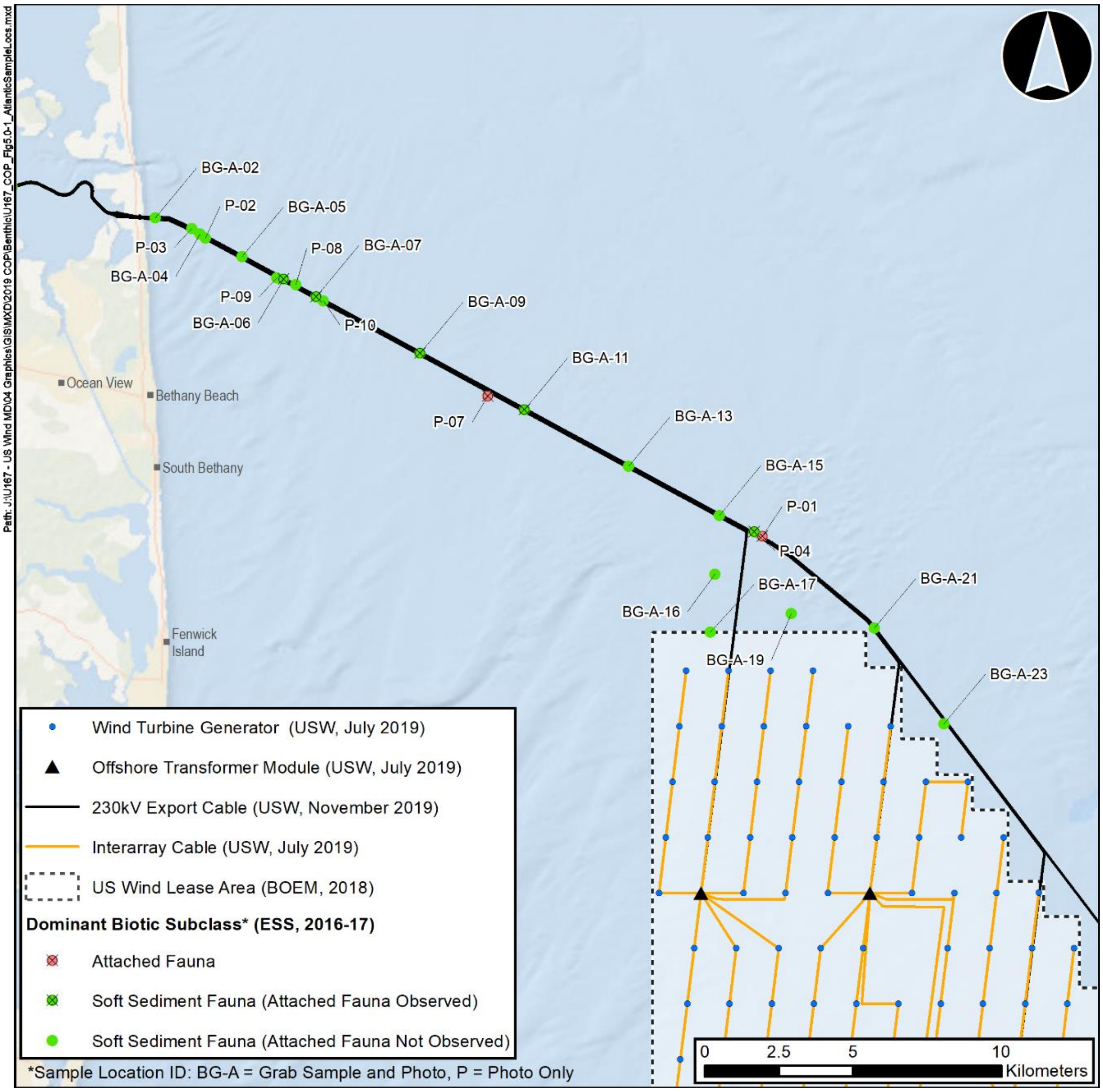


Figure 1. Offshore Export Cable Benthic Samples CMECS Biotic Subclass Classification and Attached Organism Presence

Table G. CMECS Classification of Benthic Sample Sites Along the Offshore Export Cable Route

CMECS Level		Classification
Biogeographic Setting	Realm	Temperate North Atlantic
	Province	Cold Temperate Northwest Atlantic
	Ecoregion	Virginian
Aquatic Setting	System	Marine
	Subsystem	Nearshore
	Tidal Zone	Subtidal
Water Column Component	Water Column Layer	Marine Nearshore Lower Water Column
	Salinity Regime	Euhaline Water
	Temperature Regime	Moderate Water (Seasonal Variation from Cold to Warm)
Geoform Component	Tectonic Setting	Passive Continental Margin
	Physiographic Setting	Continental Shelf
	Geoform Origin	Geologic
Substrate Component	Substrate Origin	Geologic Substrate
	Substrate Class	Unconsolidated Mineral Substrate
	Substrate Subclass	Fine Unconsolidated Substrate, Coarse Unconsolidated Substrate
	Substrate Group	Sand, Gravel, Mud
	Substrate Subgroup	Coarse Sand, Fine Sand, Medium Sand, Pebble, Silty Clay, Cobble
Biotic Component	Biotic Setting	Benthic Biota
	Biotic Class	Faunal Bed
	Biotic Subclass	Soft Sediment Fauna, Attached Fauna

*Indicates multiple classifications within this level of the CMECS hierarchy among sample sites

5.0 SUMMARY

A benthic field survey was completed to collect supplemental site-specific data along the Offshore Export Cable Route through offshore MD and DE waters for the Maryland Offshore Wind Energy Project. Twenty-three locations along the Offshore Export Cable Route were sampled using collection of still images of the seafloor and collection of benthic grab samples. These data were used to characterize the benthic community and generate taxonomic classifications of benthic habitats in the Offshore Export Cable Route in the waters offshore of MD and DE under CMECS.

Benthic imagery documented variable seafloor habitats including sandy areas dominated by sand dollars (Clypeasteroidea), and gravel beds occupied by slipper shells (*Crepidula sp*.), hermit crabs (*Pagurus sp*.), and decorator worms (*Diopatra sp*.). Various mobile organisms, including sculpin, shrimp, and a left-eyed flatfish were observed in images but not in benthic grab samples. Rocky bottom areas were inhabited by different taxa than were observed in images of benthic grab locations. These organisms included whip coral (*Leptogorgia sp*.), stony coral (*Astrangia sp*.), cancer crabs, bushy bryozoans, and colonial ascidians.

Seventy-three marine invertebrate taxa, including nematode round worms, polychaetes, slipper shells, bivalves, gastropods, amphipods, isopods, cumacean shrimp, crabs, oligochaete worms, sand dollars, sea stars, sea cucumbers, nemertean ribbon worms, and lancelets, were observed in the fourteen samples analyzed for this project. Mean macroinvertebrate density was 813 organisms/m^2, and taxa richness averaged 8.0 per site, with samples containing between two and 22 taxa. The benthic community observed in the analyzed samples was dominated by nematode roundworms, which accounted for 67% of all organisms. When this group was excluded, mollusks (slipper shells, bivalves, and gastropods) and polychaetes were dominant, constituting 45% and 31% of all non-nematode organisms. The most abundant non-nematode organism was the common slipper shell *Crepidula fornicata*, which accounted for 12% of all individuals. The most widely distributed taxa were nematodes and decorator worms (*Diopatra cuprea)*, which were observed in nine and five samples, respectively. Polychaetes and crustaceans were the most taxonomically diverse groups, each accounting for over 35% of all documented taxa.

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Appendix A

Benthic Sample Taxonomy and Enumeration Results

	Organisms/m^2													
	BG-A-02	BG-A-04	BG-A-05	BG-A-06	BG-A-07	BG-A-09	BG-A-11	BG-A-13	BG-A-15	BG-A-16	BG-A-17	BG-A-19	BG-A-21	BG-A-23
Conversion Factor (multiply by density for raw sample abundance)	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101
Taxa														
Crustacea														
Ampelisca sp.				9.9										
Ampeliscidae										9.9				
Amphipoda				39.7	19.8	9.9								
Batea sp.				79.4										
Byblis serrata														39.7
Cancer irroratus						9.9								
Crustacea									9.9					
Cumacea							9.9							9.9
Diastylis sp.														9.9
Dissodactylus mellitae										19.8				
Edotia montosa										9.9				29.8
Ericthonius sp.				9.9										
Euceramus praelongus			9.9											
Gammaridea														29.8
Hippomedon serratus														9.9
Leptocuma sp.										9.9				
Leptognathia caeca												9.9	19.8	
Libinia emarginata				19.8										
Lysianopsis sp.				9.9										
Pagurus sp.									9.9					

	Organisms/m^2													
	BG-A-02	BG-A-04	BG-A-05	BG-A-06	BG-A-07	BG-A-09	BG-A-11	BG-A-13	BG-A-15	BG-A-16	BG-A-17	BG-A-19	BG-A-21	BG-A-23
Conversion Factor (multiply by density for raw sample abundance)	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101
Taxa														
Politolana polita								9.9						
Protohaustorius sp.										9.9				
Pseudunciola obliquua										89.3				
Rhepoxynius epistomus										9.9				
Trichophoxus sp.				39.7										19.8
Unciola sp.			29.8		49.6			19.8			29.8			
Mollusca														
Anadara transversa					19.8									
Astarte sp.									9.9					
Boonea seminuda				69.4										
Crenella sp.												19.8		
Crepidula fornicata				813.4	29.8	515.8	9.9							
Crepidula plana						119.0								
Ensis directus					9.9	9.9					9.9			
Mya sp.													19.8	
Mytilus edulis						29.8								
Nucula sp.				9.9										
Solen viridis		9.9												
Tellina sp.				19.8										
Other														
Amphioxiformes		9.9												

	Organisms/m^2													
	BG-A-02	BG-A-04	BG-A-05	BG-A-06	BG-A-07	BG-A-09	BG-A-11	BG-A-13	BG-A-15	BG-A-16	BG-A-17	BG-A-19	BG-A-21	BG-A-23
Conversion Factor (multiply by density for raw sample abundance)	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101
Taxa														
Nematoda	4215.9	2162.5	634.9	49.6		178.6	79.4			168.6	19.8		29.8	
Nemertea					9.9						9.9			
Asterias sp.					9.9									
Cucumaria pulcherrima			9.9	19.8										
Echinarachnius parma							9.9							
Oligochaeta														
Enchytraeidae				19.8										
Oligochaeta				19.8										
Tubificinae		19.8			9.9						19.8			
Polychaeta														
Aglaophamus circinata										9.9				
Ampharetidae						19.8								
Brania sp.		9.9												
Capitellidae					9.9									
Ceratonereis sp.				9.9										
Diopatra cuprea		9.9	9.9	69.4	89.3	9.9								
Exogone sp.		208.3	49.6	69.4	39.7									
Glycera americana						9.9								
Glycinde solitaria					9.9									
Levinsenia gracilis				9.9										
Lumbrineridae					9.9									

	Organisms/m^2													
	BG-A-02	BG-A-04	BG-A-05	BG-A-06	BG-A-07	BG-A-09	BG-A-11	BG-A-13	BG-A-15	BG-A-16	BG-A-17	BG-A-19	BG-A-21	BG-A-23
Conversion Factor (multiply by density for raw sample abundance)	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101
Taxa														
Lumbrineris sp.			9.9											
Lumbrineris fragilis				9.9										
Mediomastus ambiseta	168.6		9.9			9.9							19.8	
Micronephthys minuta														9.9
Neoleanira tetragona				19.8										19.8
Nephtys bucera	9.9													
Nephtys picta		9.9												
Nereididae					29.8									
Pherusa sp.						9.9								
Pilargidae											9.9			
Scoletoma sp.			109.1						19.8					
Scoletoma tenuis			19.8											
Sigalion arenicola								9.9						
Syllidae			9.9											
Travisia parva				9.9			9.9							
Total Density	**4394**	**2440**	**903**	**1428**	**347**	**932**	**119**	**40**	**50**	**337**	**99**	**30**	**89**	**179**
Taxa Richness	**3**	**8**	**11**	**22**	**14**	**12**	**5**	**3**	**4**	**9**	**6**	**2**	**4**	**9**