

**Appendix L – Submerged Aquatic Vegetation Supplemental Material**

**Phase 1 - Aerial Submerged Aquatic Vegetation Survey  
2019**





## **New Jersey Submerged Aquatic Vegetation Aerial Survey**

**HDR Engineering, Inc**

**APEM Ref: P00004340**

**December 2019**

Mark Wilkins, Lauren Lequime, David Campbell

**Client:** HDR Engineering, Inc.

**Address:** 500 7<sup>th</sup> Avenue

New York, NY 10018-4502

**Project reference:** P00004340

**Date of issue:** December 2019

---

**Project Director:** David Campbell

**Project Manager:** Mark Wilkins

**Other:** Lauren Lequime

---

APEM Inc.  
2603 NW 13<sup>th</sup> Street,  
#402, Gainesville,  
Florida,  
FL 32609-2835.

Tel: +44 161 442 8938

VAT No. 47-4411075

“This is a draft document and should not be cited”

## Revision and Amendment Register

Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by
1.0	11/29/19	All	All	Created	DC
1.2	12/10/19	All	All	Client amendments made	DC

## Contents

1. Introduction .....	1
1.1 Project Background.....	1
1.2 Survey Locations .....	1
2. Surveys and Data Processing .....	3
2.1 Aerial Survey .....	3
2.2 Data Processing .....	3
3. Results.....	4
4. References .....	7

## List of Figures

Figure 1. Location of the two sites surveyed in New Jersey. Yellow denotes the Barnegat Bay site and red the Great Egg Harbor site. ....	1
Figure 2. The Barnegat Bay survey area, outlined in yellow. ....	2
Figure 3. The Great Egg Harbor survey area, outlined in red. ....	2
Figure 4 Seagrass coverage map of the Barnegat Bay survey area.....	5
Figure 5 Seagrass coverage map of the Great Egg Harbor survey area .....	6

## 1. Introduction

### 1.1 Project Background

APEM were commissioned by HDR Engineering, Inc (hereby referred to as HDR) to undertake an aerial survey of two coastal areas in New Jersey. The aim of the survey was to capture high-resolution aerial photography in order to map submerged aquatic vegetation (SAV) in the two areas.

### 1.2 Survey Locations

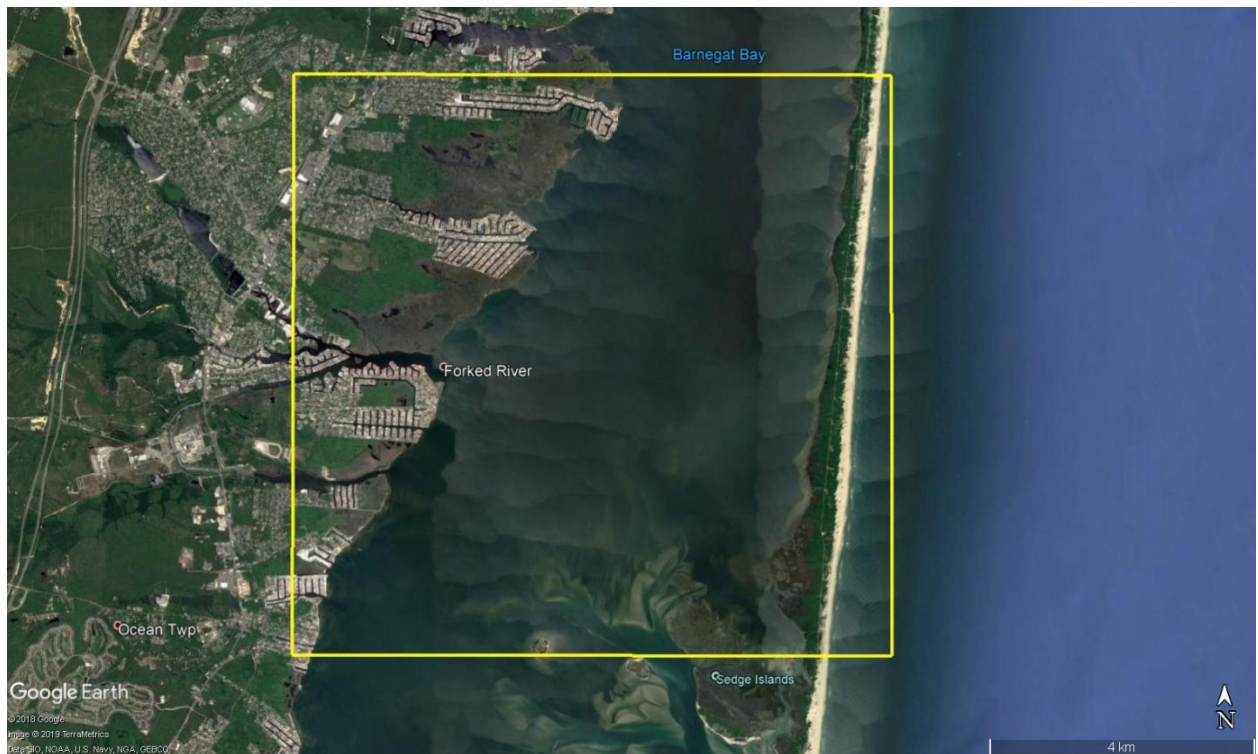
The project involved surveying two locations, one in Barnegat Bay, Ocean County and the other in Great Egg Harbor, Cape May County. An overview of the two locations is shown in Figure 1.



**Figure 1. Location of the two sites surveyed in New Jersey. Yellow denotes the Barnegat Bay site and red the Great Egg Harbor site.**

The Barnegat Bay site measured 28 square miles in area and is shown in more detail in Figure 2.





**Figure 2. The Barnegat Bay survey area, outlined in yellow.**

The Great Egg Harbor site measured approximately 13 square miles in area and is shown in more detail in Figure 3.



**Figure 3. The Great Egg Harbor survey area, outlined in red.**

## 2. Surveys and Data Processing

### 2.1 Aerial Survey

The aerial survey took place on October 7<sup>th</sup> 2019. The survey was carried out in a fixed wing aircraft using APEM's bespoke Shearwater III camera system surveying at an altitude of approximately 3,650ft above sea level. This allowed us to capture high-resolution imagery at a resolution of 4 cm ground sample distance (GSD). For Barnegat Bay, a total of 10,864 images were captured across 15 flight lines. For Great Egg Harbor a total of 7,299 images were captured across 10 flight lines. The survey was targeted to be complete within 1.5 hours either side of low tide, as this would allow for maximum intertidal exposure and help facilitate the mapping process.

Once the survey was complete, the data were downloaded and backed-up following APEM's stringent data management protocols.

### 2.2 Data Processing

The GPS data recorded on-board during the aerial survey were processed to produce location data for each aerial photograph's camera release point. These data were fed into photogrammetric processing software along with the imagery to produce georeferenced orthomosaics.

Over land, this photogrammetry process is able to create a seamless mosaic of the area. Over sea, however, it is often more problematic to generate the same type of seamless output due to the nature of the imagery (i.e. sun glint, changing wave patterns between adjacent imagery etc.). As such, a combination of automated processing and manual georeferencing of images were required in order to achieve the required mosaic. This allowed a mosaic to be generated for all areas where the sea bottom could be seen within the imagery. For areas of deeper water where the sea bottom cannot be seen (typically in areas less than 7ft below mean sea level) in any of the imagery due to lack of light penetration, it was not possible to either georeference the imagery or map SAV. However, SAV has been documented to be very patchy and rare at depths of greater than 2m in New Jersey (Good *et al.*, 1978, Kennish *et al.*, 2008). Therefore, it is unlikely these areas would contain SAV.

Once the mosaic was finalised, APEM marine biologists digitized areas of SAV using Geographic Information Software (GIS). Seagrass was mapped according to the following categories:

- Sparse cover; 10-40%
- Moderate cover; 40-80% cover
- Dense cover; 80-100% cover

The delineation of these categories was based on the data from the study by Lathrop *et al.* (2006), which mapped seagrass cover in the Barnegat Bay-Little Egg Harbor-Great Bay study area using these categories.

### 3. Results

The coverage maps for both survey areas are shown in Figures 4 and 5 below.



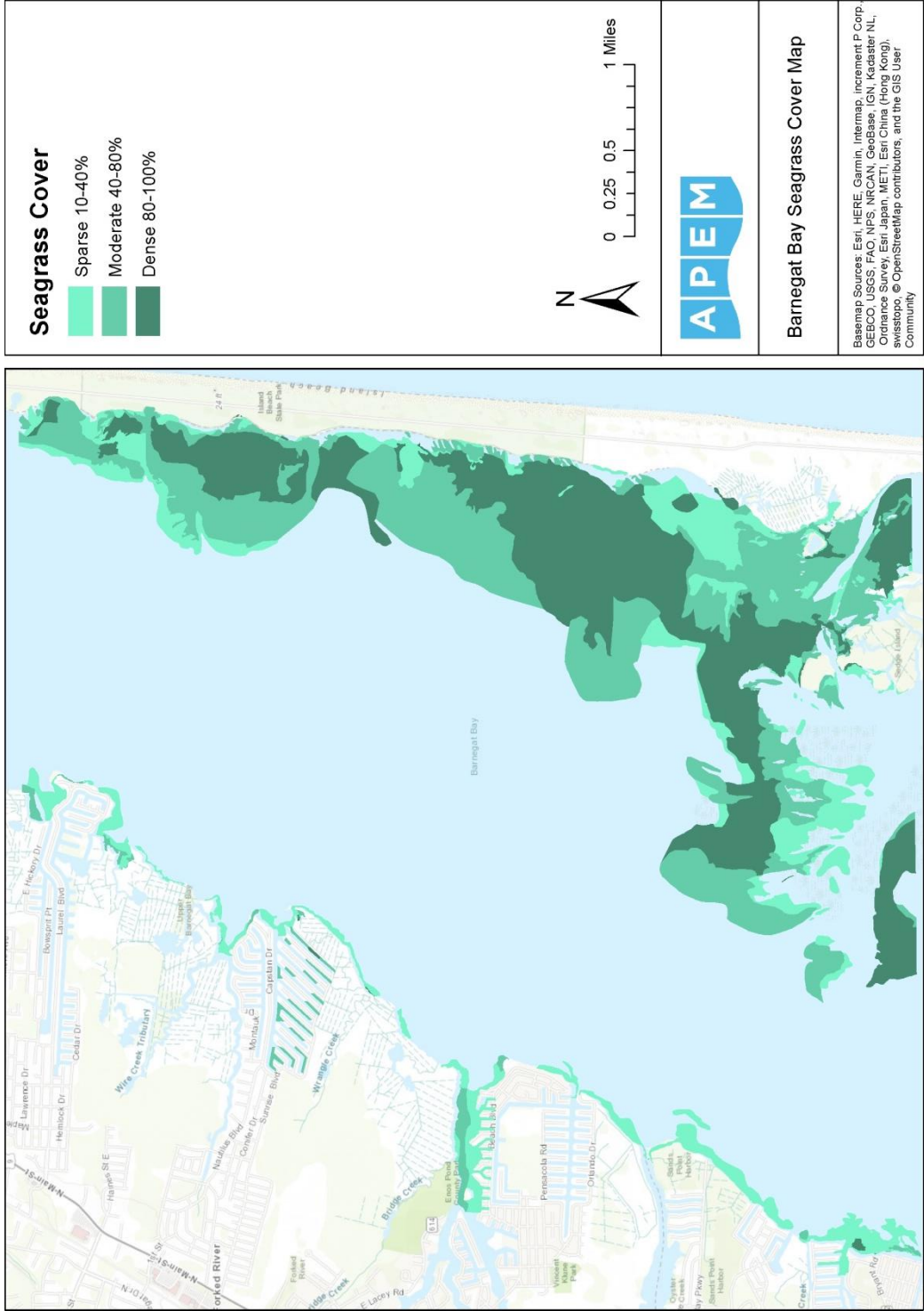


Figure 4 Seagrass coverage map of the Barnegat Bay survey area



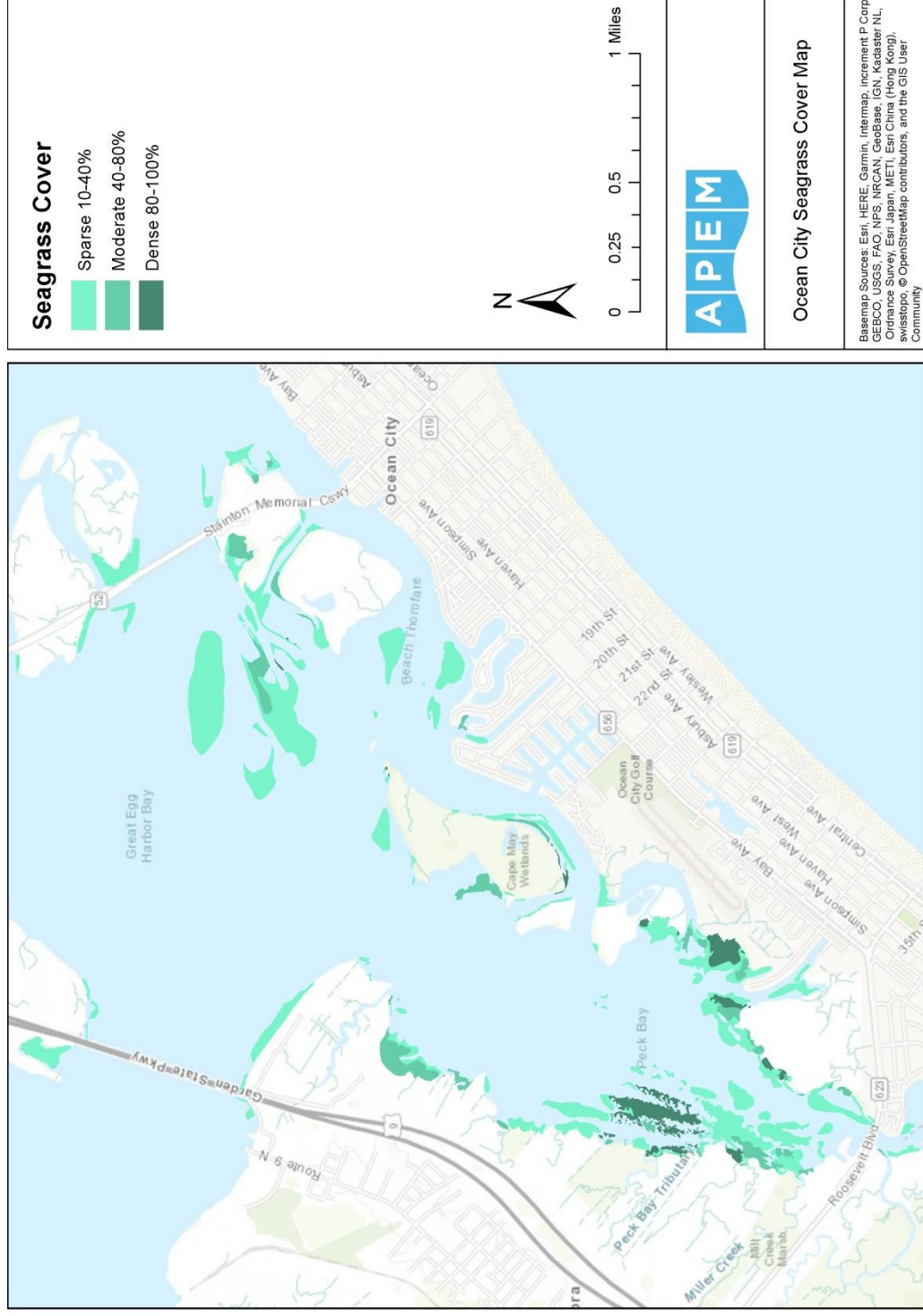


Figure 5 Seagrass coverage map of the Great Egg Harbor survey area



## 4. References

Good, R.E., Limb, J., Lyszczyk, E., Miernik, M., Ogrosky, C., Psuty, N., Ryan, J. & Sickels, F. (1978) *Analysis and Delineation of the Submerged Vegetation of Coastal New Jersey*. Center for Coastal and Environmental Studies Rutgers. Available from:

<https://www.nj.gov/dep/dsr/barnegat/casestudy-littleegg.pdf> [Accessed December 2019]

Kennish, M. J., Haag, S. M. & Sakowicz, G. P. (2008) Seagrass Demographic and Spatial Habitat Characterization in Little Egg Harbor, New Jersey, Using Fixed Transects. *Journal of Coastal Research: Special Issue*. 55, 148-170

Lathrop, R. G., Montesano, P. & Haag, S. (2006) A Multi-Scale Segmentation Approach to Mapping Seagrass Habitats Using Airborne Digital Camera Imagery. *Photogrammetric Engineering & Remote Sensing*. 72 (6), 665-675

**Phase 2 – In-Water Submerged Aquatic Vegetation Survey  
2020**

# **Ocean Wind Offshore Wind (OCW01)**

## ***Submerged Aquatic Vegetation (SAV) Survey Report***

## Document Version

File Name	Preparer	Editor	Checker	Accepter	Approver
FINAL_OCW01_Oyster Creek_SAV Report_2021-01-19	JC	AD	DY		

---

## Table of Contents

1.	Introduction.....	5
2.	Survey Area.....	5
3.	Methods.....	8
3.1	Phase 1 SAV Survey.....	8
3.2	Phase 2 SAV Survey.....	9
3.2.1	Data Analysis.....	10
3.2.1.1	Percent Cover .....	10
3.2.1.2	Stem Density.....	10
3.2.1.3	Blade Length .....	10
3.2.2	Sediment Sample Collection and Grain Size Analysis .....	11
4.	Results.....	14
4.1	Phase 1 SAV Surveys .....	14
4.2	Phase 2 SAV Survey.....	15
4.2.1	Water Depth and Quality .....	17
4.2.2	Sediment Type .....	18
4.2.3	Grain Size.....	18
4.2.4	SAV Species, Percent Cover and Density.....	18
4.2.5	Blade Length .....	24
5.	Summary.....	24
6.	Literature Cited .....	25

### List of Tables

Table 1.	Water Quality and Depth Summary.....	17
Table 2.	Grain Size Analysis Results. ....	18
Table 3.	Sampling Area SAV Presence and Percentage .....	22
Table 4.	Percentage of survey locations by estimated percent cover category of SAV by Survey Area. ....	23
Table 5.	Area of SAV cover density by Survey Area. ....	23
Table 6.	Stem Density Per 1 m <sup>2</sup> . ....	23
Table 7.	Number of Blades, Average Length, Minimum Length, and Maximum Length for Each Landing measured in place. ....	24
Table 8.	Number of Blades, Average Length, Minimum Length, and Maximum Length for blades physically collected for each landing.....	24

## List of Figures

Figure 1.	Project Area Overview Map.....	6
Figure 2.	Barnegat Bay Phase 2 SAV Survey Area .....	7
Figure 3.	Quadrat Frame with Mounted GoProHero3 for SAV Sampling. ....	12
Figure 4.	Sediment Sampling Locations.....	13
Figure 5.	SAV Map of the Barnegat Bay Phase 1 SAV Survey Area .....	14
Figure 6.	Figure excerpted from Lathrop et al. 2017 showing the distribution of watercraft and boat scar observations in the vicinity of the IBSP landfall area. The IBSP survey area is in the northern portion of each plot just to the south of the linear break in the SAV beds.....	16
Figure 7.	SAV Percent Cover Estimates at IBSP Landing. ....	19
Figure 8.	SAV Percent Cover Estimates at Holtec Property Landing.....	20
Figure 9.	SAV Percent Cover Estimates at Bay Parkway Landing.....	21
Figure 10.	SAV Percent Cover Estimates at Lighthouse Drive Landing.....	22

## List of Appendices

Appendix A.	OCW Submerged Aquatic Vegetation Survey Protocols .....	26
Appendix B.	APEM New Jersey Submerged Aquatic Vegetation Aerial Survey.....	27
Appendix C.	Survey Photography .....	28
Appendix D.	Notable Biological Observations.....	29
Appendix E.	Sediment Sampling Results.....	30



## 1. Introduction

Ocean Wind LLC (Ocean Wind), a subsidiary of Ørsted Wind Power North America LLC (Ørsted), is developing the Ocean Wind Offshore Wind Farm (Wind Farm Project or Project) to generate renewable power off the coast of New Jersey and transfer the electricity to load centers within New Jersey and the Mid-Atlantic region. Ocean Wind intends to develop, build, operate, and own a utility-scale offshore wind farm located approximately 15 miles off the coast of New Jersey within the OCS-A 0498 Lease Area (**Figure 1**). The Project will include turbines and infrastructure required to transmit power generated by the turbines to connection points with the Pennsylvania, Jersey, Maryland (PJM) electric transmission system or power pool. Up to two grid connections will be made at BL England and Oyster Creek. The offshore export cables will be buried below the seabed within federal and state waters and will connect with the onshore export cable at the onshore transition joint bays (TJBs) at the landfall location(s). For the Oyster Creek interconnection point, buried export cables from the wind farm area will make landfall at Island Beach State Park and then continue across Barnegat Bay and make landfall on the mainland at one of the three potential landfall locations (**Figure 2**). The Project would be installed from 2023 through 2024 and commissioned and operational in 2024.

SAV along the New Jersey coast has been studied by various public and private entities over the last 40 years. Barnegat Bay has been extensively studied, with historical SAV mapping completed by the New Jersey Department of Environmental (NJDEP) from 1979 to 1987. Additional studies were completed by Rutgers University in the early 2000s (Lathrop and Haag, 2011). SAV beds provide shelter and forage habitat for a variety of estuarine fish and macrocrustacean species (State of New Jersey, 2017). Additionally, SAV beds provide dissolved oxygen to the water column and provides stability to sediments against erosion forces as a function of root/rhizome development and substrate binding (Bergstrom and Hurley, 2006). The SAV canopy modifies local hydrodynamics, promoting increased sedimentation by reducing water velocity and allowing fine particles to settle out of suspension.

Based on the desktop study review of existing SAV information, Ocean Wind developed a Project-specific SAV survey plan to collect additional information near potential landfall locations (Appendix A). The survey protocol was developed using existing state and federal agency protocols and those that were used for similar surveys in New Jersey. In addition, Ocean Wind coordinated with the NJDEP and the National Oceanic and Atmospheric Administration (NOAA) on the protocols and incorporated their feedback.

To fill in the data gaps from historical NJDEP and Rutgers University mapping and existing studies, Phase 1 Aerial Photography Surveys and Phase 2 In-water SAV surveys were conducted to identify the current presence and extent of SAV beds within the proposed export cable routes and landfall locations. The Phase 1 Survey is summarized below and has been included as Appendix B. Based on project design and changes to routing, a Phase 2 survey was not conducted for BL England study area. Phase 2 SAV surveys were targeted to focus on areas where the routes are likely to cross back bay areas where SAV habitat is present and therefore, only conducted in Barnegat Bay. Phase 2 SAV surveys are discussed in further detail below. Site photographs are provided in Appendix C and notable biological observations are provided in Appendix D.

## 2. Survey Area

The Phase 2 SAV surveys were conducted in Barnegat Bay, Ocean County, with a total survey area of approximately 0.08 square miles (approximately 200,000 m<sup>2</sup>) (**Figure 2**). The SAV survey areas extend from the shoreline out to the edge of the SAV bed as identified in aerial surveys and confirmed on site. The Island Beach State Park (IBSP) survey area is located on the eastern side of the Bay and extends from the backside

of the IBSP barrier island approximately 1,200 m (3,900 ft) out into the Bay. The Holtec Property landfall area is the northernmost potential landfall area located on the western side of the Bay north of the Oyster Creek mouth and extends approximately 200 m (650 ft) out into the Bay. The Bay Parkway landfall area is the middle potential landfall area on the western side of the Bay south of the mouth of Oyster Creek and the survey area extends 370 m (1,200 ft) out into the Bay. The Lighthouse Drive landfall area is the southernmost potential landfall area located on the western side of the Bay located north of Waretown Creek and extends 220 m (720 ft) out into the Bay.

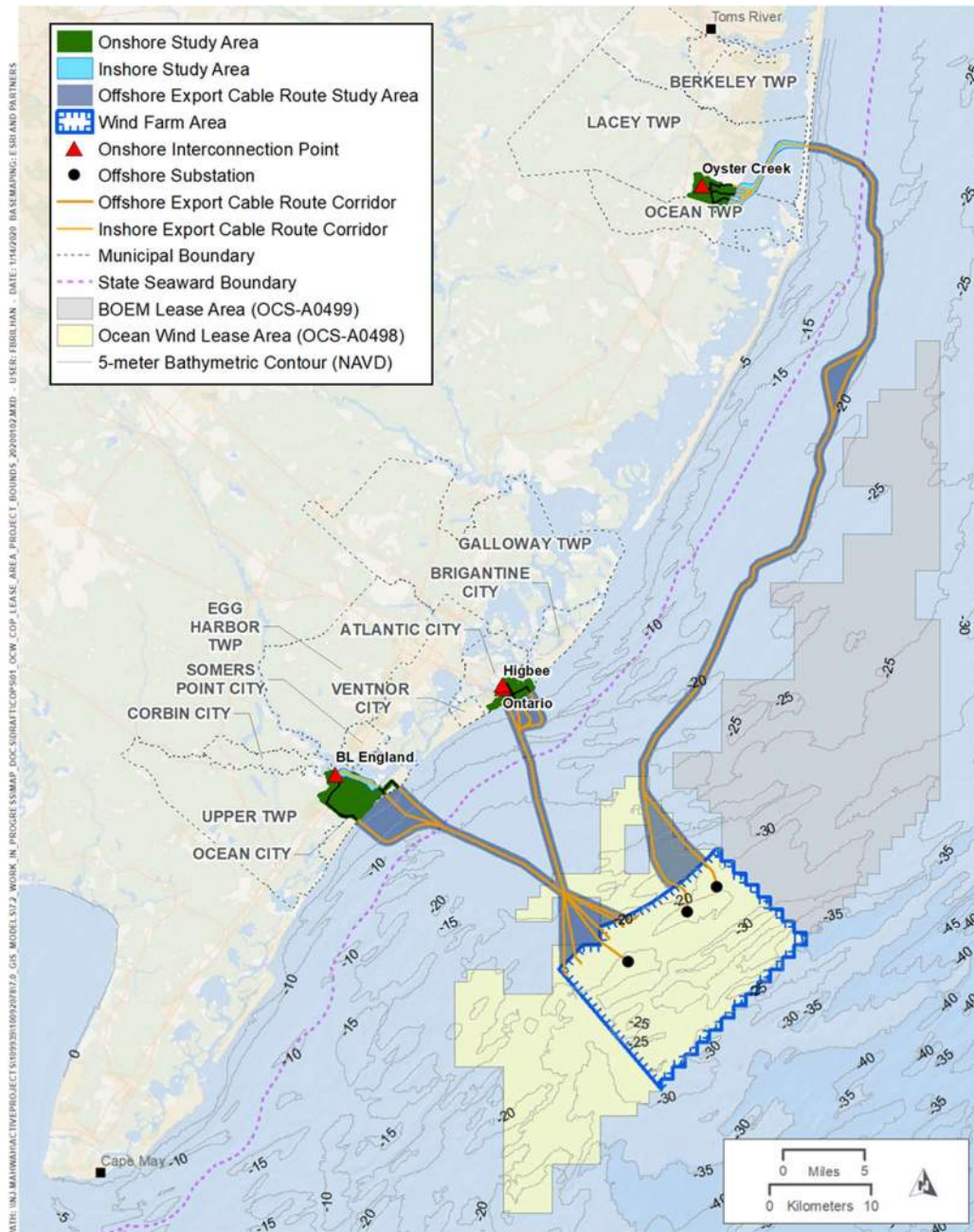


Figure 1. Project Area Overview Map.



**Figure 2. Barnegat Bay Phase 2 SAV Survey Area**



### 3. Methods

In October 2019 and October 2020, Phase 1 and Phase 2 SAV surveys were conducted at the anticipated project landfall area for Oyster Creek (**Figure 2**) to confirm the presence and extent of SAV beds located along proposed inshore export cable routes and potential landfall locations. The SAV survey method described here and provided in Appendix A, is based on methodology described in Lathrop et al. (2011), the *Submerged Aquatic Vegetation Survey Guidance for the New England Region* protocol published in 2016 by a joint agency task force including the USEPA, NOAA, and the USACE (Colarusso and Verkade, 2016), and *Guidance for Submerged Aquatic Vegetation (SAV) Surveys as Related to the Submerged Vegetation Habitat Rule at NJAC 7:7E-3.6 (NJDEP 2015)*.

Surveying efforts were divided into two phases. The first phase of the survey (referred to as “Phase 1 SAV Survey”) was conducted later in the growing season in October 2019 during periods of high visibility before the seasonal decline in water temperatures reduce growth of SAV. The presence/absence of SAV beds was determined within the study areas and their extents were mapped using aerial photography. The second phase of the survey (referred to as “Phase 2 SAV Survey”) was conducted the week of 5 October 2020 and gathered more detailed information about the SAV beds identified in Phase 1 SAV Surveys using quadrat sampling along transect lines.

#### 3.1 Phase 1 SAV Survey

The Phase 1 SAV Survey was carried out in a fixed wing aircraft using a Shearwater III camera system surveying at an altitude of approximately 1,112 m (3,650 ft) above sea level. High-resolution imagery was captured at a resolution of 4 centimeters (cm) (1.5 inches) ground sample distance (GDS) during 15 flight lines. Surveys were targeted to be complete within 90 minutes of either side of low tide to allow for maximum intertidal exposure and to facilitate the SAV mapping process. Global Positioning System (GPS) data were recorded for each aerial photograph’s camera release point. The extent and estimated cover density of SAV beds were estimated from aerial photography of shallow areas (<6 ft water depth).

Due to the nature of the imagery collected over the Bay (i.e., sun glint, changing wave patterns between adjacent imagery), a combination of automated processing, which involved feeding the collected GPS data into photogrammetric processing software along with the imagery, and manual georeferencing of images, was required to produce mosaics. This allowed a mosaic to be generated for all areas where the bay bottom could be seen.<sup>1</sup> Once the mosaic was finalized, areas of SAV were digitized using Geographic Information System (GIS) Software (ArcMap Version 10.7.1).

Seagrass was mapped according to the following categories<sup>2</sup>:

- Sparse (10-40 percent cover)
- Moderate (40-80 percent cover)
- Dense (80-100 percent cover)

---

<sup>1</sup> For areas of deeper water where the sea bottom could not be seen (typically in areas more than 7 ft below mean sea level) in any of the imagery due to lack of light penetration, it was not possible to georeference the imagery or map SAV. Details for density for “patchy” SAV beds was documented in Phase 2 SAV Surveys.

<sup>2</sup> The delineation of these categories was based on the data from the study by Lathrop et al. (2006), which mapped seagrass cover in Barnegat Bay-Little Egg Harbor-Great Bay study area using these categories.

The resulting areas of SAV documented in the Phase 1 Survey were used to inform the more intensive Phase 2 SAV survey effort.

### 3.2 Phase 2 SAV Survey

The Phase 2 SAV Survey was conducted to gather more detailed information about the SAV beds using underwater camera/quadrat sampling along transect lines. The Phase 2 SAV Surveys documented the outer extents of the SAV beds identified in the Phase 1 SAV Survey and obtained representative information on SAV species and density from the outer edge of the beds into the shoreline. Beginning the survey with the identification of the outer edge of the SAV bed allows survey effort to be focused on those areas where SAV is actually present. The Phase 2 survey was confined to the 50 m (164 ft) areas on either side of the proposed cable route that overlaps with areas of SAV identified in the Phase 1 SAV Survey. The 50 m (164 ft) on either side of the potential cable route was surveyed as this is the potential area which could be impacted during cable installation. The survey was completed the week of 5 October 2020. Initial reconnaissance of the survey area was conducted using the following visual assessment methods: visual inspection from an elevated boat platform, bathyscope/viewing bucket from the surface, and a pole mounted underwater camera which provided a real time feed to an observer on the boat. This reconnaissance was performed to identify the presence/absence of SAV and to determine the outer edge of the SAV bed. Reconnaissance was conducted on sunny days, during a falling or lower tide, to facilitate optimal viewing capabilities

Following initial reconnaissance, transect lines were established in the SAV beds identified in the Phase 1 SAV Surveys. Transect lines were spaced 30 m (98 ft) apart and perpendicular to the export cable route and spanned the 50 m (164 ft) buffer on either side of the cable route. Within each transect line points for SAV sampling were spaced every 10 m (33 ft). At each transect point a GoPro Hero3 mounted to an adjustable pole secured above a 0.5 m x 0.5 m (0.25 m<sup>2</sup>) quadrat frame divided into 4, 25 cm x 25 cm grid cells was lowered to the bottom to photo-document SAV and the benthic habitat (**Figure 3**). The camera was connected to a Wi-Fi extension cable to allow the camera feed to be viewed in real time by observers on the survey vessel. In the field and upon processing the photographs, the following data was recorded:

1. Date and time for each sampling transect.
2. Water depth at each sampling point (quadrat).
3. Water quality data (temperature, pH, salinity, dissolved oxygen, turbidity) at the beginning of each transect.
4. General sediment type characterized by visual observation (e.g., silt, mud, sand, shell hash) at each sampling point.
5. Estimated percent cover and density of SAV, per species, within a 0.25-m<sup>2</sup> quadrat divided into 25 cm x 25 cm grid cells.
6. Shoot length of 1-3 randomly chosen SAV blades within the quadrat, per species. Blades were estimated in place relative to reference markers on the quadrat. If, while watching the live camera feed, it was not possible to estimate blade length in place due to currents, samples were collected manually using a small three tine garden rake.
7. Estimated percent coverage (0-100 percent) per species. Surveyors recorded qualitative vegetative density as they surveyed SAV beds on the following scale:
  - a. Sparse (1-10 percent cover);
  - b. Low (11-25 percent cover);
  - c. Moderate (26-50 percent cover), and
  - d. High (>50 percent cover).
8. Notable biological observations (e.g., shellfish or algal beds, fish and macrocrustaceans) (Appendix D).

Based on field conditions and sampling logistics, the following modifications to the Project sampling protocol (Appendix A) were made:

- The quadrat size was modified from 1 m<sup>2</sup> to 0.25 m<sup>2</sup>. Agency review of the sampling protocol requested 1 m<sup>2</sup> sampling quadrat size, if possible. However, for ease of equipment maneuverability during data collection and to ensure that the camera could be submerged with the entire quadrat frame in the camera view, quadrat size was modified (see **Figure 3** for equipment setup). Additionally, 0.25m<sup>2</sup> is consistent with sampling guidelines set forth by Colarusso and Verkade (2016).
- Transects were conducted perpendicular to the cable route instead of perpendicular to the shoreline. This change was made to better assess the potential impacts of the proposed export cable a linear feature and resulted in more sampling locations.
- Water quality measurements were collected at the beginning of each transect instead of at every point along the transect. Each transect point was spaced 10m apart, due to the close proximity of each point the collection of water quality information at each point would have resulted in hundreds of redundant water quality measurements.

### 3.2.1 Data Analysis

#### 3.2.1.1 *Percent Cover*

To calculate the estimated percent coverage of the survey area, the SAV density results of the camera drops were divided into density categories based on visible percent coverage of SAV as part of Step 1:

- Absent (0 percent)
- Sparse (1-10 percent)
- Low (11-25 percent)
- Medium (26-50 percent)
- High (>50 percent)

In Step 2, the length and width of the survey areas were multiplied to get the total area (m<sup>2</sup>). The percentage of each category generated in Step 1 were multiplied by the total area calculated in Step 2 to yield the representative percent cover per survey area.

#### 3.2.1.2 *Stem Density*

Stem densities were determined during video reviews for the 0.25 m<sup>2</sup> quadrat sampling. The visible number of blades were counted within the 0.25 m<sup>2</sup> quadrat. When densities were very high and visibility of individual blades was limited, counts were capped at 250 stems/quadrat. These data were then multiplied by 4 to extrapolate stem density per 1 m<sup>2</sup>.

#### 3.2.1.3 *Blade Length*

Blade length was estimated in place from the still images captured during the field survey using the ImageJ photo processing software. A custom macro was developed that set the scale of the image based on the length of the 25 cm (10 in) grid cell in the image. Once the scale was calibrated a reviewer manually drew a line over selected blades of the SAV. Stems selected for measurement were generally those where the grid cells of the SAV frame/grid or the currents in the area pushed the blades of SAV over horizontally such that the length of a stem could be estimated. The estimated length of the blade was recorded on the image and in a spreadsheet. In the instances where SAV was collected the blade length was measured on a ruler and photographed. Each blade length was measured to the nearest tenth of a centimeter. The SAV blades that were physically collected during the Phase 2 SAV survey were measured to the nearest tenth of a centimeter.

### 3.2.2 Sediment Sample Collection and Grain Size Analysis

Per the NJDEP (2015) SAV Survey Guidance document and the Project survey protocol, sediment samples were collected for grain size analysis. The sediment samples were collected on October 8, 2020, using a petite ponar grab from locations representative of the observed sediment types within each of the four potential landfall areas during the SAV survey (**Figure 4**). The sediment samples were photographed, then homogenized, placed in glass jars, and sent to an analytical laboratory for grain size analysis consistent with the American Society for Testing and Materials (ASTM) methods D6913 and D7928. The results were reported according to the Wentworth (1922) grain size scale.



**Figure 3. Quadrat Frame with Mounted GoProHero3 for SAV Sampling.**





Figure 4. Sediment Sampling Locations.



During the Phase 1 aerial survey, the area along the IBSP shoreline was mapped as predominantly moderate to dense SAV with an outer fringe of sparser coverage. Presumed SAV beds on the eastern shoreline extend more than 1,200 m (3,930 ft) from the shoreline in some locations based on the aerial imagery. For the three landfall areas along the western shoreline of the Bay a comparatively narrow band of sparse SAV extending from approximately 70-330 m (230-1,080 ft) was observed.

## **4.2 Phase 2 SAV Survey**

At IBSP during the Phase 2 SAV survey, the outer edge of the SAV bed was observed 1,067 m (3,500 ft) from the shoreline and approximately 90 m (295 ft) from the edge of the SAV bed documented in the Phase 1 aerial survey. Depths in this area were 1-1.2 m (3-4 ft).

Due to shallower than anticipated depths, it was only possible to survey transects in the outer third of the IBSP landfall area. This area consists of a shallow shoal extending approximately 1,200 m (3,930) or more out from the shoreline of IBSP. To the north of IBSP, there appears to be an old channel with depths of up to 2.1 m (7 ft) based on nautical charts. The survey vessel had relatively shallow draft of ~0.6 m (~2 ft). To protect both the vessel and benthic habitat the survey vessel did not attempt to enter areas where depths were too shallow. Vessel counts and prop scars documented in Lathrop et al. (2017) are concentrated along the outer fringe of the shoal in the vicinity of the IBSP survey area, which indicates depths too shallow to be readily accessible by vessel (**Figure 6**). Slightly to the south of IBSP survey area is a portion of Tice's Shoal which experiences heavy vessel traffic with greater vessel access closer to the shoreline.

SAV was documented in only one survey location within the Holtec Property survey area and had a depth of 1 m (3.2 ft). In the Bay Parkway survey area, the outer edge of the SAV beds was documented 60 m (197 ft) further out than what was documented in the Phase 1 survey and 380 m (1,248 ft) from the shoreline. The depth at the edge of the SAV bed was 1.6 m (5.2 ft). In the Lighthouse Drive survey area, the outer edge of the SAV bed is generally in the same area as what was documented in the Phase 1 survey and approximately 150 m (492 ft) from the shoreline. The depth at the edge of the SAV bed ranged from 1.2-1.4 m (3.9-4.7 ft).

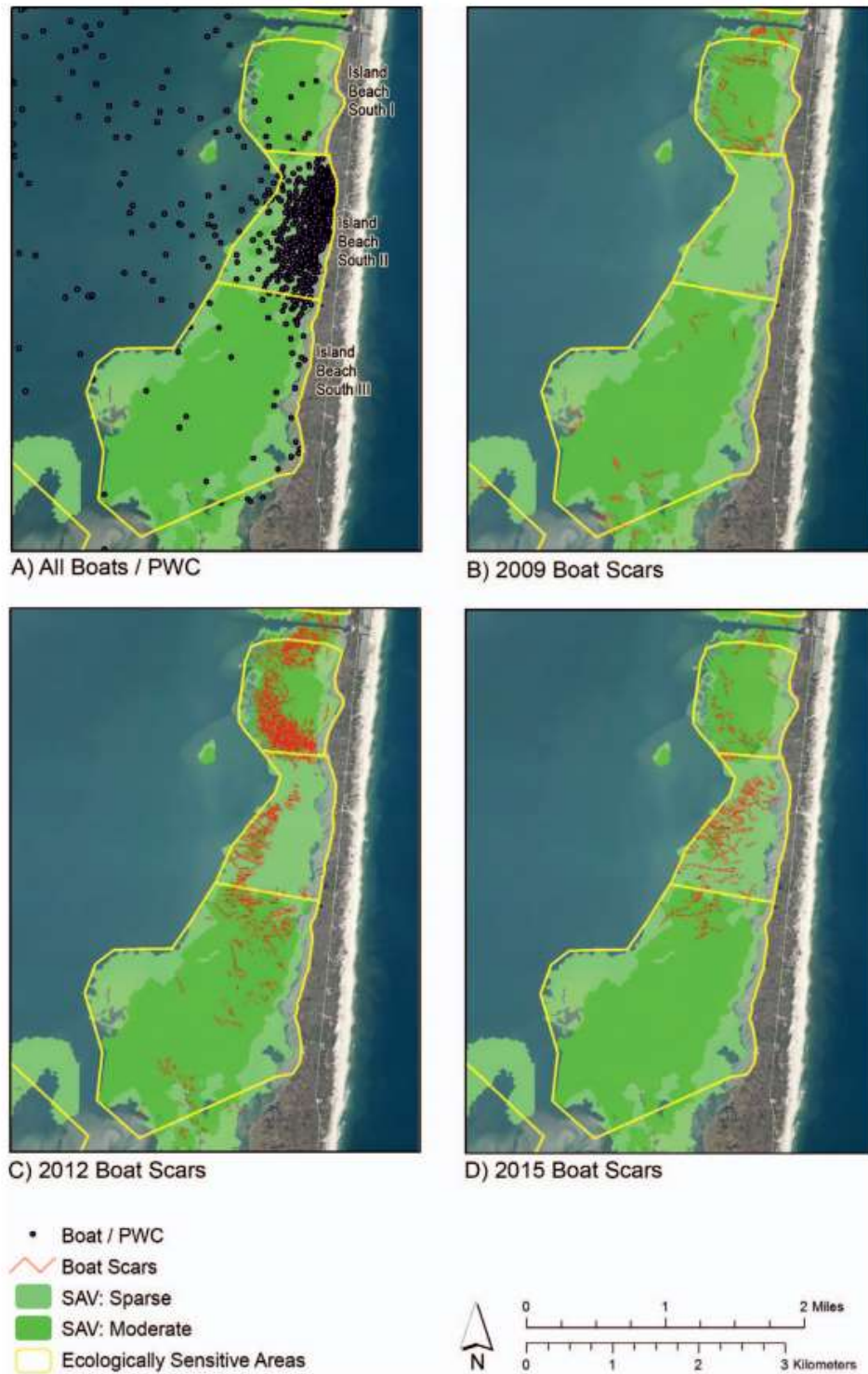


Figure 6. Figure excerpted from Lathrop et al. 2017 showing the distribution of watercraft and boat scar observations in the vicinity of the IBSP landfall area. The IBSP survey area is in the northern portion of each plot just to the south of the linear break in the SAV beds.



SAV was documented in only one survey location within the Holtec Property survey area and had a depth of 1 m (3.2 ft). In the Bay Parkway survey area, the outer edge of the SAV beds was documented 60 m (197 ft) further out than what was documented in the Phase 1 survey and 380 m (1,248 ft) from the shoreline. The depth at the edge of the SAV bed was 1.6 m (5.2 ft). In the Lighthouse Drive survey area, the outer edge of the SAV bed is generally in the same area as what was documented in the Phase 1 survey and approximately 150 m (492 ft) from the shoreline. The depth at the edge of the SAV bed ranged from 1.2-1.4 m (3.9-4.7 ft). Phase 2 SAV survey photograph is provided in Appendix C.

#### 4.2.1 Water Depth and Quality

Water depths recorded for each sampling location and water quality measurements taken at the beginning of each transect are presented in **Table 1**. The average depth across sampling locations was 4.4 ft, average temperature was 18.4°C, average salinity was 26.7 ppt, average dissolved oxygen was 7.9 mg/L average pH was 7.9, and average turbidity was 2.9 NTU.

**Table 1. Water Quality and Depth Summary.**

Survey Area	Transect	Point ID	Depth (ft)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
IBSP	360-365	360	2.3	15.8	24.5	7.5	7.8	5.38
	376-366	376	3.6	17.2	25.8	7.8	8.2	4.46
	377-387	387	3.3	17.2	25.8	7.77	8	1.89
	388-389	398	3.2	17.2	25.8	7.6	8	2.26
	399-409	409	4.6	17.2	25.8	7.5	7.9	3.95
Bay Parkway	475-465	475	4.8	18.2	26.2	7.33	7.6	3.56
	475-465	465	5.6	18.2	26.4	7.27	7.6	11.46
	477-487	477	7.1	18.3	26.4	7.27	7.7	2.93
	477-487	487	4.5	18.4	26.4	7.52	7.6	2.2
	499-489	489	4.7	18.4	27	7.5	7.6	1.84
	510-500	510	4.7	18.5	26.8	7.43	7.7	3.55
	510-500	500	4.6	18.5	26.8	7.46	7.7	1.69
	522-512	512	4.8	18.5	27.4	7.7	7.7	1.63
	534-524	534	4.9	18.5	27.4	7.7	7.7	1.17
	545-535	545	4.1	18.6	27.4	7.8	7.8	2.06
	557-547	557	4.5	18.7	27.7	7.99	7.8	1.85
	569-559	567	3.8	18.8	27.7	8.5	7.9	1.38
	571-581	581	2.5	19	27.1	8.7	8.1	0.83
	619-629	619	5.9	17.2	25.8	7.5	7.9	3.95
Holtec Property	619-629	629	6.1	19.5	27	8.4	7.9	1.73
	631-641	641	5.7	19.7	26.7	8.5	7.9	2.67
	642-652	652	4.5	19.6	27	8.6	7.9	1.56
	663-663	663	4.1	19.7	26.7	8.7	7.8	2.38
	687-677	677	4.5	19.9	26.7	8.6	7.8	3.08
	687-677	687	2.9	19.9	26.6	8.92	7.7	2.39
	699-689	689	3.1	19.6	26.6	8.4	7.9	15.3

Survey Area	Transect	Point ID	Depth (ft)	Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
Lighthouse Drive	710-700	710	5	18.3	27	7.5	8.1	1.88
	712-722	712	5.7	18.5	26.7	7.52	8.2	0.94
	724-734	734	3.9	18.3	27.3	8.7	8.2	0.78
	736-746	746	3.2	18.5	27.3	8.38	7.9	2.15
	758-748	758	2.7	18.6	27.1	7.75	8	1.7
	770-760	770	2.3	18.8	26.5	8.2	8.1	0.99
	777-772	772	4.3	18.9	26.9	8.14	8.1	1.22

#### 4.2.2 Sediment Type

Sediments varied from fine, silty sand to sand with scattered cobble or shell hash. At Bay Parkway Landing, the dominant sediment type observed was sand. Holtec Property Landing consisted predominately of silty sand and sand and IBSP Landing was dominated by silty sand. Lighthouse Drive Landing sediment consisted predominately of silty sand and sand. Overall, the Phase 2 SAV survey area sediments consisted of sand and silty sand.

#### 4.2.3 Grain Size

The grain size analysis results from the sediment samples collected during the Phase 2 SAV Surveys are reported in Table 2. Laboratory grain size analysis results are provided in Appendix E. Most of the samples consisted of medium to fine sand. There were no noticeable trends between sediment type and SAV density.

**Table 2. Grain Size Analysis Results.**

Grain Size	Sample ID						
	636	678	475	541	760	746	391
% Gravel	0	0	0	0	0	0	0
% Coarse Sand	2	3	0	3	5	0	0
% Medium Sand	65	24	9	25	15	8	13
% Fine Sand	32	54	89	49	67	88	86
% Silt or Clay	1	19	2	23	13	4	1
Landfall	Holtec Property	Holtec Property	Bay Parkway	Bay Parkway	Lighthouse Drive	Lighthouse Drive	IBSP

#### 4.2.4 SAV Species, Percent Cover and Density

During the Phase 2 SAV Survey, a total of 283 camera drops were completed. Of those camera drops, 118 had SAV present, accounting for 41.7 percent SAV presence for the entire survey area combined. SAV is known to form patchy beds with areas of exposed sediment which is consistent with the observed intermittent presence of SAV at the camera drops. SAV was present in 36 percent of the camera drops in the outer portion of the IBSP area (**Figure 7**). These findings are consistent with the narrow band of sparse SAV observed during the Phase 1 SAV survey. Based on review of the photographs collected during the field survey and the SAV samples collected, observed SAV consisted almost entirely of eelgrass (*Zostera marina*) with widgeon grass (*Ruppia maritima*) only documented at a single location (Station 691) at the Holtec Property survey area.

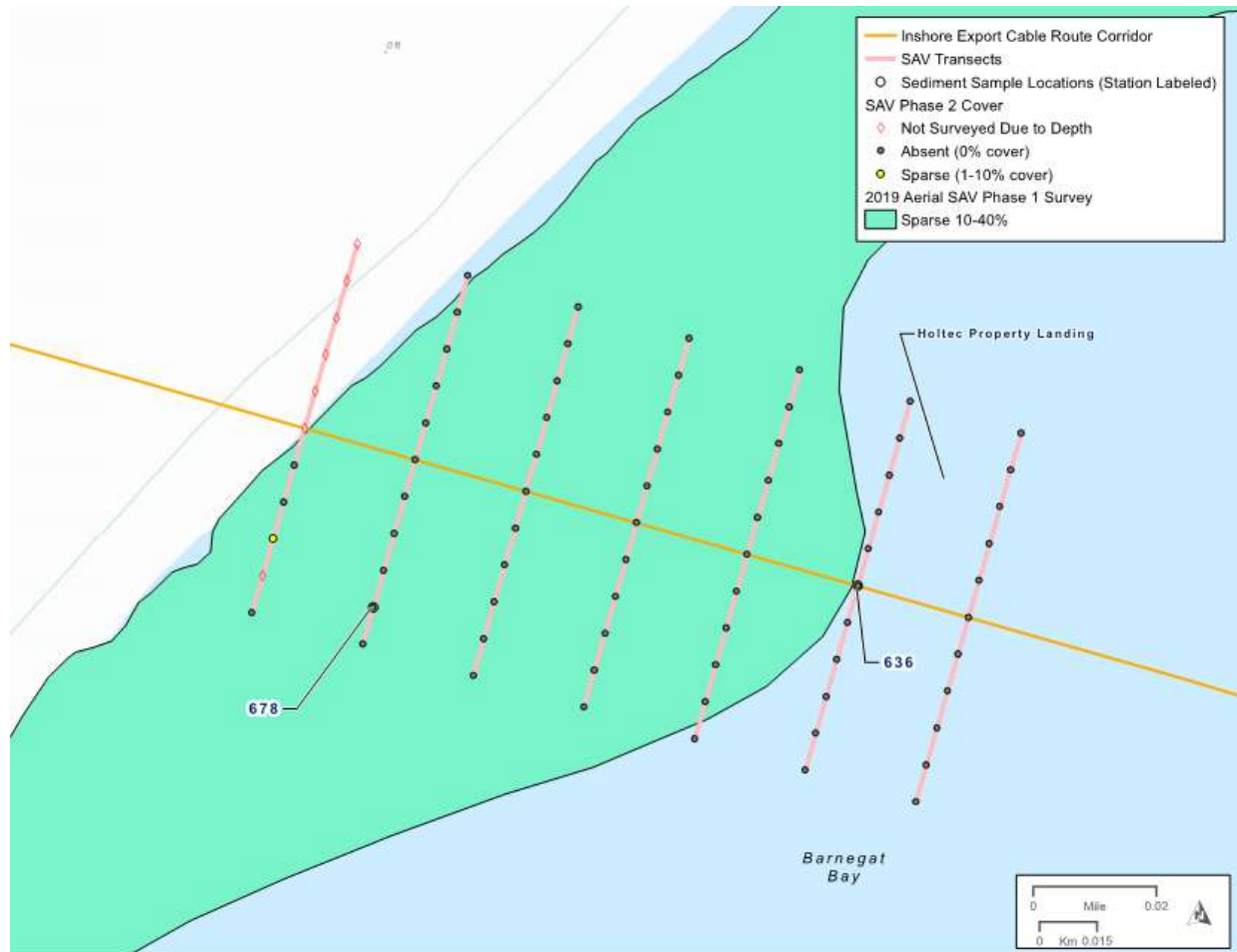
The Holtec Property did have substantial coverage of macroalgae in many of the sampled locations, but SAV was only observed at Station 691. The findings of the Phase 2 survey at the Holtec Property Landing were inconsistent with the findings of the Phase 1 aerial imagery survey. Extensive macroalgae was found to be present at the Holtec Property Landing survey area during Phase 2 survey efforts, not sparse coverage of SAV (10-40 percent). The macroalgae present likely accounted for the sparse coverage that was documented during the 2019 aerial imagery mapping of the Phase 1 survey (**Figure 8**).

The Bay Parkway Landing had the highest percentage of SAV at 67 percent (**Table 3**). Compared to the Phase 1 SAV survey, SAV was observed over a slightly larger area within the Bay Parkway Landing survey area. The findings of the Phase 2 survey at Bay Parkway Landing survey area were consistent with sparse SAV coverage identified during the Phase 1 survey. Macroalgae was also found to be present at this location (**Figure 9**).

The Lighthouse Drive Landing had SAV present in approximately 47 percent of survey stations. The number of stations with SAV present were relatively evenly distributed between the sparse, low, moderate, and high percent cover categories of SAV (**Table 4, Figure 10**). During the Phase 1 Survey, the aerial imagery captured sparse coverage and did not reveal the higher densities identified during the Phase 2 Survey.

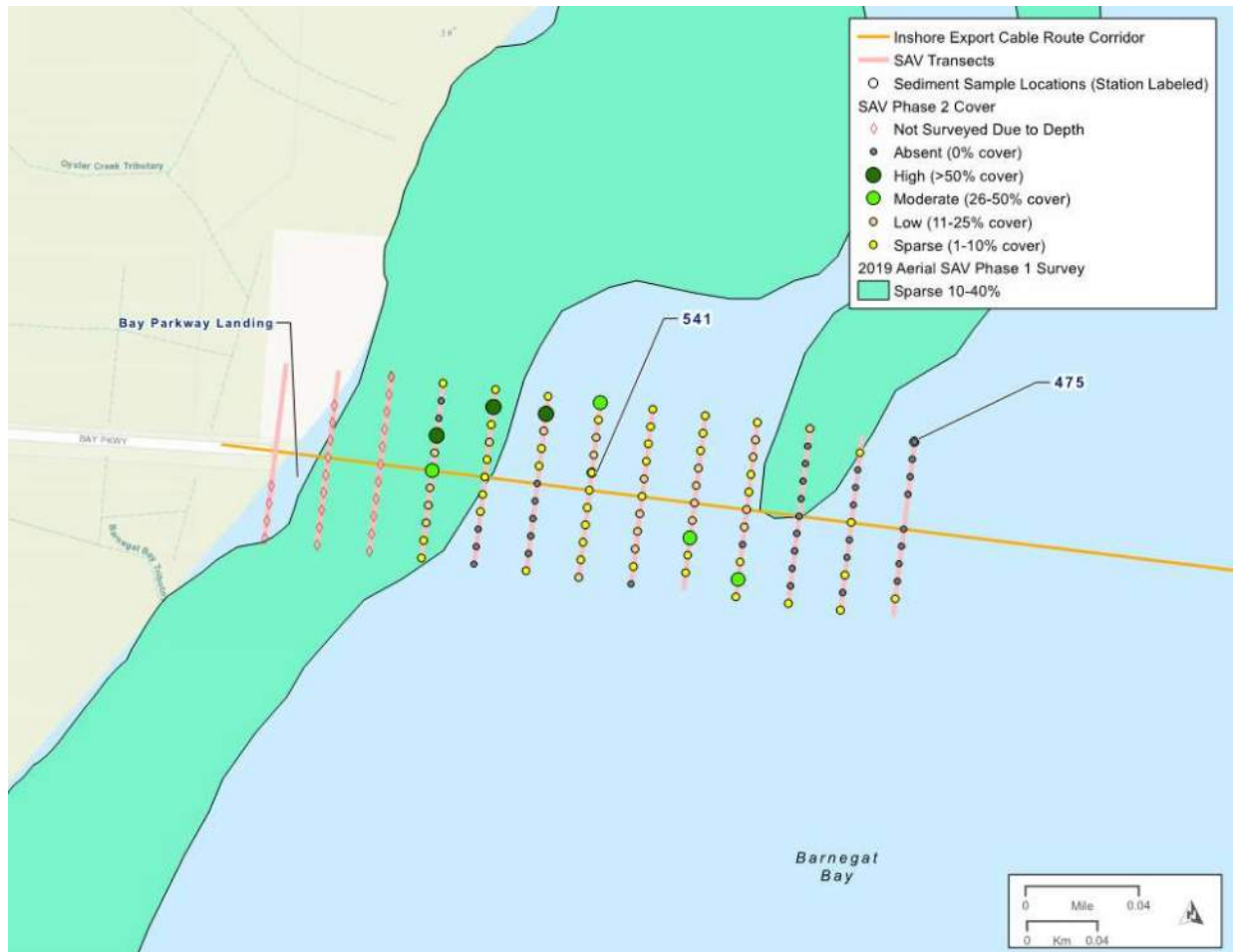


**Figure 7. SAV Percent Cover Estimates at IBSP Landing.**

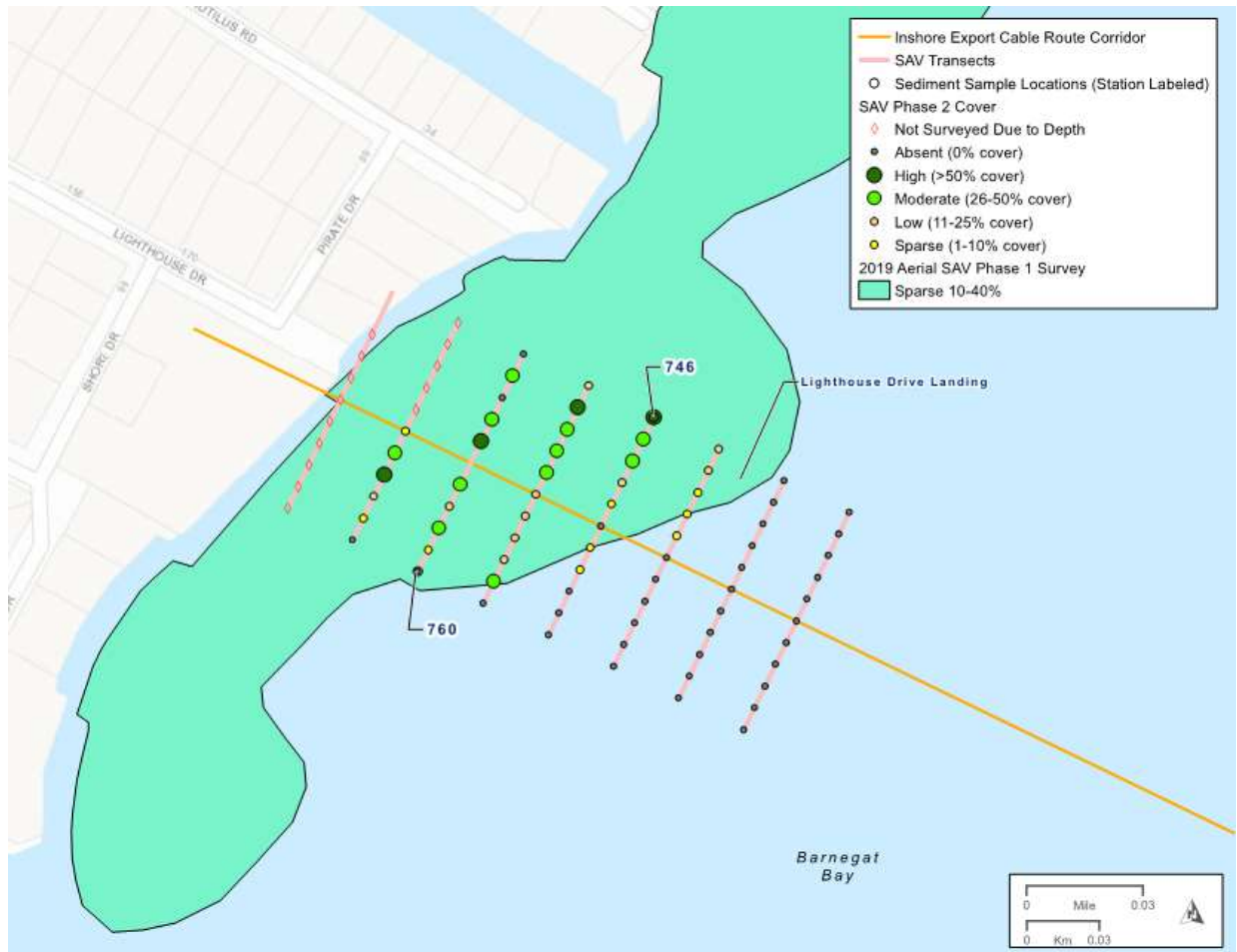


**Figure 8. SAV Percent Cover Estimates at Holtec Property Landing.**





**Figure 9. SAV Percent Cover Estimates at Bay Parkway Landing.**



**Figure 10. SAV Percent Cover Estimates at Lighthouse Drive Landing.**

For IBSP Landing, the findings of the Phase 2 survey were consistent with the findings of the Phase 1 survey in the areas that were accessible by the vessel. There were patches of sparse to moderate SAV present in the outer fringe during the Phase 2 SAV survey, with smaller areas of high percent coverage. The outer edge of the SAV bed in the IBSP area was found to be closer to shore in the Phase 2 survey than documented in the Phase 1 aerial survey. (Table 4, Figure 7).

**Table 3. Sampling Area SAV Presence and Percentage**

Landing	Camera Drop Count	Drops with SAV Present	Percentage with SAV Present
IBSP	36	13	36.1
Bay Parkway	106	71	67.0
Holtec Property	70	1	1.4
Lighthouse Drive	71	34	47.9
<b>Total</b>	<b>283</b>	<b>119</b>	<b>42.0</b>

As discussed previously, Holtec Property Landing had SAV present at only one station and had the lowest percentage of stations with SAV present across all percent cover categories. The Bay Parkway Landing had the greatest percentage of stations in the sparse and low categories, at 39.6 and 20.8 percent, respectively (**Table 4**). Lighthouse Drive had the highest percent of stations in the moderate category and IBSP and Lighthouse Drive landings had the same percentage of stations at 5.6 percent in the high category. The locations with the greatest percentage of survey locations where SAV was absent were the Holtec Property Landing and IBSP, with 98.6 and 63.9 percent of sampled quadrats lacking SAV, respectively.

**Table 4. Percentage of survey locations by estimated percent cover category of SAV by Survey Area.**

Landing	Absent (0%)	Sparse (1-10%)	Low (11-25%)	Moderate (26-50%)	High (>50%)
<b>IBSP</b>	63.9	11.1	11.1	8.3	5.6
<b>Bay Parkway</b>	33.0	39.6	20.8	3.8	2.8
<b>Holtec Property</b>	98.6	1.4	0.0	0.0	0.0
<b>Lighthouse Drive</b>	52.1	12.7	14.1	15.5	5.6

The area of SAV in each of the percent cover categories was estimated by dividing the percentage of camera drop stations with SAV present in each percent cover category (**Table 4**) by the area (m<sup>2</sup>) of each survey area. Due to the limited portion of the IBSP survey area that was able to be assessed for SAV during the Phase 2 survey, the estimates in **Table 5** are not representative of the unsampled areas.

**Table 5. Area of SAV cover density by Survey Area.**

Landing	Total Area (m <sup>2</sup> )	Absent (0%) (m <sup>2</sup> )	Sparse (1-10%) (m <sup>2</sup> )	Low (11-25%) (m <sup>2</sup> )	Moderate (26-50%) (m <sup>2</sup> )	High (>50%) (m <sup>2</sup> )
<b>IBSP</b>	120,000	76,680	13,320	13,320	9,960	6,720
<b>Bay Parkway</b>	37,000	12,210	14,652	7,696	1,406	1,036
<b>Holtec Property</b>	20,000	19,720	280	0	0	0
<b>Lighthouse Drive</b>	22,000	11,462	2,794	3,102	3,410	1,232

The minimum stem density was 0 (quadrats with no SAV present) for all four landings and the landing with the highest density was IBSP with >200 stems per meter squared (**Table 6**). There were a few IBSP Landing stations with high amounts of SAV present and the stem count was capped at 250 per 0.25 m<sup>2</sup> due to the density of the bed and difficulty reliably counting stems. The mean density was calculated for the sample stations where SAV was present. The highest mean stem density was at IBSP landfall, with 278 stems per m<sup>2</sup>. Lighthouse Drive also had a high mean stem density at 219 stems per m<sup>2</sup>.

**Table 6. Stem Density Per 1 m<sup>2</sup>.**

Landing	Minimum	Maximum	Median	Mean for Stations With SAV Present
<b>IBSP</b>	0	>1000	0	278
<b>Bay Parkway</b>	0	448	20	85
<b>Holtec Property</b>	0	56	0	56
<b>Lighthouse Drive</b>	0	680	48	219

#### 4.2.5 Blade Length

The total number of blades measured in place in reference to the quadrat frame was 254. The longest blade measured was in one of the quadrats from Bay Parkway at 50.3 cm (Table 7). The shortest length was at Bay Parkway Landing, with a length of 3.4 cm. Overall, the average length of the SAV blades was 13.8 cm.

**Table 7. Number of Blades, Average Length, Minimum Length, and Maximum Length for Each Landing measured in place.**

Landing	Number of Blades Measured	Average Length (cm)	Minimum Length (cm)	Maximum Length (cm)
<b>IBSP</b>	23	10.0	3.5	16.7
<b>Bay Parkway</b>	143	13.4	3.4	50.3
<b>Holtec Property</b>	2	5.2	4.8	5.5
<b>Lighthouse Drive</b>	88	15.5	5.0	27.5
<b>Total</b>	256	13.8	3.4	50.3

For the SAV blades that were physically collected, the longest blade measured was in one of the quadrats from Lighthouse Drive at 45.7 cm (**Table 8**). The shortest length was at IBSP, with a length of 8.9 cm. Overall, 103 SAV blades were measured with an average length of 25.1 cm.

**Table 8. Number of Blades, Average Length, Minimum Length, and Maximum Length for blades physically collected for each landing.**

Landing	Number of Blades Measured	Average Length (cm)	Minimum Length (cm)	Maximum Length (cm)
<b>IBSP</b>	24	20.4	8.9	35.6
<b>Bay Parkway</b>	44	24.9	10.2	35.6
<b>Holtec Property</b>	3	17.4	15.2	19.1
<b>Lighthouse Drive</b>	32	30.3	12.7	45.7
<b>Total</b>	103	25.1	8.9	45.7

## 5. Summary

The areas of SAV documented in the Phase 1 Survey completed in October 2019 were used to inform the more intensive Phase 2 survey effort. The Phase 2 SAV surveys were conducted to identify the presence, extent, density, and species composition of SAV beds within the proposed export cable routes at the four potential landfall locations. The Phase 2 SAV Survey was completed in October 2020 and a total of 283 camera drops were completed. SAV was documented in 41.7 percent of the survey locations. Of the three landfall areas on the western shoreline of the bay, the Holtec Property had the lowest percent cover of SAV, with SAV present at only a single survey station close to the shoreline. Based on review of the photographs collected during the field survey and the SAV samples collected, observed SAV consisted almost entirely of eelgrass with the exception of single location at the Holtec Property which contained widgeon grass. The results from this Phase 2 Survey provide the most recent information on SAV presence, density, and species composition along the export cable routes and will be used to support Project planning, routing and design.

## 6. Literature Cited

- Bergstrom, P., and L.M. Hurley. 2006. Voluntary Estuary Monitoring Manual Chapter 18: Submerged Aquatic Vegetation. *Volunteer Estuary Monitoring Manual, A methods Manual, Second Edition*. United States Environmental Protection Agency. EPA-842-B-06-003.
- Colarusso, P. and A. Verkade. 2016. *Submerged Aquatic Vegetation Survey Guidance for the New England Region*. Joint Federal Agency Publication including NOAA, EPA, and USACE.
- Lathrop, R.G. and S. Haag. 2011. Assessment of Seagrass Status in the Barnegat Bay - Little Egg Harbor Estuary: 2003 and 2009. CRSSA Technical Report#2011-01. Rutgers University, Grant F. Walton Center for Remote Sensing and Spatial Analysis, New Brunswick, NJ.
- Lathrop, R.G.; Bogner, J.; Buenaventura, E.; Ciappi, M.; Green, E., and Belton, T.J. 2017. Establishment of Marine protected areas to reduce watercraft impacts in Barnegat Bay, New Jersey. *Journal of Coastal Research*, 78: 277-286.
- New Jersey Department of Environmental Protection (NJDEP), 2015. *Guidance for the Submerged Aquatic Vegetation Surveys as Related to the Submerged Vegetation Habitat Rule at NJAC 7:7E-3.6 (as amended through June 2013)*. Updated March 2015.
- State of New Jersey, Department of Environmental Protection, Water Resource Management. 2017. *Barnegat Bay Restoration, Enhancement, and Protection Strategy: Moving Science into Action*.
- Wentworth, C.K. 1922. A scale of Grade and Class Terms for Clastic Sediments. *The Journal of Geology*, 30: 377-392.

## **Appendix A. OCW Submerged Aquatic Vegetation Survey Protocols**



## OCW Submerged Aquatic Vegetation Surveys

### *Background:*

Submerged Aquatic Vegetation (SAV) occurs in shallow estuaries where sunlight can penetrate the water column and photosynthesis can occur. SAV beds provide shelter and a potential forage habitat for many organisms including spawning fish (NJDEP 2017). Additionally, SAV beds provide dissolved oxygen to the water which helps to stabilize sediment against erosion forces (EPA 2006). Buried export cables from the Ocean Wind Project will pass through coastal habitats and have the potential to intersect SAV beds, causing impacts to the vegetation. SAV surveys will be conducted to identify the presence and extent of SAV beds within the proposed export cable routes and landfall locations to determine the potential for impacts as a result of the proposed project. The planned surveys incorporate existing information on SAV generated by Rutgers University and the State of New Jersey as well as survey protocols from state and federal agencies (Attachment 1).

The proposed export cable route approach to B.L. England is approximately 17.0 miles long, originating from lease area OCS-A-0498. This route will make landfall along the coast of Ocean City, New Jersey. The cable will proceed through the coastal barrier to Peck Bay, part of the larger Great Egg Harbor Bay. While the exact layout of the proposed approach to Oyster Creek is in its conceptual planning phase, it will make landfall via horizontal directional drilling (HDD) at the barrier island containing Island State Park, emerging within a paved area where the Park Office Buildings are located (see Figure 1). The proposed HDD route will then be buried under the barrier island emerging in Barnegat Bay where it will continue west until making landfall on the New Jersey main land at one of four potential locations. Based on existing 1979 and 1986-1987 NJDEP SAV maps and studies conducted in 2009 by Rutgers University (Lathrop et al. 2011), SAV habitats could potentially exist in the shallow coastal areas (< 6 ft water depth) of the back-bay and coastal shoreline areas along the proposed routes. SAV surveys will investigate the potential SAV habitat areas identified in Figures 1 and 2.

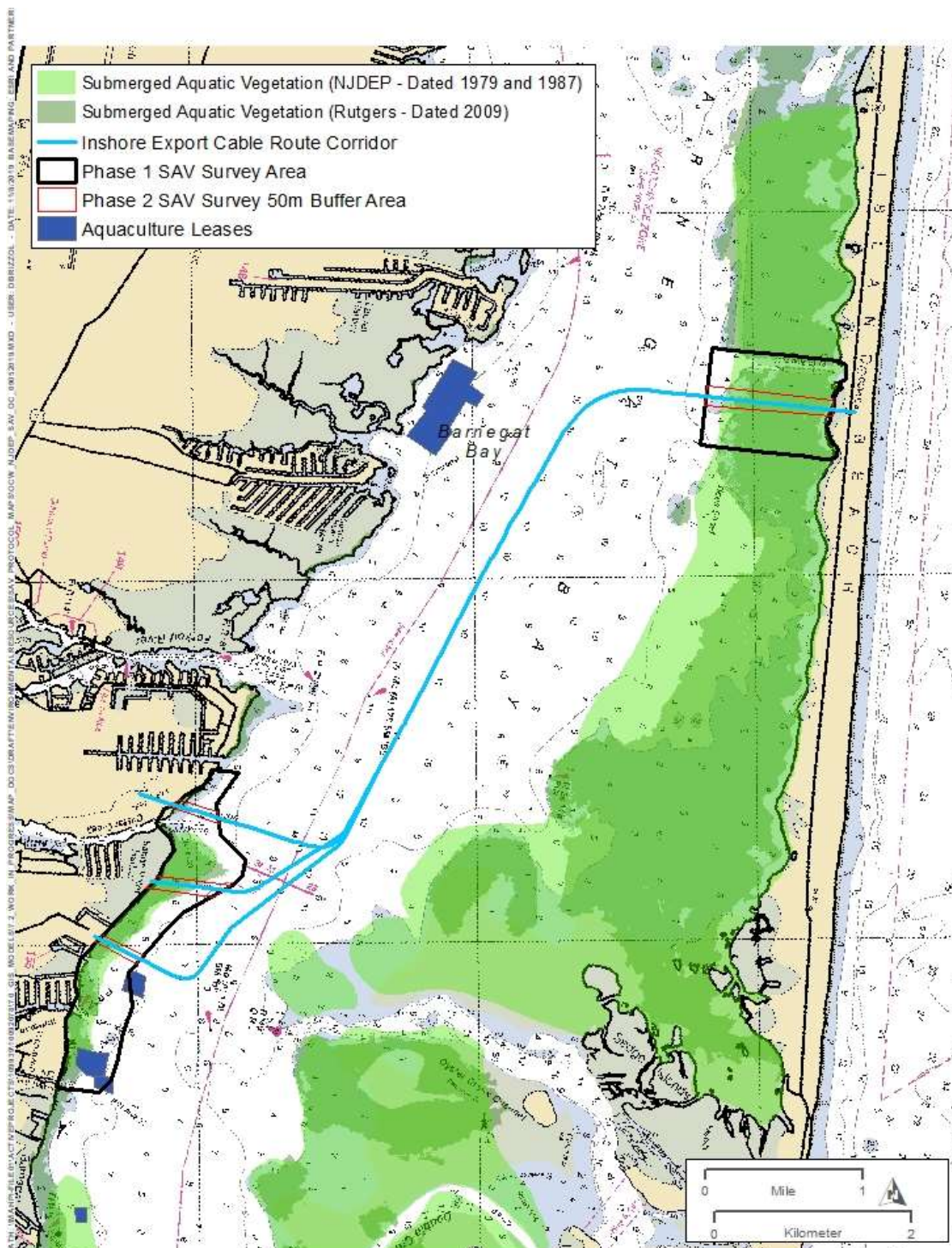
### *Statement of Work:*

In October 2019 and May 2020, a SAV survey will be conducted at the anticipated project landfall areas for Oyster Creek and BL England (Figures 1 and 2) in order to identify the presence and extent of SAV beds located along proposed inshore export cable routes and potential landfall locations. The SAV survey method detailed here is based on methodology described in Lathrop et al. (2011) and the *Submerged Aquatic Vegetation Survey Guidance for the New England Region* protocol published in 2016 by a joint agency task force involving the USEPA, NOAA, and the USACE (Colarusso and Verkade, 2016).

Surveys will map the extent of SAV beds during the growing season which runs from May through October (Colarusso and Verkade, 2016). Surveying efforts will be divided into two phases. The first phase of the survey will be conducted later in the growing season in September/October during periods of clear water quality conditions before water temperatures reduce growth of SAV and will determine the presence or absence of SAV beds within the study areas and map their extents using aerial photography. The second phase will gather more detailed information about SAV using quadrat sampling along transect lines.

The proposed methodology has been modified from the aforementioned guidance documents to inform Project design and development in order to avoid, minimize and potentially mitigate impacts to SAV. Modifications include:

- Collection of updated aerial photography via aircraft will be conducted to accurately delineate the edges of SAV beds. Lathrop et al. (2011) utilized aerial photography via plane, while the joint agency New England SAV Guidance (Colarusso and Verkade, 2016) recommends using available aerial photography from the state or a university to determine the historical extents of SAV distribution.
- Spacing of the transects and quadrats for Phase 2 of the survey was modified based on size of the Project Area to collect representative SAV density and species data to support potential mitigation planning during permitting. Lathrop et al. (2011) utilized targeted transects and a stratified random sampling design to determine the location and spacing of their in-situ sampling locations while the joint agency New England SAV Guidance (Colarusso and Verkade, 2016) recommends transects running perpendicular to shoreline 5 meters apart (spacing dependent on size of the areas to be surveyed and type of project proposed) with 3 meter spacing of quadrats within the transects. , 50 m on either side was selected to capture a representative portion of the surrounding area in addition to the area where the cable will be placed as a conservative measure. As SAV growth is variable and can be patchy, the 50m buffer to be surveyed would provide information on the presence of SAV in the area surrounding the cable path. The 50m distance will encompass the bottom disturbance from cable installation and allow for the width of barges or other work vessels that would be performing the cable installation.
- No physical sampling or staging of equipment will occur on existing aquaculture leases. In the event that a sample transect were to intersect an aquaculture lease that transect would be shifted to the first available area beyond the lease or eliminated. The survey team will coordinate with MFA staff to ensure the lease areas are avoided.



**Figure 1. Barnegat Bay SAV Survey Limits**



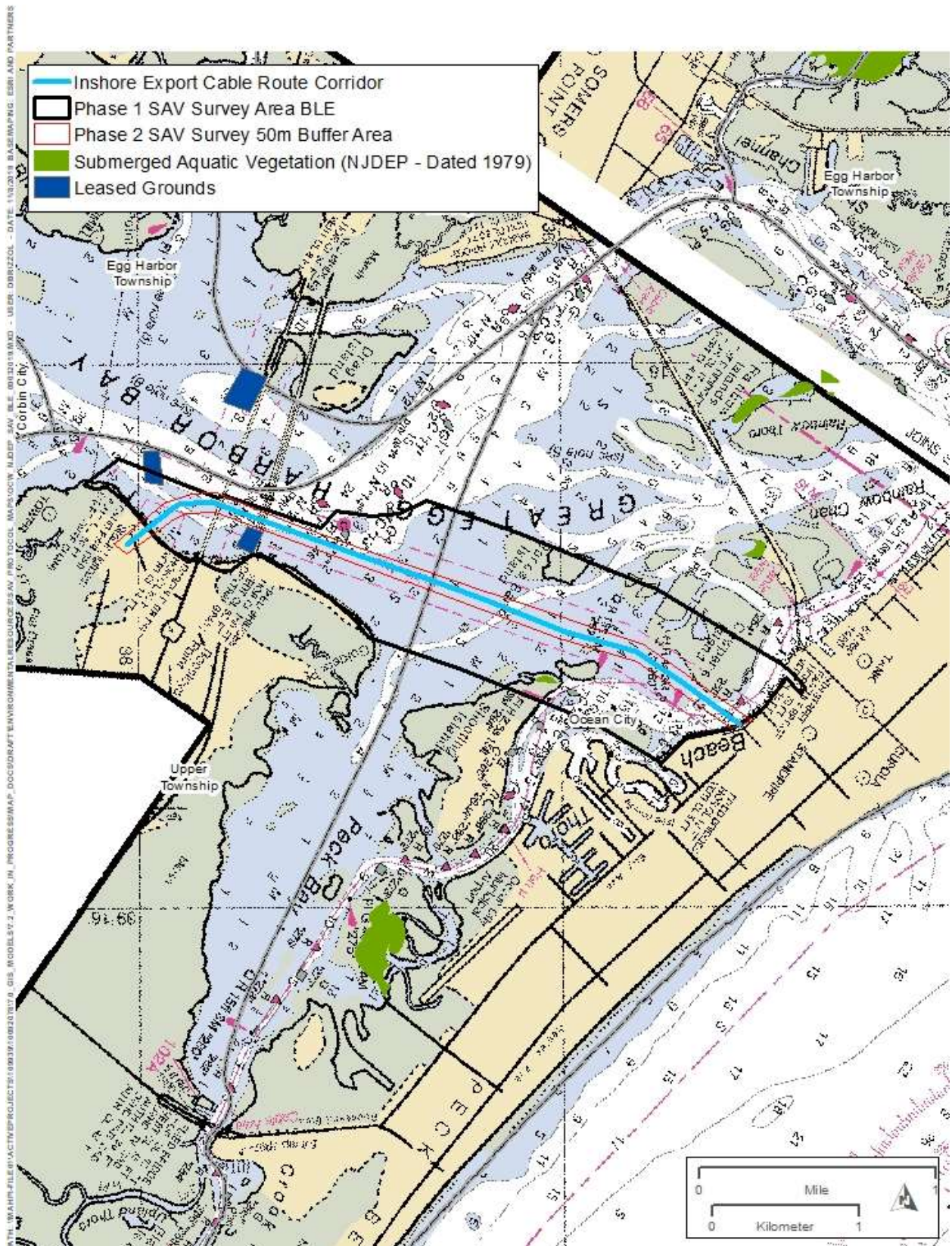


Figure 2. Great Egg Harbor SAV Survey Limits

### **SAV Survey Phase 1:**

HDR will delineate SAV beds from aerial photography of shallow areas (<6 ft water depth) within an approximately 500m buffer of the proposed inshore export cable route and will extend sufficient distance from the shoreline to capture areas where SAV had been previously identified by the NJDEP and Rutgers studies. If weather conditions are suitable (calm winds, no precipitation, high visibility), a drone equipped with a camera will be used to support this survey. If weather conditions are not suitable for drone survey, aerial photography will be conducted using a plane will take place. Both drone and plane aerial surveys will yield high resolution, ortho-rectified imagery (direct overhead/plan view photography). Surveys will be conducted at low tide to facilitate viewing to the maximum depth possible. GPS coordinates will be taken along the SAV bed's perimeter, recording both the position and approximate water depth of each location. SAV beds will be surveyed as one continuous bed where applicable (details of density for "patchy" beds will be documented in phase 2).

### **SAV Survey Phase 2:**

Phase 2 surveys will be conducted within the Phase 1 survey areas to "ground-truth" the extents of the SAV beds and obtain representative information on SAV species and density. The survey is anticipated to be completed in May 2020, when water clarity conditions are optimal. The goal of the Phase 2 survey is to gather more detailed information about the SAV beds identified in Phase 1 using a 0.5 square meter quadrat that is broken into 8 25cm x 25cm grid cells, along transect lines.

Phase 2 survey will begin with initial reconnaissance of the survey area from boat to confirm presence/absence of SAV using bathyscope/viewing bucket from the surface. The survey will be conducted on a sunny day, during a falling tide, when winds are calm to facilitate optimal viewing capabilities. Following initial reconnaissance, underwater photography will be utilized to document the SAV within each 0.5 square meter quadrat. This more detailed survey will be confined to the 50m area on either side of the proposed cable route that overlaps with areas of SAV identified in Phase 1 survey.

Transect lines will be established in SAV beds identified in Phase 1. Transect lines will be spaced approximately 30 meters apart and run perpendicular to the cable route. Start and end points of each transect line will be recorded using a GPS unit. Quadrat samples will be collected every 10 meters along each transect. Upon processing photographs, the following data will be recorded:

1. Date and time for each sampling transect.
2. Water depth at each sampling point (quadrat).
3. Water quality data (temperature, pH, salinity, dissolved oxygen, turbidity) will be collected at each sampling point.
4. General sediment type characterized by visual observation (e.g., silt, mud, sand, shell) will be collected at each sample point. Sediment samples will be collected for grain size analysis by sieving, at a frequency that is representative of the sediments within the survey area. A



minimum of 5 sediment samples will be collected per survey area. Results will be reported according to the Wentworth (1922) grain size scale.

5. Estimated percent cover and density of SAV, per species, within a 0.5-m<sup>2</sup> quadrat divided into 825cm x 25cm grid cells.
6. Shoot length of 1-3 randomly chosen SAV blades within the quadrat, per species. Blades will be estimated in place relative to reference markers on the quadrat. If it is not possible to estimate blade length in place, samples will be collected manually or using an appropriate tool, details regarding why a particular tool was chosen and a repeatable procedure will be provided in the report.
7. Estimated epiphyte percent coverage (0-100%) for each species. Surveyors will record qualitative vegetative density as they survey SAV beds on the following scale:
  - a. Sparse (1-10% cover);
  - b. Low (11-25% cover);
  - c. Moderate (26-50% cover), and
  - d. High (>50% cover).
8. Notable biological observations (e.g., shellfish or algal beds, crabs or lobsters, and fish fauna).

## Reporting

A SAV Survey Report will be prepared to summarize the findings of the field survey. The report will include the following:

- Description of the areas surveyed, results of desktop map review and summary of the habitat observed;
- Description of the survey methodology used to complete the field survey;
- Description and summary of areas of SAV identified in Phase 1 and Phase 2 surveys, including;
  - Date and time surveys were conducted.
  - Water depth at substrate for the shallowest and deepest edges of beds
  - General sediment type (e.g., silt, mud, sand, shell, etc.) and results of grain size analysis from sediment samples. Estimate of the percent cover of SAV and density within each 0.5-m<sup>2</sup> quadrat (for each species) and the mean for all quadrats across the entire area surveyed [e.g., barren, sparse (1-10% cover), low (11-25%), moderate (26-50%), high (> 50%, and shoots/blades per unit area.].
  - Shoot length measurement summary
  - Notable biological observations (e.g., shellfish or algal beds, crabs or lobsters, and fish fauna).
- Figures:
  - Figures showing the aerial photography of the Phase 1 survey areas, and areas of SAV that were identified.
  - Figures showing the Phase 2 transect lines and quadrat sample points and will include, depth, general sediment type, percent cover/density, estimated blade length, epiphyte coverage, and notable biological observations
- Tables summarizing the area of SAV within each of the survey areas.

*Schedule:*

Anticipated Project schedule and milestones are outlined in Table 1 below.

**Table 1. Project Milestones**

<b>Item</b>	<b>Due Date</b>
Survey plan approval by agencies	September 2019
Phase 1 Survey	September – October 2019
Phase 2 Survey	October 2020
Data processing and analysis	October 2020
Draft Report	November 2020
Final Report	December 2020

*Anticipated Project Staff and Qualifications:*

The roster of anticipated project staff, their roles, and qualifications will be provided prior to performing survey and reporting activities.

*References:*

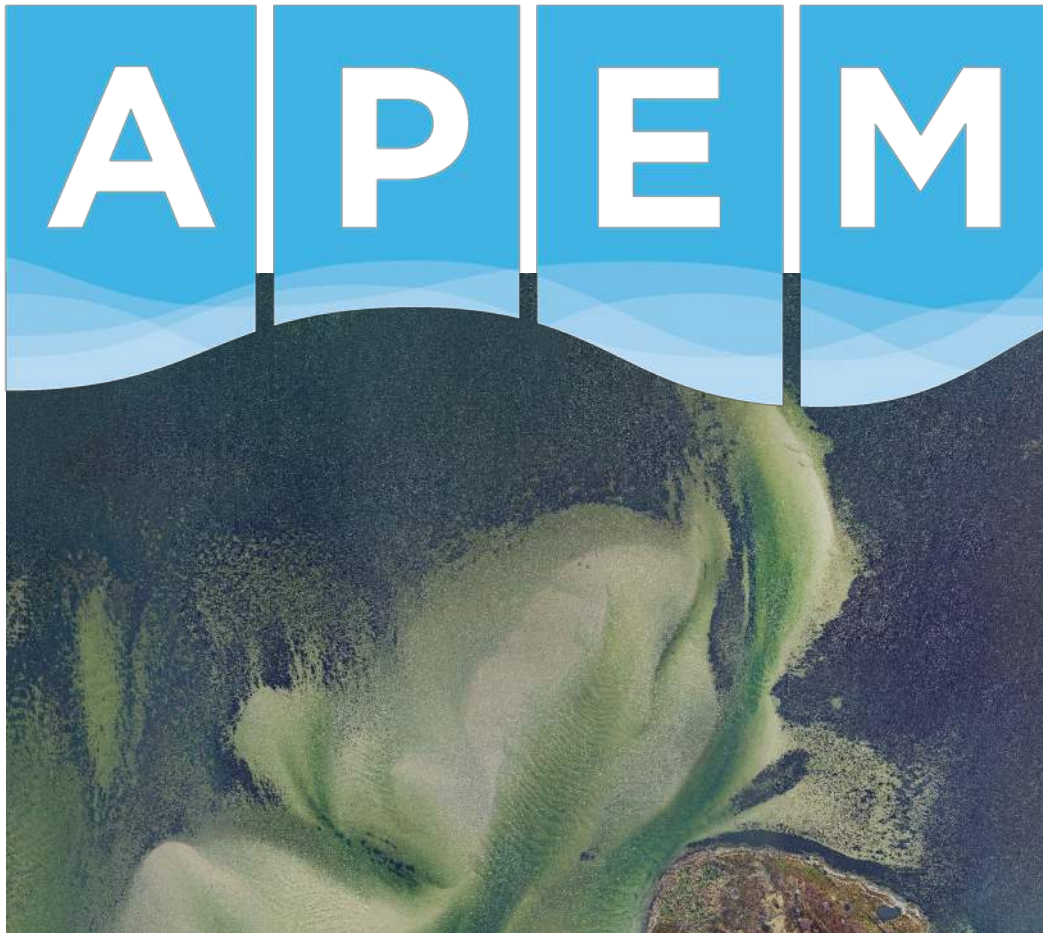
Colarusso, P. and Verkade, A. 2016. *Submerged Aquatic Vegetation Survey Guidance for the New England Region*. Joint Federal Agency Publication including NOAA, EPA, and USACE.

Lathrop, R.G. and S. Haag. 2011. Assessment of Seagrass Status in the Barnegat Bay - Little Egg Harbor Estuary: 2003 and 2009. CRSSA Technical Report#2011-01. Rutgers University, Grant F. Walton Center for Remote Sensing and Spatial Analysis, New Brunswick, NJ.

State of New Jersey, Department of Environmental Protection Water Resource Management (2017). *Barnegat Bay Restoration, Enhancement, and Protection Strategy: Moving Science into Action*.

United States Environmental Protection Agency (USEPA), Bergstrom, P., Hurley, L. M. (2006). Voluntary Estuary Monitoring Manual Chapter 18: Submerged Aquatic Vegetation. *Volunteer Estuary Monitoring Manual, A methods Manual, Second Edition*. EPA-842-B-06-003.

## **Appendix B. APEM New Jersey Submerged Aquatic Vegetation Aerial Survey**



**New Jersey Submerged Aquatic Vegetation Aerial Survey**

**HDR Engineering, Inc**

**APEM Ref: P00004340**

**December 2019**

Mark Wilkins, Lauren Lequime, David Campbell

**Client:** HDR Engineering, Inc.

**Address:** 500 7<sup>th</sup> Avenue

New York, NY 10018-4502

**Project reference:** P00004340

**Date of issue:** December 2019

---

**Project Director:** David Campbell

**Project Manager:** Mark Wilkins

**Other:** Lauren Lequime

---

APEM Inc.  
2603 NW 13<sup>th</sup> Street,  
#402, Gainesville,  
Florida,  
FL 32609-2835.

Tel: +44 161 442 8938

VAT No. 47-4411075

“This is a draft document and should not be cited”



## Revision and Amendment Register

Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by
1.0	11/29/19	All	All	Created	DC
1.2	12/10/19	All	All	Client amendments made	DC

## Contents

1. Introduction .....	1
1.1 Project Background.....	1
1.2 Survey Locations .....	1
2. Surveys and Data Processing .....	3
2.1 Aerial Survey .....	3
2.2 Data Processing .....	3
3. Results.....	4
4. References .....	7

## List of Figures

Figure 1. Location of the two sites surveyed in New Jersey. Yellow denotes the Barnegat Bay site and red the Great Egg Harbor site. ....	1
Figure 2. The Barnegat Bay survey area, outlined in yellow. ....	2
Figure 3. The Great Egg Harbor survey area, outlined in red. ....	2
Figure 4 Seagrass coverage map of the Barnegat Bay survey area.....	5
Figure 5 Seagrass coverage map of the Great Egg Harbor survey area .....	6

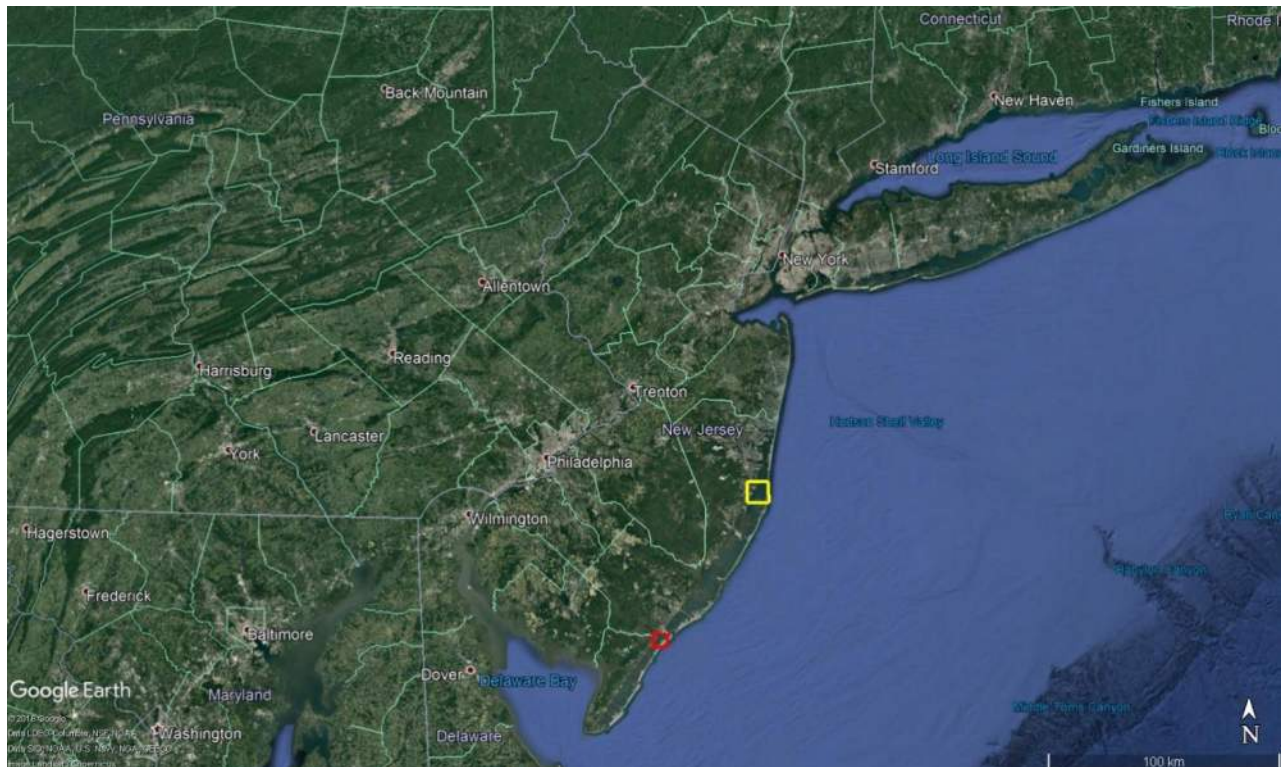
## 1. Introduction

### 1.1 Project Background

APEM were commissioned by HDR Engineering, Inc (hereby referred to as HDR) to undertake an aerial survey of two coastal areas in New Jersey. The aim of the survey was to capture high-resolution aerial photography in order to map submerged aquatic vegetation (SAV) in the two areas.

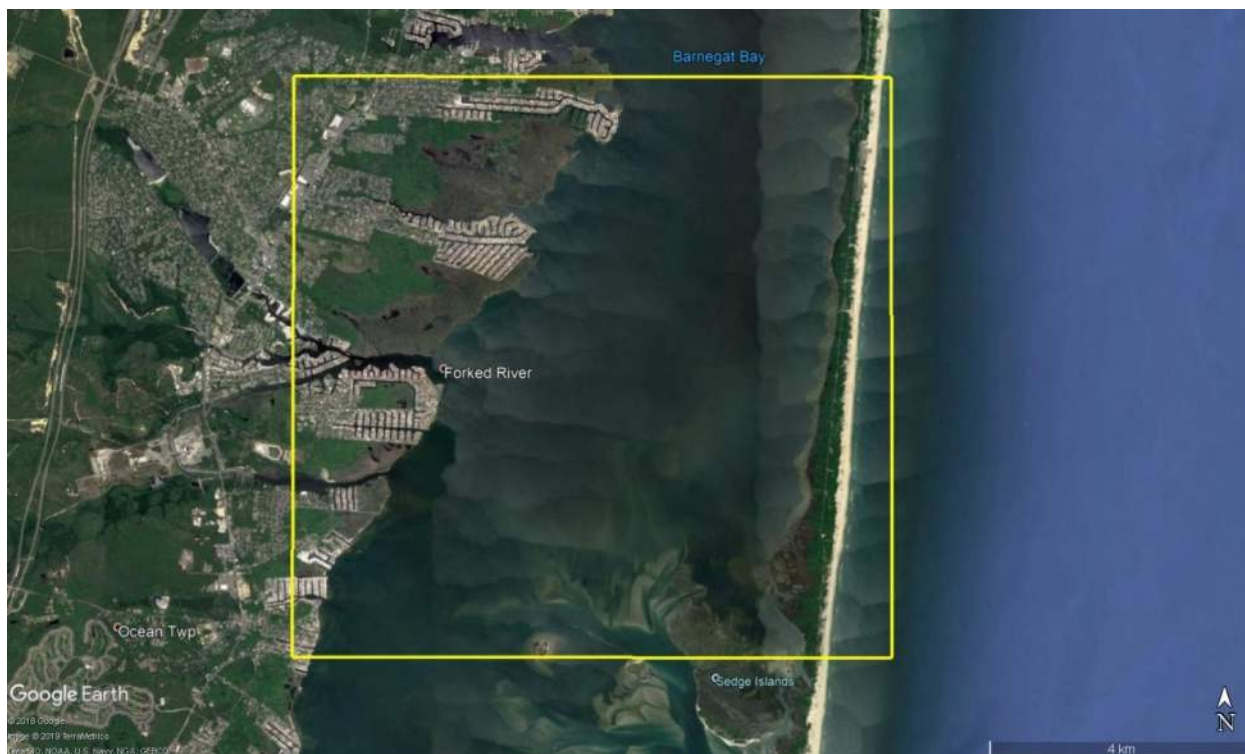
### 1.2 Survey Locations

The project involved surveying two locations, one in Barnegat Bay, Ocean County and the other in Great Egg Harbor, Cape May County. An overview of the two locations is shown in Figure 1.



**Figure 1. Location of the two sites surveyed in New Jersey. Yellow denotes the Barnegat Bay site and red the Great Egg Harbor site.**

The Barnegat Bay site measured 28 square miles in area and is shown in more detail in Figure 2.



**Figure 2. The Barnegat Bay survey area, outlined in yellow.**

The Great Egg Harbor site measured approximately 13 square miles in area and is shown in more detail in Figure 3.



**Figure 3. The Great Egg Harbor survey area, outlined in red.**



## 2. Surveys and Data Processing

### 2.1 Aerial Survey

The aerial survey took place on October 7<sup>th</sup> 2019. The survey was carried out in a fixed wing aircraft using APEM's bespoke Shearwater III camera system surveying at an altitude of approximately 3,650ft above sea level. This allowed us to capture high-resolution imagery at a resolution of 4 cm ground sample distance (GSD). For Barnegat Bay, a total of 10,864 images were captured across 15 flight lines. For Great Egg Harbor a total of 7,299 images were captured across 10 flight lines. The survey was targeted to be complete within 1.5 hours either side of low tide, as this would allow for maximum intertidal exposure and help facilitate the mapping process.

Once the survey was complete, the data were downloaded and backed-up following APEM's stringent data management protocols.

### 2.2 Data Processing

The GPS data recorded on-board during the aerial survey were processed to produce location data for each aerial photograph's camera release point. These data were fed into photogrammetric processing software along with the imagery to produce georeferenced orthomosaics.

Over land, this photogrammetry process is able to create a seamless mosaic of the area. Over sea, however, it is often more problematic to generate the same type of seamless output due to the nature of the imagery (i.e. sun glint, changing wave patterns between adjacent imagery etc.). As such, a combination of automated processing and manual georeferencing of images were required in order to achieve the required mosaic. This allowed a mosaic to be generated for all areas where the sea bottom could be seen within the imagery. For areas of deeper water where the sea bottom cannot be seen (typically in areas less than 7ft below mean sea level) in any of the imagery due to lack of light penetration, it was not possible to either georeference the imagery or map SAV. However, SAV has been documented to be very patchy and rare at depths of greater than 2m in New Jersey (Good *et al.*, 1978, Kennish *et al.*, 2008). Therefore, it is unlikely these areas would contain SAV.

Once the mosaic was finalised, APEM marine biologists digitized areas of SAV using Geographic Information Software (GIS). Seagrass was mapped according to the following categories:

- Sparse cover; 10-40%
- Moderate cover; 40-80% cover
- Dense cover; 80-100% cover

The delineation of these categories was based on the data from the study by Lathrop *et al.* (2006), which mapped seagrass cover in the Barnegat Bay-Little Egg Harbor-Great Bay study area using these categories.



### 3. Results

The coverage maps for both survey areas are shown in Figures 4 and 5 below.

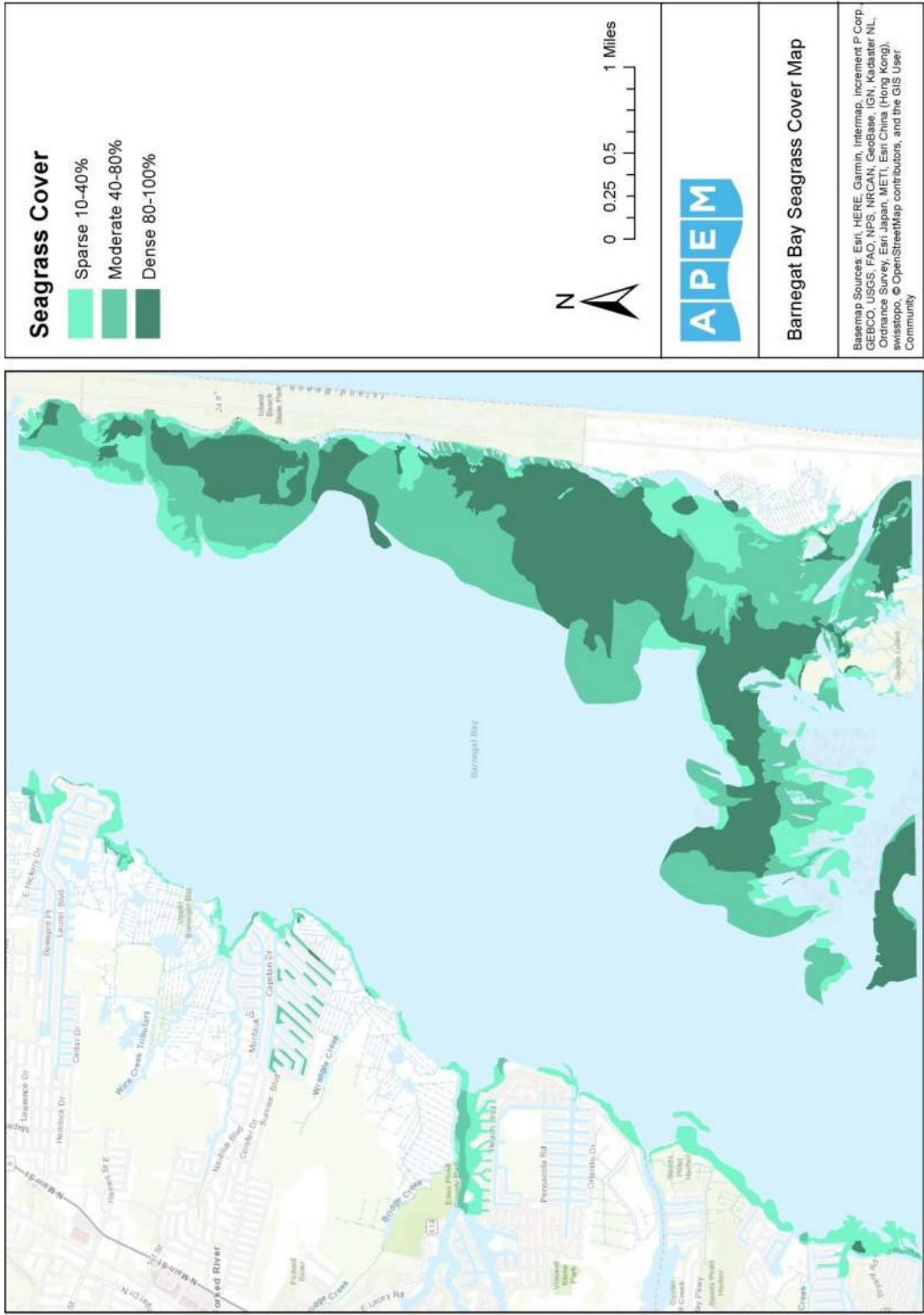


Figure 4 Seagrass coverage map of the Barnegat Bay survey area



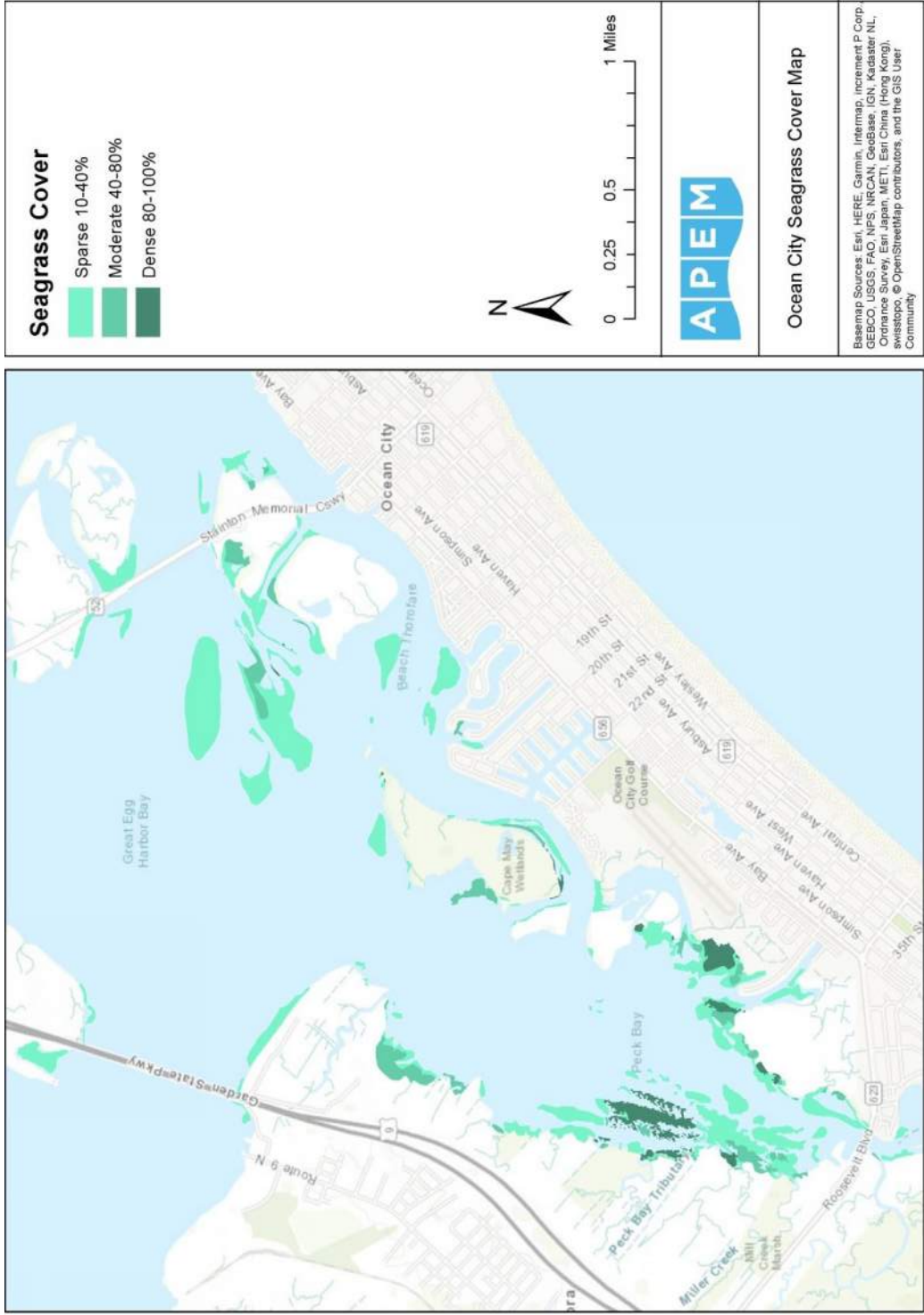


Figure 5 Seagrass coverage map of the Great Egg Harbor survey area



## 4. References

Good, R.E., Limb, J., Lyszczyk, E., Miernik, M., Ogrosky, C., Psuty, N., Ryan, J. & Sickels, F. (1978) *Analysis and Delineation of the Submerged Vegetation of Coastal New Jersey*. Center for Coastal and Environmental Studies Rutgers. Available from:

<https://www.nj.gov/dep/dsr/barnegat/casestudy-littleegg.pdf> [Accessed December 2019]

Kennish, M. J., Haag, S. M. & Sakowicz, G. P. (2008) Seagrass Demographic and Spatial Habitat Characterization in Little Egg Harbor, New Jersey, Using Fixed Transects. *Journal of Coastal Research: Special Issue*. 55, 148-170

Lathrop, R. G., Montesano, P. & Haag, S. (2006) A Multi-Scale Segmentation Approach to Mapping Seagrass Habitats Using Airborne Digital Camera Imagery. *Photogrammetric Engineering & Remote Sensing*. 72 (6), 665-675

## **Appendix C. Survey Photography**



Photo 1: Bay Parkway Landing Station 507 with sponge, red, and green algae present.



Photo 2: Bay Parkway Landing Station 521 with razor clam present.

Submerged Aquatic Vegetation Survey	Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs	DATE:	01/22/21	<b>PHOTO</b>
		CREATED BY:	JRC	<b>1 and 2</b>
		REVIEWED BY:	DJY	
		JOB NO:	10092078	





Photo 3: Bay Parkway Landing Station 560 with sponge, razor clam, and algae present.

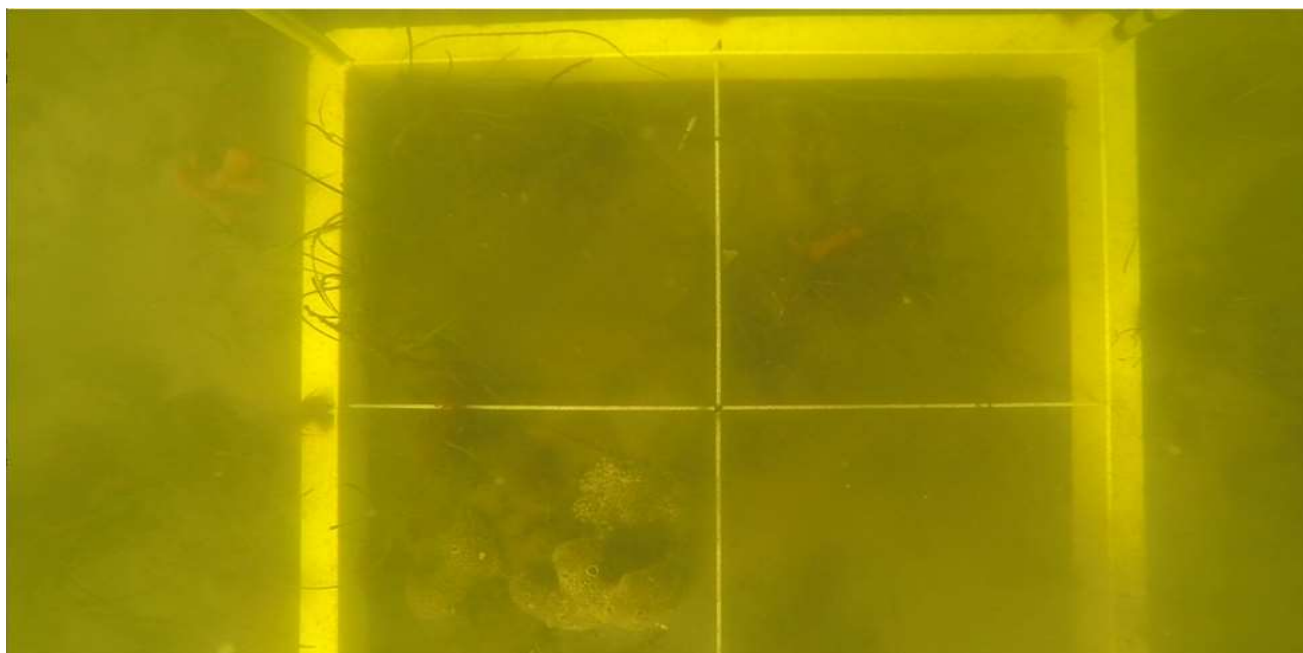


Photo 4: Bay Parkway Landing Station 535 with large sponge present.

<i>Submerged Aquatic Vegetation Survey</i>	<b>Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs</b>	DATE:	01/22/21	<b>PHOTO</b>
		CREATED BY:	JRC	<b>3 and 4</b>
		REVIEWED BY:	DJY	
		JOB NO:	10092078	

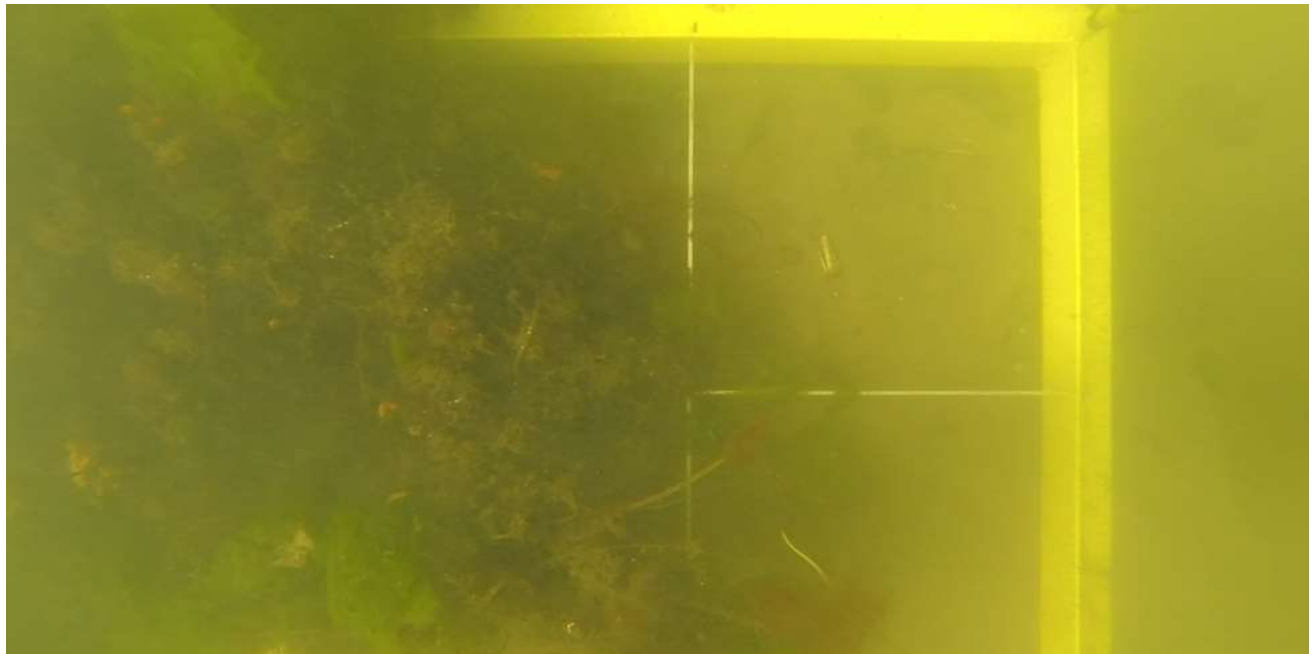


Photo 5: Bay Parkway Landing Station 557 with large algae growth and shell fragments present. Sparse SAV growth.

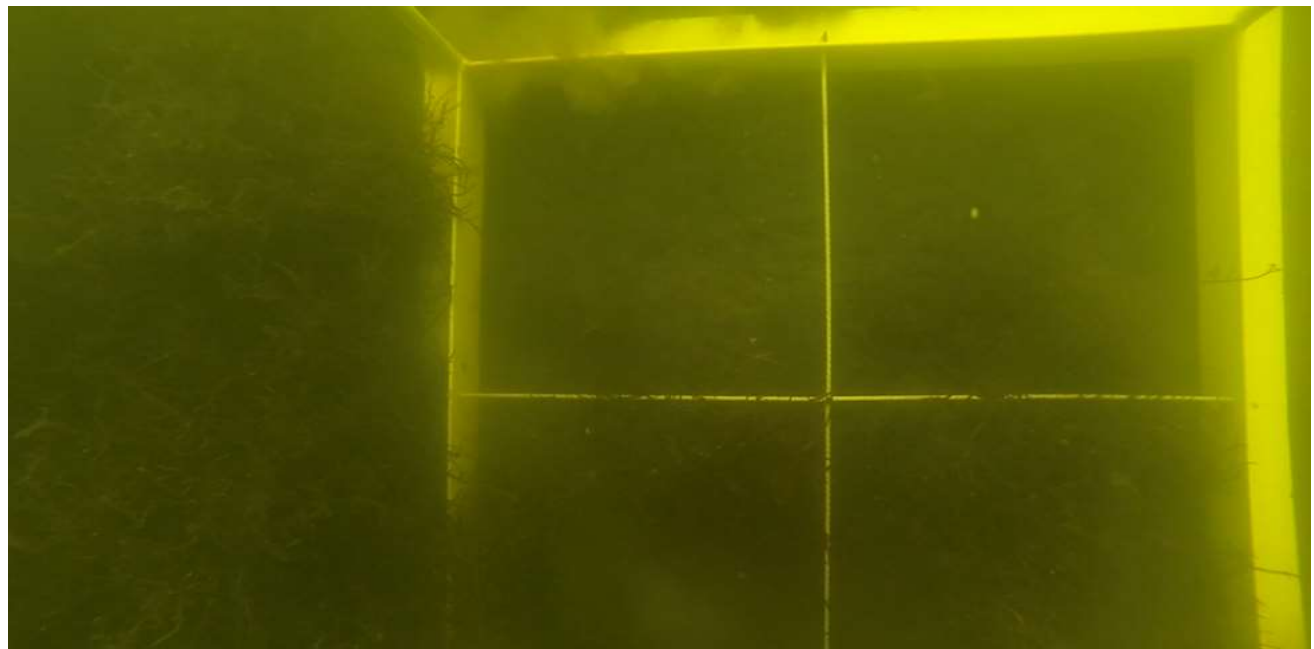


Photo 6: Holtec Property Station 638 with dense algae stand present.

<i>Submerged Aquatic Vegetation Survey</i>	<b>Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs</b>	DATE:	01/22/21	<b>PHOTO</b>
		CREATED BY:	JRC	<b>5 and 6</b>
		REVIEWED BY:	DJY	
		JOB NO:	10092078	



Photo 7: Lighthouse Drive Landing Station 715 with sandy bottom and juvenile summer flounder present.

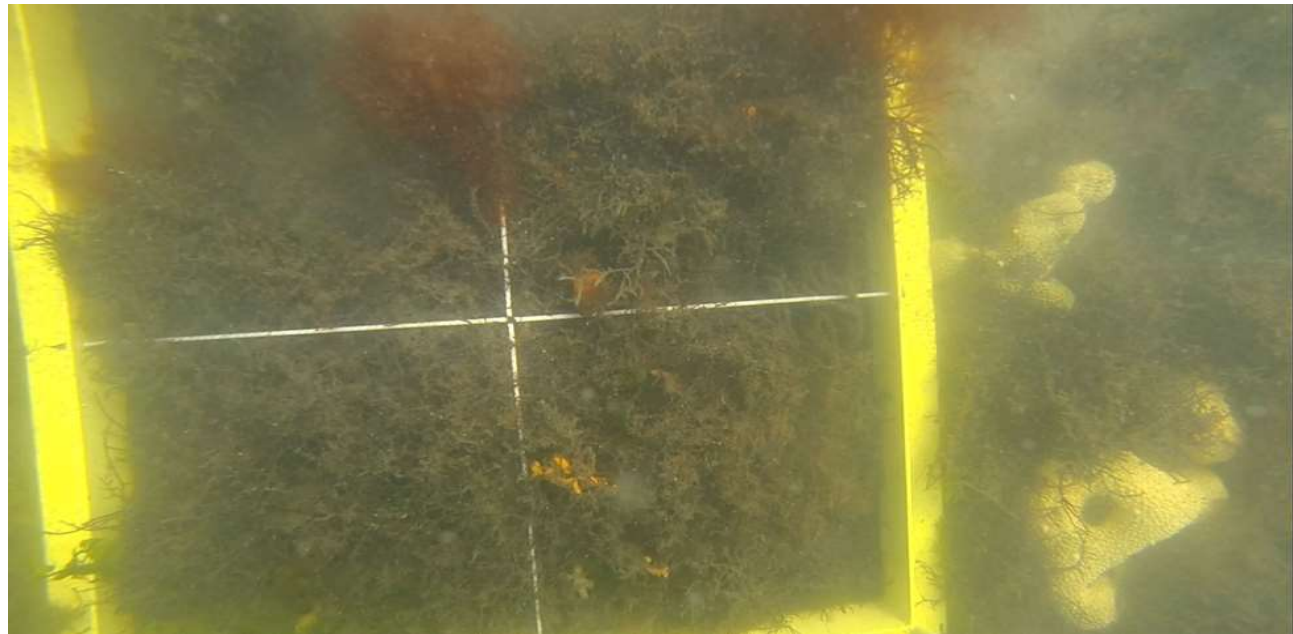


Photo 8: Lighthouse Drive Landing Station 724 with dense algae and large sponge present.

<i>Submerged Aquatic Vegetation Survey</i>	<b>Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs</b>	DATE:	01/22/21	<b>PHOTO</b>
		CREATED BY:	JRC	<b>7 and 8</b>
		REVIEWED BY:	DJY	
		JOB NO:	10092078	

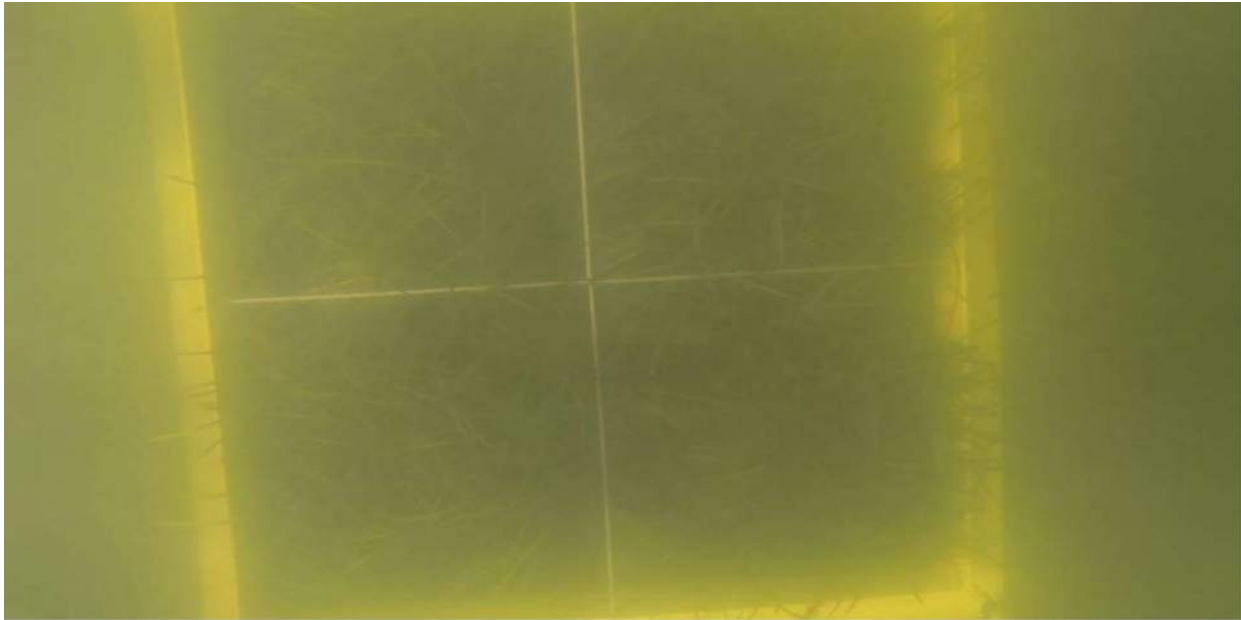


Photo 9: IBSP Landing Station 384 with thick patch of SAV present.

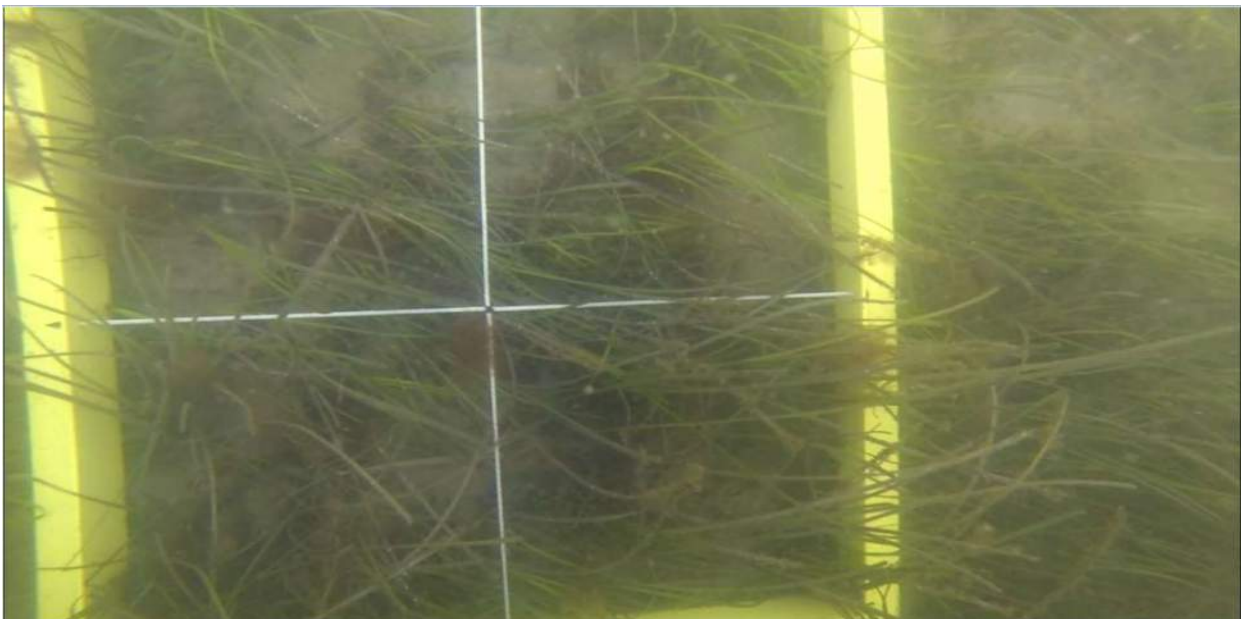


Photo 10: Lighthouse Drive Landing Station 757 with long stands of numerous SAV present.

<i>Submerged Aquatic Vegetation Survey</i>	<b>Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs</b>	DATE:	01/22/21	<b>PHOTO</b>
		CREATED BY:	JRC	<b>9 and 10</b>
		REVIEWED BY:	DJY	
		JOB NO:	10092078	



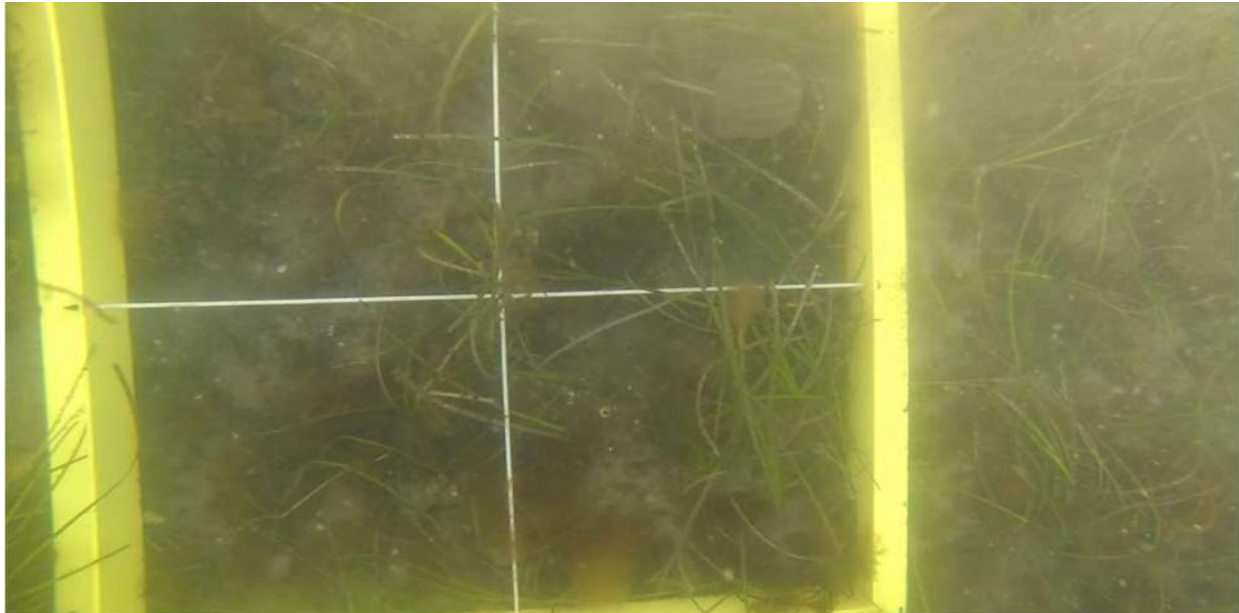


Photo 11: Lighthouse Drive Landing Station 753 with ctenophore, algae, and SAV present.



Photo 12: Photo of crab species brought up with Station 519 quadrant from Bay Parkway Landing.

<i>Submerged Aquatic Vegetation Survey</i>	<b>Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs</b>	DATE:	01/22/21	<b>PHOTO</b>
		CREATED BY:	JRC	<b>11 and 12</b>
		REVIEWED BY:	DJY	
		JOB NO:	10092078	



Photo 13: Photo facing southwest at patchy SAV distribution at Lighthouse Drive Landing.



Photo 14: Photo facing northwest at patchy SAV distribution at Lighthouse Drive Landing.

<i>Submerged Aquatic Vegetation Survey</i>	<b>Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs</b>	DATE:	01/22/21	<b>PHOTO</b>
		CREATED BY:	JRC	<b>13 and 14</b>
		REVIEWED BY:	DJY	
		JOB NO:	10092078	





Photo 15: Photo showing Bay Parkway Landing shoreline, SAV rake, and camera frame in the water.



Photo 16: Photo facing west at Holtec Property Landing shoreline.

Submerged Aquatic Vegetation Survey	Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs	DATE:	01/22/21	PHOTO
		CREATED BY:	JRC	15 and 16
		REVIEWED BY:	DJY	
		JOB NO:	10092078	

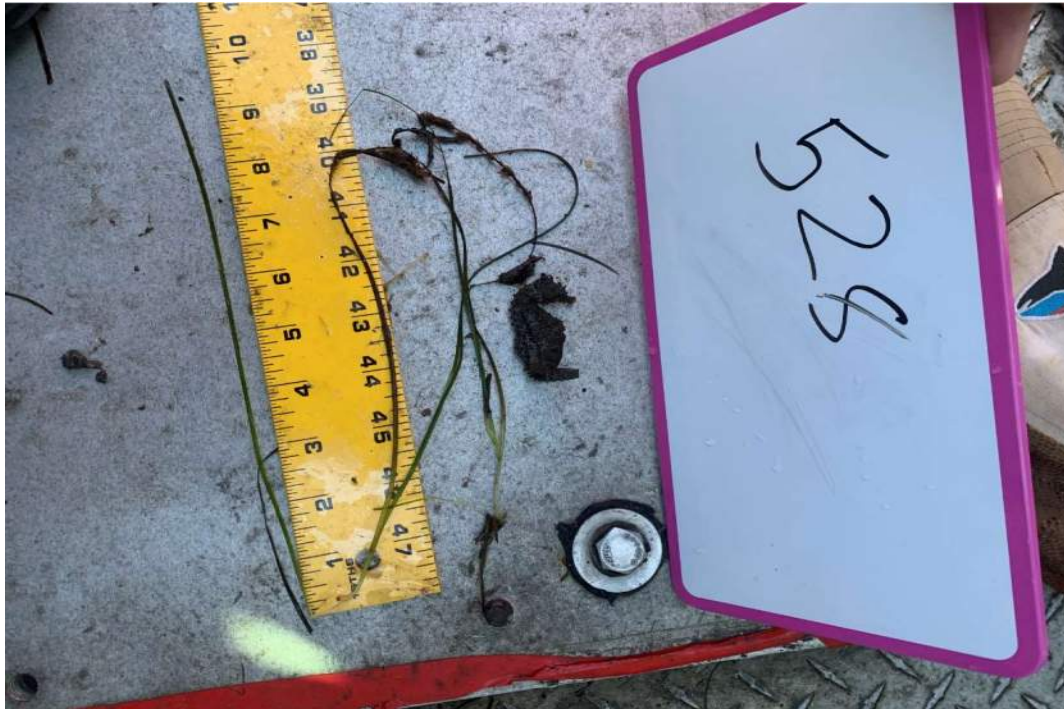


Photo 17: Photo showing SAV blades and seahorse at Bay Parkway Landing Station 528.



Photo 18: Photo showing sediment sample collected at IBSP Landing Station 391.

Submerged Aquatic Vegetation Survey	Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs	DATE:	01/22/21	PHOTO
		CREATED BY:	JRC	17 and 18
		REVIEWED BY:	DJY	
		JOB NO:	10092078	





Photo 19: Photo showing sediment sample collected at Bay Parkway Landing Station 475.



Photo 20: Photo showing sediment sample collected at Bay Parkway Landing Station 541.

Submerged Aquatic Vegetation Survey	Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs	DATE:	01/22/21	PHOTO
		CREATED BY:	JRC	19 and 20
		REVIEWED BY:	DJY	
		JOB NO:	10092078	



Photo 21: Photo showing sediment sample collected at Holtec Property Landing Station 636.



Photo 22: Photo showing sediment sample collected at Holtec Property Landing Station 678.

Submerged Aquatic Vegetation Survey	Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs	DATE:	01/22/21	PHOTO
		CREATED BY:	JRC	21 and 22
		REVIEWED BY:	DJY	
		JOB NO:	10092078	



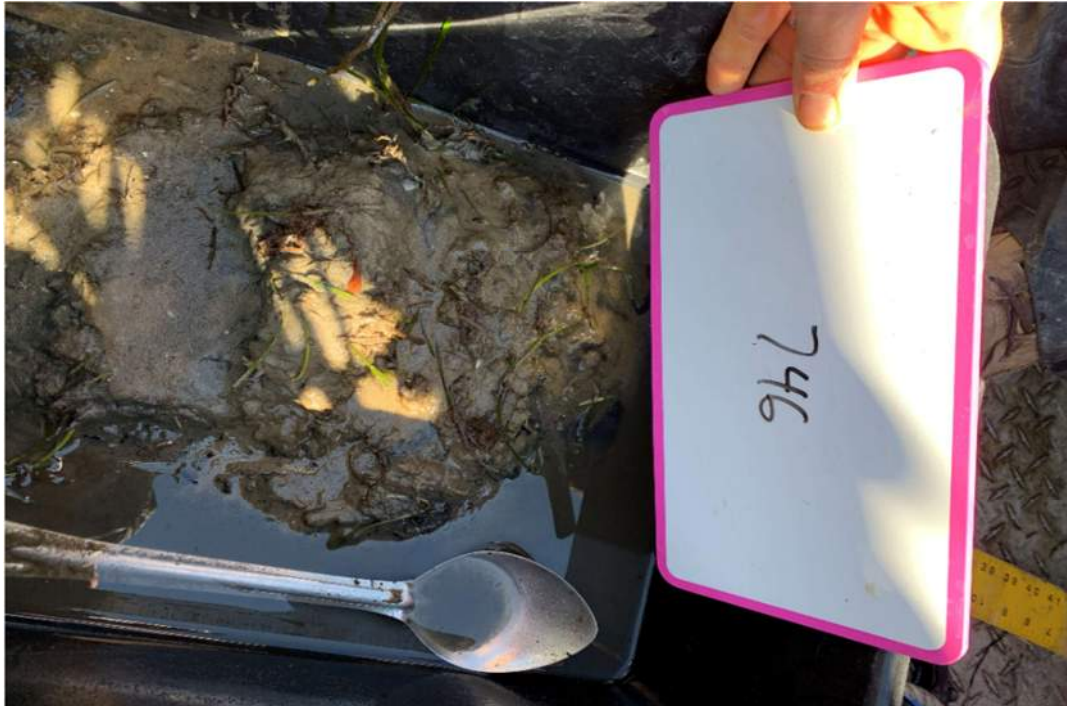


Photo 23: Photo showing sediment sample collected at Lighthouse Drive Landing Station 746.



Photo 24: Photo showing sediment sample collected at Lighthouse Drive Landing Station 760.

Submerged Aquatic Vegetation Survey	Ocean Wind Offshore Wind (OCW01) Oyster Creek SAV Survey Photographs	DATE:	01/22/21	PHOTO
		CREATED BY:	JRC	23 and 24
		REVIEWED BY:	DJY	
		JOB NO:	10092078	

## **Appendix D. Notable Biological Observations**



### **Notable Biological Observations**

While on the survey vessel at multiple locations, schools of baitfish, including Atlantic silversides (*Menidia menidia*) and juvenile Atlantic menhaden (*Brevoortia tyrannus*), were observed being chased by predatory fish assumed to be striped bass (*Morone saxatilis*) and bluefish (*Pomatomus saltatrix*).

During the review of camera drops, ctenophores were observed floating over several quadrats. Several sponge species were observed directly adjacent to the quadrat frame. The shells of Atlantic jackknife clams (*Ensis leei*) and biogenic mounds were observed in multiple quadrats. One small summer flounder (*Paralichthys dentatus*) was observed within one of the Lighthouse Drive Landing quadrats. Survey photography and notable biological observations are provided in Appendix B.

## **Appendix E. Sediment Sampling Results**



**TerraSense, LLC**  
Geotesting Laboratory

10/28/2020

TerraSense Project Number: 7736-20079

Subresults

Hampton-Clarke, Inc.

175 US Hwy 46 West

Fairfield, NJ 07004

Dear Subresults:

**Re: Laboratory Test Results for 0101203 AD19744**

The purpose of this letter is to present the results of the laboratory tests performed on the samples delivered to the TerraSense laboratory on 10/13/20. Testing was performed based on the assignment dated 10/13/20 by TR.

## **Test Results**

Test results are reported on the accompanying test pages.

## **Test Comments**

Testing was performed in general accordance to the ASTM or other methods as listed on the test pages. Deviations from the test standards are noted on these pages.

## **Limitations**

Our professional services for this project have been performed in accordance with generally accepted engineering practices; no other warranty, expressed or implied, is made.

## **Sample Disposition**

If we do not receive other instructions from you within thirty days, this material will be disposed of.

If you have any questions concerning the test results reported in this letter, please call us.

Sincerely,

TerraSense, LLC.

Rosella Thomas

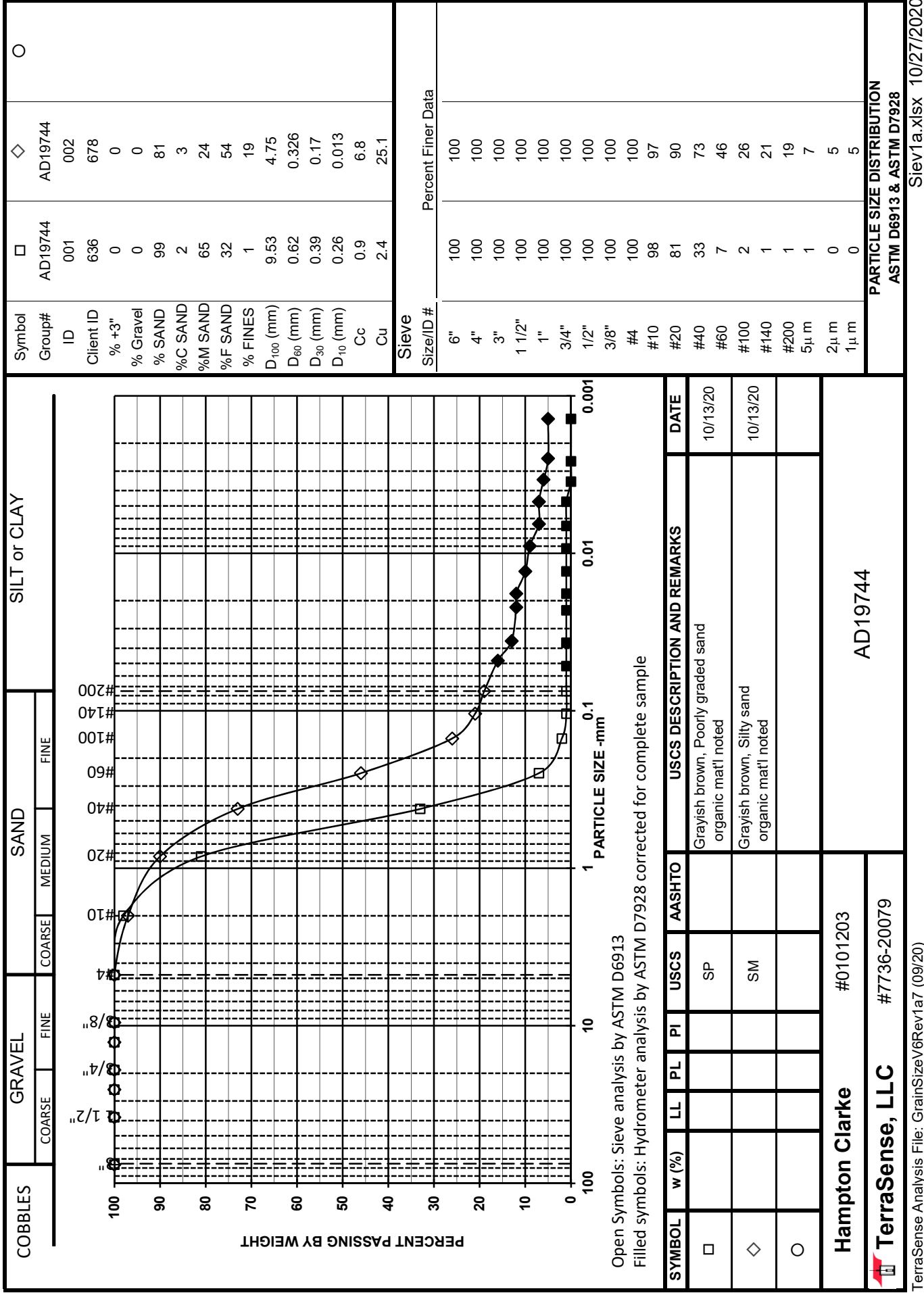
Managing Member

Enclosure:

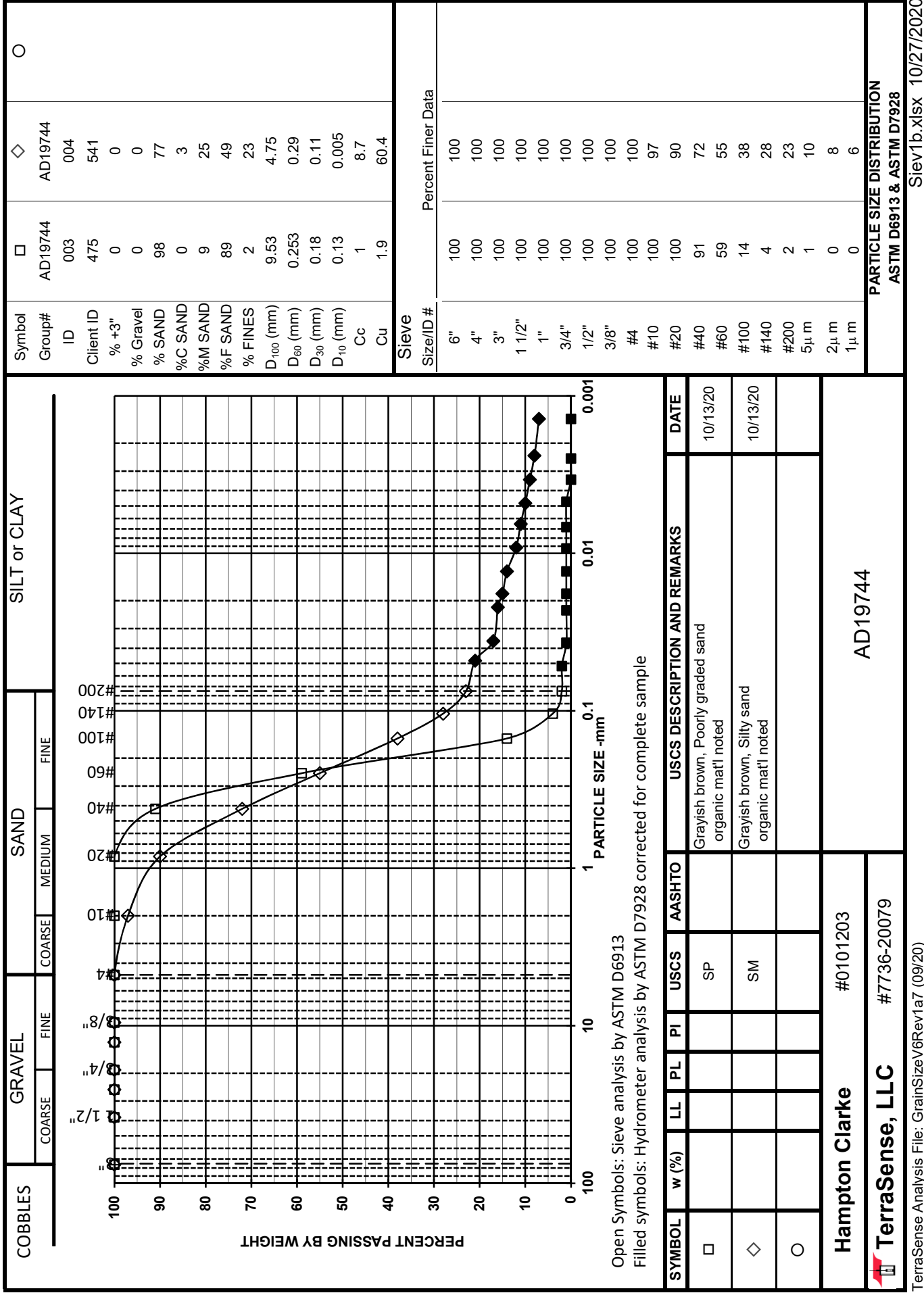
**Hampton Clarke #0101203  
AD19744  
LABORATORY TESTING DATA SUMMARY**

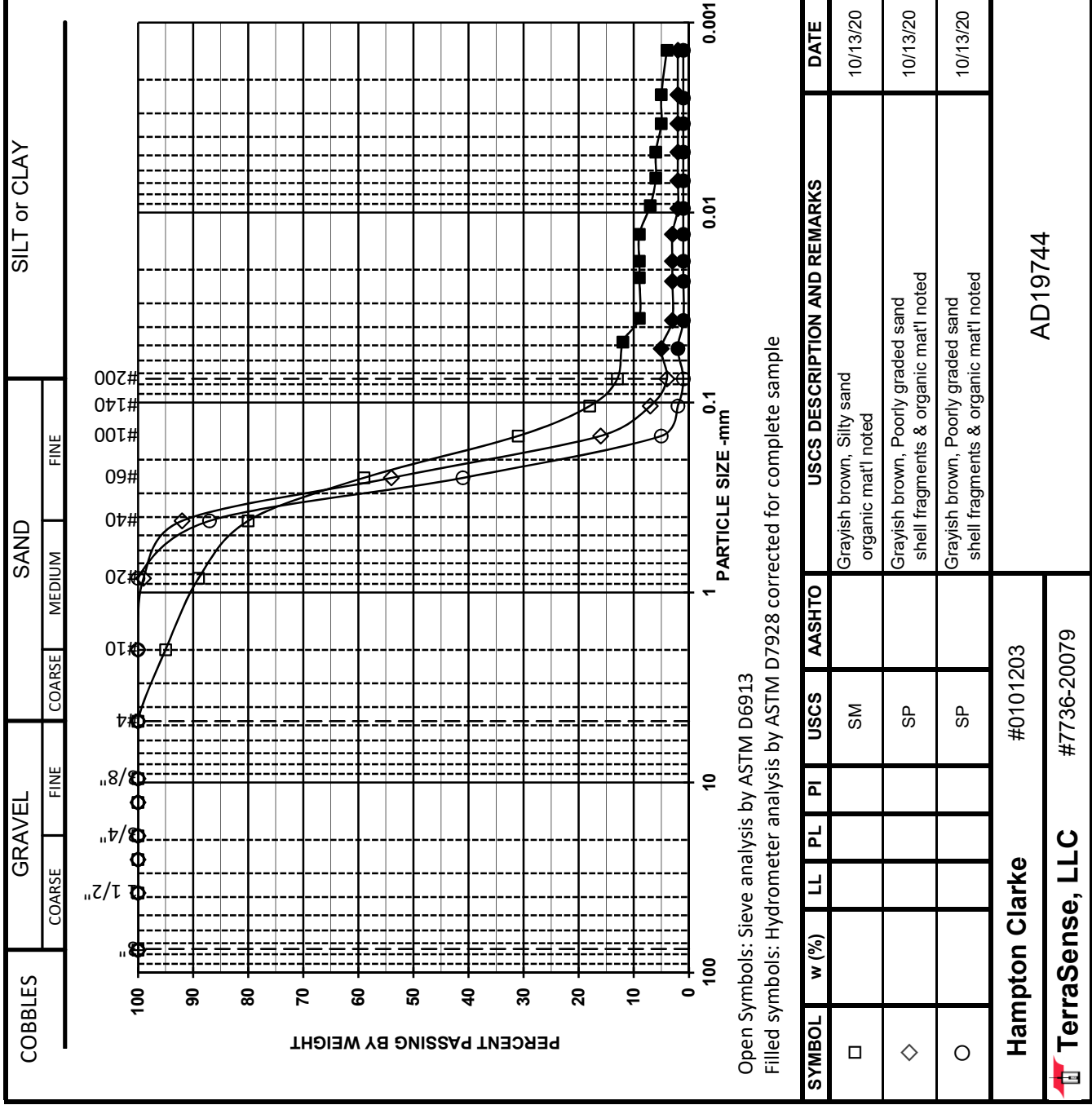
GROUP ID	SAMPLE NO.	CLIENT ID	TEST DATE	IDENTIFICATION TESTS				REMARKS
				WATER CONTENT (%)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 $\mu$ m (%)	
AD19744	001	636	10/13/2020		SP	1	0	
AD19744	002	678	10/13/2020		SM	19	5	
AD19744	003	475	10/13/2020		SP	2	0	
AD19744	004	541	10/13/2020		SM	23	8	
AD19744	005	760	10/13/2020		SM	13	5	
AD19744	006	746	10/13/2020		SP	4	2	
AD19744	007	391	10/13/2020		SP	1	1	

Note: (1) USCS symbol based on visual observation and Sieve reported.









# CHAIN OF CUSTODY RECORD

Hampton-Clarke, Inc.  
175 US Hwy 46 West  
Fairfield, New Jersey, 07004  
Ph: 800-426-9992 Fax: 973-439-1458

7736-20079

## Report To:

Hampton-Clarke, Inc.:  
Attn: Reporting  
175 Route 46 West  
Fairfield, New Jersey 07004

## Invoice To:

Hampton-Clarke, Inc.:  
Attn: Accounting  
175 Route 46 West  
Fairfield, New Jersey 07004

## Project #:



## CocID#:



FINAL RESULTS TO: [subresults@hcvlab.com](mailto:subresults@hcvlab.com)  
PRELIM/VERBAL RESULTS TO: [subresults@hcvlab.com](mailto:subresults@hcvlab.com)

EDD: NEW JERSEY HAZRESULT OR EQUIS EZEDD REQUIRED FOR ALL DATA SUBMITTALS!

Turn Around Time: Standard

Preliminary Due Date: 10/27/2020

Report Type: NJDEP-R (REDUCED) Hard Copy Due Date: 11/4/2020

Sample Number:	Client ID	Date Collected:	Time Collected:	Matrix:	Analysis Requested
AD19744-001	636	10/8/2020	10:20:00 AM	Soil	Grain Size with Hydrometer(ASTM D6913&D7928)
AD19744-002	678	10/8/2020	10:30:00 AM	Soil	Grain Size with Hydrometer(ASTM D6913&D7928)
AD19744-003	475	10/8/2020	10:48:00 AM	Soil	Grain Size with Hydrometer(ASTM D6913&D7928)
AD19744-004	541	10/8/2020	10:57:00 AM	Soil	Grain Size with Hydrometer(ASTM D6913&D7928)
AD19744-005	760	10/8/2020	1:58:00 PM	Soil	Grain Size with Hydrometer(ASTM D6913&D7928)
AD19744-006	746	10/8/2020	2:17:00 PM	Soil	Grain Size with Hydrometer(ASTM D6913&D7928)
AD19744-007	391	10/9/2020	8:21:00 AM	Soil	Grain Size with Hydrometer(ASTM D6913&D7928)

Relinquished By:

Accepted By:

Date:

Time:

Comments, Notes, Special Requirements, HAZARDS

*Greg Thomas* 10/13/20 15:02

12/10/13/2020

Cooler Temp:

**Island Beach State Park Prior Channel Route Option  
SAV Presence/Absence Survey**

## Island Beach State Park Prior Channel Route Option SAV Survey - Addendum to OCW COP, Appendix E, SAV Survey

### Objectives

On October 22, 2021 a field survey was performed in Barnegat Bay (**Figures 1 and 2**) to assess the presence or absence of Submerged Aquatic Vegetation (SAV), general sediment characteristics, and water depth in the prior channel that extends west from the Island Beach State Park Maintenance Area.

### Methods

To investigate the presence and absence of SAV in the area of the prior channel, an underwater camera mounted above a 0.25 m<sup>2</sup> steel quadrat frame was deployed at 27 stations in this area. A brief video was collected at each station; initial review was conducted in the field and a more detailed review of video was conducted on a computer. These stations were distributed across the shallow flats adjacent to the channel, the channel edge (transition from flats to channel), and the center portion of the channel. A long-handled rake was also used at each station to collect SAV (if present) at each station. SAV was also opportunistically collected from the edge of the camera frame; during retrieval the edge of the camera frame can dig into the sediment and collect SAV or macroalgae. In locations that were too shallow to deploy the camera frame, the rake was used to collect SAV (if present). A GPS point was collected at each point using the ArcGIS Field Maps Application and the internal antenna of an iPhone 10XR; a typical horizontal accuracy of 14-16 ft was achieved prior to collection. Where applicable, a photo was collected and tagged to each point and uploaded into the ESRI Field Maps Application. Each point was classified as flat, channel, or channel edge. At 4 locations a sample of benthic sediments was collected using a petite ponar. The sediments were visually inspected for texture and photographed.

To investigate the anomalous feature in the Holtec Farm landfall area the feature was visually inspected from the boat's surface, manually probed in several areas with the long handle of the SAV rake, and inspected with an underwater camera mounted to the handle of the rake as the survey boat drifted over the feature.

### Results

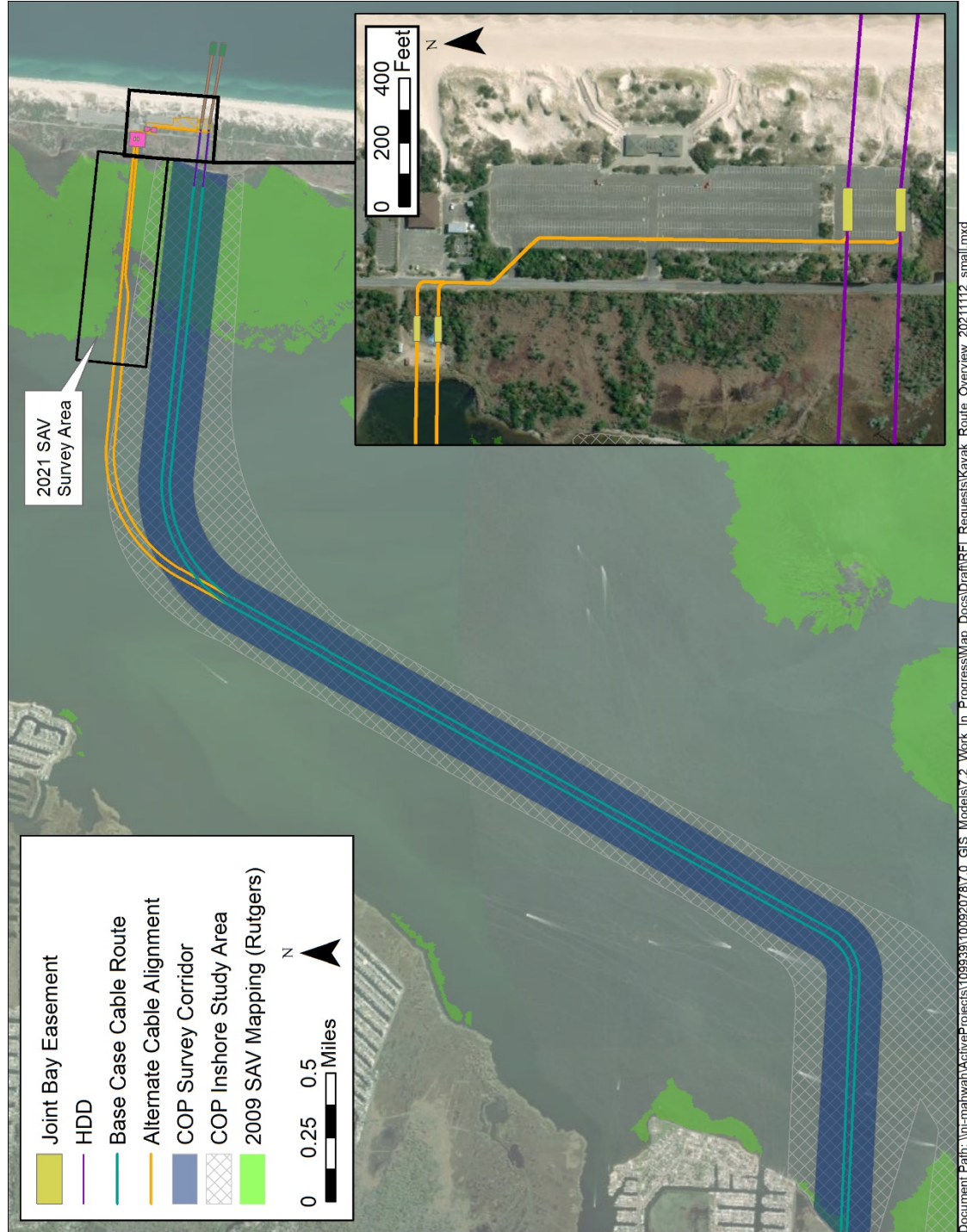
The presence or absence of SAV at each sample point is provided in Table 1. SAV was present at 13 of 33 sample stations; all of these stations were on the adjacent flats or on the channel edge. Of the 21 samples collected in the channel, SAV was absent in 20, with one station inconclusive due to soft sediments in the channel causing turbid conditions as the metal quadrat frame hit the sea floor at that station. Both widgeon grass (*Ruppia maritima*) and eel grass (*Zostera marina*) were documented. The Point IDs in **Table 1** below correspond to the point labels in **Figure 2**. Representative photos of SAV presence or absence are provided in **Figures 3 through 21**.

**Table 1. Presence or absence of SAV at each sample point.**

Point ID	Gear	Location	SAV Present	Species	Latitude	Longitude
1	Rake	Nearshore Flat	Yes	Eelgrass	39.85269	-74.08982
2	Rake	Nearshore Flat	Yes	Widgeongrass	39.85244	-74.08977
3	Camera	Nearshore Channel	No		39.85228	-74.08955
4	Camera	Nearshore Channel	Yes	Accumulated Dead Eelgrass	39.85207	-74.08983
5	Rake	Nearshore Flat	Yes	Widgeongrass	39.85165	-74.09003

Point ID	Gear	Location	SAV Present	Species	Latitude	Longitude
6	Rake	Nearshore Flat	Yes	Widgeongrass	39.85151	-74.09010
7	Camera	Nearshore Channel	No		39.85210	-74.09022
8	Camera	Nearshore Edge	Yes	Widgeongrass	39.85224	-74.09016
9	Rake	Nearshore Flat	Yes	Widgeongrass	39.85265	-74.09028
10	Camera	Channel Edge	Yes	Widgeongrass	39.85250	-74.09124
11	Camera	Channel	No		39.85236	-74.09153
12	Camera	Flat	Yes	Eelgrass	39.85195	-74.09133
13	Camera	Channel	Inconclusive	Eelgrass	39.85238	-74.09230
14	Camera	Channel Edge	Yes	Widgeongrass	39.85267	-74.09268
15	Camera	Channel	No		39.85250	-74.09327
16	Camera	Channel Edge	Yes	Eelgrass	39.85222	-74.09315
17	Camera	Channel Edge	No		39.85242	-74.09446
18	Camera	Channel	No		0.00000	0.00000
19	Camera	Channel	No		39.85257	-74.09455
20	Camera	Channel Edge	Yes	Widgeongrass	39.85286	-74.09563
21	Camera	Flat	Yes	Eelgrass	39.85218	-74.09618
22	Camera	Channel	No		39.85255	-74.09634
23	Camera	Channel	No		39.85270	-74.09654
24	Camera	Channel	No		39.85278	-74.09684
25	Camera	Channel	No		39.85260	-74.09520
26	Camera	Channel	No		39.85247	-74.09376
27	Camera	Channel	No		39.85237	-74.09284
28	Camera	Channel	No		39.85232	-74.09208
29	Camera	Channel	No		39.85226	-74.09134
30	Camera	Nearshore Channel	No		39.85213	-74.09055
31	Camera	Nearshore Channel	No		39.85207	-74.09036
32	Camera	Nearshore Channel	No	Accumulated Dead Eelgrass	39.85203	-74.08995
33	Camera	Nearshore Channel	No	Accumulated Dead Eelgrass	39.85201	-74.08948





**Figure 1. Project location map for the October 201 SAV survey in the prior channel that extends west from the Island Beach State Park Maintenance Area.**

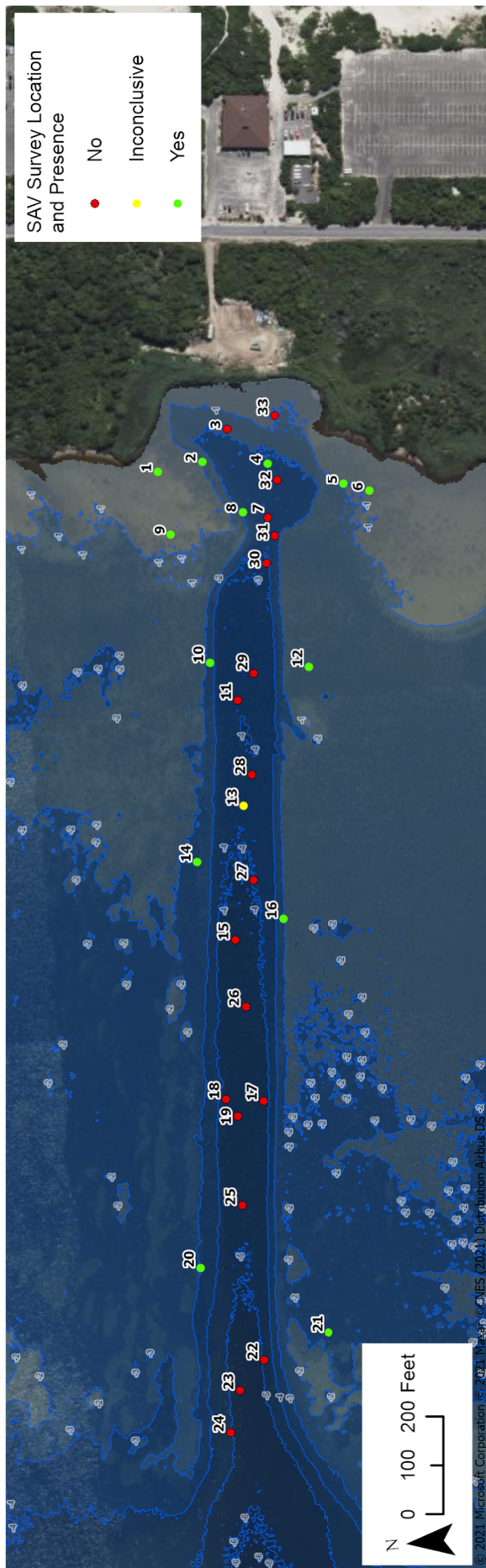
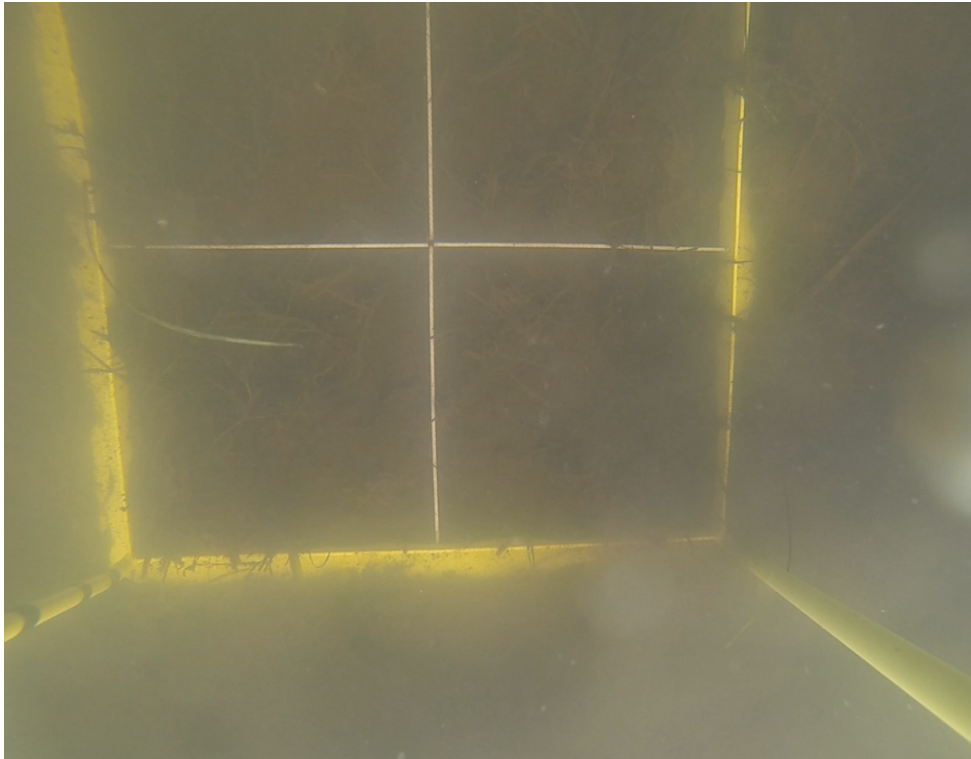


Figure 2. SAV presence and sample points collected in area of prior channel.

The sediments in the channel consisted of fine sands and dark muds with a sulfur odor. In the areas closer to shore a large quantity of organic material which was observed to be accumulated dead SAV and common reed (*Phragmites australis*) fragments. The sediments on the adjacent flats appeared to be fine sands.

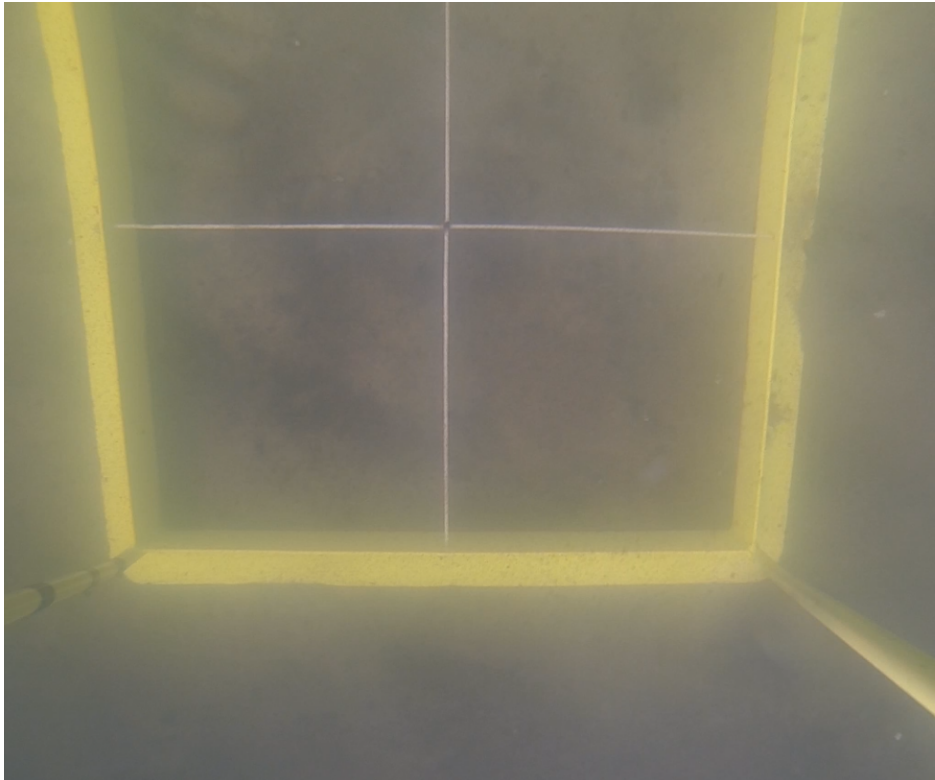
### Channel Water Depths

Depths on the flats adjacent to the bay were noticeably shallower than the channel and ranged from 1 to 3 feet. Within the channel itself, the eastern portions of the channel had depths ranging from 3 to 4 feet. Moving west, the channel deepened to a range of 5 to 7 feet. Depths were estimated via probing with a long-handled SAV rake.

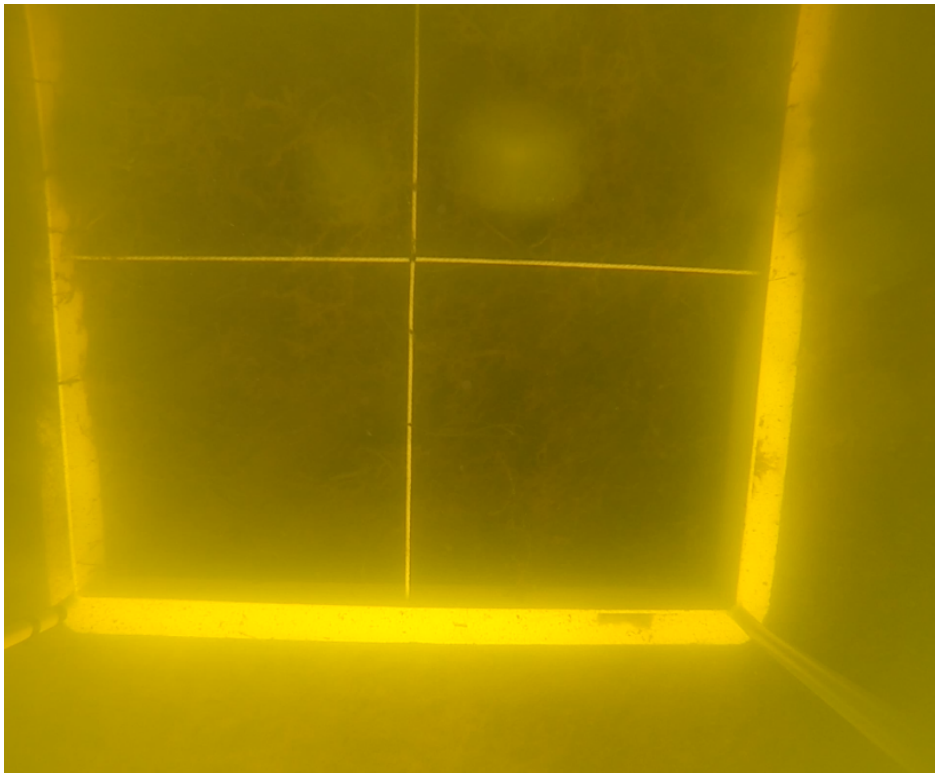


**Figure 3. Dead grass and algae observed at Point ID 3 within the nearshore channel.**

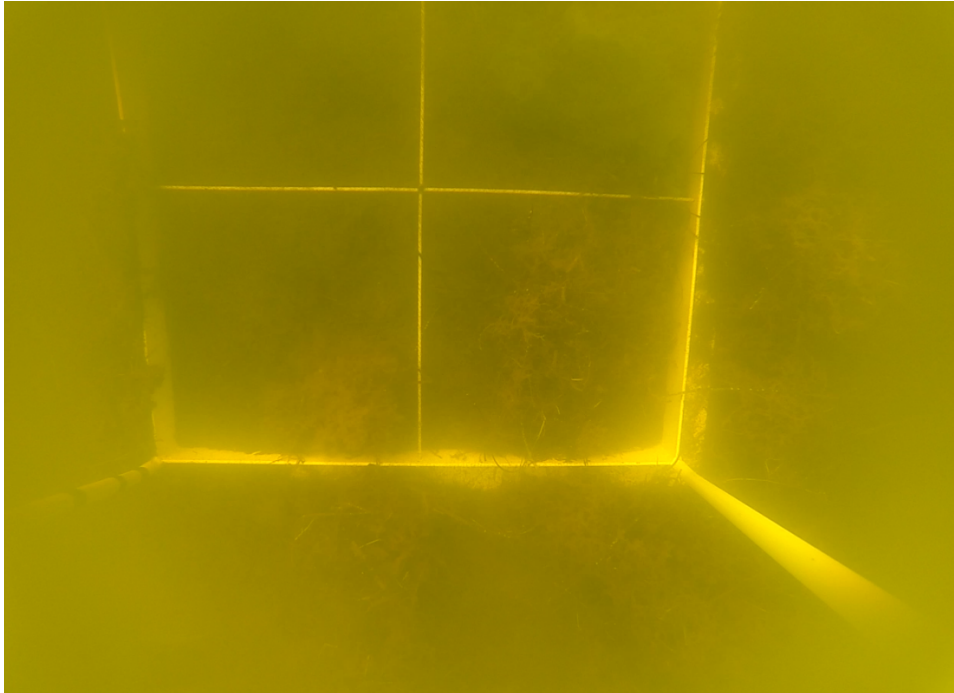




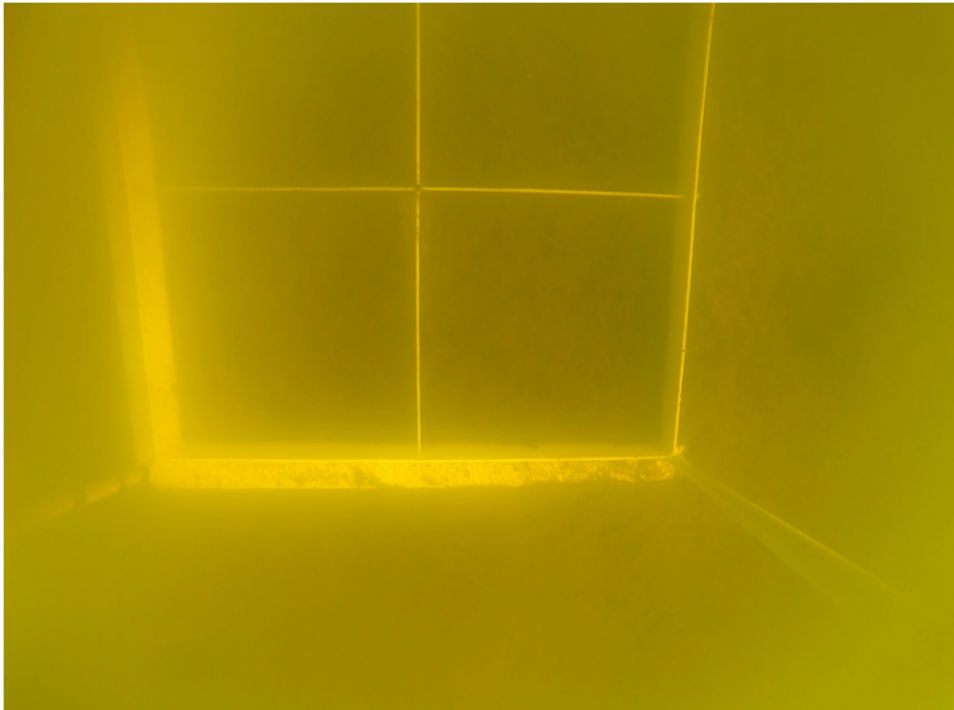
**Figure 4. Bare patch of bottom at Point ID 7 within nearshore channel.**



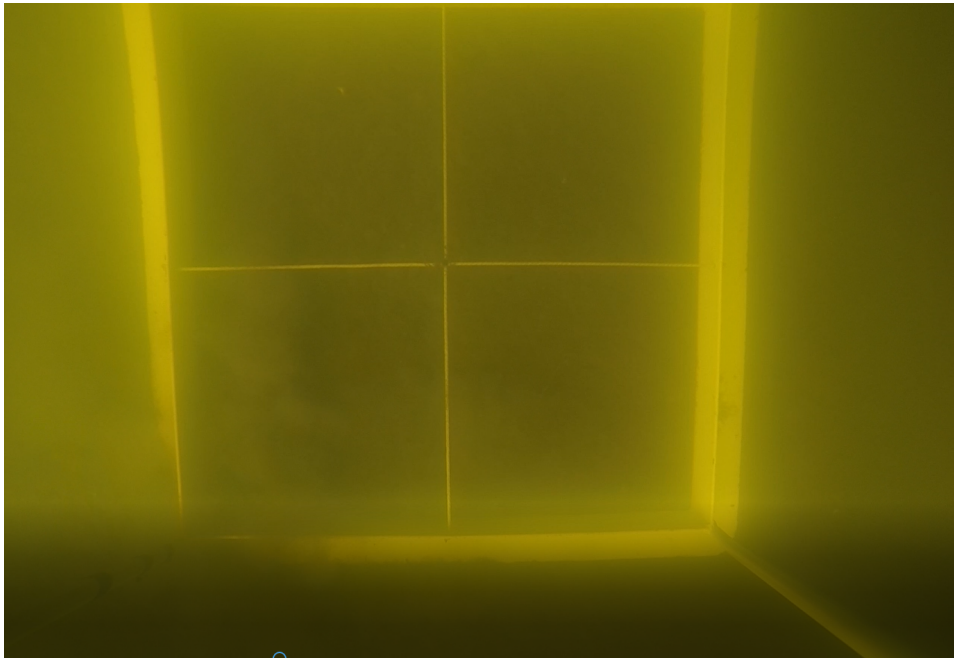
**Figure 5. Widgeongrass at Point ID 10 along channel edge.**



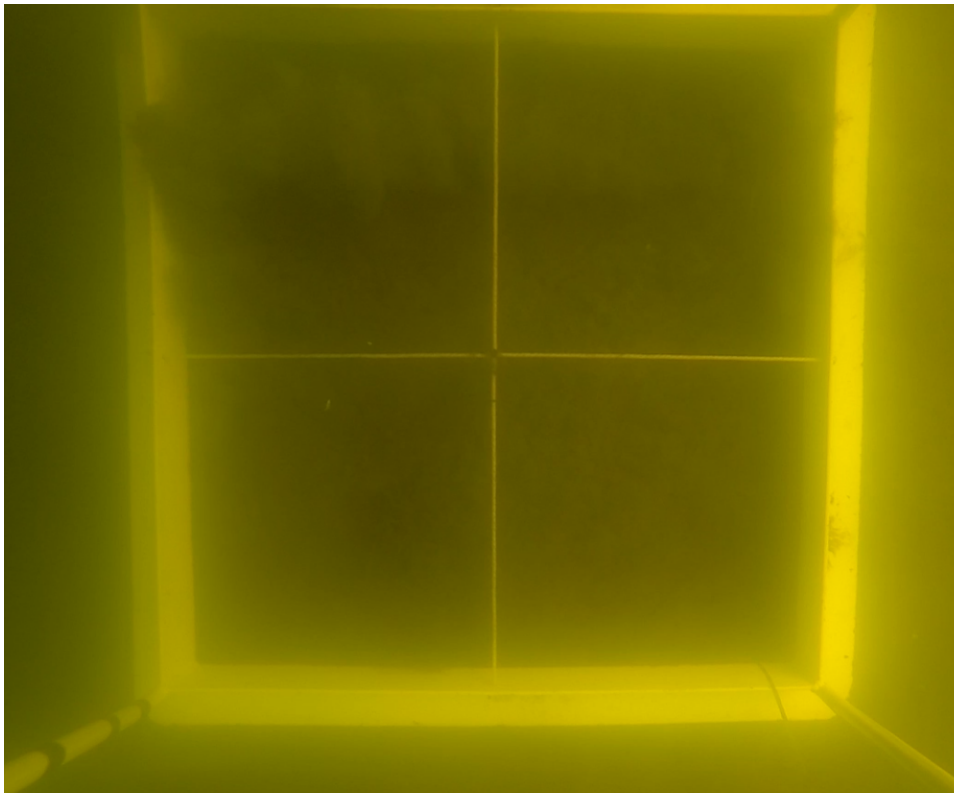
**Figure 6. Eelgrass and algae present at Point ID 14 on channel edge.**



**Figure 7. Bare patch of bottom at Point ID 15 within the channel.**

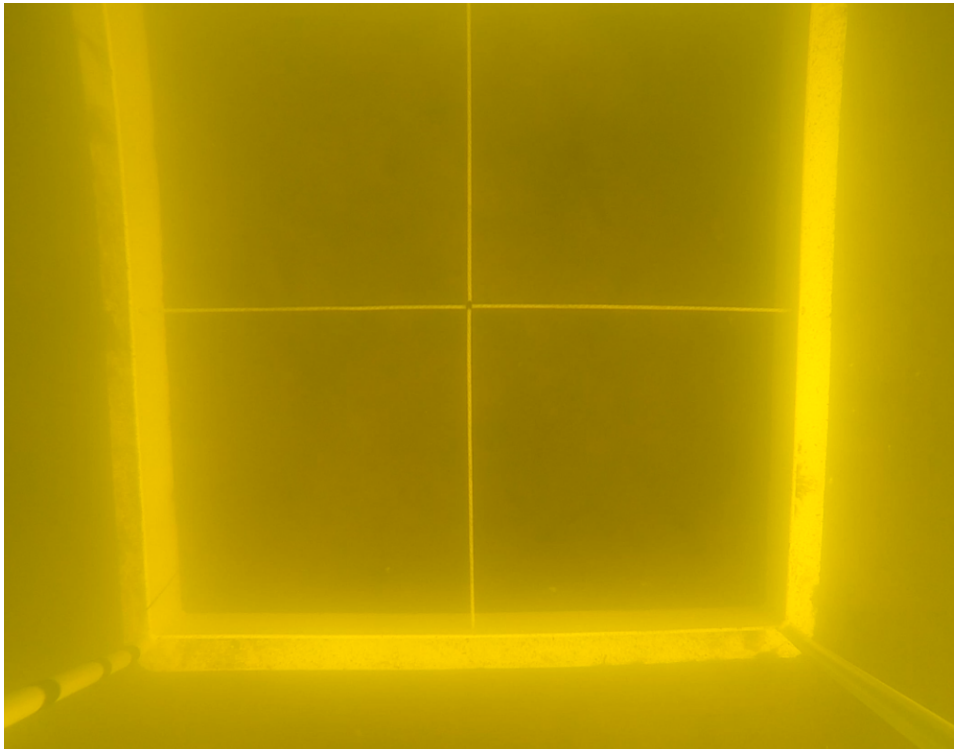


**Figure 8. Bare patch of bottom Point ID 17 within the channel edge.**

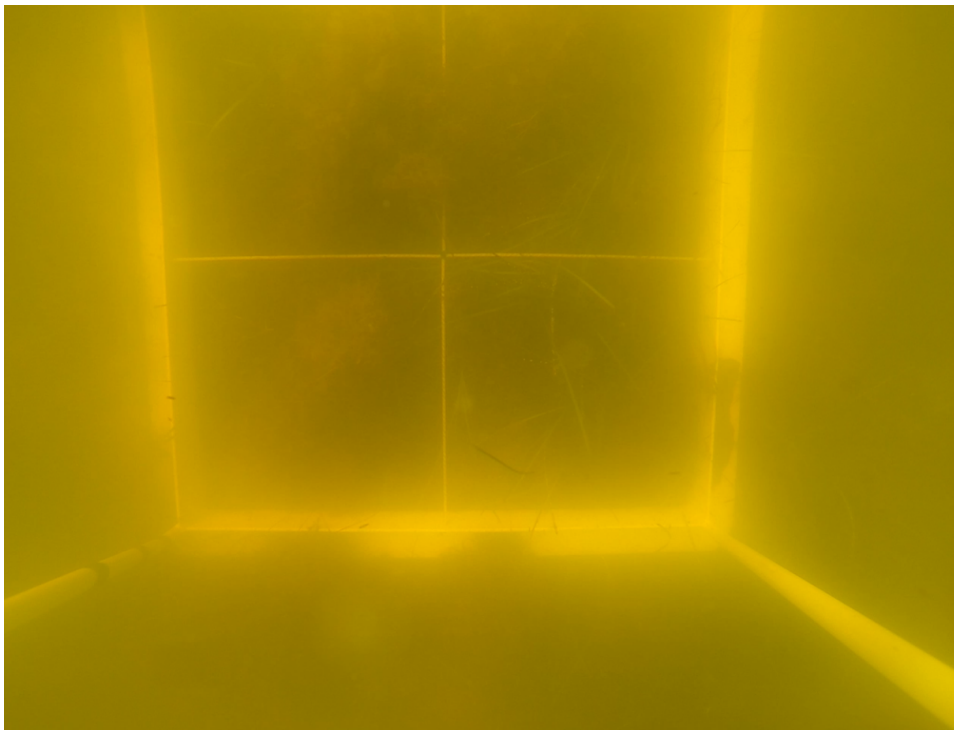


**Figure 9. Bare patch of bottom Point ID 18 within the channel edge.**

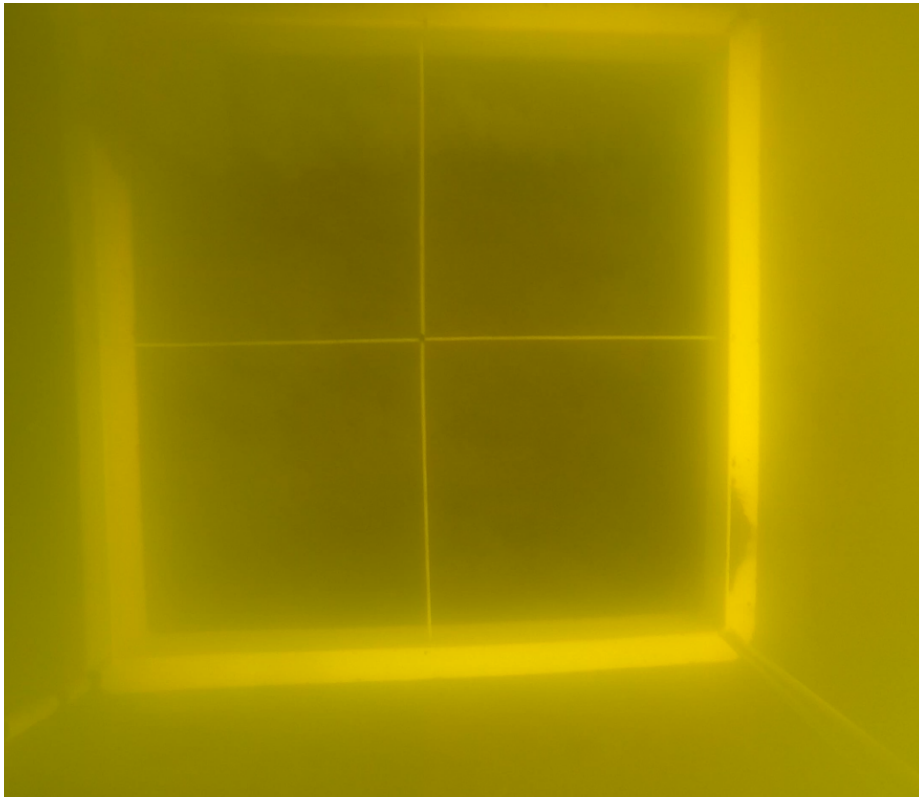




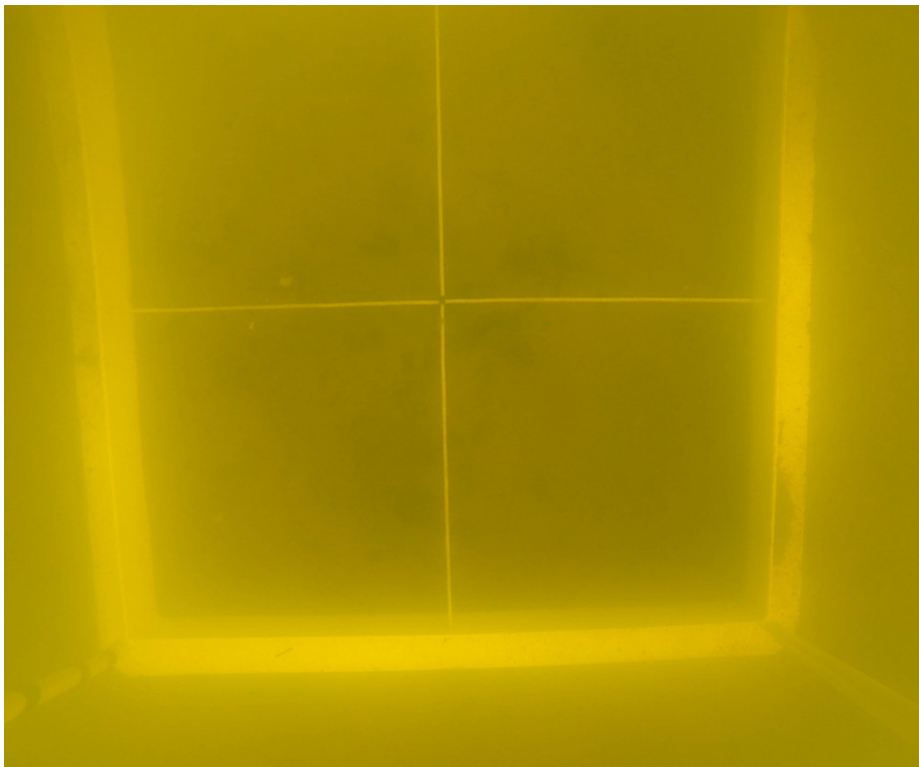
**Figure 10. Bare patch of bottom Point ID 19 within the channel edge.**



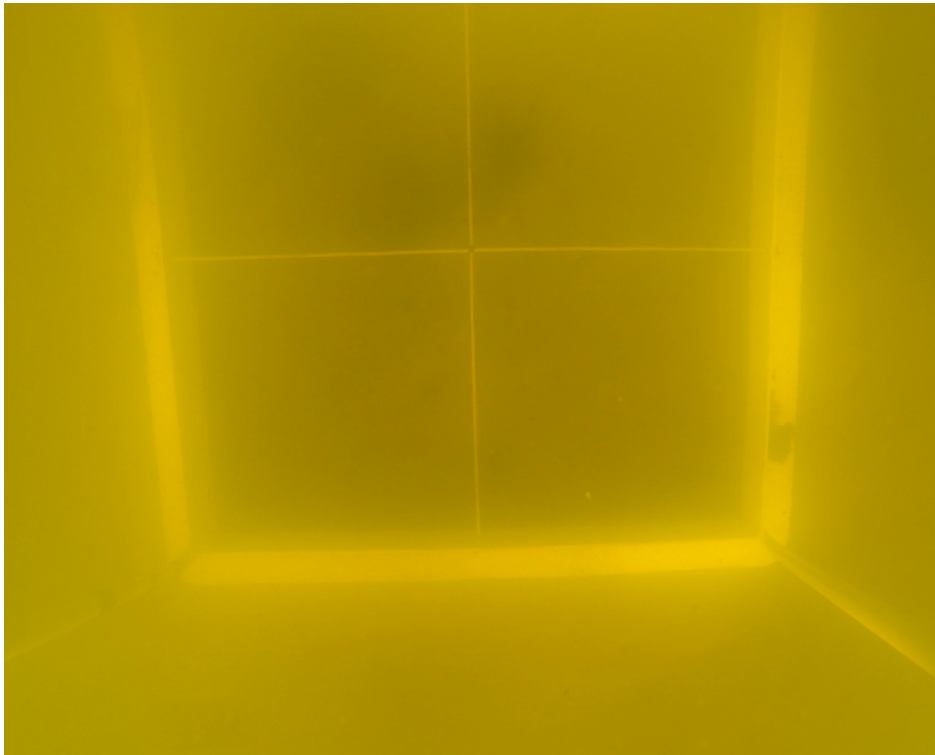
**Figure 11. Widgeongrass along channel edge at Point ID 20.**



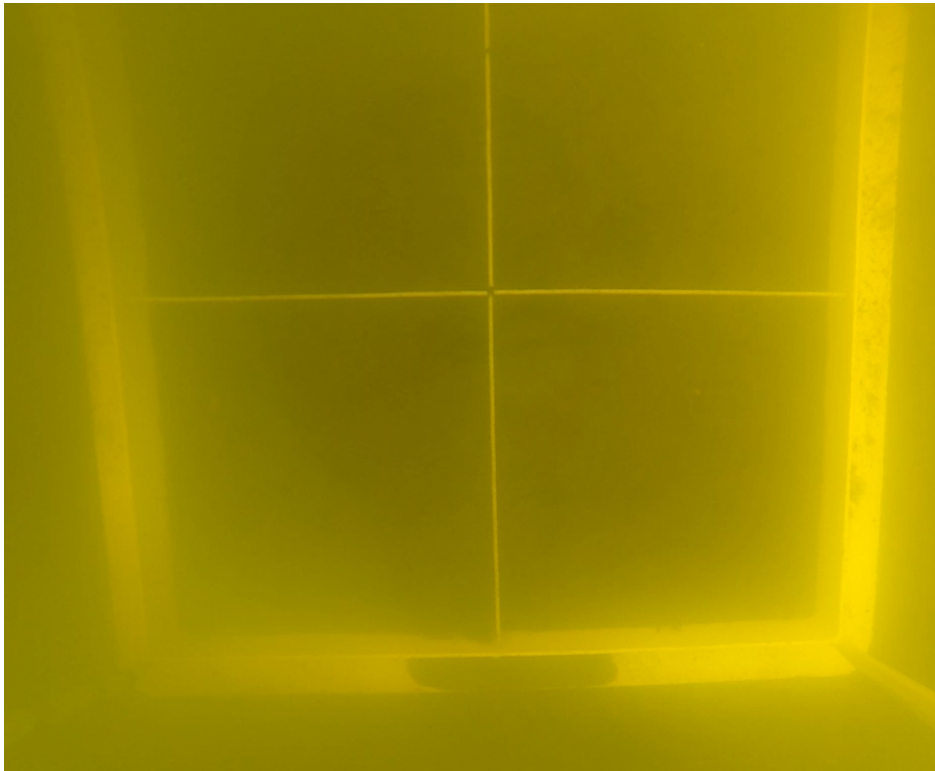
**Figure 12. Bare patch of bottom at Point ID 22 within the channel.**



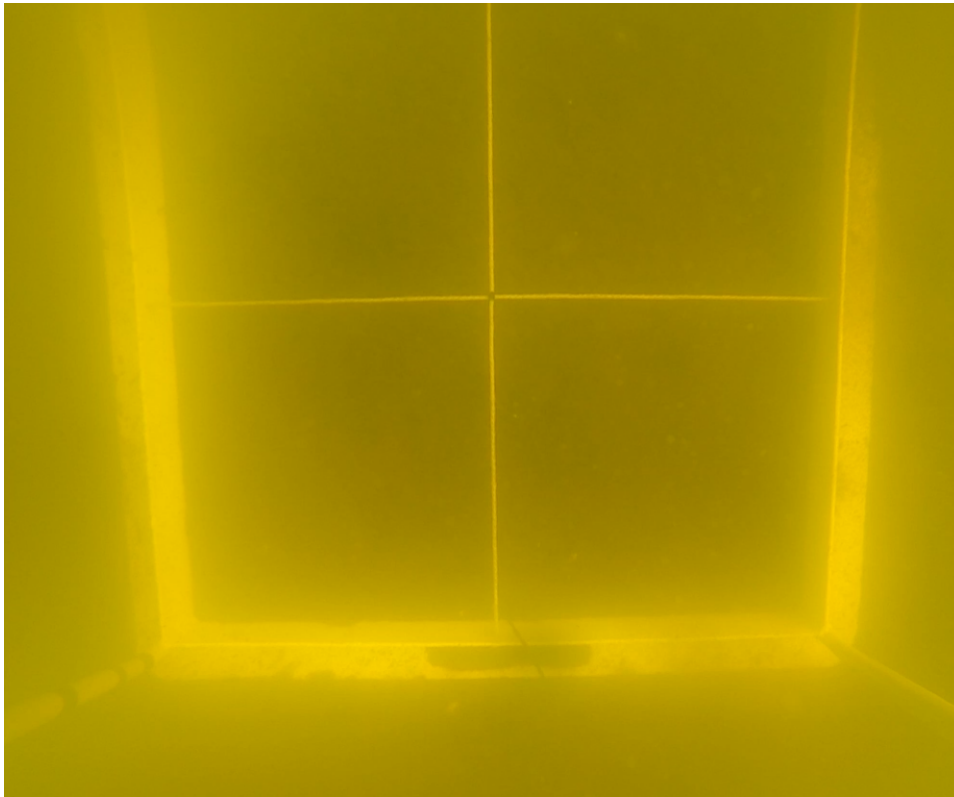
**Figure 13. Bare patch of bottom at Point ID 23 within the channel.**



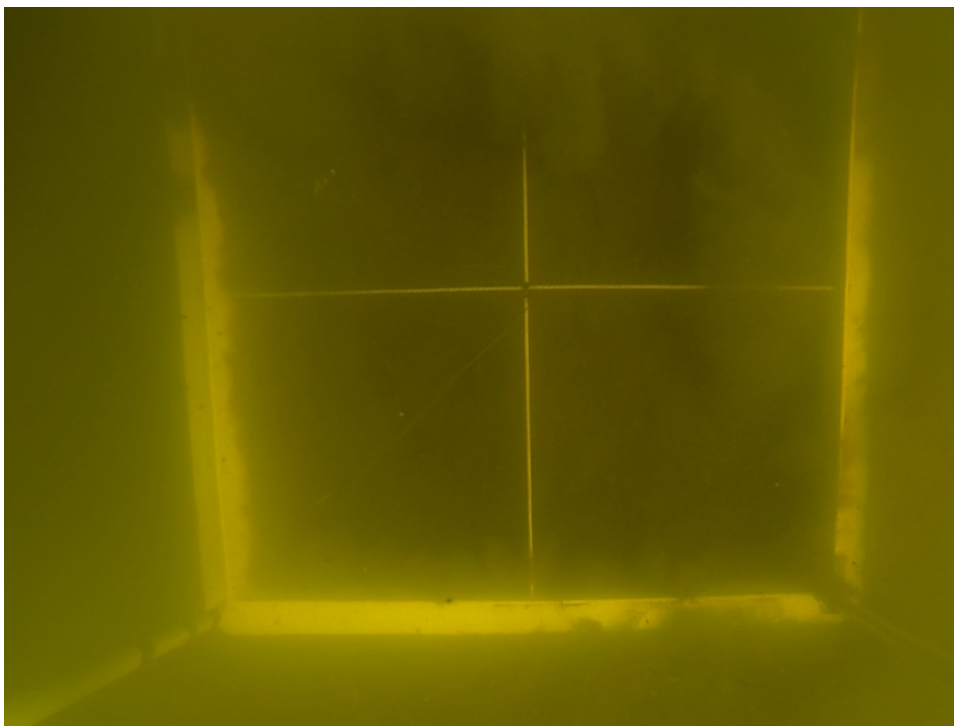
**Figure 14. Bare patch of bottom at Point ID 24 within the channel.**



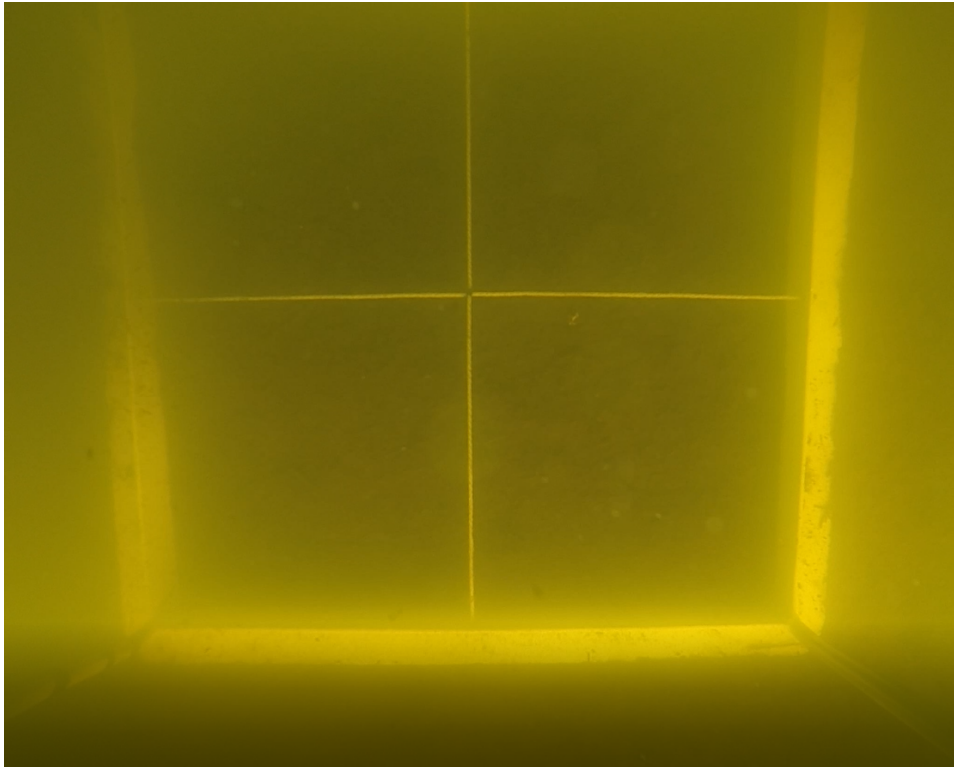
**Figure 15. Bare patch of bottom at Point ID 25 within the channel.**



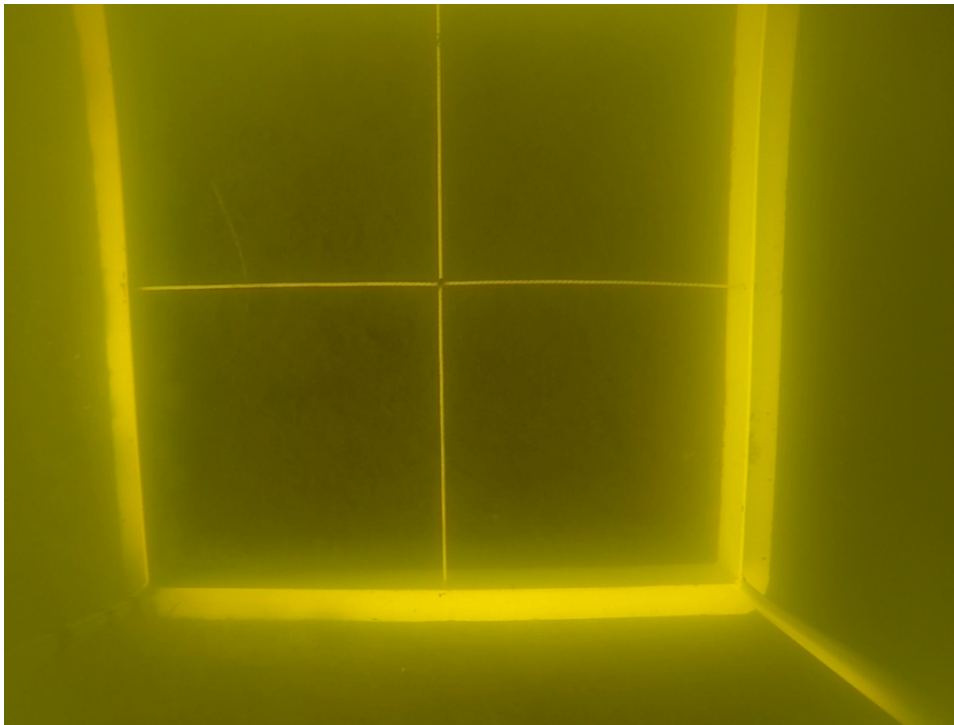
**Figure 16. Bare patch of bottom at Point ID 26 within the channel.**



**Figure 17. Bare patch of bottom at Point ID 27 within the channel.**

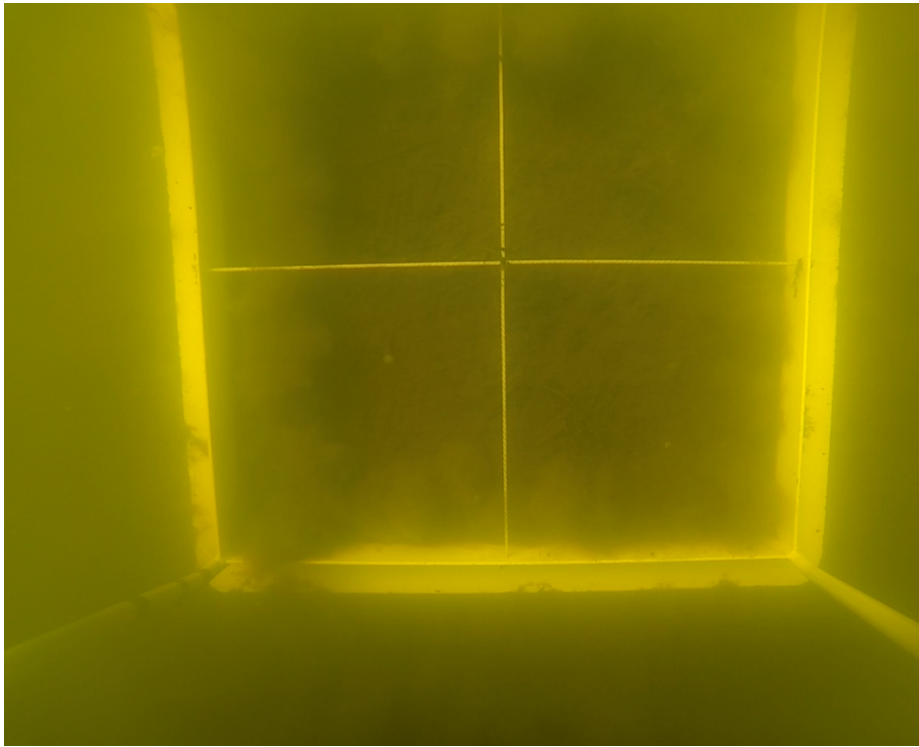


**Figure 18. Bare patch of bottom at Point ID 28 within the channel.**

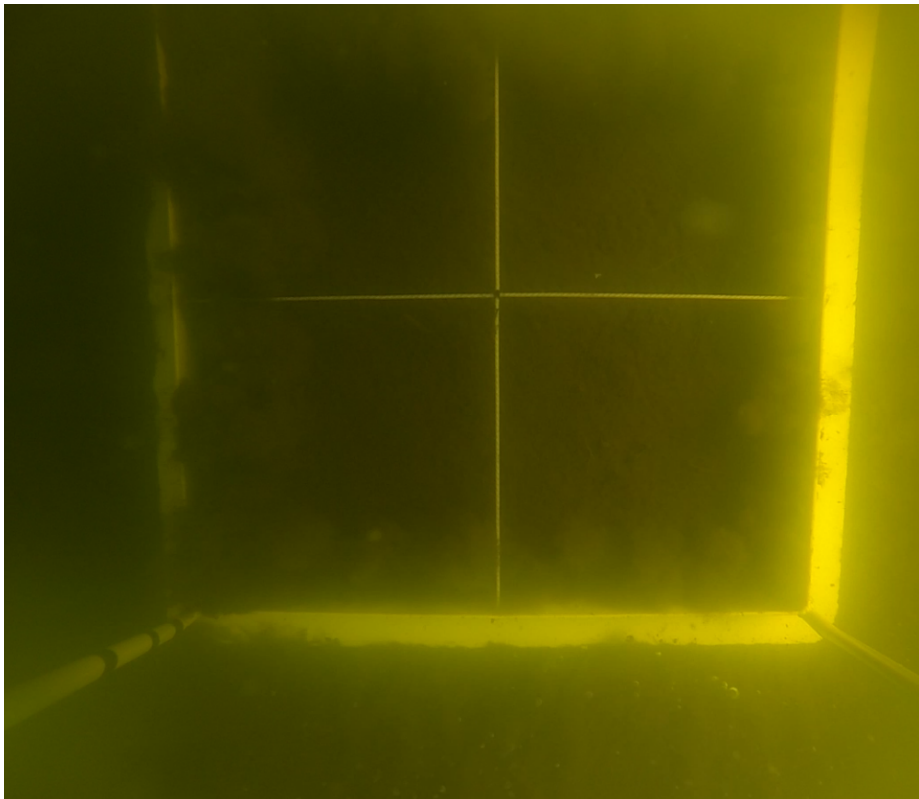


**Figure 19. Bare patch of bottom at Point ID 29 within the channel.**





**Figure 20. Bare patch of bottom at Point ID 30 within the nearshore channel.**



**Figure 21. Bare patch of bottom at Point ID 31 within the nearshore channel.**

**Submerged Aquatic Vegetation Monitoring Plan  
June 2022**

# **Ocean Wind Offshore Wind Farm Submerged Aquatic Vegetation Monitoring Plan**

Prepared for:

**Ocean Wind**

An Ørsted & PSEG project

Ørsted, U.S.

Submitted by:



INSPIRE Environmental

513 Broadway

Newport, RI 02840

June 2022

---

**TABLE OF CONTENTS**

	Page
1.0 Introduction .....	1
2.0 Baseline Submerged Aquatic Vegetation Mapping .....	6
3.0 SAV Monitoring Objectives, Hypotheses, and Schedule .....	14
4.0 Pre-Construction Surveys.....	17
4.1 Pre-Construction SAV Mapping Survey .....	17
4.1.1 Technical Approach .....	17
4.1.2 Survey Design .....	18
4.2 Pre-Construction SAV Characterization Survey .....	24
4.2.1 Technical Approach .....	24
4.2.2 Survey Design .....	24
5.0 Post-Construction Surveys .....	25
5.1 Technical Approach.....	25
5.2 Survey Design .....	25
6.0 Statistical Analyses .....	26
7.0 Data Management, Reporting, and Data Sharing .....	26
8.0 References.....	27

**LIST OF TABLES**

	Page
Table 1. Summary of Planned SAV Surveys at Ocean Wind .....	16



## LIST OF FIGURES

	Page
Figure 1. Overview of the proposed Ocean Wind Project.....	3
Figure 2. Overview of the proposed installation methodologies along the BL England Offshore Export Cable Route and the delineation of SAV coverage from the 2019 aerial survey (Ocean Wind, LLC 2021) .....	4
Figure 3. Overview of the proposed installation methodologies along the Oyster Creek Inshore Export Cable Route and the delineation of SAV coverage from the 2019 aerial survey (Ocean Wind, LLC 2021).....	5
Figure 4. Distribution of historical and recent submerged aquatic vegetation documented along the Oyster Creek Inshore Export Cable Route Corridor on the western side of IBSP (Ocean Wind, LLC 2021).....	7
Figure 5. Distribution of historical and recent submerged aquatic vegetation documented along the Oyster Creek Inshore Export Cable Route Corridor landfall options on the western side of Barnegat Bay (Ocean Wind, LLC 2021). .....	8
Figure 6. Distribution and estimated percent cover of submerged aquatic vegetation documented in 2019 and 2020 on the eastern side of IBSP along the Oyster Creek Inshore Export Cable Route Corridor (Ocean Wind, LLC 2021). Also included are the grain size data from a sediment grab sample collected near the outer edge of the SAV bed and the presence/absence of SAV data collected at the prior channel in 2021. ....	10
Figure 7. Distribution and estimated percent cover of submerged aquatic vegetation documented in 2019 and 2020 at the Bay Parkway Landfall options along the Oyster Creek Inshore Export Cable Route Corridor (Ocean Wind, LLC 2021). Also included are the grain size data collected in 2020. ....	11
Figure 8. Distribution and estimated percent cover of submerged aquatic vegetation documented in 2019 and 2020 at the Lighthouse Drive landfall options along the Oyster Creek Inshore Export Cable Route Corridor (Ocean Wind, LLC 2021). Also included are the grain size data collected in 2020.....	12
Figure 9. Conceptual representation of the pre-construction SAV mapping survey area at the prior channel, a combination of continuous underwater video collection and visual inspection on foot in the shallow landward edge will be used. ....	20

Figure 10.	Conceptual representation of the pre-construction SAV mapping survey area at the Bay Parkway landfall options, a combination of continuous underwater video collection and visual inspection on foot in the shallow landward edge will be used.....	21
Figure 11.	Conceptual representation of the pre-construction SAV mapping survey area at the Lighthouse Drive landfall options, a combination of continuous underwater video collection and visual inspection on foot in the shallow landward edge will be used.....	22

**LIST OF ACRONYMS**

BAG	Before-After-Gradient
BOEM	Bureau of Ocean Energy Management
COP	Construction and Operations Plan
GAM	Generalized Additive Model
GLM	Generalized Linear Model
HDD	Horizontal Directional Drilling
IBSP	Island Beach State Park
INSPIRE	INSPIRE Environmental, LLC
NOAA	National Oceanic and Atmospheric Administration
NJDEP	New Jersey Department of Environmental Protection
OCS	Outer Continental Shelf
OCW01	Ocean Wind Offshore Wind Farm
Project	Ocean Wind Offshore Wind Farm
ROSA	Responsible Offshore Science Alliance
SAV	Submerged aquatic vegetation
SAVMP	Submerged Aquatic Vegetation Monitoring Plan

## 1.0 Introduction

Ocean Wind, LLC proposed to construct and operate the Ocean Wind Offshore Wind Farm (OCW01 or Project) to generate renewable power off the coast of New Jersey. The wind farm portion of the Project will be located in federal waters on the Outer Continental Shelf (OCS) in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0498 (Lease Area). The Lease Area is approximately 75,525 acres and is located approximately 13 nmi southeast of Atlantic City (Figure 1). In addition to the Wind Farm Area, the Offshore Project Area includes two offshore Export Cable Route Corridors and one inshore Export Cable Route Corridor:

- **BL England Offshore Export Cable Route Corridor:** The area between the wind farm and landfall near BL England in which an offshore export cable will be installed (Figures 1 and 2);
- **Oyster Creek Offshore Export Cable Route Corridor:** The area between the wind farm and the Atlantic Ocean side of Island Beach State Park (IBSP) in which up to two offshore export cables will be installed (Figures 1 and 3);
- **Oyster Creek Inshore Export Cable Route Corridor:** The area within Barnegat Bay from the Bay side of IBSP to the landfall near Oyster Creek in which up to two offshore export cables will be installed (Figures 1 and 3);

The proposed BL England Offshore Export Cable Route Corridor and the Oyster Creek Offshore Export Cable Route Corridor do not traverse protected inshore coastal waters (i.e., estuaries, bays). As such, these offshore cable routes will not be in the vicinity of any mapped submerged aquatic vegetation (SAV) or SAV habitat (Ocean Wind, LLC 2021). Note that throughout this document SAV is referring to submerged aquatic vascular plants and not macroalgal species. The focus of this SAV Monitoring Plan (SAVMP) will be on the Oyster Creek Inshore Export Cable Route Corridor that transits through Barnegat Bay, where SAV beds and SAV habitat are documented within the vicinity of the Project.

The proposed Oyster Creek Inshore Export Cable Route Corridor transits from the western side of IBSP to the Oyster Creek landfall on the western side of Barnegat Bay, as shown in Figure 3. The Oyster Creek Inshore Export Cable Route Corridor segment adjacent to IBSP was recently moved north from its original route to avoid direct impacts to continuous SAV beds in this area. This segment now transits through a formerly dredged navigation channel, hereafter referred to as the “prior channel”. The water depth of the prior channel limits light penetration to the seafloor, preventing the growth of SAV within the channel (Lathrop et al. 2017; Ocean Wind, LLC 2021). On the western side of Barnegat Bay, several landfall options are currently being considered. Generally, in this area SAV beds occur in the shallow waters fringing the shoreline (Figure 3).

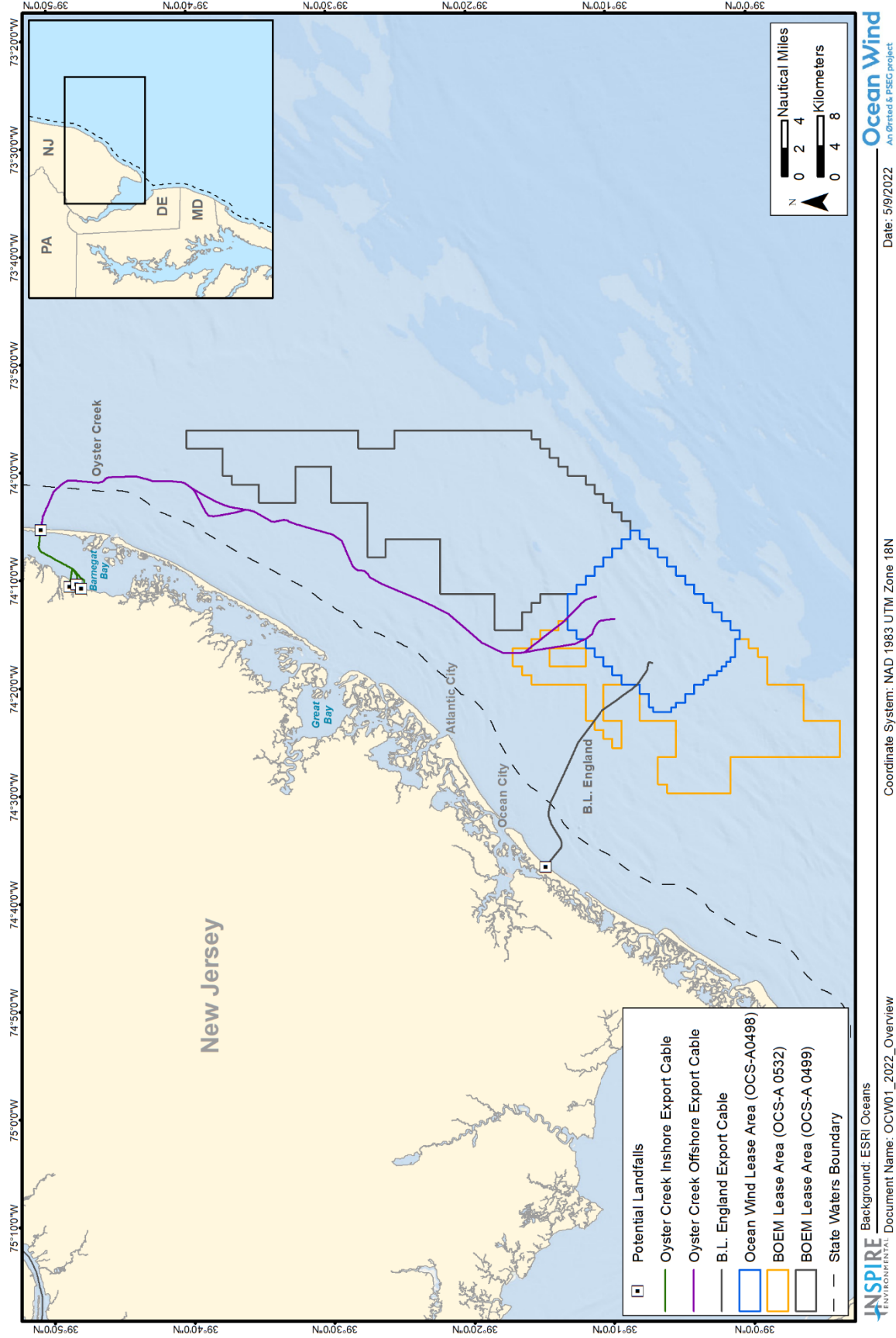
The cable installation methodologies will vary along the proposed Oyster Creek Inshore Export Cable Route Corridor and will be selected for technical feasibility and to avoid and minimize impacts to the environment including SAV beds and habitat. The final installation methods to be used will be determined during the design and engineering phase of the Project and will be based on an assessment of topography, bathymetry, accessibility, tidal conditions, geotechnical situation, environmental constraints, and other parameters. Although cable installation methodologies have not been finalized, for the purposes of developing this SAVMP the following generalized cable installation plans are assumed (as illustrated in Figure 3). Cable installation from IBSP through the prior channel will be accomplished using an open cut (i.e., “trenching”) approach. When sufficient water depth exists, the cables will be installed through jet trenching for the cable segment that transits through Barnegat Bay until it reaches the western side of the Bay. Immediately prior to landfall on the western side of the Bay and outside the SAV habitat, cable installation will occur via Horizontal Directional Drilling (HDD) (“trenchless” methods) (Figure 3).

This SAVMP was developed in close coordination and discussions with New Jersey Department of Environmental Protection (NJDEP) and Dr. Elizabeth Lacey of Stockton University. This SAVMP was developed through an iterative process, and specific survey protocols and methodologies will be refined and updated based on feedback received from stakeholder groups, including state agencies (NJDEP) and federal agencies (National Oceanographic and Atmospheric Administration [NOAA] and BOEM).

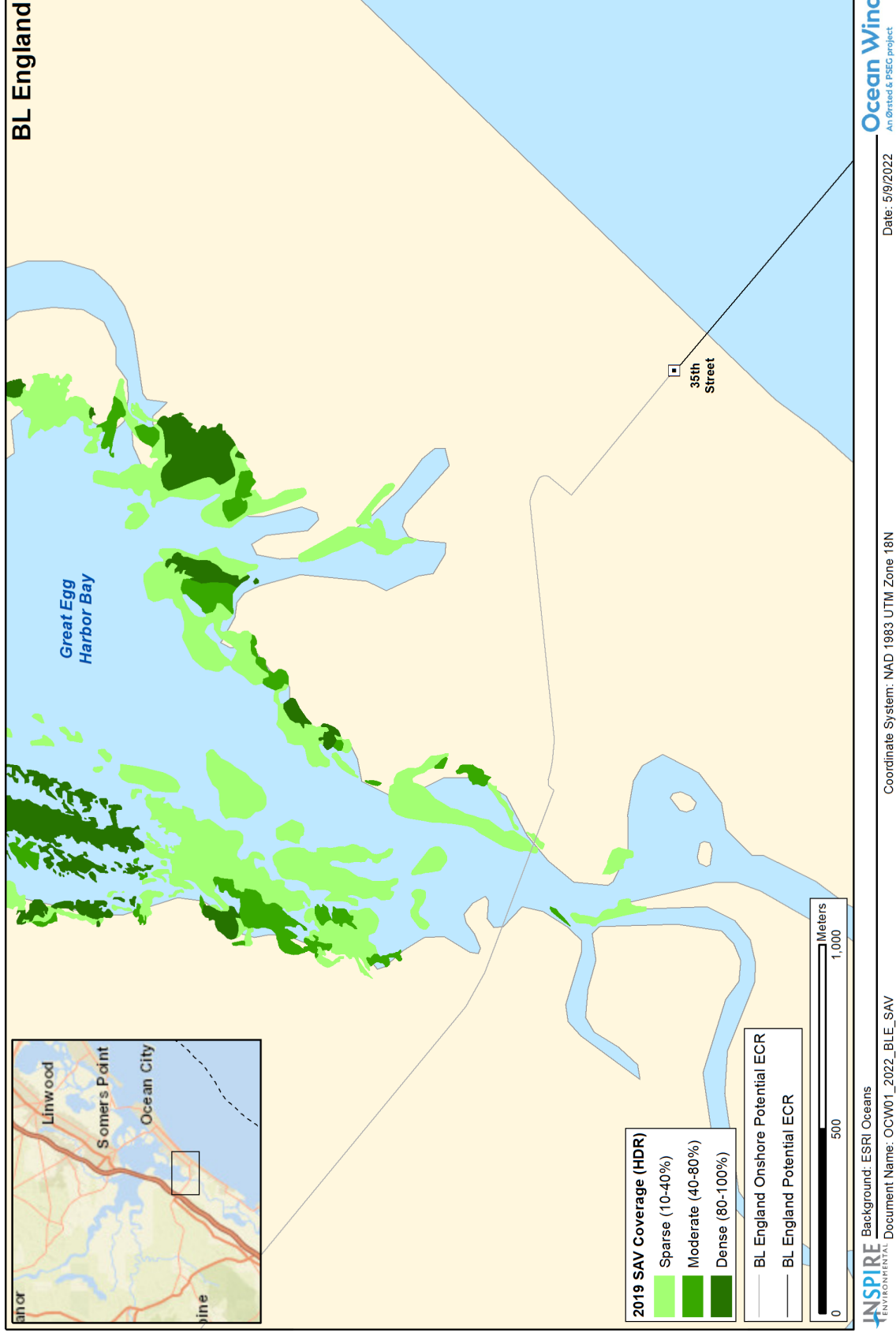
This SAVMP begins with a brief overview of the SAV beds located within the vicinity of the Project as informed by previously conducted baseline surveys. The plan then outlines specific objectives of the proposed pre-construction and post-construction surveys and describes the general approaches that will be used to meet these objectives. Generally, this SAVMP is designed to:

1. document baseline delineations and conditions of SAV beds,
2. assess potential impacts to these SAV beds as a result of the construction and operations of the inshore export cable(s) associated with the Project, and
3. track recovery of these SAV beds over time to inform potential mitigation strategies, if necessary.

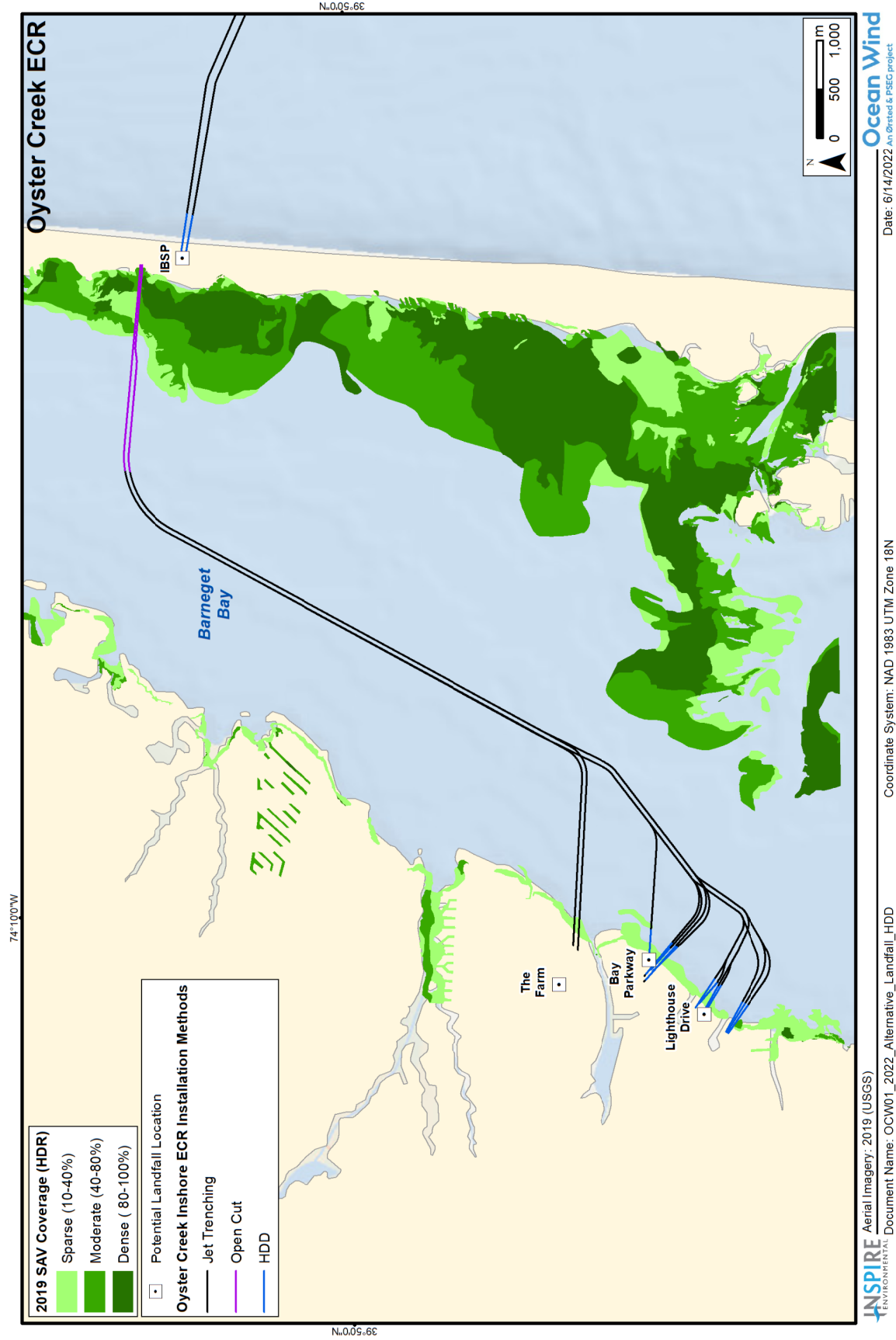




**Figure 1. Overview of the proposed Ocean Wind Project**



**Figure 2.** Overview of the proposed installation methodologies along the BL England Offshore Export Cable Route and the delineation of SAV coverage from the 2019 aerial survey (Ocean Wind, LLC 2021)

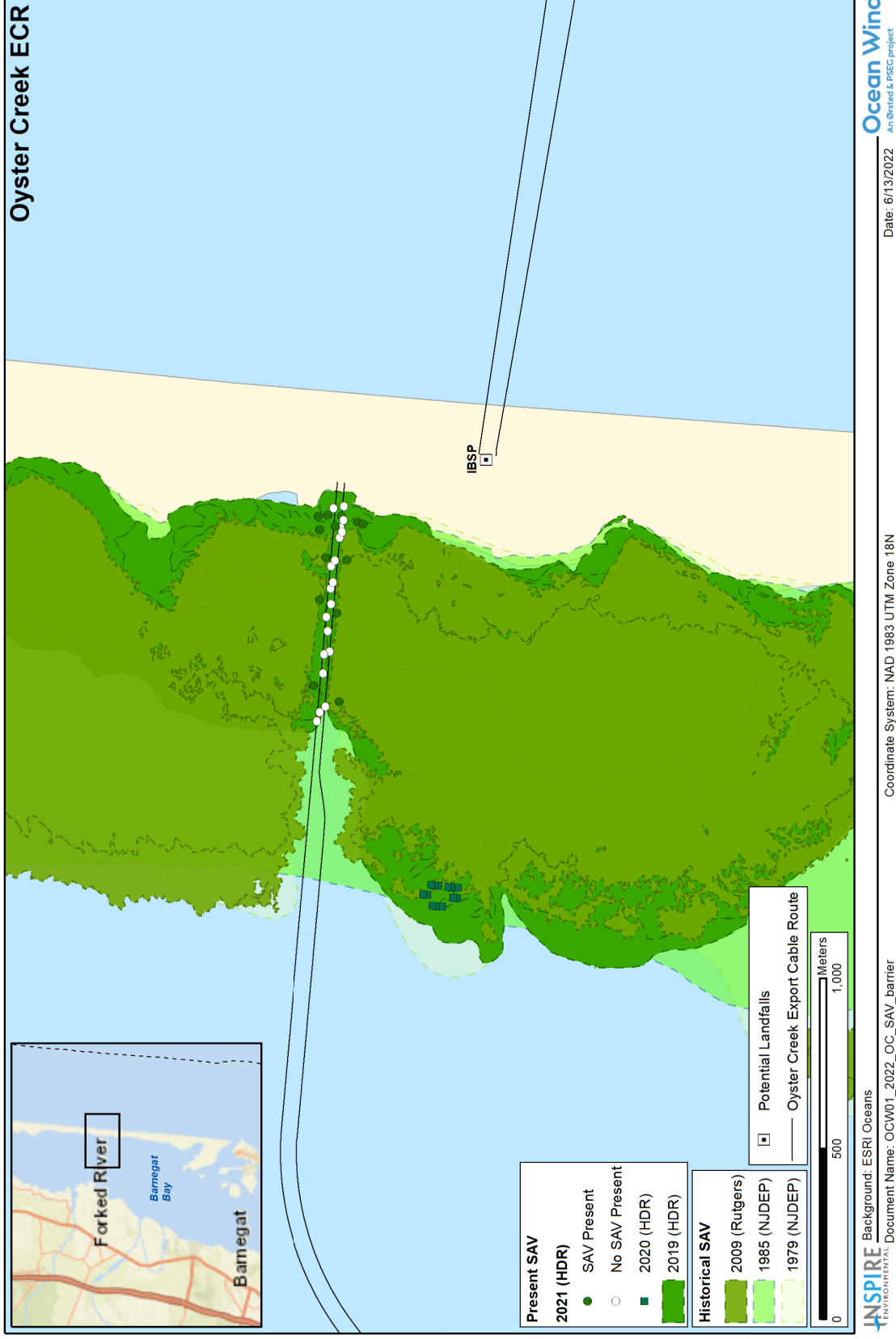


**Figure 3.** Overview of the proposed installation methodologies along the Oyster Creek Inshore Export Cable Route and the delineation of SAV coverage from the 2019 aerial survey (Ocean Wind, LLC 2021). Note that the open cut area cable method area is estimated based on water depth, occurring out to approximately the 8 ft contour line.

## 2.0 Baseline Submerged Aquatic Vegetation Mapping

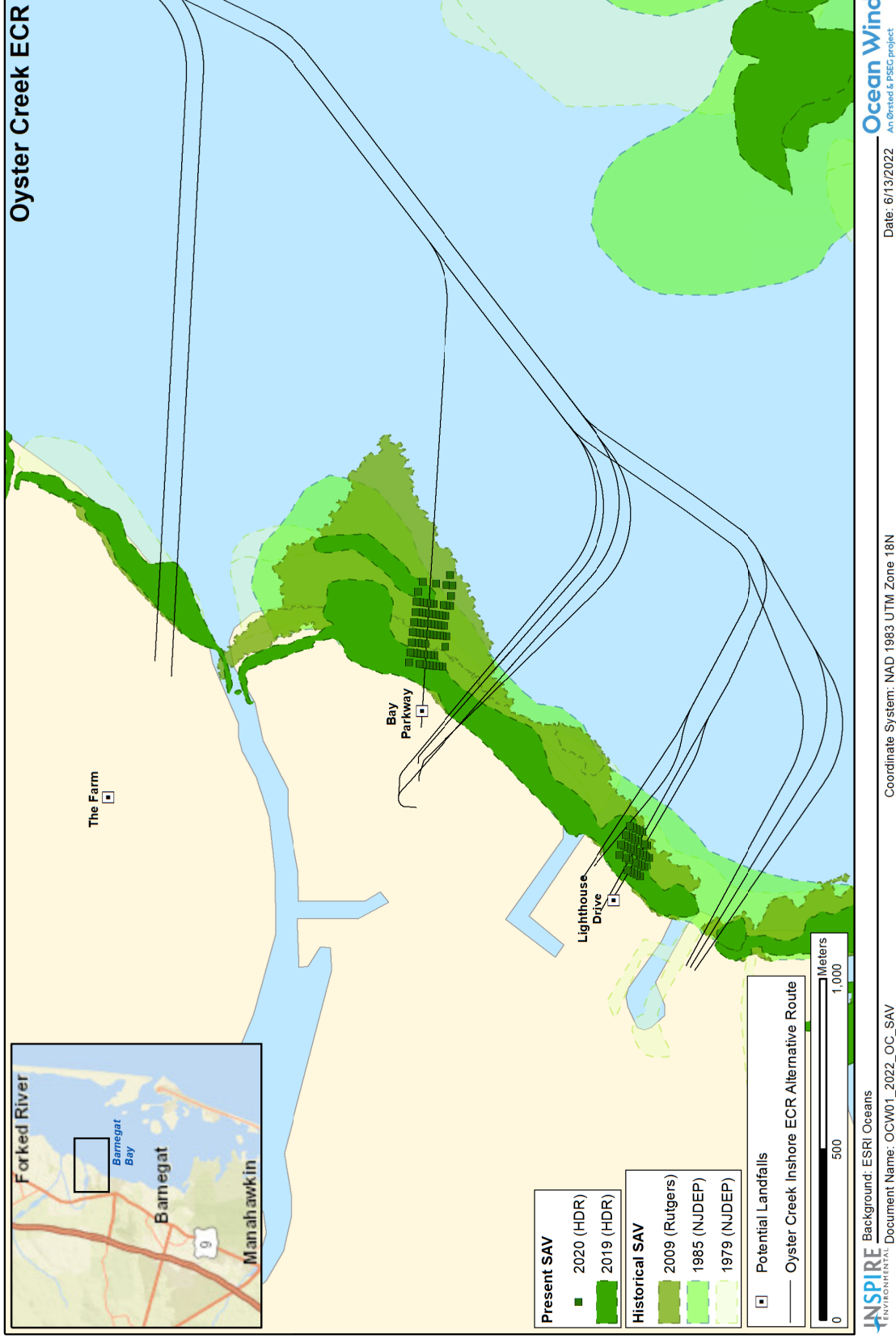
Baseline SAV data were collected near the BL England Offshore Export Cable Route Corridor and the Oyster Creek Inshore Export Cable Route Corridor during several surveys conducted between 2019 and 2021. These surveys used aerial imagery and underwater drop camera imagery to delineate the extent and percent cover of SAV beds in the vicinity of the Project. These baseline data, were compiled, synthesized, and interpreted together with historical SAV datasets in the reports *Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment to Support Essential Fish Habitat Consultation* (INSPIRE 2021) and *Ocean Wind Offshore Wind Farm Biological Survey Results* (Ocean Wind, LLC 2021; Figures 4 and 5). Provided here is a summary of the findings of these project-specific SAV surveys and the inshore benthic habitat mapping effort. Further details on the methods and results are described in Appendix E of the Ocean Wind Construction and Operations Plan (COP) (Ocean Wind, LLC 2021).

The recent SAV surveys used a combination of aerial photography (2019), systematic collection of underwater drop camera imagery (2020), and targeted underwater imagery collection (presence/absence) (2021). The aerial imagery survey documented SAV habitat within the vicinity of the Oyster Creek Inshore Export Cable Route Corridor in shallow waters fringing the coast, while no SAV beds were observed along the proposed BL England Export Cable Route Corridor (Figures 4 and 5; Appendix E of Ocean Wind, LLC 2021). Subsequent underwater imagery surveying (2020 and 2021) focused on the Oyster Creek Inshore Export Cable Route Corridor, specifically in the shallow waters to the west of IBSP and on the western side of Barnegat Bay where the cable will make landfall (Figures 4 and 5). The in-water imagery documented *Zostera marina* as the predominant SAV species throughout the surveyed area.



**Figure 4. Distribution of historical and recent submerged aquatic vegetation documented along the Oyster Creek Inshore Export Cable Route Corridor on the western side of IBSP (Ocean Wind, LLC 2021).**





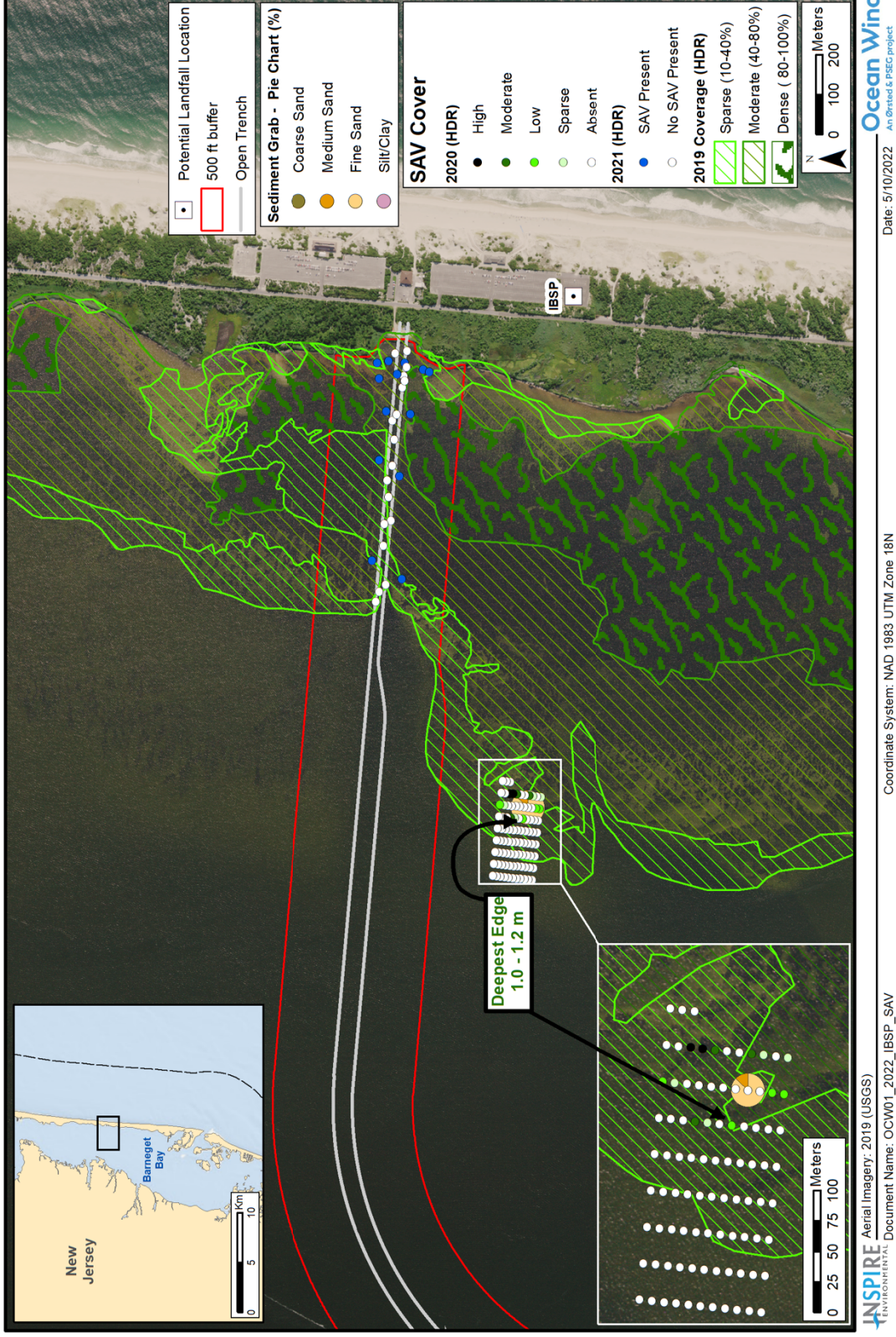
**Figure 5. Distribution of historical and recent submerged aquatic vegetation documented along the Oyster Creek Inshore Export Cable Route Corridor landfall options on the western side of Barnegat Bay (Ocean Wind, LLC 2021).**

A summary of the results of the 2019, 2020, and 2021 baseline SAV surveys is presented in Figures 6, 7, and 8. These figures provide SAV information in relation to the Project design as recommended by Colarusso and Verkade, 2016. This includes the SAV bed delineations derived from 2019 aerial imagery, the 2020 drop camera SAV percent cover data, the water depth of the deepest edge of each SAV bed surveyed (2020), and the sediment grain size distribution within each SAV bed (2020). The Project design information presented on Figures 6, 7, and 8 includes the proposed cable route(s) and installation methodologies, the area of potential project influence on SAV (i.e., 500 ft from the proposed cable route(s)), and the distance between the nearest SAV and the possible HDD exit locations for each alternate cable route.

The planned Oyster Creek Inshore Export Cable Route Corridor traverses a man-made channel on the western side of IBSP (prior channel), which is positioned perpendicular to the shore and measures approximately 50 m wide and 700 m long. The water depths within this prior channel limit SAV growth and no SAV was documented within this channel during the project specific baseline drop camera survey (2021). However, SAV (*Z. marina*) was observed along the shallower flanks of prior channel during the 2021 SAV survey and other studies (Figures 4 and 6) (Ocean Wind, LLC 2021; e.g., Lathrop et al. 2017). The deepest edge of the SAV bed in this area was documented in 2020 to be located in water depths of about 1.0 to 1.2 m (3 to 4 ft) (Figure 6).

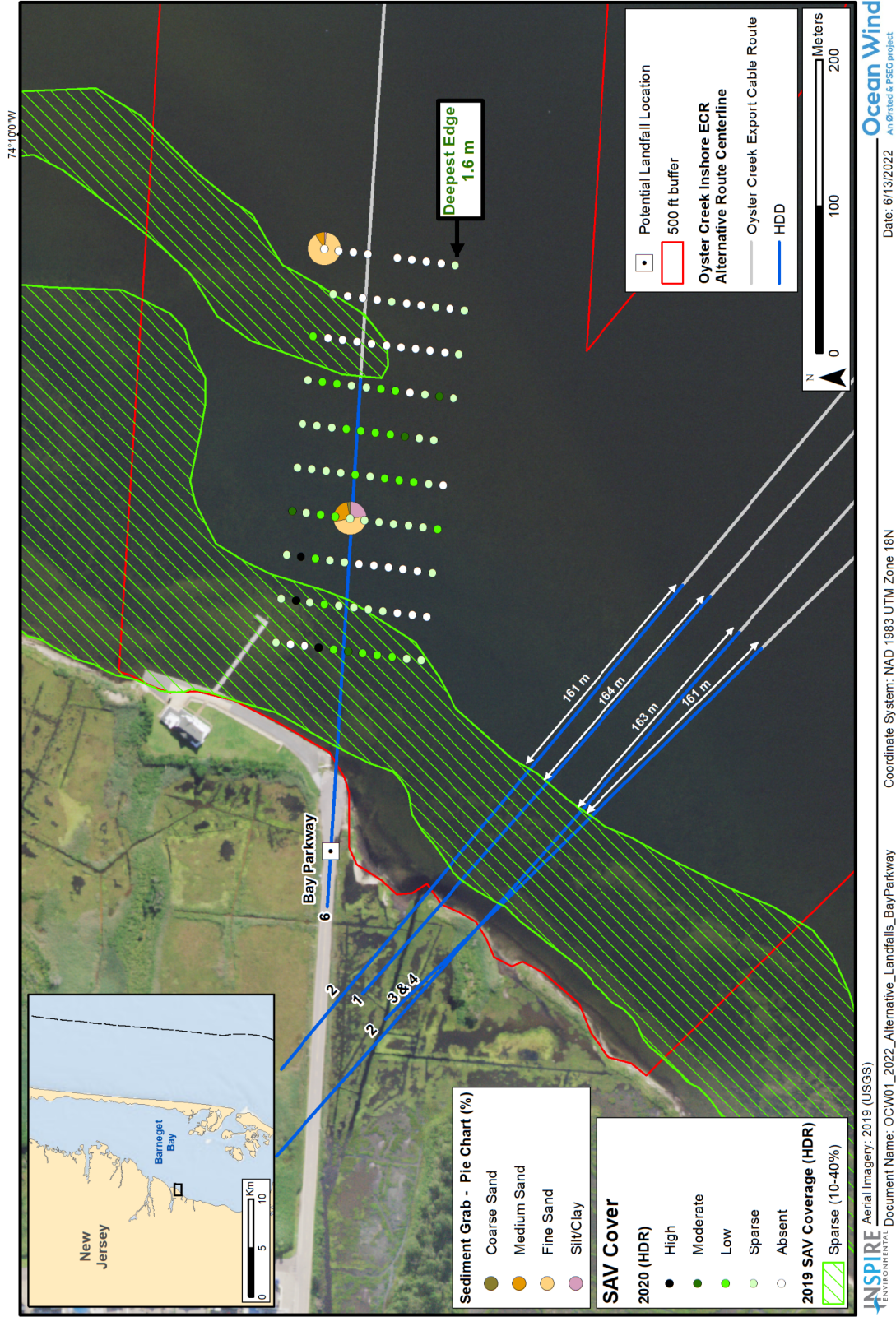
Patches of historical and/or extant SAV occur along the shoreline of the western bank of Barnegat Bay at the Oyster Creek landfall options (Figures 5, 7, 8 and 9). The drop camera in-water survey in 2020 found the deepest part of the SAV bed near the Bay Parkway Landing option in about 1.6 m (5.2 ft) water depth (Figure 7). At the Lighthouse Drive landing option, the water depth of the deepest edge of the SAV bed ranged from 1.2 to 1.4 m (3.9 to 4.7 ft) (Figure 8). At the Holtec landing option, SAV were observed at one location during the 2020 survey at approximately 1 m (3.2 ft) (Figure 9). Although these data from 2020 are useful, the landfall options in this area have changed since this survey was conducted, so additional pre-construction in-water SAV surveying will be conducted to produce more resolved mapping of the SAV within the project area as described in Section 4.1.

In summary, historical and/or extant SAV made up ~14% of the habitat area mapped along the Oyster Creek Inshore Export Cable Route Corridor, which equated to a total of about 172 acres of SAV habitat (Figure 3; INSPIRE 2021). Of these 172 acres of SAV habitat, 121 acres were documented to have SAV in 2019 and/or 2020; the remaining 51 acres were documented to have SAV present prior to 2019 (historical SAV presence) (Figures 3, 4, and 5; INSPIRE 2021).



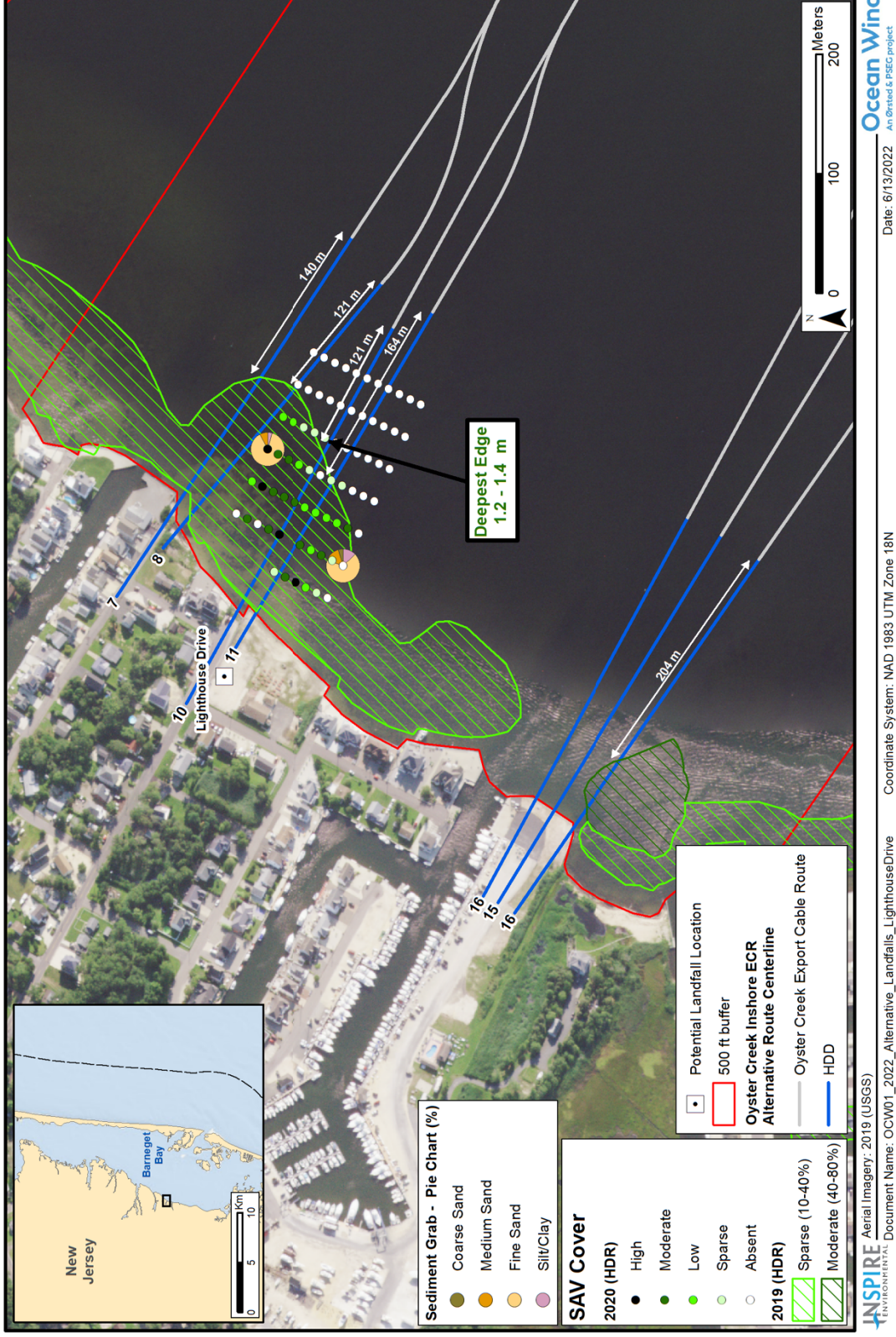
**Figure 6.** Distribution and estimated percent cover of submerged aquatic vegetation documented in 2019 and 2020 on the eastern side of IBSP along the Oyster Creek Inshore Export Cable Route Corridor (Ocean Wind, LLC 2021). Also included are the grain size data from a sediment grab sample collected near the outer edge of the SAV bed and the presence/absence of SAV data collected at the prior channel in 2021.





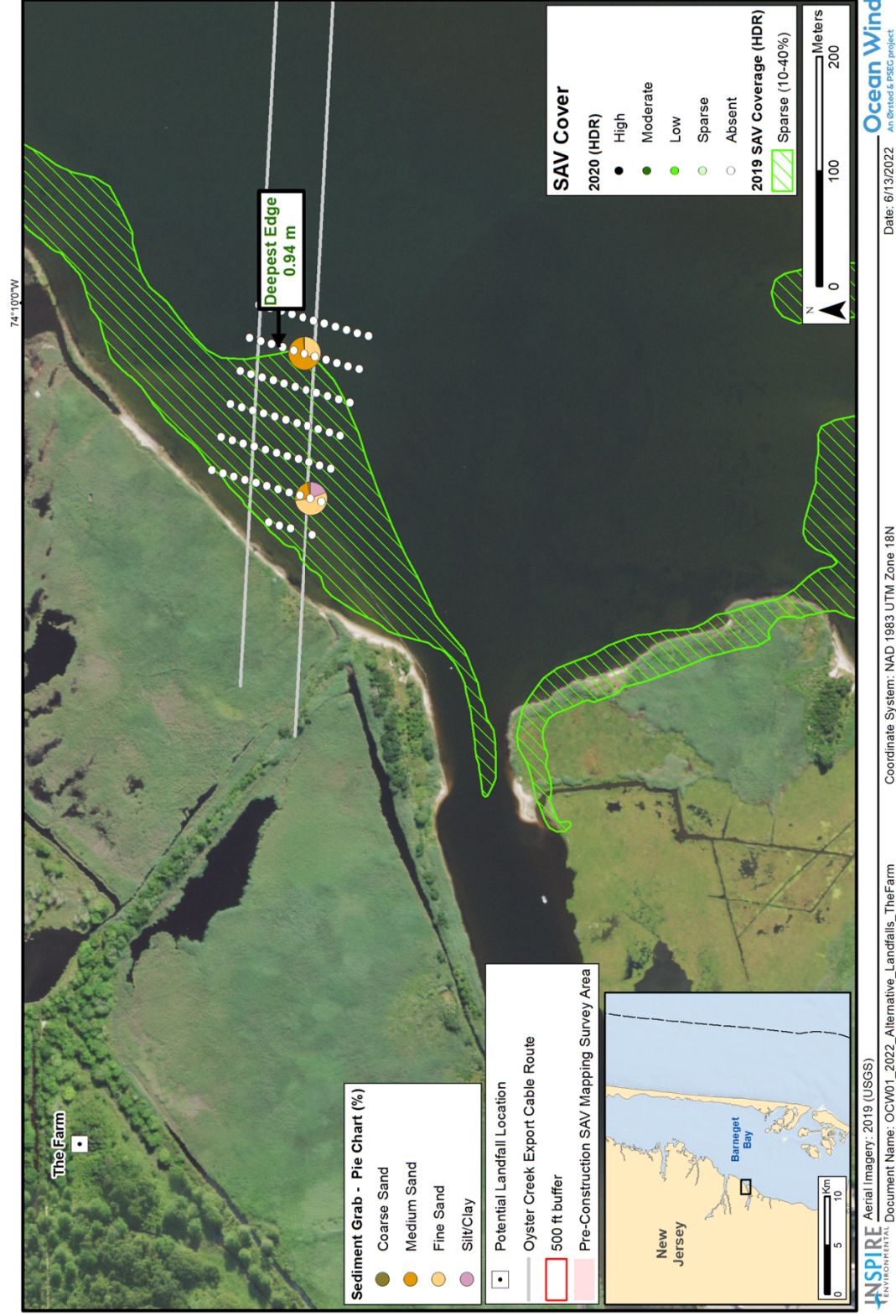
**Figure 7.** Distribution and estimated percent cover of submerged aquatic vegetation documented in 2019 and 2020 at the Bay Parkway Landfall options along the Oyster Creek Inshore Export Cable Route Corridor (Ocean Wind, LLC 2021). Also included are the grain size data collected in 2020.





**Figure 8.** Distribution and estimated percent cover of submerged aquatic vegetation documented in 2019 and 2020 at the Lighthouse Drive landfall options along the Oyster Creek Inshore Export Cable Route Corridor (Ocean Wind, LLC 2021). Also included are the grain size data collected in 2020.





**Figure 9.** Distribution and estimated percent cover of submerged aquatic vegetation documented in 2019 and 2020 at the Holtec landfall options (also known as the Farm) along the Oyster Creek Inshore Export Cable Route Corridor (Ocean Wind, LLC 2021). Also included are the grain size data collected in 2020.

### **3.0 SAV Monitoring Objectives, Hypotheses, and Schedule**

This SAV monitoring plan includes pre-construction and post-construction surveys aimed at further characterizing baseline SAV conditions and any potential impacts to SAV beds associated with the cable installation activities. In general, the purpose of the pre-construction SAV surveys is to provide estimates of total project acreage, SAV bed acreage, and total SAV habitat acreage, as well as species identification and measurements of SAV percent spatial cover and shoot density. The objective of the post-construction monitoring is to determine the impacts, if any, from the cable installation on a spatial scale and, if impacts are detected, to monitor the recovery of SAV following construction over time to determine if recovery occurs after three years.

Direct impacts to SAV will be avoided and minimized to the greatest extent possible during cable installation through several means related to cable installation methodology and cable routing. Cable installation will use HDD near the vicinity of SAV beds at the landfall area on the western side of Barnegat Bay; this will avoid any direct physical disturbance to SAV beds and SAV habitat in this area (Figures 3, 7, and 8). On the eastern side of Barnegat Bay, adjacent to IBSP, cable installation will occur using open trench methodology out to between the six and eight foot water depth contour lines where installation will change to jet trenching (Figures 3 and 6). However, direct impacts to SAV will be avoided because the cable in this area will be routed through a relatively deep channel (prior channel) that is not inhabited by SAV (Figures 4 and 6). These installation methods and the proposed cable routing avoid direct impacts to SAV (direct physical disturbance). However, there is a potential that SAV will be directly impacted by physical disturbance from anchoring and/or boat traffic (e.g., propeller scarring). The results of the initial pre-construction survey (see Section 4.1) will be used to identify designated areas away from SAV habitat for anchoring and vessel staging to avoid and minimize any direct impacts associated with these construction vessel activities.

During cable installation activities, SAV may be indirectly impacted as a result of sediment resuspension leading to short-lived increased water column turbidity and subsequent sedimentation. SAV is sensitive to both elevated water column turbidity (which decreases light availability to the seafloor) and excess sedimentation. Any construction activity that may result in sediment resuspension and deposition that occurs within 500 ft of any mapped SAV will be conducted during a time period when SAV is dormant. In addition, during construction the short-lived elevated water column turbidity is not expected to persist for extended periods of time and is not likely to influence SAV productivity or health. However, excess sedimentation can result in decreased SAV shoot density during the following growing season (as reviewed in Munkes et al. 2015). The distance from the cable installation activity (including HDD exit pit excavation) at which indirect effects from sedimentation on SAV may occur is expected to be a maximum of 500 ft, given this is the distance which activates a time of year restriction on construction activities (NJDEP 2015).

Given the proposed cable installation methods and cable routing discussed above, the following hypotheses were generated to frame this monitoring plan:

1. Indirect impacts (sedimentation) associated with cable installation activities through prior channel on the eastern side of Barnegat Bay may result in a decrease in SAV shoot density along the fringes of the prior channel but is expected to return to pre-disturbance conditions within three years (e.g., Erftemeijer and Lewis 2006; Munkes et al. 2015).
2. No direct impacts (physical disturbance) to SAV are expected to occur from cable installation activities through prior channel on the eastern side of Barnegat Bay. However, if direct impacts from vessel activity during construction (e.g., anchor or propeller scarring) do occur, recovery will likely take longer than three years (e.g., Lathrop et al. 2017).
3. Cable installation activities (planned HDD) at the landfall on the western side of Barnegat Bay are not expected to have direct or indirect impacts to nearby SAV habitat.

All SAV monitoring surveys will be conducted within the seasonal growing window, late April-October. A summary of the specific survey objectives, general approach, and survey(s) schedule is provided in Table 1. Details are provided in the following sections of this SAV monitoring plan.

**Table 1. Summary of Planned SAV Surveys at Ocean Wind**

	<b>Pre-construction SAV Mapping</b>	<b>Pre-construction SAV Characterization</b>	<b>Post-construction SAV Characterization</b>
<b>Section of this Document</b>	Section 4.1	Section 4.2	Section 5
<b>Objective(s)</b>	To refine the 2019 SAV mapping within the areas of potential influence of the Project	To characterize the condition of SAV within the areas of potential influence of the Project	To characterize the condition of SAV within the areas of potential influence of the Project to identify any impacts associated with construction spatially and document recovery of these areas over time
<b>General Approach</b>	Underwater imagery to estimate percent cover spatially	In-water snorkeler/diver-based (or other appropriate advanced imaging techniques) SAV characterization (shoot density and other parameters)	In-water snorkeler/diver-based (or other appropriate advanced imaging techniques) SAV characterization (shoot density and other parameters)
<b>Outcome</b>	<ul style="list-style-type: none"> <li>Baseline data on the extent and distribution of SAV and SAV habitat</li> <li>Inform Project design and avoidance strategies (cable routing, designated moorings/anchoring locations)</li> <li>Evaluate potential impacts from construction</li> </ul>	<ul style="list-style-type: none"> <li>Baseline data on SAV shoot density (and potentially other quantitative parameters indicative and important to SAV health)</li> <li>Evaluate potential impacts from construction</li> </ul>	<ul style="list-style-type: none"> <li>Document extent of any indirect and/or direct impacts</li> <li>Monitor recovery over time</li> <li>Assess needs and strategy for potential mitigation</li> </ul>
<b>Survey(s) schedule</b>	<u>April-Oct</u> 2022	<u>April-Oct</u> <6 months prior to the start of construction (Y0-pre)	<u>April-Oct</u> < 6 months post construction (Y0-post) 1 year post construction (Y1) 2 years post construction (Y2) 3 years post construction (Y3)



## **4.0 Pre-Construction Surveys**

Pre-construction SAV baseline surveys were completed in 2019, 2020, and 2021, as described in Section 2.0. Additional pre-construction SAV surveys will be conducted to refine and update the results from these previous baseline surveys as described below.

The overarching goal of these pre-construction SAV surveys is to map and characterize the SAV within the areas of potential influence of the Project. The pre-construction monitoring will evaluate potential impacts to the SAV resource from cable installation activities. This will be used to identify possible means to minimize impacts (e.g., adjusting the cable route, establishing designated anchoring locations outside of SAV beds), and to refine post-construction monitoring protocols for documenting impacts and informing potential mitigation plans.

Specifically, this pre-construction SAV monitoring will include two surveys (Table 1). The first survey will provide refined estimates of SAV bed and SAV habitat acreage and delineation within the Project area of influence and the percent cover and species composition of the observed SAV. The second survey will measure specific SAV characteristics to document SAV health and condition, such as percent cover and shoot density. Both surveys will occur during SAV growing season (late April-October).

### **4.1 Pre-Construction SAV Mapping Survey**

The historical aerial imagery and baseline data collected in 2019, 2020, and 2021, that were summarized together with historical SAV data in the habitat mapping report (INSPIRE 2021) and described in Section 2.0 above, will be used to inform the additional pre-construction SAV mapping survey. Using the results and interpretation of the 2019 aerial imagery that identified the SAV within the context of the Project, an in-water survey will be designed to further delineate and map the SAV habitat acreage within 500 ft of all the possible landfall areas of the Oyster Creek Inshore Export Cable Route. This survey work will define and map the shallowest and deepest points of SAV habitat within the influence of the Project using a combination of towed-video and visual observations by a person wading in the water. SAV habitat, defined as all SAV beds, patches of SAV, and bare interpatch areas between SAV beds, will be mapped within the area of Project influence. Because the Project design envelope is not finalized, the area of Project influence will include all possible landing options on the western side of Barnegat Bay. At this stage, a 500-ft buffer from every cable route option will be used as the area of potential influence from the Project (see 'Pre-construction SAV Mapping Survey Area' denoted in Figures 10, 11, 12, and 13).

#### **4.1.1 Technical Approach**

The pre-construction SAV mapping survey will follow a combination of Method 1 (visual observations from boat or on foot) and Method 3 (underwater imagery) of the Tier-1 Survey



Methodology in *Submerged Aquatic Vegetation Survey Guidance for the New England Region* protocol (Colarusso and Verkade 2016). The location and water depth of the perimeters of the SAV bed within the area of potential influence of the Project will be determined using a combination of drop camera, towed video imagery collection, and visual inspection. Data will be collected during the SAV growing season (late April-October) on a small vessel capable of transiting through waters as shallow as 2 ft. Generally, continuous towed video will be the primary method for data collection (Method 3 in Colarusso and Verkade 2016). However, in very shallow waters, the landward edges of the SAV beds will need to be delineated on-foot using visual inspection and a handheld GPS (Method 1 in Colarusso and Verkade 2016).

In all survey areas during the towed video collection the water depths will be recorded along the transects. Post-collection video analysis will include an estimate of percent cover of SAV across the transects (barren, sparse [1-10% cover], low [11-25% cover], moderate [26-50% cover], and high [>50% cover]). During visual inspection by a person wading in the shallowest parts of the SAV bed, water depth will be measured periodically and at the estimated shallowest SAV edge. Time of day will be recorded throughout the surveying event to account for tidal fluctuation.

#### **4.1.2 Survey Design**

On the western side of IBSP, the edges of the SAV beds that fringe the prior channel where the cable will be installed and along the deepest (bay-ward) and shallowest (landward) boundaries of the SAV bed will be delineated (Figure 10). An underwater video camera will be towed along transects that traverse the prior channel perpendicularly and extend to either side of the channel out to 500 ft from the cable centerlines. Each transect will be approximately 1000 ft in length (500 ft on either side of the cable route centerline) and spaced approximately 75 to 100 ft apart (within the 'Pre-Construction SAV Mapping Survey Area' denoted in Figure 10). Due to the relatively homogeneous nature of the SAV bed in this area based on the 2019 aerial imagery data, the transect spacing will be wide because variability in SAV percent cover is expected to be low for most of the area. In the shallow portions of the survey area the focus will be on documenting the edges of the SAV bed along the prior channel and along the shoreline where data will likely be collected on foot.

On the western side of Barnegat Bay, the SAV beds at each of the current landfall options will be mapped within the context of the planned location of the HDD exit pit and HDD cable route options (Figures 11, 12, and 13). For these landfall areas the underwater video transects will be set perpendicular to shore to capture a clear delineation of the deep and shallow edges of the beds. Similar to the IBSP SAV bed mapping, the area of influence of the Project will be conservatively assumed to be 500 ft on either side of the potential cable route and will extend to the proposed HDD exit pit where the marine cable will transition to an HDD cable (Figures 11, 12, and 13). Again, the focus of the survey will be to delineate the edges of the SAV beds within the area of influence of the Project, measuring the shallowest and deepest water depths where SAV are found and estimating percent cover of SAV. The landward edges of these SAV beds will likely need to be documented visually on foot using a handheld GPS.

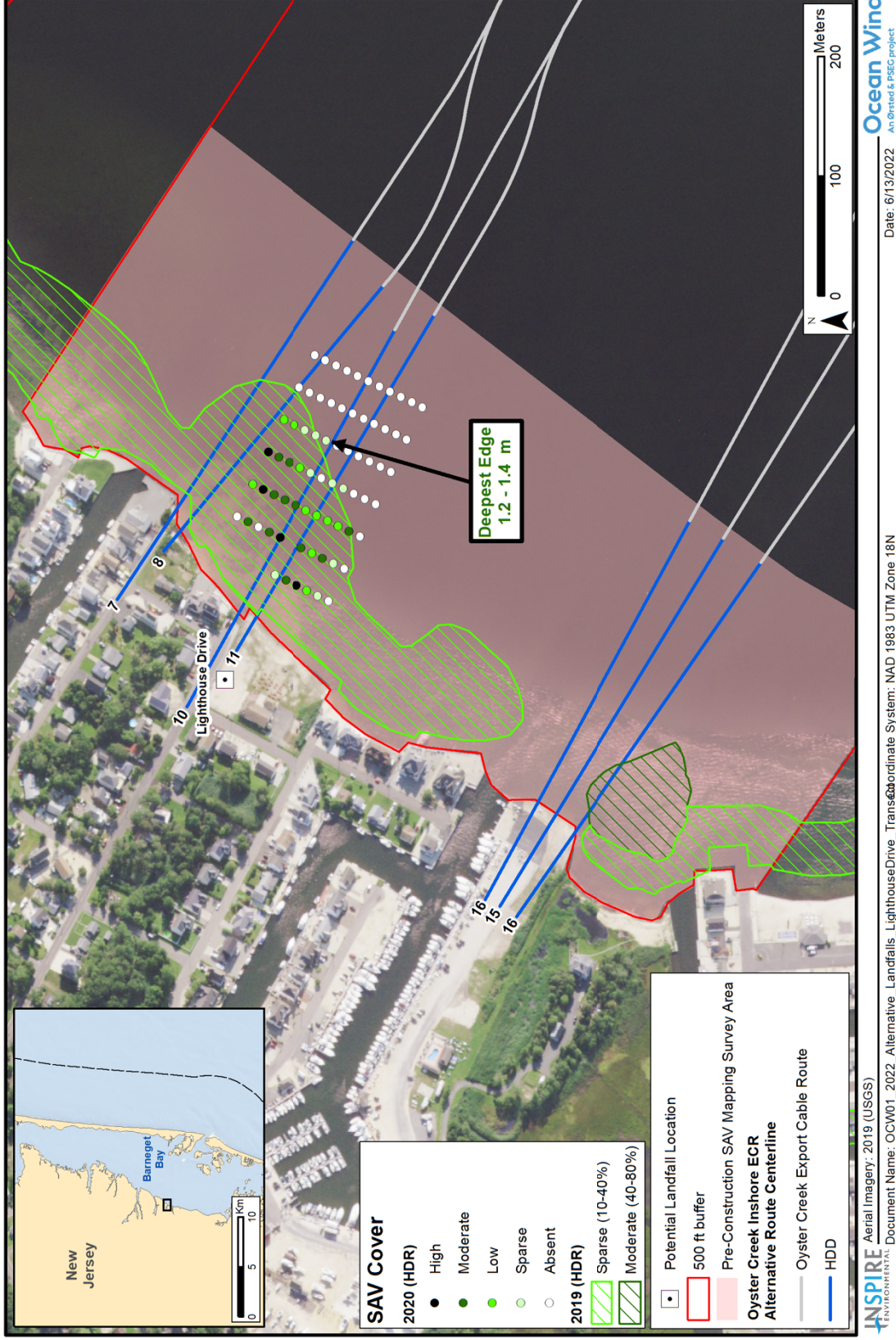
The results of this mapping and preliminary characterization (percent cover) exercise within the Project areas of influence will be used to restrict and manage the movement and anchoring of vessels in the area during cable installation. The data will also be used to identify designated anchorage areas or temporary mooring locations to avoid and minimize impacts to SAV from vessel anchoring. The SAV delineations and percent cover measurements from this survey will also inform the decision about which landfall option to pursue on the western side of Barnegat Bay, in addition to other relevant factors that will influence the cable routing.





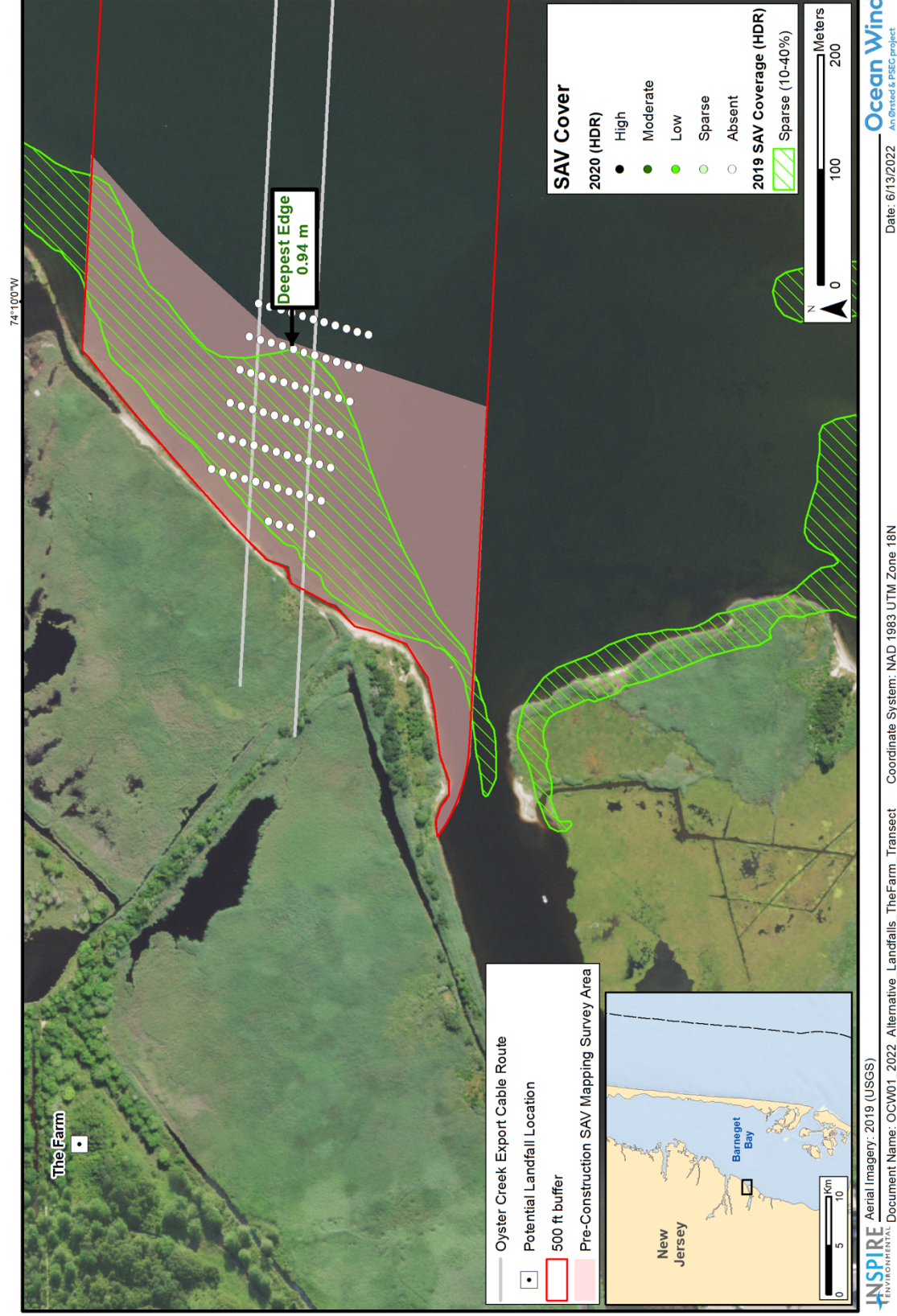






**Figure 12.** Conceptual representation of the pre-construction SAV mapping survey area at the Lighthouse Drive landfall options, a combination of continuous underwater video collection and visual inspection on foot in the shallow landward edge will be used.





**Figure 13.** Conceptual representation of the pre-construction SAV mapping survey area at the Holtec landfill options (also known as the Farm), a combination of continuous underwater video collection and visual inspection on foot in the shallow landward edge will be used.

## **4.2 Pre-Construction SAV Characterization Survey**

An additional pre-construction SAV survey will be conducted in order to document baseline SAV health and condition within the mapped SAV habitat associated with the area of influence of the Project on both sides of Barnegat Bay. This survey will use a systematic transect design aimed at characterizing the SAV across the meadows by measuring quantitative parameters indicative and important for SAV health (e.g., percent cover, shoot density, and/or biomass). The technical details of this pre-construction SAV characterization survey are being developed and will be refined following the results of the initial pre-construction SAV mapping survey described in Section 4.1 and as the Project design is further developed and finalized. Here, the general approach and timeline for this survey are described.

### **4.2.1 Technical Approach**

Shoot density measurements will be collected by divers and/or snorkelers at each pre-determined location along each pre-determined transect. At each station a 1-m<sup>2</sup> quadrat demarcated with a 25-cm by 25-cm grid will be placed on the seafloor. A random number generator will be used to select three random grid cells of the 16 cells in the quadrat. Within each of the three random grid cells a complete shoot count will be conducted. This will be repeated at each station along each transect.

Additional quantitative parameters that are indicative and important for SAV health such as above and below ground biomass may also be collected. These additional parameters will be determined following consultation with NJDEP and local SAV expert, Dr. Elizabeth Lacey.

### **4.2.2 Survey Design**

This pre-construction SAV characterization survey will be completed within six months prior to the commencement of cable installation activities, and within the SAV growing season (late-April to October) ("Y0-pre") (Table 1). Shoot density will be measured at discrete locations along pre-determined transects within the mapped SAV beds. In general, transects will be positioned perpendicular to the open trench cable route (i.e., within prior channel) and perpendicular to the HDD exit location (i.e., at the landfall on the western side of Barnegat Bay). Stations will be placed along these transects. The sampling resolution (density of stations) will be dependent on the results of the prior pre-construction SAV mapping survey described above. In SAV beds that are generally homogeneous in terms of percent cover, fewer stations will be required to characterize the SAV and estimate average shoot density across the SAV bed. However, in SAV beds that were observed to be patchier during the mapping survey (Section 4.1), a higher density of stations will be sampled to fully document this natural heterogeneity.

As discussed below in Section 5.0, this survey design will be repeated following construction completion; this will allow for a statistical analysis of change in SAV condition with distance from construction activity (Before-After-Gradient [BAG] design). Additionally, control sites will be sampled using the same approach in order to document any large-scale natural temporal

variability in SAV condition within the greater Barnegat Bay area. Appropriate control sites will be identified at a later date in consultation with Dr. Elizabeth Lacey and NJDEP. Control sites will be selected that have been documented through the Barnegat Bay SAV Monitoring Program to be relatively stable over time (Lacey, 2021).

## **5.0 Post-Construction Surveys**

The objective of the post-construction monitoring is to track any indirect and/or direct impacts to SAV resulting from cable installation activities. Specifically, any changes to SAV shoot density within the SAV beds as well as potential changes to the SAV percent cover in discrete areas (potential direct impacts from vessel activity) will be evaluated. The post-construction surveys will characterize the SAV condition within the areas of potential influence of the Project using the same approach and survey design as the pre-construction SAV characterization survey (Section 4.2). These data will be used to identify and assess any indirect impacts associated with cable installation activities (i.e., resuspension and sedimentation). Any potential direct impacts from unplanned vessel activity will be assessed using drone aerial imagery, which will be used to identify any distinguishable scars resulting from anchoring or propeller wash (e.g., Lathrop et al. 2017). An HDD inadvertent release mitigation plan will be developed prior to construction and separate from this monitoring plan.

### **5.1 Technical Approach**

The post-construction monitoring approach will mirror that of the pre-construction SAV characterization survey described in Section 4.2.

### **5.2 Survey Design**

The SAV condition monitoring will be based on a BAG design that will involve sampling before and after cable installation at locations with increasing distance from the cable. The monitoring will include collecting SAV shoot density (and potentially other quantitative SAV parameters indicative and important to SAV health) during the SAV growing season prior to any construction activity beginning (Y0-pre; Section 4.2), immediately following construction sampling within the SAV growing season (Y0-post), and annually for the next three years following construction (Y1, Y2, Y3) during the same month of the year (SAV growing season) (Table 1).

As described in Section 4.2, SAV data will be collected systematically along predetermined transects that are positioned perpendicular to the construction activities that are likely to result in sediment resuspension (i.e., open trench cable installation along the prior channel, and HDD exit pit excavation at the western landfall). Along each transect, a diver or snorkeler will collect shoot density at discrete stations previously determined based on measured variability in SAV percent cover within each area (derived from the pre-construction SAV mapping survey described in Section 4.1). As described above, control sites will also be sampled using the same approach in order to document any large-scale natural temporal variability in SAV condition within the greater Barnegat Bay area. Appropriate control sites will be identified at a later date in



consultation with Dr. Elizabeth Lacey and NJDEP. Control sites will be selected that have been documented through the Barnegat Bay SAV Monitoring Program to be relatively stable over time (Lacey, 2022).

## **6.0 Statistical Analyses**

The overall design of this monitoring plan is a BAG design and will be analyzed accordingly. Quantitative SAV condition parameters (e.g., shoot density) will be analyzed using parametric or non-parametric regression (e.g., generalized modeling such as Generalized Linear Model [GLM] or Generalized Additive Model [GAM]; or regression trees) will be applied if the data prove to be sufficient and appropriate for these tools. The model will include SAV shoot density as the dependent variable, with distance from the cable centerline and year since construction (prior to construction, 1 year post and 3 years post construction) as the explanatory variables. Covariates in the model for the SAV dataset will include distance from shore (continuous) and direction from cable (categorical); variability among transects will provide random error.

Additionally, graphical methods and descriptive statistics will be used to assess changes in the SAV shoot density over time and as a function of distance and direction from the export cable centerline. These graphical techniques may help to elucidate the spatial scale at which the greatest changes in benthic habitat condition occur. Although the BAG design explicitly incorporates gradient assessment to separate the potential SAV response from sources of change (i.e., project construction activity) and interannual variation, data collected at selected control sites will aid in interpretation of the results.

## **7.0 Data Management, Reporting, and Data Sharing**

Data management and traceability is integral to analysis and accurate reporting. The surveys will follow a rigorous system to inspect data throughout all stages of collection and analysis to provide a high level of confidence in the data being reported. Following data entry, all digital logs will be proofread using the original handwritten field log. This review will be performed by someone other than the data entry specialist.

During field operations, daily progress reports will be reported through whatever means are available (email, text, phone). Upon completion of the survey all analyzed images as well as a data report with visualizations will be provided. Options for optimal data sharing, including images, video, and analysis results, will be considered and determined at a future date. Possible delivery methods include an Azure database, a secure file share, and/or an interactive popup map. Interactive popup maps allow users to explore still and video imagery concurrent with geophysical data, project-specific boundaries, and locations, and interpretative data obtained from the imagery.

Ocean Wind is working to create a data access process and protocols that are transparent and long-lasting. Through engagement with on-going discussions with the Responsible Offshore Science Alliance (ROSA), data access and regional data sharing guidance are being developed.

## 8.0 References

- Colarusso, P. and A. Verkade. 2016. *Submerged Aquatic Vegetation Survey Guidance for the New England Region*. Joint Federal Agency Publication including NOAA, EPA, and USACE.
- Erftemeijer, P.L.A and R.R.R. Lewis. 2006. Environmental impacts of dredging on seagrasses: A review. *Marine Pollution Bulletin*. 52: 1553-1572.
- INSPIRE Environmental. 2021. Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment to Support Essential Fish Habitat Consultation. Prepared for HDR Engineering. Submitted by INSPIRE Environmental, Newport, RI. June 28, 2021.
- Lacey, E. A. 2022. Barnegat Bay Submerged Aquatic Vegetation Monitoring Program 2021 Final Report. Barnegat Bay Partnership. April 2022.
- Lathrop, R.G., J. Bognar, E. Buenaventura, M. Ciappi, E. Green, and T.J. Belton, 2017. Establishment of Marine protected areas to reduce watercraft impacts in Barnegat Bay, New Jersey. *Journal of Coastal Research*, 78: 277-286.
- Munkes, B., P.R. Schubert, R. Karez, and T.B.H. Reusch. 2015. Experimental assessment of critical anthropogenic sediment burial in eelgrass *Zostera marina*. *Marine Pollution Bulletin*. 100: 144-153.
- New Jersey Department of Environmental Protection (NJDEP), 2015. *Guidance for the Submerged Aquatic Vegetation Surveys as Related to the Submerged Vegetation Habitat Rule at NJAC 7:7E-3.6 (as amended through June 2013)*. Updated March 2015.
- Ocean Wind, LLC. 2021. Ocean Wind Offshore Wind Farm Biological Survey Results. Appendix E of Volume III. Submitted to the Bureau of Ocean Energy Management by Ocean Wind, LLC. March 2021.



# ADDENDUM

to the

## **Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment to Support Essential Fish Habitat Consultation**

### ***Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey***

*Prepared for:*

**Ocean Wind**

An Ørsted & PSEG project

Ørsted, U.S.

---

*Submitted by:*

**INSPIRE**  
ENVIRONMENTAL

INSPIRE Environmental  
Newport, Rhode Island 02840

August 26, 2022

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

## TABLE OF CONTENTS

	Page
1.0 INTRODUCTION.....	6
2.0 OBJECTIVES.....	7
3.0 APPROACH AND METHODS.....	7
4.0 RESULTS AND DISCUSSION .....	9
4.1 The Farm.....	10
4.2 Bay Parkway .....	10
4.3 Lighthouse Drive .....	11
4.4 IBSP .....	12
5.0 SUMMARY AND CONCLUSIONS.....	13
6.0 REFERENCES.....	13

## ATTACHMENTS

Attachment A – Field Log

Attachment B – Video Analysis Results

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

**LIST OF TABLES**

	Page
Table 1. Inventory of Video Data Collected at Each Survey Area.....	9
Table 2. A Summary of the Maximum and Minimum Water Depths at which SAV was Observed and SAV Coverage Categories.....	9
Table 3. Estimated Project Acreage and SAV Habitat Acreage for each Cable Route Option as Derived from this 2022 Survey and the 2019 Delineations .....	11

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

## LIST OF FIGURES

	Figure Page
Figure 1. Oyster Creek Inshore Export Cable Route through Barnegat Bay and the delineation of SAV coverage from the 2019 aerial survey (Ocean Wind, LLC 2021).....	1
Figure 2. The Farm survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021) .....	2
Figure 3. Bay Parkway survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021) .....	3
Figure 4. Lighthouse Drive survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021) .....	4
Figure 5. IBSP survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021).....	5
Figure 6. Representative video still frames of (A) complete SAV; (B) patchy SAV in a complete bed of Macroalgae (IBSP 06); and (C) sparse SAV .....	6
Figure 7. SAV observed along the video transects at the Farm.....	7
Figure 8. Macroalgae cover observed along the video transects at the Farm.....	8
Figure 9. SAV observed along the video transects at the Bay Parkway survey area and representative still frames from the video footage .....	9
Figure 10. Macroalgae cover observed along the video transects at the Bay Parkway survey area .....	10
Figure 11. Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the Bay Parkway survey area .....	11
Figure 12. SAV observed along the video transects at the Lighthouse Drive survey area and representative still frames from the video footage .....	12
Figure 13. Macroalgae cover observed along the video transects at the Lighthouse Drive survey area.....	13

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

Figure 14.	Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the Lighthouse Drive survey area .....	14
Figure 15.	SAV observed along the video transects at the IBSP survey area and representative still frames from the video footage .....	15
Figure 16.	Macroalgae cover observed along the video transects at the IBSP survey area .....	16
Figure 17.	Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the IBSP survey area.....	17



ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

## LIST OF ACRONYMS

BOEM	Bureau of Ocean Energy Management
HDD	horizontal directional drilling
IBSP	Island Beach State Park
NJDEP	New Jersey Department of Environmental Protection
OCS	Outer Continental Shelf
OCW01	Ocean Wind Offshore Wind Farm
SAV	Submerged aquatic vegetation

This addendum to the *Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment to Support Essential Fish Habitat Consultation* describes the results of a baseline submerged aquatic vegetation (SAV) mapping survey in Barnegat Bay that was completed in July 2022. The document begins with a brief overview of the motivation and purpose of this SAV survey, a description of the approach and methodology used, and a synthesis of the results. The data are also available to view in the online interactive popup map associated with the Ocean Wind Offshore Wind Farm.

## 1.0 INTRODUCTION

Ocean Wind, LLC proposes to construct and operate the Ocean Wind Offshore Wind Farm (OCW01 or Project) to generate renewable power off the coast of New Jersey. The wind farm portion of the Project will be in federal waters on the Outer Continental Shelf (OCS) in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0498 (Lease Area). In addition to the Lease Area, the Offshore Project Area includes two offshore Export Cable Route Corridors (BL England and Oyster Creek Offshore Export Cable Route Corridors) and the Oyster Creek Inshore Export Cable Route Corridor.

The focus of this baseline SAV mapping survey was on the Oyster Creek Inshore Export Cable Route Corridor that transits through Barnegat Bay, where SAV beds and SAV habitat were previously documented within the vicinity of the Project (Ocean Wind, LLC 2021) (Figure 1). The proposed Oyster Creek Inshore Export Cable Route Corridor transits from the western side of Island Beach State Park (IBSP) to the Oyster Creek landfall options on the western side of Barnegat Bay, as shown in Figure 1. The Oyster Creek Inshore Export Cable Route Corridor segment adjacent to IBSP was recently proposed to be relocated northward from its originally proposed route to minimize direct impacts to contiguous SAV beds in this area. This segment now transits through a formerly dredged navigation channel, hereafter referred to as the “prior channel.” The water depth of the prior channel restricts light penetration to the seafloor, limiting the growth of SAV within the channel (Lathrop et al. 2017; Ocean Wind, LLC 2021). On the western side of Barnegat Bay, several landfall options are currently being considered. Generally, in this area SAV beds occur in the shallow waters fringing the shoreline (Figure 1).

Note that throughout this document SAV refers to submerged aquatic vascular plants and not macroalgal species. This distinction is important because the factors that generally influence the growth and production of submerged aquatic vascular plants (e.g., turbidity/light availability at the seafloor) are typically different than the factors that are related to macroalgal blooms (e.g., water column nutrient concentrations).

## 2.0 OBJECTIVES

The overarching goal of this baseline pre-construction SAV survey was to map and characterize the SAV within the areas of potential influence of the Project. The area of potential influence of the Project was defined as a 500-ft buffer on either side of the cable route options at the landfall areas out to either the potential horizontal directional drilling (HDD) transition location (western landfall areas) or to the distance at which the 2019 mapped SAV beds ended (IBSP landfall). Specifically, the objective of this baseline SAV mapping survey was to refine the SAV bed delineations mapped using aerial surveying in 2019 by collecting in-water ground-truth imagery. This additional baseline survey was recommended by the New Jersey Department of Environmental Protection (NJDEP) upon review of the previously reported baseline data and the benthic monitoring plan (Ocean Wind, LLC 2021; INSPIRE 2022a). The data from this 2022 field survey, and the previous project-specific baseline SAV surveys (Ocean Wind, LLC 2021) will be used to inform Project design and avoidance strategies (cable routing, designated moorings/anchoring locations). Additional pre-construction SAV surveying is proposed as part of the Ocean Wind SAV-specific benthic monitoring plan (INSPIRE 2022b).

## 3.0 APPROACH AND METHODS

Underwater video data were collected July 13 – 17, 2022 (during the SAV growing season in Barnegat Bay) onboard the *R/V Redwing*, a small vessel capable of transiting through shallow waters. The approach to data collection followed Method 3 (continuous underwater towed video imagery) of the Tier-1 Survey Methodology described in *Submerged Aquatic Vegetation Survey Guidance for the New England Region* protocol (Colarusso and Verkade 2016).

Underwater towed video imagery was collected at four survey areas: The Farm, Bay Parkway, Lighthouse Drive, and IBSP. At each of these four survey areas the Oyster Creek Inshore Export Cable Route Corridor options overlap with SAV beds as delineated by aerial survey in 2019 (Figures 2, 3, 4, and 5). Each survey area included a 500-ft (152.4-m) buffer on either side of all proposed cable route options out to the deepest depth at which SAV was anticipated (no more than ~2.4 m [~8 ft]) (IBSP survey area) or out into the Bay to the transition where the potential HDD cable installation is proposed (western landfall areas).

A high-definition underwater video camera accompanied by LED lights and a scaling laser was mounted on a towable frame that was deployed from the davit of the vessel. The vessel was oriented in the best position regarding winds and currents to slowly drift/transit over the survey area and each targeted transect. Towed underwater imagery transects were generally positioned perpendicular to the suspected edge of the SAV bed. Once the towed frame was submerged, video data began recording and a live video feed allowed for real-time viewing by the crew onboard. The ideal vessel speed for video acquisition was no greater than 0.5 knots. During imagery collection, continuous navigational data were automatically recorded by HYPACK to track the position of the towed frame. Field notes on frame position and submerged

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

vegetation observations were recorded in the field log (Attachment A) during the transects. Point navigation fixes and water depths were recorded periodically during each transect.

At one survey area (the Farm), the water column turbidity was very high and a modified approach using a drop camera provided more useful imagery than the continuous towed video along some transects.

Underwater imagery was analyzed using a video analysis software (Behavioral Observation Research Interactive Software [BORIS]) that allows the analyst to annotate the video using both continuous and point variables. The focus of the image analysis was to document the presence and general coverage of SAV observed in the video. The analyst also noted the coverage of macroalgae observed in the video (Attachment B). Descriptive categories for cover of SAV, as illustrated in Figure 6, and of macroalgae included:

- “Complete” – Observed SAV and/or macroalgae was continuous, nearly the entire field of view was occupied by SAV and/or macroalgae over these stretches of video. Generally, these segments encompassed SAV and/or macroalgae >50% cover (‘high’ category described in Colarusso and Verkade, 2016).
- “Patchy” – SAV and/or macroalgae was observed in discrete patches along these stretches of video. Generally, these segments encompassed SAV and/or macroalgae 11-50% cover (‘low’ and ‘moderate’ categories described in Colarusso and Verkade, 2016).
- “Sparse” – SAV observations were infrequent and typically consisted of only a few shoots at any given location over these stretches of video. Often these SAV shoots were solitary, and sometimes floating in a bed of macroalgae or clearly not attached to the seafloor. Generally, these segments encompassed SAV typically observed as <1 to 10% cover (‘sparse’ category, as described in Colarusso and Verkade, 2016).

For each cable route option being considered in the Ocean Wind project design, a project area of potential influence on SAV was conservatively estimated. The project area of potential influence on SAV was estimated as the area within a 500-ft (152.4-m) buffer on either side of the cable route option, from the shore out into the Bay to the location where either potential HDD exits are proposed (western landfall areas) or out to where SAV was delineated to in 2019 (eastern landfall area [IBSP]). A 500-ft buffer was selected as this is the distance from the cable installation activity, which activates a time-of-year restriction for SAV on construction activities (NJDEP 2015). These project areas of potential influence on SAV estimates are conservative. Thus, these estimates of project acreage are not estimates of potential acres of impacted SAV habitat, but rather to be used to aid in selecting cable route options that limit the risk to SAV. Several project areas of potential influence for the individual cable route options being

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

considered overlap with each other within the survey areas because the cable route options are often closer than 500 ft from each other. SAV acreage within the project areas of potential influence on SAV was estimated in GIS by interpolating polygons that were manually drawn using the video transect results (including observed patchy and complete SAV) as visual guides.

#### 4.0 RESULTS AND DISCUSSION

Underwater imagery was collected along a total of 67 transects across the four survey areas, covering a total of 20.7 km (Table 1). A total of 17 hours and 48 minutes of video footage was obtained during the survey and analyzed post-collection. Generally, the deepest water depths where continuous beds of complete SAV were observed was about 1.7 m (5.6 ft), while patches of SAV beds were observed as deep as 1.8 to 2.0 m (6.0 to 6.5 ft) (Table 2). Across all four survey areas, the shallowest water depths where SAV was observed were between 0.4 and 0.9 m (1.5 and 3.1 ft).

**Table 1. Inventory of Video Data Collected at Each Survey Area**

Survey Area	Transects (n) <sup>1</sup>	Total Distance (km)	Total Analyzed Video Footage (h:m:s)
The Farm <sup>2</sup>	10	2.3	2:15:39
Bay Parkway <sup>2</sup>	15	4.8	4:27:52
Lighthouse Drive	19	5.4	4:52:54
IBSP <sup>2</sup>	23	8.2	6:12:11
Total	67	20.7	17:48:36

Notes

<sup>1</sup> "A" and "B" transects counted separately.

<sup>2</sup> Includes segments of transects with estimated coordinates.

**Table 2. A Summary of the Maximum and Minimum Water Depths at which SAV was Observed and SAV Coverage Categories**

Survey Area	SAV Point	SAV - Sparse		SAV - Patchy		SAV - Complete	
	Depth	Maximum Depth	Minimum Depth	Maximum Depth	Minimum Depth	Maximum Depth	Minimum Depth
	m	m	m	m	m	m	m
The Farm	0.5	N/A	N/A	N/A	N/A	N/A	N/A
Bay Parkway	N/A	1.9	0.6	1.8	0.5	1.7	0.6
Lighthouse Drive	N/A	2.2	0.9	1.8	0.6	1.7	0.8
IBSP	N/A	2.1	0.5	2.0	0.4	1.7	0.5
<b>Average</b>	0.5	2.1	0.7	1.9	0.5	1.7	0.6

N/A=Not Applicable



#### 4.1 The Farm

A total of ten transects were collected at the Farm survey area, covering 2.3 km and resulting in 2 hours and 15 minutes of video footage. During field collection, turbidity was noted as being high across this entire survey area (Attachment A). At one transect the turbidity was very high (F09); as a result, data collection was modified by using a drop camera approach that allowed discrete images to be collected along the transect closer to the seafloor than the towed video allowed.

No SAV beds were observed along any continuous stretch of video at the Farm survey area (Figure 7). However, SAV point observations were noted at the southern transects. Each of these point instances consisted of single shoot of SAV noted in the footage that was clearly not attached to the seafloor but rather floating in the water column (Figure 7). Patchy macroalgal beds were observed throughout most of the survey area (Figure 8).

Only one corridor is being considered at the Farm landfall, which will include two cables within it. Including the 500-ft buffer around the cable corridor and extending east to the potential HDD exit location, the total project area of potential influence on SAV for this route is 18.4 acres (Table 3). Unlike the 2019 aerial imagery (Figure 2; Ocean Wind, LLC 2021), the 2022 in-water imagery suggests zero acres of SAV throughout this project area of potential influence on SAV (Table 3). This discrepancy could be due to challenges in discerning macroalgae beds from SAV beds in aerial imagery. The results of this 2022 survey corroborate previous in-water drop camera imagery collected in 2021, that also reported no SAV at the Farm survey area (Figure 2; Ocean Wind, LLC 2021).

#### 4.2 Bay Parkway

A total of 15 transects were collected at the Bay Parkway survey area, covering 4.8 km and resulting in 4 hours and 28 minutes of video footage (Table 1). The deepest and shallowest water depths at which SAV was observed at Bay Parkway were 1.9 m (6.2 ft; sparse SAV) and 0.5 m (1.8 ft; patchy SAV), respectively (Table 2). The deepest water depth at which continuous complete SAV was observed was 1.7 m (5.6 ft).

SAV beds, dominated by *Zostera marina*, were observed along all transects sampled at the Bay Parkway survey area (Figure 9). Generally, SAV was patchy along the very shallow regions of the survey area, flanking the shoreline, and along the shore near the pier structure (western portions of Transects BP02 and BP03) (Figure 9). The spatial patterns of patchy and complete SAV observed in the video transects were generally corroborated by the orthomosaic aerial photography sourced from USGS (2019) and used as the base map (Figure 9). Complete SAV was observed out to approximately 150 m (492 ft) off the shore along the southern transects, and approximately 200 to 250 m (656 to 820 ft) off the shore in the northern portions of the survey area. SAV beds observed in 2022 were more extensive (larger area) than what was mapped from aerial imagery in 2019, but similar to what was observed during the 2021 in-water drop camera survey (Figures 3 and 9; Ocean Wind, LLC 2021). Patchy macroalgae was

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

observed concurrent with the SAV beds over the majority of the survey area, with the exception of the northern most transect (BP01), where no macroalgae was observed (Figure 10).

At the Bay Parkway survey area, two route options are being considered. The “One Shot” option consists of a single cable, encompassing 30.3 acres of project area of potential influence on SAV (including the 500-ft buffer from the cable centerline out to the potential HDD exit location) (Table 3). The double cable Bay Parkway option consists of approximately 23.2 acres of project area of potential influence on SAV. These estimates of project acreage are conservative given the installation methodology proposed at this landfall, these are not estimates of potential acres of impacted SAV habitat.

Based on the 2022 SAV data, the ‘One Shot’ cable route option and the double cable route option encompass a total of 25.0 and 19.0 acres, respectively, of complete or patchy SAV habitat (Table 3; Figure 11). These estimates are larger than the 2019 aerial imagery-derived delineations, which include 11.8 and 7.6 acres for the “One Shot” and the double cable option, respectively (Table 3; Ocean Wind, LLC 2021).

**Table 3. Estimated Project Acreage and SAV Habitat Acreage for each Cable Route Option as Derived from this 2022 Survey and the 2019 Delineations**

Landfall	Cable Route Options	Project Area of Potential Influence on SAV (acres) <sup>1</sup>	2022 Survey SAV Area (Complete and/or Patchy) (acres)	2019 Survey SAV Area (Dense, Moderate and/or Sparse) (acres) <sup>2</sup>
The Farm	Holtec (double)	18.4	0.0	9.5
Bay Parkway	One Shot (single)	30.3	25.0	11.8
	Bay Parkway (double)	23.2	19.0	7.6
Lighthouse Drive	Nautilus Rd (single)	21.6	12.5	7.8
	Lighthouse Drive (single)	22.6	10.6	7.3
	Marina (double)	25.2	9.5	5.1
IBSP	IBSP (double)	91.7	59.9	54.1

<sup>1</sup> The project area of potential influence on SAV was estimated as the area within a 500-ft (152.4-m) buffer on either side of the cable route option, from the shore out to the location where either the potential HDD exits are proposed (western landfall areas) or out to where SAV was delineated to in 2019 (eastern landfall area [IBSP]).

<sup>2</sup> Delineations derived from aerial imagery collected in 2019 (Ocean Wind, LLC 2021), acreage that overlaps with the project area of potential influence on SAV.

### 4.3 Lighthouse Drive

A total of 19 transects were collected at the Lighthouse Drive survey area, covering 5.4 km and resulting in 4 hours and 53 minutes of video footage. The deepest and shallowest water depths at which SAV was observed at Lighthouse Drive were 2.2 m (7.4 ft; sparse SAV) and 0.6 m (2.1 ft; patchy SAV), respectively. The deepest water depth at which continuous complete SAV was observed was 1.7 m (5.6 ft).

Along the northern shoreline of the Lighthouse Drive survey area, SAV beds were found to be patchy. In general, stretches of complete SAV coverage were observed beginning about 25 to

50 m (82 to 164 ft) from the shoreline and extending to about 150 m (492 ft) offshore (transects LD01 through LD11; Figure 12). Regions of sparse or no SAV characterized the southern transects with the exception of LD15, which consisted of complete SAV coverage. Macroalgal beds characterized as complete and regions of patchy macroalgae were observed through the Lighthouse Drive survey area (Figure 13).

At the Lighthouse Drive survey area, three route options are being considered: Nautilus Road (single), Lighthouse Drive (single), and Marina (double cable). Depending on the route option the project areas of potential influence on SAV ranges from 21.6 to 25.2 acres (Table 3). Similar to the Bay Parkway landfall options, these estimates of project areas of potential influence on SAV are conservative given the installation methodology proposed at this landfall. These project areas of potential influence on SAV should not be interpreted as areas of potential impact on SAV resulting directly from cable installation.

Across the three route options at Lighthouse Drive landfall, the total SAV acreage (including complete and patchy SAV) ranges from 9.5 acres for Marina (double) to 12.5 acres for Nautilus Road (single), with a total of 10.6 acres of SAV for Lighthouse Drive (single) route option (Table 3; Figure 14). These estimates are larger than the 2019 aerial-imagery derived SAV delineations that range from 9.5 to 12.5 acres (Table 3; Ocean Wind, LLC 2021)

#### **4.4 IBSP**

A total of 23 transects were collected at the IBSP survey area, covering 8.2 km and resulting in 6 hours and 12 minutes of video footage. The deepest and shallowest water depths at which SAV was observed at IBSP were 2.1 m (6.8 ft; sparse SAV) and 0.4 m (1.5 ft; patchy SAV), respectively. The deepest water depth at which continuous complete SAV was observed was 1.7 m (5.5 ft).

SAV along the video transects collected at the IBSP survey area ranged from none to complete coverage (Figure 15). Generally, the 2022 data corroborated the 2019 SAV delineations from aerial imagery (Ocean Wind, LLC 2021) and the orthomosaic imagery base map (USGS 2019). Close to the shoreline the SAV was characterized as either sparse or patchy. About 200 to 250 m (656 to 820 ft) from the shoreline, the SAV beds were characterized by complete coverage on either side of the “prior channel;” complete SAV persisted westward for about 300 to 400 m, and then transitioned to patchy or sparse, in the same general locations that the 2019 SAV delineations ended (Figure 15). Through the “prior channel” SAV was typically observed as sparse, generally as single or double shoots of SAV in any given video frame. These sparse SAV observations were often challenging to determine whether the SAV was drifting in the water column or attached to the seafloor. Previous in-water drop camera data collected in 2021 reported no SAV observed in the “prior channel” (Figure 5). Macroalgae was frequently observed as either complete or patchy coverage throughout the IBSP survey area (Figure 16).

Only one cable route option containing both cables is being considered at the IBSP survey area, which encompasses a project area of potential influence on SAV of about 91.7 acres, including

the 500-ft buffer on either side of the cable route westward to the extent of the SAV beds as delineated in 2019 with aerial imagery (Table 3). Cable installation at this landfall is proposed to be with an open cut. A total of 59.9 acres of complete and patchy SAV was estimated at the IBSP survey area using the results of the 2022 video survey (Table 3; Figure 17). This estimate is generally comparable to the 2019 aerial imagery derived SAV delineations (54.1 acres within the project area of potential influence on SAV) (Table 3; Ocean Wind, LLC 2021).

## 5.0 SUMMARY AND CONCLUSIONS

The 2022 baseline SAV mapping survey provides additional in-water SAV data at the four landfall areas being considering for the Ocean Wind Project. This dataset can be used in combination with the previously collected project-specific baseline SAV data (2019, 2020, and 2021) to inform decisions regarding cable route selection and other avoidance strategies aimed at minimizing impacts to SAV (designated moorings/anchoring locations). Additional pre-construction SAV surveying to further characterize the SAV beds at the landfalls is planned as described in the SAV-specific benthic monitoring plan (INSPIRE 2022b).

Generally, the SAV data collected in July 2022 corroborate the previous project-specific SAV surveys (Ocean Wind, LLC 2021). Within each project area of potential influence on SAV, acreage obtained from delineations derived from aerial imagery in 2019 are similar to the acreage estimated from the 2022 underwater video transects (Table 3). The exception was at the Farm landfall where no SAV beds were observed in the video data collected in 2022 (similar to the in-water data collected in 2020), although the aerial imagery from 2019 suggested about 9.5 acres of SAV in the project area of potential influence on SAV. This discrepancy is likely due to challenges in discerning between SAV and macroalgal beds using aerial imagery and highlights the importance of ground truth in-water data. At the other survey areas, the SAV acreage estimated from the 2022 video transects was generally higher than what was derived from the 2019 delineations. This is likely due to the coarse spatial resolution of towed video transects, resulting in conservative polygon interpolations, compared to the aerial imagery approach.

Across the three western landfall survey areas, encompassing six individual cable route options, the Farm had the least acreage of SAV observed (0 acres) and the smallest project area of potential influence on SAV (18.4 acres). The Marina double cable route option at the Lighthouse Drive landfall had the next lowest acreage of SAV observed (9.5 acres), but the project area of potential influence on SAV was similar to or slightly higher than the other western cable route options. The greatest SAV area and project area of potential influence on SAV were documented at the IBSP landfall, 59.9 and 91.7 acres. Cable installation through the prior channel where sparse SAV was observed, will limit direct impacts on the complete and patchy SAV habitat at this landfall. However, indirect impacts associated with sediment resuspension and deposition should be monitored.

## 6.0 REFERENCES

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

- Colarusso, P. and A. Verkade. 2016. *Submerged Aquatic Vegetation Survey Guidance for the New England Region*. Joint Federal Agency Publication including NOAA, EPA, and USACE.
- INSPIRE Environmental. 2022a. Ocean Wind Offshore Wind Farm Benthic Monitoring Plan. Prepared for Ocean Wind, Orsted US. Submitted by INSPIRE Environmental. February 10, 2022.
- INSPIRE Environmental. 2022b. Ocean Wind Offshore Wind Farm Submerged Aquatic Vegetation Monitoring Plan. Prepared for Ocean Wind, Orsted US. Submitted by INSPIRE Environmental. June 15, 2022.
- Lathrop, R.G., J. Bogнар, E. Buenaventura, M. Ciappi, E. Green, and T.J. Belton, 2017. Establishment of Marine protected areas to reduce watercraft impacts in Barnegat Bay, New Jersey. *Journal of Coastal Research*, 78: 277-286.
- New Jersey Department of Environmental Protection (NJDEP), 2015. Guidance for the Submerged Aquatic Vegetation Surveys as Related to the Submerged Vegetation Habitat Rule at NJAC 7:7E-3.6 (as amended through June 2013). Updated March 2015.
- Ocean Wind, LLC. 2021. Ocean Wind Offshore Wind Farm Biological Survey Results. Appendix E of Volume III of the Construction and Operations Plan. Submitted to the Bureau of Ocean Energy Management by Ocean Wind, LLC. March 2021
- US Geological Survey (USGS). 2019. Orthomosaic image obtained from USGS <https://apps.nationalmap.gov/downloader/>. Photo Credit USDA Aerial Photography Field Office (APFO). Barnegat Light, NJ. [air photo]. Salt Lake City, UT.



# **ADDENDUM**

to the

## **Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment to Support Essential Fish Habitat Consultation**

***Results of the Baseline Submerged Aquatic  
Vegetation 2022 Field Survey***

## **FIGURES**

***Prepared for:***  
**Ocean Wind**  
An Ørsted & PSEG project  
Ørsted, U.S.

---

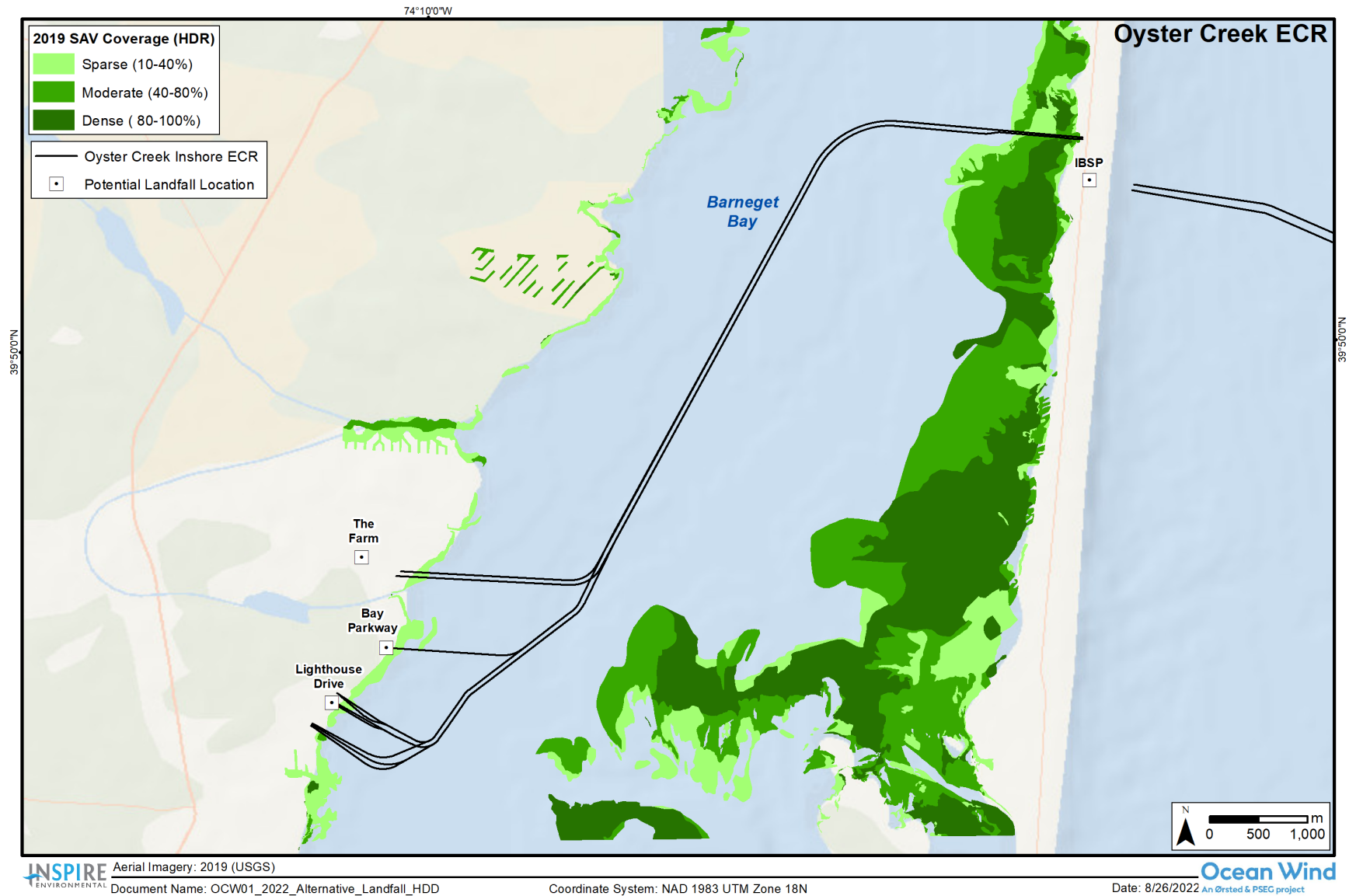
***Submitted by:***  
**INSPIRE**  
ENVIRONMENTAL  
INSPIRE Environmental  
Newport, Rhode Island 02840

August 25, 2022

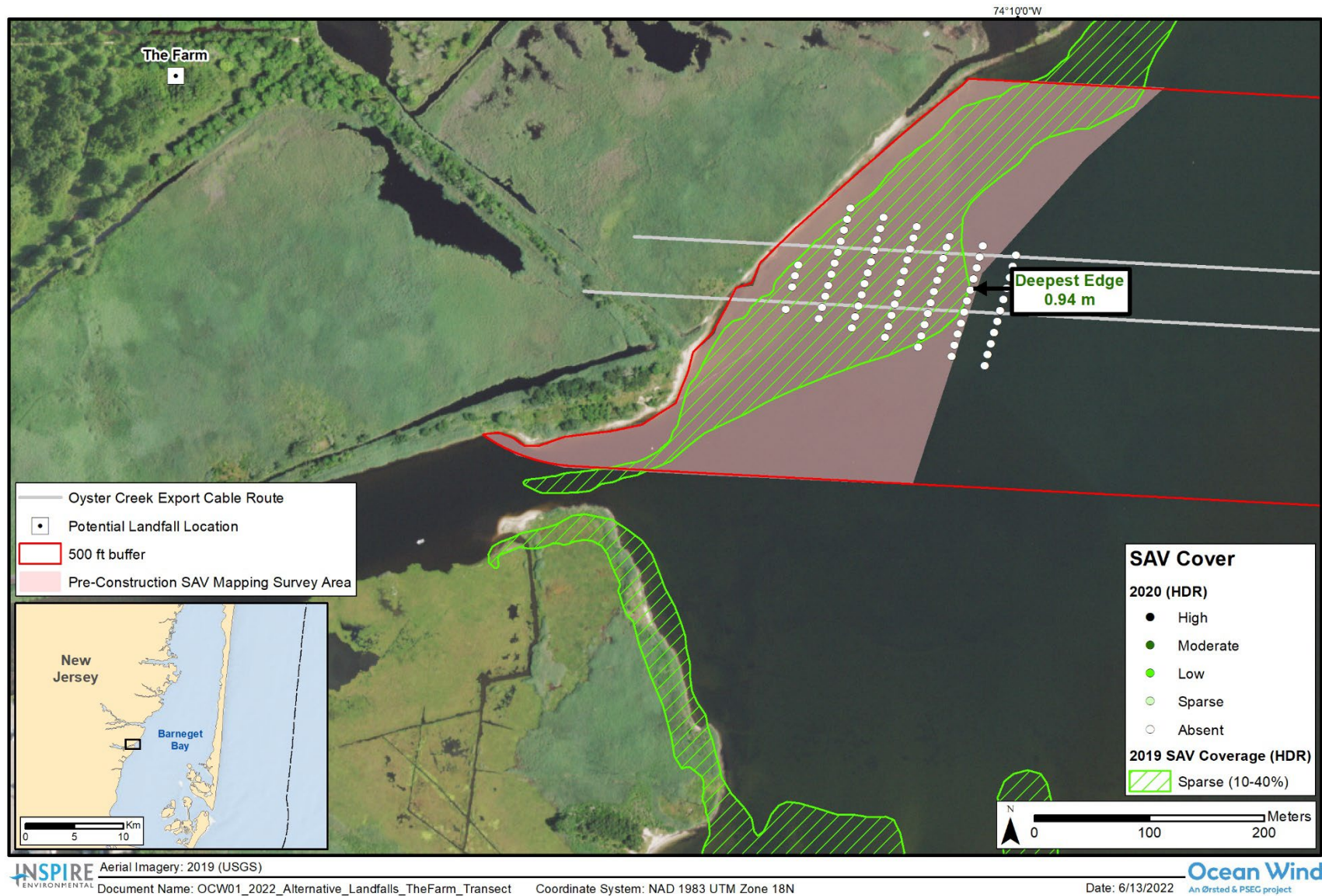
## LIST OF FIGURES

	Figure Page
Figure 1. Oyster Creek Inshore Export Cable Route through Barnegat Bay and the delineation of SAV coverage from the 2019 aerial survey (Ocean Wind, LLC 2021).....	1
Figure 2. The Farm survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021) .....	2
Figure 3. Bay Parkway survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021) .....	3
Figure 4. Lighthouse Drive survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021) .....	4
Figure 5. IBSP survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021) .....	5
Figure 6. Representative video still frames of (A) complete SAV (BP01); (B) patchy SAV in a complete bed of Macroalgae (IBSP06); and (C) sparse SAV in a bed of macroalgae (IBSP04) .....	6
Figure 7. SAV observed along the video transects at the Farm .....	7
Figure 8. Macroalgae cover observed along the video transects at the Farm.....	8
Figure 9. SAV observed along the video transects at the Bay Parkway survey area and representative still frames from the video footage.....	9
Figure 10. Macroalgae cover observed along the video transects at the Bay Parkway survey area.....	10
Figure 11. Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the Bay Parkway survey area.....	11
Figure 12. SAV observed along the video transects at the Lighthouse Drive survey area and representative still frames from the video footage.....	12
Figure 13. Macroalgae cover observed along the video transects at the Lighthouse Drive survey area .....	13
Figure 14. Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the Lighthouse Drive survey area.....	14

Figure 15.	SAV observed along the video transects at the IBSP survey area and representative still frames from the video footage.....	15
Figure 16.	Macroalgae cover observed along the video transects at the IBSP survey area .....	16
Figure 17.	Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the IBSP survey area .....	17

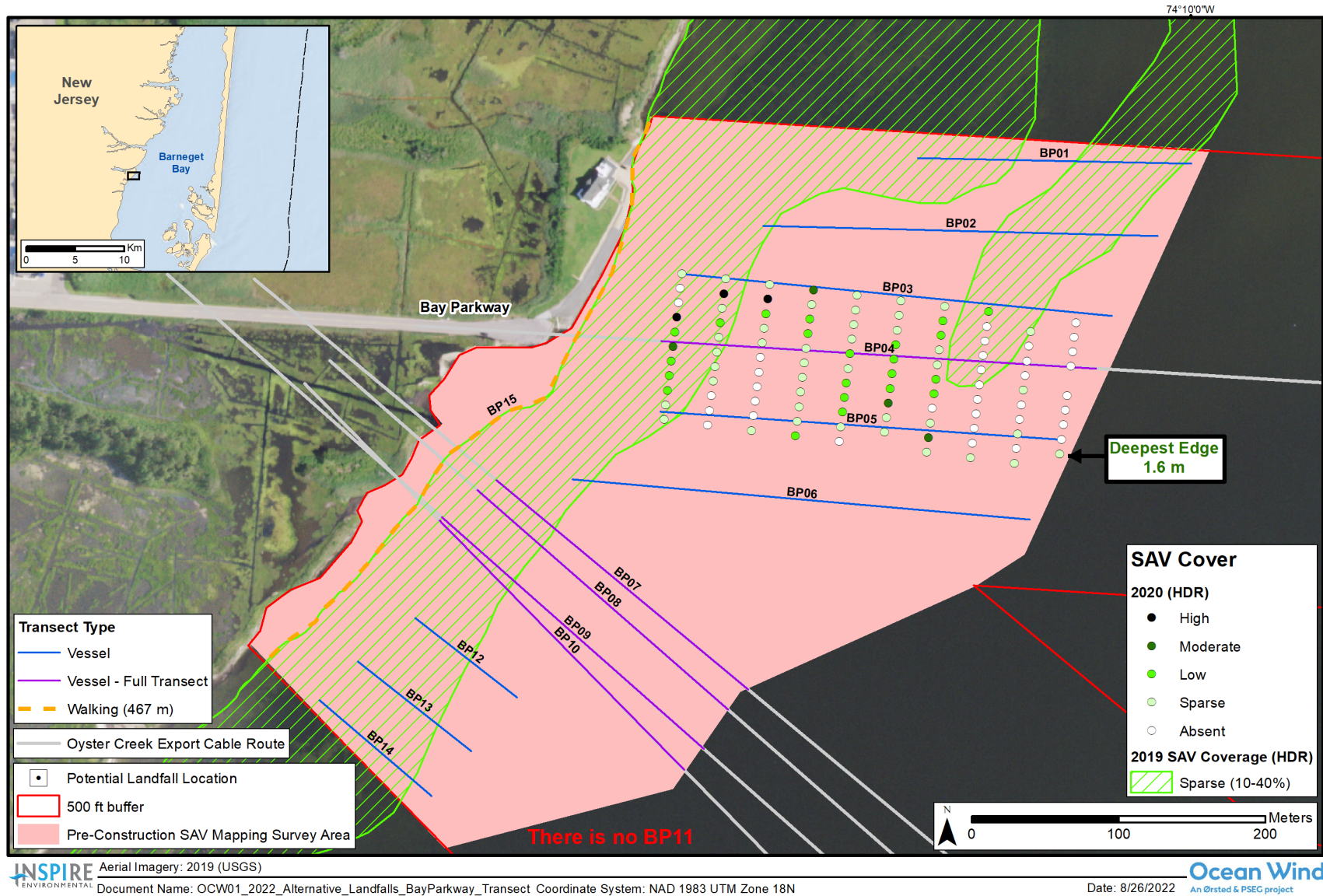


**Figure 1. Oyster Creek Inshore Export Cable Route through Barnegat Bay and the delineation of SAV coverage from the 2019 aerial survey (Ocean Wind, LLC 2021)**



**Figure 2.** The Farm survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021)





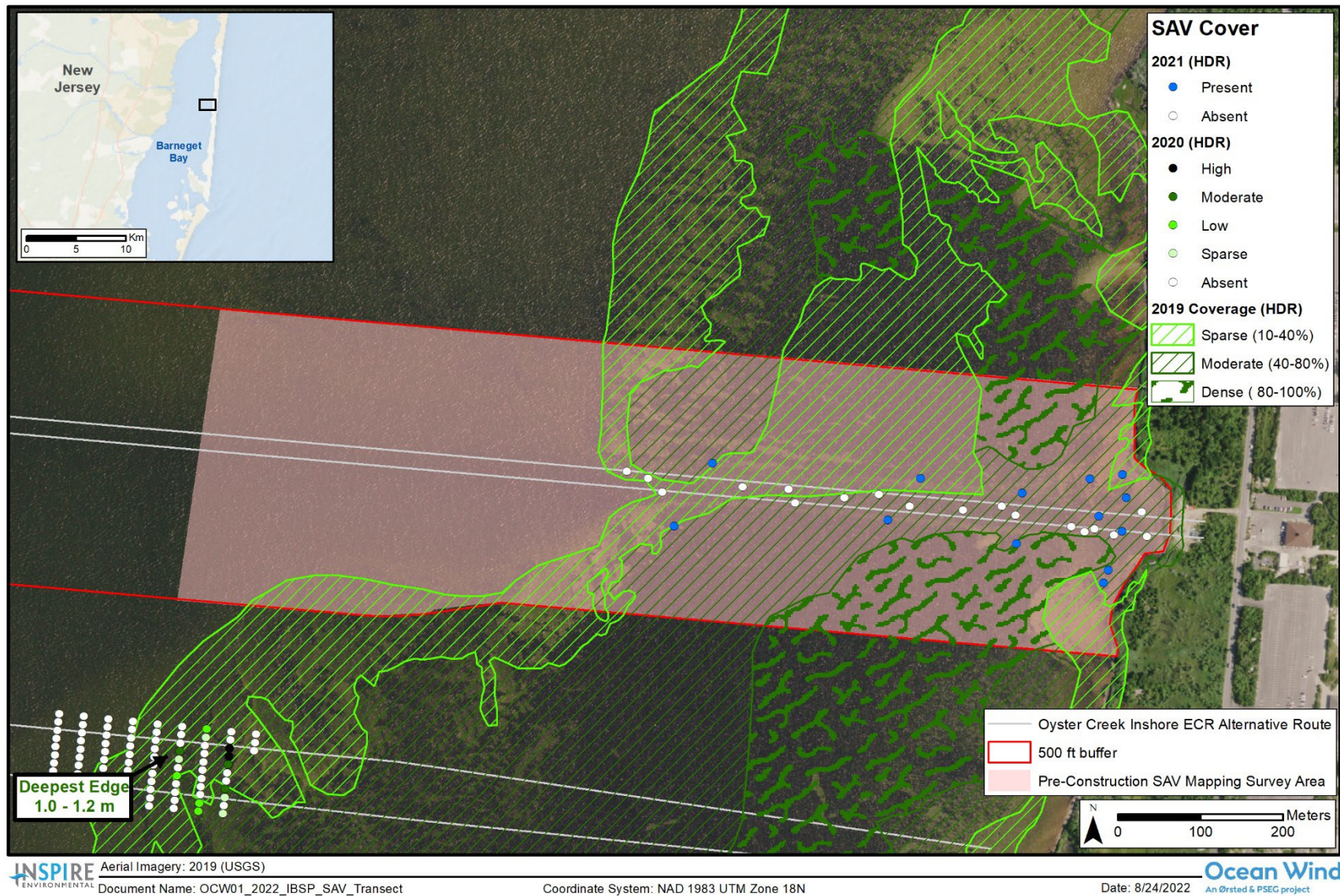
**Figure 3. Bay Parkway survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021)**





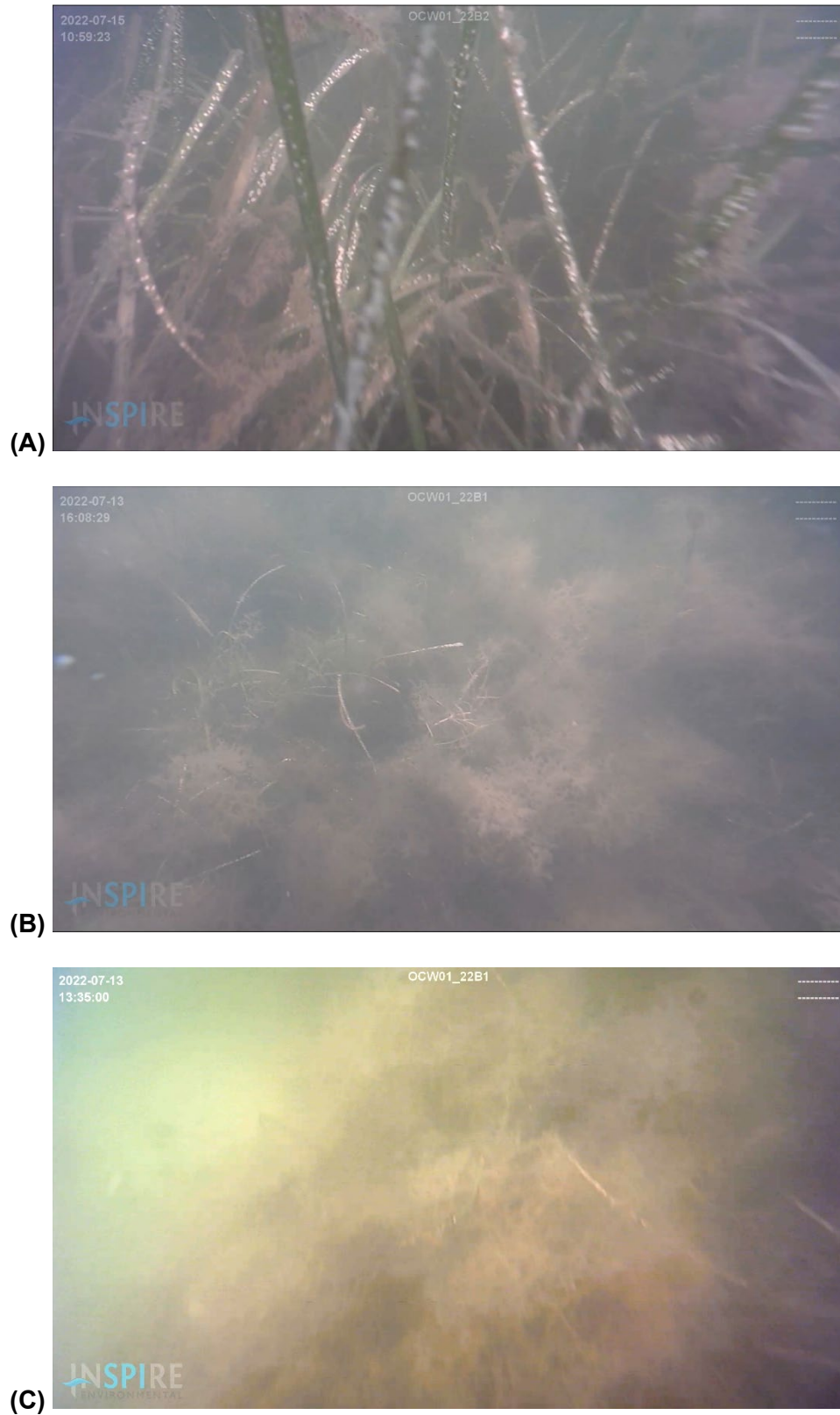
**Figure 4.** Lighthouse Drive survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021)





**Figure 5.** IBSP survey area, SAV percent cover data collected by aerial survey in 2019 and in-water drop camera in 2020 (Ocean Wind, LLC 2021)





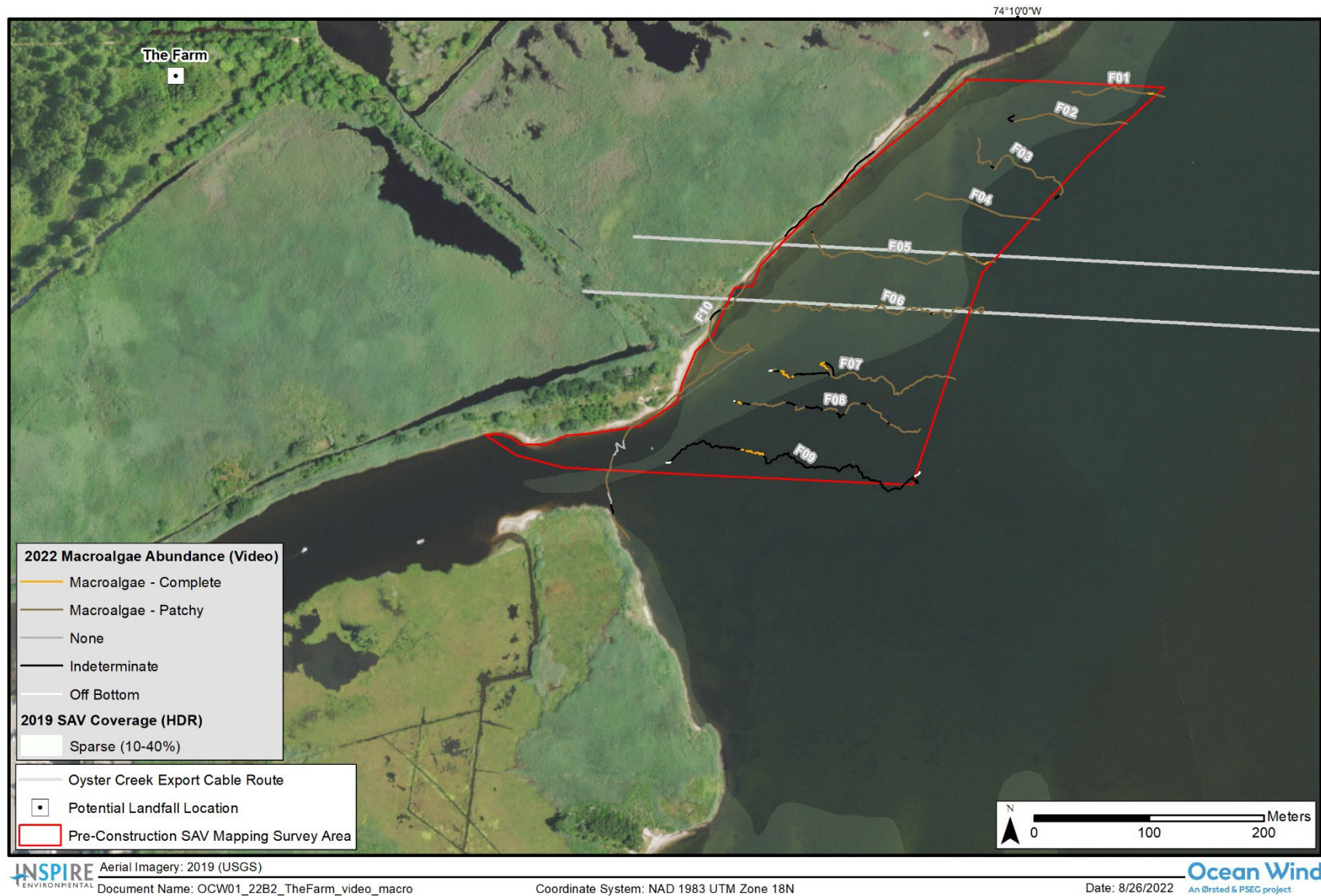
**Figure 6.** Representative video still frames of (A) complete SAV (BP01); (B) patchy SAV in a complete bed of Macroalgae (IBSP06); and (C) sparse SAV in a bed of macroalgae (IBSP04)

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*



**Figure 7. SAV observed along the video transects at the Farm**



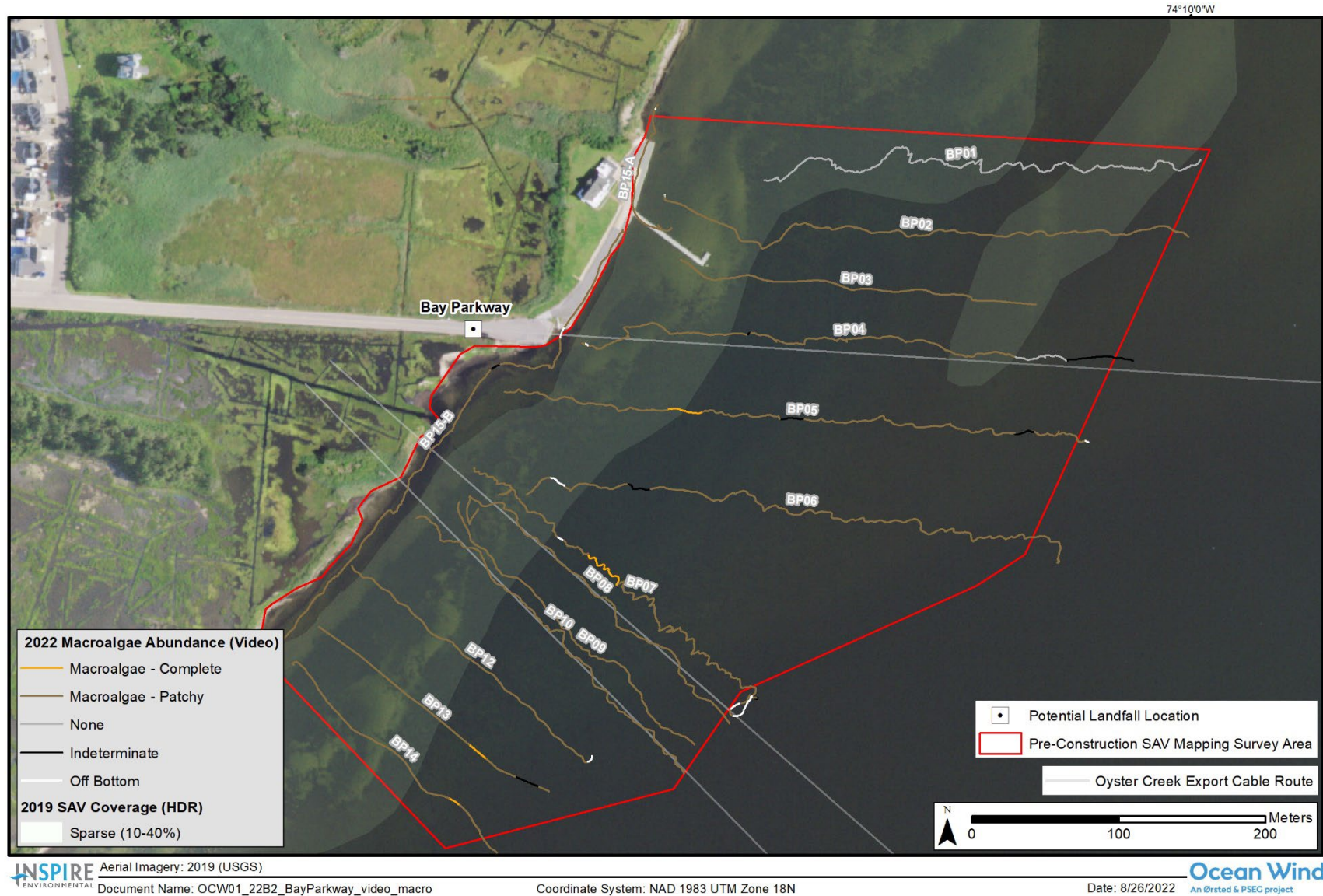


**Figure 8. Macroalgae cover observed along the video transects at the Farm**



**Figure 9. SAV observed along the video transects at the Bay Parkway survey area and representative still frames from the video footage**





**Figure 10. Macroalgae cover observed along the video transects at the Bay Parkway survey area**





**Figure 11. Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the Bay Parkway survey area**





**Figure 12. SAV observed along the video transects at the Lighthouse Drive survey area and representative still frames from the video footage**





**Figure 13. Macroalgae cover observed along the video transects at the Lighthouse Drive survey area**





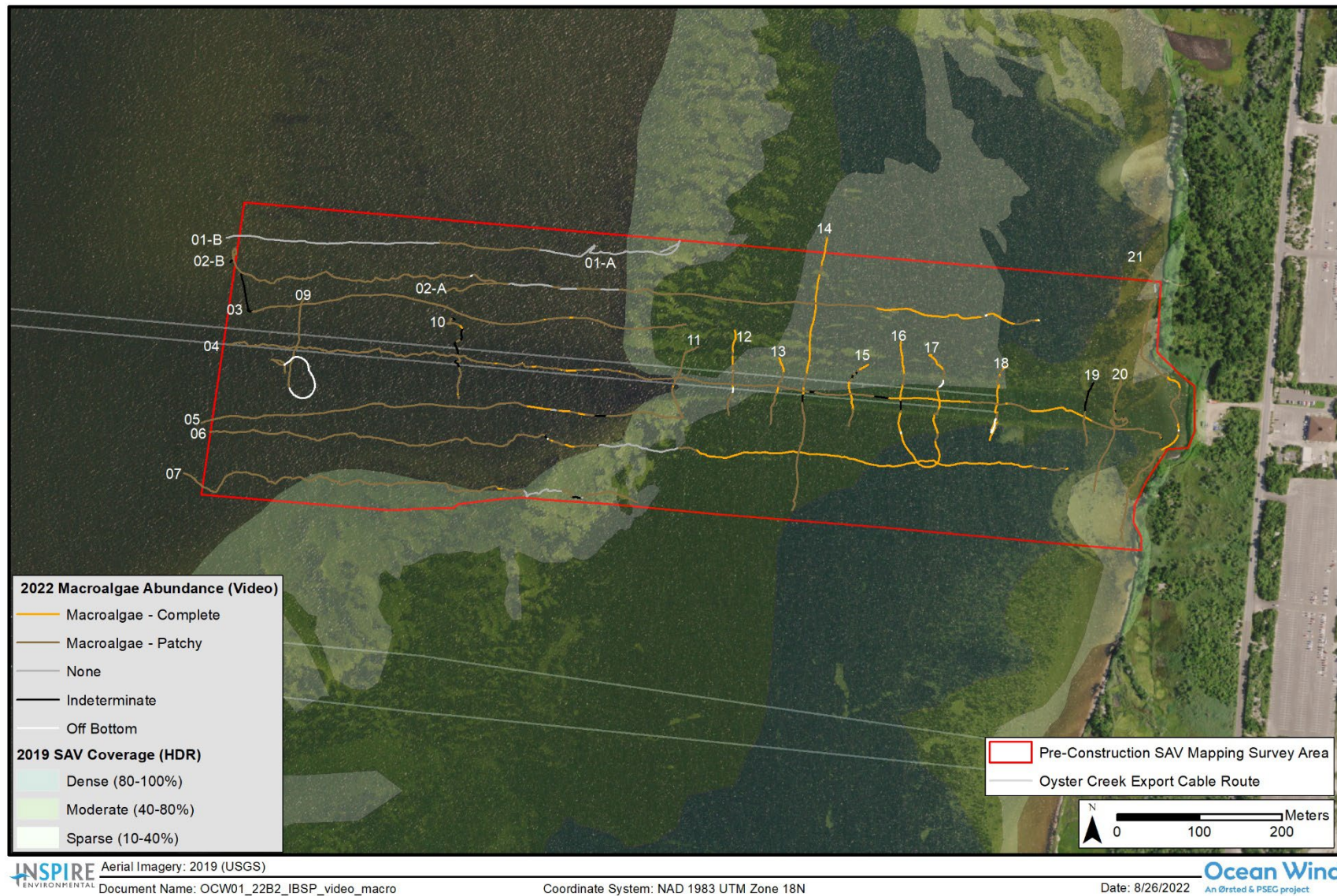
**Figure 14.** Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the Lighthouse Drive survey area





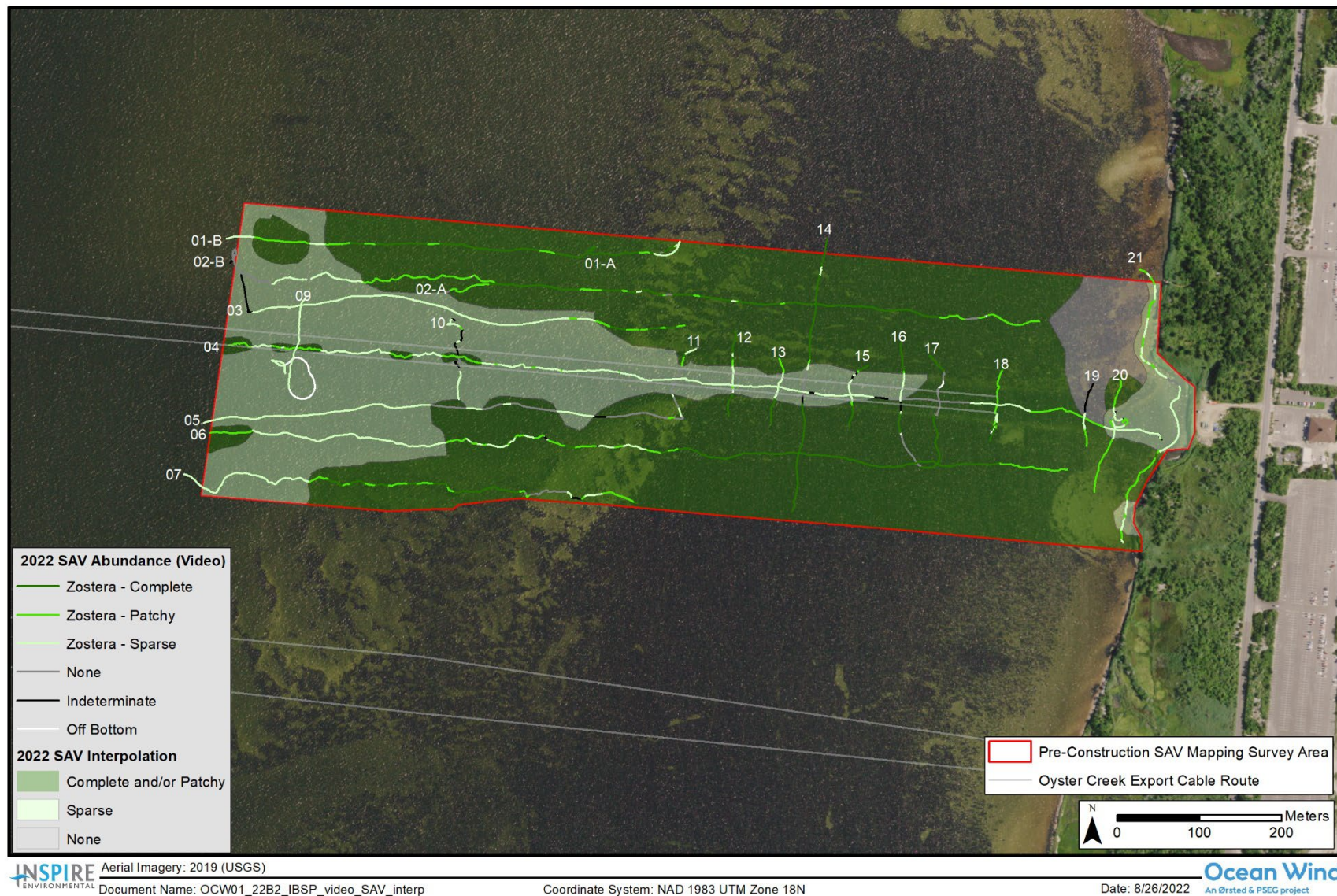
**Figure 15. SAV observed along the video transects at the IBSP survey area and representative still frames from the video footage**





**Figure 16. Macroalgae cover observed along the video transects at the IBSP survey area**





**Figure 17. Estimated SAV habitat acreage (including observations of both patchy and complete coverage of SAV in the video data) at the IBSP survey area**

ADDENDUM to the Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment  
to Support Essential Fish Habitat Consultation  
*Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

---

## ATTACHMENTS

## Attachment A – Field Log

Notes:

SAV=Submerged Aquatic Vegetation

Date	Transect ID	Notes
7/13/2022	IBSP02-A	Starts with dominant sand with patches of SAV. Transitioning to dense SAV coverage with indeterminate patches of sand near the shoreline. Continuous all the way to shore. Patches of sand and SAV evident by looking into water from vessel.
7/13/2022	IBSP22 - IBSP04	Lots of mixed macroalgae at start of transect. Some appear dead, but may be coralline algae. Transitions to patchy algae/SAV around 13:15. Continuous throughout.
7/13/2022	IBSP06	Start of transect is a dense mix of algae/SAV. Patchy sand starts around 16:24. Dense macroalgae starting around 16:30. Poor visibility at end of transect.
7/13/2022	IBSP02-B	Sampled gap in transect IBSP02. Start of transect sandy with sparse clumps of SAV, possibly dead piles. Transitioned into continuous SAV with patches of sand, with algae intermittent on SAV patches.
7/14/2022	IBSP01-A - IBSP01-B	Started at east end of transect. Dense SAV present right away. Spiraling bryozoans. Transitioned to sand with SAV patches at end.
7/14/2022	IBSP03	SAV, extended transect to cover additional SAV.
7/14/2022	IBSP11	SAV and macroalgae present.
7/14/2022	IBSP05	Dense SAV on eastern side. Transition to macroalgae and SAV, then sand with patches.
7/14/2022	IBSP07	Transect aborted for rain. Operations suspended.
7/14/2022		(9:40) Stopped for weather.
7/14/2022		(11:14) Resumed operations.
7/14/2022	IBSP07	Started transect at edge of survey box. Start with sand with patches of SAV, transition to thick SAV. Then back to sand with patches.
7/14/2022	IBSP18	Obstructions, tree and others.
7/14/2022	IBSP17	Macroalgae, SAV, possible <i>Beggiatoa</i> .
7/14/2022	IBSP10 - IBSP09	Sandy patches.
7/14/2022		(16:49) Completed all planned transects at IBSP, transiting to the Farm.
7/14/2022	F01	Visibility so bad, hard to see bottom unless on it. Saw some evidence of SAV and intermittent macroalgae. Will return as time allows.
7/14/2022	F02	Tried to "pogo" with video system, intermittent macroalgae, little evidence of SAV. Will return as time allows.
7/14/2022		(15:32) End operations for the day, hoping for better visibility with calmer seas in early AM.
7/15/2022		(6:29) Departed dock.
7/15/2022		(6:50) Arrived at the Farm, wave height is 1 ft plus, making close to shore video challenging. Visibility at bottom only few inches.
7/15/2022	F03	Attempted to "pogo" video sled on bottom as too turbid for video. Attempted to GoPro on pole, not enough light.
7/15/2022	F03	Attempted to "pogo" with light on bottom/top/side, but too narrow beam angle or about same as Outland camera.
7/15/2022	F03	Attempted GoPro mounted on camera sled with Outland and lights, good footage.
7/15/2022	F08	Hard to see anything, lots of macroalgae throughout, no evidence of SAV.
7/15/2022	F09	No Outland recording, but GoPro good. Return as time allows. Black mud and macroalgae. Occasional single blades of SAV.
7/15/2022	F10	Transect abandoned. Will return and try again with waders.



Date	Transect ID	Notes
7/15/2022	BP01	Continuous SAV throughout transect all the way to shore. Hypack stopped continuous navigation log at some point within transect, and took a picture of vessel track for reference.
7/15/2022	BP02	SAV, possible coral throughout.
7/15/2022		(11:48) Battery change.
7/15/2022		(13:45) Resume operations, troubleshoot Hypack, remove GoPro from camera sled.
7/15/2022	BP06	Western portion of transect dominated by SAV, transitioning to primary sand near western edge of survey area. Possible coral.
7/15/2022		(16:45) Battery died, end operations.
7/16/2022		(6:18) Depart for the Farm.
7/16/2022		(7:01) Arrive on site, conditions calm, nearshore area still too turbid for video sled, added GoPro companion.
7/16/2022	F10	Very hard to see, little evidence of SAV. SAV floating on surface, macroalgae throughout.
7/16/2022		(7:50) Completed all planned transects at the Farm, headed to Bay Parkway.
7/16/2022	BP15-A	North of pier, mostly sandy close to shore.
7/16/2022	BP03	Hypack stopped logging mid-transect. Took a screen shot of vessel track for reference. Possible coral present in sandy area on eastern end of transect.
7/16/2022	BP04-A	No video recorded, only navigation.
7/16/2022	BP15-B	Picked up transect again on south side of pier. SAV present along south end of transect.
7/16/2022		Transit over to Lighthouse Drive to conduct nearshore transect while good conditions prevail.
7/16/2022	LD19	(10:54) Abandoned transect due to heavy rain.
7/16/2022	BP04	(13:54) Resumed operations.
7/16/2022		(15:30) Concluded operations, incoming thunderstorm.
7/17/2022		(6:20) Depart dock for Lighthouse Drive.
7/17/2022		(6:59) Arrive at sampling location.
7/17/2022	LD04	Started in sand, and then SAV continuous almost to shore.
7/17/2022	LD05 - LD07	State commercial crab vessel has line set across transect.
7/17/2022	LD03	Putting in further out to capture end of SAV.
7/17/2022	BP14	Continuous SAV.
7/17/2022		(9:32) Completed all transects at Bay Parkway.
7/17/2022	LD01	Start end with sand with continuous SAV bed.
7/17/2022	LD10	SAV started shortly after beginning transect.
7/17/2022	LD15	(13:50) Started recording and hauled camera back up to move further offshore and restart transect at 13:56.
7/17/2022		(14:55) Transects complete. Operations called for weather.

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
IBSP02-A	7/13/2022	12:03:50	577015.57	4411899.93	39.85363332	-74.09967857	1.6
IBSP02-A	7/13/2022	12:07:19	577070.24	4411907.59	39.85369737	-74.09903867	1.5
IBSP02-A	7/13/2022	12:14:34	577199.42	4411900.58	39.85362244	-74.09752955	1.5
IBSP02-A	7/13/2022	12:18:48	577266.03	4411895.98	39.85357494	-74.09675155	0.9
IBSP02-A	7/13/2022	12:23:46	577348.24	4411888.44	39.85349952	-74.09579143	0.9
IBSP02-A	7/13/2022	12:26:18	577395.3	4411882.54	39.85344208	-74.09524215	0.9
IBSP02-A	7/13/2022	12:32:16	577501.34	4411881.09	39.85341937	-74.09400278	0.8
IBSP02-A	7/13/2022	12:36:48	577580.42	4411873.72	39.85334574	-74.09307934	0.8
IBSP02-A	7/13/2022	12:40:21	577632.39	4411869.42	39.85330222	-74.09247241	0.8
IBSP02-A	7/13/2022	12:43:49	577675.62	4411870.56	39.85330857	-74.09196696	0.9
IBSP02-A	7/13/2022	12:46:32	577723.14	4411862.94	39.85323557	-74.09141244	0.8
IBSP02-A	7/13/2022	12:47:20	577730.8	4411862.54	39.85323126	-74.09132229	0.8
IBSP22	7/13/2022	13:04:47	577878.62	4411720.48	39.85193789	-74.08961195	0.8
IBSP22	7/13/2022	13:09:51	577763.87	4411753.4	39.85224502	-74.09094939	1.3
IBSP04	7/13/2022	13:12:42	577696.45	4411761.83	39.85232709	-74.09173641	1.3
IBSP04	7/13/2022	13:13:34	577676.31	4411762.19	39.85233222	-74.09197179	1.3
IBSP04	7/13/2022	13:14:38	577646.48	4411763.81	39.85234954	-74.0923202	1.3
IBSP04	7/13/2022	13:16:57	577573.86	4411768.3	39.85239659	-74.09316851	1.4
IBSP04	7/13/2022	13:19:57	577489.32	4411772.18	39.85243929	-74.09415618	1.5
IBSP04	7/13/2022	13:21:53	577435.74	4411778.65	39.85250245	-74.09478172	1.5
IBSP04	7/13/2022	13:23:51	577382.16	4411783.78	39.85255352	-74.09540741	1.6
IBSP04	7/13/2022	13:26:44	577302.44	4411791.79	39.85263299	-74.09633822	1.7
IBSP04	7/13/2022	13:28:47	577249.23	4411793.21	39.85265064	-74.09696002	1.7
IBSP04	7/13/2022	13:33:15	577138.94	4411804.5	39.85276232	-74.09824787	2.0
IBSP04	7/13/2022	13:34:41	577106.01	4411807.63	39.85279354	-74.0986323	2.0
IBSP04	7/13/2022	13:37:18	577046.68	4411813.29	39.85284992	-74.09932517	1.9
IBSP04	7/13/2022	13:40:09	576996.75	4411824.3	39.8529536	-74.09990752	1.8
IBSP04	7/13/2022	13:42:03	576956.19	4411821.24	39.85292977	-74.10038198	2.0
IBSP04	7/13/2022	13:45:17	576891.75	4411825.18	39.85297109	-74.10113464	1.9
IBSP04	7/13/2022	13:47:34	576851.68	4411829.35	39.85301231	-74.10160252	2.0
IBSP04	7/13/2022	13:49:34	576815.94	4411830.11	39.8530224	-74.10202024	2.0
IBSP04	7/13/2022	13:51:37	576775.96	4411831.85	39.85304162	-74.10248737	2.0
IBSP04	7/13/2022	13:53:03	576749.18	4411833.63	39.85306016	-74.10280014	2.0
IBSP06	7/13/2022	16:10:45	577674.27	4411688.85	39.85167164	-74.09200432	0.5
IBSP06	7/13/2022	16:15:36	577521.11	4411689.4	39.85169063	-74.09379439	0.5
IBSP06	7/13/2022	16:19:14	577413	4411701.67	39.85181103	-74.09505664	0.6
IBSP06	7/13/2022	16:19:42	577400.91	4411702.42	39.85181889	-74.0951978	0.6
IBSP06	7/13/2022	16:21:22	577358.03	4411698.22	39.85178497	-74.09569956	0.7
IBSP06	7/13/2022	16:22:40	577319.88	4411701.54	39.85181838	-74.09614507	0.7
IBSP06	7/13/2022	16:24:16	577284.7	4411706.18	39.85186334	-74.09655565	0.7
IBSP06	7/13/2022	16:26:50	577214.55	4411709.64	39.85190093	-74.0973752	1.1
IBSP06	7/13/2022	16:28:02	577182.85	4411710.64	39.85191281	-74.09774564	1.3
IBSP06	7/13/2022	16:28:44	577163.12	4411709.86	39.85190756	-74.09797637	1.4
IBSP06	7/13/2022	16:30:21	577128.59	4411724.3	39.85204076	-74.09837824	1.7
IBSP06	7/13/2022	16:31:35	577103.97	4411724.19	39.85204204	-74.09866607	1.7
IBSP06	7/13/2022	16:32:52	577083.6	4411711.89	39.8519331	-74.09890553	1.7
IBSP06	7/13/2022	16:35:17	577029.02	4411717.72	39.85199056	-74.09954281	1.6
IBSP06	7/13/2022	16:40:32	576898.42	4411725.81	39.85207523	-74.10106842	1.7
IBSP06	7/13/2022	16:43:30	576829.04	4411723.63	39.85206187	-74.1018796	1.7
IBSP06	7/13/2022	16:45:23	576786.99	4411726.73	39.85209361	-74.10237076	1.8
IBSP06	7/13/2022	16:47:32	576744.47	4411728	39.85210889	-74.10286758	1.7

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
IBSP02-B	7/13/2022	16:54:48	576753.92	4411942.43	39.85403989	-74.10273195	1.4
IBSP02-B	7/13/2022	17:00:00	576809.41	4411913.1	39.85377065	-74.10208684	1.5
IBSP02-B	7/13/2022	17:02:58	576864.45	4411921.65	39.85384268	-74.10144247	1.5
IBSP02-B	7/13/2022	17:05:07	576906.84	4411911.09	39.85374364	-74.10094823	1.5
IBSP02-B	7/13/2022	17:10:33	577005.22	4411918.2	39.85379883	-74.09979739	1.4
IBSP02-B	7/13/2022	17:13:21	577056.74	4411910.86	39.85372799	-74.09919612	1.2
IBSP02-B	7/13/2022	17:14:06	577071.09	4411909.24	39.85371209	-74.09902857	1.4
IBSP01-A	7/14/2022	7:52:40	577271.52	4411947.04	39.85403443	-74.09668131	1.0
IBSP01-A	7/14/2022	7:57:58	577216.29	4411943.09	39.85400391	-74.09732732	1.4
IBSP01-B	7/14/2022	8:00:12	577185.55	4411945.82	39.85403124	-74.09768632	1.4
IBSP01-B	7/14/2022	8:02:30	577169.2	4411940.62	39.85398594	-74.09787806	1.5
IBSP01-B	7/14/2022	8:05:01	577104.84	4411950.79	39.85408338	-74.09862914	1.5
IBSP01-B	7/14/2022	8:08:05	577030.2	4411956.02	39.85413725	-74.09950098	1.6
IBSP01-B	7/14/2022	8:11:31	576961.34	4411957.03	39.85415259	-74.10030579	1.7
IBSP01-B	7/14/2022	8:18:38	576801.8	4411960.59	39.85419911	-74.10217016	1.5
IBSP01-B	7/14/2022	8:20:33	576759.22	4411965.28	39.85424526	-74.10266732	1.5
IBSP03	7/14/2022	8:24:07	576762.74	4411917.18	39.85381163	-74.10263183	1.7
IBSP03	7/14/2022	8:26:12	576787.78	4411876.56	39.8534434	-74.10234392	1.9
IBSP03	7/14/2022	8:28:22	576850.51	4411882.77	39.85349362	-74.10160992	1.8
IBSP03	7/14/2022	8:30:58	576921.03	4411893.29	39.85358207	-74.1007844	1.7
IBSP03	7/14/2022	8:34:31	577026.2	4411871.61	39.85337716	-74.09955768	1.7
IBSP03	7/14/2022	8:40:27	577181.8	4411865.55	39.85330844	-74.09773965	1.8
IBSP03	7/14/2022	8:41:44	577211.86	4411855.59	39.85321604	-74.09738951	1.5
IBSP03	7/14/2022	8:45:21	577297.15	4411857.23	39.85322302	-74.09639239	1.2
IBSP03	7/14/2022	8:45:39	577302.53	4411858.1	39.85323038	-74.09632936	1.1
IBSP11	7/14/2022	8:52:37	577316.65	4411831.05	39.85298541	-74.09616755	1.2
IBSP11	7/14/2022	8:54:33	577294	4411797.4	39.85268429	-74.09643623	1.7
IBSP11	7/14/2022	8:57:13	577295.5	4411750.62	39.85226269	-74.09642426	0.9
IBSP05	7/14/2022	8:58:34	577287.04	4411745.77	39.85221979	-74.09652363	1.0
IBSP05	7/14/2022	8:59:28	577270.41	4411746.75	39.85223013	-74.09671794	1.0
IBSP05	7/14/2022	9:00:57	577241.91	4411750.59	39.85226737	-74.09705055	1.5
IBSP05	7/14/2022	9:02:59	577197.75	4411746.92	39.85223827	-74.09756718	1.9
IBSP05	7/14/2022	9:03:51	577175.09	4411749.29	39.85226166	-74.09783179	2.0
IBSP05	7/14/2022	9:04:54	577147.3	4411753.28	39.85230015	-74.09815617	2.1
IBSP05	7/14/2022	9:08:42	577067.49	4411758.81	39.85235722	-74.09908832	2.0
IBSP05	7/14/2022	9:11:04	577023.4	4411757.97	39.85235371	-74.09960381	2.0
IBSP05	7/14/2022	9:14:28	576940.56	4411758.6	39.85236687	-74.10057196	1.9
IBSP05	7/14/2022	9:16:33	576894.27	4411754.61	39.85233514	-74.10111353	2.0
IBSP05	7/14/2022	9:18:46	576842.74	4411748.8	39.85228746	-74.10171651	2.0
IBSP05	7/14/2022	9:20:36	576793.28	4411747.54	39.85228059	-74.1022948	1.9
IBSP05	7/14/2022	9:22:18	576757.26	4411746.73	39.85227653	-74.10271587	2.0
IBSP05	7/14/2022	9:24:26	576715.8	4411739.05	39.85221105	-74.10320146	2.1
IBSP07	7/14/2022	11:45:04	576735.97	4411661.4	39.85150966	-74.10297472	2.0
IBSP07	7/14/2022	11:49:42	576837.95	4411670.76	39.85158484	-74.10178164	1.8
IBSP07	7/14/2022	11:52:08	576883.68	4411663.08	39.85151143	-74.10124805	1.6
IBSP07	7/14/2022	11:57:36	577007.8	4411665.5	39.85152205	-74.09979699	1.6
IBSP07	7/14/2022	12:00:22	577055.53	4411657.9	39.85144925	-74.09924004	1.5
IBSP07	7/14/2022	12:03:43	577119.29	4411653.45	39.85140333	-74.09849536	1.0
IBSP07	7/14/2022	12:06:17	577173.65	4411647.42	39.85134404	-74.09786064	1.1
IBSP07	7/14/2022	12:09:07	577242.58	4411642.56	39.851294	-74.09705558	0.9
IBSP21	7/14/2022	12:24:20	577852.97	4411925.23	39.85378486	-74.08988741	0.5

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
IBSP21	7/14/2022	12:34:30	577893.58	4411790.04	39.85256319	-74.08942887	0.5
IBSP21	7/14/2022	12:36:18	577898.26	4411768.92	39.85237246	-74.08937667	0.5
IBSP21	7/14/2022	12:39:43	577899.97	4411731.61	39.85203617	-74.0893611	0.7
IBSP21	7/14/2022	12:41:33	577877.13	4411705.06	39.85179913	-74.08963125	0.7
IBSP21	7/14/2022	12:44:31	577851.61	4411675.53	39.85153543	-74.08993308	0.6
IBSP21	7/14/2022	12:47:39	577836.95	4411638.26	39.85120099	-74.09010887	0.5
IBSP20	7/14/2022	12:55:46	577798	4411660.96	39.85140904	-74.09056145	0.6
IBSP20	7/14/2022	12:58:21	577816.55	4411712.83	39.85187468	-74.09033837	0.8
IBSP20	7/14/2022	13:04:46	577822.37	4411763.18	39.85232777	-74.09026441	0.6
IBSP20	7/14/2022	13:06:10	577829.96	4411785.45	39.8525277	-74.09017307	0.4
IBSP19	7/14/2022	13:08:37	577795.65	4411785.67	39.85253279	-74.0905741	0.6
IBSP19	7/14/2022	13:11:20	577786.03	4411732.87	39.85205799	-74.0906928	0.8
IBSP18	7/14/2022	13:17:03	577671.11	4411719.18	39.85194522	-74.09203768	0.8
IBSP18	7/14/2022	13:20:41	577673.29	4411731.06	39.85205203	-74.09201079	0.8
IBSP18	7/14/2022	13:21:42	577680.02	4411751.64	39.85223677	-74.09192968	0.6
IBSP17	7/14/2022	15:12:03	577599.84	4411820.41	39.85286369	-74.09285866	0.8
IBSP17	7/14/2022	15:15:25	577609.18	4411756.38	39.85228597	-74.09275711	1.2
IBSP17	7/14/2022	15:17:31	577606.55	4411719.93	39.8519579	-74.09279213	0.8
IBSP16	7/14/2022	15:20:25	577560.95	4411733.04	39.85208015	-74.09332362	0.6
IBSP16	7/14/2022	15:22:18	577562.82	4411773.28	39.85244251	-74.093297	1.4
IBSP16	7/14/2022	15:24:44	577563.72	4411824.83	39.85290682	-74.09328034	0.7
IBSP16	7/14/2022	15:25:19	577563.1	4411836.53	39.85301225	-74.09328619	0.8
IBSP15	7/14/2022	15:29:22	577522.42	4411808.68	39.85276507	-74.09376497	0.6
IBSP15	7/14/2022	15:34:31	577499.67	4411734.11	39.85209541	-74.09403977	0.8
IBSP14	7/14/2022	15:41:09	577431.29	4411633.16	39.85119219	-74.09485091	0.8
IBSP14	7/14/2022	15:47:04	577446.32	4411739.59	39.85214958	-74.09466266	0.7
IBSP14	7/14/2022	15:48:13	577443.84	4411766.86	39.85239547	-74.09468844	0.8
IBSP14	7/14/2022	15:48:39	577444.74	4411777.61	39.85249228	-74.09467659	1.5
IBSP14	7/14/2022	15:49:59	577450.04	4411807.48	39.8527609	-74.09461119	1.2
IBSP14	7/14/2022	15:52:39	577457.62	4411865.25	39.85328064	-74.09451565	0.7
IBSP12	7/14/2022	16:09:05	577354.32	4411749.21	39.85224465	-74.09573691	0.9
IBSP12	7/14/2022	16:10:40	577359.11	4411776.83	39.85249305	-74.09567763	1.1
IBSP12	7/14/2022	16:11:39	577359.19	4411793.79	39.85264587	-74.09567463	1.7
IBSP12	7/14/2022	16:13:09	577358.96	4411827.88	39.85295298	-74.09567335	1.0
IBSP12	7/14/2022	16:14:13	577361.2	4411851.11	39.85316205	-74.09564442	0.9
IBSP10	7/14/2022	16:22:20	577021.15	4411864.38	39.85331248	-74.09961753	1.7
IBSP10	7/14/2022	16:27:10	577026.16	4411812.71	39.85284656	-74.09956512	2.0
IBSP10	7/14/2022	16:29:45	577025.95	4411767.74	39.85244143	-74.09957289	1.8
IBSP09	7/14/2022	16:35:31	576815.67	4411800.43	39.852755	-74.10202689	0.7
IBSP09	7/14/2022	16:44:35	576840.68	4411891.56	39.85357375	-74.10172386	1.6
F02	7/14/2022	17:21:35	571318.94	4407421.97	39.81378856	-74.16675359	1.0
F03	7/15/2022	6:58:41	571288.72	4407401.21	39.8136041	-74.16710897	1.2
F04	7/15/2022	8:04:02	571234.65	4407350.27	39.81314969	-74.16774613	1.1
F04	7/15/2022	8:10:36	571342.07	4407331.33	39.81297007	-74.16649335	1.8
F05	7/15/2022	8:27:24	571144.38	4407320.41	39.8128882	-74.1688039	0.6
F05	7/15/2022	8:28:42	571156.57	4407301.07	39.81271294	-74.1686636	0.9
F05	7/15/2022	8:29:35	571172.16	4407302.71	39.81272646	-74.16848131	1.0
F05	7/15/2022	8:30:15	571188.8	4407303.23	39.81272976	-74.16828689	1.1
F05	7/15/2022	8:31:09	571205.01	4407298.96	39.81268992	-74.168098	1.1
F05	7/15/2022	8:31:54	571219.02	4407300.32	39.81270099	-74.16793412	1.1
F05	7/15/2022	8:32:54	571236.78	4407295.02	39.81265173	-74.16772727	1.1



TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
F05	7/15/2022	8:33:46	571249.21	4407295.73	39.81265711	-74.16758201	0.9
F05	7/15/2022	8:34:15	571255.56	4407297.05	39.8126685	-74.16750765	1.4
F05	7/15/2022	8:34:59	571271.99	4407302.86	39.81271944	-74.16731512	1.6
F05	7/15/2022	8:35:35	571287.1	4407296.63	39.81266208	-74.16713927	1.5
F05	7/15/2022	8:36:20	571297.47	4407294.82	39.81264484	-74.16701832	1.9
F06	7/15/2022	8:42:47	571290.33	4407251.28	39.81225321	-74.16710638	1.5
F06	7/15/2022	8:44:32	571275.23	4407253.81	39.81227723	-74.1672826	1.3
F06	7/15/2022	8:45:30	571259.97	4407246.56	39.81221326	-74.16746165	1.1
F06	7/15/2022	8:46:11	571256.72	4407252.1	39.81226341	-74.16749894	1.0
F06	7/15/2022	8:47:17	571245.43	4407252.49	39.81226784	-74.16763088	1.2
F06	7/15/2022	8:48:12	571236.08	4407254.98	39.81229112	-74.16773981	1.1
F06	7/15/2022	8:49:11	571222.67	4407252.17	39.81226688	-74.16789675	1.2
F06	7/15/2022	8:50:27	571206.97	4407255.04	39.81229409	-74.16807982	1.1
F06	7/15/2022	8:51:39	571197.93	4407254.06	39.81228598	-74.16818559	1.1
F06	7/15/2022	8:52:54	571184.68	4407255.3	39.81229827	-74.16834015	1.3
F06	7/15/2022	8:53:48	571175.9	4407254.33	39.81229031	-74.16844292	1.1
F06	7/15/2022	8:56:07	571147.3	4407254.21	39.81229162	-74.16877696	1.0
F06	7/15/2022	8:57:06	571135.79	4407256.19	39.81231039	-74.16891119	0.9
F06	7/15/2022	8:58:02	571129.27	4407258.52	39.8123319	-74.16898713	0.9
F06	7/15/2022	8:58:52	571123.09	4407258.63	39.81233343	-74.16905934	0.8
F06	7/15/2022	9:00:00	571109.14	4407252.63	39.81228052	-74.16922291	0.8
F07	7/15/2022	9:06:35	571108.75	4407200.41	39.81181013	-74.16923319	1.5
F07	7/15/2022	9:07:55	571122.37	4407195.71	39.81176663	-74.1690746	1.8
F07	7/15/2022	9:09:57	571144.92	4407198.01	39.81178545	-74.16881095	1.8
F07	7/15/2022	9:11:50	571162.32	4407198.95	39.81179248	-74.16860756	1.7
F07	7/15/2022	9:13:11	571162.28	4407194.6	39.81175331	-74.16860851	1.7
F07	7/15/2022	9:14:56	571185.72	4407193	39.81173692	-74.16833487	1.6
F07	7/15/2022	9:16:46	571214.08	4407186.76	39.81167836	-74.16800423	1.7
F07	7/15/2022	9:18:12	571225.95	4407184.76	39.8116593	-74.16786578	1.8
F07	7/15/2022	9:19:51	571254.74	4407195.24	39.81175131	-74.16752833	1.6
F07	7/15/2022	9:20:24	571268.8	4407192.57	39.81172606	-74.1673643	1.8
F08	7/15/2022	9:29:10	571076.22	4407173.64	39.81157164	-74.16961611	2.2
F08	7/15/2022	9:31:27	571116.76	4407171.9	39.81155259	-74.16914274	2.2
F08	7/15/2022	9:33:32	571149.71	4407167.79	39.81151284	-74.16875824	2.1
F08	7/15/2022	9:35:16	571171.9	4407162.48	39.81146312	-74.16849954	2.0
F08	7/15/2022	9:37:04	571203.89	4407160.64	39.81144389	-74.16812611	2.0
F08	7/15/2022	9:39:33	571237.49	4407148.84	39.81133473	-74.16773488	1.9
F09	7/15/2022	9:49:08	571205.03	4407099.78	39.81089548	-74.16811938	2.1
F09	7/15/2022	9:50:50	571188.5	4407106.67	39.8109589	-74.16831171	2.2
F09	7/15/2022	9:52:02	571183.68	4407116.33	39.81104632	-74.16836697	2.1
F09	7/15/2022	9:53:36	571164.93	4407113.99	39.81102684	-74.16858628	2.2
F09	7/15/2022	9:54:48	571150.66	4407116.69	39.81105233	-74.16875272	2.2
F09	7/15/2022	10:00:03	571096.51	4407129	39.81116781	-74.16938395	2.2
F09	7/15/2022	10:02:51	571060.33	4407134.92	39.81122415	-74.16980592	2.3
BP01	7/15/2022	10:45:54	571299.6	4406642.25	39.80676556	-74.16706439	1.4
BP01	7/15/2022	10:49:55	571243.21	4406647.23	39.80681521	-74.16772251	1.2
BP01	7/15/2022	10:51:45	571216.57	4406643.15	39.8067807	-74.16803416	1.1
BP01	7/15/2022	10:53:33	571195.88	4406642.34	39.80677511	-74.16827597	1.1
BP01	7/15/2022	10:55:46	571178.58	4406646.67	39.80681559	-74.16847758	1.1
BP01	7/15/2022	10:58:07	571148.06	4406647.54	39.80682599	-74.16883394	1.1
BP01	7/15/2022	10:59:48	571137.75	4406655.51	39.80689858	-74.16895354	1.0

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
BP01	7/15/2022	11:01:32	571117.01	4406645.44	39.80680961	-74.16919687	1.1
BP01	7/15/2022	11:03:36	571090.03	4406643.68	39.80679599	-74.16951221	1.0
BP01	7/15/2022	11:05:41	571067.06	4406648.27	39.80683927	-74.16978003	1.0
BP02	7/15/2022	11:28:27	571003.53	4406608.41	39.80648547	-74.17052641	0.9
BP02	7/15/2022	11:29:53	571026.97	4406593.65	39.80635059	-74.17025429	0.9
BP02	7/15/2022	11:30:56	571042.65	4406590.73	39.80632291	-74.17007143	1.4
BP02	7/15/2022	11:34:42	571103.09	4406602.97	39.80642819	-74.16936408	1.2
BP02	7/15/2022	11:36:52	571141.82	4406598.03	39.80638039	-74.16891215	1.5
BP02	7/15/2022	11:38:42	571176.8	4406599.45	39.80639033	-74.16850349	1.5
BP02	7/15/2022	11:40:19	571211.25	4406599.52	39.80638806	-74.16810107	1.3
BP02	7/15/2022	11:42:06	571246.05	4406599.56	39.80638551	-74.16769454	1.1
BP02	7/15/2022	11:43:15	571270.59	4406601.23	39.8063985	-74.16740773	1.3
BP06	7/15/2022	14:06:28	570907.61	4406424.64	39.80483793	-74.17166671	1.1
BP06	7/15/2022	14:08:18	570946.23	4406428.67	39.80487097	-74.17121519	1.3
BP06	7/15/2022	14:10:45	570995.89	4406422.6	39.80481218	-74.17063577	1.6
BP06	7/15/2022	14:12:51	571034.34	4406416.89	39.80475752	-74.17018724	1.2
BP06	7/15/2022	14:15:08	571072.44	4406410.56	39.80469724	-74.169743	1.5
BP06	7/15/2022	14:17:52	571114.14	4406403.18	39.80462734	-74.16925665	1.6
BP06	7/15/2022	14:20:29	571153.41	4406395.08	39.80455102	-74.16879889	1.8
BP06	7/15/2022	14:22:34	571185.13	4406391.98	39.8045205	-74.16842871	1.9
BP06	7/15/2022	14:26:30	571239.54	4406376.03	39.80437224	-74.16779487	2.1
BP07	7/15/2022	14:35:02	571034.46	4406282.89	39.80355025	-74.17020045	2.0
BP07	7/15/2022	14:36:37	571018.22	4406276.94	39.803498	-74.17039071	2.1
BP07	7/15/2022	14:38:09	571031.66	4406284.8	39.80356767	-74.17023292	2.0
BP07	7/15/2022	14:39:47	571018.07	4406297.36	39.80368198	-74.17039032	2.0
BP07	7/15/2022	14:41:43	571005.36	4406306.83	39.80376837	-74.17053772	1.8
BP07	7/15/2022	14:42:17	571001.18	4406307.45	39.80377429	-74.17058642	1.7
BP07	7/15/2022	14:43:01	570999.91	4406312.4	39.80381898	-74.17060076	1.3
BP07	7/15/2022	14:45:56	570981.15	4406330.46	39.80398327	-74.17081791	0.8
BP07	7/15/2022	14:47:23	570975.12	4406332.16	39.80399913	-74.17088816	1.4
BP07	7/15/2022	14:49:44	570963.21	4406347.49	39.80413816	-74.17102569	1.3
BP07	7/15/2022	14:52:37	570943.4	4406362.21	39.80427246	-74.17125544	1.5
BP07	7/15/2022	14:54:35	570930.94	4406372.64	39.80436748	-74.17139983	1.2
BP07	7/15/2022	14:56:13	570915.64	4406383.36	39.80446535	-74.17157746	1.2
BP07	7/15/2022	14:56:56	570903.99	4406389.7	39.8045234	-74.17171286	1.1
BP07	7/15/2022	14:59:16	570877.76	4406412.14	39.80472777	-74.17201681	1.0
BP07	7/15/2022	15:01:02	570864.29	4406422.31	39.80482048	-74.172173	0.8
BP07	7/15/2022	15:03:04	570850.9	4406434.88	39.80493488	-74.172328	0.8
BP08	7/15/2022	15:11:44	570870.79	4406408.21	39.80469294	-74.17209855	0.6
BP08	7/15/2022	15:13:00	570886.27	4406388.96	39.80451822	-74.17191992	0.9
BP08	7/15/2022	15:15:29	570928.55	4406351.67	39.80417871	-74.17143004	1.1
BP08	7/15/2022	15:17:21	570952.28	4406326.17	39.80394704	-74.17115558	1.1
BP08	7/15/2022	15:19:03	570984.32	4406297.81	39.80368882	-74.17078442	1.8
BP09	7/15/2022	15:29:25	570831.53	4406414.09	39.80474919	-74.1725565	0.6
BP09	7/15/2022	15:33:00	570891.15	4406344.34	39.80411586	-74.1718677	1.7
BP09	7/15/2022	15:34:03	570907.93	4406327.53	39.80396297	-74.17167356	1.1
BP09	7/15/2022	15:35:08	570922.24	4406311.69	39.80381911	-74.17150812	1.0
BP09	7/15/2022	15:36:43	570950.87	4406291.31	39.80363305	-74.17117584	1.8
BP09	7/15/2022	15:38:21	570973.66	4406262.49	39.80337152	-74.17091277	2.0
BP10	7/15/2022	15:48:38	570805.76	4406406.61	39.80468395	-74.17285834	0.6
BP10	7/15/2022	15:51:41	570851.53	4406370.22	39.80435229	-74.17232772	0.8

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
BP10	7/15/2022	15:52:38	570865.8	4406355.6	39.80421941	-74.17216263	0.9
BP10	7/15/2022	15:53:35	570881.46	4406343.29	39.80410713	-74.17198097	1.0
BP10	7/15/2022	15:56:24	570907.19	4406312.99	39.80383206	-74.17168371	1.1
BP10	7/15/2022	15:58:05	570929.87	4406289.29	39.8036166	-74.17142137	1.7
BP10	7/15/2022	15:59:09	570941.43	4406274.13	39.8034791	-74.17128804	1.9
F10	7/16/2022	7:09:27	570984.08	4407054.04	39.81050187	-74.17070539	0.6
F10	7/16/2022	7:11:42	570970	4407078.72	39.8107254	-74.17086717	0.6
F10	7/16/2022	7:12:16	570968.13	4407088.23	39.8108112	-74.17088797	0.8
F10	7/16/2022	7:13:40	570967.88	4407114.53	39.81104822	-74.17088813	1.8
F10	7/16/2022	7:14:22	570971.38	4407127.27	39.81116264	-74.17084578	2.5
F10	7/16/2022	7:15:13	570973.51	4407135.32	39.81123506	-74.17082006	2.5
F10	7/16/2022	7:16:51	570995.15	4407157.25	39.81143075	-74.17056486	1.4
F10	7/16/2022	7:17:47	571013.74	4407167.61	39.81152256	-74.17034662	0.8
F10	7/16/2022	7:19:43	571041.33	4407190.9	39.81173007	-74.17002176	0.7
F10	7/16/2022	7:21:12	571058.49	4407202.85	39.8118363	-74.16982006	0.7
F10	7/16/2022	7:23:29	571089.04	4407223.37	39.81201866	-74.16946096	0.8
F10	7/16/2022	7:24:40	571088.12	4407219.12	39.81198042	-74.16947211	0.7
F10	7/16/2022	7:26:25	571057.51	4407223.58	39.81202316	-74.16982928	0.5
F10	7/16/2022	7:27:09	571054.78	4407237.38	39.8121477	-74.1698596	0.5
F10	7/16/2022	7:28:47	571071.22	4407254.96	39.81230471	-74.16966564	0.5
F10	7/16/2022	7:29:43	571075.38	4407259.77	39.81234772	-74.1696165	0.5
F10	7/16/2022	7:32:16	571097.54	4407292.62	39.81264179	-74.16935417	0.5
F10	7/16/2022	7:35:28	571133.32	4407330.04	39.81297591	-74.16893203	0.5
F10	7/16/2022	7:37:10	571153.87	4407346.42	39.8131218	-74.16869023	0.5
F10	7/16/2022	7:39:13	571175.85	4407371.48	39.81334574	-74.16843076	0.5
F10	7/16/2022	7:41:45	571205.25	4407397.76	39.81358001	-74.16808447	0.5
F10	7/16/2022	7:43:08	571219.08	4407412.65	39.81371301	-74.16792126	0.5
F10	7/16/2022	7:44:53	571240.6	4407427.42	39.81384428	-74.16766827	0.5
BP15-A	7/16/2022	8:02:05	570976.42	4406602.83	39.80643753	-74.17084373	0.8
BP15-A	7/16/2022	8:05:49	570953.76	4406609.85	39.80650263	-74.17110759	0.8
BP15-A	7/16/2022	8:06:43	570951.54	4406626.88	39.80665622	-74.17113176	0.7
BP15-A	7/16/2022	8:08:14	570955.44	4406648.78	39.80685324	-74.17108376	0.6
BP15-A	7/16/2022	8:10:01	570965.37	4406667.87	39.80702438	-74.17096574	0.7
BP15-A	7/16/2022	8:11:09	570966.26	4406685.28	39.8071811	-74.17095346	0.6
BP03	7/16/2022	8:18:40	570983.38	4406581.03	39.80624047	-74.17076479	0.8
BP03	7/16/2022	8:19:51	570998.26	4406570.11	39.80614086	-74.17059211	0.7
BP03	7/16/2022	8:23:01	571065.05	4406566.67	39.80610432	-74.1698124	1.1
BP03	7/16/2022	8:27:39	571158.79	4406557.59	39.80601464	-74.16871837	1.5
BP15-B	7/16/2022	9:11:39	570925.35	4406568.95	39.80613652	-74.17144391	0.8
BP15-B	7/16/2022	9:14:20	570909.97	4406543.84	39.80591156	-74.1716263	0.7
BP15-B	7/16/2022	9:16:19	570900.17	4406517.47	39.80567482	-74.17174363	0.7
BP15-B	7/16/2022	9:18:00	570895.18	4406507.73	39.80558747	-74.171803	0.8
BP15-B	7/16/2022	9:20:43	570878.31	4406508.54	39.80559621	-74.17199995	0.5
BP15-B	7/16/2022	9:24:56	570839	4406486.35	39.80539957	-74.17246145	0.7
BP15-B	7/16/2022	9:27:41	570826.71	4406464.81	39.80520651	-74.17260733	0.7
BP15-B	7/16/2022	9:31:23	570803.56	4406437.14	39.80495919	-74.17288076	0.6
BP15-B	7/16/2022	9:34:47	570788.44	4406409.75	39.80471368	-74.17306032	0.7
BP15-B	7/16/2022	9:37:08	570772.93	4406396.13	39.80459225	-74.17324303	0.6
BP15-B	7/16/2022	9:39:42	570758.22	4406376.87	39.80441999	-74.17341686	0.7
BP15-B	7/16/2022	9:42:55	570739.03	4406354.62	39.80422111	-74.17364338	0.7
BP15-B	7/16/2022	9:46:38	570712.27	4406322.8	39.80393669	-74.17395946	0.7

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
BP15-B	7/16/2022	9:48:02	570703.72	4406309.17	39.80381462	-74.17406083	0.6
BP15-B	7/16/2022	9:48:53	570696.54	4406305.08	39.80377835	-74.1741451	0.6
LD19	7/16/2022	10:09:48	570522.9	4406146.11	39.80236054	-74.17619033	0.6
LD19	7/16/2022	10:13:00	570506.1	4406122.42	39.80214848	-74.17638919	0.6
LD19	7/16/2022	10:14:20	570496.41	4406111.41	39.8020501	-74.17650348	0.9
LD19	7/16/2022	10:16:49	570486.63	4406086.04	39.80182238	-74.17662053	0.6
LD19	7/16/2022	10:19:06	570474.89	4406058.91	39.80157896	-74.17676055	1.0
LD19	7/16/2022	10:24:39	570435.2	4406003.42	39.80108233	-74.17723009	0.8
LD19	7/16/2022	10:26:48	570412.4	4405993.12	39.80099136	-74.17749743	0.6
LD19	7/16/2022	10:30:11	570378.07	4405971.77	39.80080186	-74.17790079	0.7
LD19	7/16/2022	10:32:54	570364	4405940.89	39.80052487	-74.17806837	0.9
LD19	7/16/2022	10:40:06	570296.72	4405895.34	39.80012002	-74.17885912	1.1
LD19	7/16/2022	10:46:38	570267.29	4405840.37	39.79962728	-74.17920877	0.8
LD19	7/16/2022	10:51:04	570241.09	4405775.69	39.79904674	-74.17952168	0.9
LD19	7/16/2022	10:52:46	570221.42	4405757.66	39.79888585	-74.17975334	1.5
LD19	7/16/2022	10:53:36	570208.91	4405745.81	39.79878015	-74.17990079	2.1
LD19	7/16/2022	10:54:41	570196.72	4405727.33	39.79861468	-74.18004509	1.2
BP04	7/16/2022	13:53:56	570916.86	4406524.39	39.80573578	-74.17154792	0.8
BP04	7/16/2022	13:55:24	570945.49	4406528.24	39.80576808	-74.17121308	1.0
BP04	7/16/2022	13:58:03	570988.52	4406531.58	39.80579459	-74.17071005	1.0
BP04	7/16/2022	13:59:48	571029.26	4406531.28	39.80578845	-74.17023426	1.4
BP04	7/16/2022	14:01:36	571066.29	4406523.61	39.8057163	-74.16980247	1.5
BP04	7/16/2022	14:03:38	571096.72	4406527.16	39.80574572	-74.16944675	1.3
BP04	7/16/2022	14:06:25	571162.76	4406520.04	39.80567606	-74.16867601	1.4
BP04	7/16/2022	14:08:21	571200.26	4406517.97	39.80565424	-74.16823822	1.5
BP04	7/16/2022	14:11:01	571246.15	4406511.91	39.80559579	-74.16770283	1.5
BP05	7/16/2022	14:19:27	571259.84	4406457.28	39.80510248	-74.16754891	1.6
BP05	7/16/2022	14:21:37	571229.41	4406462.18	39.80514919	-74.1679038	1.7
BP05	7/16/2022	14:23:54	571188.94	4406465.86	39.8051857	-74.16837611	1.7
BP05	7/16/2022	14:25:02	571166.37	4406469.12	39.80521699	-74.16863944	1.5
BP05	7/16/2022	14:30:16	571050.05	4406473.05	39.80526216	-74.16999776	1.7
BP05	7/16/2022	14:32:24	571005.89	4406477.77	39.80530834	-74.17051304	1.5
BP05	7/16/2022	14:33:28	570985.68	4406478.52	39.80531681	-74.17074906	1.4
BP05	7/16/2022	14:35:09	570950.82	4406479.86	39.80533175	-74.17115607	1.0
BP05	7/16/2022	14:36:22	570927.04	4406482.95	39.80536161	-74.17143347	0.8
BP05	7/16/2022	14:37:01	570914.53	4406483.77	39.80537	-74.17157951	0.9
BP05	7/16/2022	14:39:08	570881.52	4406490.29	39.80543156	-74.17196446	0.7
BP12	7/16/2022	14:52:10	570921.74	4406241.28	39.80318479	-74.17152148	2.0
BP12	7/16/2022	14:53:40	570896.79	4406257.6	39.80333387	-74.17181123	1.6
BP12	7/16/2022	14:55:41	570865.16	4406287.76	39.80360825	-74.17217738	1.0
BP12	7/16/2022	14:56:46	570848.35	4406303.08	39.80374771	-74.17237209	1.2
BP12	7/16/2022	14:58:09	570824.72	4406322.39	39.80392363	-74.17264606	0.9
BP13	7/16/2022	15:12:17	570893.15	4406220.07	39.80299609	-74.17185776	2.0
BP13	7/16/2022	15:15:20	570857.85	4406235.15	39.8031349	-74.17226848	1.6
BP13	7/16/2022	15:18:29	570807.68	4406277.54	39.80352095	-74.17284983	1.0
BP13	7/16/2022	15:19:04	570798.04	4406284.17	39.80358147	-74.17296177	0.8
BP13	7/16/2022	15:21:20	570763.96	4406312.64	39.80384079	-74.17335682	0.7
LD04	7/17/2022	7:09:10	570631.86	4405876.27	39.79992049	-74.17494674	2.0
LD04	7/17/2022	7:10:01	570612.32	4405887.22	39.80002071	-74.17517376	1.9
LD04	7/17/2022	7:11:01	570592.89	4405902.09	39.80015631	-74.17539915	1.8
LD04	7/17/2022	7:11:52	570575.79	4405913.46	39.8002602	-74.17559765	1.5



TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
LD04	7/17/2022	7:13:55	570541.43	4405940.66	39.80050811	-74.175996	1.1
LD04	7/17/2022	7:15:23	570510.75	4405953.19	39.80062353	-74.17635301	0.9
LD04	7/17/2022	7:17:13	570477.79	4405984.15	39.80090519	-74.17673463	0.8
LD04	7/17/2022	7:18:02	570459.04	4405995.2	39.80100627	-74.17695245	0.7
LD05	7/17/2022	7:19:05	570450.67	4406002.55	39.80107319	-74.17704949	1.0
LD05	7/17/2022	7:19:23	570450.68	4406002.71	39.80107466	-74.17704929	1.0
LD05	7/17/2022	7:20:58	570445.64	4405990.87	39.8009684	-74.17710952	0.7
LD05	7/17/2022	7:23:50	570477.57	4405957.42	39.80066437	-74.17674008	0.8
LD05	7/17/2022	7:24:45	570493.03	4405947.06	39.80056978	-74.17656067	0.9
LD05	7/17/2022	7:26:39	570527.24	4405915.05	39.80027858	-74.17616459	1.5
LD05	7/17/2022	7:27:26	570545.01	4405903.03	39.80016876	-74.17595832	1.6
LD05	7/17/2022	7:28:41	570571.57	4405881.32	39.79997098	-74.17565034	1.7
LD05	7/17/2022	7:29:24	570581.66	4405870.96	39.79987677	-74.17553371	1.8
LD05	7/17/2022	7:31:14	570610.22	4405849.49	39.79968101	-74.17520244	2.0
LD06	7/17/2022	7:44:35	570633.68	4405801.59	39.79924749	-74.17493358	2.1
LD06	7/17/2022	7:45:53	570616.78	4405807.97	39.79930638	-74.17513022	2.1
LD06	7/17/2022	7:46:25	570609.43	4405811.01	39.79933436	-74.17521574	2.1
LD06	7/17/2022	7:48:26	570582.8	4405828.6	39.79949507	-74.17552487	2.0
LD06	7/17/2022	7:50:10	570558.12	4405838.7	39.7995881	-74.17581208	1.8
LD06	7/17/2022	7:52:34	570515.13	4405866.74	39.79984428	-74.1763112	1.6
LD06	7/17/2022	7:53:51	570496.97	4405878.82	39.79995466	-74.17652201	1.6
LD06	7/17/2022	7:55:10	570476.43	4405886.07	39.8000217	-74.1767611	1.5
LD06	7/17/2022	7:56:43	570453.56	4405898.65	39.80013686	-74.17702687	1.0
LD06	7/17/2022	7:57:41	570440.26	4405908.44	39.80022623	-74.1771812	1.0
LD06	7/17/2022	7:59:04	570418.6	4405917.68	39.80031119	-74.17743321	0.9
LD06	7/17/2022	8:00:00	570404.92	4405925.11	39.80037927	-74.17759211	0.8
LD06	7/17/2022	8:00:57	570384.31	4405931.27	39.80043651	-74.17783222	0.8
LD06	7/17/2022	8:01:59	570366.03	4405946.56	39.80057576	-74.17804414	0.7
LD07	7/17/2022	8:03:31	570374.03	4405941.38	39.8005284	-74.17795123	0.8
LD07	7/17/2022	8:05:26	570394.84	4405915.63	39.80029469	-74.17771096	0.8
LD07	7/17/2022	8:07:12	570427.53	4405893.66	39.80009411	-74.17733146	0.9
LD07	7/17/2022	8:08:07	570446.5	4405885.48	39.80001887	-74.17711072	1.5
LD07	7/17/2022	8:09:16	570465.97	4405873.75	39.79991154	-74.17688462	1.6
LD07	7/17/2022	8:10:05	570483.97	4405866.52	39.79984495	-74.17667519	1.7
LD07	7/17/2022	8:11:30	570516.86	4405843.51	39.79963491	-74.17629344	1.8
LD07	7/17/2022	8:13:16	570548.86	4405826.43	39.79947837	-74.17592152	1.9
LD07	7/17/2022	8:15:09	570584.5	4405799.14	39.79922956	-74.17550824	2.1
LD03	7/17/2022	8:27:59	570642.51	4405943.41	39.80052443	-74.17481515	1.9
LD03	7/17/2022	8:29:21	570629.15	4405952.49	39.80060736	-74.17497017	1.7
LD03	7/17/2022	8:31:48	570595.05	4405974.63	39.80080966	-74.17536615	1.5
LD03	7/17/2022	8:34:06	570558.43	4405986.62	39.80092071	-74.17579255	1.7
LD03	7/17/2022	8:34:56	570545.05	4405992.41	39.800974	-74.17594821	1.8
LD03	7/17/2022	8:37:50	570505.04	4406013	39.80116287	-74.17641327	1.4
LD03	7/17/2022	8:39:56	570469.57	4406029.64	39.80131567	-74.17682581	1.2
LD02	7/17/2022	8:41:37	570475.62	4406061.58	39.80160293	-74.17675166	0.9
LD02	7/17/2022	8:43:30	570515.62	4406071.92	39.80169279	-74.17628344	0.7
LD02	7/17/2022	8:45:50	570551.91	4406041.02	39.80141137	-74.1758628	1.1
LD02	7/17/2022	8:48:13	570595.14	4406023.84	39.80125303	-74.17535977	1.0
LD02	7/17/2022	8:50:08	570631.65	4405994.21	39.80098302	-74.17493649	1.4
LD02	7/17/2022	8:51:12	570647.8	4405983.59	39.80088604	-74.174749	1.5
LD02	7/17/2022	8:51:41	570656.69	4405976.57	39.800822	-74.17464599	1.5

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
LD02	7/17/2022	8:53:58	570690.91	4405955.46	39.80062905	-74.17424851	1.8
LD02	7/17/2022	8:55:07	570714.37	4405944.99	39.8005327	-74.17397563	1.9
BP14	7/17/2022	9:21:39	570733.69	4406294.31	39.80367821	-74.17371231	0.7
BP14	7/17/2022	9:24:22	570764.28	4406259.19	39.80335926	-74.1733588	0.7
BP14	7/17/2022	9:27:24	570810.31	4406219.17	39.80299488	-74.17282546	1.1
BP14	7/17/2022	9:29:03	570834.97	4406208.24	39.80289436	-74.17253861	1.7
BP14	7/17/2022	9:30:35	570847.87	4406188.44	39.8027149	-74.17239007	1.8
LD01	7/17/2022	9:41:16	570714.25	4405993.95	39.80097385	-74.17397182	1.6
LD01	7/17/2022	9:42:25	570698.08	4406008.02	39.80110194	-74.1741591	1.4
LD01	7/17/2022	9:44:07	570677.79	4406025.44	39.80126055	-74.17439421	1.1
LD01	7/17/2022	9:45:51	570654.08	4406037.44	39.80137062	-74.17466983	1.1
LD01	7/17/2022	9:47:48	570623.17	4406056.86	39.80154814	-74.17502886	1.1
LD01	7/17/2022	9:49:02	570604.61	4406068.59	39.80165536	-74.17524438	1.2
LD01	7/17/2022	9:49:59	570593.11	4406076.73	39.80172971	-74.1753778	0.9
LD01	7/17/2022	9:51:41	570563.26	4406090.74	39.80185837	-74.17572498	0.9
LD01	7/17/2022	9:52:33	570554.36	4406100.46	39.80194664	-74.17582779	0.7
LD01	7/17/2022	9:53:50	570531.98	4406110.6	39.80203987	-74.17608817	0.6
LD08	7/17/2022	10:05:45	570333.62	4405902.94	39.80018548	-74.1784273	0.9
LD08	7/17/2022	10:07:12	570345.64	4405888.92	39.80005818	-74.1782884	0.9
LD08	7/17/2022	10:09:21	570370.3	4405876.88	39.79994768	-74.17800173	1.5
LD08	7/17/2022	10:12:06	570401.24	4405853.59	39.79973524	-74.17764279	1.8
LD08	7/17/2022	10:13:44	570434.74	4405847.23	39.79967518	-74.17725227	1.8
LD08	7/17/2022	10:15:56	570467.83	4405830.68	39.7995234	-74.17686747	1.8
LD08	7/17/2022	10:18:17	570495.75	4405811.14	39.79934499	-74.17654349	2.0
LD08	7/17/2022	10:19:53	570531.15	4405806.82	39.79930316	-74.17613055	1.9
LD08	7/17/2022	10:20:36	570543.57	4405796.62	39.79921026	-74.1759865	2.0
LD08	7/17/2022	10:21:44	570550.03	4405789.67	39.79914704	-74.17591185	2.0
LD08	7/17/2022	10:25:06	570588.13	4405762.19	39.79889631	-74.17546981	2.2
LD09	7/17/2022	10:35:10	570295.79	4405870.2	39.79989362	-74.17887272	0.8
LD09	7/17/2022	10:36:38	570313.46	4405859.09	39.79979209	-74.17866746	1.4
LD09	7/17/2022	10:38:10	570335.06	4405840.62	39.79962391	-74.17841716	1.5
LD09	7/17/2022	10:39:18	570356.95	4405833.57	39.7995586	-74.17816223	1.6
LD09	7/17/2022	10:40:28	570373.66	4405819.19	39.79942762	-74.17796859	1.8
LD09	7/17/2022	10:41:29	570383.13	4405810.36	39.79934731	-74.17785896	1.7
LD10	7/17/2022	10:53:41	570389.4	4405739.61	39.79870936	-74.17779327	1.8
LD10	7/17/2022	10:54:45	570366.64	4405749.29	39.79879845	-74.17805812	1.7
LD10	7/17/2022	10:56:40	570338.08	4405770.24	39.79898958	-74.17838944	1.3
LD10	7/17/2022	10:58:22	570319.6	4405785.19	39.79912583	-74.17860364	1.1
LD10	7/17/2022	11:00:06	570285.75	4405803.2	39.79929089	-74.1789971	0.9
LD11	7/17/2022	11:06:32	570245.94	4405775.56	39.79904508	-74.17946507	0.9
LD11	7/17/2022	11:08:02	570254.19	4405773.32	39.79902422	-74.17936893	0.8
LD11	7/17/2022	11:10:20	570292.08	4405748.56	39.79879803	-74.178929	0.8
LD11	7/17/2022	11:13:14	570331.85	4405731.79	39.79864372	-74.17846634	1.2
LD11	7/17/2022	11:15:46	570363.72	4405712.95	39.79847136	-74.17809607	1.4
LD12	7/17/2022	11:24:14	570195.46	4405706.81	39.79842987	-74.18006202	1.5
LD12	7/17/2022	11:26:20	570224.11	4405694.3	39.79831484	-74.17972875	1.6
LD12	7/17/2022	11:29:52	570274.55	4405663.7	39.79803496	-74.17914288	1.5
LD12	7/17/2022	11:31:40	570304.03	4405647.05	39.79788251	-74.17880036	2.0
LD12	7/17/2022	11:33:23	570339.56	4405635.87	39.79777893	-74.17838652	2.0
LD12	7/17/2022	11:34:55	570357.3	4405617.9	39.79761549	-74.17818135	2.1
LD12	7/17/2022	11:36:28	570392.28	4405604.21	39.79748927	-74.17777418	2.1

TransectID	Date	Time	X_UTM18N_m	Y_UTM18N_m	Latitude_WGS84	Longitude_WGS84	Depth_m
LD12	7/17/2022	11:38:19	570408.74	4405593.8	39.79739411	-74.17758308	2.2
LD13	7/17/2022	11:43:58	570419.01	4405545.35	39.79695684	-74.17746831	2.2
LD13	7/17/2022	11:45:13	570399.39	4405559.1	39.79708232	-74.17769596	2.2
LD13	7/17/2022	11:46:55	570359.14	4405579.86	39.79727267	-74.17816387	2.2
LD13	7/17/2022	11:48:12	570338.64	4405594.17	39.79740331	-74.17840178	2.1
LD13	7/17/2022	11:49:24	570318.37	4405602.73	39.79748212	-74.17863757	1.6
LD13	7/17/2022	11:54:41	570223.3	4405661.79	39.798022	-74.17974167	1.8
LD18	7/17/2022	12:34:19	570190.6	4405727.71	39.7986186	-74.18011653	1.8
LD18	7/17/2022	12:36:39	570182.02	4405709.39	39.79845425	-74.18021872	1.5
LD18	7/17/2022	12:39:03	570158.57	4405675.38	39.7981498	-74.18049625	0.9
LD18	7/17/2022	12:42:17	570119.72	4405662.21	39.79803436	-74.18095134	1.1
LD18	7/17/2022	12:43:22	570108.99	4405646.33	39.79789215	-74.18107842	1.0
LD18	7/17/2022	12:46:28	570109.34	4405605.13	39.79752094	-74.1810787	1.0
LD18	7/17/2022	12:48:26	570127.85	4405587.81	39.7973634	-74.18086439	1.8
LD18	7/17/2022	12:50:17	570130.03	4405569.09	39.79719459	-74.18084091	1.5
LD18	7/17/2022	12:52:00	570129.75	4405557.18	39.79708733	-74.18084551	0.9
LD18	7/17/2022	12:56:26	570128.37	4405521.41	39.79676515	-74.18086541	0.9
LD17	7/17/2022	13:02:49	570149.24	4405525.53	39.79680053	-74.18062125	1.3
LD17	7/17/2022	13:03:54	570162.8	4405511.76	39.79667539	-74.18046434	1.6
LD17	7/17/2022	13:05:50	570188.4	4405495.65	39.79652813	-74.18016703	2.0
LD17	7/17/2022	13:07:30	570206.7	4405483.14	39.79641393	-74.17995466	2.2
LD16	7/17/2022	13:13:04	570210.37	4405527.25	39.79681102	-74.17990711	1.8
LD16	7/17/2022	13:16:31	570170.66	4405555.5	39.79706876	-74.18036787	1.9
LD16	7/17/2022	13:17:43	570155.17	4405567.53	39.79717846	-74.18054742	1.7
LD16	7/17/2022	13:18:55	570138.64	4405580.95	39.7973007	-74.18073909	1.8
LD16	7/17/2022	13:19:23	570131.22	4405584.67	39.79733486	-74.18082539	1.8
LD14	7/17/2022	13:31:48	570177.22	4405674.16	39.79813727	-74.18027853	1.4
LD14	7/17/2022	13:34:17	570210.43	4405657.93	39.79798831	-74.17989239	2.0
LD14	7/17/2022	13:36:06	570220.13	4405643.18	39.79785462	-74.17978067	2.0
LD14	7/17/2022	13:37:53	570236.12	4405627.44	39.79771149	-74.1795956	1.8
LD14	7/17/2022	13:38:56	570252.78	4405617.78	39.79762309	-74.17940205	1.9
LD14	7/17/2022	13:42:14	570296.49	4405595.78	39.79742128	-74.1788939	2.1
LD14	7/17/2022	13:44:34	570315.79	4405569.66	39.79718436	-74.17867128	1.9
LD14	7/17/2022	13:46:09	570337.85	4405556.56	39.79706452	-74.17841504	2.0
LD14	7/17/2022	13:47:45	570361.99	4405544.72	39.79695585	-74.17813437	1.9
LD14	7/17/2022	13:49:34	570383.23	4405530.82	39.79682887	-74.17788779	2.0
LD14	7/17/2022	13:50:34	570399.08	4405527.69	39.79679936	-74.17770301	2.0
LD15	7/17/2022	13:57:00	570350.93	4405524.46	39.79677424	-74.17826572	1.7
LD15	7/17/2022	13:58:11	570335.9	4405529.22	39.79681837	-74.17844075	1.8
LD15	7/17/2022	13:59:42	570302.25	4405540.57	39.7969234	-74.17883254	1.5
LD15	7/17/2022	14:00:50	570280.3	4405554.84	39.79705378	-74.17908738	1.7
LD15	7/17/2022	14:02:08	570250.04	4405566.21	39.79715868	-74.17943958	1.4
LD15	7/17/2022	14:03:23	570222.15	4405572.6	39.7972186	-74.17976461	1.2
LD15	7/17/2022	14:05:36	570182.58	4405608.62	39.79754637	-74.18022296	1.1
LD15	7/17/2022	14:06:04	570174.13	4405615.16	39.79760597	-74.1803209	0.9
LD15	7/17/2022	14:07:38	570142.93	4405632.42	39.79776403	-74.18068352	0.9

## Attachment B – Video Analysis Results

Notes:

IND=Indeterminate

N/A=Not Applicable

SAV=Submerged Aquatic Vegetation



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP02-A	7/13/2022	12:03:39	Start	Start	Macroalgae - Patchy	Start	None	Zostera
IBSP	IBSP02-A	7/13/2022	12:03:54	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP02-A	7/13/2022	12:03:55	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:07:04	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:07:05	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:08:07	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:08:08	-	Start	None	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:10:39	-	End	None	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:10:40	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:11:34	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:11:35	-	Start	None	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:12:35	-	End	None	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:12:36	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:12:51	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:12:52	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:14:32	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:14:33	-	Start	None	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:15:41	-	End	None	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:15:42	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:15:56	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:15:57	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:16:21	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:16:22	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:17:05	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:17:06	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP02-A	7/13/2022	12:17:22	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP02-A	7/13/2022	12:17:23	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:19:09	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:19:10	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP02-A	7/13/2022	12:19:15	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP02-A	7/13/2022	12:19:16	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:19:21	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:19:22	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP02-A	7/13/2022	12:19:37	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-A	7/13/2022	12:19:51	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-A	7/13/2022	12:19:53	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP02-A	7/13/2022	12:19:54	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:21:48	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:21:49	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:22:09	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:22:10	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:24:17	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:24:18	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP02-A	7/13/2022	12:24:32	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP02-A	7/13/2022	12:24:33	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:24:39	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:24:40	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:27:19	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:27:20	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:27:33	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:27:34	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:34:17	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:34:18	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:38:24	-	-	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP02-A	7/13/2022	12:38:25	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:41:13	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:41:14	-	-	Macroalgae - Complete	Start	None	N/A
IBSP	IBSP02-A	7/13/2022	12:42:26	-	-	Macroalgae - Complete	End	None	N/A
IBSP	IBSP02-A	7/13/2022	12:42:27	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:42:36	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:42:37	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:42:54	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:42:55	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP02-A	7/13/2022	12:43:12	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP02-A	7/13/2022	12:43:13	-	Start	Macroalgae - Complete	Start	None	N/A
IBSP	IBSP02-A	7/13/2022	12:43:14	-	-	Macroalgae - Complete	End	None	N/A
IBSP	IBSP02-A	7/13/2022	12:43:15	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:45:03	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:45:04	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:46:46	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:46:47	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP02-A	7/13/2022	12:47:23	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP02-A	7/13/2022	12:47:24	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP02-A	7/13/2022	12:47:46	End	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP22	7/13/2022	13:04:36	Start	Start	IND	Start	IND	N/A
IBSP	IBSP22	7/13/2022	13:04:44	-	End	IND	End	IND	N/A
IBSP	IBSP22	7/13/2022	13:04:45	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP22	7/13/2022	13:04:49	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP22	7/13/2022	13:04:50	-	Start	IND	Start	IND	N/A
IBSP	IBSP22	7/13/2022	13:04:57	-	End	IND	End	IND	N/A
IBSP	IBSP22	7/13/2022	13:04:58	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP22	7/13/2022	13:05:07	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP22	7/13/2022	13:05:08	-	Start	IND	Start	IND	N/A
IBSP	IBSP22	7/13/2022	13:05:23	-	End	IND	End	IND	N/A
IBSP	IBSP22	7/13/2022	13:05:24	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP22	7/13/2022	13:05:33	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP22	7/13/2022	13:05:34	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP22	7/13/2022	13:05:42	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP22	7/13/2022	13:05:43	-	Start	IND	Start	IND	N/A
IBSP	IBSP22	7/13/2022	13:05:46	-	End	IND	End	IND	N/A
IBSP	IBSP22	7/13/2022	13:05:47	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP22	7/13/2022	13:07:58	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP22	7/13/2022	13:07:59	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP22	7/13/2022	13:08:23	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP22	7/13/2022	13:08:24	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP22	7/13/2022	13:11:39	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP22	7/13/2022	13:11:40	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP22	7/13/2022	13:12:41	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:12:42	Start	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:12:49	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:12:50	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:13:00	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:13:01	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:14:35	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:14:36	-	Start	Macroalgae - Complete	Start	None	N/A
IBSP	IBSP04	7/13/2022	13:17:49	-	End	Macroalgae - Complete	End	None	N/A
IBSP	IBSP04	7/13/2022	13:17:50	-	Start	IND	Start	IND	N/A
IBSP	IBSP04	7/13/2022	13:18:35	-	End	IND	End	IND	N/A
IBSP	IBSP04	7/13/2022	13:18:36	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:21:03	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:21:04	-	Start	IND	Start	IND	N/A
IBSP	IBSP04	7/13/2022	13:21:20	-	End	IND	End	IND	N/A
IBSP	IBSP04	7/13/2022	13:21:21	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:30:03	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:30:04	-	Start	Macroalgae - Complete	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:30:05	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:30:10	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:30:11	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:31:01	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:31:02	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:31:18	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:31:19	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:32:02	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:32:03	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:32:32	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:32:33	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:32:42	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:32:43	-	End	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:32:44	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:32:50	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:32:51	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:33:03	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:33:04	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:33:06	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:33:07	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:33:58	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:33:59	-	Start	Macroalgae - Complete	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:34:00	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:34:09	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:34:10	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:34:57	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP04	7/13/2022	13:34:58	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:35:04	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:35:05	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:36:09	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:36:10	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:36:18	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:36:19	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:36:50	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:36:51	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:39:40	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:39:41	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:41:21	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:41:22	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:42:47	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:42:48	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:46:57	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:46:58	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:47:02	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:47:03	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:47:04	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:47:05	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:49:43	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:49:44	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:49:49	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:49:50	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:50:29	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:50:30	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:51:26	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:51:27	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:51:29	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:51:30	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:51:38	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP04	7/13/2022	13:51:39	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP04	7/13/2022	13:53:11	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:07:43	Start	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:07:48	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:07:49	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:08:28	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:08:29	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:08:40	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:08:41	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:09:00	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:09:01	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:10:29	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:10:30	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:23:01	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:23:02	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:24:01	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:24:02	-	Start	None	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:24:24	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:24:25	-	-	None	Start	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:24:43	-	-	None	End	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:24:44	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:25:23	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:25:24	-	-	None	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:26:27	-	-	None	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:26:28	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:26:50	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:26:51	-	-	None	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:27:30	-	End	None	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:27:31	-	Start	IND	Start	IND	N/A
IBSP	IBSP06	7/13/2022	16:27:37	-	End	IND	End	IND	N/A
IBSP	IBSP06	7/13/2022	16:27:38	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:28:34	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:28:35	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:29:04	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP06	7/13/2022	16:29:05	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:29:40	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:29:41	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:29:51	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP06	7/13/2022	16:29:52	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:29:58	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:29:59	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP06	7/13/2022	16:30:04	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP06	7/13/2022	16:30:05	-	Start	IND	Start	IND	N/A
IBSP	IBSP06	7/13/2022	16:30:16	-	End	IND	End	IND	N/A
IBSP	IBSP06	7/13/2022	16:30:17	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP06	7/13/2022	16:30:19	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP06	7/13/2022	16:30:20	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:30:55	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:30:56	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:31:26	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:31:27	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:32:13	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:32:14	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:32:36	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:32:37	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:32:44	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:32:45	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:33:53	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:33:54	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:34:07	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:34:08	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:34:21	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:34:22	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:34:43	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:34:44	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:34:59	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:35:00	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:36:09	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:36:10	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:45:56	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP06	7/13/2022	16:45:57	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP06	7/13/2022	16:48:28	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-B	7/13/2022	16:53:59	Start	Start	IND	Start	IND	N/A
IBSP	IBSP02-B	7/13/2022	16:54:25	-	End	IND	End	IND	N/A
IBSP	IBSP02-B	7/13/2022	16:54:26	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP02-B	7/13/2022	16:54:53	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:55:04	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:55:18	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:55:40	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:55:50	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:56:04	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:56:11	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:56:21	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:56:44	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:57:18	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:58:02	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:58:19	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:58:28	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:58:47	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:58:59	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:59:01	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP02-B	7/13/2022	16:59:21	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP02-B	7/13/2022	16:59:22	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP02-B	7/13/2022	17:01:36	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP02-B	7/13/2022	17:01:37	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP02-B	7/13/2022	17:01:51	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP02-B	7/13/2022	17:01:52	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP02-B	7/13/2022	17:05:16	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP02-B	7/13/2022	17:05:17	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-B	7/13/2022	17:12:19	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-B	7/13/2022	17:12:20	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP02-B	7/13/2022	17:12:31	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP02-B	7/13/2022	17:12:32	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP02-B	7/13/2022	17:14:00	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP02-B	7/13/2022	17:14:01	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP02-B	7/13/2022	17:14:08	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP01-A	7/14/2022	7:52:34	Start	Start	None	Start	None	N/A
IBSP	IBSP01-A	7/14/2022	7:52:36	-	-	None	-	None	Zostera



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP01-A	7/14/2022	7:52:46	-	-	None	End	None	N/A
IBSP	IBSP01-A	7/14/2022	7:52:47	-	-	None	Start	Zostera - Complete	N/A
IBSP	IBSP01-A	7/14/2022	7:53:57	-	-	None	End	Zostera - Complete	N/A
IBSP	IBSP01-A	7/14/2022	7:53:58	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP01-A	7/14/2022	7:54:06	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP01-A	7/14/2022	7:54:07	-	-	None	Start	Zostera - Sparse	N/A
IBSP	IBSP01-A	7/14/2022	7:55:57	-	-	None	End	Zostera - Sparse	N/A
IBSP	IBSP01-A	7/14/2022	7:55:58	-	-	None	Start	Zostera - Complete	N/A
IBSP	IBSP01-A	7/14/2022	7:56:13	-	-	None	End	Zostera - Complete	N/A
IBSP	IBSP01-A	7/14/2022	7:56:14	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP01-A	7/14/2022	7:56:39	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP01-A	7/14/2022	7:56:40	-	-	None	Start	Zostera - Complete	N/A
IBSP	IBSP01-A	7/14/2022	7:59:27	End	End	None	End	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:00:06	Start	Start	None	Start	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:03:33	-	-	None	End	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:03:34	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:04:08	-	End	None	End	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:04:09	-	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:09:35	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:09:36	-	Start	None	Start	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:10:10	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:10:11	-	-	None	Start	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:13:14	-	-	None	End	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:13:15	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:13:48	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:13:49	-	-	None	Start	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:14:45	-	-	None	End	Zostera - Complete	N/A
IBSP	IBSP01-B	7/14/2022	8:14:46	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:15:56	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:15:57	-	-	None	Start	Zostera - Sparse	N/A
IBSP	IBSP01-B	7/14/2022	8:16:49	-	-	None	End	Zostera - Sparse	N/A
IBSP	IBSP01-B	7/14/2022	8:16:50	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:19:42	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP01-B	7/14/2022	8:19:43	-	-	None	Start	Zostera - Sparse	N/A
IBSP	IBSP01-B	7/14/2022	8:21:23	End	End	None	End	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:23:54	Start	Start	IND	Start	IND	N/A
IBSP	IBSP03	7/14/2022	8:25:41	-	End	IND	End	IND	N/A
IBSP	IBSP03	7/14/2022	8:25:42	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:38:31	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:38:32	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:38:38	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:38:39	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:39:03	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:39:04	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:39:08	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:39:09	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:39:36	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:39:37	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:39:39	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:39:40	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:39:51	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:39:52	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:40:00	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:40:01	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:40:47	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP03	7/14/2022	8:40:48	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:41:34	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:41:35	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:41:36	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:41:37	-	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:42:38	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:42:39	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:43:23	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:43:24	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:43:30	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:43:31	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:43:51	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:43:52	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:44:26	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:44:27	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP03	7/14/2022	8:44:33	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:44:34	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:45:09	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:45:10	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:45:29	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP03	7/14/2022	8:45:30	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP03	7/14/2022	8:45:39	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP11	7/14/2022	8:52:37	Start	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP11	7/14/2022	8:52:40	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP11	7/14/2022	8:52:41	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:53:15	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:53:16	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP11	7/14/2022	8:53:37	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP11	7/14/2022	8:53:38	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP11	7/14/2022	8:54:04	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP11	7/14/2022	8:54:05	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP11	7/14/2022	8:55:04	-	End	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:05	-	Start	Macroalgae - Complete	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:08	-	End	Macroalgae - Complete	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:09	-	Start	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:21	-	End	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:22	-	Start	Macroalgae - Complete	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:31	-	End	Macroalgae - Complete	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:32	-	Start	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP11	7/14/2022	8:55:59	-	End	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP11	7/14/2022	8:56:00	-	Start	Macroalgae - Complete	Start	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:56:03	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:56:04	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:56:05	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:56:06	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP11	7/14/2022	8:56:53	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP11	7/14/2022	8:56:54	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:57:23	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP11	7/14/2022	8:57:24	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP11	7/14/2022	8:57:42	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP11	7/14/2022	8:58:33	End	End	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP05	7/14/2022	8:58:34	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP05	7/14/2022	8:58:49	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP05	7/14/2022	8:58:50	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP05	7/14/2022	9:02:36	-	End	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP05	7/14/2022	9:02:37	-	Start	IND	Start	IND	N/A
IBSP	IBSP05	7/14/2022	9:03:13	-	End	IND	End	IND	N/A
IBSP	IBSP05	7/14/2022	9:03:14	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:03:40	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:03:41	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:02	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:03	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:19	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:20	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:55	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:56	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:57	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:04:58	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP05	7/14/2022	9:05:05	-	End	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP05	7/14/2022	9:05:06	-	Start	None	-	None	N/A
IBSP	IBSP05	7/14/2022	9:05:17	-	End	None	-	None	N/A
IBSP	IBSP05	7/14/2022	9:05:18	-	Start	Macroalgae - Complete	-	None	N/A
IBSP	IBSP05	7/14/2022	9:06:40	-	End	Macroalgae - Complete	-	None	N/A
IBSP	IBSP05	7/14/2022	9:06:41	-	Start	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP05	7/14/2022	9:07:41	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP05	7/14/2022	9:07:42	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:08:03	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:08:04	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP05	7/14/2022	9:08:50	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:08:52	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:09:11	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:09:30	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP05	7/14/2022	9:09:31	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:10:27	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:10:28	-	-	Macroalgae - Patchy	Start	None	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP05	7/14/2022	9:10:48	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:11:34	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:11:44	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:11:53	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:12:11	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:12:21	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:12:24	-	-	Macroalgae - Patchy	-	None	Zostera
IBSP	IBSP05	7/14/2022	9:12:25	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP05	7/14/2022	9:12:26	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:24:24	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP05	7/14/2022	9:24:25	-	-	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP05	7/14/2022	9:24:31	End	End	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP07	7/14/2022	11:42:33	Start	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP07	7/14/2022	11:50:04	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP07	7/14/2022	11:50:05	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:51:11	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:51:12	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:52:14	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:52:15	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:52:39	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:52:40	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:53:43	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:53:44	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:54:15	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:54:16	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:55:05	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:55:06	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:56:01	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:56:02	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:56:31	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:56:32	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:57:09	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:57:10	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:57:57	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	11:57:58	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:58:27	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	11:58:28	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	12:01:02	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	12:01:03	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	12:01:19	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	12:01:20	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	12:02:13	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	12:02:14	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:02:41	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:02:42	-	Start	None	Start	None	N/A
IBSP	IBSP07	7/14/2022	12:02:59	-	-	None	End	None	N/A
IBSP	IBSP07	7/14/2022	12:03:00	-	-	None	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:03:20	-	-	None	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:03:21	-	-	None	Start	None	N/A
IBSP	IBSP07	7/14/2022	12:03:33	-	-	None	-	None	Zostera
IBSP	IBSP07	7/14/2022	12:03:41	-	-	None	-	None	Zostera
IBSP	IBSP07	7/14/2022	12:04:05	-	-	None	-	None	Zostera
IBSP	IBSP07	7/14/2022	12:04:19	-	-	None	-	None	Zostera
IBSP	IBSP07	7/14/2022	12:04:24	-	-	None	-	None	Zostera
IBSP	IBSP07	7/14/2022	12:04:49	-	-	None	-	None	Zostera
IBSP	IBSP07	7/14/2022	12:05:05	-	-	None	-	None	Zostera
IBSP	IBSP07	7/14/2022	12:05:12	-	End	None	-	None	N/A
IBSP	IBSP07	7/14/2022	12:05:13	-	Start	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP07	7/14/2022	12:05:24	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP07	7/14/2022	12:05:25	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP07	7/14/2022	12:05:45	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP07	7/14/2022	12:05:46	-	Start	IND	Start	IND	N/A
IBSP	IBSP07	7/14/2022	12:06:24	-	End	IND	End	IND	N/A
IBSP	IBSP07	7/14/2022	12:06:25	-	Start	None	Start	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:06:28	-	End	None	-	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:06:29	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:06:37	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:06:38	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP07	7/14/2022	12:07:30	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP07	7/14/2022	12:07:31	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP07	7/14/2022	12:08:56	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP07	7/14/2022	12:08:57	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP07	7/14/2022	12:09:09	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP21	7/14/2022	12:24:18	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:24:42	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:24:43	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:24:52	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:24:53	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:25:11	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:25:12	-	Start	None	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:25:27	-	End	None	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:25:28	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:25:43	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:25:44	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:28:08	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:28:09	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:29:33	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:29:34	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:30:20	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:30:21	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:30:53	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:30:54	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:31:09	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:31:10	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:31:55	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:31:56	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:32:05	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:32:06	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:32:14	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:32:15	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:32:36	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:32:37	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:33:35	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:33:36	-	Start	Macroalgae - Complete	Start	None	N/A
IBSP	IBSP21	7/14/2022	12:34:53	-	-	Macroalgae - Complete	End	None	N/A
IBSP	IBSP21	7/14/2022	12:34:54	-	-	Macroalgae - Complete	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:35:11	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:35:12	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:39:17	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:39:18	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:39:46	-	End	Macroalgae - Complete	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:39:47	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP21	7/14/2022	12:39:58	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP21	7/14/2022	12:39:59	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:40:03	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:40:04	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:41:11	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:41:12	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:41:34	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:41:35	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:41:59	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:42:00	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP21	7/14/2022	12:42:15	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP21	7/14/2022	12:42:16	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:44:04	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:44:05	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP21	7/14/2022	12:44:06	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP21	7/14/2022	12:44:07	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:47:12	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:47:13	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:48:14	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:48:15	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:48:42	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:48:43	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:50:02	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:50:03	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:51:08	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP21	7/14/2022	12:51:09	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP21	7/14/2022	12:51:26	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	12:55:30	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP20	7/14/2022	12:58:47	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	12:58:48	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	12:59:25	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	12:59:26	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	12:59:29	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	12:59:30	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:00:13	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:00:14	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	13:00:56	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	13:00:57	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:01:41	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:01:42	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	13:03:09	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	13:03:10	-	Start	IND	Start	IND	N/A
IBSP	IBSP20	7/14/2022	13:03:19	-	End	IND	End	IND	N/A
IBSP	IBSP20	7/14/2022	13:03:20	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:03:52	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:03:53	-	Start	IND	Start	IND	N/A
IBSP	IBSP20	7/14/2022	13:04:16	-	End	IND	End	IND	N/A
IBSP	IBSP20	7/14/2022	13:04:17	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:04:34	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP20	7/14/2022	13:04:35	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP20	7/14/2022	13:06:35	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP19	7/14/2022	13:08:33	Start	Start	IND	Start	IND	N/A
IBSP	IBSP19	7/14/2022	13:10:03	-	End	IND	End	IND	N/A
IBSP	IBSP19	7/14/2022	13:10:04	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP19	7/14/2022	13:10:05	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP19	7/14/2022	13:10:06	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP19	7/14/2022	13:11:23	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP19	7/14/2022	13:11:24	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP19	7/14/2022	13:12:26	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:17:00	Start	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP18	7/14/2022	13:17:58	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP18	7/14/2022	13:17:59	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:18:13	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:18:14	-	Start	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:18:15	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP18	7/14/2022	13:18:48	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP18	7/14/2022	13:18:49	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP18	7/14/2022	13:19:27	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP18	7/14/2022	13:19:28	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP18	7/14/2022	13:19:31	-	End	Macroalgae - Complete	End	Zostera - Sparse	N/A
IBSP	IBSP18	7/14/2022	13:19:32	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP18	7/14/2022	13:20:40	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP18	7/14/2022	13:20:41	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP18	7/14/2022	13:20:53	-	-	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP18	7/14/2022	13:20:54	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:21:09	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:21:10	-	Start	IND	Start	IND	N/A
IBSP	IBSP18	7/14/2022	13:21:33	-	End	IND	End	IND	N/A
IBSP	IBSP18	7/14/2022	13:21:34	-	Start	Macroalgae - Complete	Start	None	N/A
IBSP	IBSP18	7/14/2022	13:21:37	-	End	Macroalgae - Complete	End	None	N/A
IBSP	IBSP18	7/14/2022	13:21:38	-	Start	IND	Start	IND	N/A
IBSP	IBSP18	7/14/2022	13:21:48	-	End	IND	End	IND	N/A
IBSP	IBSP18	7/14/2022	13:21:49	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:24:07	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:24:08	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:24:31	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:24:32	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:24:45	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:24:46	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:25:00	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP18	7/14/2022	13:25:01	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP18	7/14/2022	13:25:32	End	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:12:02	Start	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:13:01	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:13:02	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP17	7/14/2022	15:13:40	-	End	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP17	7/14/2022	15:13:41	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP17	7/14/2022	15:14:18	-	End	Off Bottom	End	Off Bottom	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP17	7/14/2022	15:14:19	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP17	7/14/2022	15:14:31	-	End	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP17	7/14/2022	15:14:32	-	Start	Macroalgae - Complete	-	None	N/A
IBSP	IBSP17	7/14/2022	15:15:34	-	End	Macroalgae - Complete	-	None	N/A
IBSP	IBSP17	7/14/2022	15:15:35	-	Start	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP17	7/14/2022	15:16:13	-	End	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP17	7/14/2022	15:16:14	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:17:14	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:17:15	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:17:47	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:17:48	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:18:58	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP17	7/14/2022	15:18:59	End	Start	None	End	Zostera - Complete	N/A
IBSP	IBSP16	7/14/2022	15:19:00	Start	Start	Macroalgae - Complete	Start	None	N/A
IBSP	IBSP16	7/14/2022	15:20:06	-	End	Macroalgae - Complete	End	None	N/A
IBSP	IBSP16	7/14/2022	15:20:07	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP16	7/14/2022	15:20:14	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP16	7/14/2022	15:20:15	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP16	7/14/2022	15:21:14	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP16	7/14/2022	15:21:15	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:21:24	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:21:25	-	Start	IND	Start	IND	N/A
IBSP	IBSP16	7/14/2022	15:21:58	-	End	IND	End	IND	N/A
IBSP	IBSP16	7/14/2022	15:21:59	-	Start	Macroalgae - Complete	Start	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:22:49	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:22:50	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:23:20	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:23:21	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:23:26	-	-	Macroalgae - Complete	End	Zostera - Sparse	N/A
IBSP	IBSP16	7/14/2022	15:23:27	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP16	7/14/2022	15:23:36	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP16	7/14/2022	15:23:37	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP16	7/14/2022	15:25:26	End	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP15	7/14/2022	15:29:21	Start	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP15	7/14/2022	15:29:59	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP15	7/14/2022	15:30:00	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
IBSP	IBSP15	7/14/2022	15:30:04	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
IBSP	IBSP15	7/14/2022	15:30:05	-	Start	IND	Start	IND	N/A
IBSP	IBSP15	7/14/2022	15:30:17	-	End	IND	End	IND	N/A
IBSP	IBSP15	7/14/2022	15:30:18	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP15	7/14/2022	15:30:32	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP15	7/14/2022	15:30:33	-	Start	IND	Start	IND	N/A
IBSP	IBSP15	7/14/2022	15:30:48	-	End	IND	End	IND	N/A
IBSP	IBSP15	7/14/2022	15:30:49	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP15	7/14/2022	15:31:04	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP15	7/14/2022	15:31:05	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP15	7/14/2022	15:32:26	-	-	Macroalgae - Complete	End	Zostera - Sparse	N/A
IBSP	IBSP15	7/14/2022	15:32:27	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP15	7/14/2022	15:32:47	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP15	7/14/2022	15:32:48	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP15	7/14/2022	15:33:20	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
IBSP	IBSP15	7/14/2022	15:33:21	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP15	7/14/2022	15:34:31	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP14	7/14/2022	15:41:08	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP14	7/14/2022	15:48:05	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP14	7/14/2022	15:48:06	-	Start	IND	Start	IND	N/A
IBSP	IBSP14	7/14/2022	15:48:28	-	End	IND	End	IND	N/A
IBSP	IBSP14	7/14/2022	15:48:29	-	Start	Macroalgae - Complete	Start	None	N/A
IBSP	IBSP14	7/14/2022	15:48:51	-	End	Macroalgae - Complete	-	None	N/A
IBSP	IBSP14	7/14/2022	15:48:52	-	Start	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP14	7/14/2022	15:49:30	-	End	Macroalgae - Patchy	-	None	N/A
IBSP	IBSP14	7/14/2022	15:49:31	-	Start	Macroalgae - Complete	-	None	N/A
IBSP	IBSP14	7/14/2022	15:49:48	-	-	Macroalgae - Complete	End	None	N/A
IBSP	IBSP14	7/14/2022	15:49:49	-	-	Macroalgae - Complete	Start	Zostera - Sparse	N/A
IBSP	IBSP14	7/14/2022	15:50:07	-	-	Macroalgae - Complete	End	Zostera - Sparse	N/A
IBSP	IBSP14	7/14/2022	15:50:08	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP14	7/14/2022	15:50:22	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP14	7/14/2022	15:50:23	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP14	7/14/2022	15:54:49	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP14	7/14/2022	15:54:50	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
IBSP	IBSP14	7/14/2022	15:55:12	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP14	7/14/2022	15:55:13	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP14	7/14/2022	15:56:36	End	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP13	7/14/2022	16:02:30	Start	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP13	7/14/2022	16:03:21	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP13	7/14/2022	16:03:22	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP13	7/14/2022	16:04:06	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP13	7/14/2022	16:04:07	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP13	7/14/2022	16:04:28	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP13	7/14/2022	16:04:29	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP13	7/14/2022	16:04:48	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP13	7/14/2022	16:04:49	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP13	7/14/2022	16:06:16	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
IBSP	IBSP12	7/14/2022	16:09:03	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
IBSP	IBSP12	7/14/2022	16:10:30	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
IBSP	IBSP12	7/14/2022	16:10:31	-	Start	None	End	Zostera - Complete	N/A
IBSP	IBSP12	7/14/2022	16:10:32	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP12	7/14/2022	16:11:00	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP12	7/14/2022	16:11:01	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP12	7/14/2022	16:11:19	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP12	7/14/2022	16:11:20	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:11:58	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:11:59	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:12:04	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:12:05	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:12:21	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:12:22	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP12	7/14/2022	16:12:39	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP12	7/14/2022	16:12:40	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP12	7/14/2022	16:12:51	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP12	7/14/2022	16:12:52	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:12:56	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP12	7/14/2022	16:12:57	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
IBSP	IBSP12	7/14/2022	16:14:13	End	End	Macroalgae - Complete	End	Zostera - Complete	N/A
IBSP	IBSP10	7/14/2022	16:22:18	Start	Start	IND	Start	IND	N/A
IBSP	IBSP10	7/14/2022	16:22:36	-	End	IND	End	IND	N/A
IBSP	IBSP10	7/14/2022	16:22:37	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:24:02	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:24:03	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
IBSP	IBSP10	7/14/2022	16:24:10	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
IBSP	IBSP10	7/14/2022	16:24:11	-	Start	IND	Start	IND	N/A
IBSP	IBSP10	7/14/2022	16:25:06	-	End	IND	End	IND	N/A
IBSP	IBSP10	7/14/2022	16:25:07	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:25:26	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:25:27	-	Start	IND	Start	IND	N/A
IBSP	IBSP10	7/14/2022	16:26:20	-	-	IND	-	IND	Zostera
IBSP	IBSP10	7/14/2022	16:26:29	-	End	IND	End	IND	N/A
IBSP	IBSP10	7/14/2022	16:26:30	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP10	7/14/2022	16:27:17	-	End	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP10	7/14/2022	16:27:18	-	Start	IND	Start	IND	N/A
IBSP	IBSP10	7/14/2022	16:27:56	-	End	IND	End	IND	N/A
IBSP	IBSP10	7/14/2022	16:27:57	-	Start	Macroalgae - Patchy	Start	None	N/A
IBSP	IBSP10	7/14/2022	16:28:04	-	-	Macroalgae - Patchy	End	None	N/A
IBSP	IBSP10	7/14/2022	16:28:05	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:29:14	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:29:15	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:29:26	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:29:27	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
IBSP	IBSP10	7/14/2022	16:29:45	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP09	7/14/2022	16:35:29	Start	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP09	7/14/2022	16:37:44	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
IBSP	IBSP09	7/14/2022	16:37:45	-	Start	Off Bottom	Start	Off Bottom	N/A
IBSP	IBSP09	7/14/2022	16:39:43	-	End	Off Bottom	End	Off Bottom	N/A
IBSP	IBSP09	7/14/2022	16:39:44	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
IBSP	IBSP09	7/14/2022	16:44:39	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
The Farm	F01	7/14/2022	17:13:02	Start	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F01	7/14/2022	17:13:15	-	End	Macroalgae - Patchy	-	None	N/A
The Farm	F01	7/14/2022	17:13:16	-	Start	Macroalgae - Complete	-	None	N/A
The Farm	F01	7/14/2022	17:13:42	-	End	Macroalgae - Complete	-	None	N/A
The Farm	F01	7/14/2022	17:13:43	-	Start	Macroalgae - Patchy	-	None	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
The Farm	F01	7/14/2022	17:17:33	End	End	Macroalgae - Patchy	End	None	N/A
The Farm	F02	7/14/2022	17:21:29	Start	Start	IND	Start	IND	N/A
The Farm	F02	7/14/2022	17:22:18	-	End	IND	End	IND	N/A
The Farm	F02	7/14/2022	17:22:19	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F02	7/14/2022	17:28:04	End	End	Macroalgae - Patchy	End	None	N/A
The Farm	F03	7/15/2022	6:58:35	Start	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F03	7/15/2022	7:00:19	-	-	Macroalgae - Patchy	-	None	Possible SAV
The Farm	F03	7/15/2022	7:00:32	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F03	7/15/2022	7:00:33	-	Start	IND	Start	IND	N/A
The Farm	F03	7/15/2022	7:00:51	-	End	IND	End	IND	N/A
The Farm	F03	7/15/2022	7:00:52	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F03	7/15/2022	7:05:40	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F03	7/15/2022	7:05:41	-	Start	IND	Start	IND	N/A
The Farm	F03	7/15/2022	7:05:52	End	End	IND	End	IND	N/A
The Farm	F04	7/15/2022	8:04:02	Start	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F04	7/15/2022	8:10:36	End	End	Macroalgae - Patchy	End	None	N/A
The Farm	F05	7/15/2022	8:27:22	Start	Start	IND	Start	IND	N/A
The Farm	F05	7/15/2022	8:27:27	-	End	IND	End	IND	N/A
The Farm	F05	7/15/2022	8:27:28	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F05	7/15/2022	8:35:07	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F05	7/15/2022	8:35:08	-	Start	IND	Start	IND	N/A
The Farm	F05	7/15/2022	8:35:10	-	End	IND	End	IND	N/A
The Farm	F05	7/15/2022	8:35:11	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F05	7/15/2022	8:36:00	-	End	Macroalgae - Patchy	-	None	N/A
The Farm	F05	7/15/2022	8:36:01	-	Start	Macroalgae - Complete	-	None	N/A
The Farm	F05	7/15/2022	8:36:23	-	End	Macroalgae - Complete	-	None	N/A
The Farm	F05	7/15/2022	8:36:24	-	Start	Macroalgae - Patchy	-	None	N/A
The Farm	F05	7/15/2022	8:36:44	End	End	Macroalgae - Patchy	End	None	N/A
The Farm	F06	7/15/2022	8:42:41	Start	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F06	7/15/2022	8:46:44	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F06	7/15/2022	8:46:45	-	Start	IND	Start	IND	N/A
The Farm	F06	7/15/2022	8:47:04	-	End	IND	End	IND	N/A
The Farm	F06	7/15/2022	8:47:05	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F06	7/15/2022	8:59:12	-	-	Macroalgae - Patchy	-	None	Zostera
The Farm	F06	7/15/2022	9:00:06	End	End	Macroalgae - Patchy	End	None	N/A
The Farm	F07	7/15/2022	9:06:32	Start	Start	Off Bottom	Start	Off Bottom	N/A
The Farm	F07	7/15/2022	9:06:35	-	End	Off Bottom	End	Off Bottom	N/A
The Farm	F07	7/15/2022	9:06:36	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F07	7/15/2022	9:06:45	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F07	7/15/2022	9:06:46	-	Start	IND	Start	IND	N/A
The Farm	F07	7/15/2022	9:07:08	-	End	IND	End	IND	N/A
The Farm	F07	7/15/2022	9:07:09	-	Start	Macroalgae - Complete	Start	None	N/A
The Farm	F07	7/15/2022	9:08:12	-	End	Macroalgae - Complete	End	None	N/A
The Farm	F07	7/15/2022	9:08:13	-	Start	IND	Start	IND	N/A
The Farm	F07	7/15/2022	9:08:37	-	End	IND	End	IND	N/A
The Farm	F07	7/15/2022	9:08:38	-	Start	Macroalgae - Complete	Start	None	N/A
The Farm	F07	7/15/2022	9:08:46	-	End	Macroalgae - Complete	End	None	N/A
The Farm	F07	7/15/2022	9:08:47	-	Start	IND	Start	IND	N/A
The Farm	F07	7/15/2022	9:08:54	-	-	IND	-	IND	Macroalgae
The Farm	F07	7/15/2022	9:09:30	-	-	IND	-	IND	Macroalgae
The Farm	F07	7/15/2022	9:09:35	-	-	IND	-	IND	Macroalgae
The Farm	F07	7/15/2022	9:09:39	-	-	IND	-	IND	Macroalgae
The Farm	F07	7/15/2022	9:09:51	-	-	IND	-	IND	Macroalgae
The Farm	F07	7/15/2022	9:10:21	-	-	IND	-	IND	Macroalgae
The Farm	F07	7/15/2022	9:12:11	-	-	IND	-	IND	Macroalgae
The Farm	F07	7/15/2022	9:12:14	-	End	IND	End	IND	N/A
The Farm	F07	7/15/2022	9:12:15	-	Start	Macroalgae - Complete	Start	None	N/A
The Farm	F07	7/15/2022	9:12:43	-	End	Macroalgae - Complete	-	None	N/A
The Farm	F07	7/15/2022	9:12:44	-	Start	Macroalgae - Patchy	-	None	N/A
The Farm	F07	7/15/2022	9:19:00	-	-	Macroalgae - Patchy	-	None	Zostera
The Farm	F07	7/15/2022	9:20:24	End	End	Macroalgae - Patchy	End	None	N/A
The Farm	F08	7/15/2022	9:29:06	Start	Start	Off Bottom	Start	Off Bottom	N/A
The Farm	F08	7/15/2022	9:29:15	-	End	Off Bottom	End	Off Bottom	N/A
The Farm	F08	7/15/2022	9:29:16	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:29:25	-	End	IND	End	IND	N/A
The Farm	F08	7/15/2022	9:29:26	-	Start	Macroalgae - Complete	Start	None	N/A
The Farm	F08	7/15/2022	9:29:34	-	-	Macroalgae - Complete	-	None	Zostera
The Farm	F08	7/15/2022	9:29:40	-	End	Macroalgae - Complete	End	None	N/A
The Farm	F08	7/15/2022	9:29:41	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:30:04	-	End	IND	End	IND	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
The Farm	F08	7/15/2022	9:30:05	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F08	7/15/2022	9:30:17	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F08	7/15/2022	9:30:18	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:30:22	-	End	IND	End	IND	N/A
The Farm	F08	7/15/2022	9:30:23	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F08	7/15/2022	9:31:38	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F08	7/15/2022	9:31:39	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:32:10	-	End	IND	End	IND	N/A
The Farm	F08	7/15/2022	9:32:11	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F08	7/15/2022	9:32:45	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F08	7/15/2022	9:32:46	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:33:50	-	End	IND	End	IND	N/A
The Farm	F08	7/15/2022	9:33:51	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F08	7/15/2022	9:34:11	-	-	Macroalgae - Patchy	-	None	Zostera
The Farm	F08	7/15/2022	9:34:26	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F08	7/15/2022	9:34:27	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:35:06	-	-	IND	-	IND	Macroalgae
The Farm	F08	7/15/2022	9:35:21	-	End	IND	End	IND	N/A
The Farm	F08	7/15/2022	9:35:22	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F08	7/15/2022	9:35:33	-	-	Macroalgae - Patchy	-	None	Zostera
The Farm	F08	7/15/2022	9:36:01	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F08	7/15/2022	9:36:02	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:36:15	-	End	IND	End	IND	N/A
The Farm	F08	7/15/2022	9:36:16	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F08	7/15/2022	9:37:25	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F08	7/15/2022	9:37:26	-	Start	IND	Start	IND	N/A
The Farm	F08	7/15/2022	9:37:39	-	End	IND	End	IND	N/A
The Farm	F08	7/15/2022	9:37:40	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F08	7/15/2022	9:39:06	-	-	Macroalgae - Patchy	-	None	Zostera
The Farm	F08	7/15/2022	9:39:36	End	End	Macroalgae - Patchy	End	None	N/A
The Farm	F09	7/15/2022	9:45:17	Start	Start	Off Bottom	Start	Off Bottom	N/A
The Farm	F09	7/15/2022	9:45:35	-	End	Off Bottom	End	Off Bottom	N/A
The Farm	F09	7/15/2022	9:45:36	-	Start	IND	Start	IND	N/A
The Farm	F09	7/15/2022	9:49:17	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:51:34	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:52:01	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:52:18	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:52:23	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:52:26	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:52:31	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:52:35	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:52:47	-	-	IND	-	IND	Macroalgae, Possible SAV
The Farm	F09	7/15/2022	9:52:56	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:52:57	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:53:07	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:53:16	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:53:23	-	-	IND	-	IND	Zostera
The Farm	F09	7/15/2022	9:53:27	-	-	IND	-	IND	Zostera
The Farm	F09	7/15/2022	9:53:42	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:53:46	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:53:53	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:53:55	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:54:34	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:54:50	-	-	IND	-	IND	Zostera
The Farm	F09	7/15/2022	9:54:51	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:54:52	-	-	IND	-	IND	Zostera
The Farm	F09	7/15/2022	9:54:59	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:55:28	-	-	IND	-	IND	Possible SAV
The Farm	F09	7/15/2022	9:55:35	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:55:39	-	-	IND	-	IND	Zostera
The Farm	F09	7/15/2022	9:55:55	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:56:04	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:57:53	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:58:06	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	9:59:33	-	End	IND	End	IND	N/A
The Farm	F09	7/15/2022	9:59:34	-	Start	Macroalgae - Complete	Start	None	N/A
The Farm	F09	7/15/2022	9:59:54	-	-	Macroalgae - Complete	-	None	Possible SAV
The Farm	F09	7/15/2022	9:59:57	-	-	Macroalgae - Complete	-	None	Possible SAV
The Farm	F09	7/15/2022	10:00:18	-	End	Macroalgae - Complete	End	None	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
The Farm	F09	7/15/2022	10:00:19	-	Start	IND	Start	IND	N/A
The Farm	F09	7/15/2022	10:00:23	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	10:00:26	-	End	IND	End	IND	N/A
The Farm	F09	7/15/2022	10:00:27	-	Start	Macroalgae - Complete	Start	None	N/A
The Farm	F09	7/15/2022	10:00:53	-	End	Macroalgae - Complete	End	None	N/A
The Farm	F09	7/15/2022	10:00:54	-	Start	IND	Start	IND	N/A
The Farm	F09	7/15/2022	10:01:01	-	End	IND	End	IND	N/A
The Farm	F09	7/15/2022	10:01:02	-	Start	Macroalgae - Complete	Start	None	N/A
The Farm	F09	7/15/2022	10:01:09	-	End	Macroalgae - Complete	End	None	N/A
The Farm	F09	7/15/2022	10:01:10	-	Start	IND	Start	IND	N/A
The Farm	F09	7/15/2022	10:04:15	-	-	IND	-	IND	Macroalgae
The Farm	F09	7/15/2022	10:05:44	-	End	IND	End	IND	N/A
The Farm	F09	7/15/2022	10:05:45	-	Start	Off Bottom	Start	Off Bottom	N/A
The Farm	F09	7/15/2022	10:06:01	End	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP01	7/15/2022	10:42:36	Start	Start	None	Start	Zostera - Complete	N/A
Bay Parkway	BP01	7/15/2022	11:05:31	-	-	None	End	Zostera - Complete	N/A
Bay Parkway	BP01	7/15/2022	11:05:32	-	-	None	Start	Zostera - Patchy	N/A
Bay Parkway	BP01	7/15/2022	11:06:12	-	-	None	End	Zostera - Patchy	N/A
Bay Parkway	BP01	7/15/2022	11:06:13	-	-	None	Start	Zostera - Complete	N/A
Bay Parkway	BP01	7/15/2022	11:07:29	End	End	None	End	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:26:54	Start	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP02	7/15/2022	11:26:55	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP02	7/15/2022	11:26:56	-	Start	None	Start	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:26:58	-	End	None	-	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:26:59	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:29:49	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:29:50	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:31:31	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:31:32	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:31:48	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:31:49	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:32:27	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:32:28	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:32:52	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:32:53	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:40:57	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:40:58	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:42:07	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:42:08	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:46:16	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP02	7/15/2022	11:46:17	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP02	7/15/2022	11:46:28	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP06	7/15/2022	14:04:23	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:05:38	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:05:39	-	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP06	7/15/2022	14:06:10	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP06	7/15/2022	14:06:11	-	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:08:17	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:08:18	-	Start	IND	Start	IND	N/A
Bay Parkway	BP06	7/15/2022	14:09:16	-	End	IND	End	IND	N/A
Bay Parkway	BP06	7/15/2022	14:09:17	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP06	7/15/2022	14:09:48	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP06	7/15/2022	14:09:49	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP06	7/15/2022	14:10:52	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP06	7/15/2022	14:10:53	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:14:39	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:14:40	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP06	7/15/2022	14:16:07	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP06	7/15/2022	14:16:08	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:16:50	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP06	7/15/2022	14:16:51	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP06	7/15/2022	14:19:54	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP06	7/15/2022	14:19:55	-	-	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP06	7/15/2022	14:20:30	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP06	7/15/2022	14:26:40	End	End	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP07	7/15/2022	14:35:01	Start	Start	IND	Start	IND	N/A
Bay Parkway	BP07	7/15/2022	14:35:39	-	End	IND	End	IND	N/A
Bay Parkway	BP07	7/15/2022	14:35:40	-	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP07	7/15/2022	14:35:42	-	-	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP07	7/15/2022	14:35:43	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Bay Parkway	BP07	7/15/2022	14:36:24	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP07	7/15/2022	14:36:25	-	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP07	7/15/2022	14:36:42	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP07	7/15/2022	14:36:43	-	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP07	7/15/2022	14:36:56	-	End	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP07	7/15/2022	14:36:57	-	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP07	7/15/2022	14:38:00	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP07	7/15/2022	14:38:01	-	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP07	7/15/2022	14:39:41	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP07	7/15/2022	14:39:54	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP07	7/15/2022	14:40:23	-	-	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP07	7/15/2022	14:40:24	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP07	7/15/2022	14:42:11	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP07	7/15/2022	14:42:12	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP07	7/15/2022	14:42:50	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP07	7/15/2022	14:42:51	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP07	7/15/2022	14:52:14	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP07	7/15/2022	14:52:15	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP07	7/15/2022	14:52:48	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP07	7/15/2022	14:52:49	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
Bay Parkway	BP07	7/15/2022	14:55:50	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
Bay Parkway	BP07	7/15/2022	14:55:51	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
Bay Parkway	BP07	7/15/2022	14:57:00	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP07	7/15/2022	14:57:01	-	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP07	7/15/2022	14:57:14	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP07	7/15/2022	14:57:15	-	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP07	7/15/2022	15:04:00	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP08	7/15/2022	15:08:53	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP08	7/15/2022	15:18:26	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP08	7/15/2022	15:18:27	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP08	7/15/2022	15:18:54	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP08	7/15/2022	15:18:55	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP08	7/15/2022	15:19:02	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP08	7/15/2022	15:19:03	-	-	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP08	7/15/2022	15:19:19	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP08	7/15/2022	15:19:29	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP08	7/15/2022	15:19:33	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP08	7/15/2022	15:19:36	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP08	7/15/2022	15:19:51	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP08	7/15/2022	15:19:54	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP08	7/15/2022	15:19:59	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP08	7/15/2022	15:20:50	End	End	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP09	7/15/2022	15:29:18	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP09	7/15/2022	15:36:03	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP09	7/15/2022	15:36:04	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP09	7/15/2022	15:37:04	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP09	7/15/2022	15:37:05	-	-	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP09	7/15/2022	15:37:31	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP09	7/15/2022	15:38:46	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP09	7/15/2022	15:38:52	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP09	7/15/2022	15:39:00	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP09	7/15/2022	15:39:04	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP09	7/15/2022	15:39:16	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP09	7/15/2022	15:39:23	End	End	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP10	7/15/2022	15:48:35	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP10	7/15/2022	15:57:54	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP10	7/15/2022	15:57:55	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP10	7/15/2022	15:58:55	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP10	7/15/2022	15:58:56	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP10	7/15/2022	15:59:55	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP10	7/15/2022	15:59:56	-	-	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP10	7/15/2022	16:00:09	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:00:57	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:01:01	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:01:17	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:01:23	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:01:29	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:01:50	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:01:53	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:02:16	-	-	Macroalgae - Patchy	-	None	Zostera

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Bay Parkway	BP10	7/15/2022	16:02:17	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:02:19	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP10	7/15/2022	16:02:25	End	End	Macroalgae - Patchy	End	None	Zostera
The Farm	F10	7/16/2022	7:09:24	Start	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F10	7/16/2022	7:10:55	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F10	7/16/2022	7:10:56	-	Start	IND	Start	IND	N/A
The Farm	F10	7/16/2022	7:12:02	-	End	IND	End	IND	N/A
The Farm	F10	7/16/2022	7:12:03	-	Start	None	Start	None	N/A
The Farm	F10	7/16/2022	7:12:32	-	End	None	-	None	N/A
The Farm	F10	7/16/2022	7:12:33	-	Start	Macroalgae - Patchy	-	None	N/A
The Farm	F10	7/16/2022	7:14:18	-	End	Macroalgae - Patchy	-	None	N/A
The Farm	F10	7/16/2022	7:14:19	-	Start	None	-	None	N/A
The Farm	F10	7/16/2022	7:15:59	-	End	None	-	None	N/A
The Farm	F10	7/16/2022	7:16:00	-	Start	Macroalgae - Patchy	-	None	N/A
The Farm	F10	7/16/2022	7:27:09	-	-	Macroalgae - Patchy	-	None	Zostera
The Farm	F10	7/16/2022	7:27:40	-	-	Macroalgae - Patchy	-	None	Possible SAV
The Farm	F10	7/16/2022	7:27:42	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F10	7/16/2022	7:27:43	-	Start	IND	Start	IND	N/A
The Farm	F10	7/16/2022	7:28:27	-	End	IND	End	IND	N/A
The Farm	F10	7/16/2022	7:28:28	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F10	7/16/2022	7:34:17	-	End	Macroalgae - Patchy	End	None	N/A
The Farm	F10	7/16/2022	7:34:18	-	Start	IND	Start	IND	N/A
The Farm	F10	7/16/2022	7:41:04	-	End	IND	End	IND	N/A
The Farm	F10	7/16/2022	7:41:05	-	Start	Macroalgae - Patchy	Start	None	N/A
The Farm	F10	7/16/2022	7:48:13	End	End	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP15-A	7/16/2022	8:02:01	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP15-A	7/16/2022	8:05:40	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP15-A	7/16/2022	8:05:41	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP15-A	7/16/2022	8:11:33	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP15-A	7/16/2022	8:11:34	-	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP15-A	7/16/2022	8:11:40	End	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP03	7/16/2022	8:18:35	Start	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP03	7/16/2022	8:19:01	-	-	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP03	7/16/2022	8:19:02	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP03	7/16/2022	8:20:44	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP03	7/16/2022	8:20:45	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP03	7/16/2022	8:26:00	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP03	7/16/2022	8:26:01	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP03	7/16/2022	8:26:28	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP03	7/16/2022	8:26:29	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP03	7/16/2022	8:30:52	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP15-B	7/16/2022	9:07:29	Start	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP15-B	7/16/2022	9:10:53	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP15-B	7/16/2022	9:10:54	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:11:32	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:11:33	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP15-B	7/16/2022	9:12:10	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP15-B	7/16/2022	9:12:11	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:15:09	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:15:10	-	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP15-B	7/16/2022	9:15:31	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP15-B	7/16/2022	9:15:32	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:18:12	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:18:13	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP15-B	7/16/2022	9:20:35	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP15-B	7/16/2022	9:20:36	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:21:08	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:21:09	-	Start	IND	Start	IND	N/A
Bay Parkway	BP15-B	7/16/2022	9:21:15	-	End	IND	End	IND	N/A
Bay Parkway	BP15-B	7/16/2022	9:21:16	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP15-B	7/16/2022	9:22:30	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP15-B	7/16/2022	9:22:31	-	Start	IND	Start	IND	N/A
Bay Parkway	BP15-B	7/16/2022	9:22:52	-	End	IND	End	IND	N/A
Bay Parkway	BP15-B	7/16/2022	9:22:53	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP15-B	7/16/2022	9:25:49	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP15-B	7/16/2022	9:25:50	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:48:24	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP15-B	7/16/2022	9:48:25	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP15-B	7/16/2022	9:48:53	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:08:51	Start	Start	Off Bottom	Start	Off Bottom	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD19	7/16/2022	10:09:54	-	End	Off Bottom	End	Off Bottom	N/A
Lighthouse Drive	LD19	7/16/2022	10:09:55	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:14:48	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:14:49	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:15:43	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:15:44	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:18:12	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:18:13	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:21:53	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:21:54	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:22:43	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:22:44	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:24:04	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:24:05	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:24:24	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:24:25	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:25:19	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:25:20	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:25:42	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:25:43	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:28:56	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:28:57	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:29:59	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:30:00	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:42:29	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD19	7/16/2022	10:42:30	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:48:04	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:48:05	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:52:50	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD19	7/16/2022	10:52:51	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:16	-	End	IND	End	IND	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:17	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:28	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:29	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:40	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:41	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:51	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:53:52	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:54:36	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD19	7/16/2022	10:54:37	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD19	7/16/2022	10:55:44	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD19	7/16/2022	10:56:12	-	End	IND	End	IND	N/A
Lighthouse Drive	LD19	7/16/2022	10:56:13	-	Start	Off Bottom	Start	Off Bottom	N/A
Lighthouse Drive	LD19	7/16/2022	10:58:41	End	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP04	7/16/2022	13:53:44	Start	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP04	7/16/2022	13:53:52	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP04	7/16/2022	13:53:53	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP04	7/16/2022	13:55:47	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP04	7/16/2022	13:55:48	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP04	7/16/2022	13:56:44	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP04	7/16/2022	13:56:45	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP04	7/16/2022	13:57:13	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP04	7/16/2022	13:57:14	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP04	7/16/2022	13:59:38	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP04	7/16/2022	13:59:39	-	Start	IND	Start	IND	N/A
Bay Parkway	BP04	7/16/2022	13:59:52	-	End	IND	End	IND	N/A
Bay Parkway	BP04	7/16/2022	13:59:53	-	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP04	7/16/2022	14:06:38	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP04	7/16/2022	14:06:39	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP04	7/16/2022	14:08:09	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP04	7/16/2022	14:08:10	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP04	7/16/2022	14:08:58	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP04	7/16/2022	14:08:59	-	-	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP04	7/16/2022	14:09:02	-	End	Macroalgae - Patchy	-	None	N/A
Bay Parkway	BP04	7/16/2022	14:09:03	-	Start	None	-	None	N/A
Bay Parkway	BP04	7/16/2022	14:10:56	-	End	None	End	None	N/A
Bay Parkway	BP04	7/16/2022	14:10:57	-	Start	IND	Start	IND	N/A
Bay Parkway	BP04	7/16/2022	14:13:06	End	End	IND	End	IND	N/A
Bay Parkway	BP05	7/16/2022	14:19:23	Start	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP05	7/16/2022	14:19:37	-	End	Off Bottom	End	Off Bottom	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Bay Parkway	BP05	7/16/2022	14:19:38	-	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP05	7/16/2022	14:19:39	-	-	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP05	7/16/2022	14:19:40	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP05	7/16/2022	14:22:03	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP05	7/16/2022	14:22:04	-	Start	IND	Start	IND	N/A
Bay Parkway	BP05	7/16/2022	14:22:41	-	End	IND	End	IND	N/A
Bay Parkway	BP05	7/16/2022	14:22:42	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP05	7/16/2022	14:24:46	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP05	7/16/2022	14:24:47	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP05	7/16/2022	14:25:42	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP05	7/16/2022	14:25:43	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP05	7/16/2022	14:28:06	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP05	7/16/2022	14:28:07	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP05	7/16/2022	14:29:33	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP05	7/16/2022	14:29:34	-	Start	IND	Start	IND	N/A
Bay Parkway	BP05	7/16/2022	14:29:43	-	-	IND	-	IND	Zostera
Bay Parkway	BP05	7/16/2022	14:29:45	-	-	IND	-	IND	Zostera
Bay Parkway	BP05	7/16/2022	14:29:48	-	-	IND	-	IND	Zostera
Bay Parkway	BP05	7/16/2022	14:29:54	-	-	IND	-	IND	Zostera
Bay Parkway	BP05	7/16/2022	14:30:08	-	-	IND	-	IND	Zostera
Bay Parkway	BP05	7/16/2022	14:30:12	-	-	IND	-	IND	Zostera
Bay Parkway	BP05	7/16/2022	14:30:14	-	-	IND	-	IND	Zostera
Bay Parkway	BP05	7/16/2022	14:30:15	-	End	IND	End	IND	N/A
Bay Parkway	BP05	7/16/2022	14:30:16	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP05	7/16/2022	14:32:51	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP05	7/16/2022	14:32:52	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
Bay Parkway	BP05	7/16/2022	14:34:06	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
Bay Parkway	BP05	7/16/2022	14:34:07	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
Bay Parkway	BP05	7/16/2022	14:35:57	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP05	7/16/2022	14:35:58	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP05	7/16/2022	14:36:15	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP05	7/16/2022	14:36:16	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP05	7/16/2022	14:40:10	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP12	7/16/2022	14:52:05	Start	Start	Off Bottom	Start	Off Bottom	N/A
Bay Parkway	BP12	7/16/2022	14:52:14	-	End	Off Bottom	End	Off Bottom	N/A
Bay Parkway	BP12	7/16/2022	14:52:15	-	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP12	7/16/2022	14:52:54	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP12	7/16/2022	14:53:13	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP12	7/16/2022	14:53:15	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP12	7/16/2022	14:53:18	-	-	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP12	7/16/2022	14:53:19	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP12	7/16/2022	14:53:38	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP12	7/16/2022	14:53:39	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP12	7/16/2022	14:54:11	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP12	7/16/2022	14:54:12	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP12	7/16/2022	14:57:49	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP12	7/16/2022	14:57:50	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP12	7/16/2022	14:58:32	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP12	7/16/2022	14:58:33	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP12	7/16/2022	15:01:26	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP12	7/16/2022	15:01:27	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP12	7/16/2022	15:02:03	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP13	7/16/2022	15:12:15	Start	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP13	7/16/2022	15:12:37	-	-	Macroalgae - Patchy	-	None	Zostera
Bay Parkway	BP13	7/16/2022	15:12:50	-	End	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP13	7/16/2022	15:12:51	-	Start	IND	Start	IND	N/A
Bay Parkway	BP13	7/16/2022	15:14:13	-	End	IND	End	IND	N/A
Bay Parkway	BP13	7/16/2022	15:14:14	-	Start	Macroalgae - Patchy	Start	None	N/A
Bay Parkway	BP13	7/16/2022	15:14:44	-	-	Macroalgae - Patchy	End	None	N/A
Bay Parkway	BP13	7/16/2022	15:14:45	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Bay Parkway	BP13	7/16/2022	15:15:25	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP13	7/16/2022	15:15:26	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP13	7/16/2022	15:15:42	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP13	7/16/2022	15:15:43	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP13	7/16/2022	15:15:46	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
Bay Parkway	BP13	7/16/2022	15:15:47	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
Bay Parkway	BP13	7/16/2022	15:16:30	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
Bay Parkway	BP13	7/16/2022	15:16:31	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
Bay Parkway	BP13	7/16/2022	15:18:58	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP13	7/16/2022	15:18:59	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Bay Parkway	BP13	7/16/2022	15:19:06	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Bay Parkway	BP13	7/16/2022	15:19:07	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP13	7/16/2022	15:23:04	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD04	7/17/2022	7:07:16	Start	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD04	7/17/2022	7:11:34	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD04	7/17/2022	7:11:35	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD04	7/17/2022	7:11:54	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD04	7/17/2022	7:11:55	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD04	7/17/2022	7:13:07	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD04	7/17/2022	7:13:08	-	Start	Off Bottom	Start	Off Bottom	N/A
Lighthouse Drive	LD04	7/17/2022	7:13:16	-	End	Off Bottom	End	Off Bottom	N/A
Lighthouse Drive	LD04	7/17/2022	7:13:17	-	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD04	7/17/2022	7:17:50	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD04	7/17/2022	7:17:51	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD04	7/17/2022	7:18:08	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD04	7/17/2022	7:18:09	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD04	7/17/2022	7:18:44	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD04	7/17/2022	7:18:45	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD04	7/17/2022	7:19:03	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD05	7/17/2022	7:19:04	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD05	7/17/2022	7:19:32	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD05	7/17/2022	7:19:33	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD05	7/17/2022	7:19:48	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD05	7/17/2022	7:19:49	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD05	7/17/2022	7:24:29	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD05	7/17/2022	7:24:30	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD05	7/17/2022	7:27:09	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD05	7/17/2022	7:27:10	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD05	7/17/2022	7:28:02	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD05	7/17/2022	7:28:03	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD05	7/17/2022	7:32:30	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:44:31	Start	Start	IND	Start	IND	N/A
Lighthouse Drive	LD06	7/17/2022	7:44:37	-	End	IND	End	IND	N/A
Lighthouse Drive	LD06	7/17/2022	7:44:38	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD06	7/17/2022	7:44:45	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD06	7/17/2022	7:44:46	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:45:14	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:45:15	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:45:29	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:45:30	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:53:32	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:53:33	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD06	7/17/2022	7:55:26	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD06	7/17/2022	7:55:27	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD06	7/17/2022	7:58:54	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD06	7/17/2022	7:58:55	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:59:03	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD06	7/17/2022	7:59:04	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD06	7/17/2022	7:59:49	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD06	7/17/2022	7:59:50	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD06	7/17/2022	8:02:05	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD07	7/17/2022	8:03:22	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD07	7/17/2022	8:04:45	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD07	7/17/2022	8:04:46	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD07	7/17/2022	8:09:00	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD07	7/17/2022	8:09:01	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD07	7/17/2022	8:09:38	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD07	7/17/2022	8:09:39	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD07	7/17/2022	8:16:09	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD03	7/17/2022	8:27:47	Start	Start	IND	Start	IND	N/A
Lighthouse Drive	LD03	7/17/2022	8:27:51	-	End	IND	End	IND	N/A
Lighthouse Drive	LD03	7/17/2022	8:27:52	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD03	7/17/2022	8:31:32	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD03	7/17/2022	8:31:33	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD03	7/17/2022	8:32:59	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD03	7/17/2022	8:33:00	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD03	7/17/2022	8:34:24	-	End	IND	End	IND	N/A
Lighthouse Drive	LD03	7/17/2022	8:34:25	-	Start	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD03	7/17/2022	8:35:52	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD03	7/17/2022	8:35:53	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD03	7/17/2022	8:37:46	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD03	7/17/2022	8:37:47	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD03	7/17/2022	8:39:26	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD03	7/17/2022	8:39:27	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD03	7/17/2022	8:40:14	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD02	7/17/2022	8:41:34	Start	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD02	7/17/2022	8:41:35	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD02	7/17/2022	8:41:38	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD02	7/17/2022	8:41:39	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD02	7/17/2022	8:43:50	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD02	7/17/2022	8:43:51	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD02	7/17/2022	8:50:02	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD02	7/17/2022	8:50:03	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD02	7/17/2022	8:52:13	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD02	7/17/2022	8:52:14	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD02	7/17/2022	8:52:30	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD02	7/17/2022	8:52:31	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD02	7/17/2022	8:53:09	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD02	7/17/2022	8:53:10	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD02	7/17/2022	8:55:15	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD02	7/17/2022	8:55:16	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD02	7/17/2022	8:55:18	End	End	IND	End	IND	N/A
Bay Parkway	BP14	7/17/2022	9:20:06	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP14	7/17/2022	9:24:47	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP14	7/17/2022	9:24:48	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP14	7/17/2022	9:25:35	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Bay Parkway	BP14	7/17/2022	9:25:36	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Bay Parkway	BP14	7/17/2022	9:27:34	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Bay Parkway	BP14	7/17/2022	9:27:35	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Bay Parkway	BP14	7/17/2022	9:28:16	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
Bay Parkway	BP14	7/17/2022	9:28:17	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
Bay Parkway	BP14	7/17/2022	9:28:41	-	End	Macroalgae - Complete	-	Zostera - Patchy	N/A
Bay Parkway	BP14	7/17/2022	9:28:42	-	Start	Macroalgae - Patchy	-	Zostera - Patchy	N/A
Bay Parkway	BP14	7/17/2022	9:32:07	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD01	7/17/2022	9:40:17	Start	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD01	7/17/2022	9:40:20	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD01	7/17/2022	9:40:21	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD01	7/17/2022	9:40:26	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD01	7/17/2022	9:40:27	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD01	7/17/2022	9:41:21	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD01	7/17/2022	9:41:22	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD01	7/17/2022	9:42:17	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD01	7/17/2022	9:42:18	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:47:40	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:47:41	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:50:10	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:50:11	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:51:33	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:51:34	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD01	7/17/2022	9:52:02	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD01	7/17/2022	9:52:03	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:52:15	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD01	7/17/2022	9:52:16	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD01	7/17/2022	9:54:37	End	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD08	7/17/2022	10:05:42	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD08	7/17/2022	10:05:50	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD08	7/17/2022	10:05:51	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD08	7/17/2022	10:08:21	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD08	7/17/2022	10:08:22	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD08	7/17/2022	10:11:03	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD08	7/17/2022	10:11:04	-	-	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD08	7/17/2022	10:11:31	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:12:04	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:12:17	-	End	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD08	7/17/2022	10:12:18	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD08	7/17/2022	10:12:28	-	End	IND	End	IND	N/A
Lighthouse Drive	LD08	7/17/2022	10:12:29	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD08	7/17/2022	10:12:37	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:13:07	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD08	7/17/2022	10:13:08	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD08	7/17/2022	10:13:44	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A
Lighthouse Drive	LD08	7/17/2022	10:13:45	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD08	7/17/2022	10:14:48	-	End	Macroalgae - Complete	End	Zostera - Sparse	N/A
Lighthouse Drive	LD08	7/17/2022	10:14:49	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD08	7/17/2022	10:15:19	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:15:29	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:15:54	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:16:12	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD08	7/17/2022	10:16:13	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD08	7/17/2022	10:16:39	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD08	7/17/2022	10:16:40	-	-	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD08	7/17/2022	10:19:04	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:19:38	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:19:47	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:19:51	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:20:19	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:20:47	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:21:06	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:21:13	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:21:36	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:22:21	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:23:17	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:23:33	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD08	7/17/2022	10:25:07	End	End	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD09	7/17/2022	10:35:02	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD09	7/17/2022	10:37:23	-	-	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD09	7/17/2022	10:37:24	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD09	7/17/2022	10:41:38	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD09	7/17/2022	10:41:39	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD09	7/17/2022	10:42:36	-	End	IND	End	IND	N/A
Lighthouse Drive	LD09	7/17/2022	10:42:37	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD09	7/17/2022	10:43:02	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD09	7/17/2022	10:43:28	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD09	7/17/2022	10:43:40	End	End	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD10	7/17/2022	10:52:15	Start	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD10	7/17/2022	10:52:56	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD10	7/17/2022	10:52:57	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD10	7/17/2022	10:54:30	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD10	7/17/2022	10:54:31	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD10	7/17/2022	10:54:58	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD10	7/17/2022	10:54:59	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD10	7/17/2022	10:55:25	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD10	7/17/2022	10:55:26	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD10	7/17/2022	10:55:56	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD10	7/17/2022	10:55:57	-	-	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD10	7/17/2022	11:01:20	End	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD11	7/17/2022	11:06:30	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD11	7/17/2022	11:08:36	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD11	7/17/2022	11:08:37	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD11	7/17/2022	11:14:42	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD11	7/17/2022	11:14:43	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD11	7/17/2022	11:15:26	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
Lighthouse Drive	LD11	7/17/2022	11:15:27	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
Lighthouse Drive	LD11	7/17/2022	11:15:55	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
Lighthouse Drive	LD11	7/17/2022	11:15:56	-	-	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD11	7/17/2022	11:16:19	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD11	7/17/2022	11:16:20	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
Lighthouse Drive	LD11	7/17/2022	11:17:20	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD12	7/17/2022	11:24:13	Start	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:26:18	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:26:19	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:26:43	-	End	IND	End	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:26:44	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:26:47	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:26:48	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD12	7/17/2022	11:27:11	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD12	7/17/2022	11:27:12	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:28:26	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:28:27	-	-	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:28:54	-	-	Macroalgae - Patchy	-	None	Zostera

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD12	7/17/2022	11:29:03	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:29:12	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:29:19	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:29:23	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:29:40	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:29:46	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:29:49	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:29:50	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:31:10	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:31:11	-	-	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:31:35	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:31:42	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:31:47	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:31:48	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD12	7/17/2022	11:32:17	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD12	7/17/2022	11:32:18	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:33:20	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD12	7/17/2022	11:33:21	-	-	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:33:45	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:34:00	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:34:33	-	End	Macroalgae - Patchy	-	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:34:34	-	Start	Macroalgae - Complete	-	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:35:17	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:35:18	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:35:27	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:37:02	-	End	Macroalgae - Complete	End	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:37:03	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:30	-	End	IND	End	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:31	-	Start	Macroalgae - Complete	Start	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:37	-	End	Macroalgae - Complete	End	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:38	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:51	-	End	IND	End	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:52	-	Start	Macroalgae - Complete	Start	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:54	-	End	Macroalgae - Complete	End	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:38:55	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:39:29	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD12	7/17/2022	11:39:42	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD12	7/17/2022	11:39:46	-	End	IND	End	IND	N/A
Lighthouse Drive	LD12	7/17/2022	11:39:47	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD12	7/17/2022	11:39:57	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD12	7/17/2022	11:40:12	End	End	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:43:53	Start	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD13	7/17/2022	11:44:40	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD13	7/17/2022	11:44:41	-	-	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:44:47	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:45:36	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:45:45	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:46:31	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:46:46	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:46:55	-	End	Macroalgae - Patchy	-	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:46:56	-	Start	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:47:45	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:49:44	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:50:04	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:50:09	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:50:14	-	End	Macroalgae - Complete	-	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:50:15	-	Start	Macroalgae - Patchy	-	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:50:20	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:50:21	-	End	Macroalgae - Patchy	-	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:50:22	-	Start	Macroalgae - Complete	-	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:51:20	-	End	Macroalgae - Complete	-	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:51:21	-	Start	Macroalgae - Patchy	-	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:51:25	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD13	7/17/2022	11:51:34	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD13	7/17/2022	11:51:35	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD13	7/17/2022	11:52:38	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD13	7/17/2022	11:52:39	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD13	7/17/2022	11:53:57	-	End	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD13	7/17/2022	11:53:58	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD13	7/17/2022	11:54:32	-	-	IND	-	IND	Macroalgae



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD13	7/17/2022	11:54:38	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD13	7/17/2022	11:54:40	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD13	7/17/2022	11:54:42	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD13	7/17/2022	11:54:46	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD13	7/17/2022	11:54:59	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD13	7/17/2022	11:55:02	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD13	7/17/2022	11:55:59	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD13	7/17/2022	11:56:13	End	End	IND	End	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:34:16	Start	Start	IND	Start	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:35:24	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:36:14	-	End	IND	End	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:36:15	-	Start	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:36:29	-	End	Macroalgae - Patchy	-	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:36:30	-	Start	Macroalgae - Complete	-	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:37:26	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:37:27	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:41:41	-	End	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:41:42	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:41:50	-	End	IND	End	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:41:51	-	Start	Macroalgae - Complete	Start	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:42:10	-	-	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:42:11	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:42:22	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:42:23	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD18	7/17/2022	12:42:58	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD18	7/17/2022	12:42:59	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:43:39	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:44:04	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:44:09	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:44:14	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:44:27	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:44:30	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:45:02	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:45:13	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:45:15	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:45:25	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:45:57	-	End	IND	End	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:45:58	-	Start	None	Start	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:00	-	End	None	-	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:01	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:23	-	End	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:24	-	Start	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:26	-	-	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:27	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:50	-	End	Macroalgae - Complete	End	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:46:51	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:47:13	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:48:28	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:48:30	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:48:55	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:48:58	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:49:35	-	End	IND	End	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:49:36	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD18	7/17/2022	12:49:45	-	End	Macroalgae - Patchy	-	None	N/A
Lighthouse Drive	LD18	7/17/2022	12:49:46	-	Start	Macroalgae - Complete	-	None	N/A
Lighthouse Drive	LD18	7/17/2022	12:50:11	-	-	Macroalgae - Complete	End	None	N/A
Lighthouse Drive	LD18	7/17/2022	12:50:12	-	-	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD18	7/17/2022	12:50:26	-	-	Macroalgae - Complete	End	Zostera - Sparse	N/A
Lighthouse Drive	LD18	7/17/2022	12:50:27	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:51:58	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:51:59	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:52:34	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:52:35	-	Start	Macroalgae - Patchy	-	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:53:55	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:53:56	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:54:07	-	End	IND	End	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:54:08	-	Start	Macroalgae - Complete	Start	None	N/A
Lighthouse Drive	LD18	7/17/2022	12:54:29	-	-	Macroalgae - Complete	End	None	N/A
Lighthouse Drive	LD18	7/17/2022	12:54:30	-	-	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD18	7/17/2022	12:55:43	-	End	Macroalgae - Complete	End	Zostera - Sparse	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD18	7/17/2022	12:55:44	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:55:50	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD18	7/17/2022	12:56:01	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD18	7/17/2022	12:56:18	-	End	IND	End	IND	N/A
Lighthouse Drive	LD18	7/17/2022	12:56:19	-	Start	Macroalgae - Complete	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:56:31	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
Lighthouse Drive	LD18	7/17/2022	12:56:32	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
Lighthouse Drive	LD18	7/17/2022	12:56:40	End	End	Macroalgae - Complete	End	Zostera - Complete	N/A
Lighthouse Drive	LD17	7/17/2022	13:02:32	Start	Start	Macroalgae - Patchy	Start	Zostera - Complete	N/A
Lighthouse Drive	LD17	7/17/2022	13:03:25	-	End	Macroalgae - Patchy	End	Zostera - Complete	N/A
Lighthouse Drive	LD17	7/17/2022	13:03:26	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD17	7/17/2022	13:03:30	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD17	7/17/2022	13:03:31	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD17	7/17/2022	13:03:34	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD17	7/17/2022	13:03:36	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD17	7/17/2022	13:04:14	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:04:20	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:04:27	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:04:29	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:04:49	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:04:50	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:12	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:20	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:24	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:28	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:31	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:34	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:38	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:47	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:49	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:05:55	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:06:00	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:06:03	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:06:05	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:06:07	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:06:10	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:06:37	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:07:12	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD17	7/17/2022	13:07:25	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:07:27	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:07:30	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:07:36	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD17	7/17/2022	13:07:37	-	End	IND	End	IND	N/A
Lighthouse Drive	LD17	7/17/2022	13:07:38	-	Start	Off Bottom	Start	Off Bottom	N/A
Lighthouse Drive	LD17	7/17/2022	13:12:31	End	End	Off Bottom	End	Off Bottom	N/A
Lighthouse Drive	LD16	7/17/2022	13:12:32	Start	Start	IND	Start	IND	N/A
Lighthouse Drive	LD16	7/17/2022	13:12:56	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD16	7/17/2022	13:13:18	-	End	IND	End	IND	N/A
Lighthouse Drive	LD16	7/17/2022	13:13:19	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD16	7/17/2022	13:13:34	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD16	7/17/2022	13:13:40	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD16	7/17/2022	13:13:45	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD16	7/17/2022	13:13:58	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD16	7/17/2022	13:14:55	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD16	7/17/2022	13:15:52	-	End	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD16	7/17/2022	13:15:53	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD16	7/17/2022	13:16:16	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:18	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:20	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:22	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:26	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:39	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:43	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:49	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:51	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:53	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:16:58	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:02	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:05	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:07	-	-	IND	-	IND	Macroalgae



Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD16	7/17/2022	13:17:08	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:11	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:13	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:15	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:17	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:18	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:20	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:24	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:26	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:28	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:30	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:32	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:33	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:36	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:38	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:40	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:41	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:43	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:45	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:47	-	End	IND	End	IND	Macroalgae
Lighthouse Drive	LD16	7/17/2022	13:17:48	-	Start	Macroalgae - Complete	Start	None	N/A
Lighthouse Drive	LD16	7/17/2022	13:19:00	-	-	Macroalgae - Complete	-	None	Zostera
Lighthouse Drive	LD16	7/17/2022	13:19:24	End	End	Macroalgae - Complete	End	None	N/A
Lighthouse Drive	LD14	7/17/2022	13:31:10	Start	Start	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:31:23	-	End	Macroalgae - Complete	End	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:31:24	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:12	-	End	IND	End	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:13	-	Start	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:17	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:18	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:38	-	End	IND	End	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:39	-	Start	Macroalgae - Complete	Start	None	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:43	-	-	Macroalgae - Complete	End	None	N/A
Lighthouse Drive	LD14	7/17/2022	13:32:44	-	-	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:33:27	-	End	Macroalgae - Complete	End	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:33:28	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:33:29	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD14	7/17/2022	13:33:56	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD14	7/17/2022	13:34:11	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD14	7/17/2022	13:34:21	-	-	IND	-	IND	Macroalgae
Lighthouse Drive	LD14	7/17/2022	13:34:22	-	-	IND	-	IND	Zostera
Lighthouse Drive	LD14	7/17/2022	13:34:25	-	End	IND	End	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:34:26	-	Start	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:35:04	-	End	Macroalgae - Complete	End	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:35:05	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:35:22	-	End	IND	End	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:35:23	-	Start	Macroalgae - Complete	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:35:31	-	End	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:35:32	-	Start	Macroalgae - Patchy	-	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:37:39	-	-	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:37:40	-	-	Macroalgae - Patchy	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD14	7/17/2022	13:37:58	-	-	Macroalgae - Patchy	End	Zostera - Patchy	N/A
Lighthouse Drive	LD14	7/17/2022	13:37:59	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:49:02	-	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:49:03	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:49:18	-	End	IND	End	IND	N/A
Lighthouse Drive	LD14	7/17/2022	13:49:19	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD14	7/17/2022	13:49:24	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD14	7/17/2022	13:49:25	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD14	7/17/2022	13:51:13	End	End	Macroalgae - Patchy	End	Zostera - Sparse	N/A
Lighthouse Drive	LD15	7/17/2022	13:56:56	Start	Start	IND	Start	IND	N/A
Lighthouse Drive	LD15	7/17/2022	13:57:00	-	End	IND	End	IND	N/A
Lighthouse Drive	LD15	7/17/2022	13:57:01	-	Start	Macroalgae - Patchy	Start	None	N/A
Lighthouse Drive	LD15	7/17/2022	13:57:16	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD15	7/17/2022	13:57:27	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD15	7/17/2022	13:57:50	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD15	7/17/2022	13:58:04	-	-	Macroalgae - Patchy	-	None	Zostera
Lighthouse Drive	LD15	7/17/2022	13:58:15	-	-	Macroalgae - Patchy	End	None	N/A
Lighthouse Drive	LD15	7/17/2022	13:58:16	-	-	Macroalgae - Patchy	Start	Zostera - Sparse	N/A
Lighthouse Drive	LD15	7/17/2022	13:58:23	-	End	Macroalgae - Patchy	-	Zostera - Sparse	N/A

Area	Transect ID	Date	Time	Transect	Macroalgae Period	Relative Macroalgae Abundance	SAV Period	Relative SAV Abundance	Point Observations
Lighthouse Drive	LD15	7/17/2022	13:58:24	-	Start	Macroalgae - Complete	-	Zostera - Sparse	N/A
Lighthouse Drive	LD15	7/17/2022	13:58:25	-	-	Macroalgae - Complete	End	Zostera - Sparse	N/A
Lighthouse Drive	LD15	7/17/2022	13:58:26	-	-	Macroalgae - Complete	Start	Zostera - Patchy	N/A
Lighthouse Drive	LD15	7/17/2022	13:58:37	-	-	Macroalgae - Complete	End	Zostera - Patchy	N/A
Lighthouse Drive	LD15	7/17/2022	13:58:38	-	-	Macroalgae - Complete	Start	Zostera - Complete	N/A
Lighthouse Drive	LD15	7/17/2022	13:59:37	-	End	Macroalgae - Complete	-	Zostera - Complete	N/A
Lighthouse Drive	LD15	7/17/2022	13:59:38	-	Start	None	-	Zostera - Complete	N/A
Lighthouse Drive	LD15	7/17/2022	14:07:30	-	End	None	End	Zostera - Complete	N/A
Lighthouse Drive	LD15	7/17/2022	14:07:31	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD15	7/17/2022	14:07:46	-	End	IND	End	IND	N/A
Lighthouse Drive	LD15	7/17/2022	14:07:47	-	Start	None	Start	Zostera - Complete	N/A
Lighthouse Drive	LD15	7/17/2022	14:08:08	-	End	None	End	Zostera - Complete	N/A
Lighthouse Drive	LD15	7/17/2022	14:08:09	-	Start	IND	Start	IND	N/A
Lighthouse Drive	LD15	7/17/2022	14:08:14	-	End	IND	End	IND	N/A
Lighthouse Drive	LD15	7/17/2022	14:08:15	-	Start	None	Start	Zostera - Complete	N/A
Lighthouse Drive	LD15	7/17/2022	14:08:20	End	End	None	End	Zostera - Complete	N/A

## **Ocean Wind 1 Submerged Aquatic Vegetation Monitoring and Mitigation Plan**

October 2022

# Table of Contents

1. Background..... 3

2. Anticipated Scope of Impact ..... 4

3. Mapping Effort in Barnegat Bay..... 7

4. Pre and Post Construction Monitoring Activities ..... 8

5. SAV Restoration Program..... 10

5.1 Monitoring and evaluation of abiotic factors relevant to SAV growth at the site..... 10

5.2 Evaluation of direct and indirect impacts to modify spatial extent of required restoration. .... 10

5.3 Adaptive Management Refinement. .... 11

5.4 Restoration Implementation..... 11

5.5 Continued Monitoring of Restored Areas. .... 11

6. Reporting ..... 12

7. References ..... 12



## 1. Background

Ocean Wind, LLC proposes to construct and operate the Ocean Wind Offshore Wind Farm (OCW01 or Project) to generate renewable power off the coast of New Jersey. The wind farm portion of the Project will be in federal waters on the Outer Continental Shelf (OCS) in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0498 (Lease Area). In addition to the Lease Area, the Offshore Project Area includes two offshore Export Cable Route Corridors including the BL England and Oyster Creek Offshore Export Cable Route Corridors, as well as the Oyster Creek Inshore Export Cable Route Corridor.

The focus of this Submerged Aquatic Vegetation (SAV) mitigation plan is to outline the process necessary to ensure that any impacts, which cannot be either avoided or minimized, on SAV incurred during construction and installation activities of the Ocean Wind 1 export cable are adequately restored or mitigated to the greatest extent practicable. The potential areas of interest on the Oyster Creek Inshore Export Cable Route Corridor that transits through Barnegat Bay (the Bay), where SAV beds and mapped SAV habitat were previously documented within the vicinity of the Project (Ocean Wind, LLC 2021). The proposed Oyster Creek Inshore Export Cable Route Corridor transits from the western side of Island Beach State Park (IBSP) to the Oyster Creek landfall options on the western side of the Bay, as shown in Figure 1. The Oyster Creek Inshore Export Cable Route Corridor segment adjacent to IBSP was recently proposed to be relocated northward from its originally proposed route to minimize direct impacts to contiguous SAV beds in this area. This segment now transits through a previously dredged channel, hereafter referred to as the “prior channel.” The water depth of the prior channel restricts light penetration to the seafloor, limiting the growth of SAV within the channel (Lathrop et al. 2017; Ocean Wind, LLC 2021). On the western side of Barnegat Bay, several landfall options continue to be carried forward in Ocean Wind 1’s Construction and Operation Plan in an effort to provide flexibility as envisioned through the Project Design Envelope (PDE) approach. Generally, in this area SAV beds occur in the shallow waters fringing the shoreline. Ocean Wind 1 notes however, that for purposes of its state and United States Army Corps of Engineers permit applications, Ocean Wind 1 has included landfall on the western side of Barnegat Bay at the northernmost landfall (i.e., Holtec Landfall) (Figure 1).

Throughout this document SAV refers to submerged aquatic vascular plants, specifically eelgrass (*Zostera marina*) and not macroalgal species. This distinction is important because the factors that generally influence the growth and production of submerged aquatic vascular plants (e.g., turbidity/light availability at the seafloor) are typically different than the factors that are related to macroalgal blooms (e.g., water column nutrient concentrations).

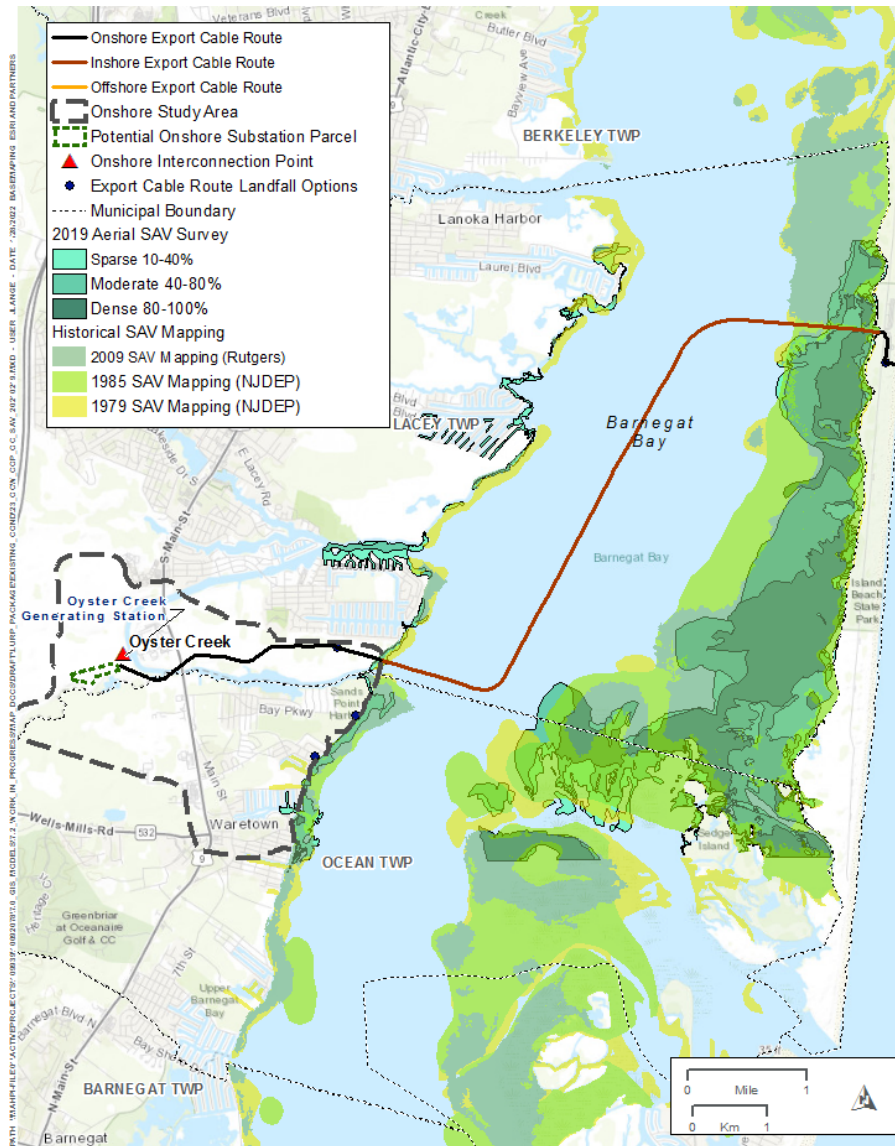


Figure 1. Proposed Oyster Creek Inshore Export Cable Route Corridor

## 2. Anticipated Scope of Impact

The scope of this mitigation plan is a result of previous discussions with New Jersey Department of Environmental Protection (NJDEP), National Marine Fisheries Service (NMFS), Bureau of Ocean Energy Management (BOEM), and an evaluation of previous SAV restoration projects withing

Barnegat Bay. Restoration of SAV beds in areas where they have previously existed, or in areas disturbed by activity have proven difficult to re-establish due to a number of biotic and abiotic factors. Without identifying and controlling for these factors, restoration activities are likely to have poor success. To this end, Ocean Wind is proposing an effective 3:1 mitigation ratio, consisting of mapping efforts, monitoring activities, restoration of documented impacts at an in-situ 1:1 ratio, as well as additional research to improve SAV mitigation in the future.

Areas expected to be impacted have been quantified within the NJDEP LRP Permit Application. The calculated totals submitted with the application are shown below in Tables 1 and 2.

**Table 1. Impacts to Mapped SAV Habitat by Construction Activity**

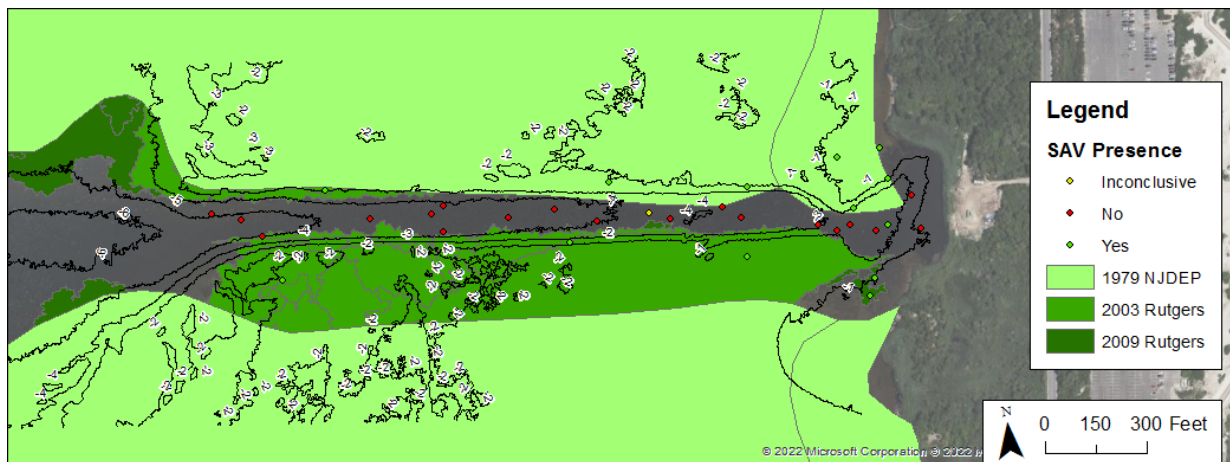
Construction Activity	Impact Area to Mapped SAV Habitat (acres)
Cable Installation Activities	2.9
Anchoring/Mooring	0.02
Total	2.92

**Table 2. SAV Impact Area by Location**

Landfall	Impact Area to Mapped SAV Habitat (acres)
Holtec Property Landfall- Open Cut	1.1
Holtec Property Landfall - HDD	0
Prior Channel – Open Cut	1.8
Anchoring/Mooring within Barnegat Bay	0.02
Total	2.92

There are two primary areas where the cable route is expected to potentially impact SAV habitat. On the eastern side of Barnegat Bay, the cable is proposed to travel through a previously dredged channel (the “prior channel”) to emerge from Island Beach State Park and enter Barnegat Bay. This is an area where extensive SAV exists to the north and south of the channel as of 2022 (Orsted 2022) and is shown in Figure 2.

**Figure 2. Island Beach State park “Prior Channel” Mapped SAV Habitat**



The Export Cable Route will cross the Bay southwest before the inshore portion makes landfall at the Holtec Property in Lacey Township. The preferred method of installation for the transition to shore is Horizontal Directional Drill (HDD). Geotechnical investigations upon which installation design depends are ongoing. Data will be reviewed to determine whether HDD is the installation technique with the least environmental impact, or whether the risk of inadvertent return is such that open cut would result in the least impact. During in-water video collected from an SAV field survey conducted in July 2022, no SAV beds were observed along any continuous stretch of video at the Holtec Farm survey area. The results of this 2022 survey corroborate previous in-water drop camera imagery collected in 2021, that also reported no SAV at the Farm survey area (Ocean Wind, LLC 2021) (Figure 3).



**Figure 3. Oyster Creek Landfall 2022 SAV Survey Results**

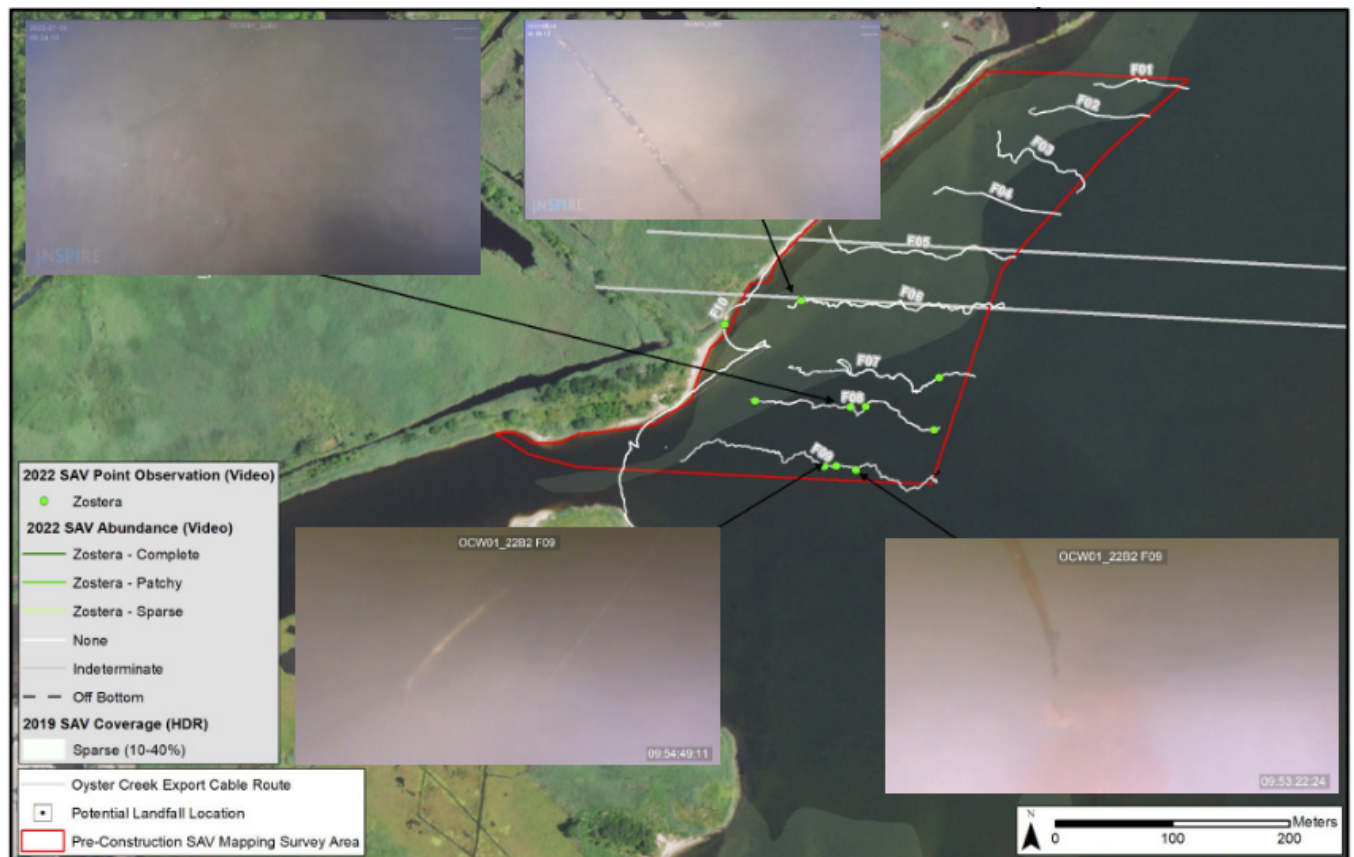


Photo obtained from Inspire Environmental's *Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey*

### 3. Mapping Effort in Barnegat Bay

The Barnegat Bay Mapping survey will include reconnaissance of SAV habitat throughout the Bay, focusing primarily within the vicinity of the construction activities and other notable areas of interest. The objective of this monitoring is to:

- 3.1 Document existing SAV beds. Regional conditions of SAV have not been updated since 2009, and changes in the SAV coverage within the bay have occurred since then due to anthropogenic stressors (Bologna and Sinnema 2012). While the cable route and directly impacted area will be the priority, other areas will be mapped to contribute to a better understanding of the regional conditions within the bay. This will include, where possible, orthographic images of SAV beds and pre-construction conditions of the proposed cable route.

- 3.2 Document comparable imagery of the sites for post-construction conditions. In addition to in-water monitoring described in Section 4, imagery can provide an evaluation of the areas of potential impact including those affected by indirect impacts to SAV from construction activities.
- 3.3 Identify potential areas of SAV habitat that could benefit from additional restoration activities. Many areas of historical SAV within Barnegat Bay do not currently support healthy *Zostera* densities. Aerial imagery may show areas that can be expected to contain SAV but currently do not.

Methods for collecting aerial imagery may include aircraft, unmanned aerial systems (UAS), or other means of providing images that can delineate areas of SAV. These will be combined with the monitoring in Section 4 to provide ground truthing of results. These surveys will follow the guidance provided in Colarusso and Verkade (2016) and NJDEP (2015).

#### **4. Pre and Post Construction Monitoring Activities**

The monitoring efforts of SAV generally follow those described in INSPIRE Environmental (2022), with additional monitoring of abiotic parameters. Included in the monitoring are SAV and subaqueous soil analyses of conditions that contribute to a before and after study of the cable installation work planned for Barnegat Bay. The installation can have impacts not only directly to SAV but also to the subaqueous conditions necessary for SAV growth, such as the sediment deposition and resuspension rates and light availability associated with these sedimentary changes. While changes in light availability and therefore reductions in SAV, are largely correlated to construction activities, resultant decreases in SAV bed health during subsequent growing seasons is possible. Decreases in SAV following the initial construction activities could result in further declines in bed health; whereas less SAV present results in less SAV to support recovery through soil stabilization, seed bank provisioning, and bed expansion over subsequent growing seasons. A before and after study with monitoring to encapsulate multiple growing seasons will document the impacts (temporary or persistent) of construction activities, the trajectory of natural recovery, and provide valuable information for any future management or mitigation actions.

Data collection to characterize community composition of SAV will occur within three regions, 'The Farm' as the western Bay site of cable installation, Island Beach State Park (IBSP) as the eastern Bay site of cable installation, and a control site (Seaside Park, SSP). In-water surveys will take place within the SAV growing season (May - October), starting in 2023 (pre-construction and post-construction) and continuing annually during post-construction monitoring (2024-2033). The control site at Seaside Park is part of the long-term monitoring program Dr. Lacey has been operating since 2014. It is within

a similar region to the IBSP construction location and is adjacent to a NJDEP DWM&S Continuous Data Monitoring Program site. The SSP SAV and water quality monitoring datasets provide a robust baseline series reflective of the natural variation experienced by SAV communities.

Given the significantly different baseline conditions at The Farm and IBSP, two different survey methods will be utilized. At The Farm, a site that has not been surveyed to support SAV, transects will be placed perpendicular to shore with quadrat substations along each transect. An RTK unit will be used to navigate from the shoreline to the predetermined transect starting and ending coordinates. During the in-water survey, if SAV is found to be present, metrics of seagrass bed health will be visually assessed (e.g., shoot density, percent cover). Given the importance of soil on conditions necessary for SAV growth and recruitment, soils for grainsize analysis will be collected at predetermined locations as navigated to via RTK. Samples will be collected by hand from the upper vegetative growing horizon using clear acrylic cores.

At IBSP, SAV has been extensively documented. For this reason, a BAG (Before-After Gradient) survey design will be utilized. Cable installation at this site is planned to occur within a prior channel traversing perpendicular to the shoreline. Transects at this site will be placed parallel to shore, with quadrat substations along each transect. Transect starting points will occur within the prior channel and proceed 200 m to the north and south of the channel, with substations occurring every 25 meters. To address any issues with bed heterogeneity, cluster sampling rather than single point sampling will occur at each substation. Other than this difference, the same survey methodology will be followed as previously outlined, including soil collection for grain size analysis. In addition, to account for the importance of water quality changes to SAV health, a water quality station will be installed at this site which will monitor abiotic parameters relative to SAV health (e.g., temperature, turbidity).

For both IBSP and SSP, more detailed analysis of sedimentation and resuspension is necessary to determine the impact of construction activities on these parameters when SAV is present. This analysis will occur in late winter-early spring (February - April) to capture the seasonal period of largest energy exposure due to stronger winds and storms. To characterize these conditions, sedimentation equipment (settlement tubes, pans, and bed level sensors) will be deployed during two-week periods before cable installation and during all years of monitoring post-installation. Parameters include soil bedload, suspended load soils, and changes to the sediment surface level and water column turbidity in timeseries. Results will form the quantitative basis to determine the immediate and persistent impacts of construction activities as compared to the control site.

## 5. SAV Restoration Program

The site-specific restoration program is outlined below. Ocean Wind understands the degree of success of the restoration and mitigation strategy will depend upon the inclusion of the following steps as follows:

### 5.1 Monitoring and evaluation of abiotic factors relevant to SAV growth at the site.

Several factors of sediment and water quality have been identified as significant to the growth and persistence of SAV in New Jersey. These include tidal range and water depth, temperature, turbidity, salinity, sediment resuspension and velocity, as well as sediment organic content and grain size. These will be monitored at the installation sites and compared to the literature to evaluate potential SAV stressors as described in Section 4. Additional environmental parameters can be measured to supplement the above, as necessary. Monitoring at the location of cable installation where temporary impacts are anticipated, as well as at a nearby control site, will give Ocean Wind a better understanding of Project impacts to the area as opposed to larger, bay-wide atypical conditions that may occur from other external sources such as extreme weather events or climate conditions.

### 5.2 Evaluation of direct and indirect impacts to modify spatial extent of required restoration.

This will be accomplished through a 4-year monitoring program (2023-2027) to allow the eelgrass to reestablish naturally in areas of temporary impacts and to determine where long-term impacts have occurred within 200 meters from the cable installation. A 4-year monitoring cycle will allow the Project to observe two sexual reproductive cycles of eelgrass. Data collection to characterize community composition of SAV will occur within three regions, Holtec (Farm) landfall, IBSP at the eastern Bay site of cable installation, and a control site (Seaside Park, SSP). In-water surveys will take place within the SAV growing season (May - October), starting in 2023 (pre-construction and post-construction) and continuing annually during post-construction monitoring (2024-2033). The SSP SAV and water quality monitoring datasets provide a robust baseline series reflective of the natural variation experienced by SAV communities. The monitoring will include both a comparative BACI study for areas on the western side of Barnegat Bay (where a 2022 survey found no rooted eelgrass), in addition to a Before After Gradient (BAG) design on the historically better documented eastern side of the Bay. These surveys will quantify the actual impacts of construction activities, whether they are the direct results of sediment disturbance or an indirect cause through resuspension or other means, to better identify the extent of area required for mitigation.



### **5.3 Adaptive Management Refinement.**

Utilizing the information gathered in all previous steps including all phases of mapping and monitoring, this step will identify potential seed sources based on existing lush SAV beds within Barnegat Bay. Seeds from plants naturally adapted to conditions similar to the restoration site typically have the best chance of success (Evans and Leschen 2010). Seed collection must not negatively impact the source beds and Ocean Wind will coordinate permission from the appropriate agencies, specifically NJDEP. While Barnegat Bay has the most extensive beds of healthy SAV in New Jersey, there are areas of degraded habitat and patchy distributions that could be harmed by seed gathering. Planting methodology will be developed based on hydrodynamic and sediment characteristics collected during the 4-year monitoring period.

### **5.4 Restoration Implementation.**

Ocean Wind will execute restoration activities in the areas identified in step 5.2 above using the methods guided by information provided in steps 5.1 and 5.3. The restoration along the cable burial route will aim to restore impacted SAV at a ratio of 1:1. If open cut installation is required for cable installation and native substrate is unsuitable, backfill will be used that is comprised of clean sand or other substrate that will increase the potential for SAV restoration success. Compliant with New Jersey regulations, disturbed areas will be restored to their previous depth below mean water. Restoration activities at the site will be scheduled after construction activities at the sites have been completed to avoid health and safety conflicts. Once the suitable seed donor beds have been identified through the activities in Sections 3 and 5.4. Seeds will be collected from plants during the summer and stored until the fall (Orth et al. 2003). Dispersion of seeds is generally most successful before the growing season when temperature stress is decreased (Granger et al. 2002). Seeding during winter can be negatively influenced by cold temperatures or ice, therefore seeding will be completed in fall (October-November) for the best chance of success, as well as to avoid other harmful impacts to estuarine species such as winter flounder and anadromous fish. Methods of seed dispersion are an area of active research within the scientific community, and Ocean Wind will seek to utilize a method that both increases the chances for success as well as minimizes impacts on other resources. The likely method of dispersion involves spreading by hand from a shallow-draft vessel, or via personnel wading in shallow waters. Additional treatments of the seeds have been employed with limited success

### **5.5 Continued Monitoring of Restored Areas.**

The Project impacted locations will be monitored through 2032, both in areas where restoration activities have occurred and those where no impacts occurred. This will allow the opportunity to assess

the degree of restoration success as well as provide insight to any additional indirect impacts that may have occurred during construction or impacts from additional activities near the Project site.

## 6. Reporting

The information gathered during each of these steps will contribute to modifications and improvements of the subsequent activities, ultimately providing the best chances for successful restoration of SAV within the area of impacts. A more detailed plan discussing these steps for restoration is being developed, however many of the actions to be taken are dependent on the outcome of the pre and post construction monitoring results.

Reports will be generated to provide a record of progress and make recommendation for future actions or adjustment to the mitigation plan. Two sets of annual reports will be generated: one detailing activities and objectives for the following year, and one annual report detailing actions from the previous year, including an assessment of goals and progress. At the conclusion of SAV mitigation (anticipated 2032), a final synthesis document will be compiled for the entire Project.

## 7. References

- Bologna, P. and M. Sinnema, M. 2012. Restoration of Seagrass Habitat in New Jersey, USA. *Journal of Coastal Research*. 28:99-104
- Colarusso, P. and A. Verkade. 2016. Submerged Aquatic Vegetation Survey Guidance for the New England Region. Joint Federal Agency Publication including NOAA, EPA, and USACE.
- Evans, N. and A. Leschen. 2010. Technical Guidelines for the delineation, restoration and monitoring of eelgrass (*Zostera marina*) in Massachusetts Coastal Waters. Massachusetts Division of Marine Fisheries Technical Report TR-43.
- Granger, S., M. Traber, S. Nixon, and R. Keyes. 2002. A practical guide for the use of seeds in eelgrass (*Zostera marina* L.) restoration. Part I. Collection, processing, and storage. M. Schwartz (ed.), Rhode Island Sea Grant, Narragansett, R.I. 20 pp.
- INSPIRE Environmental. 2022b. Ocean Wind Offshore Wind Farm Submerged Aquatic Vegetation Monitoring Plan. Prepared for Ocean Wind, Orsted US. Submitted by INSPIRE Environmental. June 15, 2022.
- Lathrop, R.G., J. Bognar, E. Buenaventura, M. Ciappi, E. Green, and T.J. Belton, 2017. Establishment of Marine protected areas to reduce watercraft impacts in Barnegat Bay, New Jersey. *Journal of Coastal Research*, 78: 277-286.

- New Jersey Department of Environmental Protection (NJDEP), 2015. Guidance for the Submerged Aquatic Vegetation Surveys as Related to the Submerged Vegetation Habitat Rule at NJAC 7:7E-3.6 (as amended through June 2013). Updated March 2015.
- Ocean Wind, LLC. 2021. Ocean Wind Offshore Wind Farm Biological Survey Results. Appendix E of Volume III of the Construction and Operations Plan. Submitted to the Bureau of Ocean Energy Management by Ocean Wind, LLC. March 2021
- Ocean Wind, LLC. 2022. Ocean Wind Offshore Wind Farm Benthic Habitat Mapping and Benthic Assessment to Support Essential Fish Habitat Consultation. Results of the Baseline Submerged Aquatic Vegetation 2022 Field Survey. Submitted to the Bureau of Ocean Energy Management by Ocean Wind, LLC. August 2022.
- Orth, R., Fishman, J., Harwell, M., and Marion, S. 2003. Seed density effects on germination and initial seedling establishment in eelgrass *Zostera marina* in the Chesapeake Bay region, USA. Marine ecology Progress Series 250: 71-79