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ENERGINET - MARINE ENVIRONMENTAL STUDIES

Hesselø Benthic Ecology, Technical Report

Energinet Eltransmission A/S

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Objective:

This document summarizes marine benthic environmental baseline data from Hesselø planned offshore wind farm area, including export cable corridor to shore in Kattegat, Danish sector.

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ABBREVATIONS

Abbreviation	Explanation
AMBI index	AZTI Marine Biotic Index (AMBI), was designed to establish the ecological quality of European coasts. The index examines the response of soft-bottom benthic communities to natural and man-induced disturbances in coastal and estuarine environments.
ANOSIM	Analysis of Similarity, statistical analysis
CTD	Conductivity-Temperature-Density
DCE	Danish Centre for Environment and Energy
DKI	The Danish Quality Index for benthic infauna used for assessment of infauna condition
DW	Dry weight
ECC	Export Cable Corridors.
EEA	European Environment Agency
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency (Miljøstyrelsen, MST)
EQS	Environmental Quality Standards
GEUS	De Nationale Geologiske Undersøgelser for Danmark og Grønland
GIS	Geographic Information System
GW	Giga Watt
HAPS	Sediment core sampler. Samples a cylinder of sediment in soft to loose seabed sediments
Landfall	Is where the cable transfers from sea to land
MDS	Multidimensional Scaling
NEQS	National Environmental Quality Standards
NOVANA	Nationale Overvågningsprogram for Vandmiljø og Natur
OWF	Offshore Wind Farm
PAH	Polycyclic aromatic hydrocarbon
PSU	Practical salinity unit
ROV	Remotely Operated Vehicle
SCAFOR	Abundance scale used for both littoral and sublittoral taxa
Shannon-Wiener index	The Shannon-Wiener Index gives a measure of the diversity of species in a community
SIMPER analysis	Similarity Percentage Analysis, calculates the contribution of each variable to the dissimilarity observed between two groups
TOC	Total Organic carbon given as % of DW

1 SUMMARY

DNV on behalf of Energinet Eltransmission A/S (Energient) has carried out benthic baseline surveys in the planned offshore wind farm area Hesselø in Danish waters, including export cable corridor to shore.

The technical report provides a comprehensive overview of the marine benthic environmental baseline data collected in 2024 for the planned Hesselø OWF and its export cable corridor (ECC). This includes details on hydrography, sediment composition, sediment chemistry, infauna, megafauna, and macroalgae. Also, results from previous studies in the area are shortly summarized.

The survey area includes the planned Hesselø OWF area at depths of 20-30 meters located approximately 30 km off the north coast of Zealand and the 34 km long ECC making landfall near Gilleleje. The fieldwork was carried out in April 2024 and involved sediment sampling, visual mapping with ROVs, and hydrography measurements. An additional nearshore sampling was performed in June 2024.

Analyses of the sediment samples from the planned Hesselø OWF area were characterized by a mixture of sand, silt, and clay, with some stations containing shell fragments and hydrogen sulfide odor. CTD profiles showed a halocline at around 10 meters depth, with salinity ranging from 14-16 PSU in the upper layers to 33-34 PSU at the bottom. Oxygen concentrations were classified as 'Good'. Results from the chemical analysis of sediment samples showed most parameters within threshold values, with some exceedances of NEQS thresholds for arsenic and chromium at certain stations.

A total of 32 stations were sampled for infauna analyses, with a total of 37 132 individuals distributed among 276 different taxa were recorded (juveniles excluded). The benthic infauna was dominated by polychaetes, with the highest diversity recorded at deeper stations. The fauna composition indicates healthy communities with a mix of filter feeders, suspension feeders, and carnivores.

Visual mapping has also been performed with ROV surveys covered 15.5 km of seabed, identifying 92 species of benthic megafauna and macroalgae. Sea pen communities were found at densities that may qualify as OSPAR habitats. The invasive Round goby (*Neogobius melanostomus*) was not seen in any of the visual transects but was registered in the area for the planned Kattegat OWF that was surveyed on the same cruise.

WSP has modelled substrate types on Hesselø according to the Danish classification system. Identified infauna communities registered are mud/silt, sand, gravel/pebbles/cobbles and mixed substrate with 1-10% rocky bottom.

The biomass measurements from samples retrieved at the planned Hesselø OWF and ECC areas. Mollusca contributed most to the biomass in most stations, but echinoderms also ranked high in total biomass in several stations. Phoronids that were also commonly dominating the fauna occurrences were also among the top five species contributing to the overall biomass.

2 INTRODUCTION

2.1 Background

In order to accelerate the expansion of Danish offshore wind production, it was decided with the agreement on the Finance Act for 2022 to offer an additional 2 GW of offshore wind for establishment before the end of 2030. In addition, the parties behind the Climate Agreement on Green Power and Heat 2022 of 25 June 2022 (hereinafter Climate Agreement 2022) decided), that areas that can accommodate an additional 4 GW of offshore wind must be offered for establishment before the end of 2030. Most recently, a political agreement was concluded on 30 May 2023, which establishes the framework for the Climate Agreement 2022 with the development of 9 GW of offshore wind, which potentially can be increased to 14 GW or more if the concession winners – i.e. the tenderers who will set up the offshore wind turbines – use the freedom included in the agreement to establish capacity in addition to the tendered minimum capacity of 1 GW per tendered area.

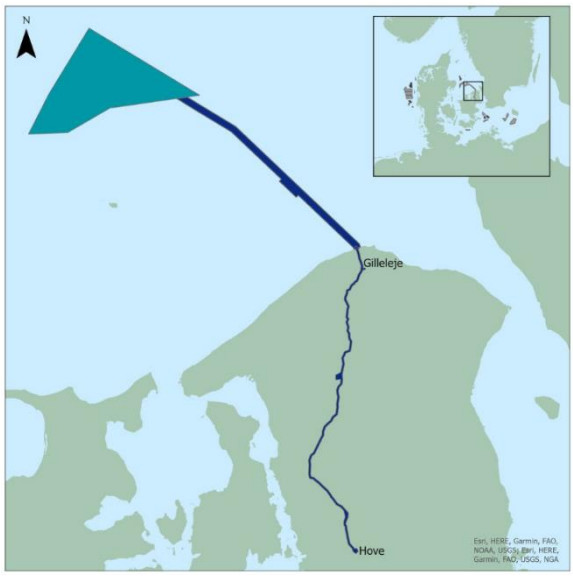

Figure 2-1 *Planned Hesselø OWF and cable route to shore (ECC). Source: Energistyrelsen.*

To enable the realization of the political agreements on significantly more energy production from offshore wind before the end of 2030, the Danish Energy Agency has drawn up a plan for the establishment of offshore wind farms in three areas in the North Sea, the Kattegat and the Baltic Sea respectively. The planned Hesselø OWF is stipulated to generate between 800 - 1.200 MW of electricity.

The offshore areas for the planned Hesselø OWF (Figure 2-1) consist of a wind farm area and an export cable corridor to Zealand. The wind farm area is located approximately 30km off the north coast of Zealand. The area for the planned Hesselø OWF is approximately 166 km^2. The planned Hesselø OWF will be connected to land via subsea cables making landfall close to Gilleleje on the north coast of Zealand.

2.2 Objective

The objective of this benthic ecology baseline report is to present an overview of existing knowledge and baseline data collected in 2024 regarding hydrography, sediment composition, sediment chemistry, infauna and megafauna and macroalgae in the areas for the planned Hesselø offshore wind farm area (OWF) and export cable corridor to shore (ECC).

2.3 Report structure

The report is initiated with a description of the methodology used in the offshore benthic survey performed in April 2024 and the survey close to shore (shallow water) performed in June 2024. The chapter elaborates on the parameters analysed, the methodology for sampling of the seabed and finally the methodology for the visual transect survey.

To give a background for placements of stations and parameters chosen, the next chapter gives a sum up of the existing information from previous studies in the area. Further details of existing data can be found in Benthic Ecology – Scope Report (DNV,2023).

Finally, Chapter 5 give a detailed description of the survey results for the offshore and shallow water surveys performed in 2024. The chapter includes a section with sediment characteristics and a description of the benthic communities.

3 METHODOLOGY

The following section describes survey area, sampling program, cruise information, equipment and methodology as well as data analyses performed in Hesselø Offshore OWF and export cable to shore (ECC) in 2024. Details regarding the cruise is given in a separate cruise report (DNV, 2024b).

3.1 Survey area

The area for the planned Hesselø OWF and its export cable corridor (Figure 3-1) is the survey area relevant for this report. The Hesselø OWF area is situated in the southern parts of Kattegat at depths of 20-30 meters and close to the Lysegrund shoal area. The export cable corridor is 34 km long, with water depths of 0-32 meters and makes landfall at Gilleleje and the Natura 2000 area Giljjeberg Hoved.

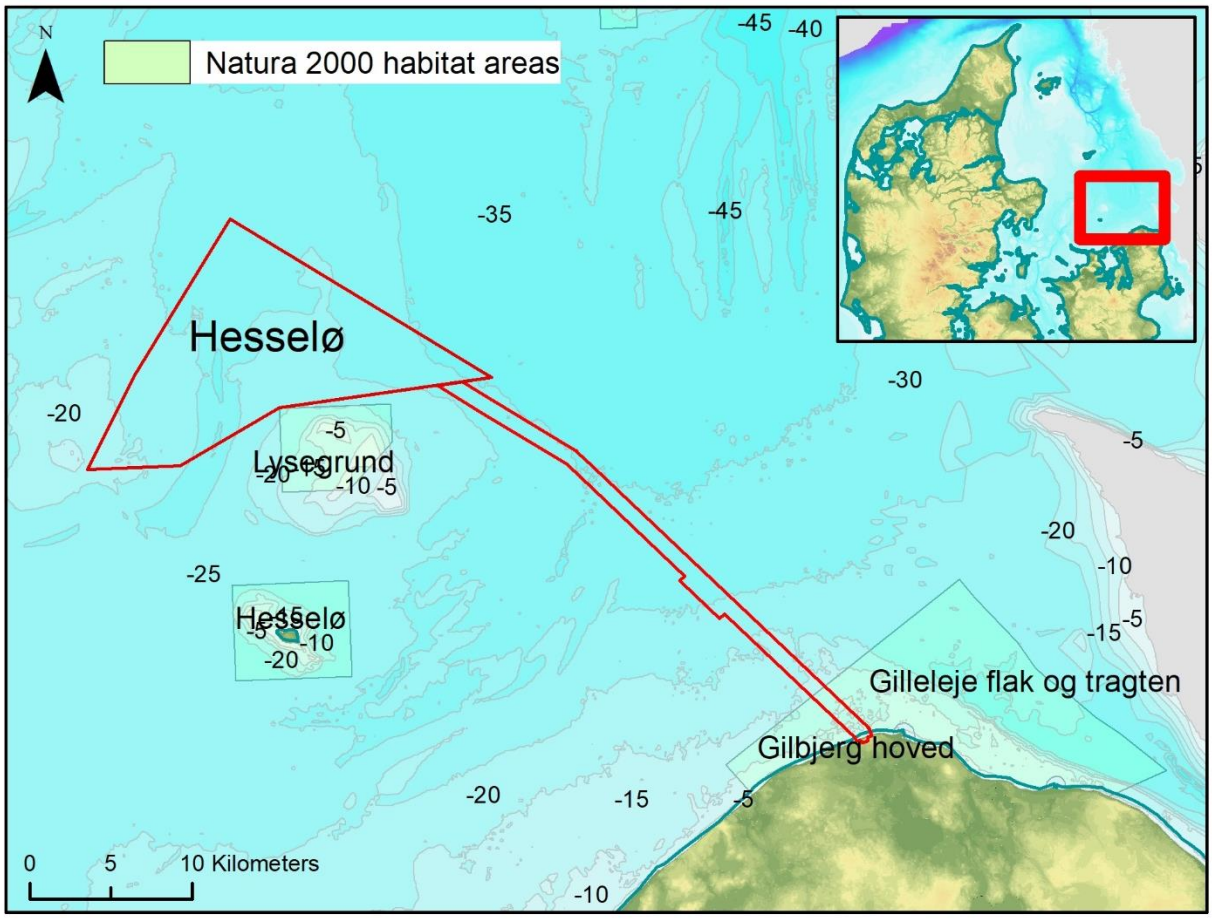

Figure 3-1 *The planned Hesselø OWF area and export cable route*.

3.2 Sampling program

Work was performed according to program developed by DNV in agreement with Energinet (DNV, 2024a).

The environmental survey scope included sampling of:

- Sediment data: benthic macrofauna (infauna) and sediment grain composition and chemistry.
- Visual mapping data of seabed habitats, fauna and flora (ROV)
- Hydrography (salinity, temperature, oxygen content in the water masses)

Overview of sampling program is given in Table 3-1 and Table 3-2. A map with the sampling locations and the locations of the visual survey transects is given in Figure 3-2 and Figure 3-3.

Sediment samples were collected from environmental stations within the two main areas, the planned Hesselø OWF and Hesselø ECC. In total 32 stations were sampled, and 16 visual survey transects were filmed. Environmental stations were evenly distributed within the areas and were placed so that main substrate types were sampled and so that the range of variability were covered. Details regarding sediment stations are given in Appendix 1.

Visual survey transects were placed in such a manner that both dominant seabed substrate types were covered in addition to areas of particular interest e.g. such as stony reefs. Transects were evenly distributed over the areas, covering the depth gradient and different substrate types.

Two or three hydrographical stations were sampled for each area to obtain baseline data regarding salinity, temperature and oxygen content in the water masses and will serve as supporting parameters for the infauna analyses.

Table 3-1. *Table showing number of sediment stations, hydrography stations and visual survey transects. Numbers in parentheses indicate number of shallow water stations in each area (separate cruise with smaller vessel).*

Area	No. environmental stations sediment sampling	No. of hydrography stations	No. transects for visual mapping
Hesselø OWF	16	3	6
Hesselø ECC	16 (2)	3	10 (3)
Total	**32**	**6**	**16**

Table 3-2. *Table showing performed sampling in the two main areas; Hesselø OWF and Hesselø ECC.*

Area	Stations	Hydrography	Bio	Grain	TOC	Metals	PAH	Phthalates	Phenols
Hesselø OWF	16	3	64	16	16	8	8	8	8
Hesselø ECC	16	3	56	16	16	9	9	9	9
SUM	**32**	**6**	**120**	**32**	**32**	**17**	**17**	**17**	**17**

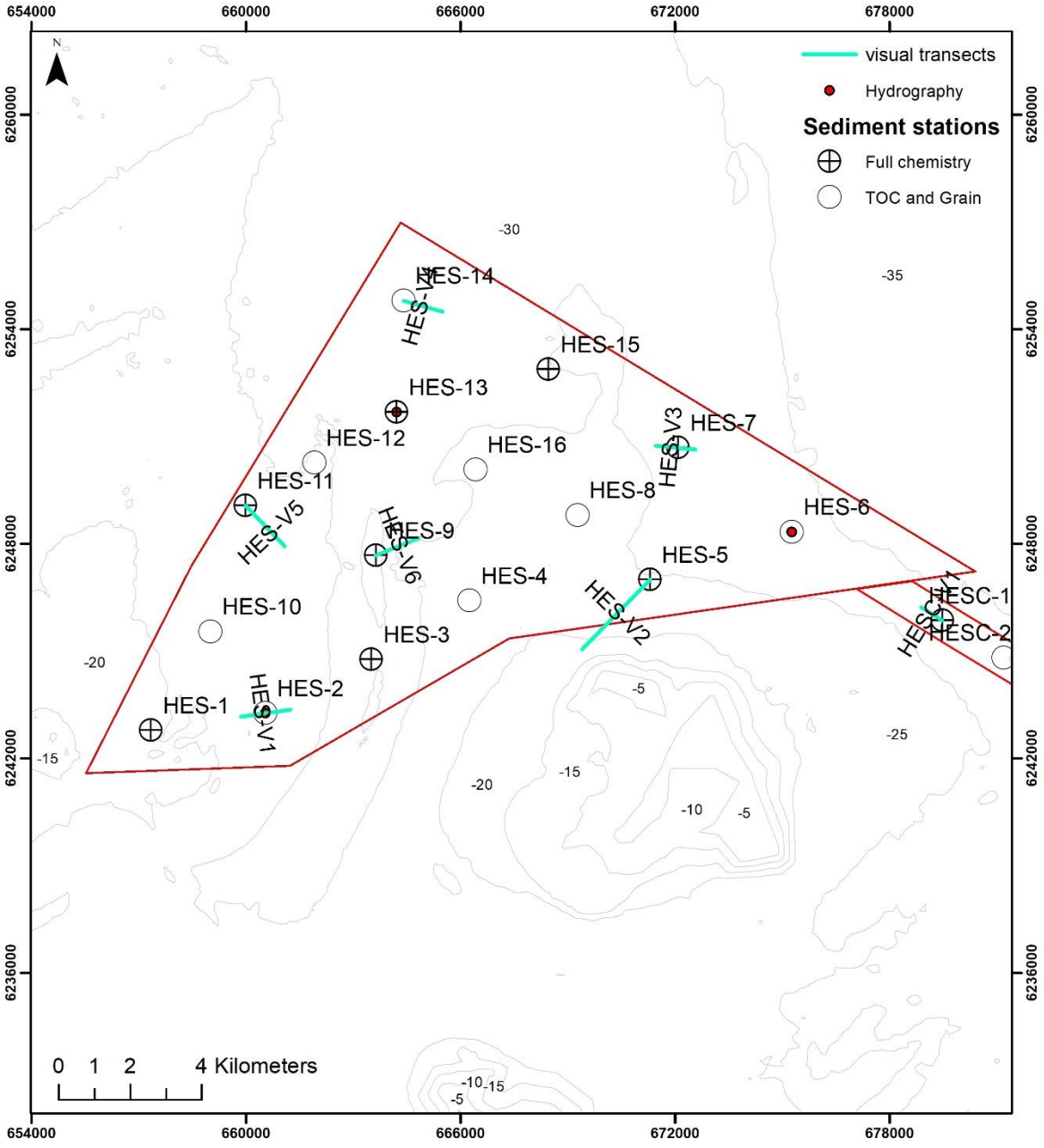

Figure 3-2 *Map showing sediment sampling stations, hydrography stations and visual survey transects in the area for the planned Hesselø OWF area.*

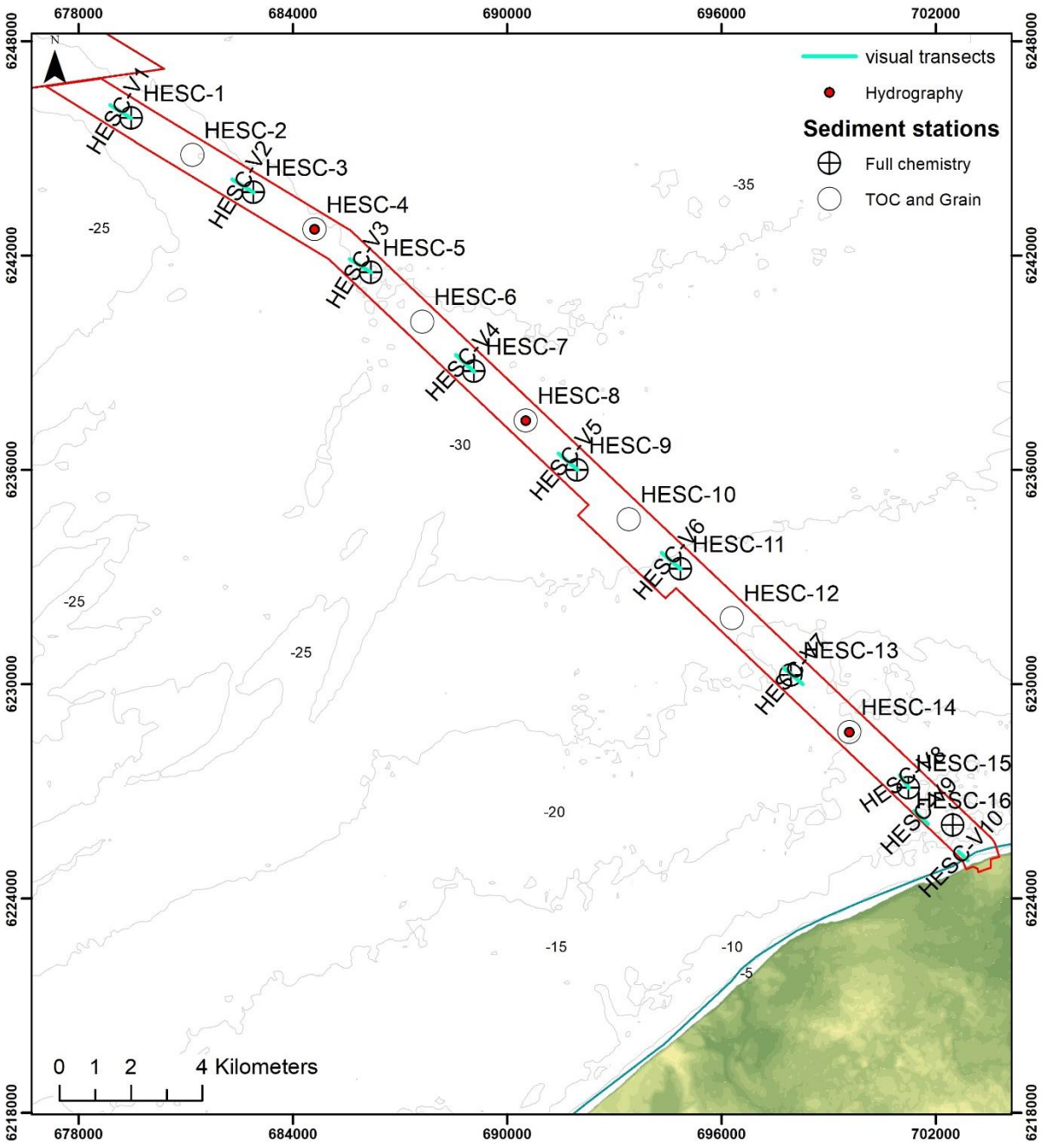

Figure 3-3. *Map showing sediment sampling stations, hydrography stations and visual survey transects in the export cable corridor for the planned Hesselø OWF.*

3.3 Methods and equipment

3.3.1 Cruise information

Offshore fieldwork was carried out 8-10 April 2024 from the vessel Esvagt Server (Figure 3-4). The fieldwork was done in conjunction with a larger environmental baseline cruise where the areas for the planned Kattegat and Kriegers Flak II OWF areas and export cable corridors were also surveyed. Nearshore/ shallow water stations were inspected and sampled 11-14 June 2024 in collaboration with WSP, by use of WSP's vessel "Sephia".

In total 15,5 km of ROV transects were visually mapped (16 ROV transects) and 120 grab samples from 32 stations were obtained for analyses of infauna and chemistry in the planned Hesselø OWF and ECC area.

Figure 3-4 *Esvagt Server (L) and WSP's SEPHIA (R).*

3.3.2 Sediment sampling and analysis

A summary of sediment sampling and analyses performed is given in Table 3-3 .

Macrobenthic fauna living in the sediments (infauna) are traditionally included in offshore environmental monitoring. The reason for this is that the study of benthic communities can give an indication of the effects of pollution from activities, while chemical monitoring of sediments is aimed at assessing the dispersion and concentration levels of pollutants in the seabed sediments. It is important to obtain baseline data on both benthic infauna communities as well as chemical and physical characteristics of the sediments before activities take place in the planned Hesselø OWF and Hesselø ECC area. The baseline will be used in the Environmental Impact Assessment (EIA) for the Hesselø project.

The benthic fauna is a suitable biological parameter for monitoring the general environmental status and effects of pollution or disturbances since most of the species have limited mobility and changes in species composition and densities of individuals can therefore easily be identified. The distribution of the fauna can be related to natural variations in environmental parameters such as depth and type of sediment, but also anthropogenic factors such as pollution and organic enrichment.

The sediment sampling carried out is standard for this type of investigation. The following equipment was used (see Figure 3-5):

- Combi grab – modified van Veen (0.15 m^2 surface area, takes chemistry and biology samples in the same cut)
- Reception table in stainless steel
- Measuring cylinder
- Washing table
- Sieves (5 mm and 1.0 mm round holes)
- Winch with Spectron rope

Each environmental station was spatially limited to an area with a radius of 25 meters where sediment sampling took place.

Each station was sampled with 4 replicates for fauna analyses. Pooled samples for chemistry and sediment composition were prepared for each station. An overview of sampled stations and grabs is given in Appendix 1.

During sampling, the sediment samples for infauna analyses were sieved on 1 mm sieves and fixated and stored for analysis in the accredited taxonomical laboratory. Procedures are described in DNV's Biolaboratory's quality system: "Sampling of marine sediment and soft bottom analyses". A flow chart showing the different steps in the preparation of macrofauna is shown in Figure 3-6.

Sampling was carried out in accordance with accredited procedures described in *Handbook for the Biology laboratory quality system; sampling of marine sediment and soft bottom analyses*. The sediment was sampled so that the surface in the samples was undisturbed, and the washing/sieving of the fauna samples was carried out gently. Animals were fixed in formalin (4 % neutralized with hexamine), added pink Bengal and stored in plastic buckets. Sediment samples for chemical analyses and sediment characteristics were stored in rilsan bags or plastic cups. Freezers were utilized for storage of chemical samples. All samples were double-labeled and packed in solid boxes to avoid damage to the sample packing. Sampling was performed in accordance with the standards NS-EN ISO 16665, NS-EN ISO 5667-19, NS-EN ISO 16665.

Measurements of infauna biomass was made on wet weight basis for each station. Biomass for different species / taxa at each station was calculated as wet weight per 1 m^2. Each taxa / species was weighed with an accuracy of 0.1 mg after conservation liquid was drain off on filter paper. Species or taxa with less weight than this was set to 0.1 mg.

Analysis of grain size composition and content of organic matter were performed as supporting parameters for the infauna analyses. Chemical analyses were performed to fulfil parameters requested by The Water Framework Directive (from coast to 12 nautical mile) and The Marine Strategy Framework Directive (outside 12 nautical mile). The national and EU's environmental quality requirements (EQS, Environmental Quality Standards) are used to assess the substance analysis results. Lab analyses of sediment samples were carried out by Eurofins and the Danish Centre for Environment and Energy (DCE) (Phthalates and phenols).

Table 3-3 *Overview of sediment sampling in the areas for the planned Hesselø OWF and its ECC. Sediment layer sampled is specified for the different analyses of chemistry and grain sizes.*

Hesselø OWF	Station depth (m)		Grain	TOC	Metals	PAH	Phthalates	Phenols
		Bio	0-5 cm	0-1 cm				
HES-1	21	4	1	1	1	1	1	1
HES-2	22	4	1	1				
HES-3	31	4	1	1	1	1	1	1
HES-4	25	4	1	1				
HES-5	28	4	1	1	1	1	1	1
HES-6	30	4	1	1				
HES-7	28	4	1	1	1	1	1	1
HES-8	24	4	1	1				
HES-9	36	4	1	1	1	1	1	1
HES-10	22	4	1	1				
HES-11	25	4	1	1	1	1	1	1
HES-12	26	4	1	1				
HES-13	29	4	1	1	1	1	1	1
HES-14	29	4	1	1				
HES-15	27	4	1	1	1	1	1	1
HES-16	21	4	1	1				
SUM		**64**	**16**	**16**	**8**	**8**	**8**	**8**
Hesselø ECC								
HESC-1	29	4	1	1	1	1	1	1
HESC-2	30	4	1	1				
HESC-3	31	4	1	1	1	1	1	1
HESC-4	32	4	1	1				
HESC-5	31	4	1	1	1	1	1	1
HESC-6	31	4	1	1				
HESC-7	31	4	1	1	1	1	1	1
HESC-8	30	4	1	1				
HESC-9	29	4	1	1	1	1	1	1
HESC-10	28	4	1	1				
HESC-11	26	4	1	1	1	1	1	1
HESC-12	24	4	1	1				
HESC-13	20	4	1	1	1	1	1	1
HESC-14	18	4	1	1				
HESC-15*	11		1	1	1	1	1	1
HESC-16*	11		1	1	1	1	1	1
SUM		**56**	**16**	**16**	**9**	**9**	**9**	**9**
Overall SUM		**120**	**32**	**32**	**17**	**17**	**17**	**17**

*: Shallow water station sampled from smaller vessel

Figure 3-5. *Grab sampling. Grab type used, a Van Veen type grab (collects sediments for 0.1 m^2 samples of macrofauna and 0.05 m^2 for sediment chemistry and grain size analyses.*

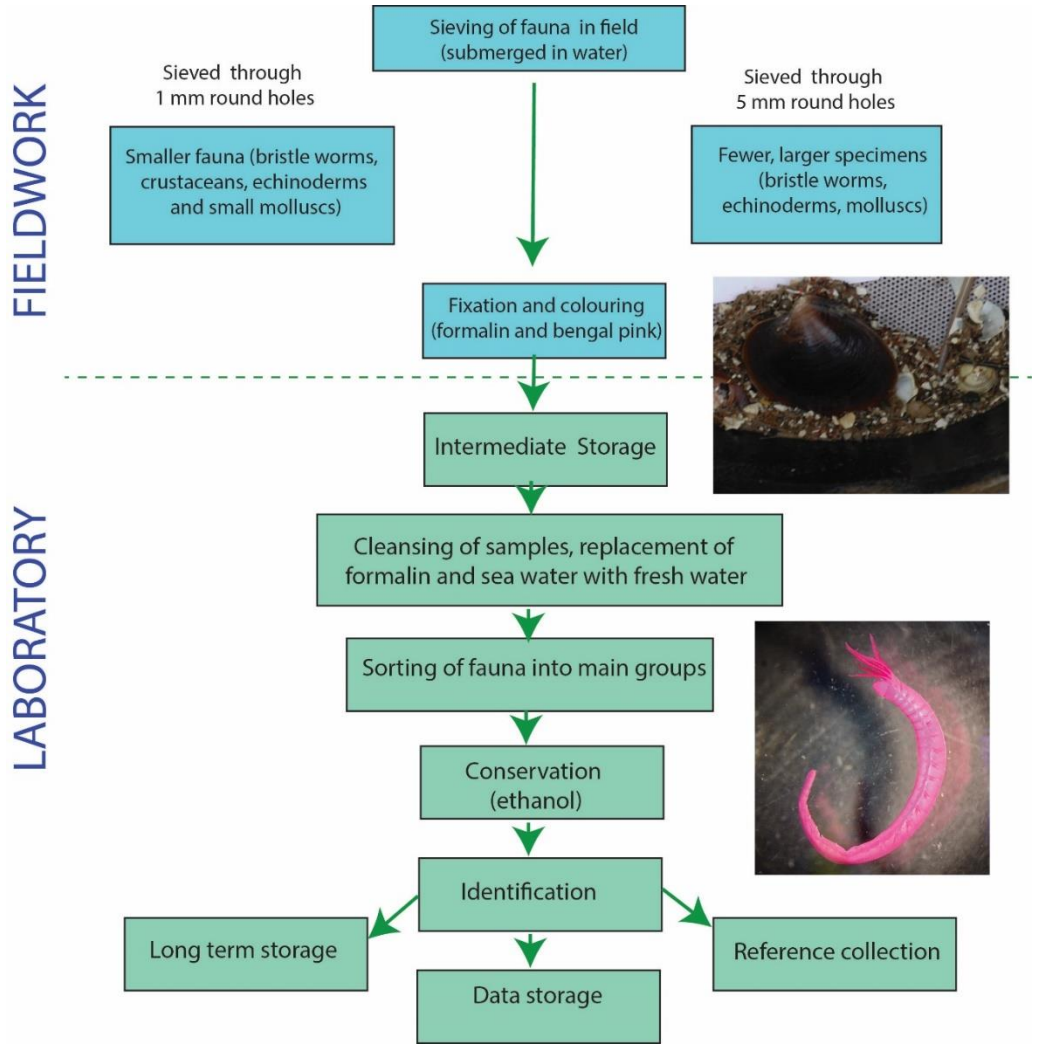

Figure 3-6. *Flow chart showing preparation and analyses of sediment macrofauna samples*.

3.3.2.1 Data analysis

Results that are reported from infauna analyses includes species present, number of species, abundance, biomass, biodiversity (Shannon-Wiener), Evenness (pileou), AMBI (AZTI's Marine Biotic Index) and the Danish DKI index (Danish Quality Index). Results are presented aided by multivariate statistics such as cluster analyses (dendrograms and multidimensional scaling plots), principal components analyses and SIMPER analyses, also including results from analyses of sediment chemistry and physical parameters.

3.3.3 Visual mapping

Summary of ROV lines performed are given in Table 3-4 and Figure 3-7. A total of 15.5 km spread over 16 visual transects were filmed and 3156 still images were captured.

Visual mapping was conducted with an observation class ROV (Remotely Operated Vehicle). DNV's ROV "Chimaera", of the type "SPERRE 15K" (Figure 3-8). The ROV was fitted with HD camera, still camera, laser for size calculations and sonar for scanning of the seafloor. Underwater navigation was obtained by transponder (Kongsberg cNode beacon) communicating with the vessels USBL system (Kongsberg Hipap 500). The navigational system onboard worked well with the cNode beacon and navigational data was clean and accurate. See Figure 3-7 . The visual mapping was carried out according to requirements in the standard EN 16260:2012. The ROV generally flew 1- 1,5 meters above the seabed along the transects and field of view was generally 1-2 meter. High resolution still photos were captured every 20-30 meters along the survey transects.

Shallow water visual transects were performed by WSP and by use of their BlueROV.

Table 3-4 *Overview of ROV transects. Positions in ETRS89 UTM32N*.

Area	Name	Length (m)	Depth interval (m)	Transect centerpoint	
				Easting	Northing
Hesselø OWF	HES-V1	1396	18-21	670347	6246020
	HES-V2	2724	17-24	672006	6250690
	HES-V3	1115	23-26	664229	6247920
	HES-V4	1129	25-27	660529	6248500
	HES-V5	1578	22-23	660544	6243260
	HES-V6	1306	24-27	670347	6246020
Hesselø ECC	HESC-V1	700	26-28	679178	6246040
	HESC-V2	700	24-29	682599	6243950
	HESC-V3	700	26-29	685891	6241720
	HESC-V4	700	26-29	688820	6238980
	HESC-V5	700	23-27	691704	6236220
	HESC-V6	700	22-24	694593	6233450
	HESC-V7	700	11-18	698010	6230230
	HESC-V8	436	9-12	679178	6246040
	HESC-V9*	539	8-12	682599	6243950
	HESC-V10*	360	1.5-7	685891	6241720

*: Shallow water transects performed with small ROV.

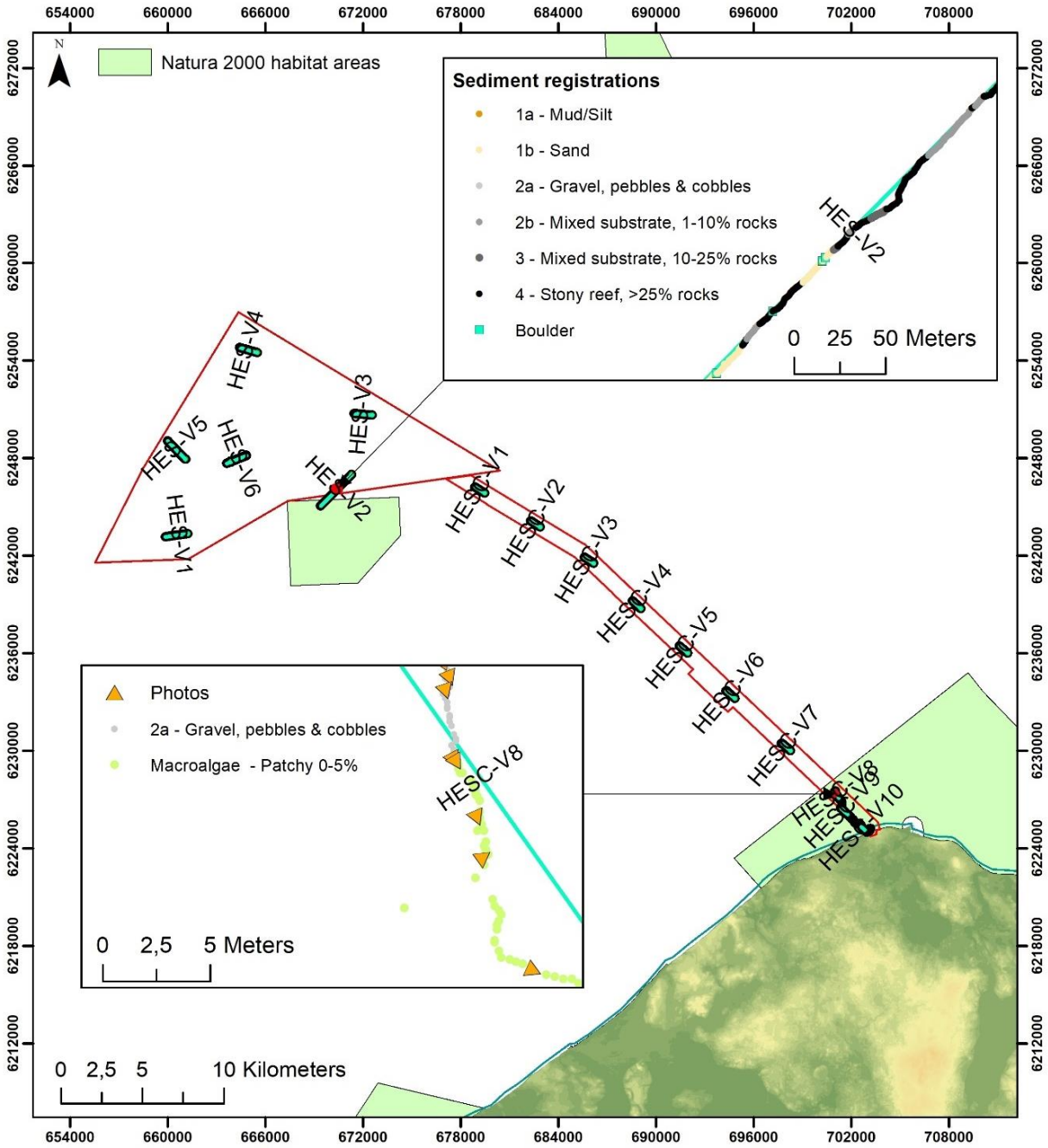

Figure 3-7 *Map showing overview of ROV transects visually inspected by DNV in the areas for the planned Hesselø OWF its ECC in April 2024. Example of ROV navigational data and georeferenced registrations of sediment (according to the Danish sediment classification system) and fauna coverage are shown for two transects (zoomed in for sections of HES-V2- sediment, and HESC-V3 - fauna registrations).*

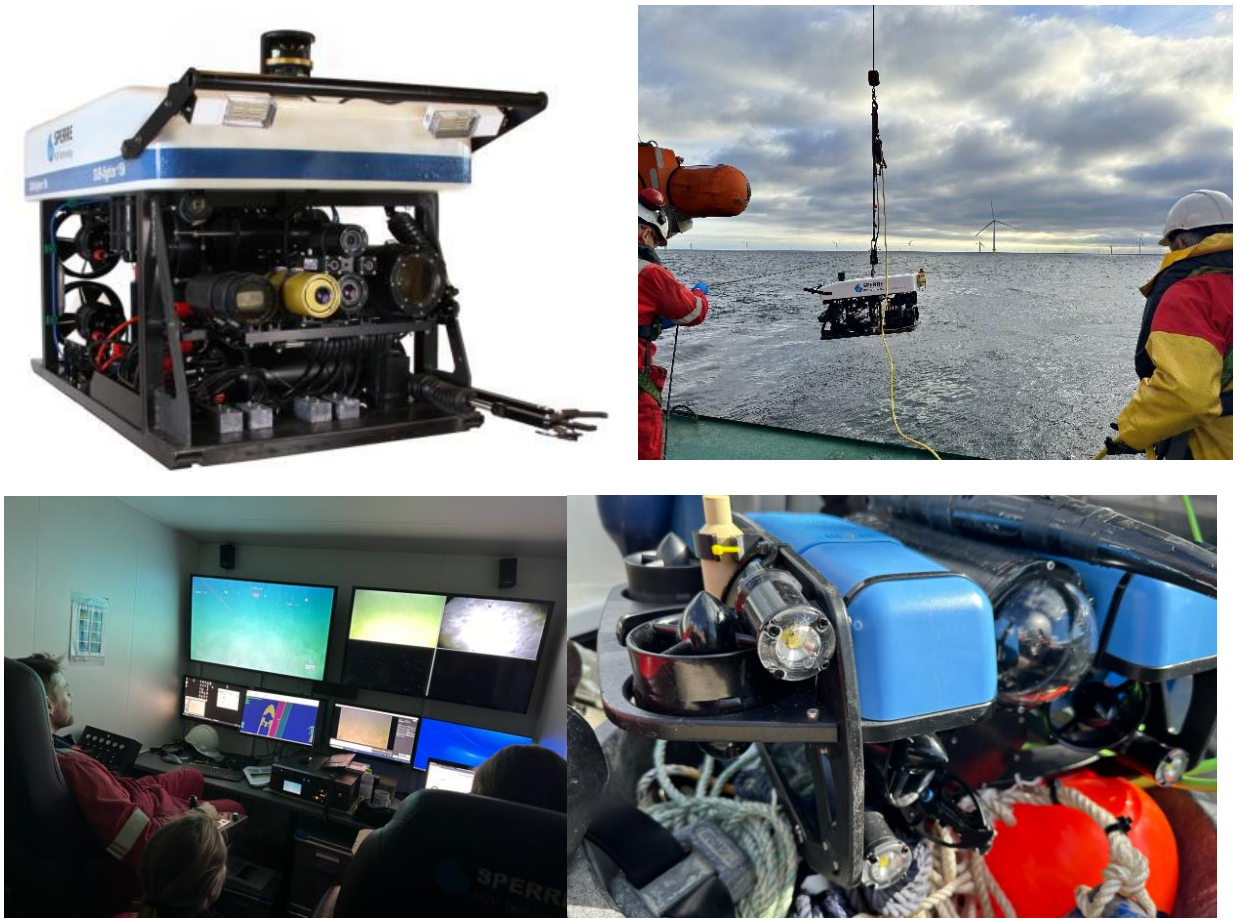

Figure 3-8 *DNV's ROV "Chimaera". A SPERRE Subfighter 15K. and WSPs BlueROV (bottom right) used for shallow water surveys.*

3.3.3.1 Data logging system

Logging of findings was made by use of DNV's video logger software ensuring that findings are georeferenced. The log included date, time, type of seabed substratum, megafauna, and any special observations (e.g., debris or fish). ROV position was recorded every second in a navigation log. By merging these two logs all registrations from the video material were given a coordinate to be used in preparation of maps. Still images were also georeferenced for presentations in GIS system. Species encountered, substrate types and distribution of fauna in general was registered along the ROV transect, and findings were georeferenced for presentations in maps, together with species lists. Seabed classifications followed the Danish substrate classification method (next section).

3.3.3.2 Substrate and fauna registrations

Registrations of substrate and fauna were made according to DS-EN-16260.

Substrate classifications were made according to the Danish classification system as described in Raw material statutory order no.1680 of 17-12-2018. Summarized in Table 3-5 (with reference to WSP, 2022). Note that WSP is preparing modelled distribution of substrate types according to the same classification system for the planned Hesselø OWF and ECC area in 2024.

All megafauna species and habitat types encountered during the surveys were registered. In addition to species registration by review of the video material, the species lists are based on identification from still photos. The abundance of each species was logged using the SACFOR scale, which is a relative six-graded abundance scale, changing with animal size (

Table **3-6**)

In instances where fauna could not be identified to species, identifications were made to higher taxonomical levels, or "video species" were introduced in instances where the same type of unidentified fauna was encountered over several transects.

The video registrations of sponges were categorised into two groups; "soft bottom sponges" and "hard bottom sponges"

Survey transects to be covered during visual mapping often constitute several km of seabed. Counting individual sponges in images or calculating percent coverage can be quite time-consuming and generally cannot be applied to the whole length of the survey transect. Semi-quantitative density estimates provide an efficient way of assessing spatial patterns on the seabed. The method requires trained experts in order to keep results reliable and methods replicable. DNV uses the following semi-quantitative scale when logging sponges: "No sponges", "single individual", "scattered", "common" and" high". Sponge individuals were logged as single when there was about 10 m or more between individuals (i.e., a couple of viewing frames in video between individuals). For illustrative purposes, single individuals and no sponges are shown as a combined group in this report, so that seabed sponge cover classification in maps and figures are represented by four semi-quantitative groups.

Sea pens, sea feathers and soft corals/carnation corals were classified as following (ind./ 25m^2): "Rare":<5, "Scattered": 6-10, "Common": 11-15, "High": >15.

Table 3-5: *Sediment characterization according to the Danish classification system (WSP, 2022).*

Main type	Description	Sub type
Type 1 – Sand and soft sediments	Areas that consist of soft sediments as gyttja, silt or mud, to hard sediments of sand (0.06 – 2.0 mm) and gravel fraction grain size, with a variation of bed forms (often dynamical). sediments), Coverage of boulders (>100 mm) is less than 1%.	1a (gyttja or silty soft bottom, loose)
		1b (firm bed type of sandy loose sediment)
		1c (clayish firm sediments).
Type 2 – Sand, gravel and small rocks with a few larger rocks (area coverage 1-10%)	Composed chiefly of sand or fine-grained matrix but with varying amounts of gravel (2-20mm) and pebbles/small cobbles (20-100 mm). The substrate may contain some (1-10%) scattered boulders (>100mm). This is further divided into the sub-divisions of type 2a and 2b.	2a is a bed type consisting of a variety of gravel, pebbles and cobbles with less than 1% area coverage of larger rocks (>100 mm).

		2b is a bed type with a varying sediment content of gravel, pebbles and cobbles and a spread of larger rocks of cobble to boulder grain sizes with an area coverage of 1-10% (>100 mm).
Type 3 – Sand, gravel, small rocks and several larger rocks (area coverage 10-25%)	Areas consisting of mixed marine sediment types dominated by sand, gravel and smaller rocks. This sediment type consists of a spread of larger rocks (>100 mm) with an area coverage of 10-25% and can be associated with rocky reefs when spatial connection to substrate type 4	
Type 4 – Rocky areas (reefs), consisting of many larger rocks (area coverage >25%)	Dense spreading of larger rocks or rock reefs (stone reefs) with forming of cavities / rock shelters and can have a bathymetric anomaly due to the high ground of large rocks compared to the adjacent sediment.	

Table 3-6 *The SACFOR scale used for logging species abundances at Hesselø. (From http://jncc.defra.gov.uk).*

% cover scale	Growth form		Size of individuals/colonies				Density scale	
	Crust/meadow	Massive/Turf	<1cm	1-3 cm	3-15 cm	>15 cm		
>80%	S		S				**>1/0.001 m² (1x1 cm)**	**>10,000 / m²**
40-79%	A	S	A	S			**1-9/0.001 m²**	**1000-9999 / m²**
20-39%	C	A	C	A	S		**1-9 / 0.01 m² (10 x 10 cm)**	**100-999 / m²**
10-19%	F	C	F	C	A	S	**1-9 / 0.1 m²**	**10-99 / m²**
5-9%	O	F	O	F	C	A	**1-9 / m²**	
1-5% or density	R	O	R	O	F	C	**1-9 / 10m² (3.16 x 3.16 m)**	
<1% or density		R		R	O	F	**1-9 / 100 m² (10 x 10 m)**	
					R	O	**1-9 / 1000 m² (31.6 x 31.6 m)**	
						R	**<1/1000 m²**	

S	A	C	F	O	R	P
super-abundant	abundant	common	frequent	occasional	rare	present

4 EXISTING DATA

In this chapter the existing data and knowledge is presented. The purpose of this is to provide an overview of previous work done in the area which also will support the baseline information of the benthic ecology in the planned Hesselø OWF and the ECC areas.

4.1 NOVANA Sampling stations

An overview of NOVANA benthic monitoring stations in the Hesselø South project area monitored in the period 1st of January 2020 to 1st of August 2023 is given in Figure 4-1. There are no registered monitoring stations inside the planned Hesselø OWF area or export cable corridor, however, four monitoring stations are in short distance to the export cable corridor and landfall: stations 1402, 167 (benthic fauna), Gilleleje and Vest for Hornbæk (eelgrass) (Table 4-1).

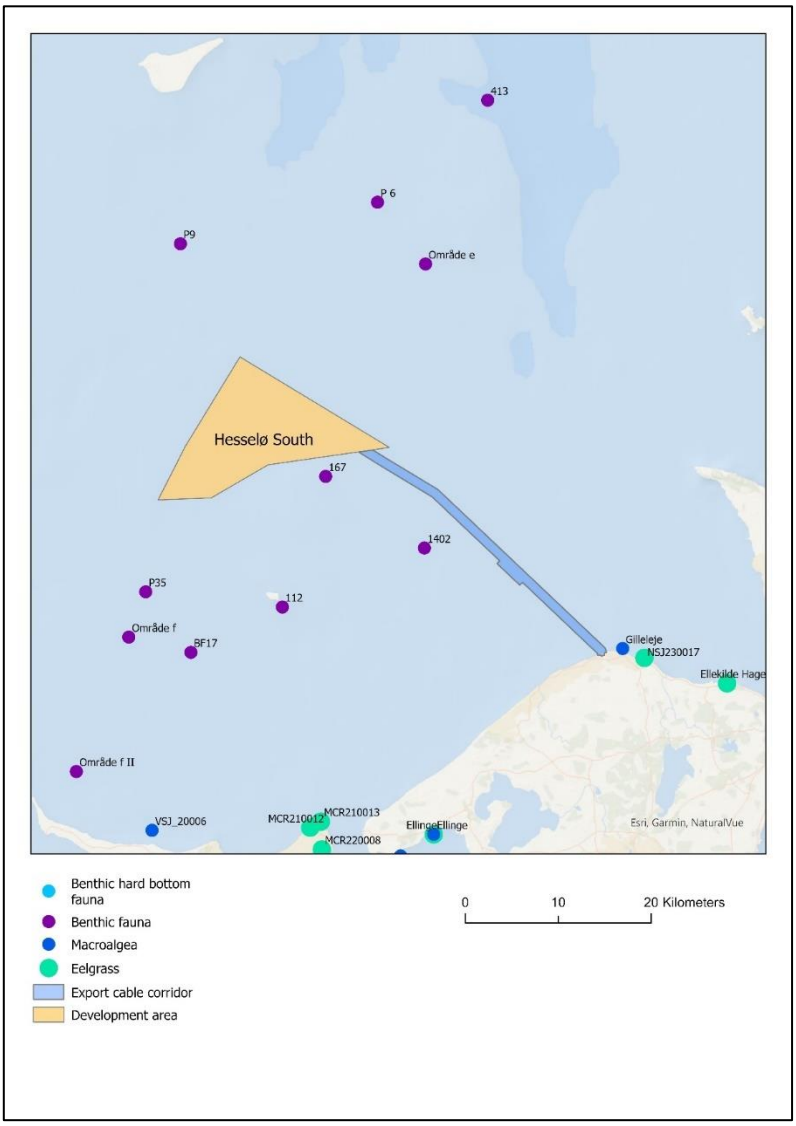

Figure 4-1. *NOVANA benthic monitoring stations monitored in the period 1st of January 2020 to 1st of August 2023 in the Hesselø area. Source: Miljøgis, 2023.*

Table 4-1. *An overview of NOVANA benthic monitoring stations in close proximity to the Hesselø project area in the period 1st of January 2020 to 1st of August 2023. Source: Miljøgis, 2023.*

Station name	Parameter	No. of surveillance	First surveillance	Last surveillance
P35	Benthic fauna	6	19-04-2017	21-04-2022
1402	Benthic fauna	6	19-04-2017	21-04-2022
BF17	Benthic fauna	2	02-05-2017	26-05-2020
112	Benthic fauna	2	07-06-2012	20-05-2020
167	Benthic fauna	2	24-05-2012	29-05-2020
Area E	Benthic fauna	3	24-03-2015	17-05-2022
Area F	Benthic fauna	2	16-03-2015	20-06-2021
Gilleleje	Eelgrass	27	08-05-1990	14-06-2023
Vest for Hornbæk	Eelgrass	3	14-09-2015	07-09-2021

An overview of all registered NOVANA benthic monitoring stations in the planned Hesselø OWF area, export cable corridor, and landfall, is given in Figure 4-2.

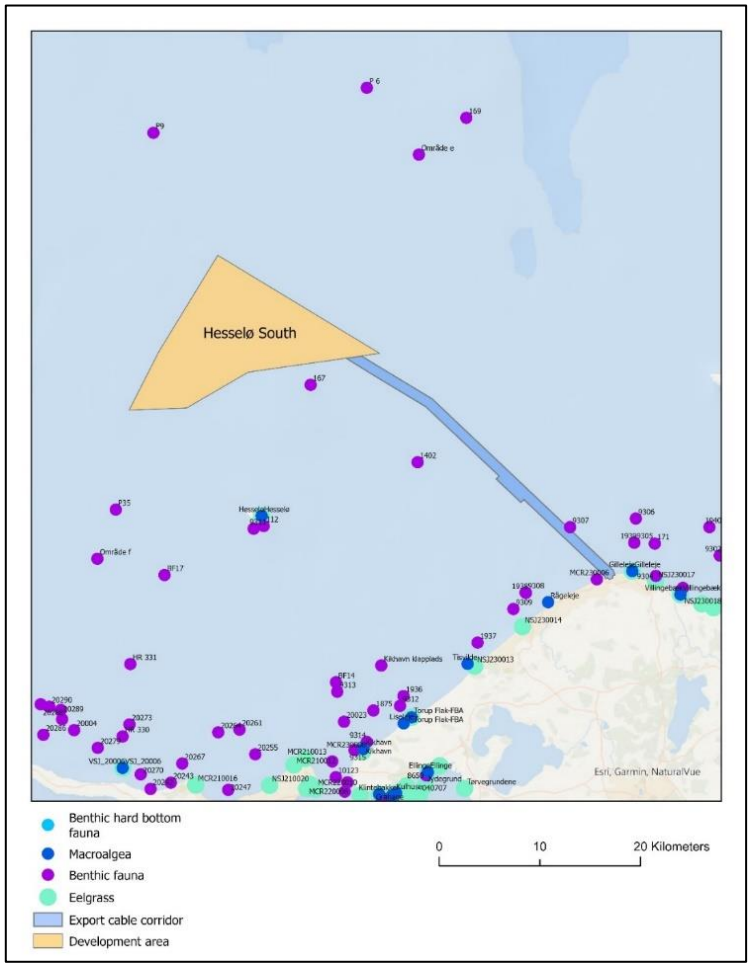

Figure 4-2. *Distribution of all registered NOVANA benthic monitoring stations in the Hesselø project area. Source: Miljøgis, 2023.*

4.2 Natura 2000 sites

There is one Natura 2000 site, *Gilleleje Flak og Tragten,* that the export cable corridor is planned to cross (Figure 4-3). Another Natura 2000 site, Lysegrund, is located in close proximity to the OWF area, however, the export cable corridor will not cross this site. Both Natura 2000 sites are protected under the Habitats Directive for det presence of sand banks, which are slightly covered by sea water all the time, and reefs (EEA, 2023). In general, the habitat type stone reefs occur in 13 Natura 2000 sites in the Kattegat/Northern Øresund area. In nine of these Natura 2000 sites, including Lysegrund, hard bottom fauna is monitored. In the Natura 2000 site *Gilleleje Flak og Tragten* however, stone reefs are not monitored (Miljøstyrelsen, 2022).

Hesselø nature reserve is a nationally designated area (Figure 4-3). The protections of the waters around the island are designated as a scientific reserve with a wide range of restrictions (Danmarks Naturfredningsforening, 2023).

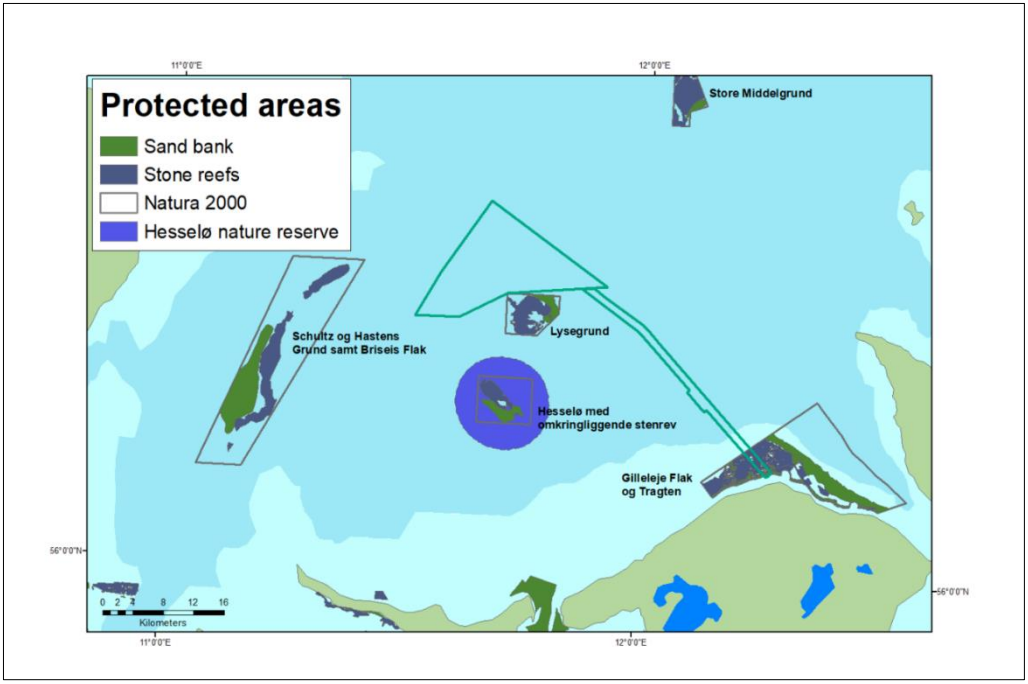

Figure 4-3. *Natura 2000 sites in the Hesselø project area. The Hesselø nature reserve is a nationally designated area with a wide range of restrictions. Source: Miljøgis, 2023.*

Table 4-2. *Results from two NOVANA stations sampled close to the Hesselø area in 2021 (also see Figure 4-1). Depth indicates the average sampling depth in the area. Salt indicates the expected (modelled) salinity, which is used to calculate DKI (ver. 3). Density indicates the individual density per square meter, biomass indicates the wet weight per square meters, species richness indicates the average number of species found in one haps sample (S1). AMBI is calculated for individual haps samples. H´ indicates the average Shannon diversity per. haps sample. The DKI value is indicated by ± the standard deviation. Source: Hansen & Høgslund, 2023.*

Station name	Locality	No. samples	Salt	Depth m	Density m^{-2}	Biomass VVg m^{-2}	S_1	AMBI	H'	DKIv.3
P35	Kattegat	5	26,6	23,5	3804	461	16,4	1,7	3,05	0,72±0,05
1402	Kattegat	5	30,7	27	2615	118	13	1,6	2,91	0,67±0,05

4.3 The first Hesselø OWF area

The area for Hesselø OWF was relocated based on preliminary seabed surveys that identified soft clay bottom in large parts of the designated site, especially in the northern and western part of the area (see e.g. https://ens.dk/presse/udbuddet-hesseloe-havvindmoellepark-saettes-paa-pause) (Figure 4-4 and Figure 4-6). The export cable corridor that was investigated for the first Hesselø OWF overlaps entirely with the export cable route for the new planned Hesselø OWF (Figure 4-5).

Altogether 142 sediment core samples for fauna and sediment analyses were retrieved from the first OWF area and export cable corridors (DCE & Niras, 2022a). In addition, 64 video recordings and 337 still photos with a quality that allowed for qualitative and quantitative analysis of the epifauna, and sea surface features were obtained. 122 haps cores were sampled inside the first Hesselø OWF area, and the rest were sampled along the export cable corridors where it was possible to sample four (stations K1, K2, K6, K7) out of seven planned stations (Figure 4-6). At the remaining three stations along the export cable corridors sampling failed, presumably due hard bottoms or the presence of larger shells in the sediment.

No hard bottom habitats were identified within the first Hesselø OWF area (DCE & Niras, 2022b). The offshore part of the export cable corridors had similar seabed area as the OWF area. However, closer to shore, the seabed became more heterogeneous and dominated by hard bottom types, including fields with boulders (DCE & Niras, 2022a). An overview of ROV-transects and dive stations conducted in connection to the first Hesselø OWF area are given in Figure 4-6 to Figure 4-10.

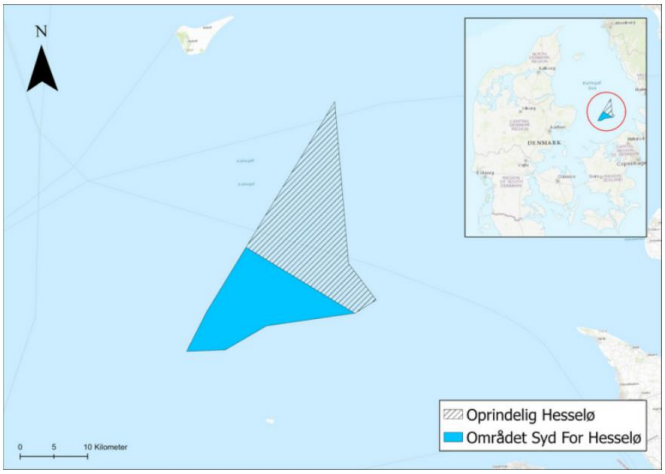

Figure 4-4. *The first (shaded area) and new location (blue) for the Hesselø OWF. Source: Energinet.*

Figure 4-5. *Hesselø OWF area and export cable corridor. The export cable corridor was previously investigated during the planning of the first Hesselø OWF area. Source: Energinet.*

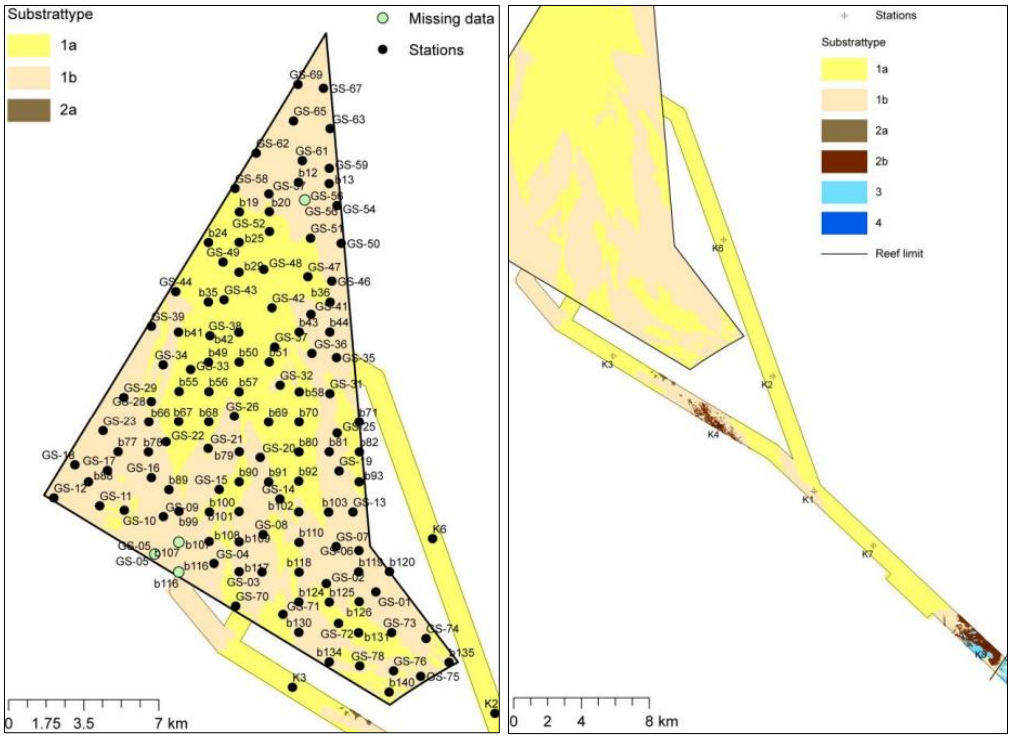

Figure 4-6. *Substrate distribution and sampling stations in the first Hesselø OWF area and export cable corridor. The offshore benthic survey was conducted in April 2021. Substrate types: 1a: muddy sand, 1b: sand, 2: gravel and coarse sand, 3 & 4: till/diamicton. Source: DCE & Niras, 2022a.*

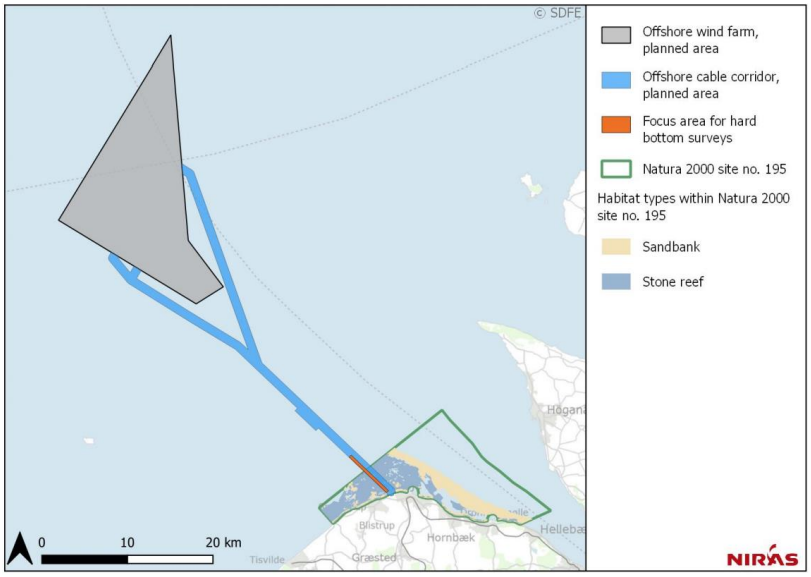

Figure 4-7. *Area of focus for hard bottom surveys in Hesselø offshore wind farm original area. Source: DCE & Niras, 2022b.*

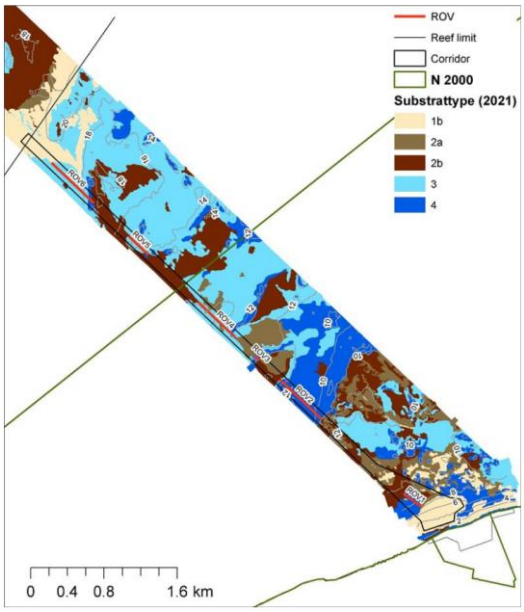

Figure 4-8. *Seabed sediments in the 1 km wide survey area for the cable corridor (black line) nearshore off Gilbjerg Hoved. The ROV investigation was conducted in June 2021. Six transects (red lines) covering substrate 3 (includes 10-25% hard substrate) and substrate 4 (includes 25-100% hard substrate). Substrate 2a and 2b are sand with some stones, and substrate 1 is sand. Source: DCE & Niras, 2022b.*

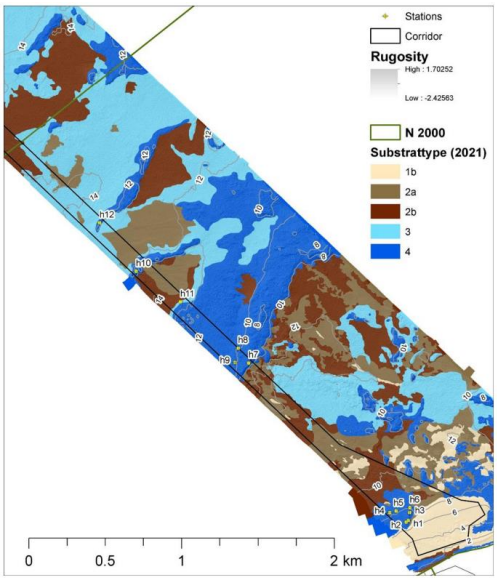

Figure 4-9. *Seabed sediments with dive stations inside the cable corridor (black line) within the Natura 2000 site Gilleleje Flak and Tragten. The dive investigations took place in June 2021. Source: DCE & Niras, 2022b*.

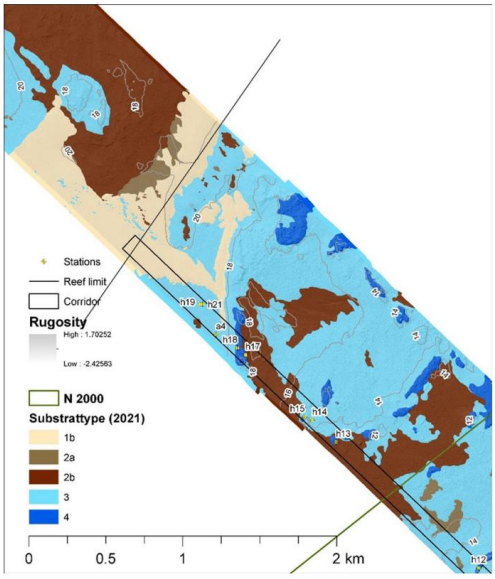

Figure 4-10. *Seabed sediments with dive stations in hard bottom areas outside the Natura 2000 site Gilleleje Flak and Tragten (indicated by a green line). The dive investigation took place in June 2021. Source: DCE & Niras, 2022b.*

4.3.1 Benthic fauna previous studies

Benthic soft bottom in the Hesselø OWF original site is described as follows (DCE & Niras, 2022a):

- The abundance of invertebrate fauna appears to be low compared to the rest of Kattegat, although there is currently no comparative data available from the wider Kattegat to confirm this. No benthic flora was recorded.

- Biomass is low compared to the rest of Kattegat across and dominated by a few large individuals of the bivalve *Arctica islandica* and the echinoderm *Brissopsis lycifera*.
- The small-scale biodiversity is low with only about 6 species per sample and Shannon-diversity is also low compared to the rest of the Kattegat.
- Species-area curve show that the total diversity in the original wind farm area is not well represented by the sampling. Total species richness is high even though the species number in the individual samples is very low. This pattern may be interpreted as indicative of disturbance, it is assumed from trawling.
- The community composition showed no clear grouping in relation to sediment composition organic content or trawling intensity.
- There is a highly significant negative correlation between biodiversity and trawling intensity and trawling may in general explain the poor condition of the benthos in the original Hesselø OWF area.
- The southwestern part of the wind farm represents a relatively less disturbed area where biodiversity is higher and where red-listed bivalve *Modiolus modiolus* occur. This area has higher conservational value than the rest of the wind farm area and is more sensitive to physical disturbance.

Benthic flora and macrofauna

Benthic flora and fauna associated with hard bottom habitats in the Hesselø OWF original site (DCE & Niras, 2022b):

- No hard bottom habitats were identified within the original offshore wind farm area.
- Reef structures mapped with acoustics were confirmed by ROV and dive investigations.
- In general, the coverage of hard stable substrate was high in areas mapped as seabed type 3 and 4.
- The sediment composition within the Natura 2000 site had a high proportion of larger boulders (>60 cm) but was also mixed with smaller stones.
- Erect algal vegetation, dominated by red algae, completely or almost completely covered the hard stable substrate from 6 to 14 m depth.
- *Fucus serratus*, *Laminaria digitata* and *Saccharina latissima* were the most dominant brown algae species in terms of cover.
- Fauna, in terms of cover, was heavily dominated by the bryozoan *Electra pilosa* from 6 to 14 m depth. Electra grew epiphytically on the algae. The sponge *Halichondria panica* also occurred entangled in the vegetation or alternatively fixed directly to the surface of boulders.
- Below 16 m, the cover of faunal organism was very low, but some larger species, for instance dead man's finger (*Alcyonium digitatum*), were observed.
- Combined biogenic-geogenic reef structures formed by the red-listed species *Modiolus modiolus* may be present in deeper waters, likely below 18 m depth. Further investigations of the spatial distribution of such reef structures are required to allow firm conclusions since it is unclear whether the feature covers more than the minimum 500 m^2 area necessary for to qualify as biogenic-geogenic reef.

- Based on experiences from a reef restoration project, colonization of opportunistic flora and fauna species is expected almost immediately. However, a full recovery of a climax hard bottom flora and fauna community dominated by perennial species in full sizes from physical damaged or on deployed new hard substrate is expected to take at least 10 years.

4.3.2 Summary

An overview of sampling stations within, or in close distance to the Hesselø area, export cable corridor, and landfall area, are given in Table 4-3.

Table 4-3. *An overview of sampling stations in close proximity to the Hesselø project area; NOVANA stations examined in the period 1st of January 2020 to 1st of August 2023, monitoring stations in connection to the original Hesselø offshore wind farm project area, and monitoring stations in the Natura 2000 site Gilleleje Flak og Tragten.*

Hesselø South	**No. of NOVANA monitoring stations with results < 3 years**	**No. of Hesselø original site stations sampled in 2021**	**No. of Natura 2000 stations *Gilleleje Flak og Tragten***
Array area	0	-	-
Cable corridor & landfall	4	2 stations - haps corer 6 ROV transects 12 dive stations	0

4.4 Abiotic data

Physical parameters such as depth, salinity, and oxygen concentration are determining factors for the living conditions and habitat types available for benthic fauna and flora. Salinity, temperature, and oxygen profiles are measured in the water column using a CTDO. The Hesselø area is located in the southern parts of Kattegat, a semi-enclosed sea between Denmark and Sweden, with water depths of 20-40 m.

Kattegat is influenced by water input from the Baltic and the North Sea and is characterised by a strong vertical salinity stratification called a halocline. This stratification creates a two-layer system, made up of highly saline water (34 PSU) from Skagerrak that sinks to the deeper water layers, whilst the surface waters are less saline and a mix of deep water and brackish water from the Baltic (15-30 PSU) (Andersson, 1996; Wesselander et al., 2017). The halocline, which is present in Kattegat throughout the year, is strongest during summer and weakest during winter (Andersson, 1996).

Dissolved oxygen is necessary for healthy marine ecosystems, making oxygen deficiency of particular concern. Well-oxygenated bottom water is important for the survival of especially benthic fauna Oxygen deficiency can be caused by eutrophication; excessive enrichment of marine water with nutrients, which may lead to extreme algal blooms. Eutrophication is a significant threat in Kattegat, as bacterial decomposition of the organic material from algal blooms can cause oxygen depletion and disturb the overall water quality (Devlin et al., 2022). The European Environment Agency measure the dissolved oxygen (DO) concentration in European marine water based on a four-class system: Good: >6 mg/l, Moderate: 4-6 mg/l, Poor: 2-4 mg/l, Very Poor: <2 mg/l (EEA, 2023). Oxygen concentrations above 6 mg/l are considered to support marine life with minimal problems, whilst concentrations below 2 mg/l can cause severe problems (hypoxia) (Levin et al., 2009). The deep-water oxygen concentrations in Kattegat typically decline with increasing distance from Skagerrak, its deep-water source, and has mean near-bed dissolved oxygen concentrations of 3.98 mg/l ('Poor' conditions) based on data from 2006-2014 (OSPAR, 2017). Oxygen deficits have been previously reported in the coastal and deep-water areas of Kattegat, especially in the southern parts where the halocline lies very close to the bottom (Wesselander et al., 2017; Andersson, 1996; Rosenberg et al., 1990).

5 2024 SURVEY RESULTS

5.1.1 Benthic habitat description

A channel structure consisting of muddy sand runs through the area for the planned Hesselø OWF with a north-south orientation (Figure 5-1). The Nature Agency has previously investigated a soft bottom area at similar water depth in the middle northeast of the planned Hesselø OWF area (around Store Middelgrund). The benthic fauna composition in this area is assumed to be representative for the composition in the soft bottom area in the northern part of the project area (COWI, 2022b). The benthic fauna community can be characterized as an *Amphiura* community dominated by brittle stars (*Amphiura filiformis),* horseshoe worms (*Phoronis sp*.), the mussel *Mysella bidentata*, the polychaetas *Scoloplos armiger* and *Pectinaria auricoma*. The benthic fauna also includes Norway lobster (*Nephrops norvegicus*), which is a very important species for fisheries. The bottom fauna community is rich in species with a high biodiversity. A total of 165 species/genera were found, and the Shannon-Wiener diversity index was calculated to 4.43. In addition, an AMBI (AZTI Marine Biotic Index) value of 1.68 was calculated, which means that the animal community in the area is only slightly disturbed by eutrophication compared to natural conditions. DKI index (Danish Quality Index) was calculated to 0.83 and the ecological condition of the benthic fauna was therefore classified as good (COWI, 2022b).

A larger part of the seabed in the Hesselø South area consists of sand (Figure 5-1). In the central and southern part of the area the seabed consists of gravel and coarse sand, with till/diamicton (contains particles ranging in size from clay to boulders) and stones in the central part of the area. The benthic fauna on sandy seabed in deeper waters in the Kattegat can be characterized as a Venus community with the following typical species: venus clam *Chamelea gallina*, the bean-like tellin *Angulus fabula*, the cut through shell *Spisula subtruncata* and common heart urchin *Echinocardium cordatum*. The export cable corridor passes through an area of sand, muddy sand, till/diamicton and gravel and coarse sand. Landfall is planned at the north coast of Zealand, where the coast alternates between sandy beaches and rocky coast (Cowi, 2022a).

In Kattegat, there is a mixing of the brackish water of the Baltic Sea and salt water of the North Sea. Depending on outflow and inflow events and their extent, the salinity can vary considerably and there is typically a stratification with more salty bottom water, which is most clear during summer. The biological diversity is strongly regulated by the salinity, but also light (depth), water flow and oxygen are conditions that may affect both the diversity and the density of the individual organisms. Macroalgae dominate the communities on hard bottom down to a depth of 15-20 metres. As the macroalgae decline, various faunal organisms such as dead man's hand and various hydroids and Bryozoa, gradually take over the surfaces of the stones. Biogenic reefs in the form of denser collections of horse mussels (*Modiolus modiolus*) are known from the area around Schultz's ground in the southern Kattegat and scattered occurrences of horse mussels are known from the Store Middelgrund. Blue mussels occur in the area, but only sporadically and for a short time with high coverage. These populations are likely to quickly be eaten by starfish (Naturstyrelsen, 2014).

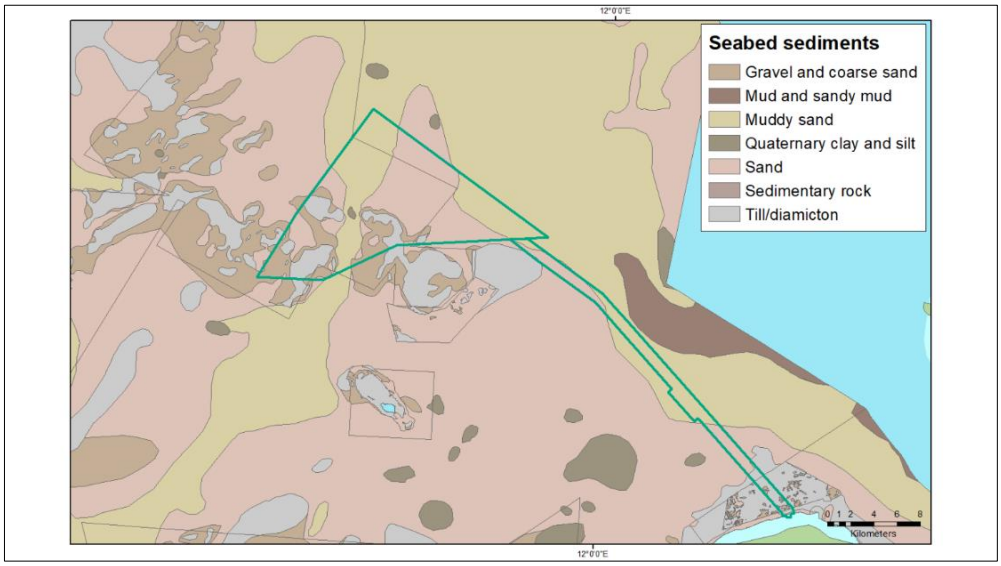

Figure 5-1. *Seabed sediments in the Hesselø South project area. Source: GEUS, 2023***.**

5.2 Abiotic data (Hydrography)

Abiotic data refers to the environment's non-living chemical and physical parts that affect living organisms and ecosystem functioning. This includes factors such as temperature, oxygen, salinity, and other non-biological influences that contribute to the conditions and habitat types available for organisms. In the context of environmental studies, abiotic data is crucial for understanding the habitat and living conditions of species like benthic fauna and flora.

CTD profiles of salinity, temperature and oxygen concentrations were sampled at six stations from west to east (HES-2, HES-6, HES-13, , HESC-4, HESC-8, HESC-14) in the Hesselø area (Figure 5-2). CTD profiles show the variation in salinity, temperature and oxygen vertically in the water column from the sea surface to approximately 1 meter above the sea bottom, to avoid collision with the seabed and damaging the instrument. The maximum depth for the six stations in the area for the planned Hesselø area varied between 15 and 27 meters, with HES-2 and HESC-14 representing the shallowest areas (Figure 5-2).

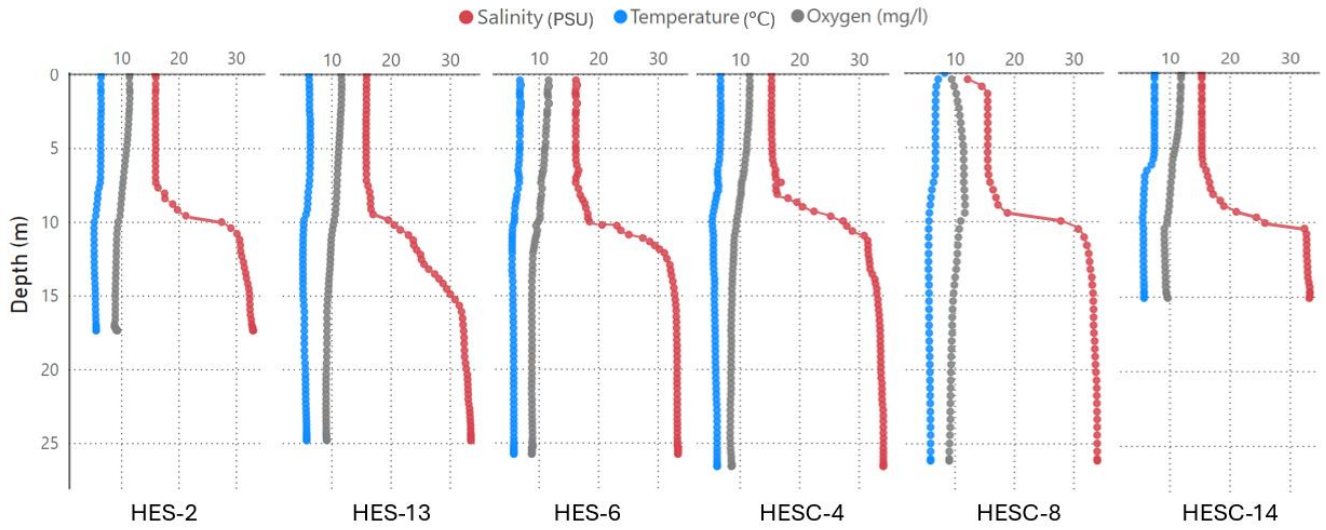

Figure 5-2 *CTD profiles of salinity, temperature and oxygen in the area for the planned Hesselø OWF.*

The salinity ranges from 14-16 in the upper water layers and has the highest concentrations at the sea bottom (33-34 PSU). The salinity rapidly increases at around 10 meters depth for all stations, representing a layer in the water column termed the halocline, which is typical for Kattegat. The halocline works as a density barrier between the less saline upper water layers and the more saline lower water layers, which can prevent mixing between the two. The halocline is found at 8-11 meters depth for all stations except for HES-13 where the halocline is less prominent and found between 10-15 meters of depth.

Generally, the temperature and oxygen concentrations remain relatively constant downwards in the water column with slightly higher values at the sea surface. No distinct thermocline (sharp change in temperature with depth) was observed at any of the stations, which can be explained by the fact that the CTDO measurements were taken in April 2024. A thermocline typically forms during summer when there is sufficient heating of the surface waters, whilst salinity stratification (halocline) is independent of temperature and can be caused by water input from Skagerrak and the Baltic, wind-driven mixing near the surface, and/or coastal circulation patterns. The presence of a halocline without a thermocline in April suggests salinity-driven stratification but minimal temperature stratification due to the cooler, well-mixed water column typical of early spring.

The oxygen concentrations in the surface layers had an average concentration of 11-12 mg/l for all stations and decreased gradually to 8-9 mg/l in the bottom water, except for HESC-8 with slightly lower surface water concentrations of 9.5 mg/l. The oxygen concentrations are classified as ‘Good’ (>6 mg/l) for all stations (EEA, 2023). The data did not show any signs of oxygen depletion in the deeper waters as previously reported in Kattegat (Andersson, 1996; Wesselander et al., 2017), or it could be the hydrography of the localized area.

5.3 Seabed sediment characteristics

5.3.1 Sediment samples

The colour and characteristics (clay, silt, sand, gravel etc.) of the sediments collected in the grab samples were described during sampling. In the planned Hesselø OWF area, the sediment was characterized by an olive to grey-brown colour, typically with a thin layer of brown sediment on the surface and a more grey-brown colour throughout the rest of the sample (Figure 5-4). The sediment composition at these stations was predominantly a mixture of sand and silt, with clay present in the deeper layers. Several stations also contained shell fragments, and HES-13 exhibited an odor of hydrogen sulfide (H_2S).

Figure 5-3 *Sediment colour and characteristics in a selection from the planned Hesselø OWF area*.

In Hesselø ECC, the sediment similarly featured a thin layer of brown sediment at the top, transitioning to a grey-brown color further down (Figure 5-4). The sediment at these stations varied widely, ranging from silt/clay to coarse sand, and even to sand mixed with gravel, stones, and shells. The presence of coarser sediment and stones often resulted in more unsuccessful grab attempts, as it was challenging to target a soft-bottom area.

Figure 5-4 *Sediment colour and characteristics in a selection from Hesselø ECC.*

The sediment characteristics determine which species can live in the area. Several grabs revealed the presence of fauna living on the sediment surface, so-called epifauna. The epifauna can attach to larger rocks, such as the dead man's fingers (*Alcyonium digitatum*) or live on top of the sediments, such as common tower shell (*Turritella communis*). Figure 5-5 also shows two different species of sea pens (*Virgularia mirabilis* and *Pennatula phosphorea*) attached to the soft sediments.

Figure 5-5 *A selection of the fauna observed in the sediment samples during sampling at the planned Hesselø ECC (top) and planned Hesselø OWF (bottom).*

5.3.1.1 Physical parameters

Physical and chemical sediment samples were collected from the sediment as supporting parameters for the statistical analysis. The physical parameters total organic content (TOC) and grain size in the sediments determine the oxygen conditions. From the grain size distribution, the fraction of silt and clay fraction (particles < 0.063 mm) was determined, as well as the median particle size in the sediment (D50). D50 is the particle size where 50 % of the particles are bigger and 50 % of the particles are smaller than this size.

The results from the planned Hesselø OWF area (Table 5-1) and the Hesselø ECC (Table 5-2) revealed that, in general, the organic content (TOC) and the silt and clay fractions increased with greater water depth, while the average grain size (D50) decreased. Consequently, the deeper areas exhibited high organic content and fine grain size. In contrast, the shallow stations typically displayed larger grain sizes and lower organic content. The fraction of silt and clay varied from 1.2 % to 77.3 %, with a mean of approximately 27 %.

Table 5-1 *Physical conditions in the sediment surface at the planned Hesselø OWF area. TOC = total organic carbon, D50 = median particle size. Silt and clay are all particles <0.063 mm*

Station	Depth [m]	TOC [% of DW]	D50 [mm]	Silt and Clay fraction (%)
HES-1	21	< 0.2	0.290	7.8
HES-2	22	< 0.2	0.387	1.2
HES-3	31	0.77	0.063	77.3
HES-4	25	< 0.2	0.237	5.6
HES-5	28	0.31	0.102	24.3
HES-6	30	0.68	0.074	33.6
HES-7	28	0.41	0.137	36.4
HES-8	24	< 0.2	0.365	2
HES-9	36	0.68	0.063	71.6
HES-10	22	< 0.2	0.177	13.6
HES-11	25	0.23	0.152	22.8
HES-12	26	0.31	0.165	21.8
HES-13	29	0.52	0.063	51.9
HES-14	29	0.43	0.068	48.7
HES-15	27	< 0.2	0.219	9.6
HES-16	21	< 0.2	0.310	7.3

Table 5-2 *Physical conditions in the sediment surface at the planned Hesselø ECC. TOC = total organic carbon, D50 = median particle size. Silt and clay are all particles <0,063 mm*

Station	Depth [m]	TOC [% of DW]	D50 [mm]	Silt and Clay fraction (%)
HESC-1	29	0.46	0.108	29.4
HESC-2	30	0.41	0.148	22.7
HESC-3	31	0.49	0.205	25.9
HESC-4	32	0.88	0.063	61.1
HESC-5	31	0.48	0.102	38.8
HESC-6	31	0.36	0.151	26.2
HESC-7	31	0.71	0.063	49.9
HESC-8	30	0.66	0.066	48.4
HESC-9	29	0.61	0.063	49.9
HESC-10	28	< 0.2	0.084	41.2
HESC-11	26	0.52	0.088	33.2
HESC-12	24	0.32	0.176	17.5
HESC-13	20	< 0.2	0.976	1.5
HESC-14	18	< 0.2	0.554	1.3
HESC-15	11	< 0.2	1.197	0.5
HESC-16	11	< 0.2	0,496	2.9

5.3.1.2 Chemical parameters

Classification of environmental quality status in the sampled sediments is made according to the threshold criteria in Table 5-3, listed in the order of importance.

Table 5-3 *Threshold values for the parameters analysed. NEQS = National Environmental Quality Standards (Miljøstyrelsen, n.d.), Danish EPA. EQS = Environmental Quality Standards (HELCOM, 2017), EU. ERL = Effect Range Low (OSPAR Commission, 2021), US EPA. LAL = Lower Action Level (Miljøstyrelsen, 2008), Danish Dredging Manual/Klapvejledningen.*

Parameter		Thresholds			
		NEQS	EQS	ERL	LAL
Heavy metals	Arsenic (As)	0.4		8.2*	20
	Barium (Ba)				
	Lead (Pb)	163	120	47*	40
	Cadmium (Cd)	3.8	2.3	1.2*	
	Chromium (Cr)	9.2		81*	
	Copper (Cu)			34*	20
	Mercury (Hg)			0.15*	
	Nickel (Ni)	6.8		21*	30
	Silver (Ag)	13			
	Zinc (Zn)			150*	
PAH	Naphthalene	0.138		0.160**	
	Acenaphthylene				
	Acenaphthene	0.048***			
	Fluorene				
	Anthracene	0.024***	0.024***	0.085**	0.085
	Fluoranthene	3.5***		0.600**	
	Pyrene	0.42***		0.665**	
	Chrysene/ Triphenylene	0.0231***		0.384**	
	Benzo(b+j+k)fluoranthene				
	Benzo(e)pyrene				
	Indeno(1,2,3-cd)pyrene			0.240**	
	Benzo(g.h.i)perylene			0.085**	
	1-Methylnaphthalene	0.478 x fOC			
	2-Methylnaphthalene	0.478 x fOC		0.070**	
	Dimethylnaphthalenes, sum	0.478 * fOC			
	Trimethylnaphthalenes, sum	0.478 * fOC			
Phthtalates	Dibutyl phthalate (DBP)				
	Benzylbutylphthalate (BBP)	0.4***			
	Di(2-ethylhexyl)adipat (DEHA)				
	Di(2-ethylhexyl)phthalate (DEHP)	0.53***			
	Di-n-octylphthalate (DNOP)				
	Diisononylphthalate (DNP)				
	Diisodecylphthalat (DIDP)				
Phenols	4-t-octylphenol	0.2***			
	4-n-octylphenol				
	4-n-nonylphenol				
	Nonylphenols, sum				
	Nonylphenol-monoethoxylater (NP1EO)				
	Nonylphenol-diethoxylater (NP2EO)				
	Dibenzothiophene			0.190**	

* 5% Al
** 2.5 % TOC
*** 5% OC

The analysis of the samples collected from the planned Hesselø OWF area and ECC shows that most chemical parameters are within their threshold values. Still, the NEQS threshold values for arsenic were slightly exceeded at all stations at both locations (Table 5-4 and Table 5-5). Chromium also exceeded the NEQS threshold values at HES-3 and HES-9, both at close to 30 meters depth. HESC-7 and HESC-11 at Hesselø ECC also exceeded the threshold values for chromium, while also being at a similar depth (28 and 25 meters). With 9 over 6.8 mg/kg, nickel exceeded the threshold values at HES-9. Furthermore, chrysene/triphenylene exceeded its NEQS threshold at HESC-7, but the values were still low.

Table 5-4 *Chemical conditions in the sediment surface at the planned Hesselø OWF. Unit = mg/kg. Chemical parameters (heavy metals, PAH-compounds, phthalates, phenols, and dibenzothiophene). Red numbers represent exceeded threshold values (see Table 5-3). Heavy metals, PAH and dibenzothiophene are analysed by Eurofins, and phthalates and phenols are analysed by DCE.*

Parameter		Station and depth (m)							
		HES-1	HES-3	HES-5	HES-7	HES-9	HES-11	HES-13	HES-15
		21	31	28	28	36	25	29	27
Heavy metals	Arsenic (As)	2.6	5	3.2	3.2	6.5	2.5	2.8	3.5
	Barium (Ba)	3.8	13	5.7	8	20	5.7	9.2	3.3
	Lead (Pb)	3.4	11	6.1	6.5	15	5.5	7.4	4.5
	Cadmium (Cd)	<0.03	0.061	0.046	0.041	0.087	0.032	0.047	0.033
	Chromium (Cr)	2.9	10	4.8	6.8	15	4.6	7	3
	Copper (Cu)	0.49	3.9	1.5	2	6.4	1.2	2.2	0.67
	Mercury (Hg)	<0.005	0.012	0.024	0.014	0.018	0.0069	0.014	<0.005
	Nickel (Ni)	1.1	5.8	2.5	3.5	9	2.3	3.8	1.5
	Silver (Ag)	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
	Zinc (Zn)	5	27	12	14	39	10	16	7.2
PAH	Naphthalene	<0.0008	0.0037	0.0011	0.0018	0.0031	<0.0015	0.0027	<0.00085
	Acenaphthylene	<0.0005	0.001	<0.0005	0.0006	0.0009	<0.0005	0.0007	<0.0005
	Acenaphthene	<0.0005	<0.0005	<0.0005	<0.0007	<0.0009	<0.0005	<0.0009	<0.0005
	Fluorene	<0.0005	0.0012	<0.0005	0.0013	0.0017	0.0006	0.0016	<0.0005
	Anthracene	<0.0005	0.0022	0.0008	0.0012	0.0022	0.0005	0.0019	<0.0005
	Fluoranthene	<0.003	0.016	0.0074	0.0094	0.019	0.0048	0.014	<0.003
	Pyrene	<0.003	0.012	0.0048	0.0083	0.016	0.0043	0.013	<0.003
	Chrysene/ Triphenylene	<0.001	<0.01	0.0041	0.0081	0.015	0.0044	0.011	0.0017
	Benzo(b+j+k)fluoranthene	<0.0015	0.029	0.013	0.022	0.036	0.011	0.029	0.0056
	Benzo(e)pyrene	<0.001	0.01	0.0043	0.0089	0.014	0.0044	0.011	0.0018
	Indeno(1,2,3-cd)pyrene	<0.002	0.012	0.0054	0.0091	0.014	0.0044	0.012	0.0033
	Benzo(g,h,i)perylene	<0.001	0.014	0.0064	0.012	0.018	0.0065	0.015	0.0029
	1-Methylnaphthalene	<0.0005	0.0017	<0.0005	<0.0025	0.0023	<0.0015	0.0018	<0.0008
	2-Methylnaphthalene	<0.001	0.0037	0.0014	0.0026	0.0036	0.0012	0.003	<0.001
	Dimethylnaphthalenes. sum	<0.003	0.01	0.0036	0.0071	0.01	<0.003	0.009	<0.003
	Trimethylnaphthalenes sum	<0.001	0.0046	0.0018	0.0029	0.0044	0.0013	0.0038	<0.001
Phthalates	Dibutylphthalate (DBP)	0.007	0.006	0.005	0.003	0.019	<0.001	0.012	0.012
	Benzylbutylphthalate (BBP)	<0.001	<0.001	0.001	0.003	0.002	0.005	0.005	0.004
	Di(2-ethylhexyl)adipat (DEHA)	0.009	0.015	0.009	0.010	0.030	0.005	0.007	0.007
	Di(2-ethylhexyl)phthalate (DEHP)	0.009	0.020	0.011	0.008	0.036	0.007	0.065	0.035
	Di-n-octylphthalate (DNOP)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Diisononylphthalate (DNP)	0.005	0.040	0.006	0.010	0.010	<0.005	0.017	<0.005
	Diisodecylphthalat (DIDP)	0.006	0.104	0.011	0.012	0.032	0.006	0.021	0.001
Phenols	4-t-octylphenol	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	4-n-octylphenol	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	4-n-nonylphenol	0.0006	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Nonylphenols, sum	0.0062	0.0049	0.0037	<0.001	0.006	0.0015	0.0031	0.0015
	Nonylphenol-monoethoxylater (NP1EO)	0.0048	<0.001	0.0065	<0.001	<0.001	<0.001	<0.001	0.0010
	Nonylphenol-diethoxylater (NP2EO)	0.0036	0.0028	0.0037	0.0021	0.0027	0.002	0.0021	0.0021
	Dibenzothiophene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 5-5 *Chemical conditions in the sediment surface at Hesselø ECC. Unit = mg/kg. Chemical parameters (heavy metals, PAH-compounds, phthalates, phenols, and dibenzothiophene). Red numbers represent exceeded threshold values (see Table 5-3). Heavy metals, PAH and dibenzothiophene are analysed by Eurofins, and phthalates and phenols are analysed by DCE, except those noted with an asterisk (*).*

Parameter		Station and depth (m)								
		HESC-1	HESC-3	HESC-5	HESC-7	HESC-9	HESC-11	HESC-13	HESC-15	HESC-16
		21	31	28	28	36	25	29	27	11
Heavy metals	Arsenic (As)	3.2	4	2.5	4.1	3.4	3.9	3.8	5.4	1
	Barium (Ba)	11	16	6.6	12	8.2	15	2.6	3.5	1.4
	Lead (Pb)	7.3	6.5	4.7	9.3	7	12	3.1	2.5	1
	Cadmium (Cd)	0.03	0.046	0.032	0.052	0.045	0.061	<0.03	<0.03	0.035
	Chromium (Cr)	8	6.3	5.1	9.9	7.1	12	2.5	1.7	0.65
	Copper (Cu)	2.7	1.9	1.3	3.2	2.7	4	0.7	0.88	0.8
	Mercury (Hg)	<0.005	<0.005	0.0071	0.0077	0.0062	0.0084	<0.005	0.0066	0.0063
	Nickel (Ni)	4.4	4	2.6	5.3	3.3	6	1.5	1.2	0.71
	Silver (Ag)	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
	Zinc (Zn)	17	15	11	23	17	28	9.5	7.4	3.3
PAH	Naphthalene	0.0021	0.0021	0.0028	0.0053	0.0035	0.0025	<0.0008	<0.0008	<0.0009
	Acenaphthylene	0.0005	<0.0005	0.0008	0.0017	0.0008	0.0006	<0.0005	<0.0005	<0.0005
	Acenaphthene	0.0007	<0.0005	<0.0005	0.0006	<0.0006	<0.0008	<0.0005	<0.0005	<0.0005
	Fluorene	0.001	0.0007	0.001	0.0016	0.001	0.0014	<0.0005	<0.0005	<0.0005
	Anthracene	0.0018	0.0016	0.0015	0.009	0.0026	0.0016	<0.0005	<0.0005	<0.0005
	Fluoranthene	0.018	0.013	0.016	0.044	0.019	0.012	<0.003	<0.003	<0.003
	Pyrene	0.012	0.0088	0.011	0.032	0.013	0.01	<0.003	<0.003	<0.003
	Chrysene/ Triphenylene	0.0087	0.0065	0.0078	0.024	0.0092	0.01	<0.001	<0.001	<0.001
	Benzo(b+j+k)fluoranthene	0.029	0.024	0.028	0.069	0.033	0.029	<0.0015	<0.0015	<0.0015
	Benzo(e)pyrene	0.01	0.0088	0.009	0.021	0.011	0.011	<0.001	<0.001	<0.001
	Indeno(1,2,3-cd)pyrene	<0.015	0.0099	0.011	0.022	0.012	0.012	<0.002	<0.002	<0.002
	Benzo(g,h,i)perylene	0.013	0.012	0.013	0.026	0.014	0.014	<0.001	<0.001	<0.001
	1-Methylnaphthalene	<0.0015	<0.002	0.0018	<0.0035	0.0024	0.0019	<0.0005	<0.0005	<0.0005
	2-Methylnaphthalene	0.003	0.0031	0.0035	0.0056	0.0043	0.0031	<0.001	<0.001	<0.001
	Dimethylnaphthalenes. sum	0.0081	0.0084	0.0092	0.015	0.011	0.0088	<0.003	<0.003	<0.003
	Trimethylnaphthalenes. sum	0.0037	0.0042	0.0045	0.007	0.0054	0.0037	<0.001	<0.001	<0.001
Phthalates	Dibutylphthalate (DBP)	0.001	0.024	0.003	0.009	0.005	0.004	0.012	0.005	<0.01*
	Benzylbutylphthalate (BBP)	0.006	0.012	0.003	0.003	0.001	0.003	0.010	0.008	-
	Di(2-ethylhexyl)adipat (DEHA)	<0.001	0.006	0.002	0.002	0.003	0.002	0.008	0.013	0.01*
	Di(2-ethylhexyl)phthalate (DEHP)	0.005	0.010	0.021	0.019	0.018	0.022	0.015	0.016	<0.01*
	Di-n-octylphthalate (DNOP)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01*
	Diisononylphthalate (DNP)	0.009	<0.005	0.010	0.007	0.006	<0.005	<0.005	<0.005	<0.02*
	Diisodecylphthalat (DIDP)	0.010	0.009	0.016	0.018	0.014	0.009	<0.001	<0.001	-
Phenols	4-t-octylphenol	<0.001	0.0037	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005*
	4-n-octylphenol	<0.0005	<0.0005	<0.0005	<0.0005	<0.00,5	<0.0005	<0.0005	<0.0005	<0.01*
	4-n-nonylphenol	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002*
	Nonylphenols, sum	0.0060	0.0062	0.0052	<0.001	0.0019	0.0012	<0.001	<0.001	<0.1*
	Nonylphenol-monoethoxylater (NP1EO)	<0.001	0.0045	0.0020	<0.001	<0.001	0.00<1	<0.001	<0.001	-
	Nonylphenol-diethoxylater (NP2EO)	0.0049	0.0043	0.0044	<0.001	<0.001	<0.001	<0.001	<0.001	-
	Dibenzothiophene	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.001	<0.001	<0.001	<0.001

5.3.2 Visual registrations of sediment type (ROV)

A total of 15.5 km of seabed in the planned Hesselø OWF area was surveyed by use of ROV in April 2024, and registrations of substrate type according to the Danish classification system were made along the survey transects. A map summarising substrate registration in each survey transect is shown in Figure 5-6. Detailed maps of substrate registrations for each visual survey transect are given in Appendix 2.

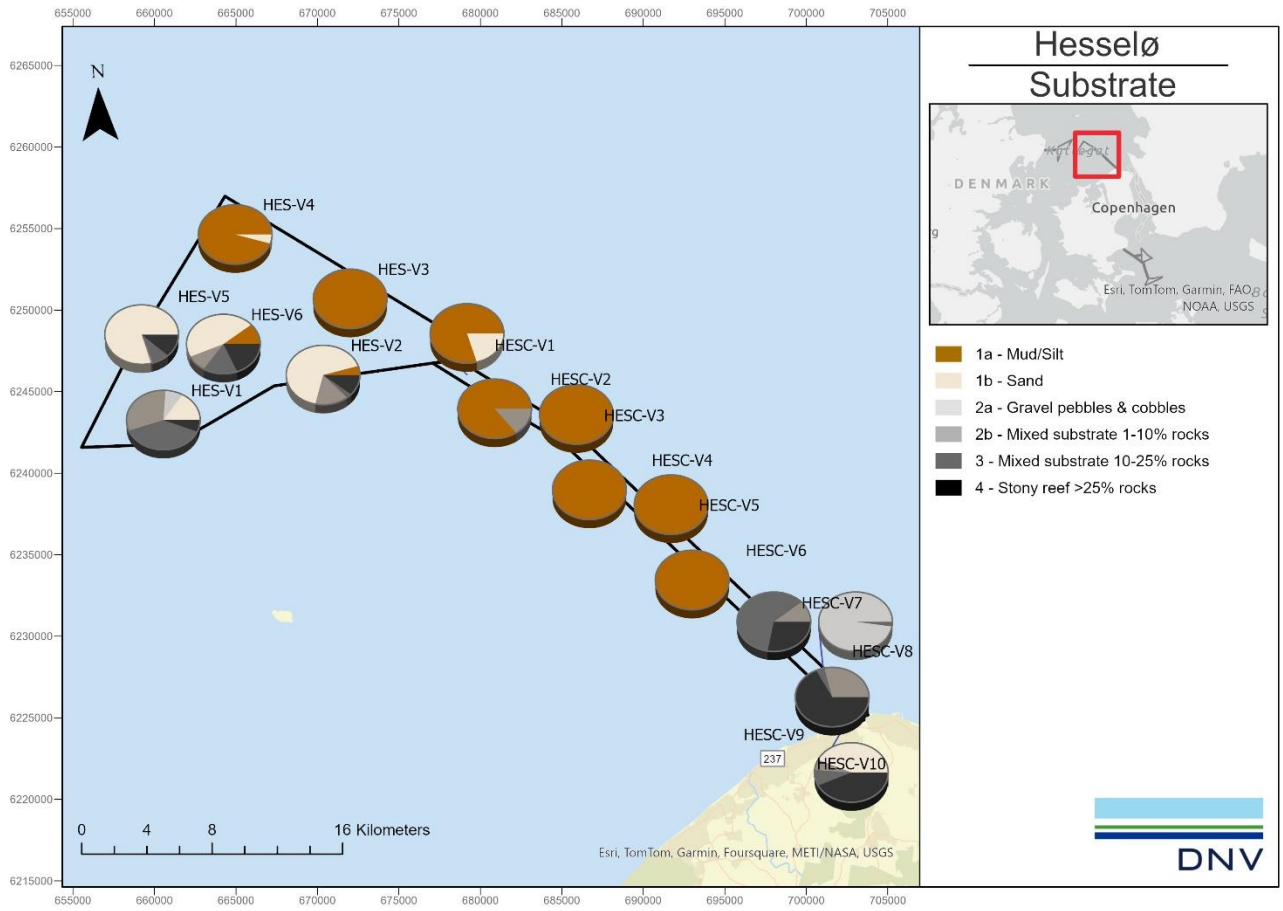

Figure 5-6 *Map summarising registrations of substrate types according to the Danish classification scheme in visual survey transects.*

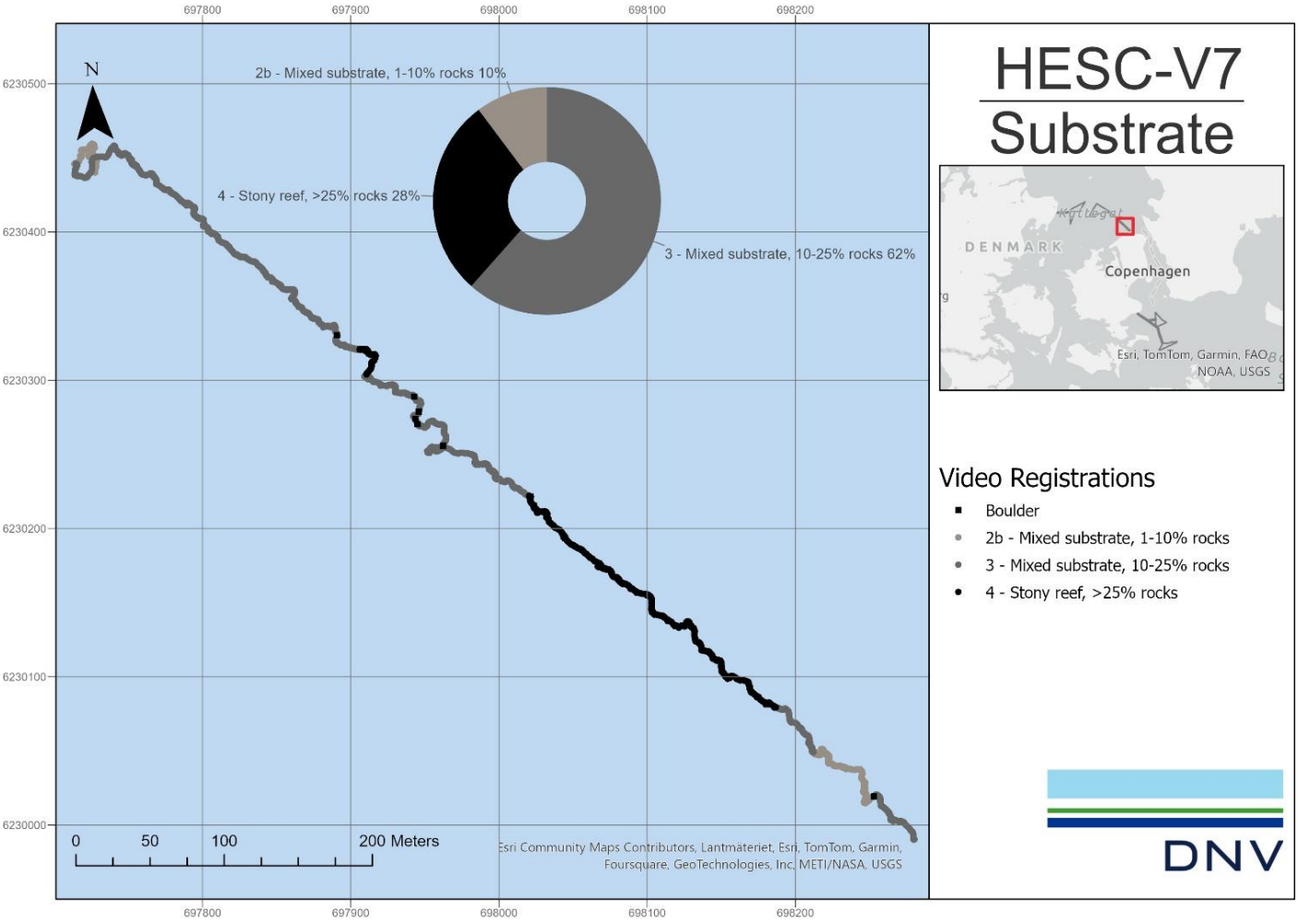

Figure 5-7 *Example map of substrate registrations along the ROV survey track*

5.4 Benthic communities (nature types)

5.4.1 Benthic megafauna and macroalgae (ROV)

5.4.1.1 General overview

A total of 15.5 km with visual survey transects were surveyed in detail, and registrations were made of dominating fauna and flora types along the survey tracks. A species list was produced for each survey transect. A map summarizing main registrations of fauna and flora types in each visual transect is given in Figure 5-9. Detailed maps of fauna and flora registrations along the seabed for each visual survey transect is given in Appendix 3. An example map of detailed registrations of flora and fauna along a visual survey transect is given in Figure 5-10. The species list for the visual survey is given in Appendix 4.

A total of 92 species of benthic megafauna and macroalgae were registered at the planned Hesselø OWF area and ECC, in addition, 21 fish species were encountered during the survey Table 5-6 and Figure 5-8 gives a summary of the distribution of species within taxonomical groups. Example images of fauna and flora is given in Figure 5-11 and Figure 5-12.

Sea pen communities were encountered at three visual transects in Hesselø ECC, at densities that possibly qualify to be considered as the OSPAR habitat "Seapens and burrowing megafauna" (OSPAR, 2010), described in detail in the next section.

Table 5-6 *Table summarising number of species of megafauna and macro algae in each taxonomical group in the visual survey transects at the planned Hesselø OWF area and Hesselø ECC.*

AREA	STATION	GROUP								
		Porifera	Polychaeta	Varia	Crustacea	Mollusca	Echinodermata	Cnidaria	Pisces	Plantae
HESSELØ OWF	HES-V1				1	3	9		5	3
	HES-V2	2	2	1	6	7	5	5	6	7
	HES-V3		3		2	3	2	3	8	
	HES-V4	1	2		4	6	3	2	9	
	HES-V5		1		5	5	11	1	6	1
	HES-V6		2		3	7	9	5	8	5
	No. Species	3	4	1	9	9	15	8	17	8
HESSELØ ECC	HESC-V1		1		3	3	1	1	2	
	HESC-V2				1	2	2	5	4	
	HESC-V3				1	1	1	2	3	
	HESC-V4				1		1	2	2	
	HESC-V5		1		2	2	2	2	3	
	HESC-V6		3	1	1	4	3	2	5	
	HESC-V7	1		1	5	5	4	2	5	12
	HESC-V8			2	3		1		2	9
	HESC-V9			2	2	1	3	2	1	11
	HESC-V10		1	2	3	2	2	1	1	14
	No. Species	1	4	3	9	8	8	8	12	26
TOTAL		4	7	4	12	11	16	10	21	28

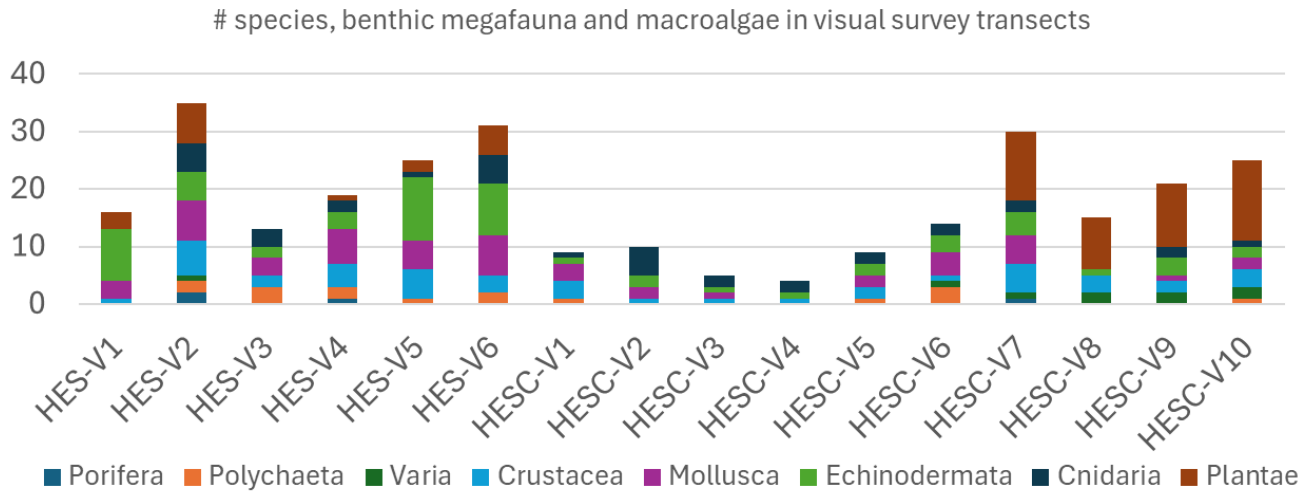

Figure 5-8 *Histogram showing number of species within different taxonomical groups of benthic megafauna and macroalgae registered in visual survey transects in the planned Hesselø OWF area and Hesselø ECC.*

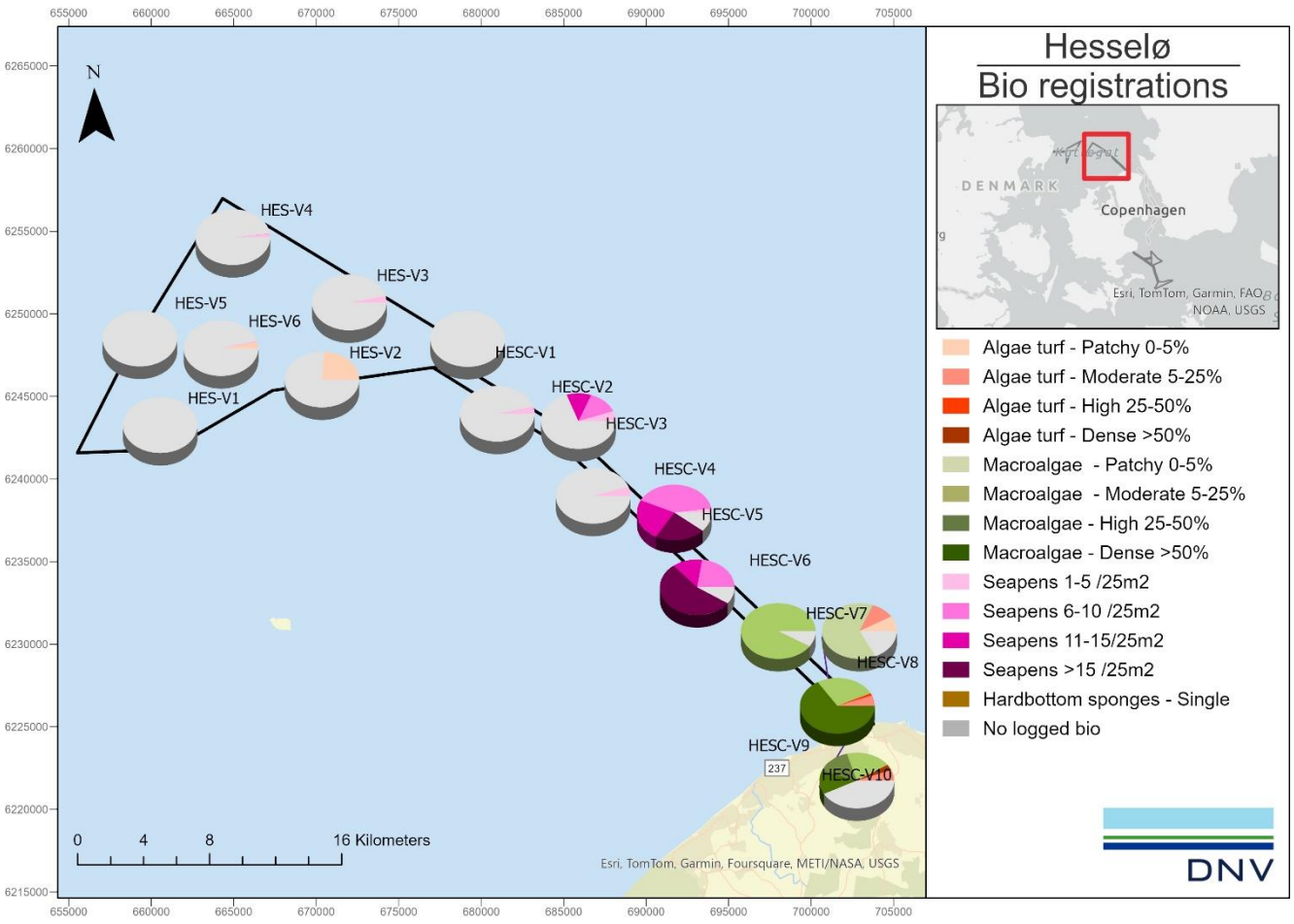

Figure 5-9 *Map summarising relative amounts of main findings of fauna and flora coverage types in visual survey transects*.

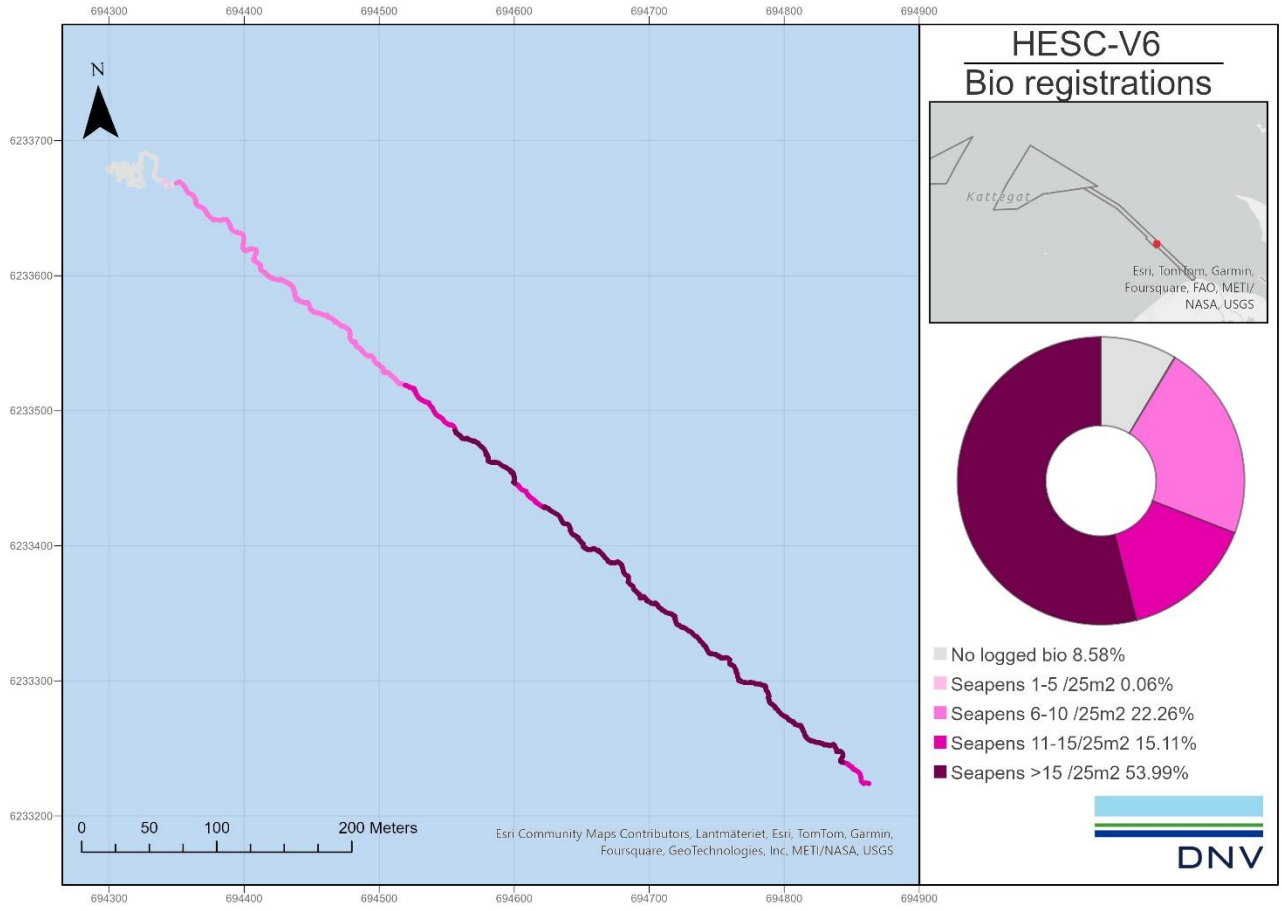

Figure 5-10 *Map showing example of registrations of fauna along visual survey track for transect HESC-V6*.

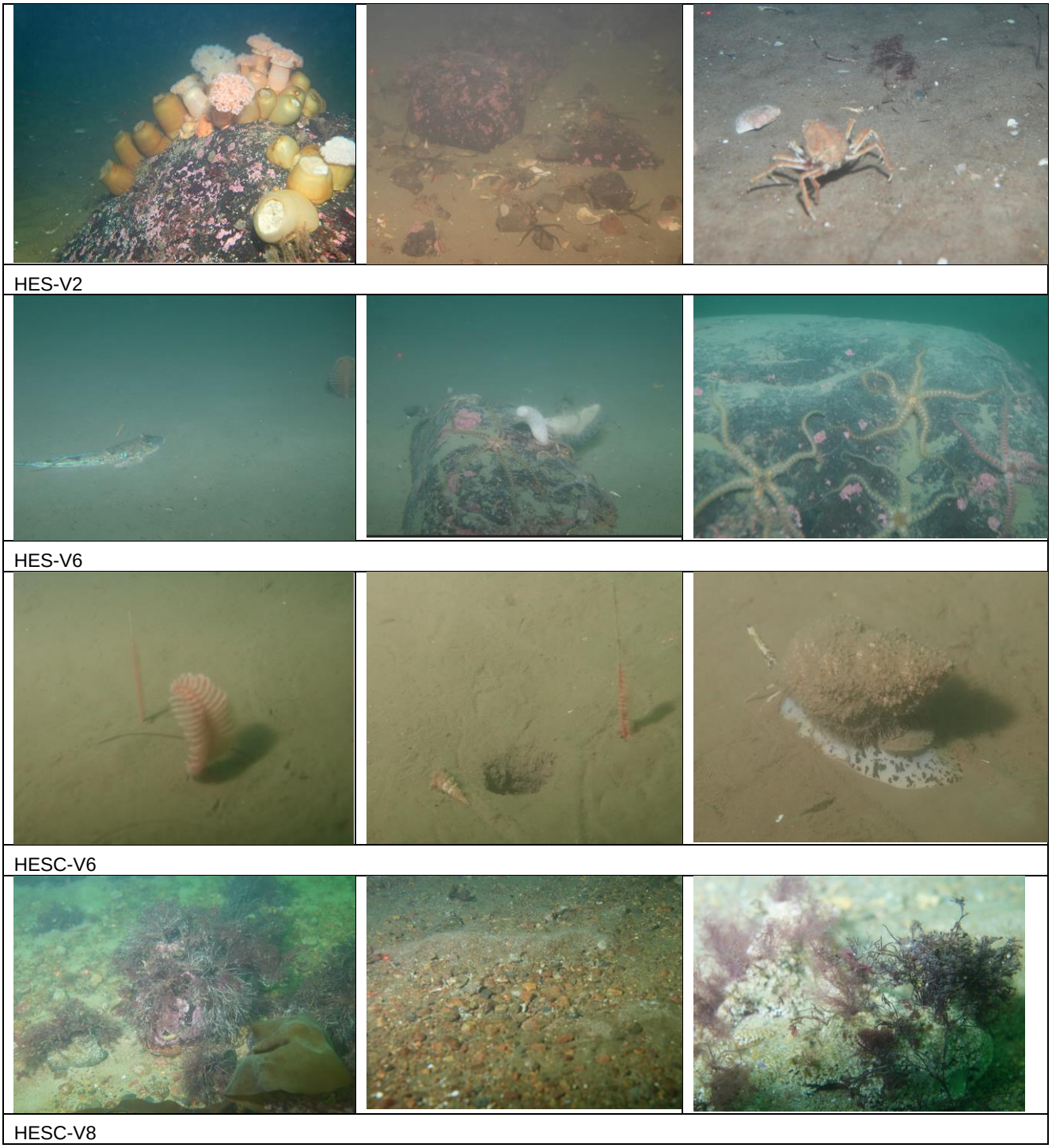

Figure 5-11 *Example images from selected visual survey transects: HES-V2, HES-V6, HESC-V6, HESC-V8.*

Figure 5-12 *Example images from landfall at Hesselø ECC, bottom images show visual footage from 1- and 3-meters depth.*

5.4.1.2 Red-listed or vulnerable species and nature types

Sea pen communities were registered at densities >15 per 25 m2. In DNVs experience the densities encountered in parts of the seabed at the transects HESC-V5, HESC-V6, and for smaller portions of HESC-V3 (Figure 5-13) possibly qualify to be considered as the OSPAR habitat “Seapens and burrowing megafauna” (OSPAR, 2010). Note that to DNV’s best knowledge there are no established exact definitions regarding at what densities of seapens or burrowing megafauna seapen habitats should be regarded to fall under the OSPAR habitat.

According to OSPAR (2010) the habitat is defined as follows: “Plains of fine mud, at water depths ranging from 15-200m or more, which are heavily bioturbated by burrowing megafauna with burrows and mounds typically forming a prominent feature of the sediment surface. The habitat may include conspicuous populations of seapens, typically *Virgularia mirabilis* and *Pennatula phosphorea*. The burrowing crustaceans present may include *Nephrops norvegicus*, *Calocaris macandreae* or *Callianassa subterranea*….."

Occurrences of the OSPAR habitat type “Seapens and burrowing megafauna“ has been reported from Swedish surveys / OSPAR Threatened and/or Declining habitats database, (2020). In the same area (Figure 5-13), with closest reported findings 7 km from the Hesselø ECC. Exact delineation of the habitat type and whether the findings at Hesselø ECC constitute the OSPAR habitat can be subject to discussion and is dependent on both densities of burrows from megafauna and densities of seapens. In DNVs experience the findings show relatively dense occurrences of seapens in some areas, but densities of burrows were relatively low 1-10 per 25 m^2, up to 15/ 25m^2 for smaller portions of the transects.

Stony reefs supporting increased levels of biodiversity of hard bottom fauna and flora were registered in smaller portions of transects HES-V1, HESV-5, HES-V6 and in larger parts of transect HESC-V7, HESC-V9 and HESC-V10 (Figure 5-6)

Ocean Quahog (*Arctica islandica)* was registered at low densities in several transects. The species is listed in OSPAR list of declining species and/or habitats and considered to be under threat/ or in decline in OSPAR Region II (The greater North Sea), see OSPAR (2009).

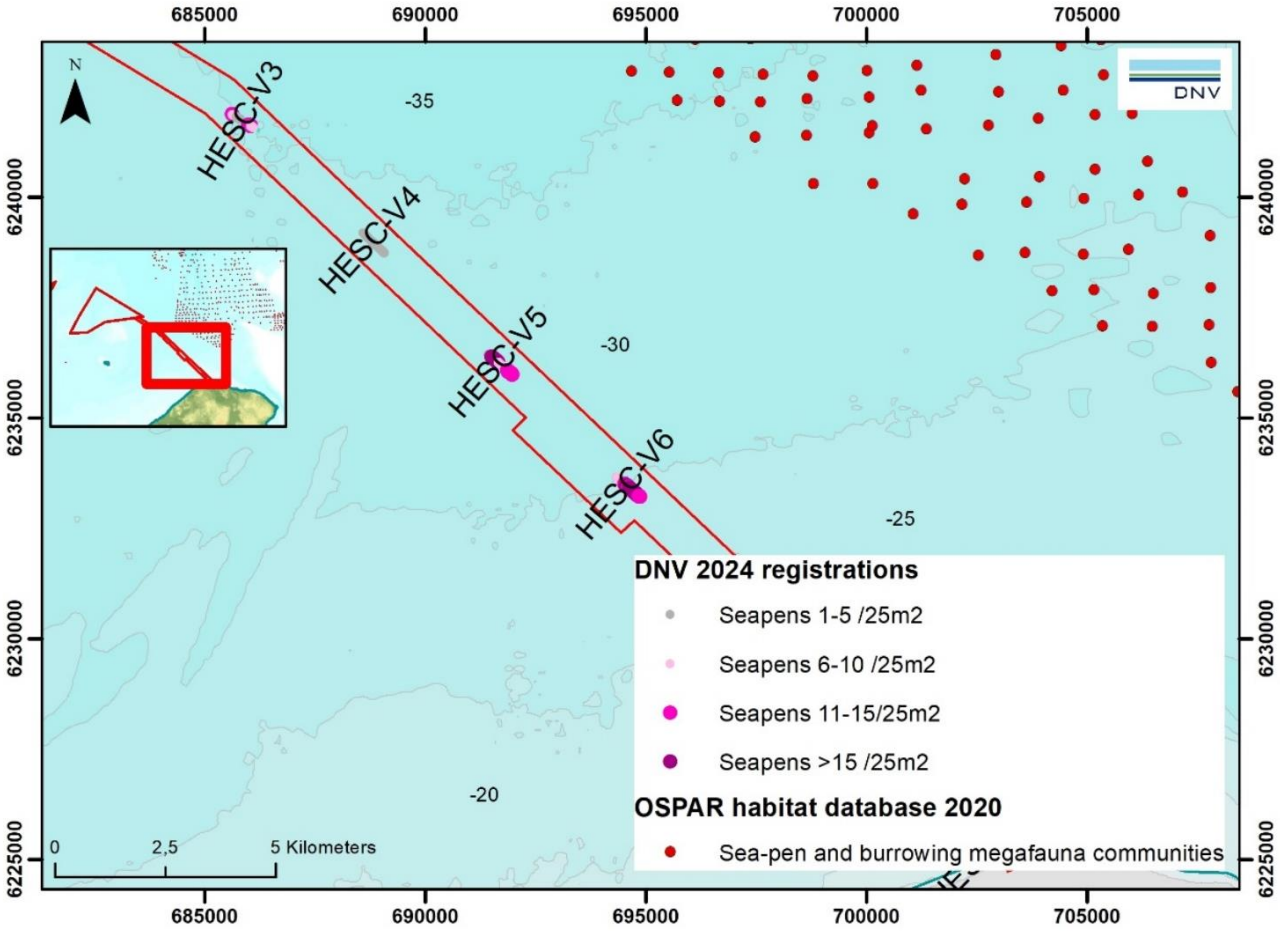

Figure 5-13 *Map showing logged registrations of sea pens along the ROV track in transects in ECC with moderate-high occurrences of seapens. Red dots show registrations of "Sea-pens and burrowing megafauna communities" habitat from OSPAR Threatened and/or Declining habitats database (2020).*

5.4.1.3 Introduced species

No macrofauna or macroalgae species considered as alien species to Danish waters were registered in the visual surveys. The invasive Round goby (*Neogobius melanostomus*) was not seen in any of the visual transects but was registered in the area for the planned Kattegat OWF that was surveyed on the same cruise. It seems likely that the species can occur in Hesselø area as well even though the species main area of habitation seems to be in the waters south of Zealand (see Jensen et al., 2023).

5.4.1.4 Multivariate analyses, visual data

Similarity analyses based on relative abundances of species in visual survey transects were performed. The resulting cluster diagram (dendrogram) is shown in Figure 5-14. The analyses show that the visual transects can be separated in three main groups at 30% similarity. The main reason for grouping can be attributed to the substrate types dominating in each of the transects with the transects having substrates being composed of either mud/silt or sand, a mix of sand with smaller areas of harder substrates such as gravel, pebbles cobbles or as the last group being dominated by harder substrates such as gravel pebbles and rocks and smaller portions of sand. The fauna types associated with the soft sediments are typically sea pens (*Pennatula phosphorea, Virgularia mirabilis*), hermit crabs (Pagurus), Ocean quahog (*Arctica islandica*). Mixed substrates group is dominated by brittle stars (*Ophiocomina nigra, Ophiothrix fragilis, Ophiura sp*.), edible crab (*Cancer pagurus*) and sea urchins (*Ecinus acutus , Echinus esculentus*). The group with hard substrates is located in shallow waters and is dominated by algae and kelp (*Saccharina latissima, Ceramium spp., Furcellaria lumbricalis*), associated epifanua and typical shallow water hard bottom species such as barnacles.

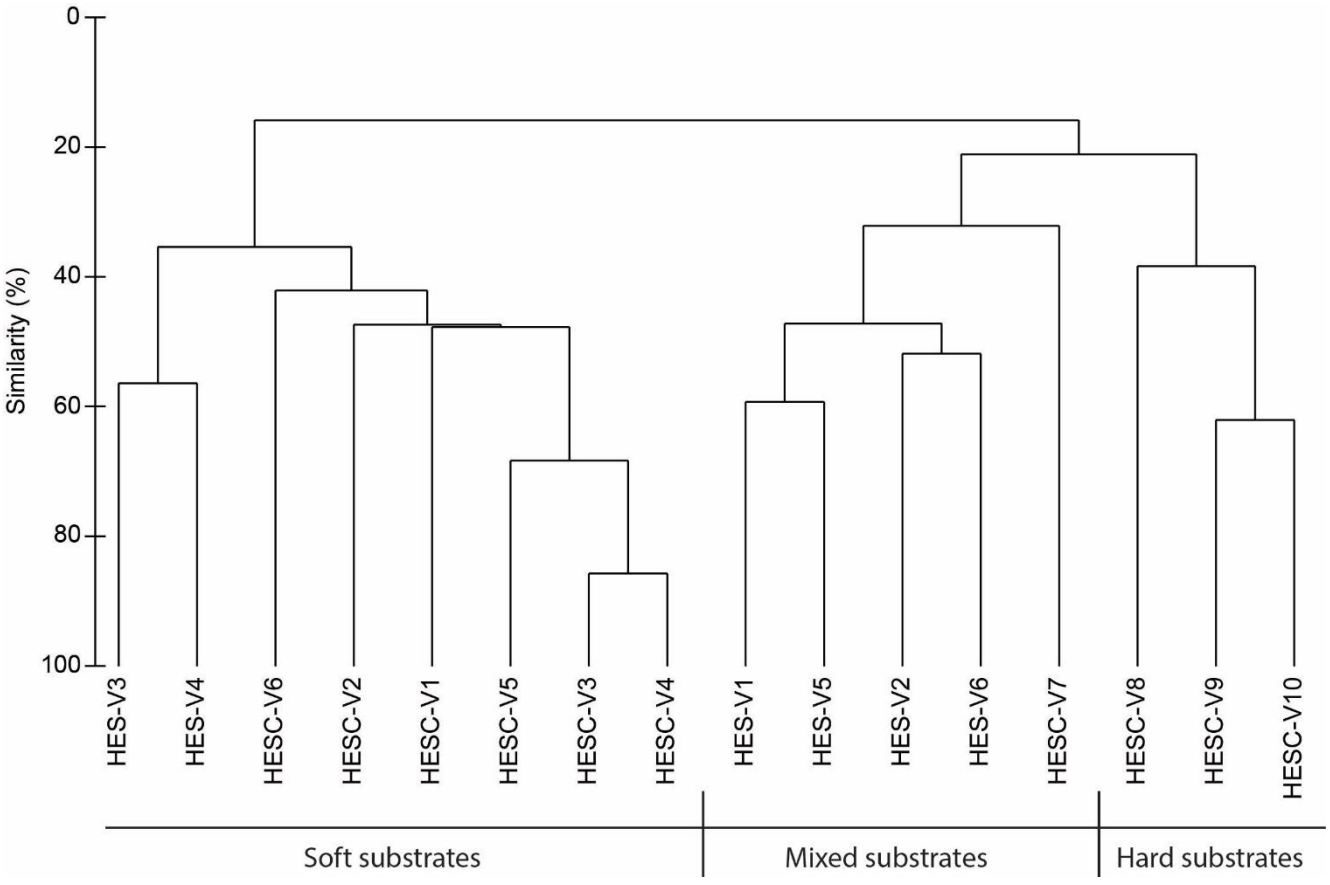

Figure 5-14 *Dendrogram resulting from similarity analyses of relative abundances of species of macrofauna and macroalgae in visual survey transects. Main reason for grouping based on dominating substrate types (three main groups at 30% similarity) is highlighted.*

5.4.2 Benthic infauna (sediment samples)

A total of 120 sediment samples were analyzed from 32 different stations at the planned Hesselø OWF and ECC. Four grab samples (0.1 m^2 surface area) were analyzed for each environmental station. The samples were analyzed for benthic infauna species occurrences and abundances. The biomass of each infauna species at each sediment station was calculated.

5.4.2.1 Diversity and dominant species

Table 5-7 shows the distribution of individuals and taxa for infauna sampled at the planned Hesselø OWF area and ECC. Species list from the survey is given in Appendix 5. A total of 37132 individuals distributed among 276 different taxa were recorded (juveniles excluded). Polychaeta dominated the seabed macrofauna, constituting 39 % of individuals and 49 % of the species.

Number of species, individuals, and the diversity indexes H, J and ES100, AMBI and DKI for the different environmental stations sampled is given in Table 5-8. Relative distribution of species in relation to ecological AMBI group is given in Figure 5-15. Highest number of individuals were recorded at station HES-5 Lowest number of individuals were registered at station HES-1. Highest number of species was registered at station HESC-2, and lowest number of species was registered at HESC-14. Lowest number of infauna species occurred at the shallowest stations closest to shore. Shannon-Wiener diversity (H') varied between 2.3 – 5.3 (HESC-14 and HES-8, respectively). The diversity indexes are generally high and indicate high to good ecological status. HESC-14 is the shallowest environmental sediment station in the survey and had lowest diversity and highest AMBI score, indicating slight disturbance at this station.

Table 5-7 *Distribution of individuals and taxa of infauna within the main taxonomic groups in the planned Hesselø OWF area and Hesselø ECC (jueveniles excluded).*

	Hesselø total				OWF				ECC			
Faunal groups	**Ind.**		**Taxa**		**Ind.**		**Taxa**		**Ind.**		**Taxa**	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Varia	7724	20.8	20	7.2	4143	20.6	17	7.8	3581	21.0	14	6.8
Polychaeta	14283	38.5	136	49.3	6613	32.9	102	46.6	7670	45.1	108	52.4
Crustacea	2655	7.2	51	18.5	1542	7.7	45	20.5	1113	6.5	32	15.5
Echinodermata	5999	16.2	12	4.3	3616	18.0	8	3.7	2383	14.0	11	5.3
Mollusca	6471	17.4	56	20.3	4202	20.9	47	21.5	2269	13.3	41	19.9
Total	**37132**	**100.0**	**276**	**100.0**	**20116**	**100.0**	**219**	**100.0**	**17016**	**100.0**	**206**	**100.0**

The ten most common species at each station is shown in Table 5-8. The fauna composition reflects healthy communities in most stations characterized with high biodiversity and with infauna communities being comprised of a mix of filter feeders, suspension feeders and carnivores, with HESC-14 having slightly higher dominance of opportunistic species such as the polychaeta *Chaetozone* and *capitella.* Most stations are dominated by the horseshoe worm *Phoronis* spp., the brittle star *Amphiura filiformis* the polychaeta *Prionospio fallax* and the mussel *Kurtiellea bidentata.*

Table 5-8 *Univariate indexes calculated based on infauna samples The number of species (S) and individuals (N) per 0.4 m^2, Shannon Wiener's diversity index (H'), ES100 and evenness (J') AMBI and DKI. Results are presented station wise. Juveniles excluded.*

Station	S	N	J'	ES(100)	H'(log2)	AMBI	DKI
HES-1	64	517	0.79	33.26	4.74	1.32	0.83
HES-2	69	670	0.77	30.73	4.69	1.27	0.84
HES-3	76	1444	0.79	32.78	4.92	1.77	0.84
HES-4	71	1534	0.68	24.49	4.18	1.84	0.77
HES-5	76	1939	0.65	24.89	4.09	1.78	0.77
HES-6	78	998	0.75	32.51	4.74	1.90	0.81
HES-7	86	1366	0.71	31.07	4.56	1.85	0.81
HES-8	91	674	0.82	40.07	5.31	1.24	0.89
HES-9	68	1584	0.73	28.85	4.44	1.76	0.80
HES-10	67	1097	0.67	25.32	4.05	1.76	0.76
HES-11	88	1579	0.65	27.43	4.22	1.70	0.79
HES-12	81	1351	0.67	28.13	4.24	1.71	0.78
HES-13	82	1340	0.73	30.70	4.62	1.71	0.82
HES-14	88	1242	0.76	33.29	4.88	2.01	0.82
HES-15	93	1533	0.62	26.46	4.02	1.65	0.77
HES-16	81	1248	0.69	27.49	4.38	1.90	0.78
HESC-1	88	1155	0.67	30.68	4.31	1.86	0.77
HESC-2	99	1107	0.78	37.81	5.18	1.80	0.83
HESC-3	93	1341	0.79	36.29	5.19	1.94	0.84
HESC-4	66	771	0.78	32.07	4.73	1.76	0.80
HESC-5	74	884	0.80	35.09	4.97	2.06	0.81
HESC-6	92	1316	0.71	32.51	4.65	1.88	0.80
HESC-7	76	1091	0.75	32.21	4.66	2.20	0.77
HESC-8	87	1490	0.73	31.28	4.68	2.21	0.78
HESC-9	87	1611	0.68	29.60	4.36	1.79	0.78
HESC-10	86	1570	0.69	29.35	4.45	2.00	0.78
HESC-11	81	1379	0.58	25.10	3.69	1.76	0.72
HESC-12	88	1794	0.62	24.60	3.99	1.95	0.74
HESC-13	44	931	0.60	19.28	3.27	1.18	0.73
HESC-14	32	576	0.54	13.95	2.70	3.17	0.51
Min.	32	517,0	0,5	13,9	2,7	1,2	0.51
Max.	99	1939,0	0,8	40,1	5,3	3,2	0.89

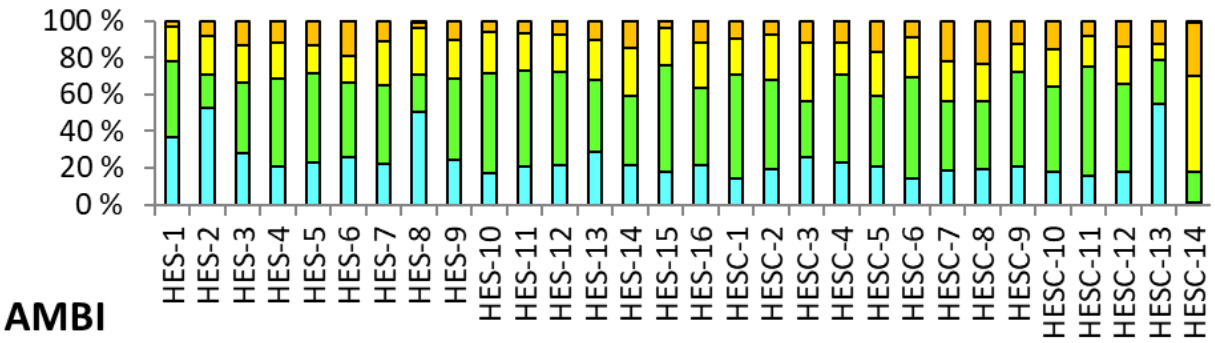

Figure 5-15 *Relative amounts of individuals of macrofauna in various ecological AMBI groups at the different stations. Explanation: ● Gr. I - sensitive species; ● Gr. II – neutral species; ● Gr.III – tolerant species; ● Gr.IV – opportunistic species; ● Gr.V – pollution indicators*

Table 5-1. Ten most dominant taxa at each station (juveniles included),in the planned Hesselø OWF and Hesselø ECC 2024**.**

HES-1	No.ind	%	Cum%
Phoronis	97	18	18
Echinocyamus pusillus	49	9	27
Spio	38	7	34
Ampelisca tenuicornis	35	6	41
Parajassa pelagica	31	5	47
Edwardsia	26	4	52
Scoloplos armiger	19	3	56
Cephalochordata	18	3	59
Bathyporeia elegans	17	3	62
Fabulina fabula	14	2	65
Number of taxa 64			

HES-2	No.ind	%	Cum%
Leptocheirus pilosus	90	12	12
Urothoe elegans	74	10	22
Echinocyamus pusillus	70	9	32
Edwardsia	42	5	37
Polycirrus	42	5	43
Echinoidea juv.	39	5	49
Cephalochordata	37	5	54
Chaetopterus norvegicus	35	4	58
Leptochiton asellus	33	4	63
Amphiura filiformis	25	3	66
Number of taxa 69			

HES-3			
Phoronis	152	10	10
Amphiura filiformis	144	9	19
Nucula nucleus	108	7	27
Prionospio fallax	102	6	34
Kurtiella bidentata	92	6	40
Diplocirrus glaucus	81	5	45
Cirripedia	71	4	50
Abra nitida	70	4	55
Magelona minuta	58	3	59
Diastyloides serratus	43	2	61
Number of taxa 76			

HES-4			
Amphiura filiformis	300	18	18
Phoronis	274	17	36
Kurtiella bidentata	123	7	43
Pholoe baltica	114	7	50
Prionospio fallax	76	4	55
Edwardsia	75	4	60
Thyasira flexuosa	72	4	64
Chaetozone setosa kompleks	60	3	68
Scoloplos armiger	54	3	72
Magelona minuta	51	3	75
Number of taxa 71			

HES-5			
Phoronis	440	22	22
Amphiura filiformis	327	16	39
Prionospio fallax	204	10	49
Magelona minuta	162	8	57
Kurtiella bidentata	139	7	64
Pholoe baltica	72	3	68
Nucula nucleus	50	2	70
Parajassa pelagica	49	2	73

HES-6			
Amphiura filiformis	131	12	12
Phoronis	128	12	25
Prionospio fallax	125	12	37
Magelona minuta	91	8	46
Spiophanes kroyeri	48	4	51
Amphiura chiajei	30	2	54
Diplocirrus glaucus	28	2	56
Ampelisca tenuicornis	28	2	59

Amphictene auricoma	45	2	75
Thyasira flexuosa	44	2	78
Number of taxa 76			

Abra nitida	28	2	62
Nephtys incisa	25	2	64
Number of taxa 78			

HES-7			
Amphiura filiformis	289	20	20
Kurtiella bidentata	159	11	32
Phoronis	149	10	42
Prionospio fallax	108	7	50
Magelona minuta	76	5	55
Nucula nucleus	49	3	59
Spiophanes kroyeri	41	2	62
Praxillella affinis	37	2	65
Pholoe baltica	30	2	67
Amphictene auricoma	29	2	69
Number of taxa 86			

HES-8			
Echinocyamus pusillus	62	8	8
Leptocheirus pilosus	58	7	15
Urothoe elegans	58	7	23
Cephalochordata	41	5	28
Prionospio	40	5	34
Cochlodesma praetenue	37	4	39
Glyceridae juv.	28	3	42
Parexogone hebes	27	3	46
Autonoe longipes	25	3	49
Scoloplos armiger	24	3	52
Number of taxa 91			

HES-9			
Amphiura filiformis	308	19	19
Phoronis	227	14	33
Kurtiella bidentata	155	9	43
Nucula nucleus	120	7	50
Diplocirrus glaucus	90	5	56
Prionospio fallax	78	4	61
Ennucula tenuis	43	2	64
Abra nitida	36	2	66
Thyasira flexuosa	35	2	68
Magelona minuta	32	2	70
Number of taxa 68			

HES-10			
Phoronis	319	28	28
Edwardsia	111	9	38
Kurtiella bidentata	108	9	47
Amphiura filiformis	99	8	56
Thyasira flexuosa	63	5	62
Nucula nucleus	53	4	66
Scoloplos armiger	36	3	70
Chaetozone setosa kompleks	30	2	72
Prionospio fallax	27	2	75
Ophiuroidea juv.	26	2	77
Number of taxa 67			

HES-11			
Phoronis	382	23	23
Amphiura filiformis	267	16	40
Kurtiella bidentata	164	10	50
Nucula nucleus	118	7	58
Prionospio fallax	75	4	63
Pholoe baltica	52	3	66
Thyasira flexuosa	40	2	68
Magelona minuta	37	2	71
Amphictene auricoma	31	1	73
Spiophanes kroyeri	27	1	74
Number of taxa 88			

HES-12			
Amphiura filiformis	372	27	27
Phoronis	190	13	40
Kurtiella bidentata	114	8	49
Nucula nucleus	100	7	56
Magelona minuta	54	3	60
Prionospio fallax	54	3	64
Spiophanes kroyeri	50	3	68
Pholoe baltica	44	3	71
Notomastus latericeus	37	2	73
Amphictene auricoma	19	1	75
Number of taxa 81			

HES-13			
Amphiura filiformis	261	19	19
Phoronis	154	11	30
Nucula nucleus	115	8	39
Diplocirrus glaucus	86	6	45
Kurtiella bidentata	80	5	51
Prionospio fallax	78	5	57
Abra nitida	56	4	61
Magelona minuta	50	3	64
Spiophanes kroyeri	35	2	67
Pholoe baltica	32	2	69
Number of taxa 82			

HES-14			
Amphiura filiformis	197	15	15
Phoronis	135	10	26
Prionospio fallax	87	6	33
Kurtiella bidentata	80	6	39
Nucula nucleus	63	4	44
Diplocirrus glaucus	55	4	48
Abra nitida	55	4	53
Spiophanes kroyeri	52	4	57
Magelona minuta	35	2	59
Amphictene auricoma	35	2	62
Number of taxa 88			

HES-15			
Phoronis	435	27	27
Amphiura filiformis	324	20	48
Kurtiella bidentata	102	6	55
Pholoe baltica	90	5	61
Notomastus latericeus	75	4	65
Amphictene auricoma	51	3	69
Thyasira flexuosa	36	2	71
Edwardsia	33	2	73
Scoloplos armiger	32	2	75
Caprellidae	25	1	77
Number of taxa 93			

HES-16			
Amphiura filiformis	243	17	17
Pholoe baltica	143	10	28
Phoronis	142	10	38
Kurtiella bidentata	125	9	47
Ophiuroidea juv.	116	8	55
Scoloplos armiger	73	5	61
Prionospio fallax	67	4	65
Edwardsia	56	4	70
Thyasira flexuosa	47	3	73
Varicorbula gibba	30	2	75
Number of taxa 81			

HESC-1			
Phoronis	363	30	30
Amphiura filiformis	160	13	43
Prionospio fallax	59	4	48
Spiophanes kroyeri	52	4	52
Ophiuroidea juv.	41	3	55
Magelona minuta	36	2	58
Kurtiella bidentata	36	2	61
Pholoe baltica	29	2	64
Praxillella affinis	28	2	66
Diplocirrus glaucus	27	2	68
Number of taxa 88			

HESC-2			
Phoronis	150	13	13
Amphiura filiformis	125	11	24
Parajassa pelagica	77	6	31
Amphiura chiajei	51	4	35
Prionospio fallax	46	4	39
Spiophanes kroyeri	43	3	43
Pholoe baltica	42	3	47
Kurtiella bidentata	39	3	50
Magelona minuta	33	2	53
Abra nitida	33	2	56
Number of taxa 99			

HESC-3			
Amphiura chiajei	141	10	10
Spiophanes kroyeri	96	6	17
Pholoe baltica	92	6	23
Amphiura filiformis	86	6	30
Kurtiella bidentata	80	5	36
Prionospio fallax	66	4	40
Mediomastus fragilis	58	4	45
Magelona minuta	48	3	48
Nucula nucleus	47	3	52
Praxillella affinis	45	3	55
Number of taxa 93			

HESC-4			
Phoronis	140	17	17
Amphiura filiformis	76	9	26
Diplocirrus glaucus	52	6	33
Amphiura chiajei	51	6	39
Spiophanes kroyeri	42	5	45
Prionospio fallax	36	4	49
Nephtys incisa	34	4	53
Magelona minuta	33	4	57
Ophiuroidea juv.	29	3	61
Tharyx killariensis	22	2	64
Number of taxa 66			

HESC-5	**No.ind**	**%**	**Cum%**
Amphiura filiformis	119	13	13
Prionospio fallax	89	9	23
Phoronis	88	9	33
Abra nitida	58	6	39
Spiophanes kroyeri	45	5	44
Diplocirrus glaucus	28	3	47
Pholoe baltica	27	3	50
Magelona minuta	26	2	53
Amphiura chiajei	26	2	56
Tharyx killariensis	22	2	59
Number of taxa 74			

HESC-6	**No.ind**	**%**	**Cum%**
Phoronis	263	19	19
Amphiura filiformis	206	15	34
Cirripedia	109	8	42
Prionospio fallax	77	5	48
Spiophanes kroyeri	75	5	53
Kurtiella bidentata	46	3	57
Praxillella affinis	44	3	60
Diplocirrus glaucus	30	2	62
Pholoe baltica	30	2	64
Ophiuroidea juv.	28	2	67
Number of taxa 92			

HESC-7			
Phoronis	203	18	18
Prionospio fallax	164	14	33
Abra nitida	84	7	40
Amphiura filiformis	62	5	46
Magelona minuta	57	5	51
Diplocirrus glaucus	44	3	55
Spiophanes kroyeri	44	3	59
Nucula nucleus	37	3	62
Kurtiella bidentata	27	2	65
Tharyx killariensis	25	2	67
Number of taxa 76			

HESC-8			
Prionospio fallax	232	15	15
Phoronis	225	14	30
Amphiura filiformis	153	10	40
Magelona minuta	88	5	45
Abra nitida	74	4	50
Tharyx killariensis	69	4	55
Spiophanes kroyeri	47	3	58
Kurtiella bidentata	43	2	61
Cirripedia	42	2	63
Diplocirrus glaucus	40	2	66
Number of taxa 87			

HESC-9			
Phoronis	345	21	21
Amphiura filiformis	327	20	41
Prionospio fallax	145	8	50
Magelona minuta	100	6	56
Praxillella affinis	55	3	60
Diplocirrus glaucus	45	2	62
Pholoe baltica	42	2	65
Kurtiella bidentata	37	2	67
Nucula nucleus	37	2	69
Spiophanes kroyeri	33	2	72
Number of taxa 87			

HESC-10			
Phoronis	333	20	20
Amphiura filiformis	205	12	33
Prionospio fallax	198	12	45
Kurtiella bidentata	99	6	52
Magelona minuta	75	4	56
Nucula nucleus	59	3	60
Cirripedia	51	3	63
Pholoe baltica	50	3	66
Spiophanes kroyeri	36	2	69
Diplocirrus glaucus	27	1	70
Number of taxa 86			

HESC-11			
Phoronis	570	40	40
Amphiura filiformis	174	12	53
Prionospio fallax	105	7	60
Kurtiella bidentata	79	5	66
Magelona minuta	69	4	71
Pholoe baltica	30	2	73
Nucula nucleus	25	1	74
Thyasira flexuosa	24	1	76
Diplocirrus glaucus	18	1	77
Praxillella affinis	18	1	79
Number of taxa 81			

HESC-12			
Phoronis	521	28	28
Kurtiella bidentata	228	12	40
Amphiura filiformis	216	11	52
Prionospio fallax	150	8	60
Pholoe baltica	95	5	66
Magelona minuta	80	4	70
Tharyx killariensis	54	2	73
Nucula nucleus	50	2	76
Edwardsia	42	2	78
Amphictene auricoma	32	1	80
Number of taxa 88			

HESC-13			
Pisione remota	392	41	41
Protodorvillea kefersteini	136	14	55
Tharyx killariensis	79	8	64
Echinocyamus pusillus	48	5	69
Cirripedia	37	3	73
Scoloplos armiger	29	3	76
Dipolydora	26	2	78
Mediomastus fragilis	23	2	81
Astarte montagui	22	2	83
Edwardsia	16	1	85
Number of taxa 44			

HESC-14			
Scoloplos armiger	272	46	46
Chaetozone setosa kompleks	81	13	60
Tharyx killariensis	77	13	73
Cirripedia	46	7	81
Protodorvillea kefersteini	17	2	84
Parajassa pelagica	17	2	87
Mediomastus fragilis	13	2	89
Eteone	13	2	91
Polynoidae juv.	7	1	92
Dipolydora	6	1	94
Number of taxa 32			

5.4.2.2 Multivariate analyses

Cluster diagram and MDS plot resulting from similarity analyses of species composition at the different stations are shown in Figure 5-16. The analyses show that stations can be grouped into three main groups at 40 % similarity (group A, B and C). A general description and main reason for groupings are given in Table 4 7. Group A is comprised of stations situated at depths between 21-24 meter and with sediments consisting of little clay and silt. Group B is comprised of stations at depths of 24-30 meters and with relatively high content of silt and clay. Group C consists of shallower stations close to shore with little clay and silt. As can be seen in the MDS plot the grouping of stations between groups, but also within groups is according to depth interval samples are located.

BIOENV analysis show best correlation (0.86) between the observed similarities and a combination of the environmental variables depth, total organic carbon (TOC) and median grain size (D50).

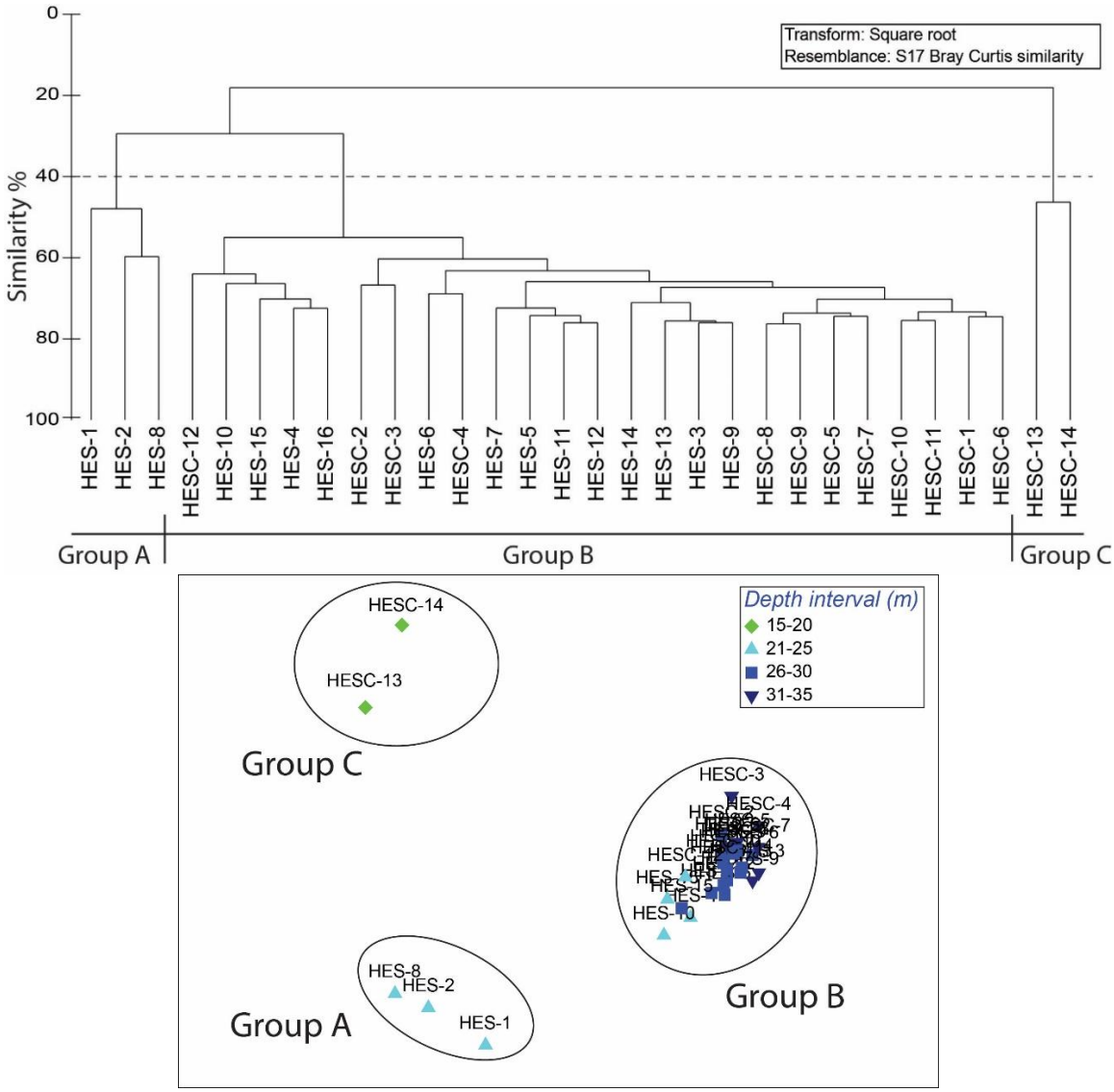

Figure 5-16 *Cluster diagram (top) and MDS plot (bottom) resulting from similarity analyses of species composition of infauna in sediment samples from the planned Hesselø OWF area and Hesselø ECC.*

Table 5-9 *Table showing main reason for grouping of stations according to infauna species similarities.*

Group	Stations	General description	Main reason for grouping
A	HES-1, HES-2, HES-8	Stations at intermediate depths with sandy sediments	Dominated by the irregular sea urchin *Echinocyamus pusillus, Urothoe elegans, Leptocheirus pilosus, Edwardsia.*
B	Remaining stations from the planned Hesselø OWF area and ECC	Deepest stations with highest content of silt and clay in sediments.	Dominated by horseshoe worm *Phoronis, brittle star Amphiura filiformis,* bristle worm *Prionospio fallax* and the mussel *kurtiella bidentata.*
C	HESC-13, HESC-14	Shallow stations with coarser sediments	Relatively species poor. Dominated by the bristle worms *Tharyx killariensis, Scoloplos armiger* and barnacles - *Cirripedia*

Sampling effort in the current study is relatively high compared to earlier studies in the area, mainly because of equipment used (Van Veen grab instead of HAPS corer), but also because of replicate samples at each environmental station. A species accumulation plot is given in Figure 5-17. The figure indicates that the species richness in the area is relatively well-captured with the chosen sampling regime (the saturation curve flattens out with increased sampling effort).

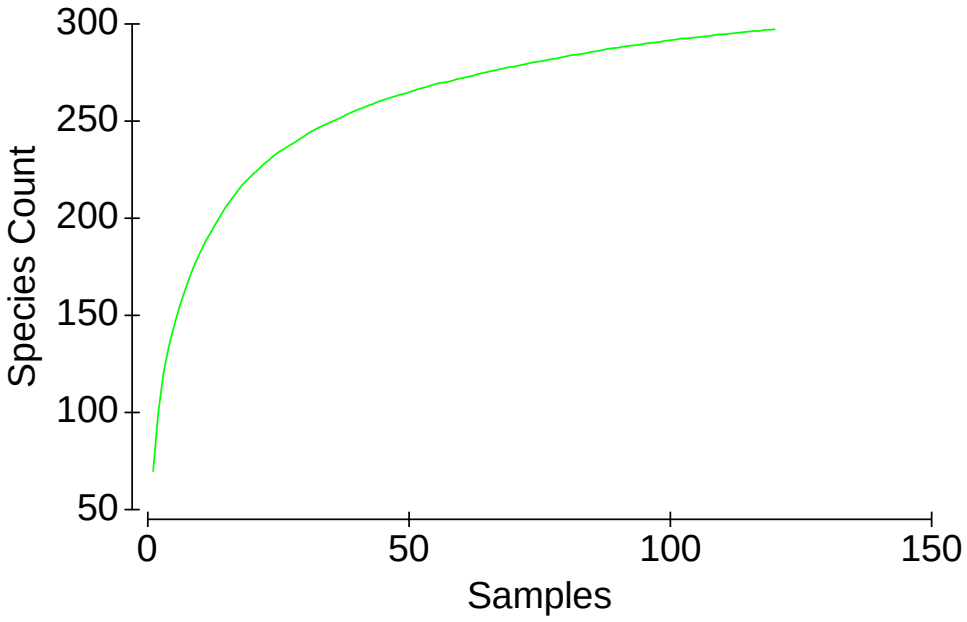

Figure 5-17 *Species accumulation plot showing number of species in relation to sampling effort, - grab samples (each grab sampling 0.1 m^2 surface area) at the planned Hesselø OWF area and Hesselø ECC combined.*

5.4.2.3 Infauna and modelled substrate type

WSP has modelled substrate types on Hesselø according to the Danish classification system. Infauna communities identified in grab samples are shown in Table 5-10. There were no clear groupings of infauna communities relating to substrate types as shown in the multivariate similarity analyses described in previous section.

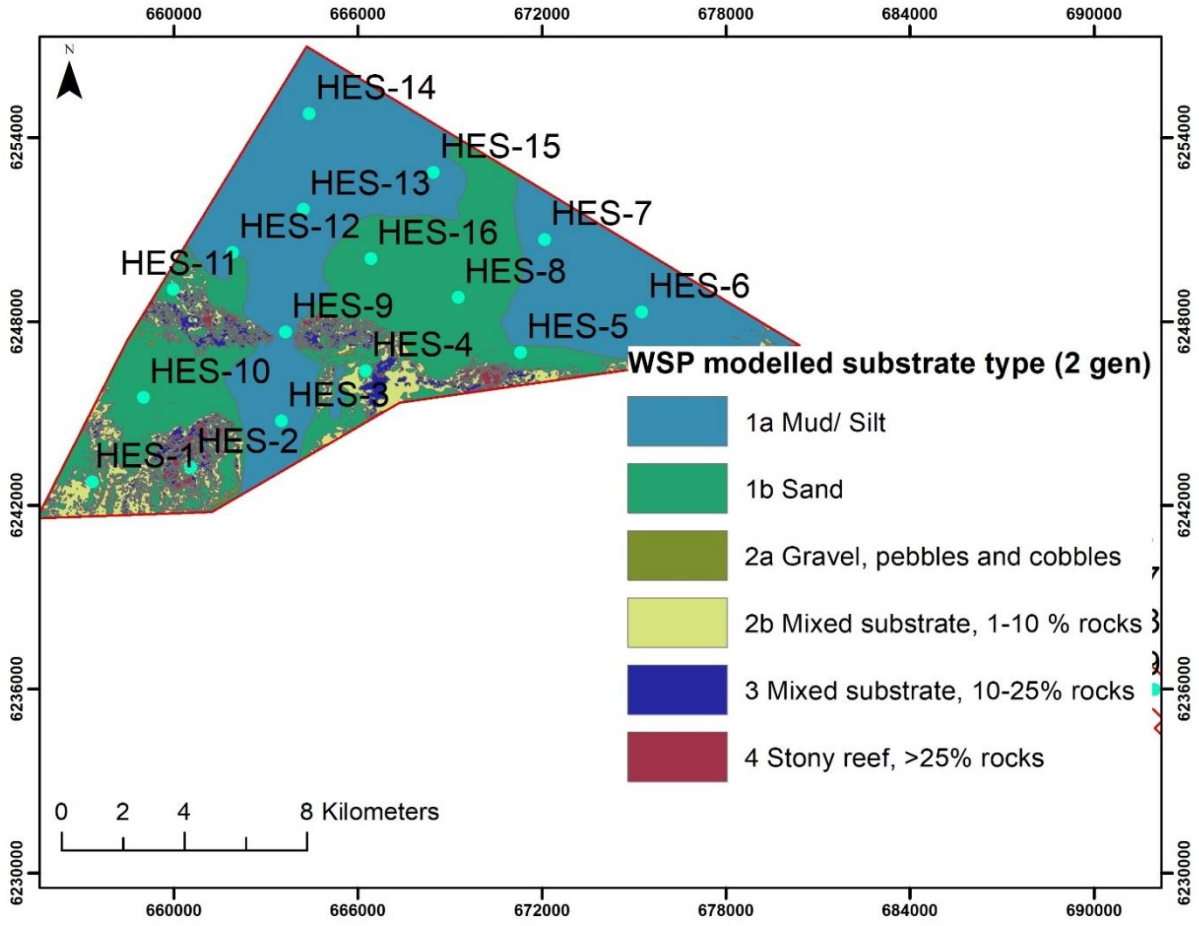

Figure 5-18 *Modelled substrate types at Hesselø (WSP, 2024).*

Table 5-10 ***I****nfauna communities dominating in modelled substrate types****.***

Substrate type	Fauna
1a Mud/silt	*Amphiura filiformis, phoronis, Kurtiella bidentata, Prionospio fallax, Nucula nucleus*
1b Sand	*Amphiura filiformis, phoronis, Kurtiella bidentata, pholoe baltica, Thyasira flexuosa*
2a Gravel, pebbles and cobbles	*Phoronis, Spio sp. Echinocyamus pusillus,*
2b Mixed substrate, 1-10% rocks	*Leptocheirus pilosus, Urothoe elegans, Echinocyamus pusilus*

5.4.2.4 Biomass registrations

Summary of biomass measurements at the planned Hesselø OWF and ECC is given in Table 5-11 and Table 5-12. A map showing biomass registrations in relation to taxonomical group is shown in Figure 5-19. Mollusca contributed most to the biomass in most stations, particularly due to occurrences of ocean quahog – *Arctica islandica*, but echinoderms also ranked high in total biomass in several stations, particularly due to the irregular sea urchin *Echinocardium cordatum* and the brittle star *Amphiura filiformis*. Phoronids that were also commonly dominating the fauna occurrences numerically were also among the top five species contributing to the overall biomass. See Figure 5-20 for overview of contribution to biomass at different stations from six species contributing most to the biomass.

Table 5-11 *Table summarising biomass measurements at each station at Hesselø OWF (wet weight (g) per m2) for different taxonomical groups*

Group	Varia	Polychaeta	Mollusca	Echinodermata	Crustacea	Total biomass
HES-1	18,45	7,09	155,96	156,34	0,26	338,10
HES-2	4,01	14,74	292,01	34,93	0,84	346,53
HES-3	3,59	9,78	34,81	139,98	0,29	188,44
HES-4	19,40	9,38	19,71	106,43	0,26	155,17
HES-5	29,67	17,02	20,35	177,70	0,72	245,46
HES-6	5,87	14,04	11,72	63,82	0,41	95,87
HES-7	10,96	22,56	14,06	101,10	0,26	148,94
HES-8	1,83	2,43	705,70	61,84	0,47	772,27
HES-9	6,75	36,97	374,15	46,46	2,25	466,59
HES-10	38,50	5,59	109,53	137,37	0,10	291,09
HES-11	26,10	8,28	308,89	121,77	0,18	465,22
HES-12	18,90	13,15	162,52	135,69	0,16	330,41
HES-13	5,31	14,91	892,65	101,35	0,25	1014,47
HES-14	10,76	15,62	749,97	32,06	6,74	815,15
HES-15	40,47	16,76	145,59	67,73	0,44	270,99
HES-16	17,79	7,21	33,00	59,84	0,51	118,36

Table 5-12 *Table summarising biomass measurements at each station at Hesselø ECC (wet weight g per m2) for different taxonomical groups*

Group	Varia	Polychaeta	Mollusca	Echinodermata	Crustacea	Total biomass
HESC-1	14,39	15,56	6,23	28,66	2,46	67,29
HESC-2	6,80	33,15	25,81	91,62	0,34	157,71
HESC-3	1,31	42,54	212,40	132,54	0,26	389,05
HESC-4	6,04	19,09	5,94	67,63	1,73	100,44
HESC-5	7,23	12,27	166,33	73,75	0,21	259,79
HESC-6	13,89	47,96	6,58	49,86	0,30	118,59
HESC-7	8,72	38,52	25,09	17,50	0,25	90,09
HESC-8	9,18	8,08	525,50	46,53	2,90	592,20
HESC-9	12,51	11,87	7,70	90,60	0,53	123,22
HESC-10	7,60	13,64	128,74	66,41	0,29	216,68
HESC-11	22,70	9,44	258,79	101,06	0,11	392,09
HESC-12	21,55	7,42	247,54	85,48	0,28	362,27
HESC-13	0,42	3,36	8,07	1,17	1,59	14,61
HESC-14	0,02	8,19	3,76	0,15	0,04	12,16

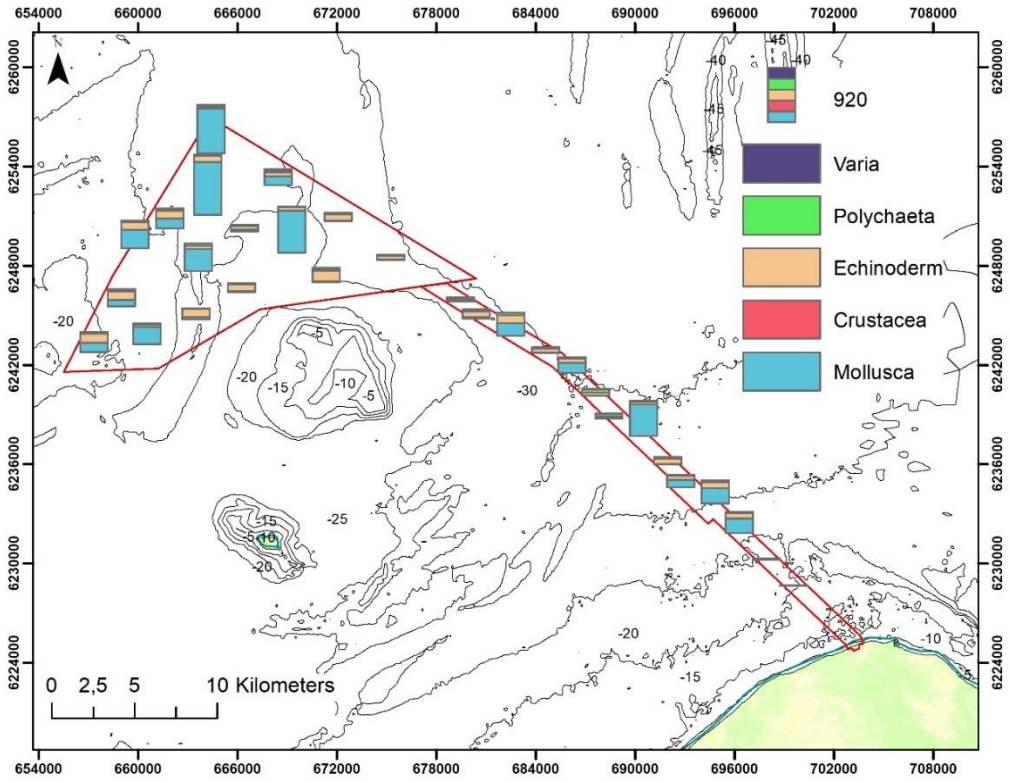

Figure 5-19 *Map showing biomass registrations at Hesselø OWF and ECC. Histogram shows relative contribution to the total biomass from different taxonomical groups.*

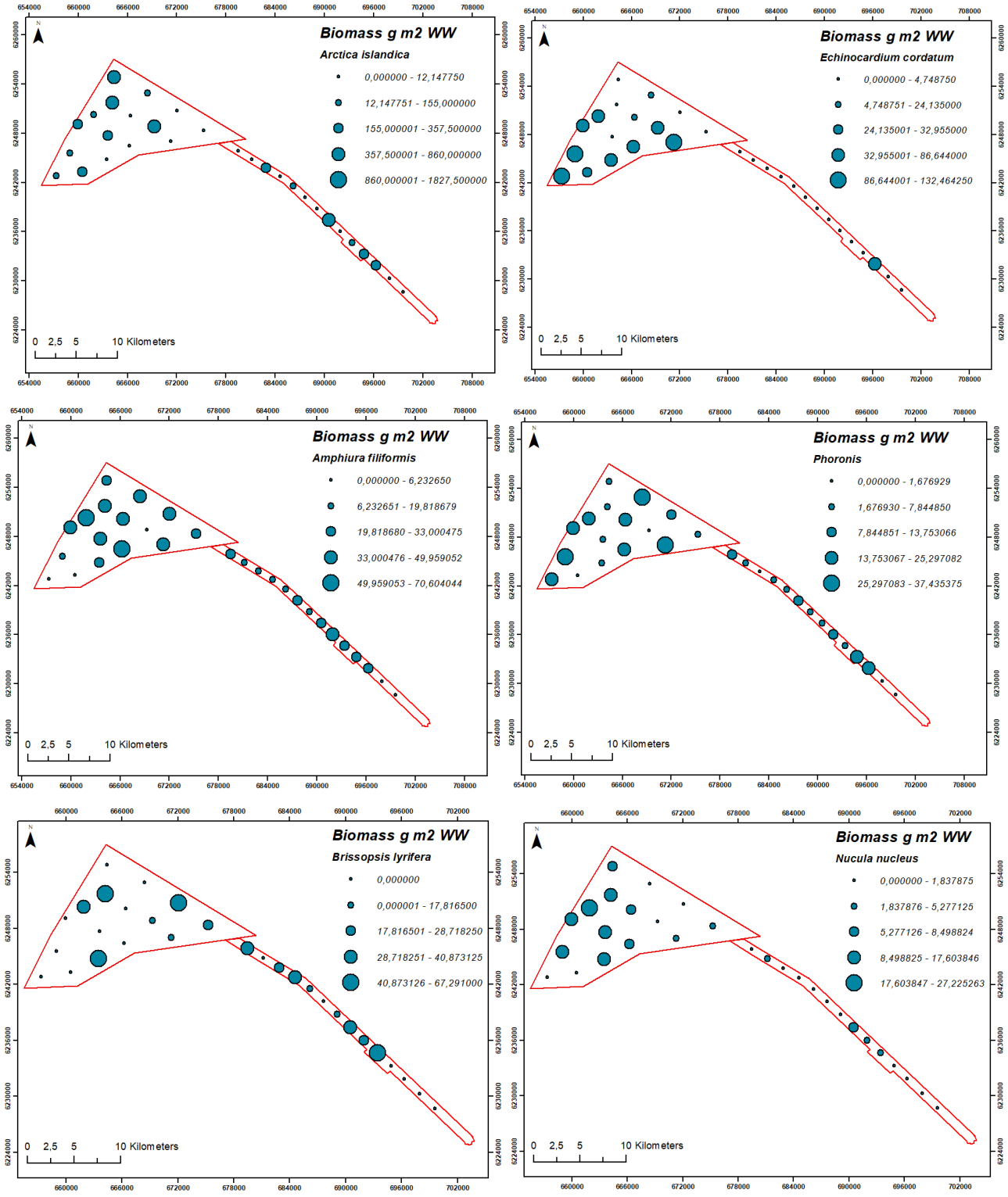

Figure 5-20 *Map showing biomass measurements of six species contributing most to the biomass at Hesselø OWF and ECC.*

6 CONCLUSIONS FROM SURVEY IN 2024

The survey area includes the planned Hesselø OWF area at depths of 20-30 meters located approximately 30 km off the north coast of Zealand and the 34 km long ECC making landfall near Gilleleje. The fieldwork was carried out in April 2024 and involved sediment sampling, visual mapping with ROVs, and hydrography measurements. An additional nearshore sampling was performed in June 2024.

Analyses of the sediment samples from the planned Hesselø OWF area were characterized by a mixture of sand, silt, and clay, with some stations containing shell fragments and hydrogen sulphide odour. CTD profiles showed a halocline at around 10 meters depth, with salinity ranging from 14-16 PSU in the upper layers to 33-34 PSU at the bottom. Oxygen concentrations were classified as 'Good'. Results from the chemical analysis of sediment samples showed most parameters within threshold values, with some exceedances of NEQS thresholds for arsenic and chromium at certain stations.

A total of 32 stations were sampled for infauna analyses, with a total of 37 132 individuals distributed among 276 different taxa were recorded (juveniles excluded). The benthic infauna was dominated by polychaetes, with the highest diversity recorded at deeper stations. The fauna composition indicates healthy communities characterized with high biodiversity, with a mix of filter feeders, suspension feeders, and carnivores.

Visual mapping was also performed with ROV surveys covered 15.5 km of seabed, identifying 92 species of benthic megafauna and macroalgae. Sea pen communities were found at densities that may qualify as OSPAR habitats. The invasive Round goby (*Neogobius melanostomus*) was not seen in any of the visual transects but was registered in the area for the planned Kattegat OWF that was surveyed on the same cruise.

WSP has modelled substrate types on Hesselø according to the Danish classification system. Identified infauna communities registered are mud/silt, sand, gravel/pebbles/cobbles and mixed substrate with 1-10% rocky bottom.

The biomass measurements from samples retrieved at the planned Hesselø OWF and ECC areas. Mollusca contributed most to the biomass in most stations, but echinoderms also ranked high in total biomass in several stations. Phoronids that were also commonly dominating the fauna occurrences were also among the top five species contributing to the overall biomass.

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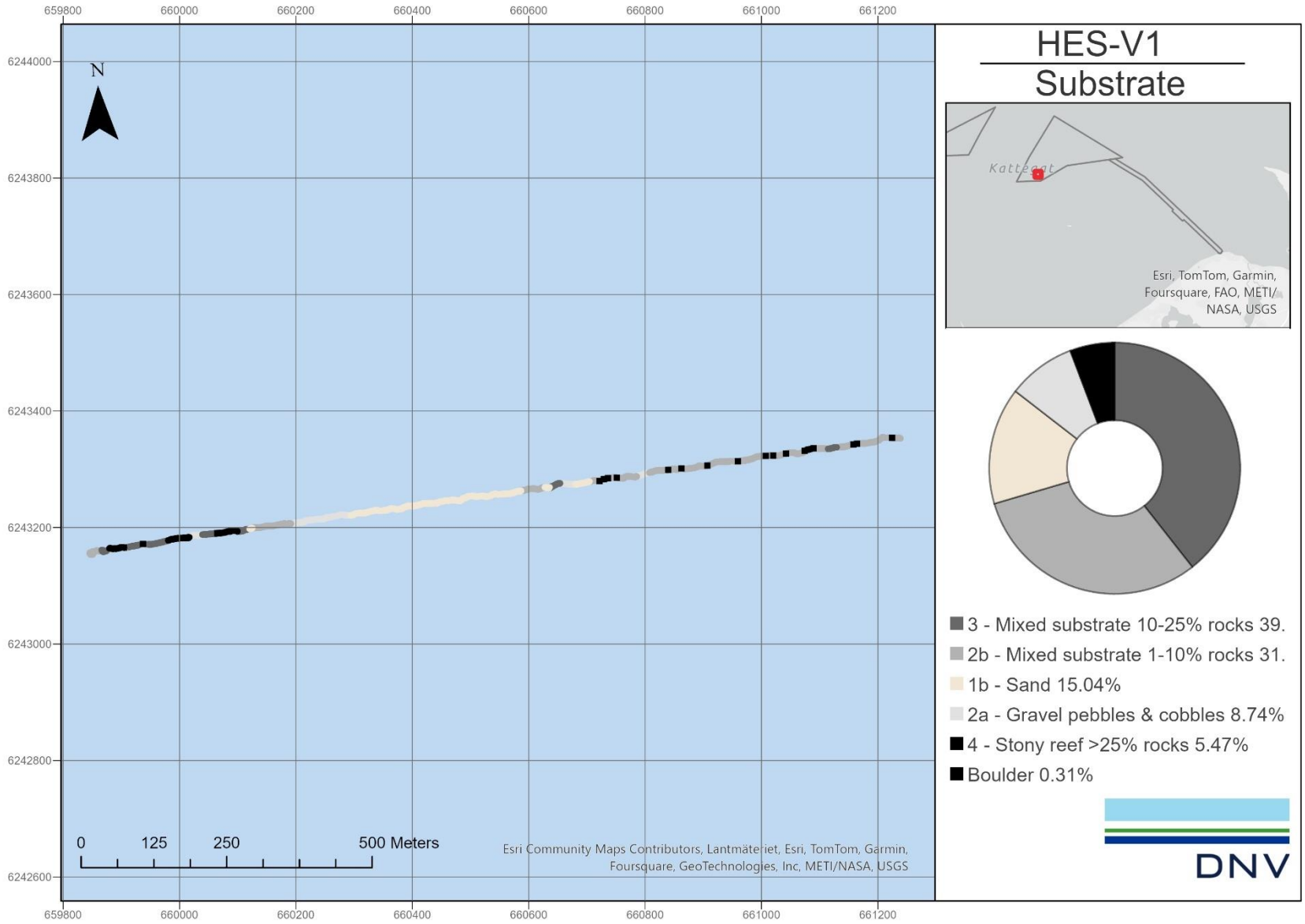
APPENDIX 1 STATION LOG, SEDIMENT SAMPLING

ETRS 89 UTM 32N																										
*Shallow water stations			#														Chemistry		Bio (cm)							
	East	North	st.	CTD	Bio	Grain	TOC	Metal	PAH	Phtalates	Phenols	Depth	Date	Start	Stop	Time	Blend sample	#1	#2	#3	#4	GrabbID	Misses	Description	Comments
Hesselø																										
HES-1	657343	6242780	1		4	1	1	1	1	1	1	21	08.apr	02:41	03:34	00:53	x	9	8	7	7	B25	2	Olive brown sand	
HES-2	660544	6243257	1	1	4	1	1					22	08.apr	04:01	04:29	00:28	x	8	6	4	5	B25	3	Olive brown sand w shells	
HES-3	663510	6244767	1		4	1	1	1	1	1	1	31	09.apr	00:11	00:40	00:29	x	8	7	15	14	B25	0	Brown top grey soft clay	Shells
HES-4	666249	6246405	1		4	1	1					25	08.apr	23:32	23:51	00:19	x	10	7	9	5	B25	0	Grey brown silt/ sand	
HES-5	671301	6246996	1		4	1	1	1	1	1	1	28	08.apr	22:45	23:09	00:24	x	8	10	10	10	B25	0	Grey brown silty clay	
HES-6	675264	6248327	1	1	4	1	1					30	10.apr	05:27	06:00	00:33	x	15	15	15	18	B25	0	Brown top grey sandy clay	
HES-7	672088	6250686	1		4	1	1	1	1	1	1	28	10.apr	06:26	06:50	00:24	x	12	12	12	12	B25	0	Greybrown silty clay	Shells
HES-8	669272	6248795	1		4	1	1					24	10.apr	07:21	07:37	00:16	x	8	7	9	6	B25	0	Brown coarse sand	
HES-9	663638	6247672	1		4	1	1	1	1	1	1	36	09.apr	01:01	01:32	00:31	x	17	15	15	14	B25	0	Brown top, grey silty soft clay	
HES-10	659005	6245538	1		4	1	1					22	08.apr	04:56	05:15	00:19	x	5	8	7	7	B25	0	Olive brown sand	
HES-11	659984	6249067	1		4	1	1	1	1	1	1	25	09.apr	01:59	02:24	00:25	x	9	9	7	5	B25	0	Brown top, grey silty sand	
HES-12	661915	6250261	1		4	1	1					26	09.apr	02:42	03:05	00:23	x	17	7	11	11	B25	0	Brown top, grey silty clay	
HES-13	664215	6251675	1	1	4	1	1	1	1	1	1	29	09.apr	03:23	04:02	00:39	x	8	11	10	12	B25	0	Brown top, grey silty clay	
HES-14	664409	6254796	1		4	1	1					29	09.apr	04:24	04:50	00:26	x	12	15	11	10	B25	0	Brown top , grey silty clay	
HES-15	668463	6252874	1		4	1	1	1	1	1	1	27	09.apr	05:16	05:37	00:21	x	8	8	8	5	B25	0	Brown top , grey sandy clay	
HES-16	666426	6250069	1		4	1	1					21	10.apr	07:59	08:17	00:18	x	7	7	9	7	B25	0	Grey brown sandy clay	
			16	**3**	**64**	**16**	**16**	**8**	**8**	**8**	**8**															
Hesselø ECC																										
HESC-1	679479	6245847	1		4	1	1	1	1	1	1	29	10.apr	04:33	04:59	00:26	x	12	13	14	14	B25	0	Brown top sandy clay	Sea pen
HESC-2	681187	6244808	1		4	1	1					30	10.apr	03:16	04:12	00:56	x	6	14	10	14	B25	7	Brown sand/ gravel	Pebbles and shells
HESC-3	682896	6243769	1		4	1	1	1	1	1	1	31	10.apr	02:15	02:48	00:33	x	8	6	6	5	B25	0	Brown top grey sand silt clay	shells
HESC-4	684605	6242729	1	1	4	1	1					32	10.apr	01:18	01:48	00:30	x	13	15	15	14	B25	0	Brown top grey silty clay	
HESC-5	686186	6241525	1		4	1	1	1	1	1	1	31	10.apr	00:39	01:01	00:22	x	16	11	13	13	B25	0	Brown top grey silty clay	
HESC-6	687631	6240141	1		4	1	1					31	09.apr	23:59	00:24	00:25	x	12	14	14	11	B25	0	Grey brown silty clay	
HESC-7	689075	6238758	1		4	1	1	1	1	1	1	31	09.apr	23:17	23:41	00:24	x	14	15	16	13	B25	0	Grey brown silty clay	
HESC-8	690520	6237375	1	1	4	1	1					30	09.apr	22:34	23:03	00:29	x	12	14	15	17	B25	0	Grey brown silty clay	
HESC-9	691964	6235991	1		4	1	1	1	1	1	1	29	09.apr	21:46	22:11	00:25	x	13	11	11	11	B25	0	Grey brown silty clay	Shells
HESC-10	693409	6234608	1		4	1	1					28	09.apr	21:02	21:24	00:22	x	10	9	7	10	B25	1	Grey brown silty clay	Shells
HESC-11	694853	6233225	1		4	1	1	1	1	1	1	26	09.apr	20:22	20:49	00:27	x	12	11	12	12	B25	0	Grey brown silty clay	Shells
HESC-12	696297	6231841	1		4	1	1					24	09.apr	19:53	20:09	00:16	x	6	7	7	8	B25	0	Grey brown silt/sand	
HESC-13	697954	6230252	1		4	1	1	1	1	1	1	20	09.apr	19:12	19:33	00:21	x	6	7	5	5	B25	0	Brown sandy gravel	
HESC-14	699578	6228655	1	1	4	1	1					18	09.apr	18:30	18:45	00:15	x	7	8	7	6	B25	0	Brown coarse sand	
HESC-15*	701241	6227095	1			1	1	1	1	1	1	11	09.apr	17:45	18:00	00:15	x	5	7			B25	0	Brown sand rocks	
HESC-16*	702481	6226046	1			1	1	1	1	1	1	11	18.jun	13:50	14:15	00:25	x					Mini		Gravel and sand	WSP
			16	**3**	**56**	**16**	**16**	**9**	**9**	**9**	**9**															
Sum analyses																										
			32	**6**	**120**	**32**	**32**	**17**	**17**	**17**	**17**															

APPENDIX 2 MAPS OF SUBSTRATE REGISTRATIONS IN VISUAL SURVEY TRANSECTSSUBSTRATE REGISTRATIONS IN VISUAL SURVEY TRANSECTS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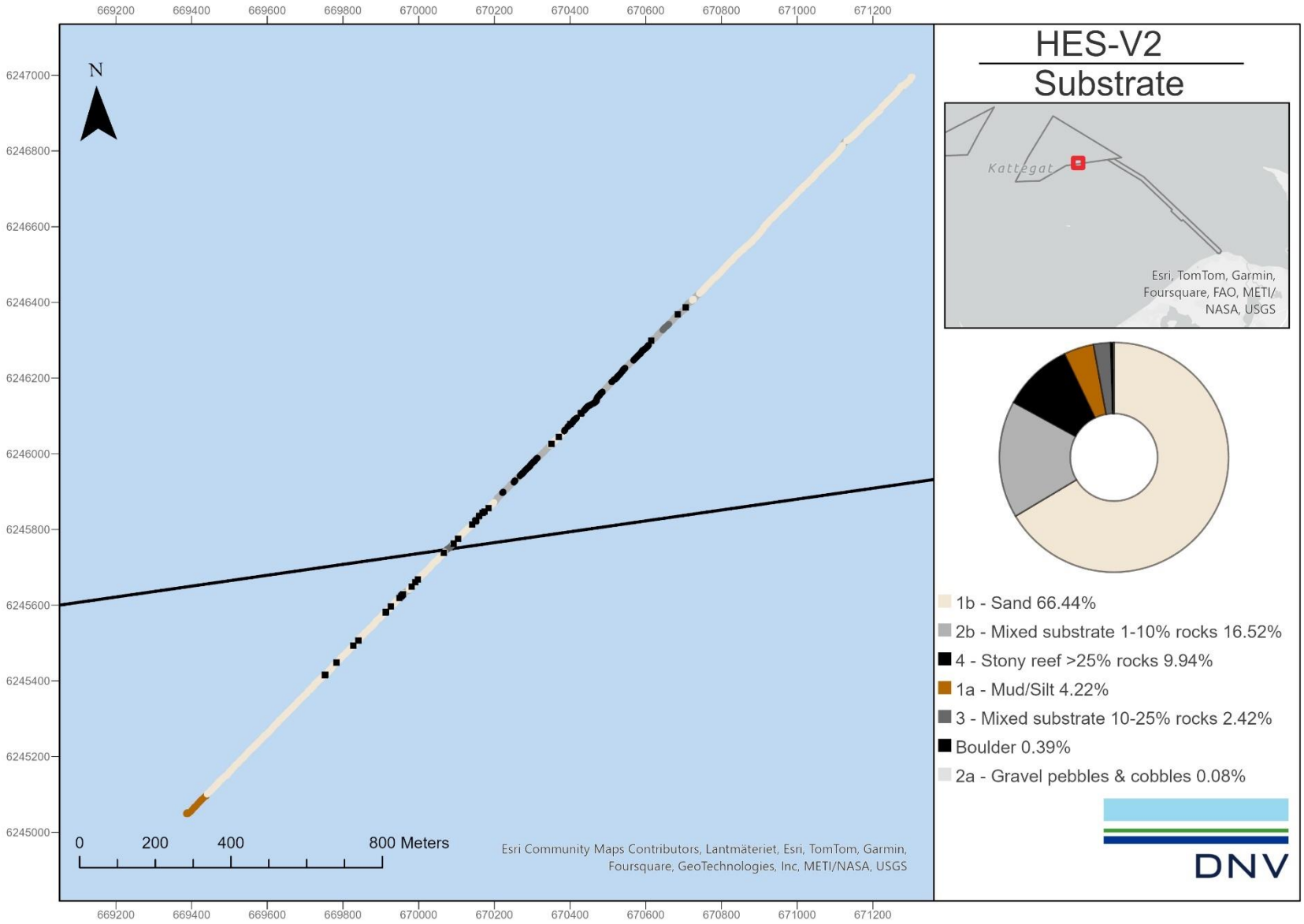
660400
660600
660800
661000
661200
6244000
6243800
6243600
6243400
6243200
6243000
6242800
6242600
N
0
125
250
500 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V1
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
3 - Mixed substrate 10-25% rocks 39.
2b - Mixed substrate 1-10% rocks 31.
1b - Sand 15.04%
2a - Gravel pebbles & cobbles 8.74%
4 - Stony reef >25% rocks 5.47%
Boulder 0.31%
DNV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669600
669800
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670200
670400
670600
670800
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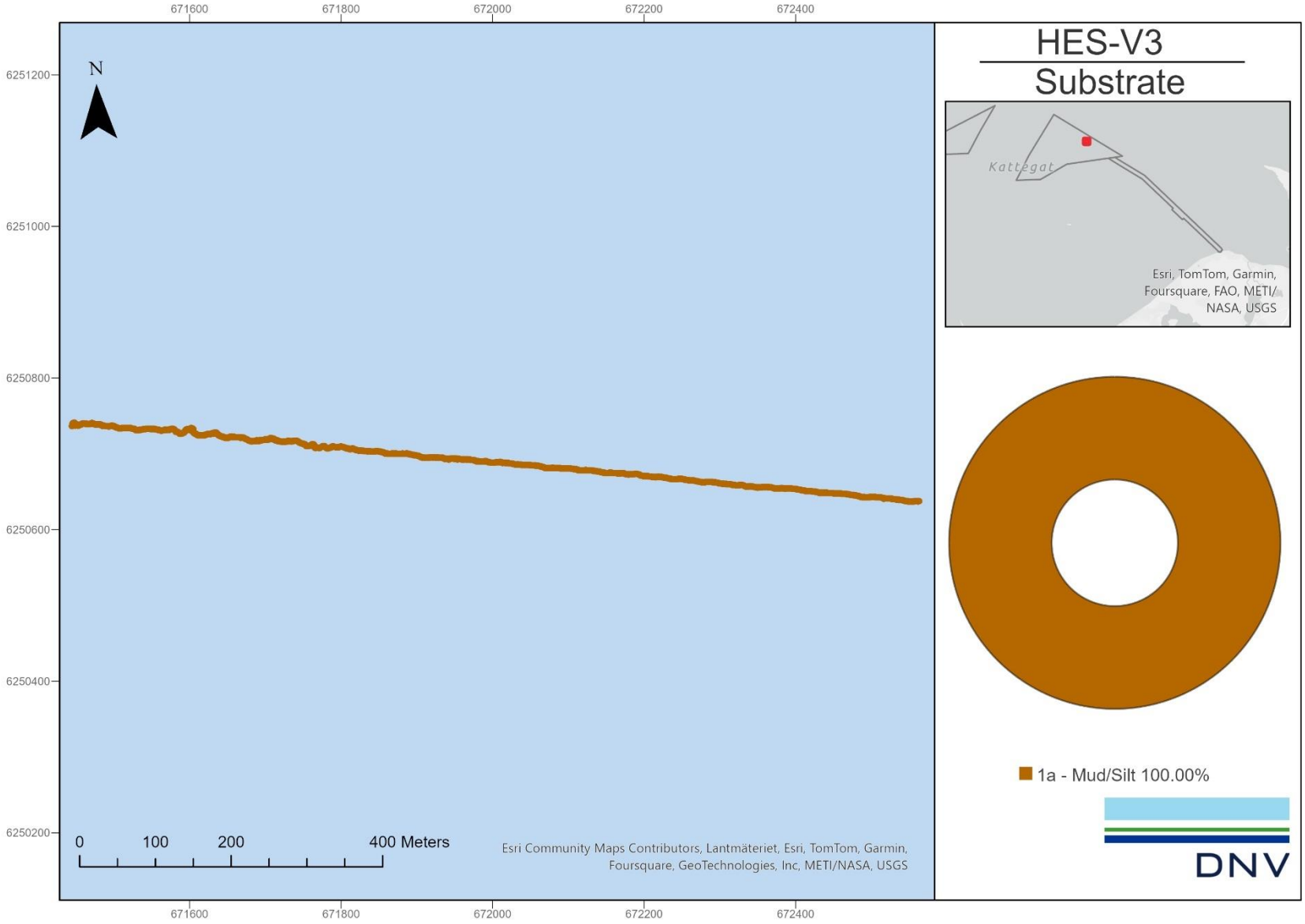
671200
6247000
6246800
6246600
6246400
6246200
6246000
6245800
6245600
6245400
6245200
6245000
N
0
200
400
800 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V2
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1b - Sand 66.44%
2b - Mixed substrate 1-10% rocks 16.52%
4 - Stony reef >25% rocks 9.94%
1a - Mud/Silt 4.22%
3 - Mixed substrate 10-25% rocks 2.42%
Boulder 0.39%
2a - Gravel pebbles & cobbles 0.08%
DNV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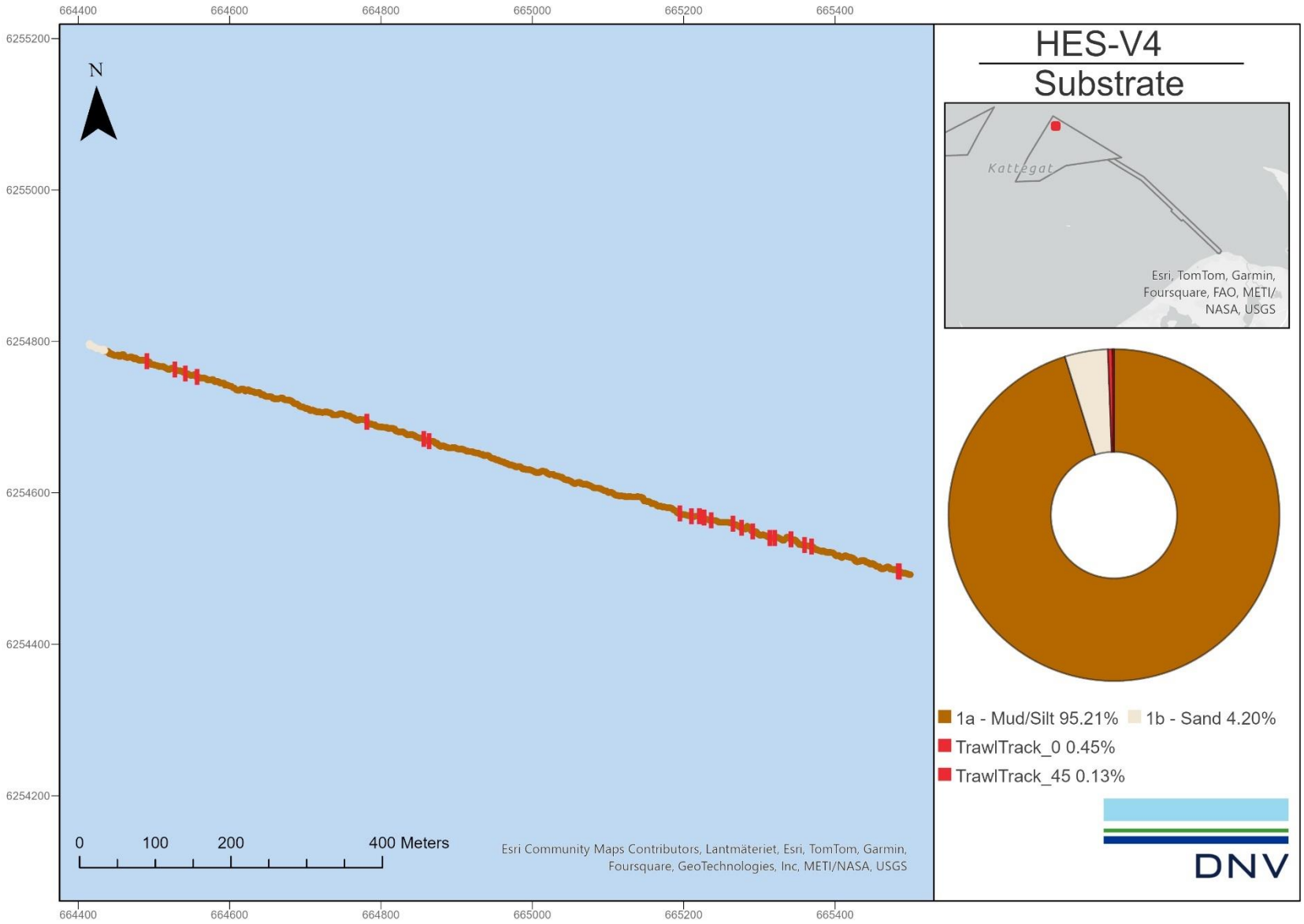
671800
672000
672200
672400
6251200
6251000
6250800
6250600
6250400
6250200
N
0
100
200
400 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V3
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 100.00%
DNV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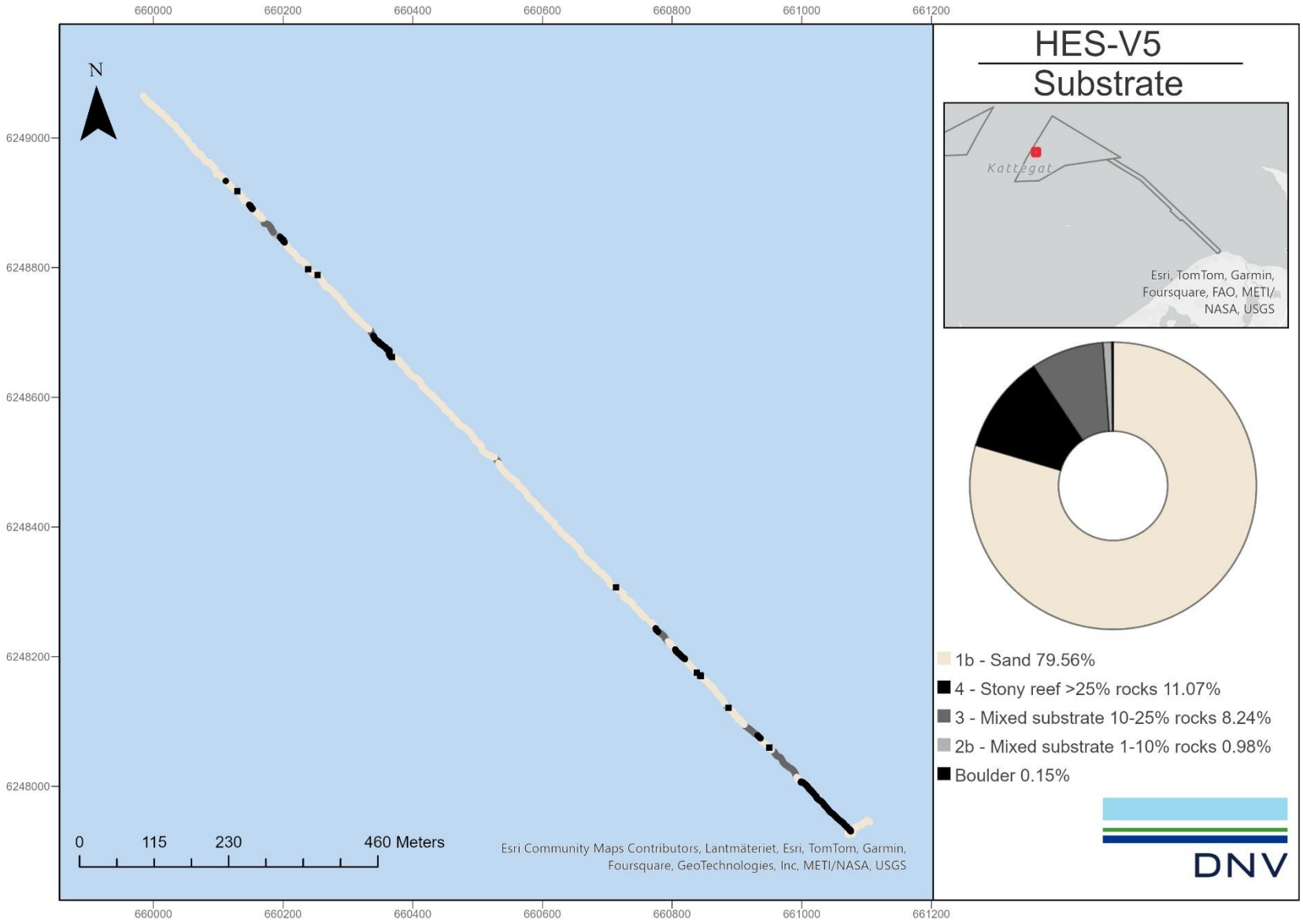
664600
664800
665000
665200
665400
6255200
6255000
6254800
6254600
6254400
6254200
N
0
100
200
400 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V4
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 95.21%
1b - Sand 4.20%
TrawlTrack_0 0.45%
TrawlTrack_45 0.13%
DNV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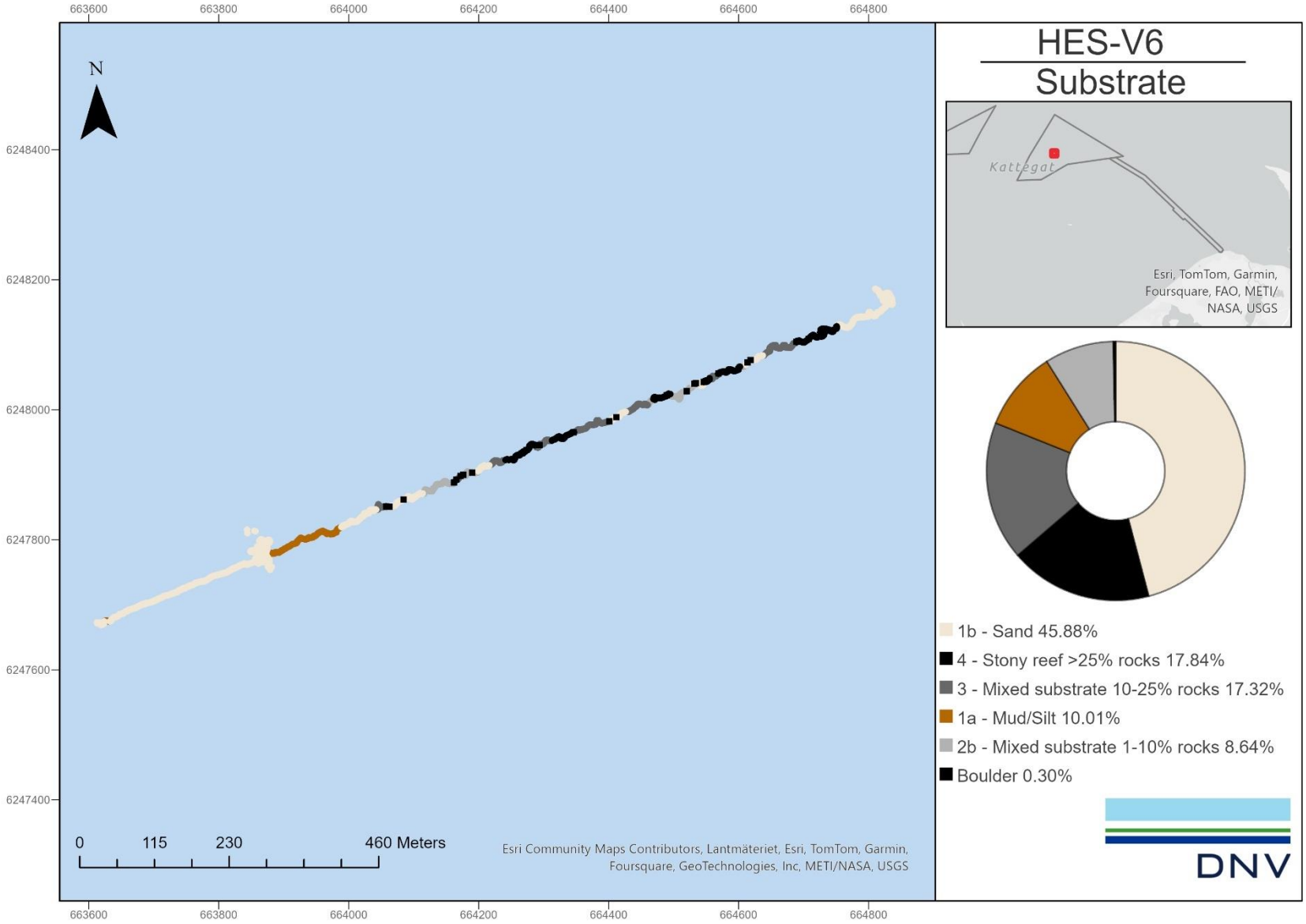
660200
660400
660600
660800
661000
661200
6249000
6248800
6248600
6248400
6248200
6248000
N
0
115
230
460 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V5
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1b - Sand 79.56%
4 - Stony reef >25% rocks 11.07%
3 - Mixed substrate 10-25% rocks 8.24%
2b - Mixed substrate 1-10% rocks 0.98%
Boulder 0.15%
DNV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664800
N
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6248200
6248000
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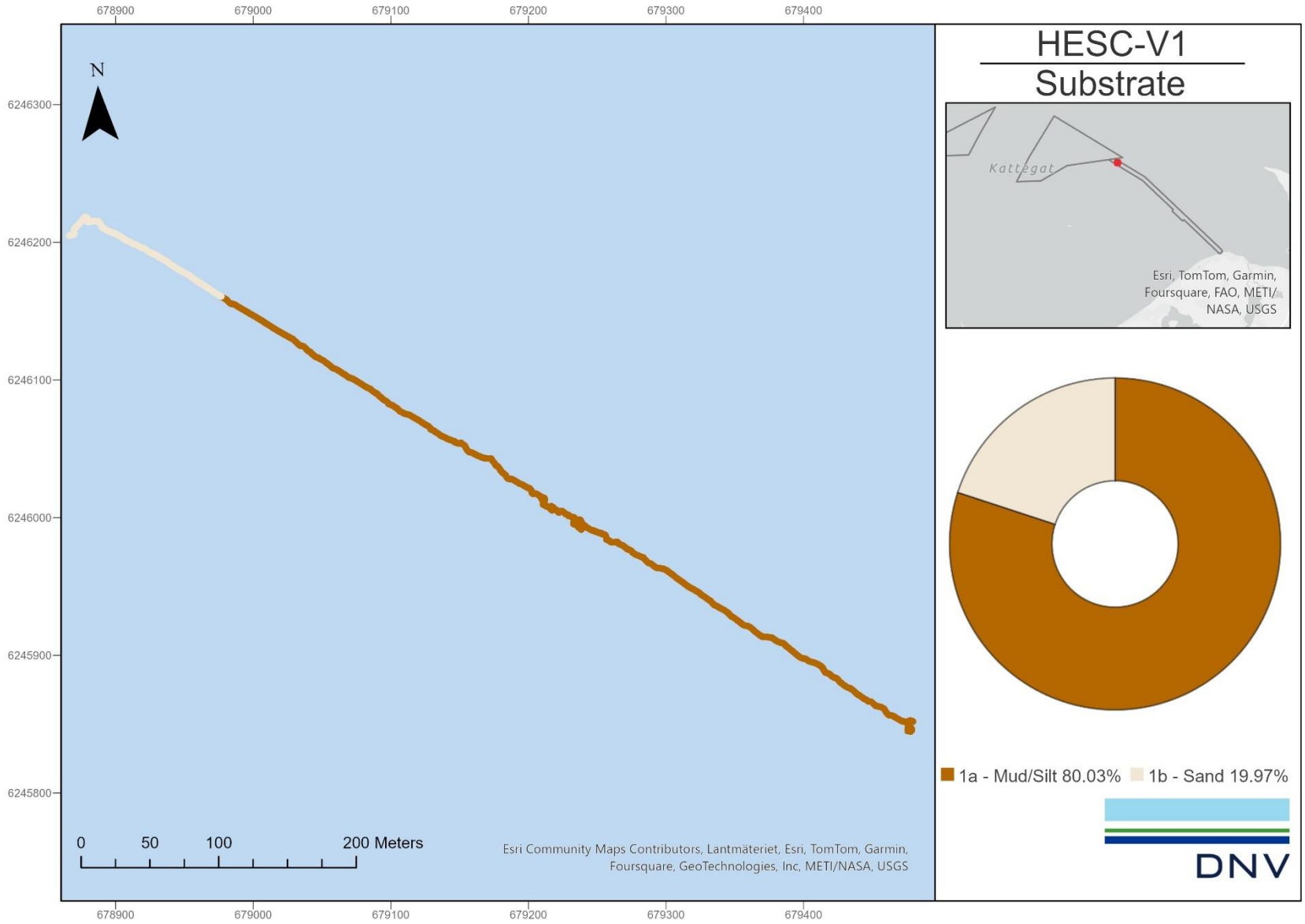
6247600
6247400
0
115
230
460 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V6
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1b - Sand 45.88%
4 - Stony reef >25% rocks 17.84%
3 - Mixed substrate 10-25% rocks 17.32%
1a - Mud/Silt 10.01%
2b - Mixed substrate 1-10% rocks 8.64%
Boulder 0.30%
DNV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679100
679200
679300
679400
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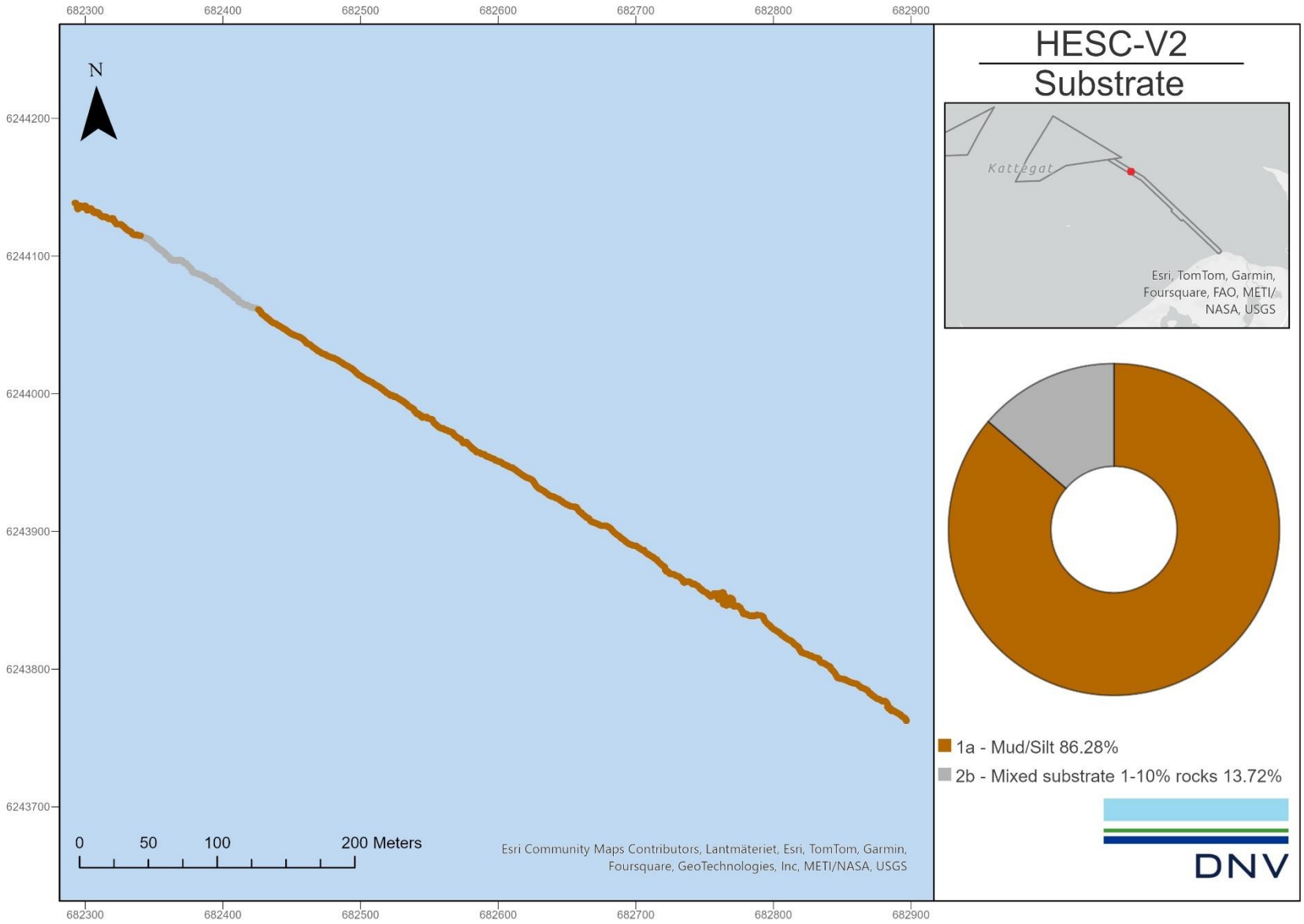
6246300
6246200
6246100
6246000
6245900
6245800
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V1
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 80.03%
1b - Sand 19.97%
DNV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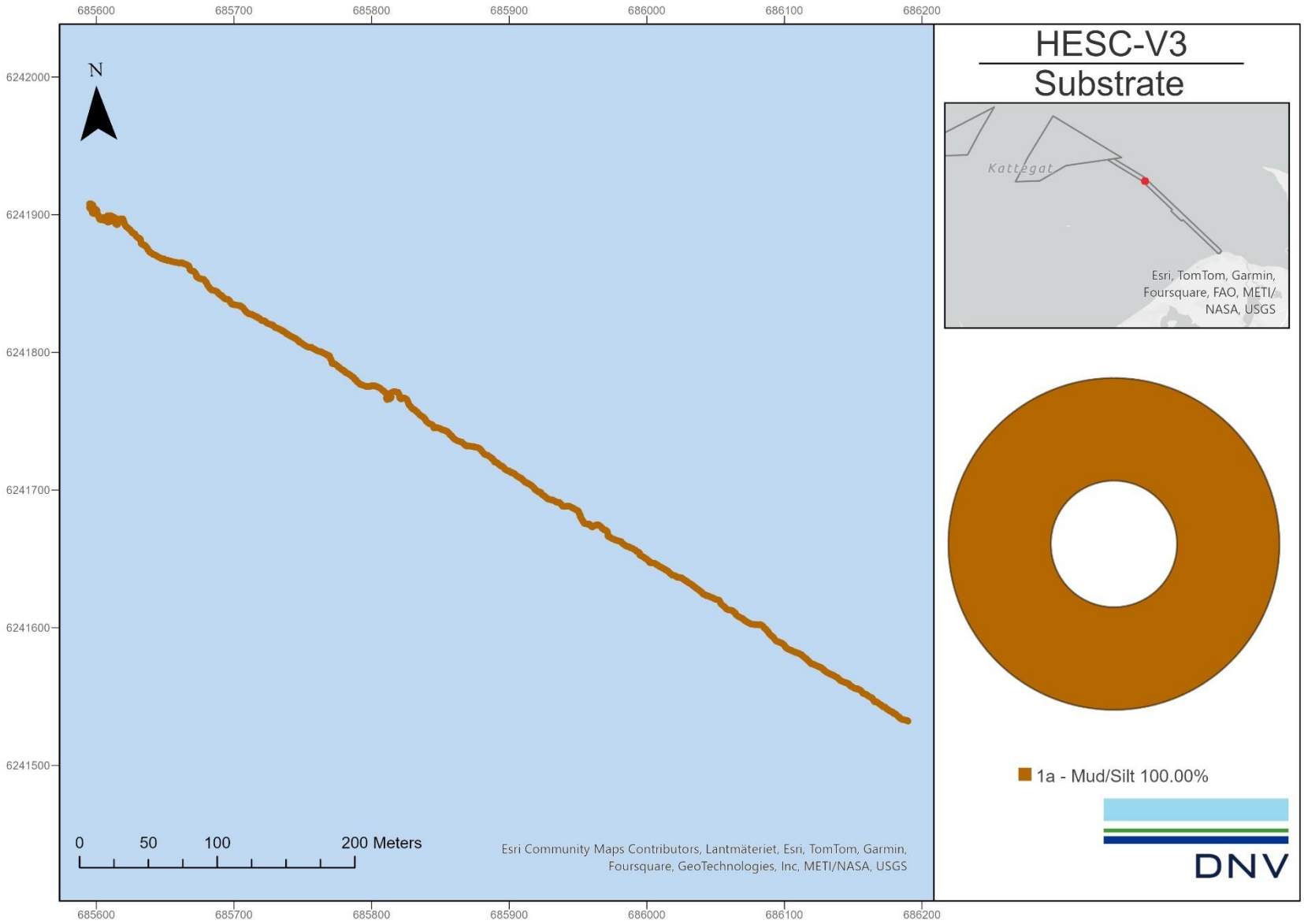
682400
682500
682600
682700
682800
682900
N
6244200
6244100
6244000
6243900
6243800
6243700
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V2
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 86.28%
2b - Mixed substrate 1-10% rocks 13.72%
DNV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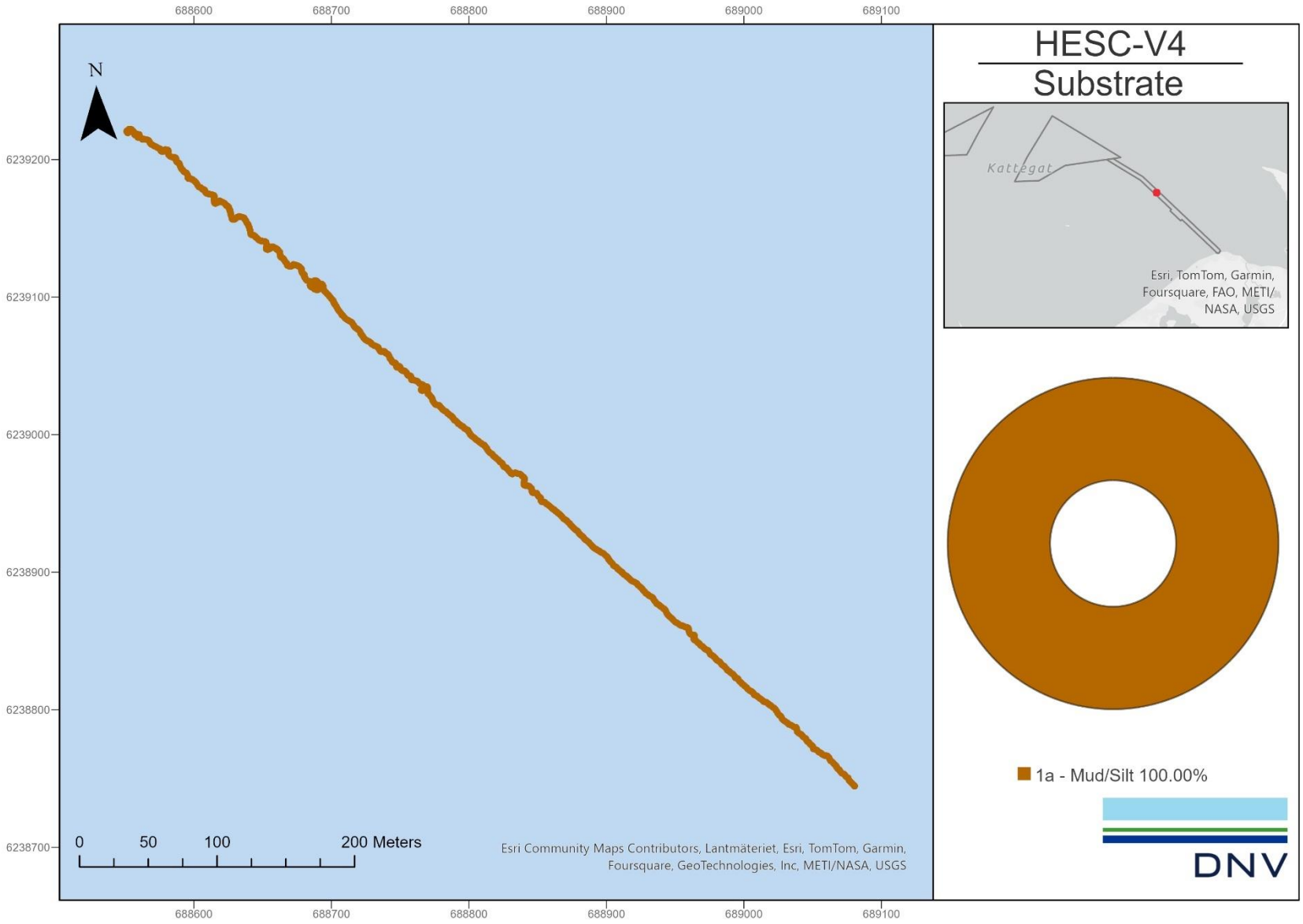
685800
685900
686000
686100
686200
6242000
6241900
6241800
6241700
6241600
6241500
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V3
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 100.00%
DNV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688900
689000
689100
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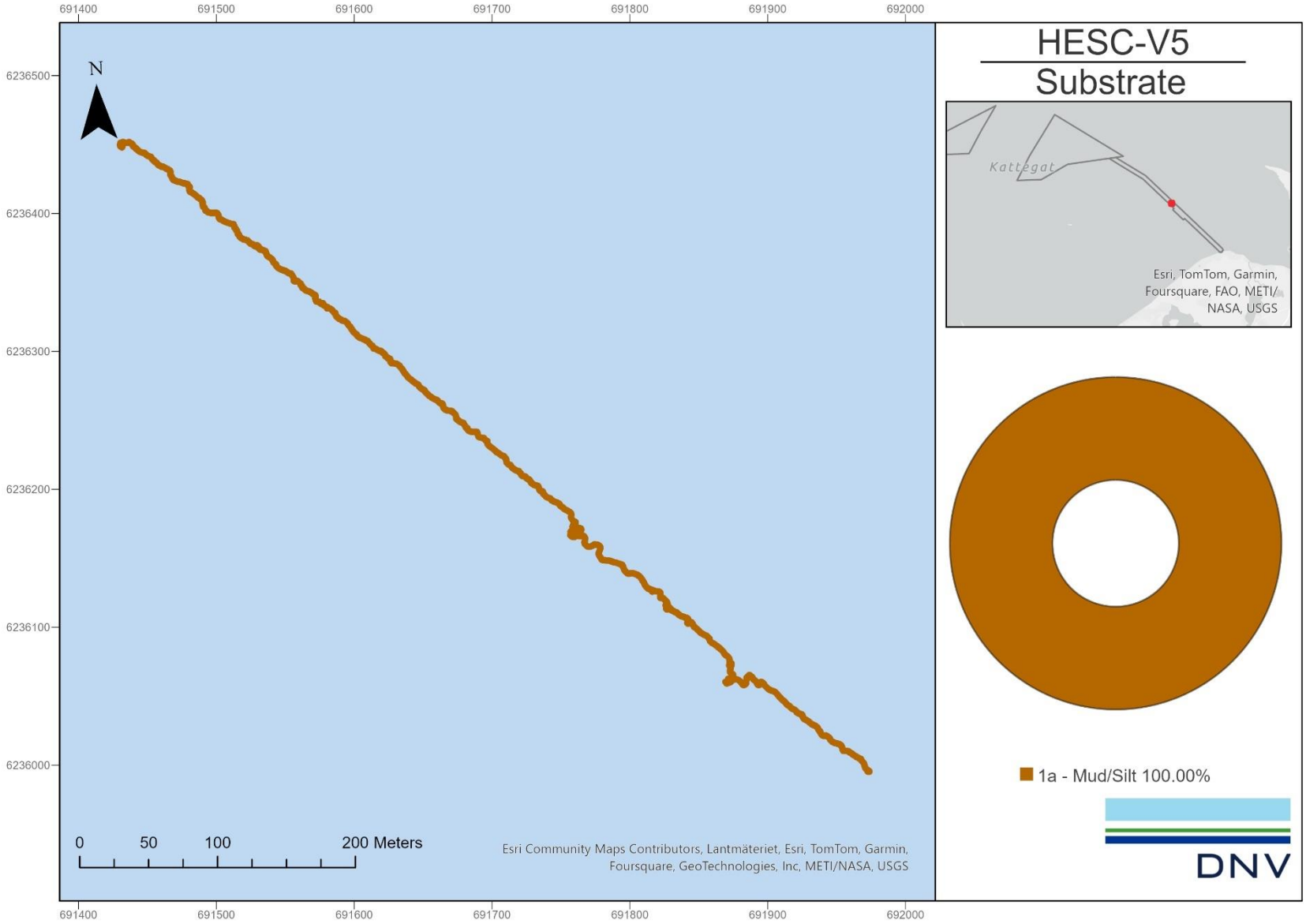
6239200
6239100
6239000
6238900
6238800
6238700
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V4
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 100.00%
DNV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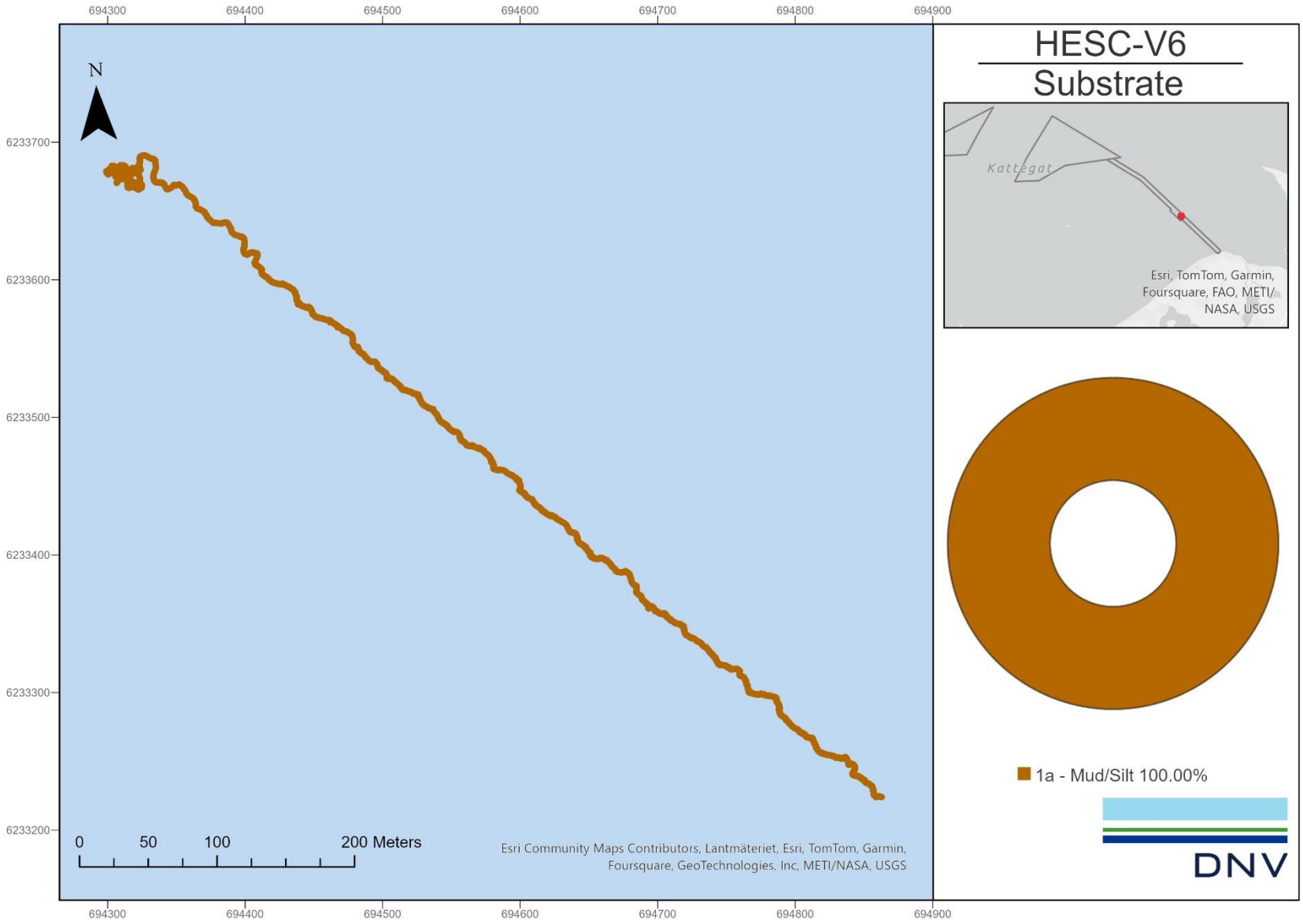
6236000
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V5
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 100.00%
DNV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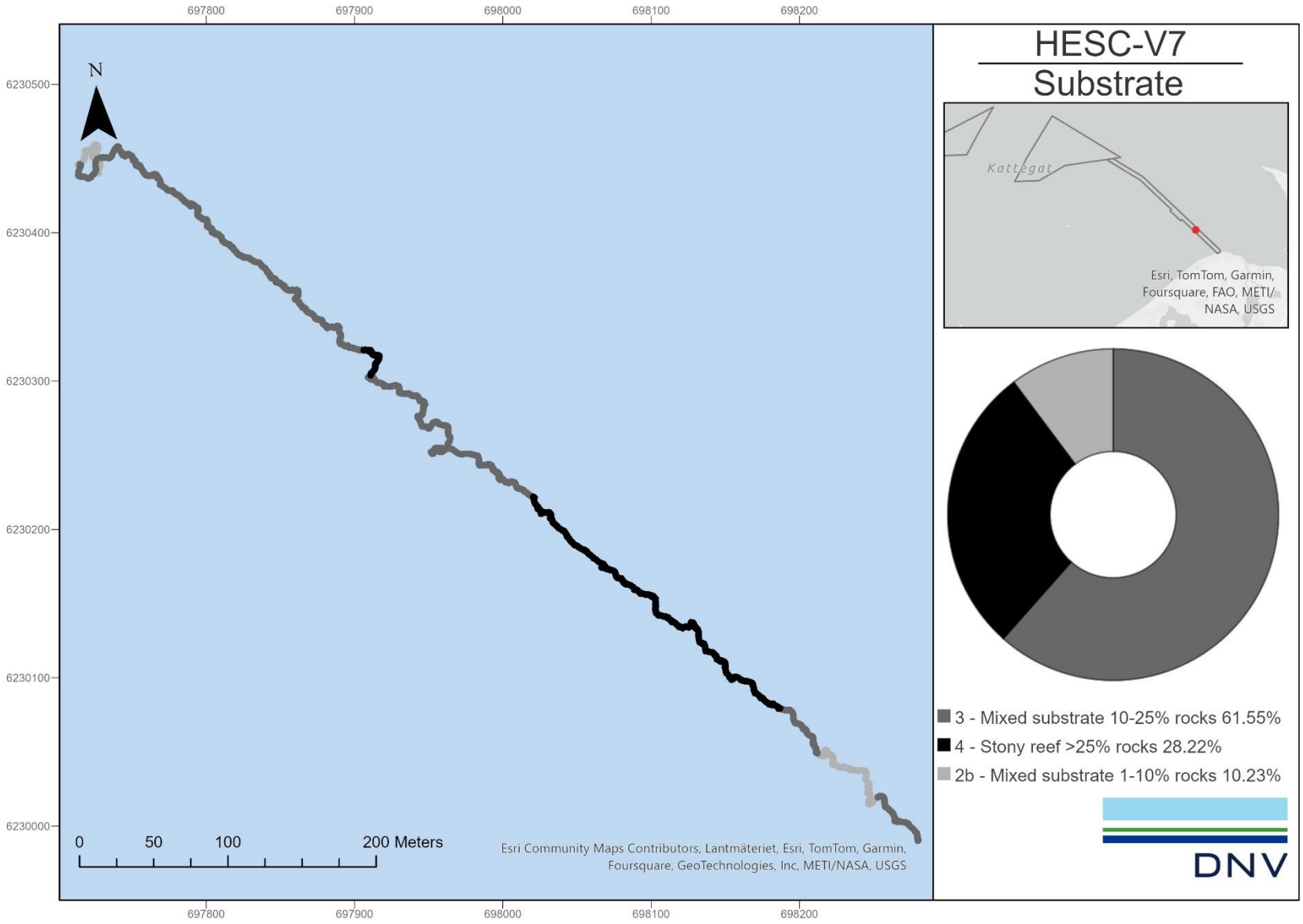
6233200
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V6
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
1a - Mud/Silt 100.00%
DNV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698100
698200
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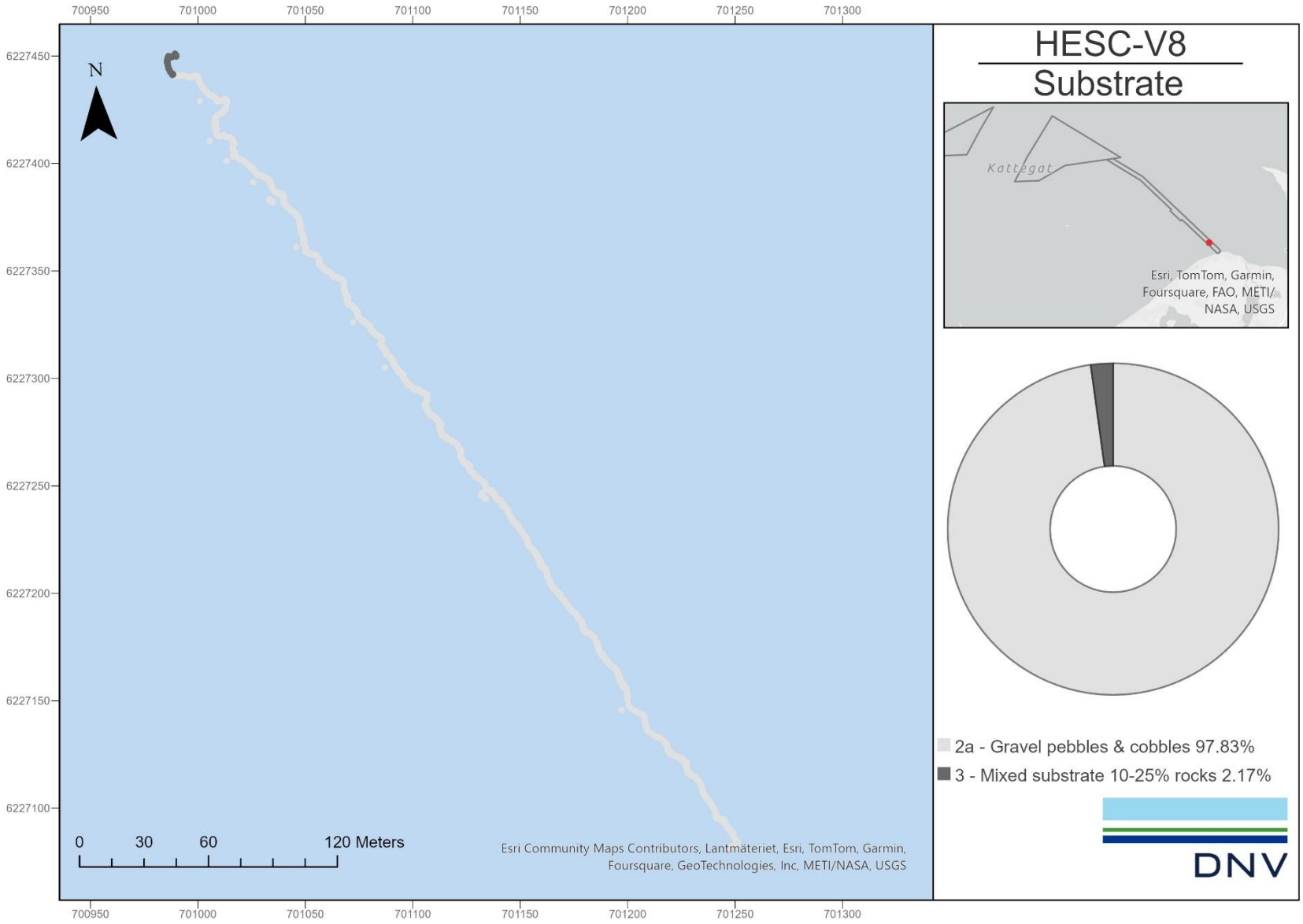
6230000
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V7
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
3 - Mixed substrate 10-25% rocks 61.55%
4 - Stony reef >25% rocks 28.22%
2b - Mixed substrate 1-10% rocks 10.23%
DNV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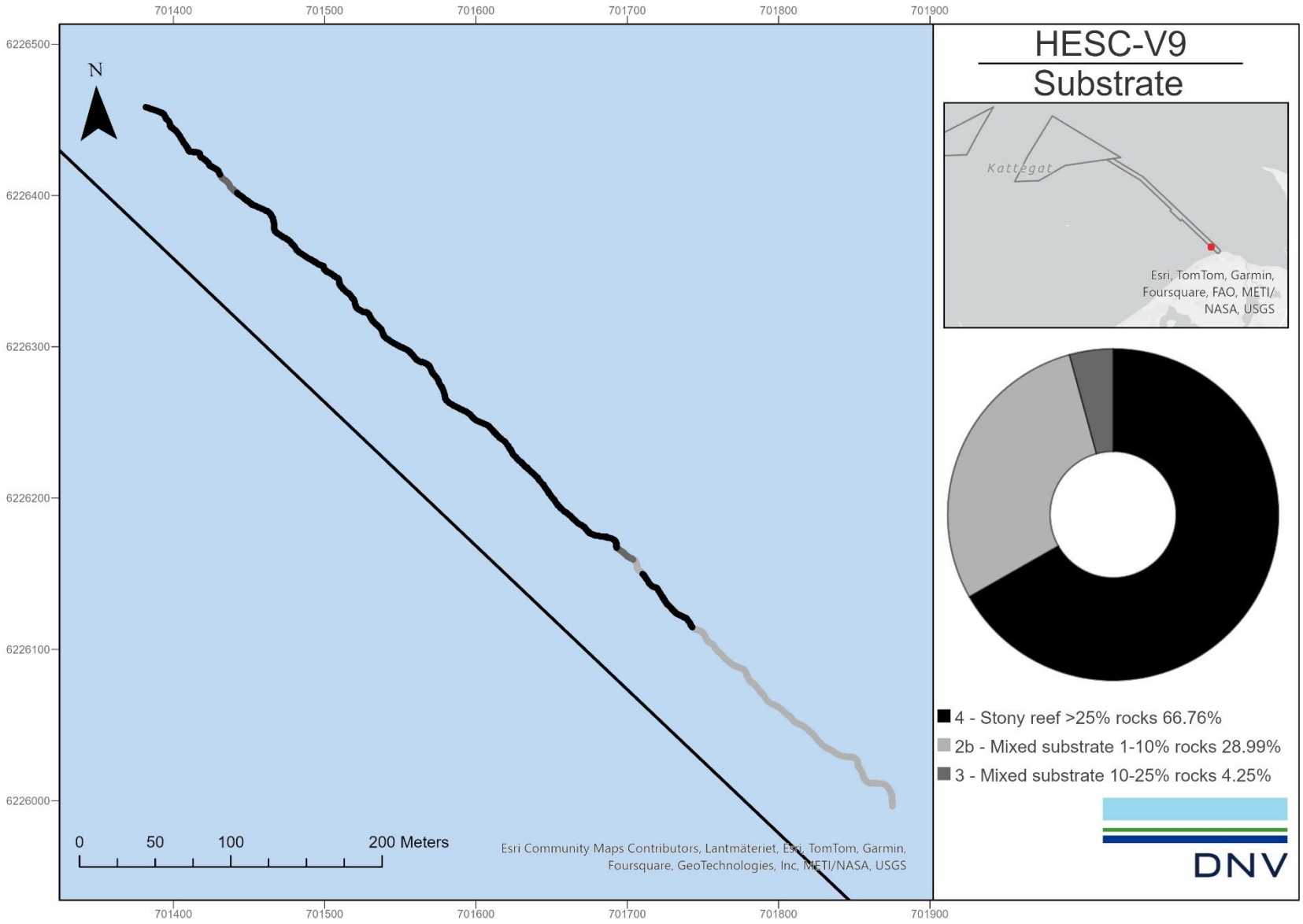
701050
701100
701150
701200
701250
701300
6227450
6227400
6227350
6227300
6227250
6227200
6227150
6227100
N
0
30
60
120 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V8
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
2a - Gravel pebbles & cobbles 97.83%
3 - Mixed substrate 10-25% rocks 2.17%
DNV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701600
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701800
701900
6226500
6226400
6226300
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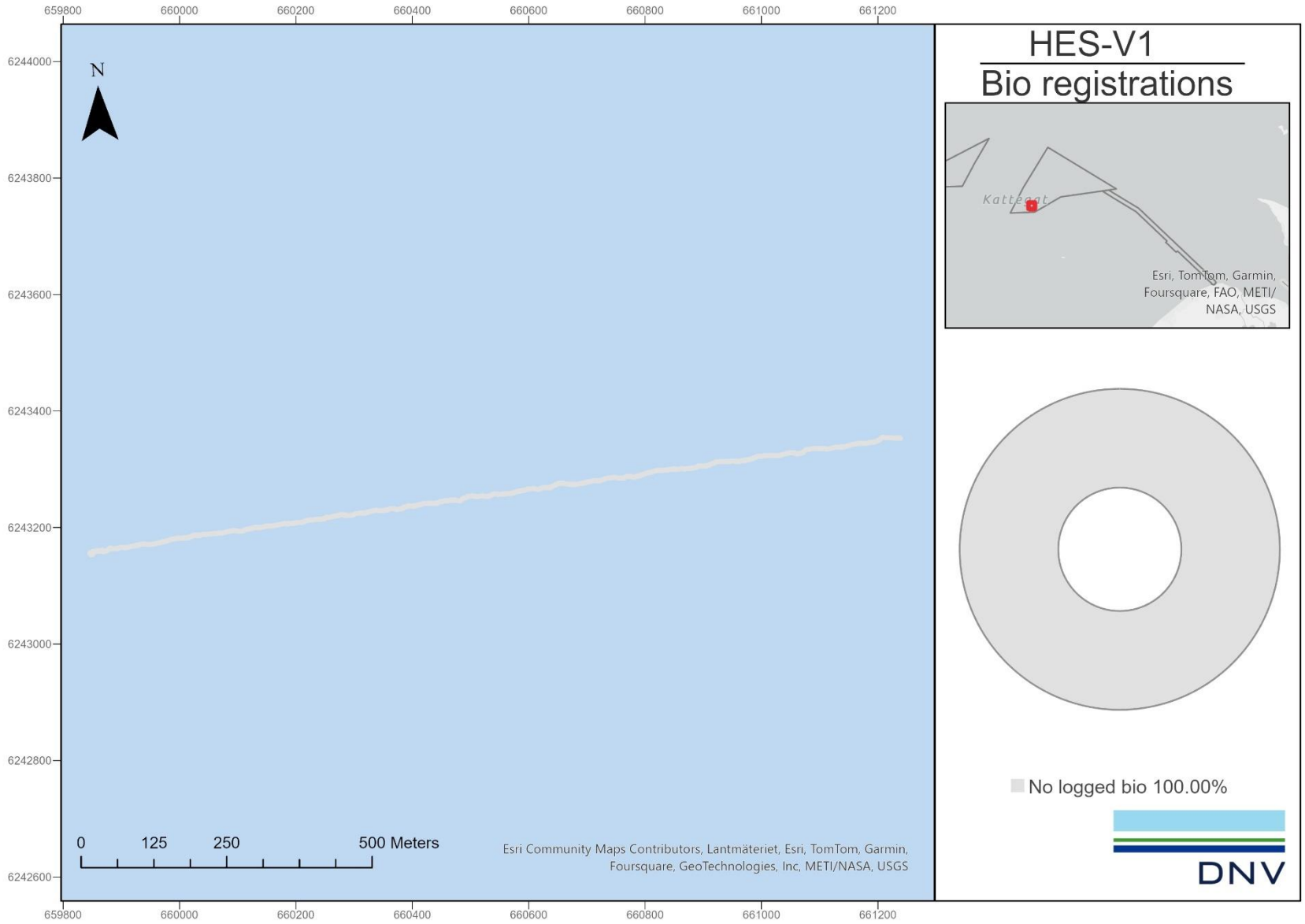
6226100
6226000
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V9
Substrate
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
4 - Stony reef >25% rocks 66.76%
2b - Mixed substrate 1-10% rocks 28.99%
3 - Mixed substrate 10-25% rocks 4.25%
DNV

APPENDIX 3 MAPS OF FAUNA AND FLORA REGISTRATIONS IN VISUAL SURVEY TANSECTS MAPS OF FAUNA AND FLORA REGISTRATIONS IN VISUAL SURVEY TRANSECTS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660800
661000
661200
6244000
6243800
6243600
6243400
6243200
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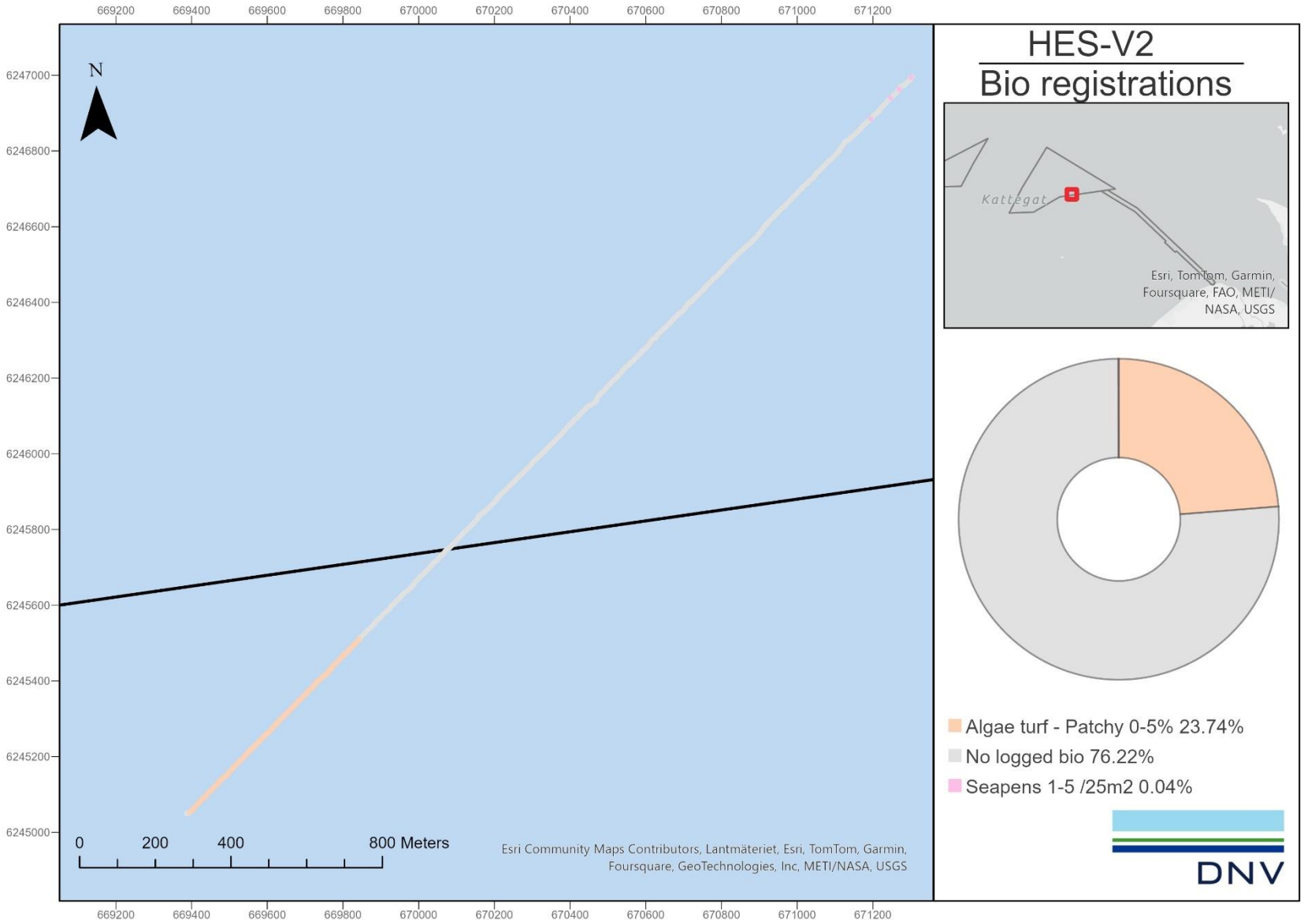
6242800
6242600
N
0
125
250
500 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V1
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
No logged bio 100.00%
DNV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669400
669600
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670200
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670600
670800
671000
671200
6247000
6246800
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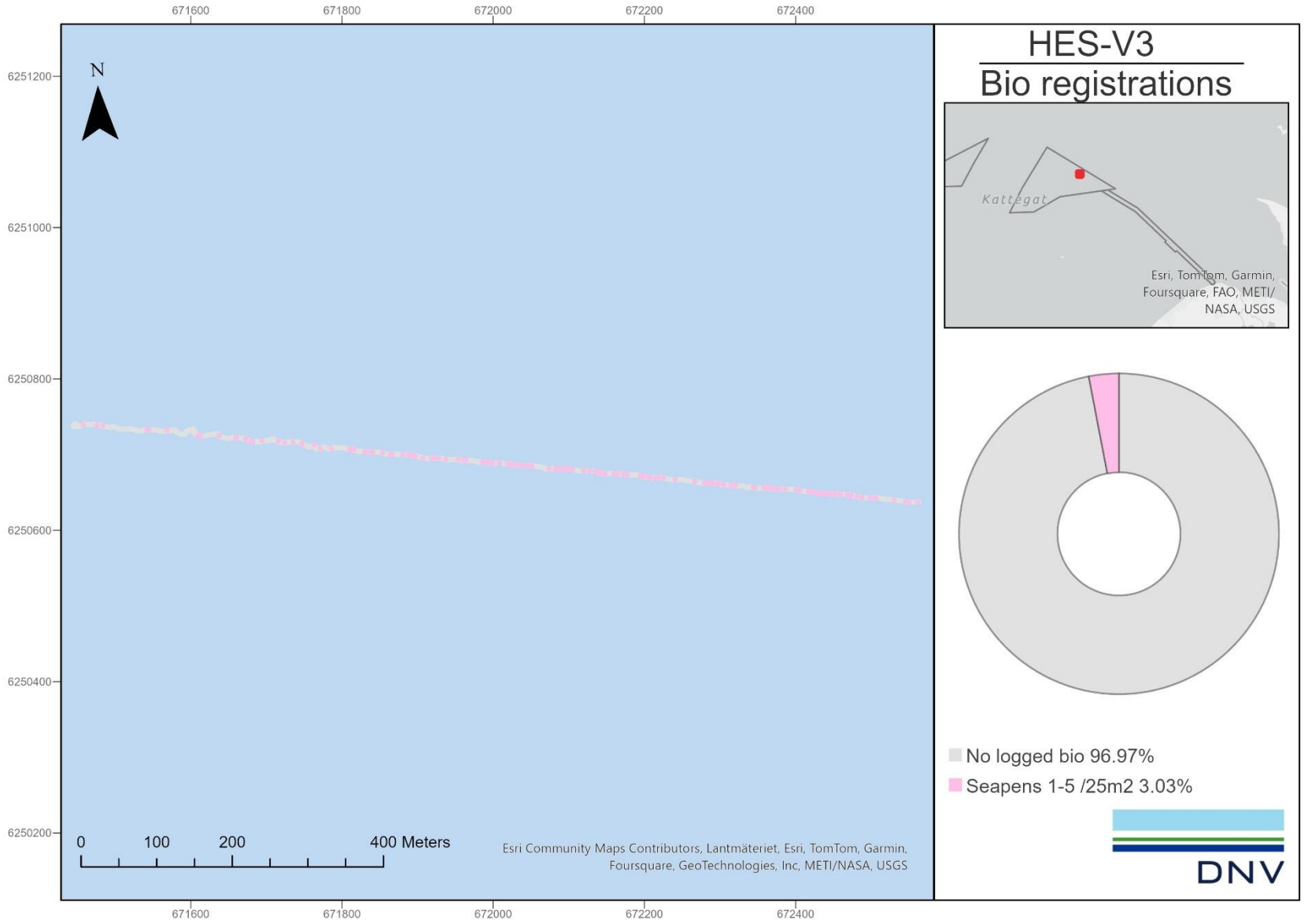
6246400
6246200
6246000
6245800
6245600
6245400
6245200
6245000
N
0
200
400
800 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V2
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
Algae turf - Patchy 0-5% 23.74%
No logged bio 76.22%
Seapens 1-5 /25m2 0.04%
DNV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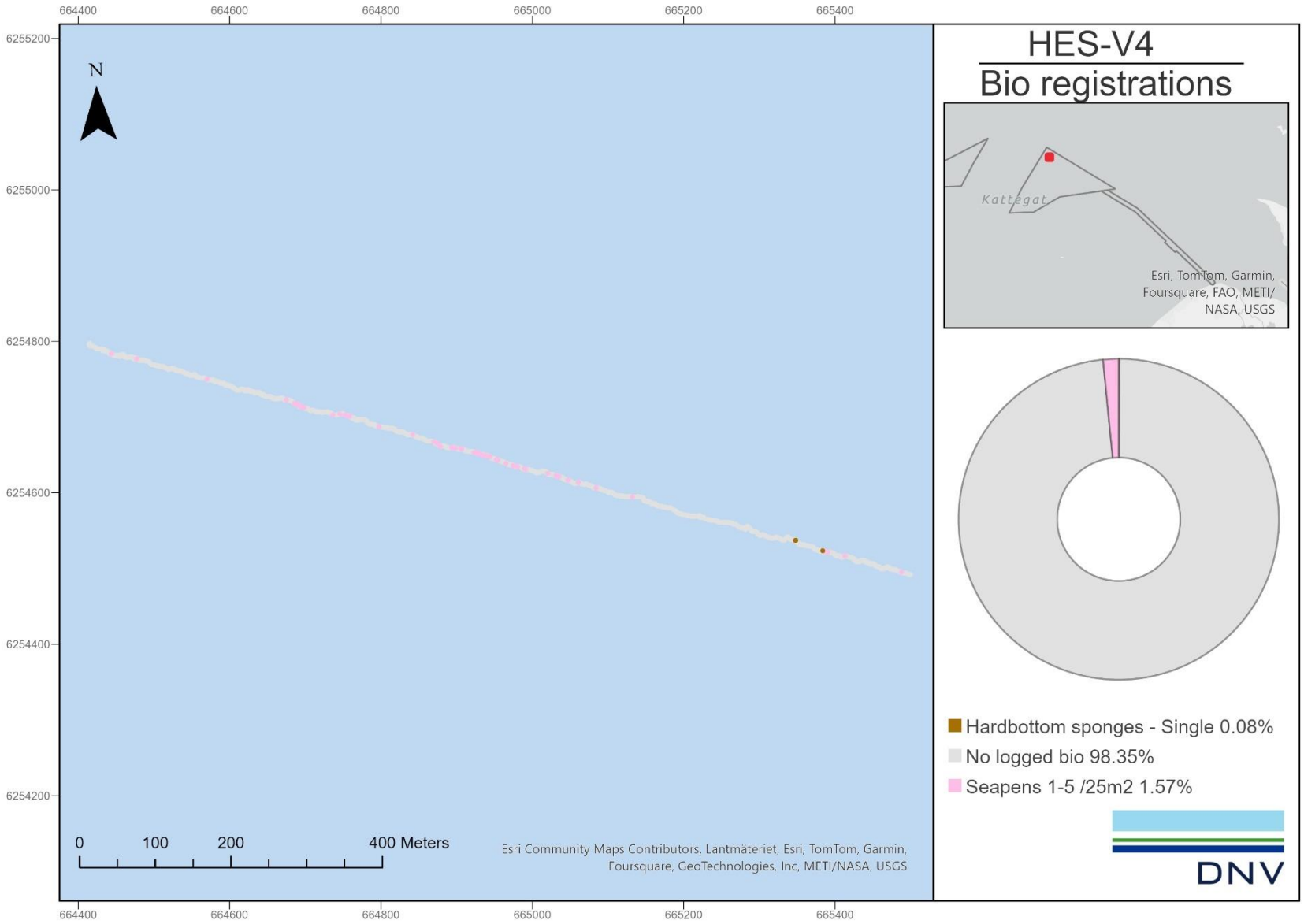
671800
672000
672200
672400
6251200
6251000
6250800
6250600
6250400
6250200
N
0
100
200
400 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V3
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
No logged bio 96.97%
Seapens 1-5 /25m2 3.03%
DNV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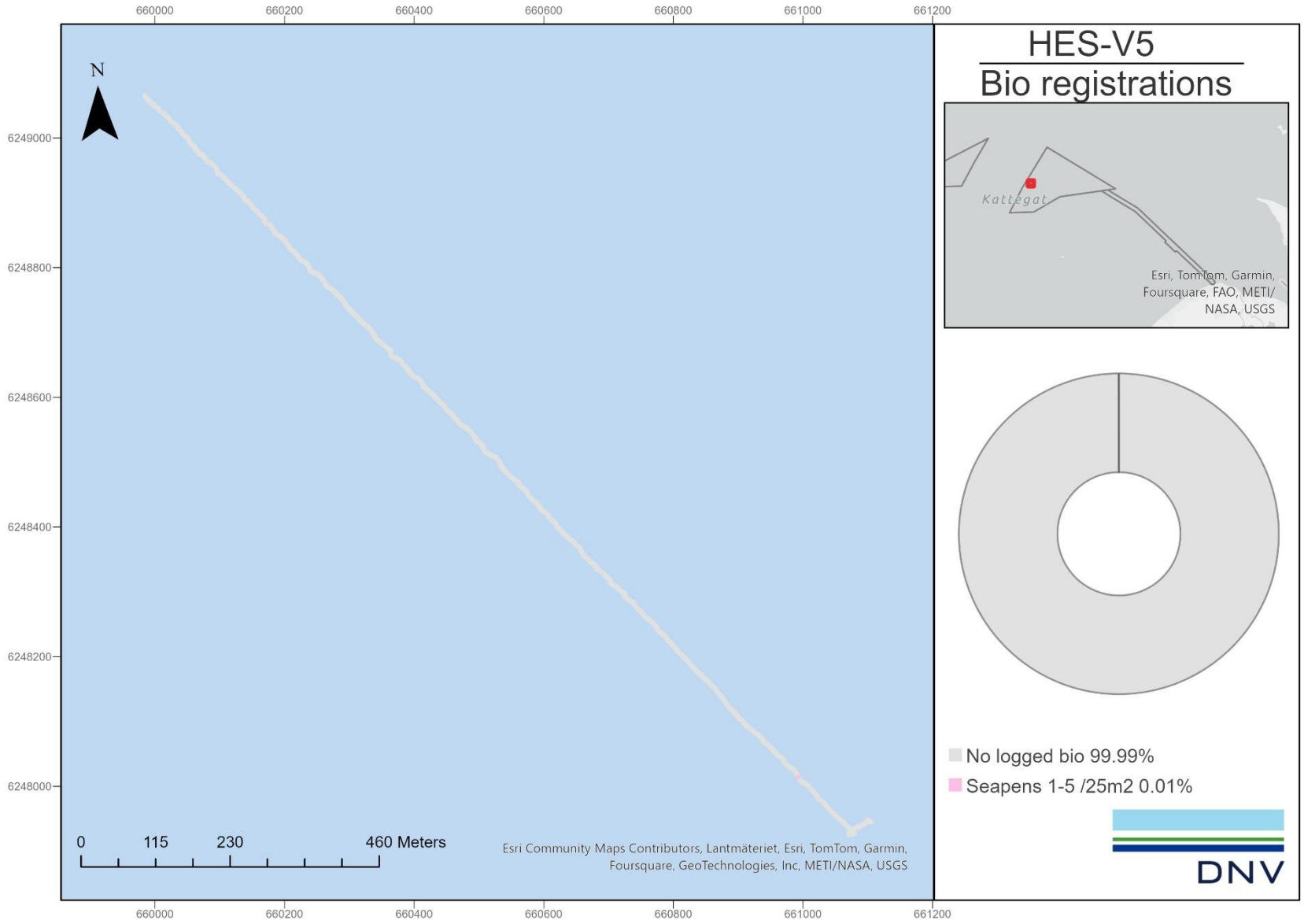
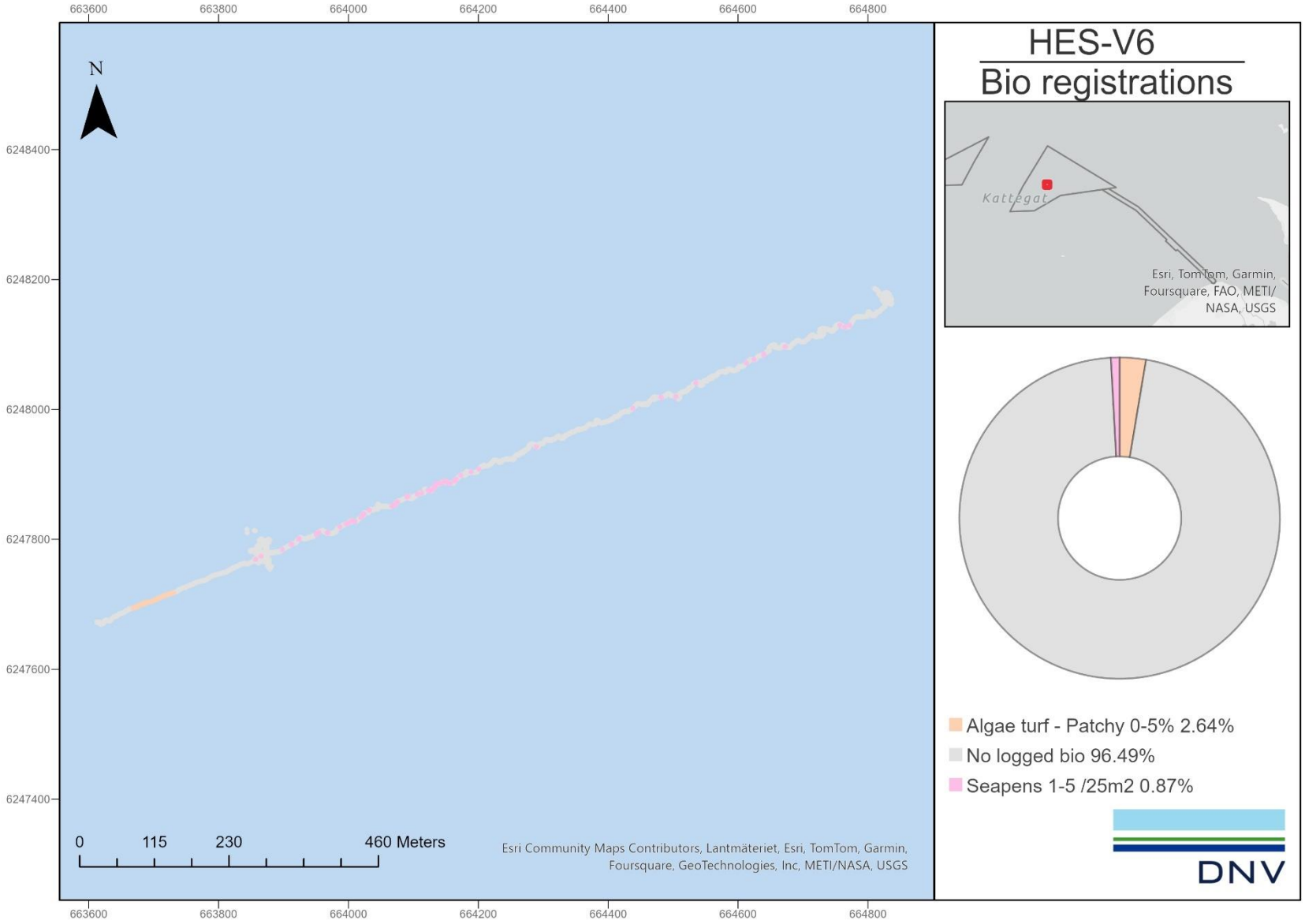
664600
664800
665000
665200
665400
6255200
6255000
6254800
6254600
6254400
6254200
N
0
100
200
400 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V4
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
Hardbottom sponges - Single 0.08%
No logged bio 98.35%
Seapens 1-5 /25m2 1.57%
DNV


660000
660200
660400
660600
660800
661000
661200
6249000
6248800
6248600
6248400
6248200
6248000
N
0
115
230
460 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V5
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
No logged bio 99.99%
Seapens 1-5 /25m2 0.01%
DNV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663800
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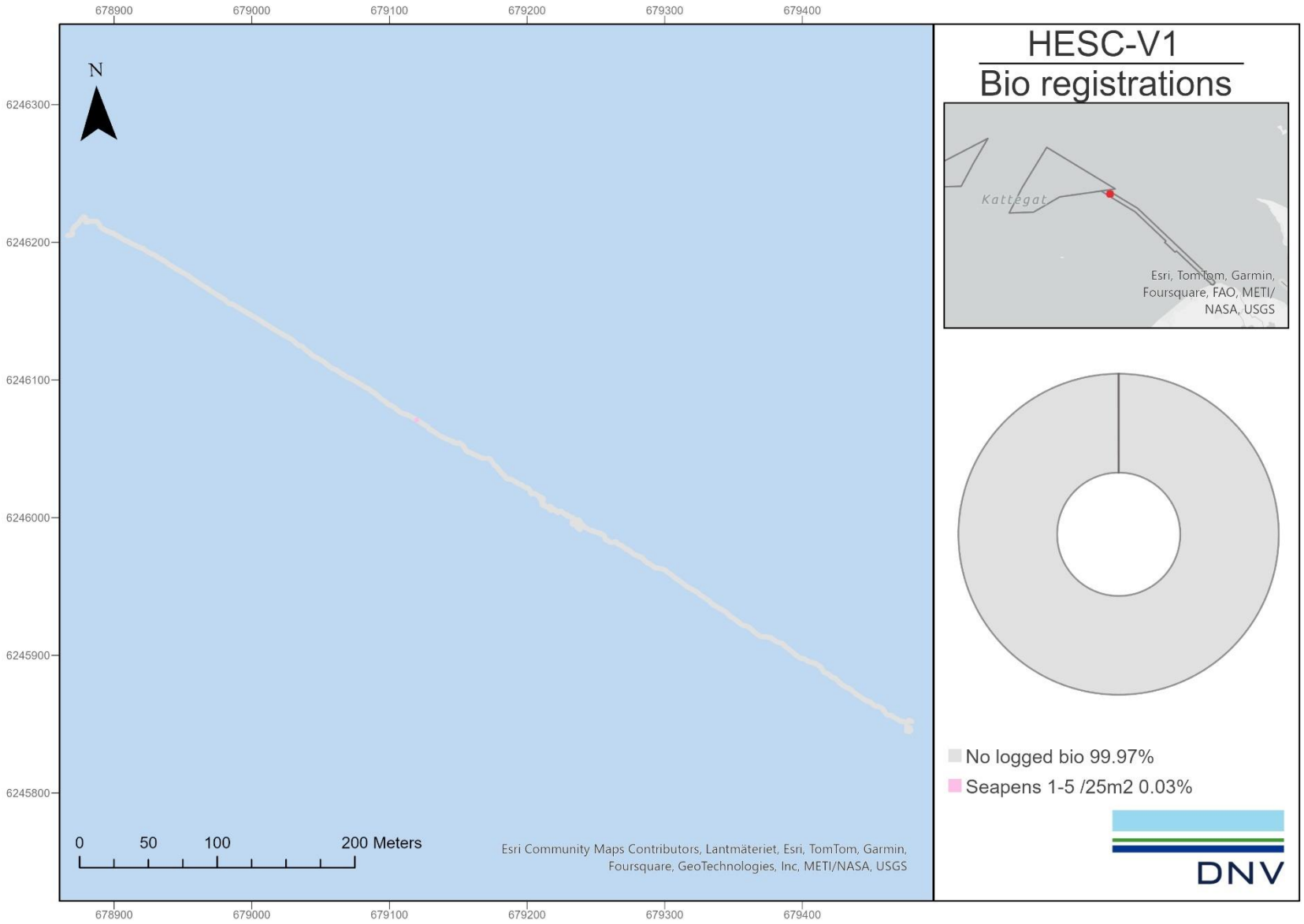
664200
664400
664600
664800
N
6248400
6248200
6248000
6247800
6247600
6247400
0
115
230
460 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HES-V6
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
Algae turf - Patchy 0-5% 2.64%
No logged bio 96.49%
Seapens 1-5 /25m2 0.87%
DNV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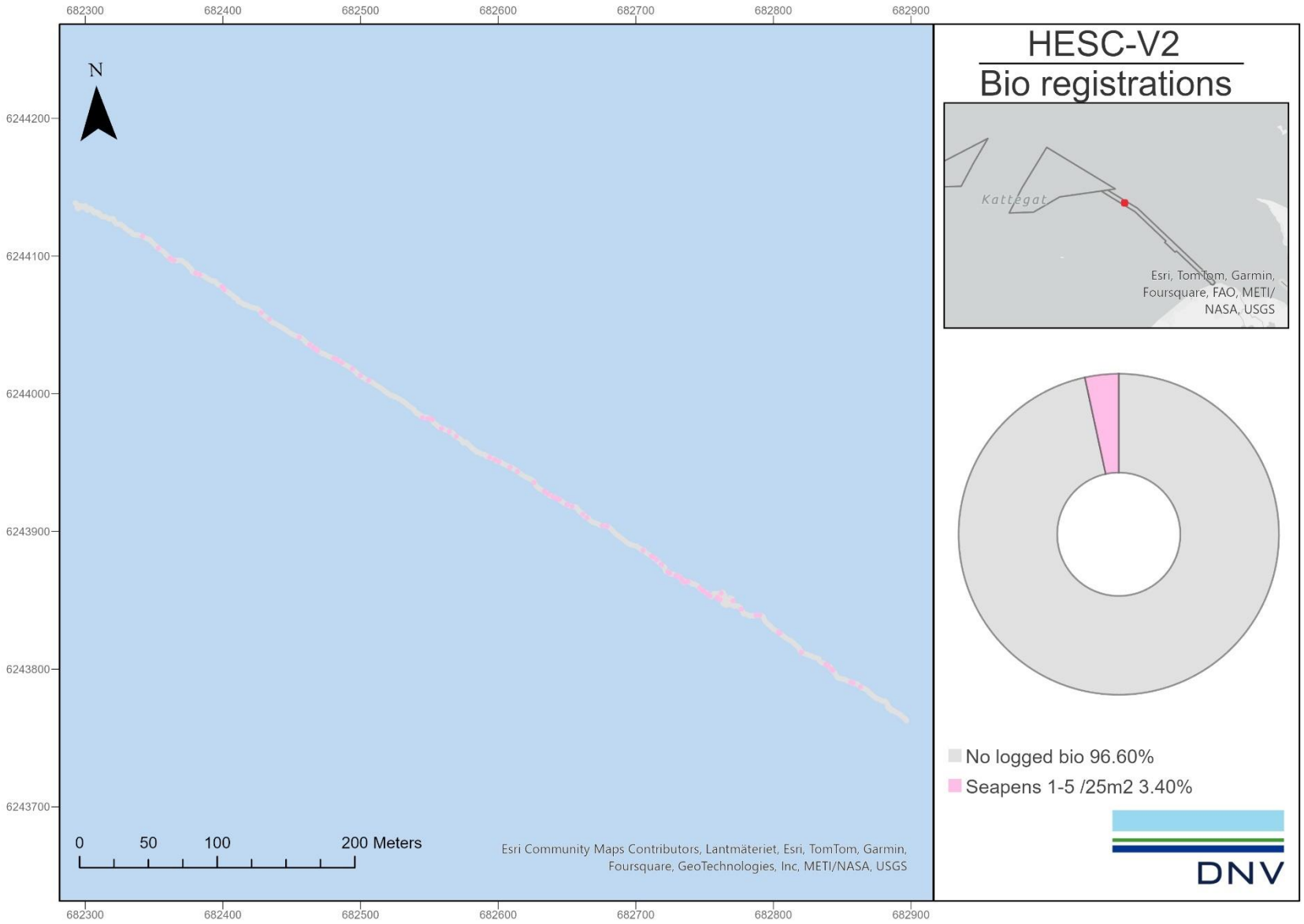
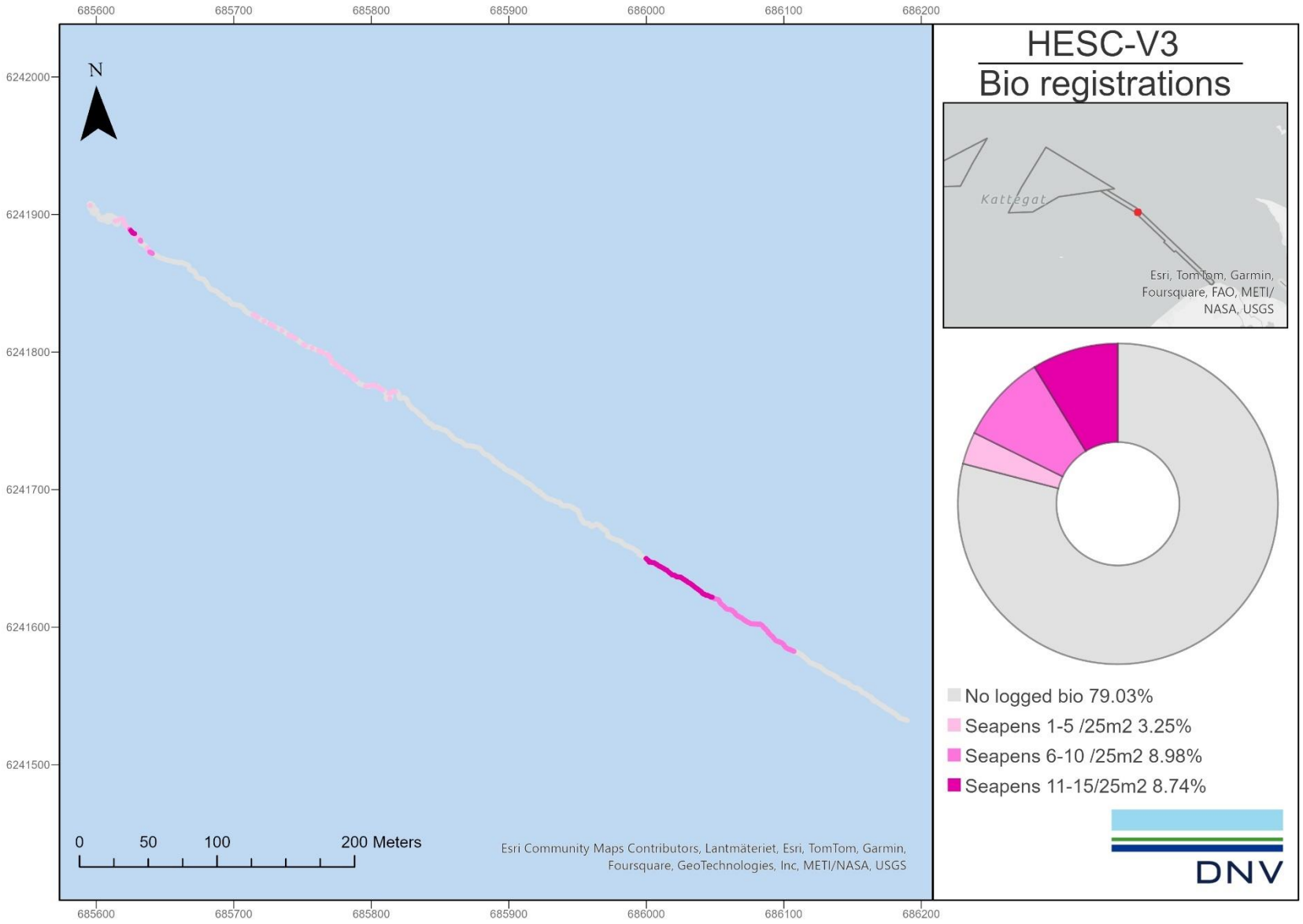
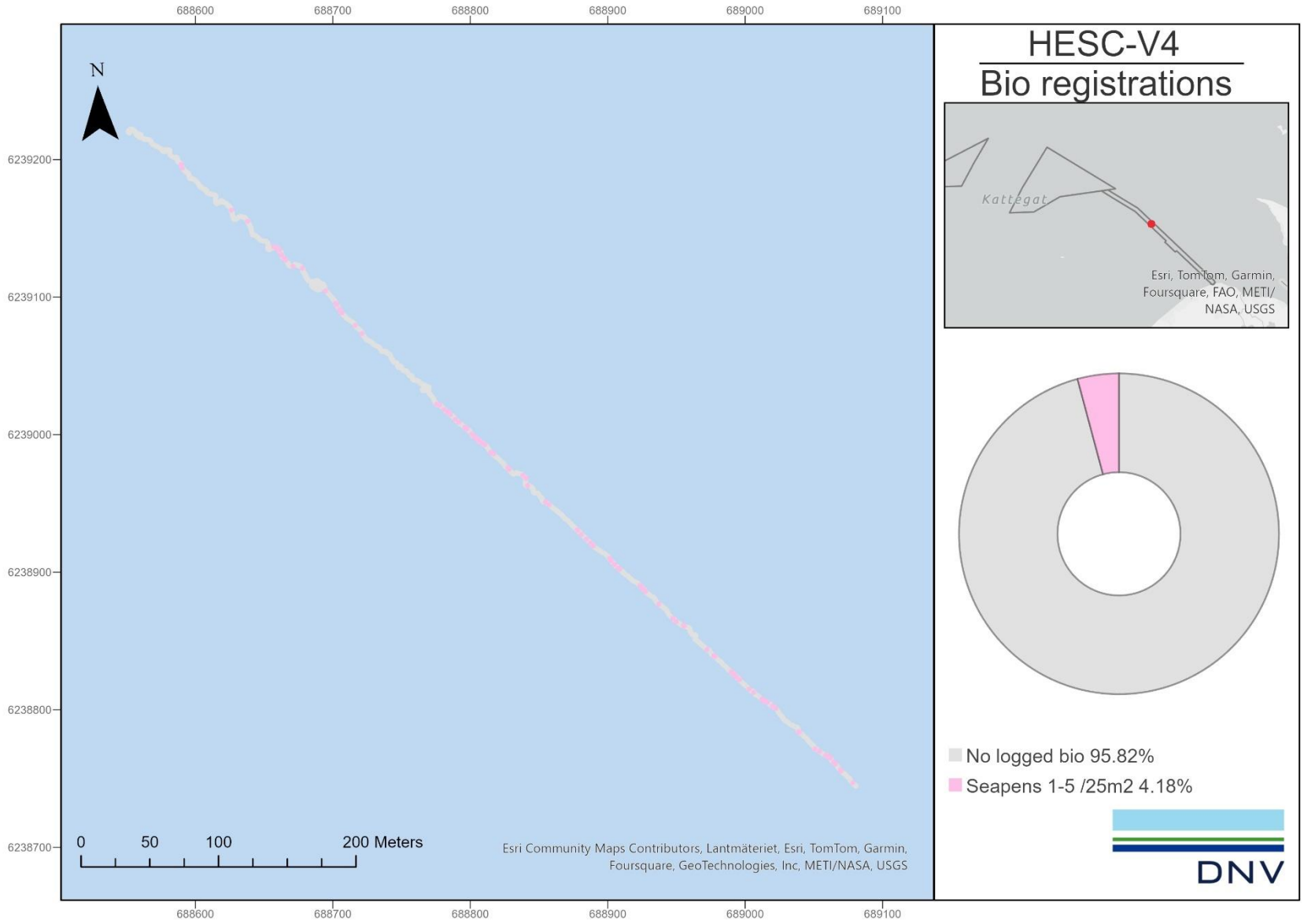
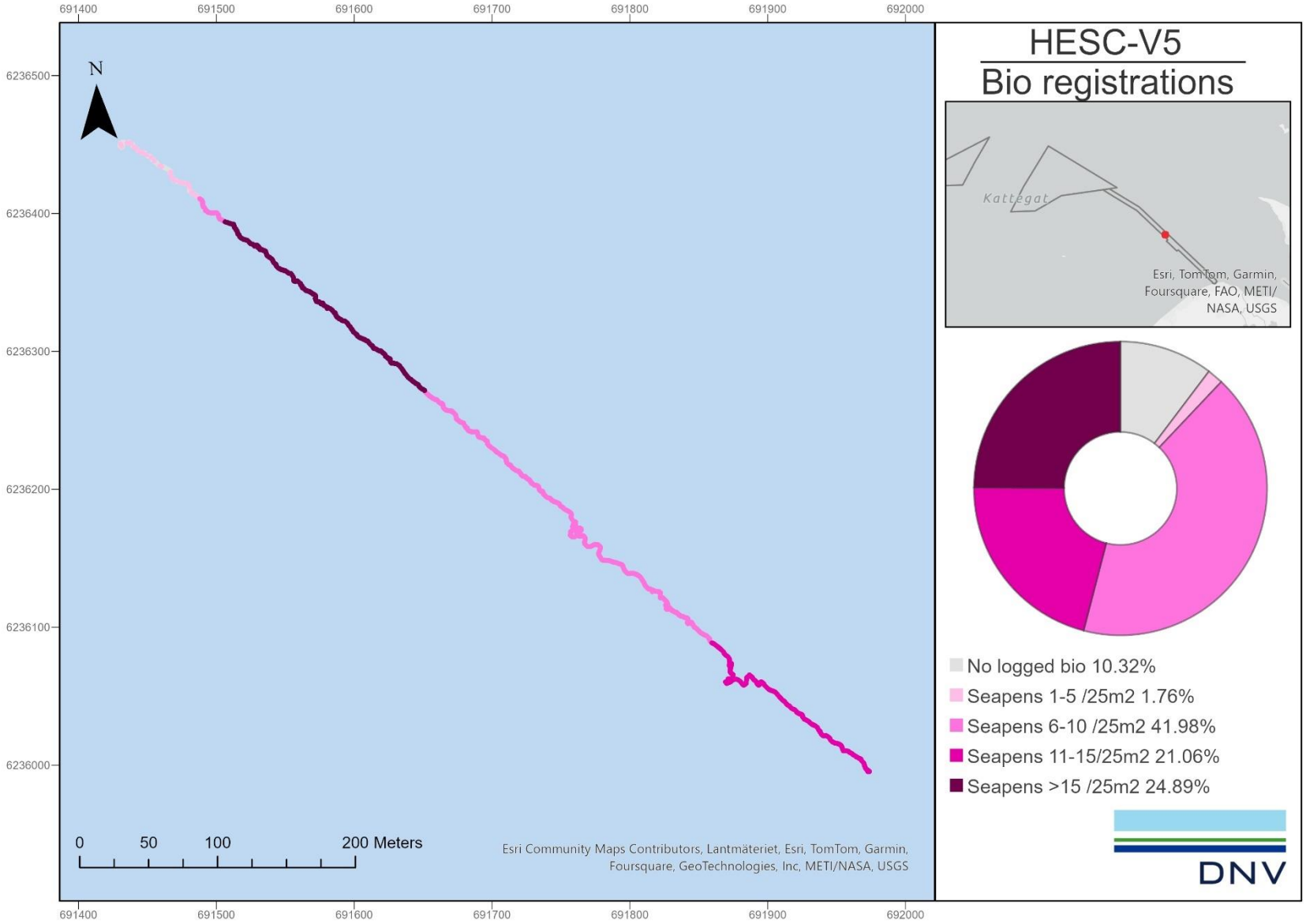
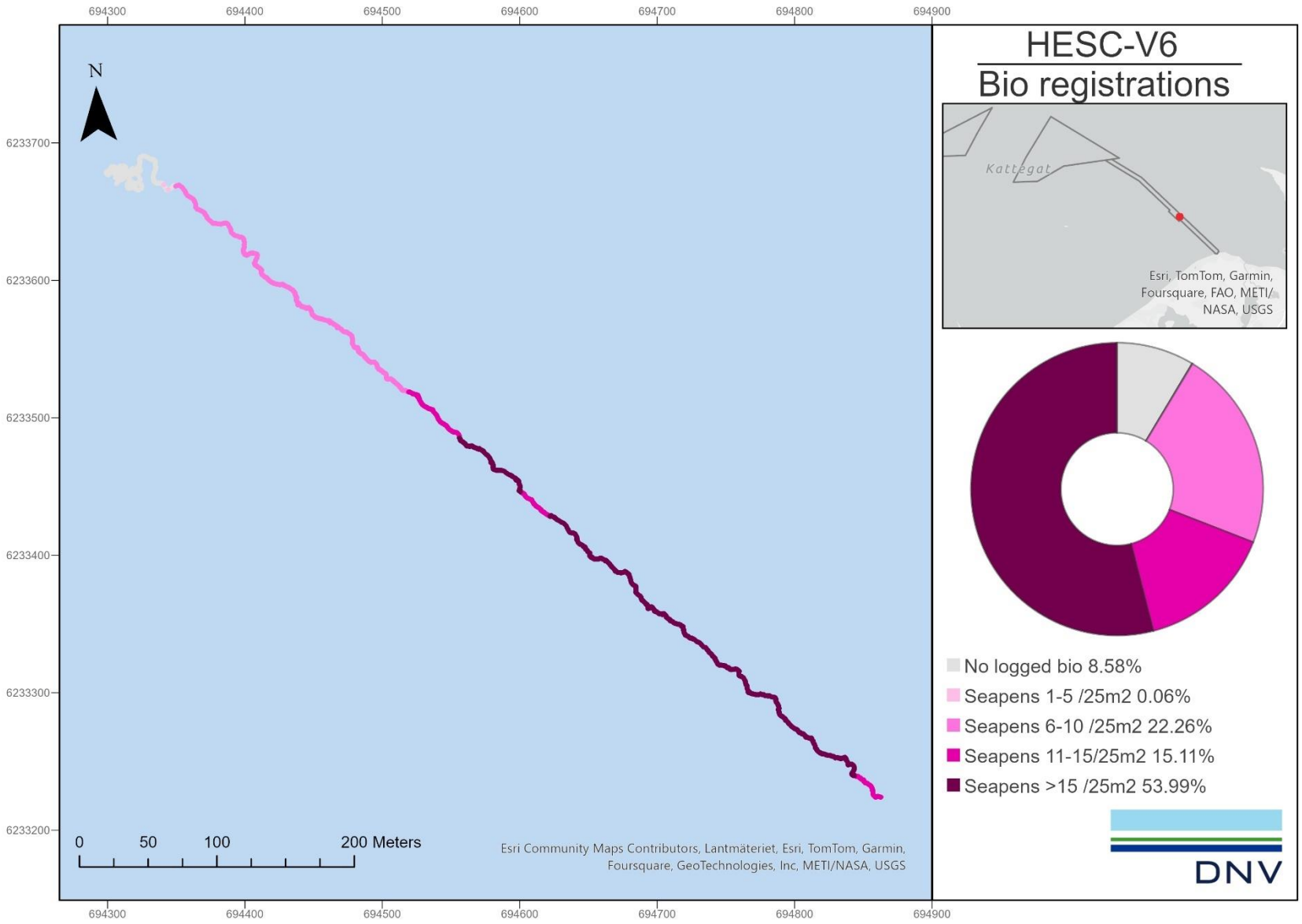
679000
679100
679200
679300
679400
N
6246300
6246200
6246100
6246000
6245900
6245800
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V1
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
No logged bio 99.97%
Seapens 1-5 /25m2 0.03%
DNV

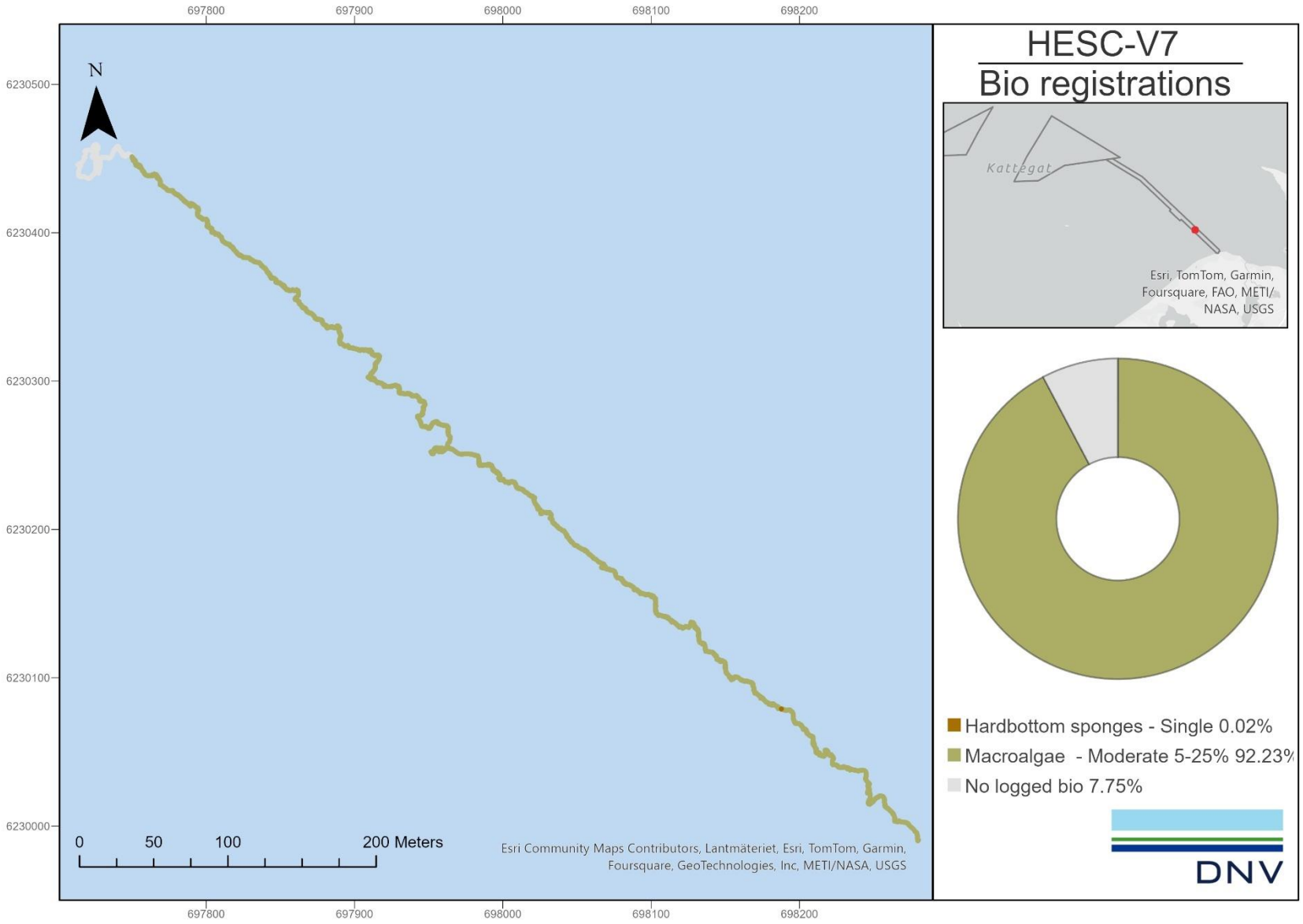

682300
682400
682500
682600
682700
682800
682900
6244200
6244100
6244000
6243900
6243800
6243700
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V2
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
No logged bio 96.60%
Seapens 1-5 /25m2 3.40%
DNV

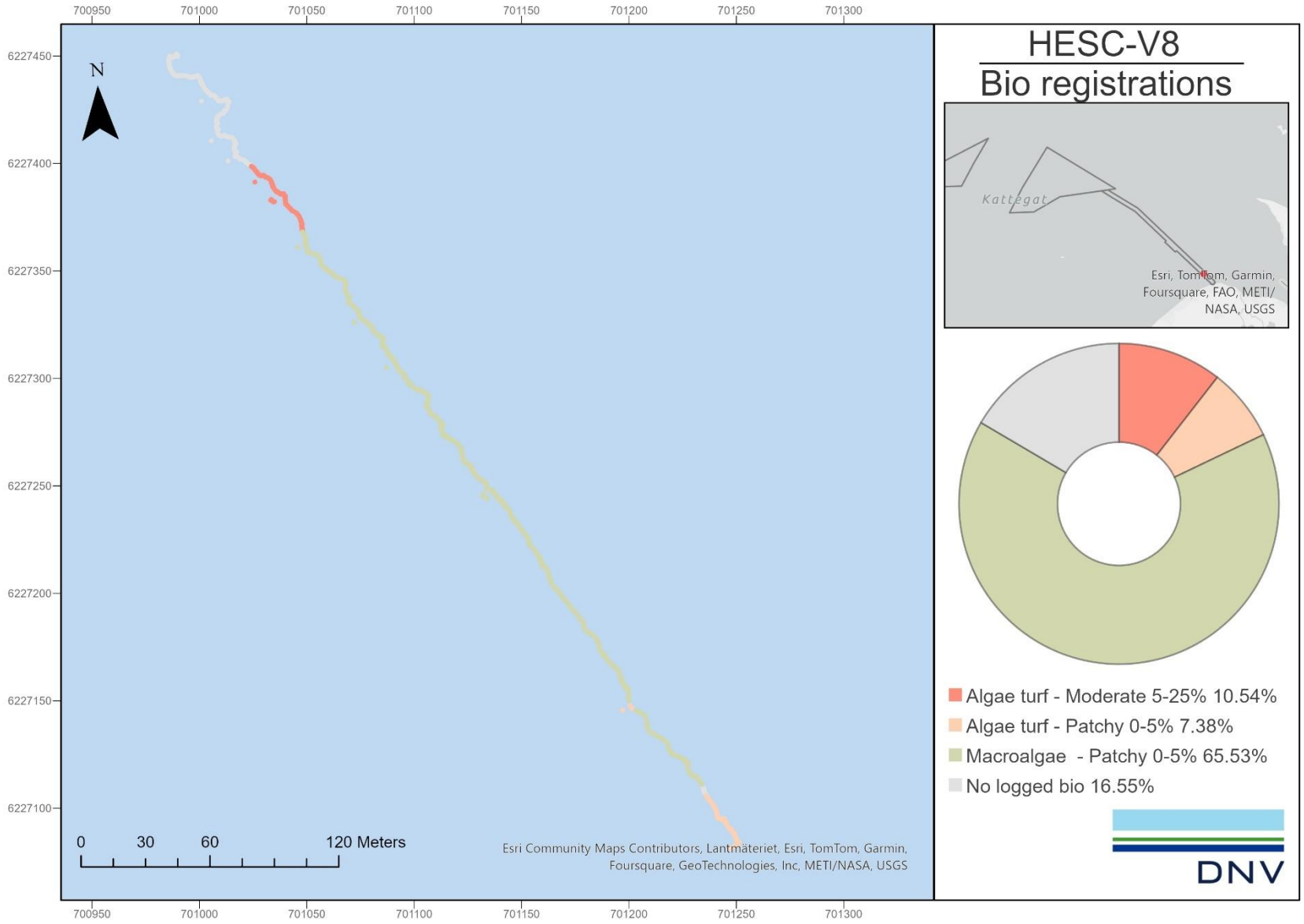

685600
685700
685800
685900
686000
686100
686200
6242000
6241900
6241800
6241700
6241600
6241500
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V3
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
No logged bio 79.03%
Seapens 1-5 /25m2 3.25%
Seapens 6-10 /25m2 8.98%
Seapens 11-15/25m2 8.74%
DNV

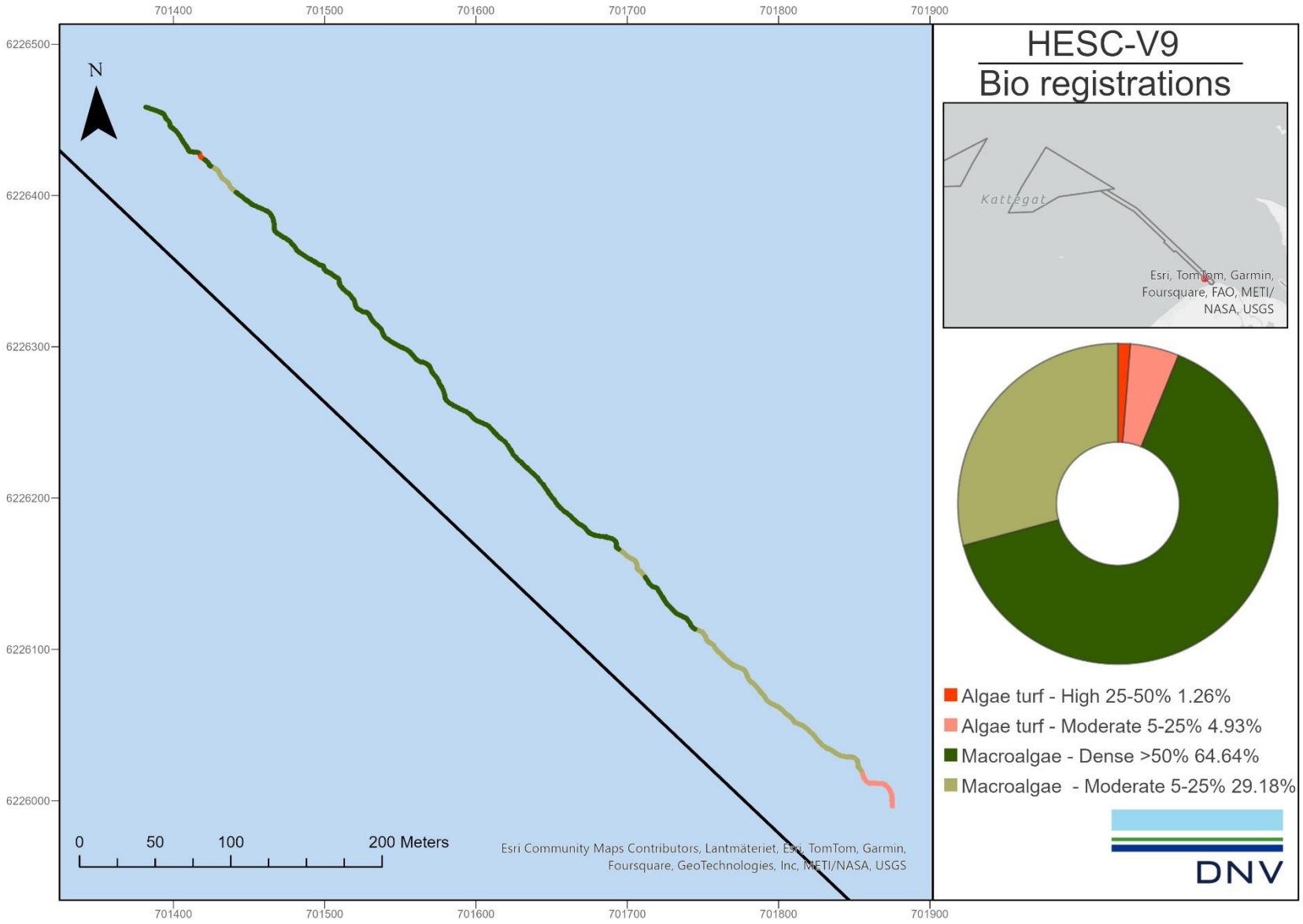

688600
688700
688800
688900
689000
689100
N
6239200
6239100
6239000
6238900
6238800
6238700
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V4
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
No logged bio 95.82%
Seapens 1-5 /25m2 4.18%
DNV

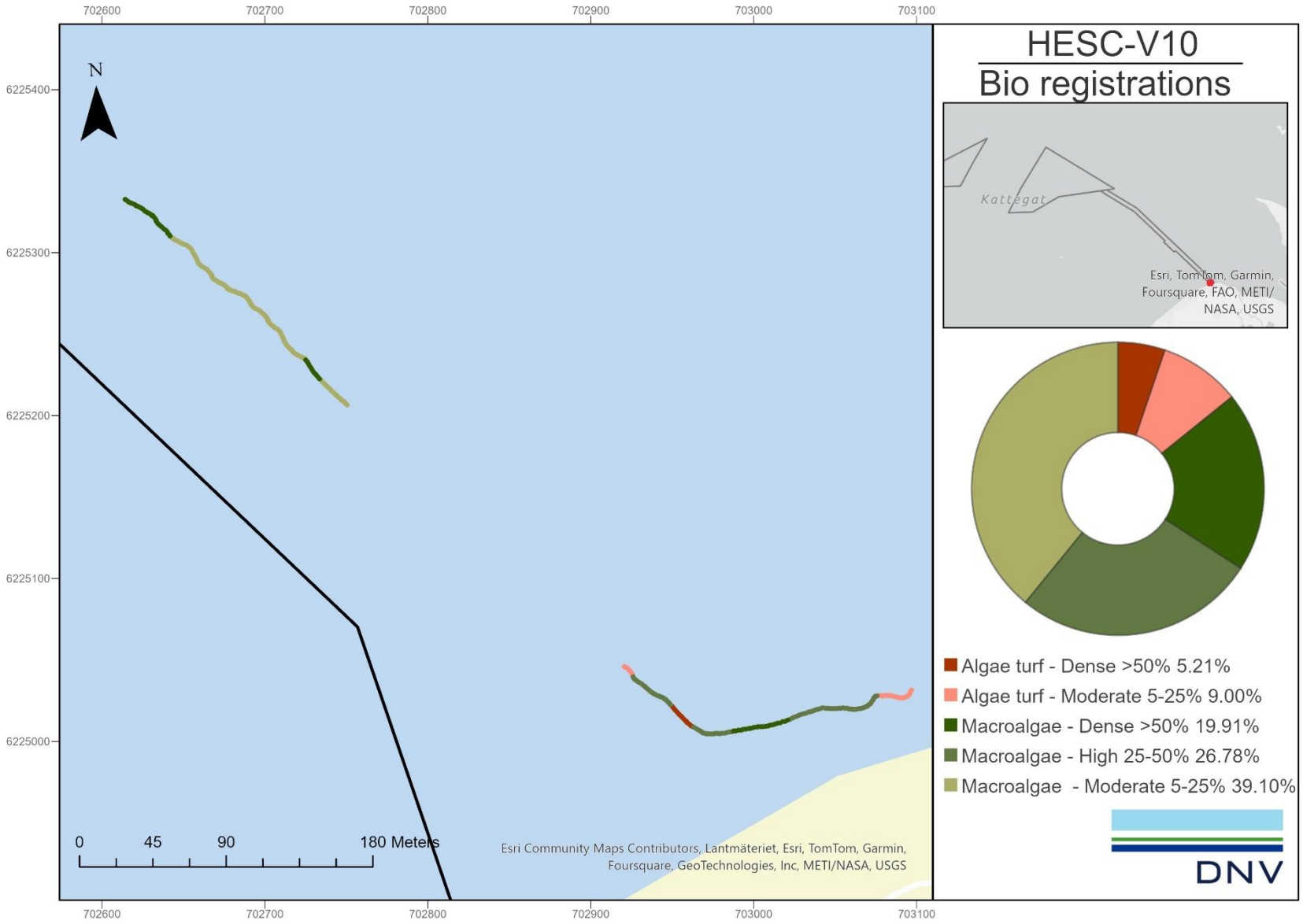

691400
691500
691600
691700
691800
691900
692000
6236500
6236400
6236300
6236200
6236100
6236000
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V5
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
No logged bio 10.32%
Seapens 1-5 /25m2 1.76%
Seapens 6-10 /25m2 41.98%
Seapens 11-15/25m2 21.06%
Seapens >15 /25m2 24.89%
DNV


694300
694400
694500
694600
694700
694800
694900
N
6233700
6233600
6233500
6233400
6233300
6233200
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V6
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
No logged bio 8.58%
Seapens 1-5 /25m2 0.06%
Seapens 6-10 /25m2 22.26%
Seapens 11-15/25m2 15.11%
Seapens >15 /25m2 53.99%
DNV


697800
697900
698000
698100
698200
6230500
6230400
6230300
6230200
6230100
6230000
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V7
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
Hardbottom sponges - Single 0.02%
Macroalgae - Moderate 5-25% 92.23%
No logged bio 7.75%
DNV


700950
701000
701050
701100
701150
701200
701250
701300
6227450
6227400
6227350
6227300
6227250
6227200
6227150
6227100
N
0
30
60
120 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V8
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
Algae turf - Moderate 5-25% 10.54%
Algae turf - Patchy 0-5% 7.38%
Macroalgae - Patchy 0-5% 65.53%
No logged bio 16.55%
DNV


701400
701500
701600
701700
701800
701900
6226500
6226400
6226300
6226200
6226100
6226000
N
0
50
100
200 Meters
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
HESC-V9
Bio registrations
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
Algae turf - High 25-50% 1.26%
Algae turf - Moderate 5-25% 4.93%
Macroalgae - Dense >50% 64.64%
Macroalgae - Moderate 5-25% 29.18%
DNV


HESC-V10
Bio registrations
N
702600
702700
702800
702900
703000
703100
6225400
6225300
6225200
6225100
6225000
0
45
90
180 Meters
Kattegat
Esri, TomTom, Garmin, Foursquare, FAO, METI/ NASA, USGS
Esri Community Maps Contributors, Lantmäteriet, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
Algae turf - Dense >50% 5.21%
Algae turf - Moderate 5-25% 9.00%
Macroalgae - Dense >50% 19.91%
Macroalgae - High 25-50% 26.78%
Macroalgae - Moderate 5-25% 39.10%
DNV

APPENDIX 4 SPECIES LIST VISUAL TRANSECTS

Species	HES-V1	HES-V2	HES-V3	HES-V4	HES-V5	HES-V6	HESC-V1	HESC-V2	HESC-V3	HESC-V4	HESC-V5	HESC-V6	HESC-V7	HESC-V8	HESC-V9	HESC-V10
PORIFERA																
Geodia spp.		1														
Cf. pachymatisma johnstonia		1														
Porifera indet				1												
cf. Suberites carnosus													1			
POLYCHAETA																
Ahrodita aculeata			1	1			1									
Arenicola marina		2	1	3	1	3						1				2
Oxydromus flexuosus											1	1				
Pectinariidae indet		1														
Polychaeta indet 1			1													
Sabellidae indet												1				
cf. Spirobranchus triqueter						1										
VARIA																
cf. Ascidella aspersa		1														
Electra pilosa														1	1	2
Membranipora membranacea													1	1	1	1
Platyhelminthes indet												1				
CRUSTACEA																
Amphibalanus improvisus													1	1		
Antalis entalis			1	1							1					
Callochiton septemvalvis		1														
Cancer pagurus	1	1			1	1							1		1	
Carcinus maenas		1		1	1		1							1		1
Colus sp.				1												
Hyas spp.		1			1	1							1			
cf. Leptochiton asellus		1														
Liocarcinus depurator							1									

Pagurus bernhardus		1	2	1	1	1	2	1	1	1	1	1	1			
Polyplacophora indet																1
Semibalanus balanoides					1								1	1	2	2
MOLLUSCA																
Acanthocardia echinata		1				1						1				
Aporrhais pespelecani	2	2	1	1	1	1										
Arctica islandica		2	1	1	1	1	1				1	1	1			
Buccinum undatum		1	1	1		1					1	1	1		1	
Buccinum undatum (eggs)						1							1			
Cardiidae indet	2	2			1		1	1	1							
Ensis ensis		1		1												
Modiolus modiolus													1			
Mytilus edulis													1			2
Pectinidae indet				1	1	1										
Turitella spp.	1	2		1	2	1	1	1				1				1
ECHINODERMATA																
Asterias rubens	2	1	1	3	1	2	1	1	1	1	1	1	1	1	1	1
Asteroidea indet					1	1							1			
Astropecten irregularis	1															
Crossaster paposus	1				1								1			
Echinus acutus	1				1											
Echinus esculentus	2	1	1		1	1										
Hippasteria phrygiana						1										
Marthasterias glacialis	1	1		1	1						1		1			
Mesothuria intestinalis				1												
Ophiocomina nigra	4	2			3	2										
Ophiotrix fragilis	2	1			3	3		1							1	
Ophiura albida					1	1									1	2
cf. Ophiura robusta	1				1											
Ophiura sarsii												3				
Ophiura sp.					1	1						2				
Solaster endeca						1										
CNIDARIA																

Actinia equina																
cf. Actiniaria indet		1														
Actiniaria indet						1									1	
Alcyonium digitatum		1	1	1		2		1								
Halecium cf. halecinum		1	1										1			
Hydroidea indet		1				1							1		2	2
Metridium senile		1						1								
Pennatula phosphorea			2	2	1	2		1	2	2	2	1				
Tubularia indivisa						1										
Urticina eques								1								
Virgularia mirabilis							2	1	3	2	3	2				
PISCES																
Actinopterygii indet			1			1										
Anguilla anguilla				1												
cf. Arnoglassus laterna						1										
Callionymus sp.	1	1		1	1	1						1	1			
Clupea harengus		1														
Eutrigla gurnardus			1	1							1					
Gadus morhua						1										
Gobiidae sp.	1				1	1										
Labridae indet													1	1	1	1
Limanda limanda	2	3	2	1	3	1	1	1	1			1				
Lumpenus lampretaeformis										1						
Melanogrammus aeglefinus								1								
Merlangius merlangus					1											
Myoxocephalus scorpius			1													
Pholis gunnellus												1	1			
Platichthys flesus	1	1	1	1	1	1		1			1	1	1	1		
Pleuronectes platessa	1	1	1	1	1			1	1							
Pleuronectidae indet			1	1		1				1	1	1	1			
Pomatoschistus sp.				1												
cf. Solea solea			1	1			1									
Trachinus draco		1							1							

PLANTAE																
Ceramium shuttleworthianium														1		
Ceramium sp.	1	1				1							1	1	3	3
Ceramium tenuicorne															2	2
Ceramium virgatum														1	3	3
Chorda filum															1	4
Cladophora sericea																2
cf. Coccotylus truncatus													1			
Delesseria sanguinea		1											3			
cf. Desmarestia aculeata													1			
Dilsea carnosa													2			
Ectocarpus spp.																4
Fucus serratus																3
Fucus vesiculosus																2
Furcellaria lumbricalis		1				1							1	4	4	3
Halidrys siliquisa														1		
Hildenbrandia rubra		1				1							1		2	2
Laminaria digitata						1									2	1
Lithothamnion glaciale		1														
Palmaria palmata													1	1		
Phycodrys rubens															1	
Phymatolithon lenormandii	1	2			1	1							1	1	2	2
cf. Phyllophora crispa	1	1											1			
Polyides rotunda														1		
Rhodophyta indet													1			
Saccharina latissima													3	1	1	
Ulva intestinalis																2
Vertebrata spp.															2	2

APPENDIX 5 SPECIES LIST INFAUNA

Hesselø	HES-1	HES-2	HES-3	HES-4	HES-5	HES-6	HES-7	HES-8	HES-9	HES-10	HES-11	HES-12	HES-13	HES-14	HES-15	HES-16
Oligochaeta				2		2		3							1	4
Halicryptus spinulosus		2														
Priapulus caudatus									1		1					
Ascidiacea			5													
Cephalochordata	18	37						41		1						
Actiniaria														1		
Cerianthus lloydii		1						2							1	1
Edwardsia	26	42		75	8	2		17		111	21	9		6	33	56
Pennatula phosphorea															1	
Virgularia mirabilis						1										
Nemertea	9	13	23	22	21	12	11	10	30	8	20	13	17	27	18	14
Phoronis	97	18	152	274	440	128	149	14	227	319	382	190	154	135	435	142
Platyhelminthes									1				1	1		
Golfingiidae		1		1	1	1	3	3				1				
Phascolion (Phascolion) strombus strombus							1					1	2			
Thysanocardia procera			1			1	2				4	2	3	9	4	3
Ampharete lindstroemi kompleks	2	1	7	8	12	4	10	1		5	12	7	5	7	9	8
Ampharetidae juv.			4										4	4		
Amphicteis gunneri														3	1	
Anobothrus gracilis		1		1	1		1		3		1	1	1	5	3	
Sosane wireni		1						1							9	1
Laetmonice							1						7		2	1
Apistobranchus tullbergi				4												
Heteromastus filiformis		3	20	3		7	2		28		1	2		8		
Mediomastus fragilis					2			10			3				2	12
Notomastus latericeus		2	21	5	21	7	19	1	9	4	26	37	23	24	75	9
Chaetopterus norvegicus		35		2			1	2							4	2
Chaetozone setosa kompleks	1	1	27	60	15	6	10		27	30	4	10	19	16	13	16

Cirratulus cirratus	2	2		1				4								
Dodecaceria concharum								3								
Tharyx killariensis				18	13	18	9	1	3	1	1	5	10	13	16	26
Dorvilleidae													1	1		
Bradabyssa villosa						1						4				
Diplocirrus glaucus			81	14	29	28	8		90	2	17	7	86	55	5	3
Glycera alba		1				2		1	1							
Glycera lapidum							1									
Glycera unicornis	3	5	11	2	8	9	7	7	13	1	12	6	5	11	5	8
Glyceridae juv.		3	2	7	6	2	12	28			7	10	6	9	3	3
Goniada maculata	8	2	2	2	4	1	7	2	1	4	10	6	3	5	7	7
Goniadidae juv.								7								
Oxydromus vittatus			6		3	3	2			1	3	4	1	1		1
Abyssoninoe hibernica						1								3		
Magelona alleni	3			6				2				2		1	1	4
Magelona minuta	2	6	58	51	162	91	76	2	32	20	37	54	50	35	13	24
Clymenella cincta							2								2	
Euclymeninae			2									3		2		
Maldane sarsi			2			1			2			1				
Praxillella affinis			6	1	9	5	37		8		16	18	18	27	2	1
Praxillella praetermissa			6			3			4				5		4	
Praxillura longissima							2							3	1	
Rhodine gracilior			1		3	2	4		2		12	7	2	1		
Rhodine loveni				1	2							1				
Nephtys juv.	2	3	3					10					1			1
Nephtys assimilis										1						
Nephtys caeca	2															
Nephtys hombergii	1	2	1	5	5		7			2	1	2	2			3
Nephtys hystricis											2					
Nephtys incisa	3		6			25			4				1	3		
Nephtys kersivalensis										1				1		
Nephtys longosetosa		1														
Nereididae								1			1					

Ophelia borealis	3	10						6								
Ophelina acuminata				1	1					2		2	1			2
Orbinia sertulata					1									1		
Scoloplos armiger	19	5		54		1	1	24		36	2		1		32	73
Galathowenia oculata			3				1	4	4			3	4	6		1
Owenia		1		1	2					1	2	7	3		2	1
Aricidea																1
Aricidea (Acmira) catherinae							1								1	
Aricidea (Strelzovia) suecica								8								
Levinsenia gracilis			5		8	15	16	1	14		4	2	23	13		
Paradoneis															3	
Paraonidae								6								
Amphictene auricoma	4	2	20	35	45	5	29		24	14	31	19	18	35	51	18
Cistenides hyperborea			10		3	2			12			2	2			
Lagis koreni	2													2		
Pectinariidae juv.			3			1			1							
Pholoe baltica	2	19	15	114	72	18	30	6	22	19	52	44	32	22	90	143
Pholoe pallida			5		1	5			11			2	4	4		
Eteone	1	3		5			2	3		1				1	3	4
Eulalia					2	2						1			1	
Eumida			2	1			2		2	6			1		1	
Hypereteone foliosa																1
Phyllodoce groenlandica	1	1	1						1		1					
Phyllodoce rosea			1		2	3	3		2		2	2	2			
Sige fusigera			2													1
Glyphohesione klatti			5		3	4			1				1		2	
Poecilochaetus serpens	2	2		1		1		1		3	1				1	4
Enipo					1								1			
Gattyana cirrhosa				2										1		
Polynoidae juv.		5	3	7		4	8	21	1	1	3	1	1	1	8	9
Chone							1			1						
Jasmineira caudata		3						10							2	1
Sabellidae	3				1	1					1					1

Polyphysia crassa									1							
Scalibregma inflatum					1	1					1			1		4
Hydroides norvegica	1															
Pisione remota		8						2								
Sthenelais limicola					5	3	7		2	4		2			3	2
Sphaerodorum					1							1		2		
Aonides paucibranchiata								2								
Dipolydora	3	1			1			6			5	1				
Laonice					2									1		
Prionospio		7			3	3	9	40			2				3	7
Prionospio dubia						4								1		
Prionospio fallax	4	1	102	76	204	125	108		78	27	75	54	78	87	24	67
Prionospio multibranchiata			12		7	2			12		1	4	5	5	1	1
Pseudopolydora nordica	1		4	1	1	7	3					4	6	30	2	
Pseudopolydora pulchra						1										
Scolelepis korsuni	1	3	4			2		5					3			
Spio	38	1		4				10	1	14	4	3			6	3
Spiophanes bombyx		2		2	2			6		1	1					
Spiophanes kroyeri			27	3	28	48	41	1	10	7	27	50	35	52	11	5
Exogone naidina	1							3		1	2	2				
Parexogone hebes	2							27								
Sphaerosyllis hystrix								2							1	2
Syllidae								1								
Artacama proboscidea			1		1	7							2			
Lysilla loveni							2			1	1		1			
Pista		13	1				1	10						2		
Polycirrus		42	1		1	4	2	2	2	2	3	3	2	3	1	1
Travisia forbesii	4															
Terebellides			38	2	5	9	5		27		3	2	8	15	2	2
Trichobranchus roseus			12	3	15	8	16		13		20	12	7	10	11	3
Cirripedia	11		71				1	2	5		10	5	1	15		9
Acidostoma obesum	5	1					2				2			1		
Ampelisca brevicornis	1	3		7	1	1	1			1	1	1			2	3

Ampelisca tenuicornis	35	13	7	14	14	28	16	16	13	7	5	7	11	15	9	3
Amphilochus manudens									1							
Paramphilochoides odontonyx															1	
Autonoe longipes	1	3			1	1	6	25		5	2	3	2	1	2	1
Astacilla dilatata			2					1		1	3			2	13	2
Argissa hamatipes	2		2			1	2	9			3		2		5	4
Bathyporeia elegans	17			2				5		1					5	
Caprellidae				7	1		1	4		2	1				25	6
Cheirocratus assimilis		1														
Natatolana borealis															1	1
Crassicorophium crassicorne		1											1	1		
Leptocheirus pilosus		90					1	58								
Diastylis rathkei			1				4		6		2	2	4	2	1	1
Diastyloides biplicatus								1								
Diastyloides serratus			43			11	6	1	19		1		15	2	2	
Dulichia		2											1			
Eriopisa elongata			1			3	1						1			
Ischyrocerus megacheir															1	
Parajassa pelagica	31	8	9	13	49	20	13	3	12	9	18	6	11	7	7	2
Eudorella emarginata			3			1			7		1			1		
Eudorella truncatula				1		10	12			1	3	5	1		1	
Leucothoe lilljeborgi		9	10		11	11	4	6	3	3	3	8	5	3	3	3
Hippomedon denticulatus				1				2							1	
Tryphosella nanoides								3		1						
Tryphosites longipes					1			2								1
Nebalia bipes				1								4		1		
Monoculodes								1								
Perioculodes longimanus			3	3	1	2	1		4	4	1	2	1	2		4
Synchelidium haplocheles		1		3	1						1	3				
Synchelidium tenuimanum								1							1	1
Westwoodilla caecula						1						1	3	2	1	
Paguridae														1		
Megamphopus cornutus	2	4	4					6								

Harpinia antennaria				2	25		21	2	5	11	5	1	3	1	5	3
Harpinia plumosa			1													
Paraphoxus oculatus								4								
Processa canaliculata									3		1	1				1
Pseudocuma			1											1		1
Urothoe elegans	10	74		1				58								
Centraloecetes kroyeranus	1	1						1		1						
Cheirocratus sundevallii		3					1	1	2				3			
Nototropis vedlomensis		3		1						1						
Asteroidea juv.			1													
Echinoidea juv.	5	39			14			15								
Ophiuroidea juv.	2	5	28	44	3	15	9	2	7	26	5	8	3	9	15	116
Amphiura chiajei			15			30	3		1				7	7		
Amphiura filiformis	7	25	144	300	327	131	289	1	308	99	267	372	261	197	324	243
Brissopsis lyrifera			3		1	1	3	1				2	2			
Echinocyamus pusillus	49	70		3				62		9					6	6
Echinocardium cordatum	5	1	3	4	5			2		7	5	2			1	2
Ophiocten											1					
Psolus	1															
Leptosynapta			1													
Caudofoveata			2		2	2	6		8		4	2	6	8		
Polyplacophora juv.		1														
Acteon tornatilis																1
Aporrhais pespelecani											1					
Arctica islandica	2	3						5	3	1	2	2	6	6	1	1
Arctica islandica juv.					2		1			2	1	3	1	2		1
Astarte montagui								3								
Acanthocardia echinata				1										1		
Parvicardium pinnulatum															1	
Bittium reticulatum														1		
Cuspidaria cuspidata			1										2			
Cylichna cylindracea	4		10	24	32		8		8	9	13	17	3		5	17
Antalis entalis														1	1	

Peringia cf. ulvae											1					
Hyala vitrea			16		1	1	6		22		1	3	7	4	1	
Leptochiton asellus		33						5		2						
Lucinoma borealis															2	
Lyonsia norwegica													1			
Spisula subtruncata	2						2							1		
Oenopota		1		1				1			1	1				
Kurtiella bidentata	10	2	92	123	139	19	159	1	155	108	164	114	80	80	102	125
Tellimya ferruginosa	2				1		2			5	1	6			1	
Tellimya tenella			19		2	5	3	1	2			1	10			
Mya arenaria						1	1			1	2					
Crenella decussata								6								
Euspira nitida	3	2		1	1		2	2						4		
Naticidae juv.		2														
Ennucula tenuis			26	9	12		20	2	43	3	23	7	9	8	2	1
Nucula nucleus	1		108	40	50	21	49	2	120	53	118	100	115	63	20	16
Cochlodesma praetenue	8							37		1						1
Phaxas pellucidus		2	1	4	3		2	1		4	2	4		2	5	2
Philinidae	2	2	1			2	1	4					1		1	
Gari fervensis	2			2				2		1	1				2	1
Ondina				1												
Pyrgiscus rufescens				4	6		1				5	2	1		1	
Retusa umbilicata				1		2	14		1		4	4	3	3		
Abra nitida		1	70	1	7	28	18		36	1	3	16	56	55	1	
Abra prismatica		1						1						2	1	
Fabulina fabula	14								1	19						
Limecola balthica	5										1					
Thracia convexa			7			1	5		5		6	4	10	1	3	
Thracia phaseolina	7	7						6		3					3	9
Thyasira flexuosa	5		21	72	44	4	11	1	35	63	40	12	10	15	36	47
Chamelea striatula	1		3	1	1		1			3	1					1
Dosinia lupinus				1	4			1					3	1	2	2
Mysia undata									1		4				1	3

Timoclea ovata	1	2						1								
Papillicardium minimum			3				1							1		
Parathyasira equalis						4			5							
Pyrgiscus jeffreysii							1							1		
Varicorbula gibba	1		31	22	18	14	13		25	6	17	16	26	24	3	30

Hesselø ECC	**HESC-1**	**HESC-2**	**HESC-3**	**HESC-4**	**HESC-5**	**HESC-6**	**HESC-7**	**HESC-8**	**HESC-9**	**HESC-10**	**HESC-11**	**HESC-12**	**HESC-13**	**HESC-14**
Oligochaeta				1								1	1	3
Priapulus caudatus											1			
Cephalochordata													1	2
Edwardsia	5	14	1	1	1	8		1	5	2	2	42	16	2
Virgularia mirabilis	1						1				1			
Nemertea	11	13	9	5	11	7	4	16	6	20	11	8	6	1
Phoronis	363	150	27	140	88	263	203	225	345	333	570	521		
Golfingia (Golfingia) vulgaris vulgaris			3			1		1	1					
Golfingiidae		1	12		3	1	1		1					
Phascolion (Phascolion) strombus strombus												1		
Thysanocardia procera	4	8	5	6	6	6	5	2	2	3	5	1		
Onchnesoma steenstrupii steenstrupii			2											
Ampharete lindstroemi kompleks	7	7	8	2	6	5	2	1		4	4	2		
Ampharetidae juv.		3			2									
Amphicteis gunneri		6	3				1	1		1				
Anobothrus gracilis	1	7	5		3	5		6	3	7	6	4		
Sosane wahrbergi		1												
Aphrodita aculeata	1				1	3			1					
Heteromastus filiformis	2	2	2	3	4	2	16	3	2	1	1			
Mediomastus fragilis	10	29	58		3	7		7	6	25	6	5	23	13
Notomastus latericeus	21	16	29		8	22	6	7	15	20	13	13		
Chaetopterus norvegicus							2	1	1	1				
Spiochaetopterus							1							

Aphelochaeta													2	
Chaetozone setosa kompleks	13	7	15	9	19	16	19	26	22	20	1	17	3	81
Cirratulus caudatus					1		2							
Cirratulus cirratus												1		
Tharyx killariensis	16	8	36	22	22	4	25	69	9	5	1	54	79	77
Protodorvillea kefersteini													136	17
Bradabyssa villosa			2			3		1		2	1	2		
Diplocirrus glaucus	27	19	17	52	28	30	44	40	45	27	18	4	1	
Glyceridae juv.	7	7	13			5		19		18	14	20	1	
Glycera alba	1	4	7				3	3	14	5		4		
Glycera lapidum													16	
Glycera unicornis	8	6	11	8	21	13	13	6	7	7	2	3		
Glycinde nordmanni				1				1						
Goniada maculata		2	3		4	3	8	2	3	3	2	16		
Goniada norvegica	4													
Microphthalmus														1
Nereimyra punctata		1												
Oxydromus vittatus	2	1	1		1	3	3	1	7	2	7	3		
Podarkeopsis helgolandicus		1				3		1				1		
Abyssoninoe hibernica					1									
Lumbrineris		1												
Magelona alleni		1			2			2	1		1	1		
Magelona minuta	36	33	48	33	26	26	57	88	100	75	69	80		
Clymenura		3				1				3	2			
Euclymeninae		1	1						2					
Lumbriclymene						2					1	1		
Maldane sarsi			1			2	3	4		1	5			
Maldanidae juv.						4								
Nicomache		2	4											
Notoproctus			1			1								
Praxillella affinis	28	18	45	6	18	44	8	25	55	21	18			
Praxillella praetermissa	2	4		3	6	7	3	4	7	14	3	7		
Rhodine gracilior	2									1	5	9		

Rhodine loveni				1			1							
Nephtys juv.												1		1
Nephtys ciliata	2		1						1					
Nephtys hombergii	2							2	1	1	4	1		
Nephtys incisa			1	34	8	2	9	8	5					
Nephtys longosetosa														1
Nephtys pente		1												
Ophelia borealis													7	
Ophelina acuminata	1	1	4	1	3	4	1	4			1	2		
Orbinia sertulata	1			1					1					
Orbiniidae juv.	1													
Scoloplos armiger										1		23	29	272
Galathowenia oculata	1	5	1	3	2	5	3	6		1	2	3		
Owenia	1	4	7						1		1	2		
Levinsenia gracilis	9	18	20	18	16	11	13	31	21	20	13	15		
Paradoneis lyra	1	2												
Amphictene auricoma	8	19	17	2	2	13	6	4	6	21	3	32		
Lagis koreni		1												
Pectinaria belgica	1	1		3						2	1			
Pectinariidae juv.					1		1			1				
Pholoe baltica	29	42	92	20	27	30	7	30	42	50	30	95	2	1
Pholoe pallida	2	1	8	13	20	11	10	14	20	1	5	2	1	1
Chaetoparia nilssoni			1											
Eteone													6	13
Eumida	3	1	3		2	3	4	1	4	3	4	2		
Hypereteone foliosa												1	3	
Phyllodoce groenlandica	1												3	
Phyllodoce rosea	2	1	1		1	1	6	1	3		1			
Sige fusigera	1		1			1								
Glyphohesione klatti	3			3	3		7	6	2		1	1		
Sigalionidae					1		1		2					
Poecilochaetus serpens	1								1		1	1		
Bylgides			2											

Enipo elisabethae							1							
Gattyana cirrhosa		1	1		2		2	1	2				1	3
Polynoidae	1		2											2
Polynoidae juv.	1		3		1	1	4	1	1		2	1	8	7
Chone	1		13				1							
Euchone	1	1	1			2		3	1					
Jasmineira		1	8		1	3						2		
Polyphysia crassa	1	18	37							1				
Scalibregma inflatum		1										7	4	
Hydroides norvegica			3											
Pisione remota										1			392	3
Sthenelais limicola	1	2				2		2		3	3			
Sphaerodorum gracilis		1				1			2	1				
Aonides paucibranchiata													2	
Dipolydora		6	28			1				3		8	26	6
Laonice		1	2						1					
Prionospio	1			5	2		3	1	10	2		7	8	
Prionospio dubia		1		4	2	3	8	10	5					
Prionospio fallax	59	46	66	36	89	77	164	232	145	198	105	150		
Prionospio multibranchiata	6		3			2	2		1	3	2			
Pseudopolydora paucibranchiata	1	3	3	10	5	7	3	5	2	1	2	4		
Scolelepis				6	1									
Scolelepis korsuni							6	1	1					
Spio										2		13		
Spionidae juv.													4	
Spiophanes bombyx											2			
Spiophanes kroyeri	52	43	96	42	45	75	44	47	33	36	14	9		
Exogone verugera														1
Syllidae														1
Artacama proboscidea								1			7			
Lanice conchilega		4				1								
Lysilla loveni				1					1					

Pista		1	2											
Polycirrus	4	1	2	2		2	1	2	1	2		1		1
Thelepus cincinnatus			1											
Travisia forbesii	1													
Terebellides	22	17	22	11	16	15	12	12	29	17	3			
Trichobranchus roseus	16	17	6	7	5	17	3	11	13	18	3			
Trochochaeta multisetosa	1													
Cirripedia	1		12		11	109		42	5	51	3		37	46
Pycnogonida						1						1		
Acidostoma obesum	2	1		1	2	2				1		1		
Ampelisca brevicornis					1		1			2	1	5		
Ampelisca tenuicornis	9	14	39	12	17	14	6	23	25	10	5	6		
Paramphilochoides odontonyx												1		
Autonoe longipes	1		2		4	1	5		5	4	1	1	1	
Astacilla dilatata		4								1		1	1	
Argissa hamatipes	1			1		2		1	2	1	4	1	2	
Atelecyclus rotundatus		2												
Phtisica marina			1									1	1	1
Crassicorophium crassicorne	1	2	2			1				1	2			
Diastylis rathkei	5	5	5	11	9	7	15	6	18	4	4	6		
Diastyloides biplicatus				1	2	1	1		1					
Eriopisa elongata		2		1	5				3					
Gnathia oxyuraea			3											
Parajassa pelagica	10	77	11	12	6	6	4	12	13	8	4	3	10	17
Hemilamprops roseus				1										1
Eudorella emarginata	2		1	2		4	7	2	12	1				
Eudorella truncatula	1	1		3				1	4	3	9			
Leucothoe lilljeborgi	11	6	1	8	1	5	4	4	7	1	4	3	1	
Perioculodes longimanus	1	1		1		1	3	1	2	4	2	2		
Synchelidium tenuimanum						1						4		
Westwoodilla caecula	1	1		2		4	1	1	4	1		1		
Paguridae	1												1	
Megamphopus cornutus						1	1	4			1			

Harpinia antennaria		4			3	1		1	5	3				
Harpinia crenulata								2	4					
Polybius henslowii			2											
Processa canaliculata				2				5	3					
Pseudocuma										1	2	2	1	
Cheirocratus sundevallii	1			1	1	4		1		2		2	9	
Nototropis vedlomensis		2											2	
Ophiuroidea juv.	41	10	15	29	4	28	9	11	6	13	7	13	2	
Amphiura chiajei	7	51	141	51	26	8	15	9	8	15	4			
Amphiura filiformis	160	125	86	76	119	206	62	153	327	205	174	216		1
Brissopsis lyrifera		3		1	1	1		2	2	1	2			
Leptopentacta elongata										1				
Echinocyamus pusillus	1											2	48	
Echinocardium cordatum											1	3		
Ophiothrix fragilis			30											
Ophiura albida		9	10			1				6	2			
Ophiura robusta			5											
Psolus			3											
Leptosynapta	1							2						
Caudofoveata	2				2		4	2	5	8	4	2		
Heteranomia squamula			1											
Arctica islandica			1		1			4		2	2	2		
Arctica islandica juv.	2	2		1		1			1		1			
Astarte montagui		1										2	22	
Astarte sulcata		1												
Parvicardium pinnulatum													2	
Cylichna cylindracea	8	4	2	1	4	5	1	5	9	3	6	9		
Hiatella arctica			3			1								
Hyala vitrea		6	1	9	6	5	11	10	1	5	4	6		1
Iothia fulva		1	1											
Leptochiton asellus		4	5										16	
Lucinoma borealis												1		
Spisula subtruncata	1			1	1					1		1		

Kurtiella bidentata	36	39	80	12	18	46	27	43	37	99	79	228	3	2
Tellimya ferruginosa				2		5			3			4		
Tellimya tenella		8			3		1	8	1		4			
Mya arenaria		3												
Euspira nitida		2	3				1	1		1				
Ennucula tenuis	1	3	2	3	3	5	13	9	3	7	3	1		
Nucula nucleus	12	29	47	4	14	5	37	39	37	59	25	50		
Palliolum tigerinum		2												
Cochlodesma praetenue													2	
Phaxas pellucidus	3	6	1		4	2		6	1	2	2	2		
Philinidae	1					2			2			2	1	2
Eulimella						1								
Odostomia unidentata			3											
Pyrgiscus rufescens						1								
Retusa umbilicata	10	6	2		2	17	6	2	2	13	6	7	1	
Abra alba								1						
Abra nitida	21	33	15	22	58	27	84	74	30	24	18	5		
Fabulina fabula														1
Macoma calcarea														1
Thracia convexa	8	3			3	9	4	3	4	4	6			
Thracia phaseolina												1		
Thyasira flexuosa	20	10	5	4	12	17	21	22	5	19	24	11		
Chamelea striatula	2											2		
Dosinia lupinus				1		1					1			
Mysia undata		1					1					2		
Timoclea ovata						1						1		
Papillicardium minimum		2	4	2		1	1							
Parathyasira equalis								1						
Varicorbula gibba	11	5		8	9	7	6	9	4	5	6	11	2	1

APPENDIX 6 BIOMASS RESULTS

Hesselø OWF area

Group	Species	HES-1	HES-2	HES-3	HES-4	HES-5	HES-6	HES-7	HES-8	HES-9	HES-10	HES-11	HES-12	HES-13	HES-14	HES-15	HES-16
Varia	Oligochaeta				0,001		0,0015		0,001875							0,000625	0,0005
Varia	Halicryptus spinulosus		0,0623889														
Varia	Priapulus caudatus									0,01425		0,0085					
Varia	Ascidiacea			0,03275													
Varia	Cephalochordata	0,216	1,9825833						0,9342143		0,0294563						
Varia	Actiniaria														3,5955		
Varia	Cerianthus lloydii		0,003625						0,004							0,003625	0,00525
Varia	Edwardsia	0,1308125	0,413		0,31875	0,01	0,03125		0,07735		0,9167069	0,162	0,046125		0,0165	0,078375	0,3145882
Varia	Pennatula phosphorea															1,00525	
Varia	Virgularia mirabilis						0,90825										
Varia	Nemertea	0,2655	0,26325	0,3170714	0,1309	1,2714167	0,072	0,204875	0,0741667	0,432	0,117	0,630625	0,5210833	0,0255	0,12825	5,146875	0,086625
Varia	Phoronis	17,8383	1,25775	3,24216	18,92381	28,365806	4,8380952	10,633323	0,723625	6,123325	37,435375	25,297082	18,305972	5,1071731	6,8407031	34,2315	17,387111
Varia	Platyhelminthes									0,17775				0,17775	0,17775		
Varia	Golfingiidae		0,023375		0,023375	0,023375	0,023375	0,12675	0,0135				0,023375				
Polychaeta	Phascolion (Phascolion) strombus strombus							0,11375					0,11375	0,2275			
Polychaeta	Thysanocardia procera			0,0268854			0,0268854	0,0537708				0,068	0,0537708	0,0806563	0,388125	0,0896667	0,075
Polychaeta	Ampharete lindstroemi complex	0,011	0,00505	0,04725	0,0404	0,0415	0,0202	0,0505	0,00505		0,055	0,113	0,041125	0,00375	0,01225	0,018	0,032
Polychaeta	Ampharetidae juv.			0,003										0,00025	0,012		
Polychaeta	Amphicteis gunneri														0,36075	0,12025	
Polychaeta	Anobothrus gracilis		0,05275		0,0455	0,01175		0,0367143		0,333		0,0367143	0,0367143	0,00625	0,08125	0,0405	
Polychaeta	Sosane wireni		0,012						0,012							0,108	0,012
Polychaeta	Laetmonice							0,00255						0,01785		0,0051	0,00255
Polychaeta	Apistobranchus tullbergi				0,01												
Polychaeta	Heteromastus filiformis		0,01875	0,123	0,00975		0,0447611	0,0127889		0,2527778		0,003	0,0235		0,0426667		
Polychaeta	Mediomastus fragilis					0,0095			0,0025			0,009				0,004625	0,015
Polychaeta	Notomastus latericeus		0,0045	0,165375	0,2978868	3,215625	0,4170415	4,68635	0,00875	0,08325	0,2383094	0,6232778	4,0750455	0,399625	1,14	1,9663043	0,5361963
Polychaeta	Chaetopterus norvegicus		7,9634722		0,3341389			0,13475	0,084							1,056	0,3341389
Polychaeta	Chaetozone setosa complex	0,004847413	0,0048474	0,0429107	0,206875	0,02625	0,07275	0,055		0,0599063	0,3075	0,037	0,0883333	0,0184063	0,0225	0,0455	0,0333333
Polychaeta	Cirratulus cirratus	0,0105	0,0091667		0,0065				0,008								
Polychaeta	Dodecaceria concharum								0,0225								
Polychaeta	Tharyx killariensis				0,02025	0,00585	0,02025	0,00975	0,001	0,00355	0,0011833	0,0011833	0,005	0,0133333	0,0200417	0,0384	0,02015
Polychaeta	Dorvilleidae													0,0015	0,0011833		
Polychaeta	Bradabyssa villosa						0,00925						0,02775				
Polychaeta	Diplocirrus glaucus			0,91692	0,6601	0,3389375	0,299	0,006		1,4462069	0,244	0,1090833	0,147875	0,4596552	0,5683333	0,24	0,153
Polychaeta	Glycera alba		0,11275				0,2255		0,11275	0,11275							
Polychaeta	Glycera lapidum							0,0056875									
Polychaeta	Glycera unicornis	0,586185	0,01375	0,1375	0,0265	0,041	0,29625	4,8078333	0,1248333	19,29265	0,01075	0,639	0,05125	1,9366667	2,1395	0,0641667	0,054
Polychaeta	Glyceridae juv.		0,01575	0,0065	0,01925	0,0135	0,0071864	0,0468	0,091			0,044625	0,0375	0,02175	0,018375	0,0107795	0,0075
Polychaeta	Goniada maculata	0,318	0,0202372	0,0025	0,0125	0,027	0,0101186	0,04025	0,003	0,003	0,0785	0,1925	0,015	0,0303558	0,07875	0,05425	0,0169167
Polychaeta	Goniadidae juv.								0,0175								
Polychaeta	Oxydromus vittatus			0,0045		0,0514375	0,11025	0,003			0,00325	0,008625	0,0685833	0,0171458	0,05775		0,0171458
Polychaeta	Abyssoninoe hibernica						0,07875								0,23625		
Polychaeta	Magelona alleni	0,1335			0,0075				0,005				0,1775		0,02845	0,02845	0,021
Polychaeta	Magelona minuta	0,00025	0,0077872	0,02175	0,0591136	0,0859592	0,0990294	0,029	0,0025957	0,016	0,0207143	0,0531875	0,0970313	0,0554688	0,048125	0,07475	0,0076667
Polychaeta	Clymenella cincta							6,258								6,258	
Polychaeta	Euclymeninae			0,001									0,0015		0,001		
Polychaeta	Maldane sarsi			0,2795			0,13975			0,2795			0,13975				
Polychaeta	Praxillella affinis			0,15975	0,1166546	0,786375	0,7075	1,739		0,3045		0,2089333	1,48725	0,5427	3,90555	1,111	0,1166546

Group	Species	HES-1	HES-2	HES-3	HES-4	HES-5	HES-6	HES-7	HES-8	HES-9	HES-10	HES-11	HES-12	HES-13	HES-14	HES-15	HES-16
Polychaeta	Praxillella praetermissa			2,454			2,61			2,558				3,1975		2,558	
Polychaeta	Praxillura longissima							0,014							0,578625	0,37875	
Polychaeta	Rhodine gracilior			0,0182344		0,027	0,0364688	0,019		0,0364688		0,58725	0,07175	0,0364688	0,0182344		
Polychaeta	Rhodine loveni				0,1645	0,329							0,1645				
Polychaeta	Nephtys juv.	0,0155	0,0405	0,00675					0,0925					0,0081875			0,0081875
Polychaeta	Nephtys assimilis										1,1325						
Polychaeta	Nephtys caeca	2,64325															
Polychaeta	Nephtys hombergii	0,27175	2,9525	0,5995417	2,9977083	2,9977083		1,413125			1,1990833	0,5995417	0,712	1,5415			1,561875
Polychaeta	Nephtys hystricis											0,641					
Polychaeta	Nephtys incisa	0,54275		0,66			4,5375			1,005				0,1809167	0,54275		
Polychaeta	Nephtys kersivalensis										0,1305				0,1305		
Polychaeta	Nephtys longosetosa		0,0155														
Polychaeta	Nereididae								0,0035			0,0035					
Polychaeta	Ophelia borealis	0,2475	1,9725						1,0645								
Polychaeta	Ophelina acuminata				0,04325	0,03575					0,096125		0,096125	0,0495			0,1275
Polychaeta	Orbinia sertulata					2,10875									0,2915		
Polychaeta	Scoloplos armiger	0,2033	0,0465251		0,1266429		0,0065	0,009305	0,3732		0,4303636	0,01861		0,00225		0,4613333	0,7828289
Polychaeta	Galathowenia oculata			0,01865				0,00025	0,013	0,0248667			0,0075	0,066	0,053		0,0062167
Polychaeta	Owenia		0,4838		0,00975	2,914					0,0065	0,9676	3,3866	1,4514		0,0125	0,9395
Polychaeta	Aricidea																0,00325
Polychaeta	Aricidea (Acmira) catherinae							0,00125								0,0015	
Polychaeta	Aricidea (Strelzovia) suecica								0,012								
Polychaeta	Levinsenia gracilis			0,0025		0,0067841	0,0125	0,0111111	0,000848	0,0245		0,004	0,001696	0,0220417	0,0026		
Polychaeta	Paradoneis															0,0045	
Polychaeta	Paraonidae								0,009								
Polychaeta	Amphictene auricoma	0,0275	0,047	0,6325	2,9410938	1,1803125	0,0825	0,6782045		2,136	0,4013333	0,7445167	0,3630357	1,2105	1,8502885	0,7600962	0,315
Polychaeta	Cistenides hyperborea			0,4375		0,7935469	0,095			5,36775			0,5290313	1,039			
Polychaeta	Lagis koreni	0,926													0,926		
Polychaeta	Pectinariidae juv.			0,003			0,001			0,001							
Polychaeta	Pholoe baltica	0,006	0,133	0,066875	0,3387115	0,0878824	0,06225	0,02775	0,015	0,04895	0,10545	0,0754	0,05775	0,056	0,05225	0,1585227	0,3983571
Polychaeta	Pholoe pallida			0,01125		0,00975	0,0125			0,105875			0,01175	0,018	0,0265		
Polychaeta	Eteone	0,003083333	0,00075		0,0154167			0,0061667	0,00925		0,0030833				0,0030833	0,004	0,028
Polychaeta	Eulalia					0,00825	0,0035						0,0029375			0,0029375	
Polychaeta	Eumida			0,0045	0,0147656			0,03275		0,0055	0,226125			0,0147656		0,0147656	
Polychaeta	Hypereteone foliosa																0,0015
Polychaeta	Phyllodoce groenlandica	0,2485	0,2485	0,2485						0,2485		0,2485					
Polychaeta	Phyllodoce rosea			0,00075		0,0055833	0,008375	0,011625		0,009		0,008	0,00075	0,00575			
Polychaeta	Sige fusigera			0,006													0,003
Polychaeta	Glyphohesione klatti			0,01125		0,0075	0,005			0,00225				0,001		0,0085	
Polychaeta	Poecilochaetus serpens	0,005583333	0,0055833		0,0027917		0,0027917		0,0027917		0,007875	0,0027917				0,00225	0,014
Polychaeta	Enipo					0,142								0,142			
Polychaeta	Gattyana cirrhosa				0,402										0,201		
Polychaeta	Polynoidae juv.		0,0396875	0,0059653	0,00875		0,011167	0,0046667	0,0105	0,001	0,0019884	0,00525	0,0019884	0,001	0,0019884	0,008	0,025875
Polychaeta	Chone							0,0109444			0,0109444						
Polychaeta	Jasmineira caudata		0,00675						0,00875							0,0001	0,0015
Polychaeta	Sabellidae	0,102				0,00425	0,0225					0,02025					0,02025
Polychaeta	Polyphysia crassa									0,939							
Polychaeta	Scalibregma inflatum					0,0004375	0,0005					0,0004375			0,0004375		0,0015

Group	Species	HES-1	HES-2	HES-3	HES-4	HES-5	HES-6	HES-7	HES-8	HES-9	HES-10	HES-11	HES-12	HES-13	HES-14	HES-15	HES-16
Polychaeta	Hydroides norvegica	0,03125															
Polychaeta	Pisione remota		0,0056667						0,0014167								
Polychaeta	Sthenelais limicola					0,2775	0,1635	0,301		0,2298	0,4596		0,2298			0,23475	0,6865
Polychaeta	Sphaerodorum					0,00125							0,00125		0,0025		
Polychaeta	Aonides paucibranchiata								0,0055								
Polychaeta	Dipolydora	0,007547222	0,0025157			0,0025157			0,00025			0,0125787	0,0025157				
Polychaeta	Laonice					0,0375									0,01875		
Polychaeta	Prionospio		0,0011667			0,0024063	0,0024063	0,00025	0,00875			0,0015				0,00675	0,004375
Polychaeta	Prionospio dubia						0,093								0,02325		
Polychaeta	Prionospio fallax	0,003705885	0,0009265	0,0940667	0,085087	0,2073443	0,1371528	0,0532286		0,0791471	0,027	0,1015086	0,0926036	0,0288261	0,1119485	0,0102857	0,0817794
Polychaeta	Prionospio multibranchiata			0,0294		0,0120042	0,0034298			0,026		0,00175	0,0068595	0,0021875	0,00725	0,0005	0,00325
Polychaeta	Pseudopolydora nordica	0,001		0,00325	0,013	0,0054375	0,0380625	0,0163125					0,0295	0,006	0,06	0,008	
Polychaeta	Pseudopolydora pulchra						0,006										
Polychaeta	Scolelepis korsuni	0,00975	0,02925	0,039			0,0195		0,07125					0,01575			
Polychaeta	Spio	0,248357143	0,0045019		0,0215				0,0508333	0,00275	0,0349375	0,0143333	0,00075			0,0585	0,0135056
Polychaeta	Spiophanes bombyx		0,027375		0,01525	0,0035			0,03375		0,0136875	0,03975					
Polychaeta	Spiophanes kroyeri			0,22275	0,078	0,198	0,4392	0,3882188	0,084	0,05875	0,042	0,4412813	0,2903846	0,4272917	0,3192222	0,1276	0,18125
Polychaeta	Exogone naidina	0,00075							0,003375		0,001125	0,00225	0,003				
Polychaeta	Parexogone hebes	0,0015							0,0042955								
Polychaeta	Sphaerosyllis hystrix								0,00025							0,00025	0,0005
Polychaeta	Syllidae								0,0025157								
Polychaeta	Artacama proboscidea			0,628		0,4245	1,84625							0,8775			
Polychaeta	Lysilla loveni							0,72225			0,227	0,49525		0,361125			
Polychaeta	Pista		0,2968333	0,94075				0,3226111	0,0425						0,6452222		
Polychaeta	Polycirrus		0,14175	0,0085		0,1035	0,427	0,0235	0,003	0,008	0,073925	0,0315	0,1108875	0,073925	0,02925	0,11	0,0369625
Polychaeta	Travisia forbesii	0,4794															
Polychaeta	Terebellides			0,3497188	0,0075	0,0325	0,44325	0,03375		1,4878125		0,1052047	0,02	0,029	0,09375	0,0701365	0,4005
Polychaeta	Trichobranchus roseus			0,33375	0,21825	0,39825	0,335	0,3648		0,3796		0,962	0,26775	0,154875	0,4716667	0,418	0,1087341
Mollusca	Abra nitida		0,00725	13,3	0,0848238	0,5937668	2,5046	1,9755		2,962125	0,0848238	0,2544715	1,58	6,6069231	3,613631	0,00225	
Mollusca	Abra prismatica		0,019						0,013375						0,02675	0,00775	
Mollusca	Acanthocardia echinata				0,215										0,215		
Mollusca	Acteon tornatilis																0,00475
Mollusca	Antalis entalis														0,03075	0,03075	
Mollusca	Aporrhais pespelecani											0,22575					
Mollusca	Arctica islandica	147,5	287,5						687,5	350	80	280	132,5	860	735	130	12,14775
Mollusca	Arctica islandica juv					0,1384		0,08675			0,1384	0,0692	0,0045	0,05425	0,007		0,2
Mollusca	Astarte montagui								0,246								
Mollusca	Bittium reticulatum														0,00125		
Mollusca	Caudofoveata			0,0825		0,0535	0,0535	0,1605		0,214		0,107	0,0535	0,1605	0,098		
Mollusca	Chamelea striatula	1,395		1,8925	0,4885	0,6308333		7,5			5,027	6,25					0,6308333
Mollusca	Cochlodesma praetenue	0,291							5,8521667		0,00625						0,2095
Mollusca	Crenella decussata								0,0165								
Mollusca	Cuspidaria cuspidata			0,25625										0,5125			
Mollusca	Cylichna cylindracea	0,127666667		0,05625	0,449	0,2906667		0,12		0,2006667	0,68625	0,2396875	0,238	0,094		0,020625	0,095625
Mollusca	Dosinia lupinus				1,4935625	11,7385			0,0525					4,4806875	1,4935625	2,987125	2,987125
Mollusca	Ennucula tenuis			1,17325	1,636875	0,1095		0,485	0,0035	2,16075	0,950625	1,3225	0,04025	0,567	0,111	0,1566042	0,17025
Mollusca	Euspira nitida	0,171	0,1575		0,07875	0,07875		0,036	0,3065						0,347		
Mollusca	Fabulina fabula	5,480125								1,5715	1,3620625						

Group	Species	HES-1	HES-2	HES-3	HES-4	HES-5	HES-6	HES-7	HES-8	HES-9	HES-10	HES-11	HES-12	HES-13	HES-14	HES-15	HES-16
Mollusca	Gari fervensis	0,007			0,19175				4,2864375		2,1432188	4,87675				7,1935	2,1432188
Mollusca	Hyala vitrea			0,116		0,00638	0,00638	0,01875		0,12155		0,00638	0,01875	0,04466	0,039	0,00638	
Mollusca	Kurtiella bidentata	0,031666667	0,0070576	0,250125	0,4855938	0,5339917	0,0486875	0,5380116	0,0035288	0,4011765	0,198	0,7692895	0,4746346	0,2027273	0,34625	0,4925526	0,6019022
Mollusca	Leptochiton asellus		1,3457206						0,19125		0,119						
Mollusca	Limecola balthica	0,15875										0,03175					
Mollusca	Lucinoma borealis															0,04875	
Mollusca	Lyonsia norwegica													0,089			
Mollusca	Mya arenaria						0,07575	0,07575			0,07575	0,1515					
Mollusca	Mysia undata									0,0055		0,424				0,1494167	1,01025
Mollusca	Naticidae		0,0195														
Mollusca	Nucula nucleus	0,03		13,118143	8,4988235	3,6085938	3,7365	1,2350227	0,3109034	15,120833	13,477143	12,999288	22,959259	17,603846	7,730625	0,6975	8,102
Mollusca	Oenopota		0,01675		0,04175				0,02925			0,02925	0,02925				
Mollusca	Ondina				0,00275												
Mollusca	Papillicardium minimum			0,1065				0,018							0,053		
Mollusca	Parathyasira equalis						0,0622			0,07775							
Mollusca	Parvicardium pinnulatum															0,02825	
Mollusca	Peringia ulvae											0,0045					
Mollusca	Phaxas pellucidus		0,2707639	0,1353819	0,2965	0,597		0,2707639	0,1353819		0,18	0,2707639	0,7163333		0,2707639	0,8966667	0,2715
Mollusca	Philinidae	0,0365	0,047	0,01825			0,0365	0,01825	0,052					0,01825		0,01825	
Mollusca	Polyplacophora		0,039775														
Mollusca	Pyrgiscus jeffreysii							0,00225							0,00225		
Mollusca	Pyrgiscus rufescens				0,0335	0,0465		0,0168125				0,089375	0,0665	0,0168125		0,0168125	
Mollusca	Retusa umbilicata				0,0031667		0,0055	0,0525		0,0031667		0,012	0,017	0,006	0,00975		
Mollusca	Spisula subtruncata	0,361						0,361							0,1805		
Mollusca	Tellimya ferruginosa	0,0295				0,00425		0,04007			0,289375	0,003	0,1218			0,020035	
Mollusca	Tellimya tenella			0,2234479		0,0235208	0,02875	0,00675	0,0117604	0,03975			0,0117604	0,1916667			
Mollusca	Thracia convexa			0,9961667			5	0,12375		0,065		0,2085	3,423	0,4291667	0,0135	0,0345	
Mollusca	Thracia phaseolina	0,076125	2,4187917						6,57525		1,036625					0,66525	0,483
Mollusca	Thyasira flexuosa	0,155349531		0,160125	5,1447857	1,408	0,008	0,319	0,0310699	0,35875	3,5978906	0,2833333	0,2052	0,1966667	0,15125	2,1111429	3,8489643
Mollusca	Timoclea ovata	0,08175	0,1635						0,08175								
Mollusca	Varicorbula gibba	0,027093353		2,9243333	0,5649286	0,49275	0,154	0,60125		0,8489583	0,1625601	0,257125	0,058	1,3754	0,231	0,006	0,0975
Echinodermata	Asteroidea juv.			0,0025													
Echinodermata	Echinoidea juv.	0,005104167	0,0398125			0,0142917			0,0153125								
Echinodermata	Ophiuroidea juv.	0,0015	0,001875	0,013475	0,0187	0,0014438	0,005625	0,0043313	0,0009625	0,0033688	0,0125125	0,0024063	0,00385	0,0014438	0,0043313	0,0072188	0,055825
Echinodermata	Amphiura chiajei			5,516625			11,03325	1,103325		0,367775				2,574425	2,574425		
Echinodermata	Amphiura filiformis	1,148583333	1,3289063	21,549257	52,735526	48,93477	26,929118	43,248161	0,1496476	46,091465	14,815114	39,955913	55,668913	39,058028	29,48058	48,485827	36,36437
Echinodermata	Brissopsis lyrifera			60,12975		8,026	25,85475	56,7432	10,79				31,728	59,716			
Echinodermata	Echinocyamus pusillus	0,588	2,1525		0,09075				1,5086667		0,219					0,146	0,146
Echinodermata	Echinocardium cordatum	107,76	31,40525	52,423313	53,5875	120,72167			49,3725		122,32106	81,7075	48,288667			19,089	23,276
Echinodermata	Ophiocten											0,108175					
Echinodermata	Psolus	46,835															
Echinodermata	Leptosynapta			0,34425													
Crustacea	Ampelisca brevicornis	0,0235	0,06075		0,167125	0,03175	0,023875	0,0295			0,023875	0,008	0,036			0,068	0,0525
Crustacea	Ampelisca tenuicornis	0,096923077	0,144625	0,0193846	0,056	0,4585	0,202	0,0443077	0,101	0,036	0,0193846	0,0138462	0,0193846	0,0304615	0,091875	0,0249231	0,0315
Crustacea	Amphilochus manudens									0,00025							
Crustacea	Paramphilochoides odontonyx															0,00025	
Crustacea	Autonoe longipes	0,00025	0,00075			0,00025	0,00025	0,00075	0,0020833		0,00125	0,0005	0,000375	0,00025	0,00025	0,0005	0,00025
Crustacea	Argissa hamatipes	0,0005		0,0005			0,00025	0,0005	0,001125			0,00075		0,0005		0,0003125	0,0005

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Crustacea	Astacilla dilatata			0,0005					0,00025		0,00025	0,00075			0,0005	0,00325	0,0005
Crustacea	Nototropis vedlomensis		0,00075		0,00025						0,00025						
Crustacea	Cheirocratus sundevalli		0,0255					0,0085	0,0085	0,017				0,0255			
Crustacea	Caprellidae				0,00175	0,00025		0,00025	0,0003333		0,0005	0,00025				0,00625	0,00075
Crustacea	Cheirocratus assimilis		0,00025														
Crustacea	Natatolana borealis															0,25	0,3025
Crustacea	Crassicorophium crassicorne		0,00025											0,00025	0,00025		
Crustacea	Centraloecetes kroyeranus	0,00025	0,00025						0,00025		0,00025						
Crustacea	Leptocheirus pilosus		0,3934756					0,0021087	0,1223043								
Crustacea	Diastylis rathkei			0,0145				0,058		0,087		0,029	0,029	0,058	0,0365	0,01575	0,0145
Crustacea	Diastyloides biplicatus								0,00025								
Crustacea	Diastyloides serratus			0,1370625			0,0350625	0,019125	0,0031875	0,0576786		0,0031875		0,0478125	0,006375	0,006375	
Crustacea	Megamphopus cornutus	0,0005	0,001	0,00025					0,0005								
Crustacea	Ischyrocerus megacheir															0,00025	
Crustacea	Parajassa pelagica	0,066536585	0,0171707	0,0163929	0,0176429	0,1051707	0,0429268	0,0279024	0,006439	0,0257561	0,0221786	0,0324643	0,012878	0,0236098	0,0150244	0,0150244	0,0042927
Crustacea	Eudorella emarginata			0,0435			0,0145			0,1015		0,0145			0,0145		
Crustacea	Eudorella truncatula				0,00025		0,0005	0,0015			0,00025	0,00075	0,00125	0,00025		0,00025	
Crustacea	Leucothoe lilljeborgi		0,036375	0,0404167		0,03465	0,0444583	0,0161667	0,02425	0,012125	0,012125	0,012125	0,0323333	0,0202083	0,012125	0,012125	0,012125
Crustacea	Acidostoma obesum	0,000416667	0,00025					0,0005				0,0005			0,00025		
Crustacea	Hippomedon denticulatus				0,00025				0,00025							0,00025	
Crustacea	Tryphosella nanoides								0,00075		0,00025						
Crustacea	Tryphosites longipes					0,04725			0,0945								0,04725
Crustacea	Eriopisa elongata			0,0135			0,0405	0,016						0,0135			
Crustacea	Nebalia bipes				0,00025								0,001		0,00025		
Crustacea	Monoculodes								0,00025								
Crustacea	Perioculodes longimanus			0,00075	0,00075	0,00025	0,0005	0,00025		0,0005	0,001	0,00025	0,0005	0,00025	0,0005		0,001
Crustacea	Synchelidium tenuimanum								0,00025							0,00025	0,00025
Crustacea	Westwoodilla caecula						0,0095						0,0095	0,0285	0,019	0,0095	
Crustacea	Synchelidium haplocheles		0,00025		0,00075	0,00025						0,00025	0,00075				
Crustacea	Paguridae														6,541		
Crustacea	Harpinia antennaria				0,0032	0,04		0,0336	0,0032	0,008	0,0176	0,008	0,0016	0,0048	0,0016	0,008	0,0048
Crustacea	Harpinia plumosa			0,00025													
Crustacea	Paraphoxus oculatus								0,0005								
Crustacea	Processa canaliculata									1,906125		0,05	0,015				0,037
Crustacea	Dulichia		0,0005											0,00025			
Crustacea	Bathyporeia elegans	0,056022727			0,0065909				0,0164773		0,0032955					0,0164773	
Crustacea	Pseudocuma			0,00025											0,00025		0,00025
Crustacea	Urothoe elegans	0,015	0,15355		0,0015				0,087								

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Group	Species	HESC-1	HESC-2	HESC-3	HESC-4	HESC-5	HESC-6	HESC-7	HESC-8	HESC-9	HESC-10	HESC-11	HESC-12	HESC-13	HESC-14
Varia	Oligochaeta				0,000875								0,00025	0,00025	0,0045
Varia	Priapulus caudatus											0,011375			
Varia	Cephalochordata													0,00075	0,0015
Varia	Edwardsia	0,0170833	0,0735	0,0015	0,0065166	0,0065166	0,0226667		0,0065166	0,02375	0,0045	0,0130331	0,3713182	0,3726667	0,0130331
Varia	Virgularia mirabilis	1,90275						2,83675				2,36975			
Varia	Nemertea	0,1375	0,4577083	0,0691071	0,02875	0,066	0,1089375	0,028	0,036	0,0255	0,103	0,0064167	0,1755	0,04875	0,0055
Varia	Phoronis	12,301074	5,9046875	0,93825	5,7161702	6,7290667	10,732067	5,5342056	6,2203125	12,147023	7,4533725	20,267124	20,922525		
Varia	Golfingia (Golfingia) vulgaris vulgaris			0,204			2,1675		2,8265	0,18025					
Varia	Golfingiidae		0,0024583	0,0295		0,007375	0,0024583	0,0024583		0,0024583					
Varia	Phascolion (Phascolion) strombus strombus												0,032		
Varia	Thysanocardia procera	0,0305	0,358	0,06875	0,2867556	0,4218	0,858	0,321875	0,0955852	0,134	0,039	0,0316667	0,0477926		
Varia	Onchnesoma steenstrupii steenstrupii			0,00375											
Polychaeta	Ampharete lindstroemi comlpex	0,01925	0,01155	0,0146667	0,0067741	0,021	0,008125	0,01	0,003387		0,028	0,0115	0,0085		
Polychaeta	Ampharetidae juv.		0,009			0,006									
Polychaeta	Amphicteis gunneri		0,7215	0,36075				0,12025	0,12025		0,12025				
Polychaeta	Anobothrus gracilis	0,0025	0,12775	0,07125		0,0105	0,07125		0,048	0,0585	0,01225	0,1185	0,12225		
Polychaeta	Sosane wahrbergi		0,00025												
Polychaeta	Aphrodita aculeata	0,939				0,00625	10,286125			0,00225					
Polychaeta	Heteromastus filiformis	0,01525	0,0215	0,01525	0,022875	0,055	0,002	0,08	0,022875	0,01525	0,007625	0,007625			
Polychaeta	Mediomastus fragilis	0,013	0,025375	0,0818214		0,00225	0,0155659		0,0589167	0,006	0,0760417	0,02475	0,01125	0,0124583	0,00975
Polychaeta	Notomastus latericeus	0,3185	2,4464	0,9991818		0,315	6,3899	0,138	0,14875	1,01175	0,8575	0,9383026	0,45305		
Polychaeta	Chaetopterus norvegicus							2,6365	1,31825	1,31825	1,31825				
Polychaeta	Spiochaetopterus							0,015125							
Polychaeta	Aphelochaeta													0,004	
Polychaeta	Chaetozone setosa complex	0,04225	0,05215	0,0365625	0,021375	0,0300833	0,0228571	0,0342	0,065	0,385	0,091875	0,0043508	0,0432083	0,0130525	0,38475
Polychaeta	Cirratulus caudatus					0,003		0,006							
Polychaeta	Cirratulus cirratus												0,0045833		
Polychaeta	Tharyx killariensis	0,045	0,004	0,023	0,0262778	0,03575	0,008	0,0109375	0,08625	0,01035	0,005	0,00475	0,0405	0,0755652	0,0625625
Polychaeta	Protodorvillea kefersteini													0,1226061	0,0038958
Polychaeta	Bradabyssa villosa			0,02375			0,035625		0,011875		0,02375	0,011875	0,02375		
Polychaeta	Diplocirrus glaucus	0,1388571	0,0536071	0,1312188	0,1542667	0,11725	0,2295	0,2038235	0,2333333	0,21375	0,30825	0,1697143	0,1203333	0,00075	
Polychaeta	Glyceridae juv.	0,042	0,0385826	0,1960833			0,027559		0,0700625		0,054	0,0357	0,055	0,0055118	
Polychaeta	Glycera alba	0,0687622	0,25	0,40075				0,09275	0,27825	0,4781875	0,675		0,2750486		
Polychaeta	Glycera lapidum													0,091	
Polychaeta	Glycera unicornis	2,452	3,873075	3,6421	7,765	7,32025	26,229667	24,334375	0,042	0,05075	2,72405	1,291025	0,616125		
Polychaeta	Glycinde nordmanni				0,00975				0,00975						
Polychaeta	Goniada maculata		0,1206143	0,009		0,2412286	0,00675	0,23	0,0425	0,38775	0,1809214	0,421	0,4344		
Polychaeta	Goniada norvegica	0,0605													
Polychaeta	Microphthalmus														0,0005
Polychaeta	Nereimyra punctata		0,0103125												
Polychaeta	Oxydromus vittatus	0,005	0,0340417	0,0340417		0,0340417	0,31275	0,174	0,0340417	0,23275	0,0680833	0,02275	0,009		
Polychaeta	Podarkeopsis helgolandicus		0,00525				0,046125		0,0103125				0,0103125		
Polychaeta	Abyssoninoe hibernica					0,07875									
Polychaeta	Lumbrineris		0,01175												
Polychaeta	Magelona alleni		0,005			0,01			0,01	0,005		0,005	0,005		

Group	Species	HESC-1	HESC-2	HESC-3	HESC-4	HESC-5	HESC-6	HESC-7	HESC-8	HESC-9	HESC-10	HESC-11	HESC-12	HESC-13	HESC-14
Polychaeta	Magelona minuta	0,0331875	0,01875	0,0825	0,03135	0,0455	0,0104	0,0502941	0,0733333	0,0428571	0,058125	0,0582188	0,1464865		
Polychaeta	Clymenura		0,00825				0,00275				0,00825	0,0055			
Polychaeta	Euclymeninae		0,0005	0,0005						0,001					
Polychaeta	Lumbriclymene						0,067					0,0335	0,0335		
Polychaeta	Maldane sarsi			0,32975			0,41	0,615	0,82		0,205	0,40125			
Polychaeta	Maldanidae juv.						0,009								
Polychaeta	Nicomache		0,0075	0,015											
Polychaeta	Notoproctus			0,015			0,015								
Polychaeta	Praxillella affinis	1,0808	0,24675	1,198125	0,0165	0,74175	1,2736429	0,147	0,5402778	1,0640385	0,2160577	0,383625			
Polychaeta	Praxillella praetermissa	0,0975	0,2073333		0,11625	0,5535	0,07175	0,38025	0,203	0,46725	2,1595	0,4315	0,5215		
Polychaeta	Rhodine gracilior	0,4615									0,13125	0,15875	1,18125		
Polychaeta	Rhodine loveni				0,1645			0,1645							
Polychaeta	Nephtys juv.												0,0005		0,0005
Polychaeta	Nephtys ciliata	0,789		0,3945						0,3945					
Polychaeta	Nephtys hombergii	1,052							1,052	0,526	0,526	2,104	0,526		
Polychaeta	Nephtys incisa			0,0145	2,1859167	1,215	0,4841	7,72425	0,9706667	1,21025					
Polychaeta	Nephtys longosetosa														0,0155
Polychaeta	Nephtys pente		0,01925												
Polychaeta	Ophelia borealis													1,2104167	
Polychaeta	Ophelina acuminata	0,0318125	0,0318125	0,089	0,0318125	0,0954375	0,12725	0,03775	0,113			0,0318125	0,078		
Polychaeta	Orbinia sertulata	4,1625			0,27375					2,218125					
Polychaeta	Orbiniidae juv.	0,2181													
Polychaeta	Scoloplos armiger										0,0169668		0,2084375	0,406	7,5719259
Polychaeta	Galathowenia oculata	0,0059464	0,02875	0,01375	0,009	0,0118929	0,020625	0,0135	0,027		0,0059464	0,012	0,0178393		
Polychaeta	Owenia	0,2181	0,0513333	4,0559167						0,2181		0,2181	0,1241		
Polychaeta	Levinsenia gracilis	0,0105	0,0118125	0,02	0,01575	0,0115556	0,0075625	0,0089375	0,0406875	0,0144375	0,0425	0,0124583	0,03		
Polychaeta	Paradoneis lyra	0,0005	0,001												
Polychaeta	Amphictene auricoma	0,2936473	1,3982813	0,1432857	0,0734118	0,0734118	0,01625	0,0045	0,1468237	0,387	1,603875	0,049875	1,668		
Polychaeta	Lagis koreni		0,463												
Polychaeta	Pectinaria belgica	1,1870625	1,1870625		7,033125						0,0595	1,1870625			
Polychaeta	Pectinariidae juv.					0,001		0,001			0,001				
Polychaeta	Pholoe baltica	0,0331429	0,0602	0,115	0,0325	0,0405	0,0320455	0,0135	0,0191667	0,054	0,0526786	0,0575	0,1908796	0,015	0,001898
Polychaeta	Pholoe pallida	0,0095	0,0041129	0,029	0,0125357	0,2575	0,03025	0,0085	0,0575813	0,0642857	0,0041129	0,019375	0,0082259	0,0041129	0,0041129
Polychaeta	Chaetoparia nilssoni			0,028											
Polychaeta	Eteone													0,00375	0,008125
Polychaeta	Eumida	0,026475	0,0035	0,026475		0,01765	0,0255	0,0353	0,008825	0,0905	0,008	0,0353	0,011		
Polychaeta	Hypereteone foliosa												0,0015	0,0045	
Polychaeta	Phyllodoce groenlandica	0,288												0,864	
Polychaeta	Phyllodoce rosea	0,003	0,0023	0,0023		0,0023	0,00175	0,0138	0,0035	0,00375		0,0035			
Polychaeta	Sige fusigera	0,003		0,003			0,003								
Polychaeta	Glyphohesione klatti	0,005625			0,004875	0,011625		0,0035	0,018	0,00435		0,002175	0,002175		
Polychaeta	Sigalionidae					0,1149		0,1149							
Polychaeta	Poecilochaetus serpens	0,008125								0,008125		0,00775	0,0085		
Polychaeta	Bylgides			0,013											
Polychaeta	Enipo elisabethae							0,012							

Group	Species	HESC-1	HESC-2	HESC-3	HESC-4	HESC-5	HESC-6	HESC-7	HESC-8	HESC-9	HESC-10	HESC-11	HESC-12	HESC-13	HESC-14
Polychaeta	Gattyana cirrhosa		0,128	0,099875		0,0015		0,19975	0,2705	0,19975				0,099875	0,00075
Polychaeta	Polynoidae	0,03025		0,0605											0,0605
Polychaeta	Polynoidae juv.	0,0009167		0,00275		0,0009167	0,0009167	0,0036667	0,0009167	0,001		0,0018333	0,0009167	0,01	0,0035
Polychaeta	Chone	0,004		0,3585833				0,00125							
Polychaeta	Euchone	0,00125	0,00125	0,0015			0,0025		0,003	0,00125					
Polychaeta	Jasmineira		0,00225	0,018		0,00225	0,00675						0,0045		
Polychaeta	Polyphysia crassa	0,0375	16,75575	25,40235							0,65075				
Polychaeta	Scalibregma inflatum		0,00075										0,006125	0,0815	
Polychaeta	Hydroides norvegica			0,0345											
Polychaeta	Pisione remota										0,0007582			0,2972131	0,0022746
Polychaeta	Sthenelais limicola	0,0653333	0,1306667				0,119		0,1306667		0,27075	0,13875			
Polychaeta	Sphaerodorum gracilis		0,00025				0,00225			0,0025	0,00125				
Polychaeta	Aonides paucibranchiata													0,0095	
Polychaeta	Dipolydora		0,012	0,0824444			0,0025157				0,01425		0,034	0,0169	0,003
Polychaeta	Laonice		0,00525	0,008						0,0065					
Polychaeta	Prionospio	0,0013542			0,01	0,004		0,0040625	0,0013542	0,0016667	0,0027083		0,00875	0,0108333	
Polychaeta	Prionospio dubia		0,008		0,024	0,033	0,024	0,04	0,045	0,04					
Polychaeta	Prionospio fallax	0,0791136	0,04554	0,0664231	0,0253125	0,1103229	0,0595833	0,2106552	0,1325714	0,1054545	0,028725	0,0411486	0,2465426		
Polychaeta	Prionospio multibranchiata	0,01125		0,006			0,0035	0,00375		0,001875	0,00525	0,004			
Polychaeta	Pseudopolydora paucibranchiata	0,00215	0,00645	0,00975	0,02	0,008125	0,0084	0,00825	0,0225	0,0043	0,00215	0,00275	0,002		
Polychaeta	Scolelepis				0,0135	0,00475									
Polychaeta	Scolelepis korsuni							0,0585	0,00975	0,00975					
Polychaeta	Spio										0,00975		0,063375		
Polychaeta	Spionidae juv.													0,0036059	
Polychaeta	Spiophanes bombyx											0,016			
Polychaeta	Spiophanes kroyeri	0,2886	0,1993636	1,09	0,1141875	0,35625	0,2647059	0,4136	0,2154167	0,1503333	0,315	0,0861	0,030375		
Polychaeta	Exogone verugera														#VALUE!
Polychaeta	Syllidae														0,0025157
Polychaeta	Artacama proboscidea								0,25925			0,7880833			
Polychaeta	Lanice conchilega		3,3405				0,20025								
Polychaeta	Lysilla loveni				0,13325					0,13325					
Polychaeta	Pista		0,3226111	0,6452222											
Polychaeta	Polycirrus	0,0535	0,02325	0,0205	0,274		0,0695	0,036	0,0245	0,03475	0,02225		0,03475		0,03475
Polychaeta	Thelepus cincinnatus			1,69825											
Polychaeta	Travisia forbesii	0,11985													
Polychaeta	Terebellides	0,2841667	0,11475	0,1063333	0,07095	0,108	0,06	0,0546	0,0975	0,0700833	0,028	0,0285			
Polychaeta	Trichobranchus roseus	0,2531429	0,4763864	0,2025	0,392875	0,15875	0,83725	0,05325	0,163625	0,1625	0,6377143	0,05175			
Polychaeta	Trochochaeta multisetosa	0,1435													
Mollusca	Abra alba								1,6645						
Mollusca	Abra nitida	1,72095	2,625975	0,33625	2,3839444	8,7059318	0,5727857	8,905	9,8605	1,0455	2,3348571	0,3096	0,3873713		
Mollusca	Arctica islandica			210		155			505		120	242,5	240		
Mollusca	Arctica islandica juv	0,031	0,0425		0,00975		0,0155			0,0155		0,0155			
Mollusca	Astarte montagui		3,5325										0,0195	7,106	
Mollusca	Astarte sulcata		5,73525												
Mollusca	Caudofoveata	0,0378021				0,0378021		0,0756042	0,0155	0,0908333	0,2955	0,051	0,0378021		

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Mollusca	Chamelea striatula	0,553											0,458		
Mollusca	Cochlodesma praetenue													0,08775	
Mollusca	Cylichna cylindracea	0,186	0,082	0,0297963	0,0148981	0,007	0,1525	0,0148981	0,0125	0,09975	0,0045	0,0705	0,28125		
Mollusca	Dosinia lupinus				2,25		2,25					13,25			
Mollusca	Ennucula tenuis	0,0722281	0,1545	0,1444563	0,2166844	0,279	0,0625	0,771875	1,27665	0,01125	0,06195	0,621	0,0722281		
Mollusca	Eulimella						0,0025								
Mollusca	Euspira nitida		0,031	0,02625				0,02275	0,012		0,01425				
Mollusca	Fabulina fabula														0,073
Mollusca	Heteranomia squamula			0,084											
Mollusca	Hiatella arctica			0,33225			0,11075								
Mollusca	Hyala vitrea		0,015	0,0039562	0,0396	0,014	0,0375	0,0605	0,04	0,0039562	0,0197813	0,015825	0,019		0,00225
Mollusca	Iothia fulva		0,24425	0,24425											
Mollusca	Kurtiella bidentata	0,1253077	0,23925	0,1872727	0,0195	0,0615	0,3890833	0,0826875	0,2365	0,06475	0,2513077	0,2521417	0,5149655	0,0135	0,00375
Mollusca	Leptochiton asellus		0,213	0,2553365										0,7821538	
Mollusca	Lucinoma borealis												0,8845		
Mollusca	Macoma calcarea														3,579
Mollusca	Mya arenaria		0,014625												
Mollusca	Mysia undata		1,6695					1,75					3,339		
Mollusca	Nucula nucleus	0,5802	3,7688553	0,611	0,81775	1,0505833	0,3981193	0,110075	6,0764167	5,277125	4,3712059	0,4125	0,6539474		
Mollusca	Odostomia unidentata			0,018											
Mollusca	Palliolum tigerinum		6,5												
Mollusca	Papillicardium minimum		0,014	0,0843333	0,059		0,02675	0,0210833							
Mollusca	Parathyasira equalis								0,0855						
Mollusca	Parvicardium pinnulatum													0,024	
Mollusca	Phaxas pellucidus	0,0225	0,6495	0,02125		0,003	0,006		0,56775	0,12	0,002	0,1095278	0,273		
Mollusca	Philinidae	0,065					0,0955			0,146			0,00275	0,0025	0,07585
Mollusca	Pyrgiscus rufescens						0,0035								
Mollusca	Retusa umbilicata	0,0225	0,01275	0,003		0,0035313	0,02975	0,0165	0,0035	0,0035313	0,0229531	0,00675	0,006125	0,0017656	
Mollusca	Spisula subtruncata	0,0705625			0,03425	0,01675					0,07425		0,157		
Mollusca	Tellimya ferruginosa				0,0195		0,04275			0,02025			0,012		
Mollusca	Tellimya tenella		0,024			0,0255		0,0048611	0,0246667	0,0048611		0,0194444			
Mollusca	Thracia convexa	2,627	0,144			0,4652344	1,8376875	13	0,4652344	0,6203125	0,159	0,9304688			
Mollusca	Thracia phaseolina												0,002		
Mollusca	Thyasira flexuosa	0,0525	0,095	0,01625	0,031	0,063	0,40375	0,19275	0,12925	0,15	0,4571875	0,2016	0,40425		
Mollusca	Timoclea ovata						0,00025						0,00025		
Mollusca	Varicorbula gibba	0,06325	0,00125		0,0488	0,597	0,14175	0,0605	0,028125	0,0273333	0,67375	0,0225	0,0142083	0,0475	0,0235222
Echinodermata	Ophiuroidea juv.	0,01025	0,0025	0,00375	0,00725	0,001	0,007	0,00225	0,00275	0,0015	0,00325	0,00175	0,00325	0,0005	
Echinodermata	Amphiura chiajei	3,7467809	27,297975	51,882816	27,297975	18,9813	4,2820353	8,0288162	4,8172897	4,2820353	7,61625	2,1410176			
Echinodermata	Amphiura filiformis	24,444796	19,097497	13,49426	11,611278	18,634994	31,472675	9,4723584	23,375336	49,959052	29,690833	26,583716	33,000475		0,15278
Echinodermata	Brissopsis lyrifera		40,873125		28,71825	36,13575	13,6195		17,8165	36,3576	22,42805	67,291			
Echinodermata	Leptopentacta elongata										1,9955				
Echinodermata	Echinocyamus pusillus	0,0243333											0,0486667	1,168	
Echinodermata	Echinocardium cordatum											4,072	52,423313		
Echinodermata	Ophiothrix fragilis			53,046429											
Echinodermata	Ophiura albida		4,347675	1,865			0,483075				4,6779	0,96615			

Group	Species	HESC-1	HESC-2	HESC-3	HESC-4	HESC-5	HESC-6	HESC-7	HESC-8	HESC-9	HESC-10	HESC-11	HESC-12	HESC-13	HESC-14
Echinodermata	Ophiura robusta			0,35375											
Echinodermata	Psolus			11,891625											
Echinodermata	Leptosynapta	0,43							0,51775						
Crustacea	Ampelisca brevicornis					0,019		0,0275			0,0635	0,018	0,1225		
Crustacea	Ampelisca tenuicornis	0,040125	0,0536667	0,173875	0,0934286	0,0799	0,0624167	0,0231	0,1081	0,08875	0,075	0,0222917	0,031		
Crustacea	Paramphilochoides odontonyx												0,00025		
Crustacea	Atelecyclus rotundatus		0,045												
Crustacea	Autonoe longipes	0,00025		0,00025		0,0005	0,00025	0,000625		0,000625	0,001	0,00025	0,00025	0,00025	
Crustacea	Argissa hamatipes	0,00025			0,00025		0,0005		0,00025	0,0005	0,00025	0,0005	0,00025	0,0005	
Crustacea	Astacilla dilatata		0,0003333								0,00025		0,00025	0,00025	
Crustacea	Nototropis vedlomensis		0,0005											0,0005	
Crustacea	Cheirocratus sundevalli	0,00025			0,00025	0,00025	0,001		#DIV/0!		0,0005		0,0005	0,00225	
Crustacea	Phtisica marina			0,00025									0,00025	0,00025	0,00025
Crustacea	Crassicorophium crassicorne	0,00025	0,00025	0,00025			0,00025				0,00025	0,0005			
Crustacea	Cirripedia						0,18175								
Crustacea	Diastylis rathkei	0,049375	0,049375	0,049375	0,108625	0,088875	0,00175	0,148125	0,05925	0,17775	0,104	0,0395	0,1095		
Crustacea	Diastyloides biplicatus				0,00025	0,0005	0,00025	0,00025		0,00025					
Crustacea	Gnathia oxyuraea			0,000375											
Crustacea	Megamphopus cornutus						0,00025	0,00025	0,0005			0,00025			
Crustacea	Parajassa pelagica	0,0212037	0,1632685	0,0233241	0,0254444	0,0127222	0,0127222	0,0084815	0,0254444	0,0275648	0,016963	0,0084815	0,0063611	0,0212037	0,0360463
Crustacea	Hemilamprops roseus				0,00025										0,00025
Crustacea	Eudorella emarginata	0,008625		0,0043125	0,008625		0,01725	0,0301875	0,008625	0,073	0,02125				
Crustacea	Eudorella truncatula	0,00025	0,00025		0,00075				0,00025	0,00025	0,00075	0,000375			
Crustacea	Leucothoe lilljeborgi	0,0407917	0,02225	0,0037083	0,0296667	0,0037083	0,0185417	0,0148333	0,0148333	0,0259583	0,0037083	0,0148333	0,011125	0,0037083	
Crustacea	Acidostoma obesum	0,0005	0,00025		0,00025	0,0005	0,00025				0,00025		0,00025		
Crustacea	Eriopisa elongata		0,0005		0,00025	0,0004167				0,00075					
Crustacea	Perioculodes longimanus	0,00025	0,00025		0,00025		0,00025	0,00075	0,00025	0,0005	0,001	0,0005	0,00025		
Crustacea	Synchelidium tenuimanum						0,00025						0,0005		
Crustacea	Westwoodilla caecula	0,00025	0,00025		0,0005		0,001	0,00025	0,00025	0,001	0,00025		0,00025		
Crustacea	Paguridae	2,29675												1,558	
Crustacea	Harpinia antennaria		0,0005			0,000375	0,00025		0,00025	0,00125	0,00075				
Crustacea	Harpinia crenulata								0,0005	0,0005					
Crustacea	Processa canaliculata				1,46325				2,68125	0,1335					
Crustacea	Polybius henslowii			0,0005											
Crustacea	Pseudocuma										0,00025	0,00025	0,0005	0,00025	

About DNV

DNV is the independent expert in risk management and assurance, operating in more than 100 countries. Through its broad experience and deep expertise DNV advances safety and sustainable performance, sets industry benchmarks, and inspires and invents solutions.

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