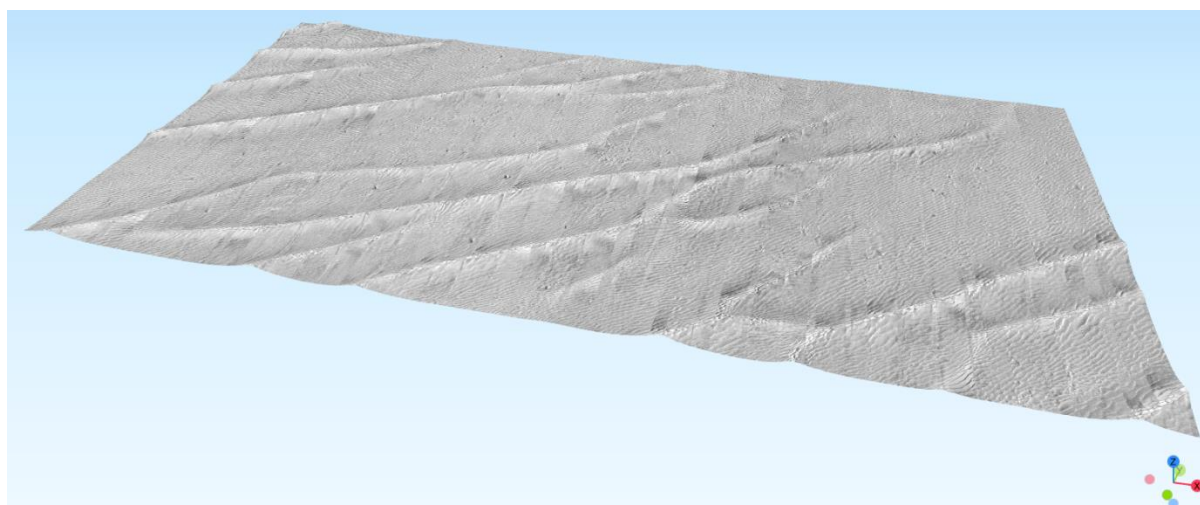


Verification of 2020 Erebus Array Habitats Interpretation against 2021 Geophysical data



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Executive Summary

MarineSpace has undertaken a review of the benthic habitats interpretation of the Erebus Floating Offshore Windfarm array area, which was based on 2020 project-specific data. These data consisted of particle size and benthic assemblages, drop down video data and geophysical data and seabed substrate interpretation. However, due to technical issues the 2020 geophysical data did not achieve complete coverage of the array area. Therefore, the habitat assessment presented by the survey contractor following completion of the 2020 survey campaign was based on an incomplete geophysical dataset.

In 2021, an additional geophysical survey was undertaken that achieved full coverage of the array area. Following the acquisition of this new geophysical dataset, MarineSpace has undertaken an appraisal of the veracity of the 2020 benthic habitats interpretation against the 2021 geophysical dataset.

The updated broad scale habitat interpretation of the Erebus array area, based on 2021 data, classified the area as circalittoral sandy mud (A5.351) and circalittoral fine sand (A5.251). This classification is consistent with the 2020 data and assessment, however, it does not account for boulder fields that are more apparent in the 2021 geophysical data (though which were not sampled via drop down video or particle size analysis).

It is suggested that 2 additional EUNIS classes: A4.2 Atlantic and Mediterranean moderate energy circalittoral rock, or A5.1 Sublittoral coarse sediment be included in the Erebus array area broadscale habitats, to include the geodiversity represented by these boulder fields.

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1. Introduction

The following report has been produced to review the Habitat Assessment conducted on the Erebus Floating Offshore Windfarm Array Area, produced using incomplete geophysical data acquired in 2020; against the 2021 geophysical data that covers the whole site.

OEL (Ocean Ecology Ltd) undertook the combined habitat assessment and environmental baseline surveys, including data acquisition and reporting, on behalf of Rovco in 2020. However the full geophysical survey scope for the offshore array was not completed by Rovco, and consequently, the Rovco/OEL deliverable “Integrated Geophysical and Habitat Assessment Report -ERE-ENG-RVC-REP-GEO-0010” (Rovco, 2021) was produced without reference to a full geophysical dataset over the offshore array. A complete geophysical dataset was acquired over the offshore array area by GeoXYZ (2021) for wider engineering/EIA purposes.

The purpose of this report is, therefore, to determine whether the Rovco/OEL habitat interpretations, based on data acquired in 2020, are consistent with the latest 2021 geophysical survey data.

1.1. Scope of Works

In order to verify the accuracy of the Rovco/OEL habitats interpretation alongside the 2021 geophysical data, the following work scope was undertaken:

- Present the existing habitats interpretation alongside the 2020 data that were used to interpret the benthic habitats;
- Assess 2021 (GeoXYZ) seabed geophysical data (multibeam bathymetry (MBES) and side scan sonar (SSS)) and seabed features interpretation; and
- Cross reference the 2020 habitats interpretation against the 2021 data and assess the compatibility.

2. 2020 Geophysical and Environmental Data

A combined geophysical and environmental survey of the Erebus array area and export cable corridor was undertaken by Rovco during 2020. Due to a number of issues, geophysical data coverage on the array area was incomplete, with the SSS coverage and resolution particularly affected. Data acquired during this campaign is shown in Figure 2-1 and Figure 2-2.

Figure 2-1. Bathymetry data acquired in 2020 during the Rovco combined geophysical and environmental survey

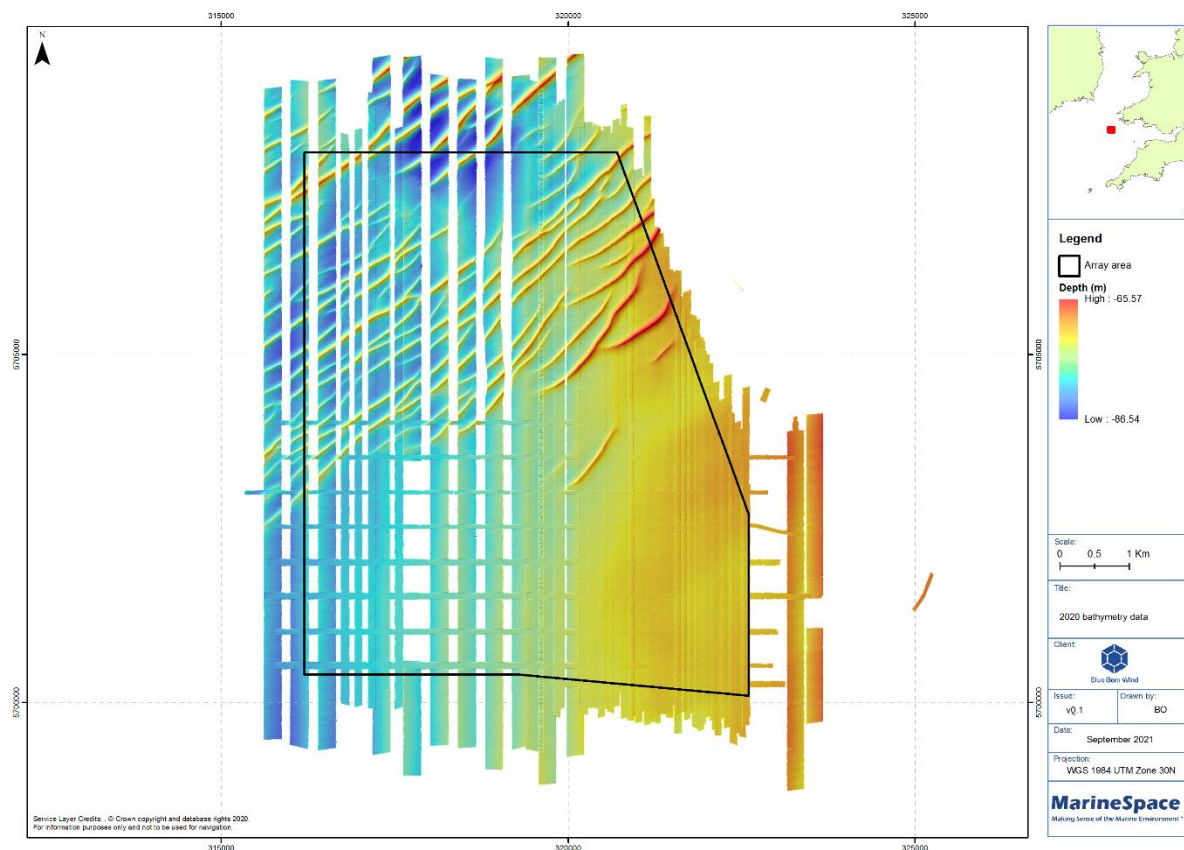
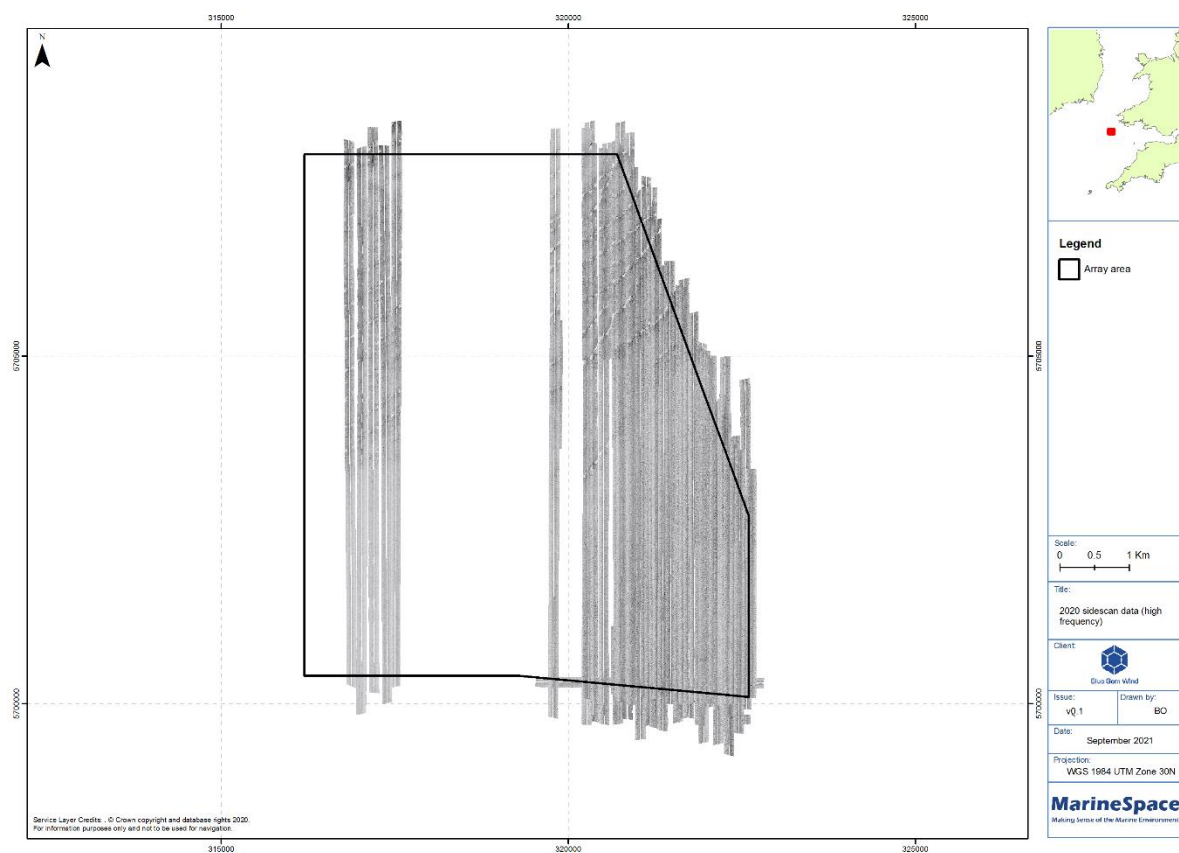


Figure 2-2. Side scan sonar mosaic from the Rovco combined geophysical and environmental survey



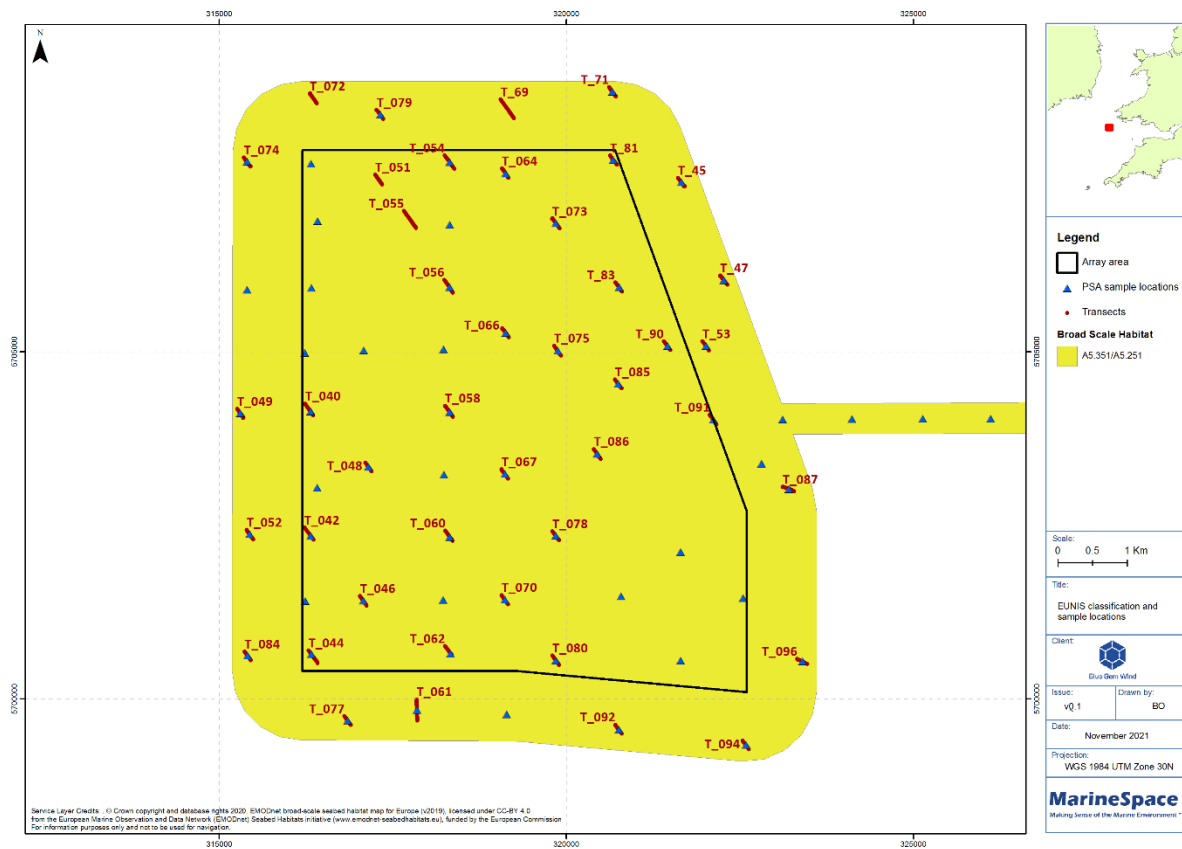
3. 2020 Habitat Interpretation

A habitat assessment for the array area was undertaken by OEL as part of the combined geophysical and environmental survey (Rovco, 2021). This assessment was based on (as shown in Figure 3-1) the 2020 geophysical data, drop down video (DDV), benthic grab data and Particle size analysis (PSA) grab data.

Following the assessment, the Erebus array area was classified as consisting of A5.351 (*Amphiura filiformis*, *Mysella bidentata* and *Abra nitida* in circalittoral sandy mud) and A5.251 (*Echinocyamus pusillus*, *Ophelia borealis* and *Abra prismatica* in circalittoral fine sand) (Rovco, 2021). This classification is consistent with the data available in 2020 and reflects the generally fine-grained PSA data, where samples from the array area were classified (descending in frequency) as muddy sand, sand, sandy mud and gravelly sand.

However, it is apparent that the geophysical data, and in particular the SSS data (Figure 2-2), from this survey is incomplete leaving the potential for habitat types that are present on the seabed to be unobserved in the data.

Figure 3-1. Particle size analysis/benthic samples, drop down video transects and broad scale habitat interpretation



4. 2021 Geophysical Data

Additional geophysical data was acquired over the Erebus Array area in 2021 (GEOxyz, 2021) providing a more complete coverage of the area. The MBES and SSS data are shown in Figure 4-1 and Figure 4-2. These data are consistent with those acquired in 2020, showing the same features, indications of substrate, and morphology, though the coverage is more complete. No additional PSA or DDV data were acquired in 2021.

Of particular note in the 2021 data are the interpreted boulder fields. This data, and the GEOxyz reporting, documents 44 areas of boulders (interpreted as such by GEOxyz) which cover a total area of 0.94 km², 2.2% of the array area (Figure 5-1).

Figure 4-1. Bathymetry data acquired during the 2021 geophysical survey

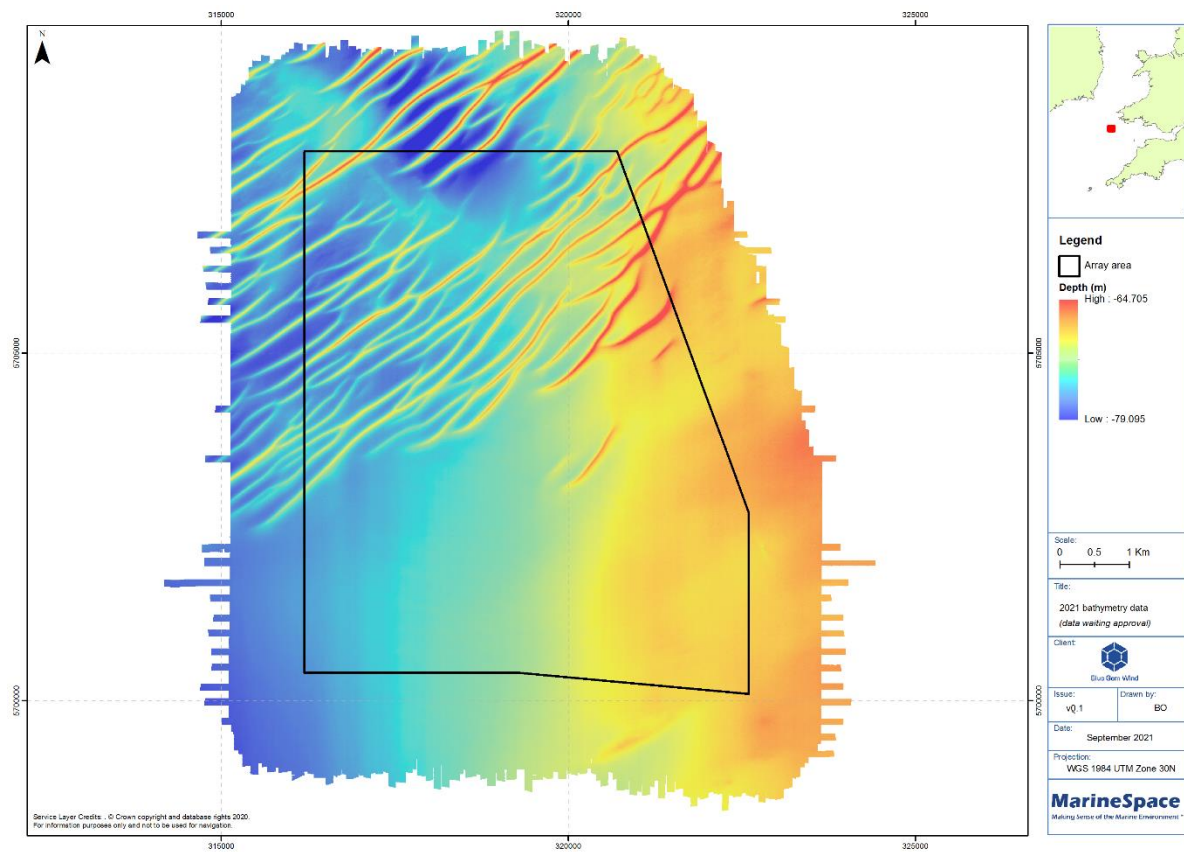
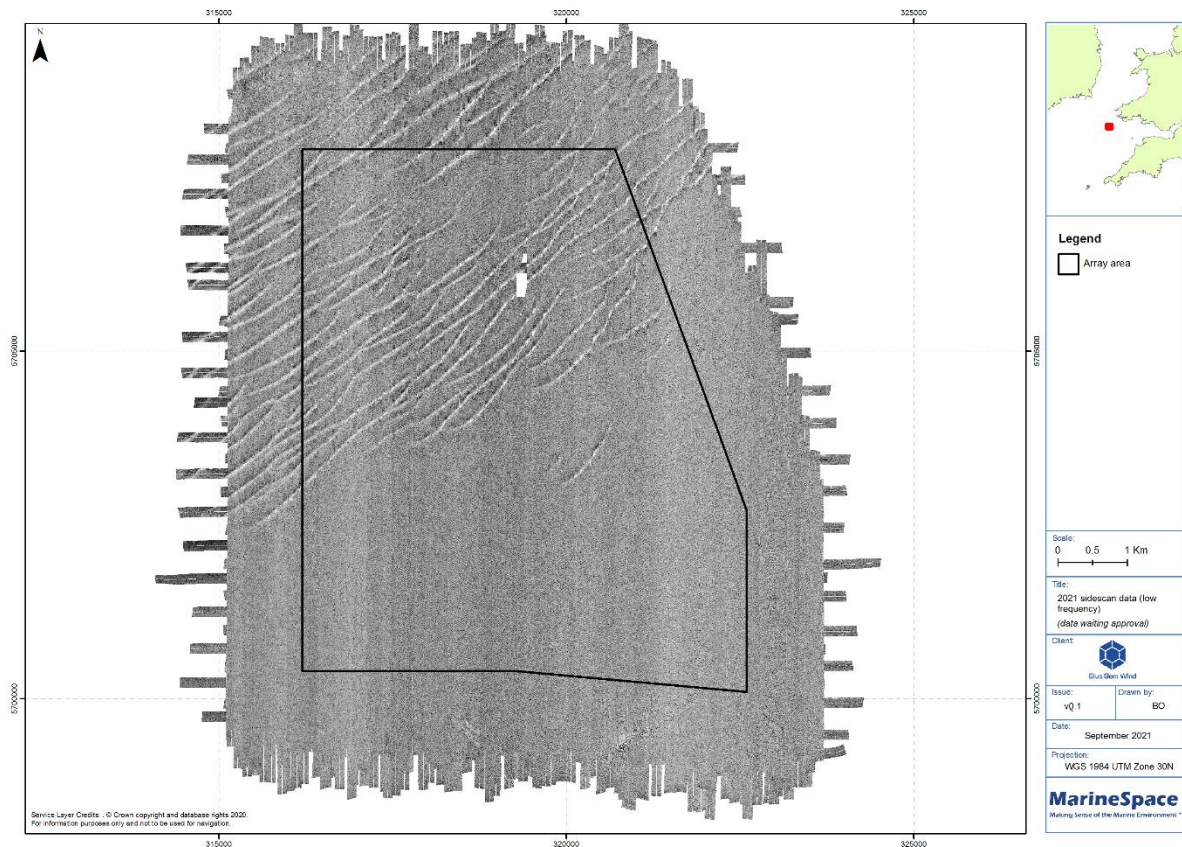
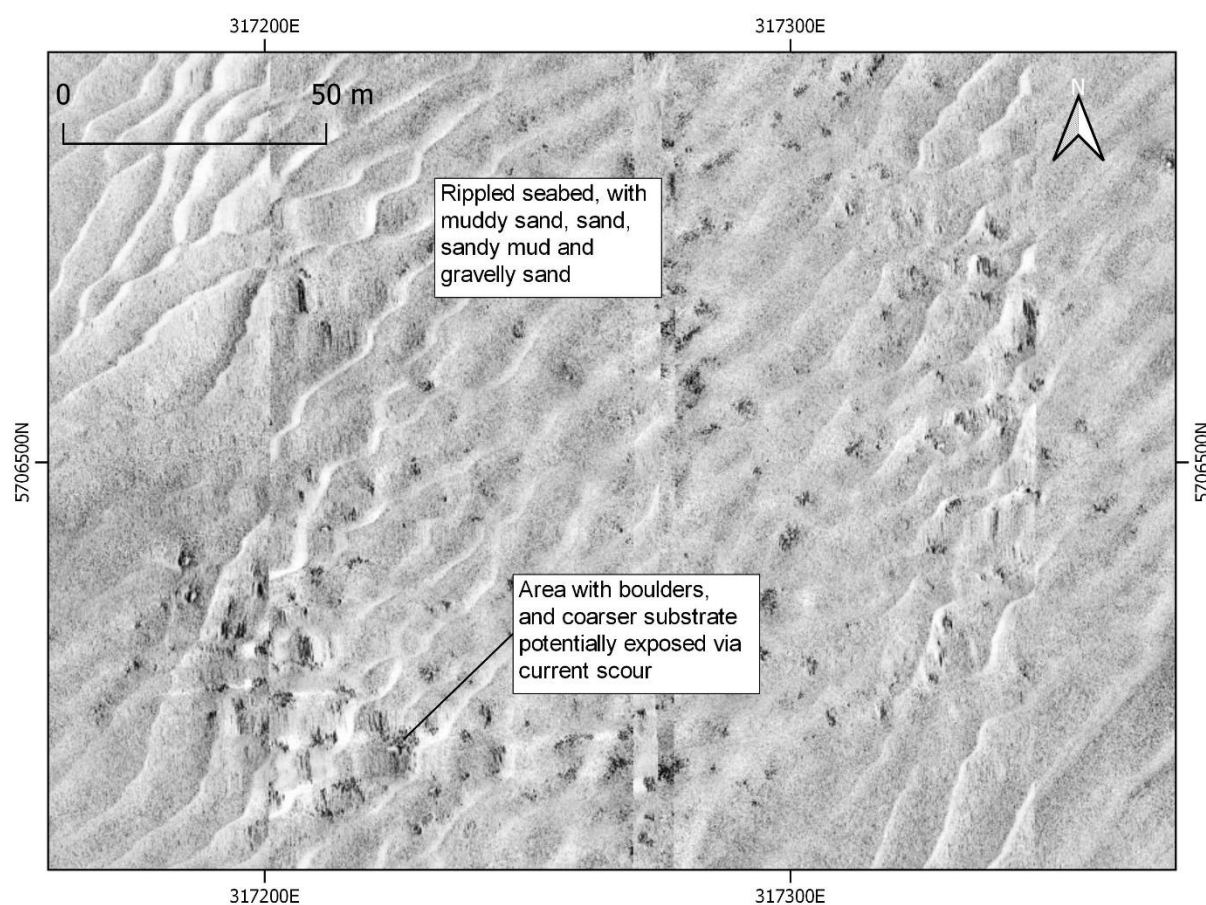


Figure 4-2. Side scan sonar data acquired during the 2021 geophysical survey



From an assessment of the SSS data in these areas it seems that in addition to boulders, other more coarse-grained sediments (i.e. gravel, cobble) may also be present (Figure 4-3), potentially as a consequence of current scour around the seabed boulders. These areas are more pronounced in the SSS data than the bathymetry, where only minor morphology is visible: at a vertical scale less than that of the adjacent sand ripples. Boulder density in the interpreted boulder fields is generally low and the areas do not display positive relief with respect to the adjacent seabed.

**Figure 4-3. Side scan sonar data example showing boulder field interpreted by GEOxyz (2021).
Annotation from MarineSpace**



5. Verification of 2020 Habitat Interpretation against 2021 Geophysical data

As stated in Section 4, the 2021 geophysical data are broadly consistent with those acquired in 2020. Thus, the 2021 geophysical data is also broadly consistent with the habitat interpretation that was undertaken using the 2020 data (geophysical, PSA and DDV).

One qualification to this statement is the boulder fields interpreted from the 2021 data (Figure 4-3 and Figure 5-1). These areas, and the potentially coarser substrate within, were not sampled via PSA or DDV analysis; and whilst Rovco (2021) did interpret boulder fields, the data did not present sufficient resolution to allow clear assessment of substrate. Therefore, these areas (which have a total interpreted area of 0.94 km²) were not captured within the 2020 habitat interpretation, which characterised the seabed as consisting of circalittoral sandy mud and circalittoral fine sand (A5.351 and A5.251, respectively).

Figure 5-1. Broad scale habitat interpretation based on Rovco 2020 data and boulder fields from GEOxyz (2021)



It is recommended that the broad scale habitats interpretation for the Erebus array area be updated to include reference to an additional broad scale habitat type, which would be spatially coincident with the boulder fields as interpreted by GEOxyz (2021), as shown in Figure 5-1.

There are two potential EUNIS classes for these areas, summarised in Table 5.1.

Table 5.1. Potential EUNIS classifications to use for boulder fields (EUNIS, 2021)

EUNIS Code	Classification Name	Description	Comments regarding suitability for boulder field areas
A4.2	Atlantic and Mediterranean moderate energy circalittoral rock	Mainly occurs on exposed to moderately wave-exposed circalittoral bedrock and boulders, subject to moderately strong and weak tidal streams. This habitat type contains a broad range of biological subtypes, from echinoderms and crustose communities (A4.21) to <i>Sabellaria</i> reefs (A4.22) and circalittoral mussel beds (A4.24).	Areas of boulders at circalittoral depth match the observed boulder fields. Though interpreted boulder fields are not densely packed boulders, but rather areas with boulders and other substrate.

EUNIS Code	Classification Name	Description	Comments regarding suitability for boulder field areas
A5.1	Sublittoral coarse sediment	Coarse sediments including coarse sand, gravel, pebbles, shingle and cobbles which are often unstable due to tidal currents and/or wave action. These habitats are generally found on the open coast or in tide-swept channels of marine inlets. They typically have a low silt content and a lack of a significant seaweed component. They are characterised by a robust fauna including venerid bivalves	Shown in Figure 4-3, boulder areas also consist of gravel and cobble substrate (as well as finer grained material).

6. References

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Rovco (2021), Blue Gem Wind Project Geophysical and Environmental Final Survey Report. Document No. ERE-ENG-RVC-REP-GEO-0010ERE-ENG-RVC-REP-GEO-0010. Rev. A06.

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